10-6-165

DCRHID

bcc: J. M. Anderson
G. T. Leatham
W. C. McDaniel
J. R. Melvin
R. V. Parekh
J. W. Peckis
E. B. Poser
C. Rau
G. H. Shah
C. Turnbow
J. B. Violette
J. F. Warren

IN REPLY PLEASE REF.

BLP 14366

R

MAR 12 '81 135708

Mr. E. M. Mead
Pennsylvania Power & Light Company
P. O. Box 1870
Allentown, PA 18105

Subject: Susquehanna Steam Electric Station
Units 1 and 2 - Job 8856
Service Water Anchor Schedule PS 1019

Dear Earle:

Attached is Revision 0 of the Service Water Anchor Schedule, PS 1019, dated 2/27/81.

Evaluation of the loads transmitted by the buried service water lines in the yard indicates that problems exist with the present design of restraints where the lines enter the Reactor Building, Emergency Service Water Pumphouse and the Diesel Generator Building, and also where the lines pass through the ESW valve pit.

To correct the problem at the Reactor Building wall we have identified two alternatives. Alternative one is to replace existing guides with anchors. Alternative two is to anchor the lines to the "Big B" foundation in the yard.

This schedule incorporates Alternative 1. Alternative 2 is pending Field investigation as to its feasibility.

The design of the anchors for remainder of the buildings will proceed as per this schedule regardless of the outcome of the Reactor Building alternatives.

Presently, this schedule is projecting 12 weeks of negative float to the June 1, 1981 Fuel Load.

May 22nd 1981

Very truly yours,

E B Poser

E. B. Poser
Project Engineer

Written Response Req'd: No
JMA/IAS/crm
(CS22/5)

Attachment: Service Water Anchor Schedule PS 1019

cc: J. Gordon
R. Mazzini
R. Shovlin

e No. _____

SUSQUEHANNA STEAM ELECTRIC STATION
ENGINEERING DELAY/CHANGE NOTICE
JOB 8856

BECHTEL

re: DCR-410

PLEASE ROUTE EXPEDITIOUSLY

Routing	Init	Route	Date
Project Admin		E	
Civil	Jjm	1	2/17/81
Mech		3	
CS			
Plant Design		2	2/24/81
Electrical			
Arch			
CE			
EPPR			
APE		4	
APE			
PE			
Project Admin			

Total Hours	

1) STRUCTURE, SYSTEM OR COMPONENT Buried piping - RHR & ESW Lines.

2) REQUIRED BY, REFERENCES DCR 410

3) CAUSE

Engineering Development ☒ AEC Requirement ☐

Client Preference ☐ Construction Requirement ☐

Other

4) DESCRIPTION OF CHANGE Thermal analysis has been reassigned to civil group. Determine anchor forces of pipes and check structures for new loads.

5) EFFECT ON OTHER STRUCTURE, SYSTEM, OR COMPONENT

6) ENGINEERING SCHEDULE EFFECTS

7) ESTIMATED ENGINEERING MANHOURS: (ALLOCATE MANHOURS TO APPROPRIATE ACTIVITY)

CIVIL 2130		MECH 2143		CS 2155		PD 2145		ELECT 2190		ARCH 2135		CE 2174							
ACT	M/H	ACT	M/H	ACT	M/H	ACT	M/H	ACT	M/H	ACT	M/H	ACT	M/H	ACT	M/H	ACT	M/H	ACT	M/H
400	230	400		400		400	100	400		400									
410		410		410		410		410		410									
420		420		420		420		420		420									
440		440		440		440		440		440									
450		450		450		450		450		460									
480		460		460		480		480		480									
490		490		490		490		490		490									
600		500		500		500		500		550									
610		520		550		520		550		680									
620	2310	530		570		530		570		690									
630		550		580		590		580		750									
640		560		760		790	960	700		910									
650		580		900		800		710		930									
660		820		910		810		720		940									
670		850		920		820		730		950									
780		860		920		830		740											
910		900		930		840		750											
930		910		940		850		760											
940		920		950		860		900											
950		930				870	1960	910											
		930				880		920											
		940				890		930											
		950				900		940											
						910		950											
						920													
						930													
						940													
						950													
2540						3020													

8856-8-20 (7/77)

PROVIDE BREAKDOWN OF MANHOURS AND/OR INFORMATION TO SUBSTANTIATE THE REQUEST. (NUMBER OF DRAWINGS OR OTHER DOCUMENTS TO BE PREPARED OR CHANGED, NUMBER OF PEOPLE NEEDED AND DURATION, ETC. ADD WORK SHEETS IF NECESSARY.)

Civil: Thermal analysis 2 m. - 1 mo. = 350 MHS
Check for 24 anchors @ 40 Hrs = 960
Redesign of 4 @ 250 = 1000
Act. 620 = 1310
Act. 400 - Admin. 230

PD: STRESS : PIPING FLEX. & EQUIPMENT NOZZLE ALLOWABLE CHECKING FOR 24 ANCH. @ 40 HRS / ANCH. = 960 HRS.

Account 6792

ACCT. NO. KB72 PIPE SUPPORT GRP.
REDESIGN & REDRAW 24 ANCHORS @ 20 Hrs/Anc. = 480 MHS.
PREPARE AND CHECK 24 ANC CALCS @ 20 Hrs/Anc. = 480 MHS.
REDESIGN & REDRAW 4 SUPERSTRUCTURE ANC. @ 100 Hrs/Anc = 400 MHS.
PREPARE AND CHECK 4 SUPERSTRUCTURE ANC CALCS @ 150 Hrs/Anc = 600 MHS.
TOT = 1960 MHS.

M400 - 100 mh for Supervision & Intra discipline coordination time

EFFECT ON COST

MAJOR ☐ MINOR ☒ EVALUATION REQUIRED ☐ COST TREND ITEM NO. _____

10) RECOMMENDED ACTION _____

11) COMMENTS _____

TOTAL MANHOURS REQUESTED	
TOTAL MANHOURS APPROVED	

Requested by/Date
W. Tuesley 2/17/81
Originator

Review / Date
2/17/81.
Group Leader / Group Supervisor

Approved / Disapproved / Date
Proj Engr/Asst PE

Dist:
Orig: Project Admin.
Discipline Group Supervisor

☐ SCOPE
☐ OTHER

8356-S-20 (7/77)

RESOLVED OTHER TRENDS

End Number	Class	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
6-163 CR 415	1C	Additional work required for redesign of 58 pipe whip restraints outside containment, Units 1 and 2 (21,300 Direct MHRs).	1,000	Critcl	Revised load requirements on these pipe whip restraints.	BLP 14335 3/9/81	Design and construction work are in progress.
6-165 410	1C	Allowance for modifications to the pipe anchors of RHR and ESW yard piping. (20,000 Direct MHRs).	1,000	See Remark	Increased anchor loads for Reactor Building, ESSW pumphouse, diesel generator building and yard valve vault. Redesign of wall anchors will be necessary to accommodate increased loads due to thermal analysis of buried lines. Some existing anchors will be changed to guides where possible.	BLP 14060 2/12/81 BLP 14366 3/12/81	1) Schedule transmitted on 3/12/81. 2) Engineering design in progress. Completion date 5/22/81. 3) Schedule impact: twelve week negative float to 6/1/81 Fuel Load.
6-186 6-2 248 ✓		Increase in labor cost for pipe restraints in Unit 1 Reactor and Containment. (No Unit 2 included) (30,000 Direct MHRs).	880	See Remark	Revised forecast for modification of existing installed restraints and completion of those remaining to be worked.		1) Possible manpower density in containment could impact the overall schedule activity. Completion forecast of 4/15/81. 2) Engineering included in Forecast 10.

s U = Uneval.

/2)

10-6-81

PENNSYLVANIA POWER & LIGHT

TRENT 56-2

Trend 10-6-86

Resolved - ~~Type~~ OTHER

TAKEOFF
PRICED
CHECKED
AP
DATE
SHEET

BASE FORECAST NO.

	MANHOURS	TOTAL COST MATERIAL	LABOR	O/C	TOTAL
RY					
DIRECT COSTS	30,000		517200		
TABLE LABOR @ 25% DIRECT MH COMP 15.86	7,500		119100		
TABLE MATERIAL @ $12.00 DIRECT MH		75000			
NUAL @ 42% DIRECT MH 12.63	12,600		159100		
NCT @ %					
SUBTOTAL		1900	7000		
DH 10% ON 25% OF DIST COST		76900	802400		879300
ELD COST					

See attached Cost Code Worksheet

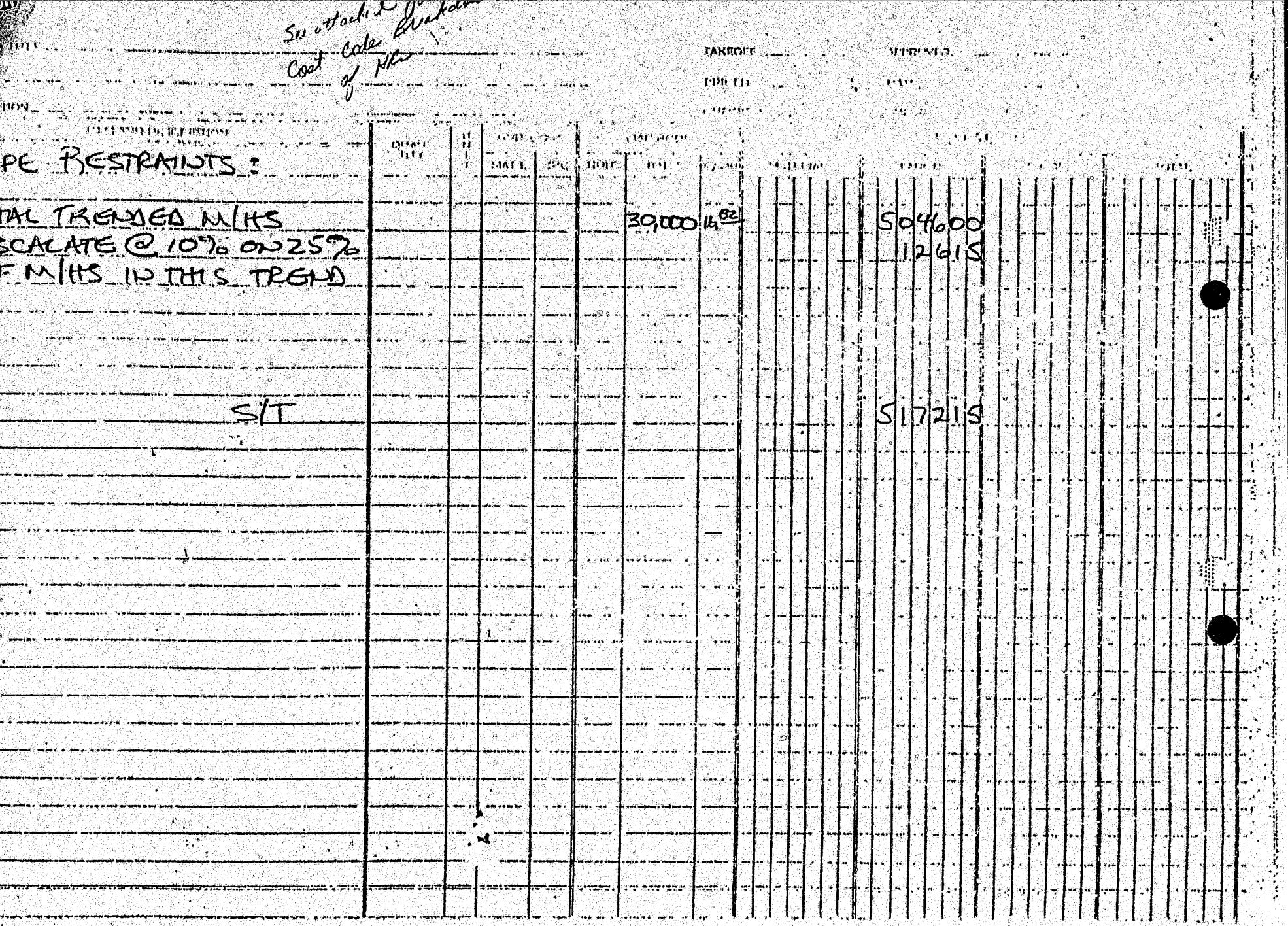
PE RESTRAINTS:

TAL TRENDED M/HS 39,000 14.82 504600

SCALATE @ 10% ON 25% 12615

F M/HS IN THIS TREND

SIT 517215



BECHTEL

MEMORANDUM

TO: TOM CLARKIN

FROM: JIM TRUJZO

LOCATION

DATE: FEB 3, 1981 19

SUBJECT: IM & IR PIPE RESTRAINTS

JOB NO.

FILE

THE FOLLOWING ARE THE TRUNNIONS REQUIRED FOR THE IM2260 & IR2260 PIPES.

IM - ~~6,000~~ 12,000 TRUNNIONS

IR - 18,000 TRUNNIONS

3/31 QK
Any Unit
projected on D/C
no way of knowing
after condition
IR22.60
Master
how relate to DCR
58 pipe whip restraint
outside containment
not related
SHT 1

REF C-1080 SHT 1 REV 9
C-1050 SHT 2 REV. 2

DCR 248 is noted on dwg.
As Built Program

PR 105, 107, 109, 110, 111.

cut PR in 2 PLACES
scrap center piece
grind and bevel cut surfaces
fab new center piece
add plates where required
rewld with backing strip
grind off backing strip
Xray
clean up, etc.

New steam pipe penetration different from DCR 4

5 x 2000 = 10,0

PR 104, 106, 108

add stiffener plates where required
weld, grind, Xray

3 x 1000 = 3000

PR 104, 105, 106, 107, 108, 109, 110, 111

add W24 x 110 beam between PR
cut and weld beam, grind
rough walls, grout CP & CA line
5 pieces per assembly x 2 = 10 pieces

10 x 200 = 2000

PR 96, 97, 98, 99, 100, 101, 102, 103

rework steel beams between PR's
cut existing beams, grind
add plates and slim
weld grind 1 x ray

8 x 200 = 16

add new pieces of steel at ends

4 x 200 = 80

PR 96 & 100

notch out existing steel
add plate
weld, grind
cut out existing plate and move it to clear new plate
rewld, grind

2 x 400 = 80

18,20

Hrs will include c/s for time, other crafts and DISTRIBS.

SAY 18,00

Work finished

BECHTEL

CALCULATION SHEET

DESIGN BY IPT DATE 1-29-81 CHECKED BY DATE SHEET NO.

SUBJECT PR Unit 1 Containment JOB NO.

SUBJECT Issue: F/C 11 Backup CALCULATION NO. FILE NO.

PR #		
219	Rework reinforcing plates	150
27	"	150
28	NCR 6195 -	100
95	Rework maple row	100
214	Rework NCR 6800	200
220		200
* 801	installed since F/C 10	3000
802	reworked as per NCR 6273 → rework restraints	
901	S/B restraints being done F/C 10	coded
902		
18	rework interf. with HSRV's	1500
19	C/S FAO big MH's	
502	NCR 4907 - rework	200
212	welding	200
	PR 69 PR 67	200
		6000
	Add - work still being performed 2/6/81	6000
		12,000

* Actual Hrs for PR 801 & 802 = 2550 as of 1/25/81
Work still to go say 3000 hrs

→ above restraints running extremely high and late. + mostly night shift work.

RESOLVED SCOPE TRENDS

nd oer	l a s s	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
7-41 7-1	1C	Additional Engineering and construction to support New Loads requirements: o Increase in pipe supports for Unit 1 (180,000 Direct MHRs). $6,800K o Additional pipe supports in Unit 2 based on current estimated quantities and rates on Unit 1. (180,000 Direct MHRs) $7,100K o Allowance for additional Engineering and Home Office to support New Loads Phase 3, Units 1 and 2 (200,000 Engineering and Home Office MHRs). $10,600K	24,500	Critcl	The addition of New Loads Phase 3 which adds 600 large pipe and 2900 small pipe hangers. (see above) Engineering has been directed to initiate the New Loads Phase 3 analysis.		1) Direct schedule impact to Unit 1 Fuel Load. 2) Construction on Unit 1 to be completed by 11/16/81. 3) Ref. Trend 10-2-41 for additional large and small pipe hangers due to New Loads, Phase 1 and 2. 4) Ref. Trend 10-4-110 for additional Engineering due to New Loads.

U = Uneval.

)

MAY 22 '81 14 03 81

14-7-41

PA 2 7,100,000
PART 3 10,600,000
24,500,000

TREND NO. 7-41 SCOPE

TITLE Summary

TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

TION BERWICK, PA

TAKEOFF

PRICED GK

CHECKED

APPROVED

DATE 5/14/81

SHEET 1 OF 1

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
ECT ACCOUNTS:											
IL											
CHANICAL											
NG						360,000					
TRUMENTATION											
CTRICAL											
DIRECT COSTS						360,000		—	6055200		6055200
TRIBUTABLES:											
NUAL						90,000			1429200		1429200
TERIAL								900000			900000
MANUAL						151,200			1909600		1909600
DISTRIBUTABLE COSTS								900000	3338800		4238800
FIELD COST								900000	9394000		10294000
GINEERING						151,000	50				7550000
ME OFFICE						45,000	38				1710000
ENGINEERING & HOME OFFICE						196,000					9260000
ITINGENCY											2058000
ALATION											2888000
											24500000

SFP-20052

TREND NO. 7-41 (PART 1)

TITLE Unit 1 - Phase 3 Pipe Hangers

SCOPE

JEHANNA STEAM ELECTRIC STATION - 8856

SYLVANIA POWER AND LIGHT COMPANY

CK, PA

TAKEOFF _____ APPROVED _____

PRICED 9K DATE 5/18/81

CHECKED _____ SHEET 1 OF 2

AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
TS:											
						180,000					
ON											
TS						180,000	16.82	0	3027600		3027600
S:											
% of D.L MH						45000	15.88		714600		714600
2.50/D.L. MH								450000			450000
42% of D.L. MH						75600	12.63		954800		954800
BLE COSTS								450000	1669400		2119400
								4500000	4697000		5147000
G & HOME OFFICE											
@ 20%											1029000
@ 10%											624000
											6800000

TITLE Unit 1 - Phase 3 Pipe Hangers

TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

LOCATION BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED JK DATE 5/18/81

CHECKED _____ SHEET 2 OF 2

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
ated Qty. per Jim Easton 4/29/81 Phase 3 New Loads											
e Pipe 120 - New	600	EA	120 @ 500		150	90,000		60000			
480 - Revision			480 @ 100					48000			
l Pipe 100 - New } Detailed	2900	EA	200 @ 500		60	174,000		100000			
100 - Rev. }			2700 @ 100					270000			
1350 - New } Simplified											
1350 - Rev }											
10 + Trend 10-2-41 Credit						<85,000>		<577000>			
TOTAL THIS TREND						179,000		<99000>			
				Say		189,000		Say -0-			

TREND NO. -7-41 (PART 2)

TITLE Unit 2 - Phase 3 Pipe Hangers

& TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

CATION BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED JK DATE 5/11/81

CHECKED _____ SHEET 1 OF 2

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
RECT ACCOUNTS:											
VIL											
ECHANICAL											
PING						180,000					
STRUMENTATION											
ECTRICAL											
T DIRECT COSTS						180,000	16.82	0	3027600		3027600
STRIBUTABLES:											
NUAL @ 25% of D.L. MH						45,000	15.88		714600		714600
TERIAL @ $2.50 / D.L. MH								450000			450000
NMANUAL @ 42% of D.L. MH						75,600	12.63		954800		954800
T DISTRIBUTABLE COSTS								450000	1669400		2119400
T FIELD COST								4500000	4697000		5147000
GINEERING											
ME OFFICE											
T ENGINEERING & HOME OFFICE											
NTINGENCY @ 20%											1029000
CALATION @ 15%											924000
											7100000

BECHTEL

TR [illegible] S. [illegible]

TITLE Unit 2 - Phase 3 Pipe Hangers

NO. & TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

NT PENNSYLVANIA POWER AND LIGHT COMPANY

LOCATION BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED JK DATE 5/11/81

CHECKED _____ SHEET 2 OF 2

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	MAN HOURS $/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
Assumption: Unit 2 qtys. are equal to Unit 1 and Unit rates equal to Unit 1 unit rates. To Ho Unit Rates per Fold-in Twin											
per Jim Baston 4/29/81 - Unit 1 qtys. per Phase 3 New Loads											
Large Pipe 120 - New 480 - Rev.	600	ea	120@500 480@100		150	90,000		60000 / 48000			
Small Pipe 100 - New } Detailed 100 - Rev. }	2900	ea	200@500 2700@100		60	174,000		100000 / 27000			
1350 - New } Simplified 1350 - Rev. }											
C10 + Trend 10-2-41 Credit						(85,000)		(57000)			
TOTAL THIS TREND						179,000		(99000)			
					say	180,000	say				

CODE

0052

BECHTEL

TREND NO. 7-41 (PART 3) SCOPE

TITLE Increase in Engr. + Home Office for New Loads Phase 3

T NO. & TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

ENT PENNSYLVANIA POWER AND LIGHT COMPANY

T LOCATION BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED JK DATE 5/11/81

CHECKED _____ SHEET 1 OF 2

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	MAN HOURS $/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
DIRECT ACCOUNTS:											
CIVIL											
MECHANICAL											
PIPING											
INSTRUMENTATION											
ELECTRICAL											
S/T DIRECT COSTS											
DISTRIBUTABLES:											
MANUAL											
MATERIAL											
NONMANUAL											
S/T DISTRIBUTABLE COSTS											
S/T FIELD COST											
ENGINEERING (usage rate includes job shippers)						151,000	50				7550000
HOME OFFICE @ 30% of Engr.						45,000	38				1710000
S/T ENGINEERING & HOME OFFICE						196,000					9260000
CONTINGENCY 20% on TO Mo MHRs. Engr.	36,000	F/C	10 Cost	1 and 10 #-110 Cost							-0-
ESCALATION @ 15%			< 1. >	< 23,000 >							1340000
											10,600,000

BECHTEL

TITLE Increase in Engr. & Home Office for Berlin Sheet 5

NO. & TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

T PENNSYLVANIA POWER AND LIGHT COMPANY

OCATION BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED JK DATE 5/11/81

CHECKED _____ SHEET 2 OF 2

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
ENGINEERING											
8856-001 TO DATE 3/27/81						331,700					
TO GO - Per Unit 1 & Common Workplans (Phase 3 began on 4/1/81)						90,000					
Unit 2 - Assumes Phase 3 is same as Unit 1		Phase 3				90,000					
TOTAL ENGR						511,700					
						say 512,000					
F/C 10 Credit (Both Units combined)						<250,000>					
Trend 10-4-110 Plant Design Credit						<111,000>					
TOTAL ENGR. THIS TREND						151,000					

ODE

20052

BECHTEL

10-7-41

ENGR. & HOME OFC.

5/8

ENGR.

	To Date 3/27/81		UNIT 1 TO GO 4/81 → (Phase 3)	ASSUME UNIT 2 TO GO (Phase 3)	20% Contingency ON TO GO		Remain TOTAL F/C	F/C to ✓ 10-4-110	TH -TR
Engr.	331,657		86,815	86,815	34,700		540 K	383K	19
157,000 MHrs @ $50/MH (to include jet ckoppe rate)							=	7,850	
Contingency (incld. w/MHrs)									
Escal. @ 10%								750	
								8,600	

HOME OFC.

30% of Engr. MHrs treated above									
47,000 MHrs @ $38/MH								1,786	
Contingency (incld. w/MHrs)									
Escal. @ 10%								179	
								1965	
							say	2,000	

BECHTEL

10-7-41

Excluded Unit 2 :: Revised 5/ 4/81 sht

NEW LOADS ANALYSIS - ENGR.

	MHRs	#			
F/C 10 (Both Units)	~~250,000~~ ~~264,000~~	9,237	271 Less Environ. of 21,000 =		
TREND 10-4-110					
PLT. DESIGN	111,000				
Contingency (20%)	~~22,000~~				
To Date, Included F/C	383 ~~394,000~~				
8856-001			TO GO 4/81 →	20% Contingency on TO GO	
Engr. TO DATE 3/27/81		331,657	86,815	17,400	
TPE (per Report JC820)					
Engr. To Date 4/10/81 per EPPR 101-C		361,454			

This Trend : 436 less ~~394~~ 393 = ~~42,000~~ 53,000 MHRs @ ~~38~~ 50/MH

(MHRs include Contingency MHRs) 10% Escal.

Fld. Trend

Total Trend

Say

Revised TOTAL F/C say 436,000

increased to include 1st Supplement

265,000

1,550,000

260,000

160,000

290,000

1,750,000

4,140,000

5,890,000

7,100,000

6,000,000

BECHTEL

D/1

4/2

SUMMARY ENGINEERING - PHASE III NEW LOADS

H.P.	MHRS TO GO 4/81→		COST	
CIVIL	10,300 @ $38		391,000	add'l Elect. 1,000 MHrs
P.D.	67,000 @ 38		2,546,000	
Resident Engr.	9515 @ 18.62		177,000	
S/T	86,815 MHrs	Say 90,000		3,114,000
Contingency @ 20% + adj.				623,000
Escalation @ 10%				374,000
TOTAL				4,110,000 Say 4,100,000

Notes

Ref. Engr. Workplans of 4/81 NOTE: (Workplans are in Trend 10-7 Book 2

Assume Phase III starts April 1

No reduction made for any Phase II work which was previously scheduled for after April 1 since MHRs cannot be determ

BECHTEL

Gaston checking on: duration for Phase II
review w/ Raj & Marge

7 Fitzhugh
balance of
Phase II

4/22/81
9K

Phase III New Loads – Engineering

Gaston - 7781

Plant Design

Ref. Workplan dated 3/28/81

	Man Weeks April 1 →
STRESS GROUP:	
Phase III Annulus Pressurization w/ME 101	209
Phase III ME 101 (inside cont.)	26
(outside cont.)	234
(Reanalysis for complete Phase II Calcs	44
(John Blume)	36
Phase III ME-909 Analysis	28
PIPE SUPPORT:	
Phase III Hanger Adequacy Review	212
Mat. Capacity Hanger Calculations	550
Reanalysis N.L.A. anchors	146
Review New Standard clamps, anchor bolts, liner plate	107
Layout:	
say 5% of the above	80
	1672

40 hrs/wk ~~+15% OVT~~ = ~~46 hrs/wk~~

1672 Manweeks @ ~~46~~ 40 hrs/wk = ~~76,912 say~~ 66,880 ~~77,000 MHR~~ 67,000

~~77,000~~ 67,000 MHR @ $38/MH	=	~~2,926,000~~	2,546,000
Contingency @ 20%	=	~~585,000~~	509,000
Escal. @ 10% + adj.	=	~~349,000~~	305,000
TOTAL PHASE 3		~~3860.000~~	3360000

BECHTEL

Phase II - Plant Design

4/23/

4R

Ref. Workplans dated 3/25/81

	Equiv. Manweeks 4/1 →
STRESS:	
Phase II Annulus Pressurization	253
Phase II ME 101	325
PIPE SUPPORT:	
Phase II Hanger Adequacy Review	462
Phase II Design / Redesign	69
N.L.A. anchors + liner plate (by CIVIL)	—
Review non standard clamps, anchor bolts	105
Layout:	
say 5% of the above	60
	1274

1274 @ 40 MHR/WK ≈ 51,000 MHR

BECHTEL

4/22

Phase III New Loads - Engineering

Civil Ref. Workplan dated 4/81

K. Mordasi Group:

N. Shah

K. Rajagopal (Raj.)

		MHRs
		6850
		1020
~~9900~~	2400	
~~17,700~~	10,270	
677,000	391,000	
140,000	78,000	
83,000	46,000	
900,000	515,000	

10,300
~~17,800~~ MHRs @ $38/MH

Contingency @ 20%

Escalation @ 10%

BECHTEL

4/22/8
GK

Phase III New Loads — Engineering

R.E. (per Lido Caparas)

Large pipe supports - 6 men from 6/1 — 10/1 +25% OVT
Small " " - 5 " " " " " " "

say 4 months @ 173 MHR/month + 25% OVT. = 216 MHR/month

4 months @ 216 = 865 MHR

11 men @ 865 MHR = 9,515 MHR @ 18.62 = 177,000

+ 20% Contingency 35,000

+ 10% escal. 23,000

235,000

BECHTEL

Phase 2 New Loads based on 11/80 Curves

Use MHRs associated with Phase 2 after April 1981 to deduct from Phase 3 portion.

		Manweeks
R.E. Hangers	Hp.	179
SFNO	Struts	~~2~~
SFNO	Hangers	24
		203 @ 40 MH/Week = 8,120 MHR

8120 MHRs @ $38/MH	310,000	
Contingency @ 20%	62	
Escal. @ 10%	38	
	410	Credit

STUDY NO. PD 10-2-41

TITLE LAY-UP LABOR DUE TO NEW LOADS PACKAGE

& TITLE SUSQUEHANNA STEAM ELECTRIC STATION

PENNSYLVANIA POWER AND LIGHT COMPANY

CATION BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED AK+GT DATE 11/21/80

CHECKED [illegible] 11/25 SHEET 1 OF 4

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	MAN HOURS $/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
RECT ACCOUNTS:											
VIL											
ECHANICAL											
ING						64000		564000	1080000		1644000
STRUMENTATION											
LECTRICAL											
T DIRECT COSTS						64000		564000	1080000		1644000
STRIBUTABLES:											
ANUAL 25% of D.L. MH						16000	15.18		243000		243000
ATERIAL @ $1.20 / D.L. MH								141000			141000
ONMANUAL 42% of D.L. MH						26900	12.60		339000		339000
T DISTRIBUTABLE COSTS								141000	582000		723000
T FIELD COST								705000	1662000		2367000
GINEERING											
OME OFFICE											
T ENGINEERING & HOME OFFICE											
ONTINGENCY @ 20%											475000
CALATION @ 5% - 0.1 10% - 0.2											158000
						106900					3000000

721 8FP-20052

Rev #5 2 4

I + PHASE II. (pg. 3)	170,000	1.154.000 2860 000	4014000
LO CREDIT (pg. 4)	<106,000>	<590.00 1780 000>	<2370.00>
TOTAL DIRECT INCREASE	64000	564000 1080.000	1644000

8756 - 5565

PP+L

Berwick, Pa.

TAKEOFF _____ APPROVED _____

PRICED AK + AI DATE 11/21/80

CHECKED BCW 11/25 SHEET 3 OF 4

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
T											
LARGE PIPE HANGERS	156	EA	500		125	19500		78000			
SMALL PIPE HANGERS	450	EA	500		25	11250		225000			
- L. P. HANGERS	63	EA	100		75	4725		6500			
- S. P. HANGERS - ALLOW						3500		17500			
E											
L. P. HANGERS ✓	40	EA	500		125	5000		20000			
S. P. HANGERS ✓	340	EA	500		25	8500		170000			
CONTAINMENT ✓	20	EA	500		300	6000		10000			
- L.P. HANGERS ✓	100	EA	100		75	7500		10000			
- S. P. HANGERS ✓	340	EA	100		20	6800		34000			
- CONTAINMENT ✓	60	EA	100		200	12000		6000			
						84775 ✓					
AL UNIT 1					Say	85000	16.79	577000	1430000		
FOR UNIT 2						85000	16.79	577000	1430000		
TOTAL UNIT 1 & UNIT 2						170000		1154000	2860000		4014000

20052

& TITLE _____ TAKEOFF _____ APPROVED _____

PRICED per QT DATE _____

CATION _____ CHECKED [illegible] 11/25 SHEET 4 OF 4

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST		MAN HOURS			TOTAL COST			
			MAT'L	S/C	UNIT	TOTAL	$/MH	MATERIAL	LABOR	SUB-CONT.	TOTAL
C 10 HANGERS - NEW LOADS + A.P.											
T 1											
EW - L.P. HANGERS	100	EA	500		125	12500		50000			
- S.P. HANGERS	450	EA	500		25	11250		225000			
- A.P. HANGERS	50	EA	500		500	25,000		25000			
EVISED - L.P. HANGERS ALLOW						2500		4000			
- S.P. HANGERS ALLOW						3500		17000			
TOTAL UNIT 1						54750					
T 2											
EW - L.P. HANGERS	100	EA	500		125	12500		50000			
- S.P. HANGERS	350	EA	500		25	8750		175000			
- A.P. HANGERS	50	EA	500		500	25000		25000			
VISED - L.P. HANGERS ALLOW						2000		4000			
- S.P. HANGERS ALLOW						3000		15000			
TOTAL UNIT 2						51250					
TOTAL F/C 10						106000	16.75	590000	178000		2370000

721 SEP 20052

J.T.
11/17/80

UNIT 1 & COMMON

F/C 10 NEW LOADS (HANGERS)

11/21/80

	NEW QTY	QTY'S MHRS	UNIT/RATE	HANGER REVISIONS QTY	MHRS	UNIT/RATE
..P. HANGERS	100	12,500	125 MH/EA.	—	2500	—
.P. HANGERS	450	11,250	25 MH/EA.	—	3500	—
.P. HANGERS	~~50~~	~~2500~~				
	~~50~~	~~12,500~~	500 MH/EA.	—	—	—
TOTAL		~~36,250~~ 48,750			6,000	

TOTAL MHRS = 42,250
12,500
54,750 → UNIT 1 & C

51,000 → UNIT 2

106,000 F/C 10 (56,000)
FOR NEW LOADS
& A.P. (50,000)

SCOPE + OTHER
~~$4,440~~ ~~$5,060~~
~~July $4,200~~ ~~$5,000~~

DIRECT COSTS	293,100	202500	4929900	
TAXABLE LABOR @ 75% DIRECT ST	15.88	73,275	1163600	
TAXABLE MATERIAL @ 50% DIRECT MA			732750	
NON-TAX @ 42½% DIRECT MA	12.62	123,100	1554750	
OTHER @ %				
DEDUCTION				
@10% ON 80% OF LABOR AFTER 6/81			611900	
FIELD COST		935250	8260150	9195400

SAY
#9200000

BECHTEL

O. & TITLE _____ TAKEOFF _____ APPROVED _____

T _____ PRICED _____ DATE _____

OCATION _____ CHECKED _____ SHEET _____ OF _____

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST		MAN HOURS			TOTAL COST			
			MAT'L	S/C	UNIT	TOTAL	$/MH	MATERIAL	LABOR	SUB-CONT.	TOTAL
STIMATED M/HS OVER F/CH/C						271,100	16.82		4559900		
D TRENDED M/HS											
CALATION @ 10% ON 80%									364800		
- M/HS TO BE SPENT AFTER											
B1											
UBO SHOP HANGER FAB	550				40	22,000	"	202500	3700000		
TL COST IS ADJUSTED AFTER											
2ELD 10-2-41 MTL CREDIT											
ER UNIT 1)											
CALATION @ 10% ON 80%									29600		
M/HS TO BE SPENT AFTER											
1											
S/T LABOR									4929900		
S/T ESCALATION									394400		
						293,100		202500	5324300		5526800

BECHTEL

UNIT 1 & C

HANGERS TO GO AS OF 3/10/81

LARGE PIPE

	TOTAL QTY	100 % INSTALLED	TO GO QTY	AVG. * U/R	To Go MHRS
3/6/10 IM-916, IR-1980, IT-4302, QC-68, QE-20, QG-286, QK-35, QP-253, QR-150, QW-1123	10320	9180	1140	150 MH/EA.	171,000 (514

SMALL PIPE

~~9445~~ 9686		5753	~~2692~~ 3785	60 MH/EA.	~~162,00~~ 227,1

TOTAL ~~333,0~~ 398,1

* AVG. UNIT RATE WAS BASED ON ACTUAL MAN HOURS AND CUMMULATIVE NET PROGRESS SINCE JANUARY 2, 1981. THIS WOULD MEAN THAT THE AVG. UNIT RATE WOULD INCLUDE REWORK.

NOTE includes Phase 3 ~~EXCLUDES PHASE 3 ITEMS~~

KOEHLER SCOTT

BECHTEL

3/10/81

MANPOWER FOR TO 60 HANGERS (SP & LP

MONTH	MAN POWER (170 MH/MO) EQ. MEN
MARCH	150
APRIL	300
MAY	300
JUNE	300
JULY	300
AUG.	300
SEPT	300
TOTAL	1950

COMMENTS

CURRENT MAN POWER
PROPOSED "

OR 333,000 MHRS

THIS WAS BASED ON
2692 SM PIPE HA
NOT 3785 TO GO

BECHTEL

		L.P.		S.P.			
3/2/81		2321	43	3440	93	177	feet
2/23		2866	51	3852	51	386	
2/16		2257	42	3412	93	171	

LARGE PIPE
SMALL Pipe

509-377-2501

2785

CHARLES

BECHTEL

HANGER MANHOURS (UNIT 1 & C)

MANHOUR LEFT

CWH

.5 LARGE PIPE HANGERS Other 25,000.

(14) SMALL PIPE overrun (14,000)

-6 NEW LOADS ALLOWANCE 56,000.

30 TREND ON NEW LOADS 30,000

10-2-41

97,000

0.5 0 TOTAL 127,000 HOURS LEFT

81 NEED 398,100

-93.1 TREND ~~206,000~~ MHRS

271,100

301

→ CONTRO SHOP FAB M/HS FOR 550 (ASSUME) NEW HANGERS 27,000

323

1. Split to Scope + Other use

550 @ 40/ea

5/18/81

QK

Needed - 398

- 22

- 14

434

P/L + Trench + Large Hanger Credit 111

323 say 325 to

Scope Cont

Other

Add. to total Sc

+ new other

to go m

Combo S

overrun

J.T.
11/17/80
11/21/80

UNIT 1 & C

NEW LOADS (HANGERS)

	NEW QTY	QTY'S MHRS	UNIT RATE	HANGER REVISIONS QTY	MHRS	UNIT RATE
PHASE I						
L.P. HANGERS	156	19500	125 MH/EA.	63	4725	75 MH/EA.
S.P. HANGERS	450	11250	25 MH/EA.	*	3500	—
PHASE II						
L.P. HANGERS	40	5000	125 MH/EA.	100	7500	75 MH/EA.
S.P. HANGERS	340	8500	25 MH/EA.	340	6800	20 MH/EA.
CONTAINMENT	20	6000	300 MH/EA.	60	12,000	200 MH/EA.
TOTAL MANHOURS		50250			34,525	

TOTAL ≅ 85,000 MHRS

RESOLVED OTHER TRENDS

er	Class	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
-41 -1		Increase in material and labor for pipe supports in Unit 1 (145,000 Direct MHRs).	5,500	Critcl (See Note 1)	Increase in quantities due to field conditions for rerouting and interferences (Phase 0) and due to revisions to calculations used for New Loads. (Additional quantities include approximately 500 large and 900 small pipe hangers)		1) Direct schedule impact to Unit 1 Fuel Load. 2) To be completed by 11/16/81.
-205 -2		Increase in cost of sub-contract for penetration seals (FSC-150).	3,000	Critcl	Total penetrations requiring lead seals were originally estimated by BISCO at 30% of total penetrations based on their past historical experiences. Current requirements are that 75% of total penetrations require lead seals. The Forecast 10 penetration quantity has also increased from 6,600 to 7,250. Previous S/C Value $6,650K This Trend 3,000 New S/C Value $9,650K	Field Study #677 4/2/81	1) Overrunning the 29 month contract duration is not considered. 2) Overrunning the 7,250 penetration fixes fee limit is not considered. 3) Potential exposure of additional claim for change in contract from fixed fee to cost plus for actual weight increase per seal. 4) Potential exposure for cost increase due to schedule extension and increased manpower requirement of BISCO. 5) Impact to NLRT and PLRT.

s U = Uneval.

/6)

Rev. 2, 11/4/81

16-7-41

TREND NO. 7-41 "OTHER" CHANGE

TITLE Unit 1 - Pipe Hanger Addl. Work

TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

ATION BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED JK per FW Jr. DATE 5/18/81

CHECKED _____ SHEET 1 OF 2

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	MAN HOURS $/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
RECT ACCOUNTS:											
VIL											
CHANICAL											
PING						145.00					
STRUMENTATION											
ECTRICAL											
T DIRECT COSTS						145,000	16.82		2439000		2439000
STRIBUTABLES:											
ANUAL @ 25% of D.L. MH						36,250	15.86		576000		576000
ATERIAL @ 2.50/D.L. MH								363000			363000
ONMANUAL @ 42% of D.L. MH						60,900	12.63		769000		769000
T DISTRIBUTABLE COSTS								363000	1345000		1708000
T FIELD COST								363000	3784000		4147000
NGINEERING											
OME OFFICE											
T ENGINEERING & HOME OFFICE											
ONTINGENCY @ 20%											853000
SCALATION @ 10%											500000
											5500000

9-721 SEP-20052

SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED JL pwn Sept. DATE 5/18/81

CHECKED _____ SHEET 2 OF 2

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
F57-1 Backup											
PIPE: FLD TO GO QTY	1140										
PHASE 3 - SCOPE	<600>										
BAL. TO "OTHER"	540	EA			150	81,000					
PIPE: FLD. TO GO QTY.	3785										
PHASE 3 - SCOPE	2900										
BAL. TO "OTHER"	885	EA			60	53,000					
OF MHR. REMAINING IN HANGER ACCTS.											
ARGE PIPE - UNDERRUN CREDIT						<25,000>					
SMALL PIPE - OVERRUN CREDIT						14,000					
SHOP FAB. per F57-1						22,100					
						145,000					

RESOLVED SCOPE TRENDS

d er	Class	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
-41	1B	Additional Phase III New Loads requirements: o Mechanical snubbers supports for power actuators (air and motor operators) (320 ea.) for 2" and smaller valves, Units 1 and 2. (P3A) (16,000 Direct MHRs) $1,375K	8,200	Critcl	In order for the piping to satisfy the seismic and hydrodynamic load criteria.	BLP 15552 6/19/81	
		o Increase in pipe supports for Units 1 and 2, (16,000 Direct MHRs) $650K.			Increase in large pipe supports from 600 to 614 per Unit and in small pipe hangers from 2,900 to 3,006 per Unit.		
		o Reinforcement of block walls, replacement of concrete expansion anchors, modify supports for cable tray, conduit and HVAC supports. Analyze structures and associated architectural items Units 1 and 2. (140,000 Direct MHRs)(10,000 Eng'g MHRs)		See Remark #2	Review of structures and supports for Phase III requirements.		1) Engineering to start issuing fixes 7/27/81; to be completed 11/30/81. Containment duct supports July through September, 1981. P.S. 1064 Rev. 0 2) Indeterminate on potential architectural fixes; others assumed supportive of 1/18/82 Construction Completion.

Trend	$1000's	D. Mhr 1,000's	Eng'g Mhr 1,000's
10-2-41	3,000	64	—
10-4-110	4,800	—	111
10-7-41	24,500	360	151
10-8-41	200	3	1
10-9-41	8,200	172	10
Total	40,700	579	273

U = Uneval.

/5)

4.3.1-0145368

10-9-41

TREND NO. 2 9-41

TITLE Additional Phase III New Load Reqmts & TOTAL

SUSQUEHANNA STEAM ELECTRIC STATION - 8856 w/12

PENNSYLVANIA POWER AND LIGHT COMPANY

BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED KMS DATE 7/15/81

CHECKED _____ SHEET 1 OF 1

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
CCOUNTS:											
AL											
NTATION											
L											
COSTS w/12						172,200		7990000	2920000		3719000
ABLES:											
25% DL Mhrs						43050			652000		652000
@ 2.5/DL mhr.								430000			430000
L @ 42% DL mh						72,300			911000		911000
BUTABLE COSTS								4300000	15630000		19930000
COST								12290000	4483000		5712000
NG						10,000					380000
CE						4,000					152000
ERING & HOME OFFICE						14,000	38				532000
CY 20%									1250000		1250000
N 10%									706000		706000
											57000000

BECHTEL

DYNAMIC QUALIFICATIONS
PHASE 3 U1 & U2

10-9-91

Rev 86

ACCT	MH'S	O/O		MATL $
IR20	76,000	41	X 779,000 =	327,590
2R20	16,100	9	X =	71,910
1M50	76,000	41	X =	327,590
2M60	16,100	9	X =	71,910
TOTAL	184,200	100%		779,000

NO. & TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

ENT PENNSYLVANIA POWER AND LIGHT COMPANY

LOCATION BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED _____ DATE _____

CHECKED _____ SHEET _____ OF _____

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST		MAN HOURS			TOTAL COST			
			MAT'L	S/C	UNIT	TOTAL	$/MH	MATERIAL	LABOR	SUB-CONT.	TOTAL
1R 20						70,000					
2R 20						16,100					
M 50						70,000					
M 50						16,100					
						172,200					

BECHTEL

TREND NO. 2-9-41 - PART 1 UNITS 1+2

TITLE Mechanical Snubbers for Seismic + Hydrodynamic Loads Phase III Tech Mods

NO. & TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

TAKEOFF _____ APPROVED _____

ENT. PENNSYLVANIA POWER AND LIGHT COMPANY

PRICED JK DATE 7/1/81

LOCATION BERWICK, PA

CHECKED _____ SHEET 1 OF 2

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
DIRECT ACCOUNTS:											
CIVIL											
MECHANICAL											
PIPING						16,000		640000	270000		910000
INSTRUMENTATION											
ELECTRICAL											
S/T DIRECT COSTS						16,000		640000	270000		910000
DISTRIBUTABLES:											
MANUAL @ 25% of D.L. MHrs.						4000	15.18		60000		60000
MATERIAL @ $2.50 / D.L. MH.								40000			40000
NONMANUAL @ 42% of D.L. MH						6700	12.69		85000		85000
S/T DISTRIBUTABLE COSTS								40000	145000		185000
S/T FIELD COST								680000	415000		1095000
ENGINEERING w/ 10-7-41											
HOME OFFICE											
S/T ENGINEERING & HOME OFFICE											—
CONTINGENCY @ 10% Direct on Matl. + 20% on Balance											155000
ESCALATION @ 10%											125000
											1375000

DE

(9 72) SEP-20052

LOCATION BERWICK, PA

CHECKED

SHEET ___ OF ___

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
F/C 11 WAGE RATES											
UNITS 1 + 2											
P 3A - Mechanical Snubbers for 2" and smaller valves	320	EA			50	16,000	16.80	640000	270000		910000
(Ref. BLP 15552, dated 6/19/81)					per Tom Clarke - F/C. on 7/1/81						

CODE

BECHTEL

TREND NO. 0-9-41 - PART 2

TITLE Phase 3 Pipe Hangers - Addtl.

JOB NO. & TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

CLIENT PENNSYLVANIA POWER AND LIGHT COMPANY

JOB LOCATION BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED 4K DATE 7/2/81

CHECKED _____ SHEET 1 OF 2

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
DIRECT ACCOUNTS:											
CIVIL											
MECHANICAL											
PIPING						16200		340000	270000		304000
INSTRUMENTATION											
ELECTRICAL											
S/T DIRECT COSTS						16200		340000	270000		304000
DISTRIBUTABLES:											
MANUAL @ 25% of D.L. MHrs						4050	15[18]		60000		60000
MATERIAL @ 2.50 / D.L. MH								40000			40000
NONMANUAL @ 42½% of D.L. MH.						6800	12[60]		85000		85000
S/T DISTRIBUTABLE COSTS								400000	145000		185000
S/T FIELD COST								740000	415000		489000
ENGINEERING w/ 10-7-41											
HOME OFFICE											
S/T ENGINEERING & HOME OFFICE											
CONTINGENCY @ 20%											90000
ESCALATION ~ (½ @ 10% + ½ @ 15⅜)											71000
											650000

CODE

01 (4-72) SEP-20052

BECHTEL

TITLE Phase 3 Pipe Hangers - Addtl.

O. & TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

T PENNSYLVANIA POWER AND LIGHT COMPANY

OCATION BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED GK DATE 7/2/81

CHECKED _____ SHEET 2 OF 2

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
Revised Qtys.											
UNITS 1 + 2											
LARGE PIPE (BOTH UNITS)	28	EA	500		150	4200		14000			
10-7-41 600 EA/UNIT											
REVISED 614 EA/UNIT											
A 14 EA/UNIT											
SMALL PIPE (BOTH UNITS)	200	EA	100		60	12000		20000			
10-7-41 2900 EA/UNIT											
REVISED 3000 EA/UNIT											
A 100 EA/UNIT											
						16200	16.80	34000	270000		304000

052

TREND NO. 1-41 PART 3 Units 1 & 2

TITLE Dynamic Qual. Phase III – Addtl. Work Other Than Pipe Supports & Equip. Piping (10-1-78)

NO. & TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

ENT PENNSYLVANIA POWER AND LIGHT COMPANY

LOCATION BERWICK, PA

TAKEOFF APPROVED

PRICED GK & FBV DATE 7/8/81

CHECKED SHEET 1 OF 2

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
DIRECT ACCOUNTS:											
CIVIL											
MECHANICAL											
PIPING											
INSTRUMENTATION											
ELECTRICAL											
S/T DIRECT COSTS						140,000		1250000	2380000		2505000
DISTRIBUTABLES:											
MANUAL w/F/c 11 Workplans	per Tavis										
MATERIAL w/F/c 11	" "										
NONMANUAL @ 42% of D.L.M.H.						57,800	12.60		740000		740000
S/T DISTRIBUTABLE COSTS									740000		740000
S/T FIELD COST								1250000	3120000		3245000
ENGINEERING w/10-7-41											
HOME OFFICE											
S/T ENGINEERING & HOME OFFICE											
CONTINGENCY @ 20% + Adj.											670000
ESCALATION @ 10% on U.1 + 15% on U.2											585000
											4500000

CODE

BECHTEL

JOB NO. & TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

CLIENT PENNSYLVANIA POWER AND LIGHT COMPANY

JOB LOCATION BERWICK, PA

TITLE Dynamic Qual. Class III - Addtl. Work Effort for Pipe Supports & Equip. Fixes (Ref. 1-8-25) Units #2

TAKEOFF

APPROVED

PRICED JK & FJ

DATE 7/2/81

CHECKED

SHEET 2 OF 2

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
Scope of work includes reinforcement of block walls, replacement of concrete expansion anchors, reinforcement of existing duct and tray supports and additional supports where required											
Fld. Estimated MHs - Units 1 & C						70000		incl. below			
Blockwall Fixes 30,000											
Elect. Fixes 24,000											
Duct Support Fixes 8,000											
Expansion Anchors 20,000											
Ductwork Drywall 2,000											
76,000 say 70,000											
Allow: Unit 2						70000		incl. below			
						140,000	17	1250000	2380000		

52

10-9-41

P3-A

The commitment amount for this change is $ 638,716 (which is firm) ~~which includes escalation~~. The total commitment for this P.O. is now $ 12,923,716 ~~which is included~~ (including $ 2,035,000 in escalation). The Forecast No. 10 total for this P.O. is $ 12,400,000. This change will be trended in Trend. 10-9.

JOB 8856
UNITS 1 & 2
SUSQUEHANNA STEAM ELECTRIC STATION

JUL 1 3 8101431 09

TELETYPE DISTRIBUTION SHEET

ADMINISTRATION	
PROJECT MANAGEMENT	Violette
ASST PROJECT MANAGER	Berra
	Damerval
CONSTRUCTION	
CONSTRUCTION COORDINATOR	Johanson
ENGINEERING	
PROJECT ENGINEER	Poser
ASST PROJECT ENGINEER	Weyandt
	Titus
	McDaniel
	Mehegan
	Hempe
DISCIPLINES	
ARCHITECTURAL	
CIVIL	
CONTROL SYSTEM	
ELECTRICAL	
MECHANICAL	
PLANT DESIGN	R.V. Parrish ; C.H. Nichols
LICENSING	
CONTAINMENT	
QUALITY ENGINEERING	
SERVICES	
COST & SCHEDULE	C.W. Heusser
COST TREND	J. Kramon
PROJECT PLANNER	
ENGINEERING PLANNER	
PROCUREMENT	
PROCUREMENT MANAGER	Stojkov ; Glen Gobel
FIELD	
ADDITIONAL DISTRIBUTION	

8856-S-98 4/81 (Rev. 2)

REVIEWED AND DISTRIBUTED BY _____

RESOLVED OTHER TRENDS

	Class	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
89	1C	Provide additional stiffening for supports attached to the containment liner plate, Units 1 and 2. (150,000 Direct MHRs) (12,000 Eng'g MHRs)	6,900	Critcl (See Remark #2)	Stiffness of the liner plate is not sufficient to maintain the integrity of the piping system.	Mtg. Minutes No. 1587 6/29/81	1) Engineering to start issuing fixes, 8/15/81. Design completion by end of October. 2) Potential impact on ILRT schedule due to high congestion in the working area.
22	1C	Bracing modifications to the MSRV lines and to the LOCA downcomers. Units 1 and 2. (50,000 Direct MHRs) (10,000 Eng'g MHRs)	2,600	Critcl (See Remark #2)	Phase III load evaluation and design reconsideration.	Mtg. Minutes No.1588 6/29/81	1) Engineering to be completed by 8/1/81. 2) No impact to 1/18/82 Construction Completion assuming part of the work to be done during the September wetwell window and remaining work can be completed over water in parallel with ISG effort.

] = Uneval.

10-9-222

TREND NO. 0-9-222

TITLE MSRV Downcomers modification

J. & TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

LOCATION BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED R.T.M. DATE 7/14/81

CHECKED K SHEET _____ OF _____

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
DIRECT ACCOUNTS:											
CIVIL											
MECHANICAL											
PIPING											
INSTRUMENTATION											
ELECTRICAL											
W/T DIRECT COSTS See Estimate						50,000	17		850000		850000
DISTRIBUTABLES:											
MANUAL 25% of D.C. Mhr						12,500	15.2		190000		190000
MATERIAL $2.5 / D.C. Mhr.								125000			125000
NONMANUAL .42 / D. Mhr.						21,000	12.6		265000		265000
W/T DISTRIBUTABLE COSTS								125000	455000		580000
W/T FIELD COST								125000	1305000		1430000
ENGINEERING						10,000					
HOME OFFICE						4,000					
W/T ENGINEERING & HOME OFFICE						14,000	38		532000		532000
CONTINGENCY 20%											392000
ESCALATION 10% + Adj.											246000
											2660000

HANNA STEAM ELECTRIC STATION - 8856

NIA POWER AND LIGHT COMPANY

, PA

TAKEOFF TMC APPROVED

PRICED DATE 7/31/91

CHECKED SHEET OF

D DESCRIPTION	QUANTITY	UNIT	UNIT COST		MAN HOURS			TOTAL COST			
			MAT'L	S/C	UNIT	TOTAL	$/MH	MATERIAL	LABOR	SUB-CONT.	TOTAL
						15000					
						15000					
						7500					
						7500					
						2500					
						2500					
						50,000					

10-9-222

R

MEETING MINUTES

NO. 1588

JUN 29 '81 0142851

DATE OF MEETING: June 25, 1981

PLACE OF MEETING: 221/11/B23 - 3:00 p.m.

SUBJECT: SRV Support at Wetwell Bracing Level

ATTENDEES:

J. W. Hempe
K. Buchert
G. Shah
J. Benkert
P. Sawney
F. Vinson
M. Khalafallah
M. Malkani
M. Memula
C. Fazendin
A. Derkacs

DISCUSSIONS:

1. Civil informed that field has been instructed to proceed with cutting loose bracings connecting downcomers with wetwell.

2. SRV Straight Runs:

2.1. With SRV line supports left 'as is' i.e., connected with downcomer, the 1.8" deflection at bracing level during OBE or 2.4" deflection during SSE overstresses the pipe by about 25%.

2.2. With SRV lines cut loose from downcomer bracing supports (large ring aound SRV line), reactions at quencher support go up to unacceptably high value.

3. SRV "Crooked" Lines"

3.1 PD reported that study was made with changing elbow from schedule 40 to schedule 80 and also pipe above elbow from schedule 40 to schedule 80. This brought elbow stresses within marginally acceptable range, but reactions at quencher support group to unacceptable range, based on present load definitions.

3.2 Changing pipe below the 3-way restraint from schedule 80 to schedule 40 does not help either, as frequency changes only from 5 Hz to 4.2 Hz.

3.3 In either case, field construction time due to difficulties at counterbase, 3-way restraint and quencher re-alignment would be in the range of 3 to 6 months.

CONCLUSIONS:

1. It was decided that any change to the SRV line itself should be avoided as that has major construction schedule impact.

2. It was also felt that some support would be necessary for SRV lines at about present bracing level.

3. It was agreed to put together a team with participation from PD, Civil, Nuclear (for load definition) and Construction coordinated to work together and come up with a recommended solution by Monday, July 6th.

4. Schedule for engineering completion of the required re-design could not be established, because the disciplines represented felt that better problem definition would be required.

S.V. Devine 6-26-81

Bechtel Power Corporation

Interoffice Memorandum

10-9-222

To B. E. Harper

File No. JUL 15 '81 0144062

Subject Susquehanna Steam Electric Station
Job #8856 Submerged Structure Loads
Due to KWU SRV and Chugging

Date

From E. B. Poser

Of SFPD - Engineering

At 221/11/B1 Ext. 2753

Copies to:

G. K. Ashley, II	w/a
H. Safwat	"
H. Hollingshaus	"
K. Buchert	"
J. Weyandt	"
T. S. Leong	"
J. K. Chan	"
O. S. Nossardi	"
G. H. Shah	"

For the assessment of the downcomers and downcomer bracing system, the civil group is presently developing a 3 dimensional finite element model. The bracing system consists of four separate trusses one in each of the four quadrants of the suppression pool. The model consists of only one quadrant and includes 23 downcomers, 4 MSRV discharge lines and the bracing. The geometry of the model is shown in attachment 1.

We require that you calculate the submerged structures loads on the downcomers and MSRV discharge lines for KWU SRV and chugging. For each downcomer there are three nodal points below the water surface at which pressure time histories (force per unit length) are to be generated. At each nodal point, time histories for the radial and tangential direction with respect to the centerline of the containment are required. For the MSRV lines pressure time histories are required for five nodal points in the radial and tangential direction. In the transient analysis the resulting 178 time histories will be applied simultaneously.

The SRV loads should be developed from the source applied at the ADS valves only as indicated on attachment 1. Appropriate time phasing should be considered. For chugging traces 303 and 306 have proven to be dominate. As a result of the dynamic analysis performed on the single downcomer for the loads received from you

JL 15 9101440062

previously trace 306 has yielded higher response for the bracing attached to containment wall, and trace 303 has yielded higher response for disconnecting the bracing from containment wall.

If you have any questions, do not hesitate to call.

E.B. Poser

Written Response Req'd: No
GHS/EWU/eat

Attachment: Downcomer and bracing model

F-51/8-2

EWU

15

RESOLVED OTHER TRENDS

er	Class	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
-289	1C	Provide additional stiffening for supports attached to the containment liner plate, Units 1 and 2. (150,000 Direct MHRs) (12,000 Eng'g MHRs)	6,900	Critcl (See Remark #2)	Stiffness of the liner plate is not sufficient to maintain the integrity of the piping system.	Mtg. Minutes No. 1587 6/29/81	1) Engineering to start issuing fixes, 8/15/81. Design completion by end of October. 2) Potential impact on ILRT schedule due to high congestion in the working area.
-222	1C	Bracing modifications to the MSRV lines and to the LOCA downcomers. Units 1 and 2. (50,000 Direct MHRs) (10,000 Eng'g MHRs)	2,600	Critcl (See Remark #2)	Phase III load evaluation and design reconsideration.	Mtg. Minutes No.1588 6/29/81	1) Engineering to be completed by 8/1/81. 2) No impact to 1/18/82 Construction Completion assuming part of the work to be done during the September wetwell window and remaining work can be completed over water in parallel with ISG effort.

U = Uneval.

10-9-289

TREND NO. 1 9-289

TITLE Containment Liner Plate Attachment

J. & TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

CATION BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED KJH DATE 7/15/81

CHECKED _____ SHEET 1 OF 1

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
IRECT ACCOUNTS:											
VIL											
ECHANICAL											
PING											
ISTRUMENTATION											
LECTRICAL											
T DIRECT COSTS						150,000		3000000	25500000		28500000
STRIBUTABLES:											
ANUAL 65% D.L. Mhr						37,500	15.20		5700000		5700000
ATERIAL $2.5/D.L mhr								375000			375000
ONMANUAL 42% of D.L mh						63,000	12.60		8000000		8000000
T DISTRIBUTABLE COSTS								375000	13700000		17450000
T FIELD COST								6750000	39200000		45950000
GINEERING						12,000					
ME OFFICE						4,000					
T ENGINEERING & HOME OFFICE						16,000	38				6080000
NTINGENCY @ 20% + Adj.									10430000		10430000
CALATION @ 10% / Mfg									6540000		6540000
											69000000

TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

ON BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED FHJ+GC DATE 7/8/81

CHECKED _____ SHEET 2 OF 2

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST		MAN HOURS			TOTAL COST			
			MAT'L	S/C	UNIT	TOTAL	$/MH	MATERIAL	LABOR	SUB-CONT.	TOTAL
J. Tesla											
Unit 1						100,000					
Unit 2						50,000					
Matl. Both Units								300000			
						150,000	17	300000	2550000		2850000

10-9-789

2

MEETING MINUTES
NO. 1587

JUN 29 '81 0142855

DATE OF MEETING: June 23, 1981

PLACE OF MEETING: 221 Main Street, 11th Floor Conference Room

SUBJECT: Pipe Supports on Containment Liner Plate

ATTENDEES:

F. Vinson	B. Wedellsborg	
M. Khalafallah	J. Benkert	(part time)
L. Memula	S. Sawhney	(Part time)
W. Tseng	M. Malkani	(Part time)
	R. Roberts	

REPORT OF MEETING:

The meeting was held to discuss the effects of liner plate deflections and flexibility on piping supported from the liner plate. There are approximately 700 existing pipe supports on the Unit 1 containment liner plate. Civil has calculated the following maximum liner plate deflections:

Wall Liner Plate:	0.132" (at center of 2' panel)
Diaphragm Slab Liner Plate:	0.359" (at 11" from embed)

The above deflections must be combined with the overall building deflections in order to determine the total pipe support movement.

Plant Design stated that they were more concerned about liner plate flexibility than deflections. L. Memula stated that due to the liner plate's low stiffness, all of the piping supported from the liner plate would have stress problems. He asked Civil whether the liner plate could be locally stiffened in areas of pipe hangers to resolve this problem. Civil agreed that such stiffeners could be designed.

JUN 29 '81 0142855

ACTION ITEMS:

1. Plant Design to give Civil the minimum liner plate stiffness requirements as a function of pipe size.

2. Based on the information in Action Item #1, Civil to develop details of additional liner plate stiffeners.

3. Civil will then revise the table of stiffnesses in MCAR-1-50. Plant Design will review the final draft and give comments to Civil.

Prepared by:

R. Roberts
Civil

GHS/RGR/cgs

Distribution:

All Attendees
E. Poser
K. Buchert
J. Hempe
W. McDaniel
R. Parekh
G. Shah

WP33/20-2

RESOLVED SCOPE TRENDS

Class	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
291	Allowance for additional funding for subcontract M-166 RPV Preservice Inspection.	1,250		Reforecast of estimated manhours and revised labor and equipment rental rates.	CCA #7 144878 7/28/81 F0732556 7/6/81	Total funding committed to this contract through this CCA is $3,098K.
28 1B	Additional Engineering and Other Home Office manhours (17,000 Eng'g MHRs).	950		Phase III, dynamic requalification of equipment - (Analysis & Retest)	BLP 16263 8/5/81	Unresolved Trend 10-1-28 includes a $2,000K allowance for equipment modification due to Phase III.
	TOTAL SCOPE CHANGES	59,200				
	Direct Mhrs: 26,000 Eng'g Mhrs: 197,000					

U = Uneval.
)

SEP 1 '81 0147333

10-10-28

TREND NO. 10-10-28

TITLE Engg Mhr. for Phase II Equipt. Removal ...

ANNA STEAM ELECTRIC STATION - 8856

VANIA POWER AND LIGHT COMPANY

PA

TAKEOFF

PRICED R. J. M.

CHECKED

APPROVED

DATE 8/27/81

SHEET OF

DESCRIPTION	QUANTITY	UNIT	UNIT COST		MAN HOURS			TOTAL COST			
			MAT'L	S/C	UNIT	TOTAL	$/MH	MATERIAL	LABOR	SUB-CONT.	TOTAL
See Blue Print BLP 16203											
COSTS											
						17,000					
						5,100					
HOME OFFICE			---			22,100	38				$40,000
											11,000
											11,000

bcc: J. Violette w/g
D. Hardie
B. Stojkov
C. Heusser

REPLY PLEASE REF:

BLP 16263

AUG 5 '81 0145469

10-10-78

Mr. T. M. Crimmins, Jr.
Pennsylvania Power & Light Co.
P.O. Box 1270
Allentown, Pennsylvania

Subject: Susquehanna Steam Electrtic Station
Units 1 and 2 Job 8856
Dynamic Qualification of Equipment,
Phase II Loads

Dear Tom:

Confirming our telephone conversation with E. Mead, attached is the estimate to perform the subject equipment qualification. This estimate is in addition to the previous estimate for equipment qualification to Phase II loads.

Very truly yours,

D. B. Poser

E. B. Poser
Project Engineer

Written Response Req'd: No

DBH/vw

PE26/19

cc: E. Mead (PP&L)
R. McNamara (PP&L)

Attachment: Cost Estimate

Grp. Resp. Code	
Orig.	R-J M.
Grp. Ldr.	
Grp. Supvr.	
APE	
Cln. Discp.	

COST ESTIMATE

PHASE III DYNAMIC REQUALIFICATION OF EQUIPMENT
(does not include any hardware changes)

Allowance for Reanalysis	$ 175,000
* Allowance for Retesting	575,000 *
Quotations for Reanalysis	192,000
Quotations for Retest	101,000
Total Material	$1,043,000
Total Eng'g & O.H.O. (22,100 MHR)	950,000
Contingency at 20% & Rounding	407,000
Total Estimated Costs	$2,400,000

* Required IF qualification at high frequencies is necessary. In case high frequency qualification does not require retesting total estimated costs would be: $1,700,000.

COST ESTIMATE

PHASE III DYNAMIC REQUALIFICATION OF EQUIPMENT
(does not include any hardware changes)

$ 1,000's

PO-SQRT	ALLOWANCE FOR REANALYSIS	ALLOWANCE FOR RETESTING	QUOTATION FOR REANALYSIS	QUOTATION FOR RETESTING
E121-2		100		
E151		100		
J05A &B			30	
M334			Included in above	
E152		100		
E155		10		
J98		30		
J03C		150		
J27-2		30		
M320 (1&2)		30		
M321-2		25		
M325-2	25			
M55			9	
M149			5	
M164			20	
M307			40	
M309			30	
M315			35	
M317			18	
M321 2			5	
M192	150			
M320-3				
M336A				101
				Included in above
TOTAL 23 P.O.	175	575	192	101

Eng'g Mhr's: Civil 13,500 Mhr.
Mech. 1,800 Mhr.
Elect. 1,500 Mhr.
C.S. 200 Mhr.

17,000 Mhr.

O.H.O. at 30% 5,100 Mhr.

Total 22,100 Mhr. at $43 = $950K
(includes escalation)

(CS32/19)

RESOLVED SCOPE TRENDS

Class	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
-141 141)	Schedule delay for Units 1 and 2 Construction Completion.	57,000* (See table below)		Current job status shows the re-scheduling of the Unit 1 Construction Completion from June 1, 1981 to January 18, 1982 and the Unit 2 Construction Completion from November 1, 1982 to April 15, 1983.		* This estimate excludes any costs associated with longer duration between construction completion and commercial operation than projected in F/C 10.

	Manhours (in 1,000's)	Cost (in 1,000's)
Field Non-Manual	792	$ 10,000
Distributable Manual	438	7,000
Distributable Material	—	1,100
Direct Manual for Equipment Maintenance & Dewatering	26	450
Manual Startup Support	152	2,400
Field Startup	79	3,100
Engineering	180	6,850
Other Home Office	180	6,850
Contingency		5,650
Escalation	—	13,600
TOTAL SCHEDULE DELAY COSTS		$ 57,000

55-1'810147333

s U = Uneval.
/5)

10-10-141

TREND NO. 10-10-10

TITLE Schedule No. 2 for Cont. w.o. #

NO. & TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

LOCATION BERWICK, PA

TAKEOFF

PRICED

CHECKED

APPROVED

DATE 8/28/81

SHEET OF

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST		MAN HOURS			TOTAL COST			
			MAT'L	S/C	UNIT	TOTAL	$/MH	MATERIAL	LABOR	SUB-CONT.	TOTAL
DIRECT ACCOUNTS:											
CIVIL											
MECHANICAL											
PIPING											
INSTRUMENTATION											
ELECTRICAL											
W/T DIRECT COSTS											
DISTRIBUTABLES:											
MANUAL	See attached B/up.										
MATERIAL											
NONMANUAL											
W/T DISTRIBUTABLE COSTS											
W/T FIELD COST											
ENGINEERING											
HOME OFFICE											
W/T ENGINEERING & HOME OFFICE											
CONTINGENCY											
ESCALATION											
											571-00-00

10-10-141

as of 8/26/81

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 and 2 - JOB 8856

SCHEDULE DELAY COST EVALUATION
BASIS AND QUALIFICATIONS

1. Unit 1 Construction Completion changed from 6/1/81 to 1/18/82 and Unit 2 Construction Completion changed from 11/1/82 to 4/15/83.

2. Field Non-Manual manhours are based on estimated time related staffing for current level of effort and after Unit 1 Construction Completion. rewriting

3. Distributable Manual manhours, Distributable Material Costs, Manual Startup Support and Direct Manual manhours for Unit 2 Equipment Maintenance are based on jobsite estimates.

4. Field Startup is based on continuing at current level of effort (40 people) through Unit 2 Construction Completion.

5. Engineering and Other Home Office is based on analysis of time related staffing required to support continued level of Engineering work (340 people).

6. Escalation is based on the change in centroid of the to-go cash flow including trends and schedule slip costs.

(CS30/17)

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 and 2 - JOB 8856

SCHEDULE DELAY COST EVALUATION
SUMMARY

	Manhours (in 1,000's)	Cost (in 1,000's)
Field Non-Manual	792	$ 10,000
Distributable Manual	438	7,000
Distributable Material	—	1,100
Direct Manual for Equipment Maintenance	26	450
Manual Startup Support	152	2,400
Field Startup	79	3,100
Engineering	180	6,850
Other Home Office	180	6,850
Contingency	—	5,700
Escalation	—	13,700
TOTAL SCHEDULE DELAY COSTS		$ 57,000

(CS30/17)

BECHTEL

Units 1 + 2

Assumptions

Unit 1: 6/1/81 → 1/18/82 33 Weeks

Unit 2: 11/1/82 → 4/15/83 24 Weeks

8/24/8

CWH

	NO. OF MEN	@ 40 HR PER WEEK	TOTAL MHS. PER WK.		WAGE RATE	# PER WK.	DURATION	TOTAL MHRS	TOTAL COST ($ IN
									Rounde
NON-MANUAL									
Unit 1									
	200		8,000		12.63	101,040	33 Weeks	264,000	3,33
Unit 2									
	550		22,000		12.63	277,860	24 Weeks	528,000	6,66
Distributable Manual									
Unit 1									
	150		6,000		15.88	95,280	33 weeks	198,000	3,20
Unit 2									
	250		10,000		15.88	158,800	24 weeks	240,000	3,80
Distributable Material					Mat. $ per MH				
Unit 1									
		Base	6,000		$2.50	15,000	33 weeks		50
Unit 2									
		Base	10,000		$2.50	25,000	24 weeks		600
Manual S.U. Support									
Unit No. 1									
	100	46/wk	4,600		15.88	73,048	33 weeks	151,800	2,40
Unit 2									
									0
Field Startup									
Unit 1									
	40	60/week	2400		39.50	94800	33 weeks	79,200	3,100
Unit 2									

BECHTEL

(2)

8/03/8
CWH

NO. OF MEN	@ 40 HR PER WEEK	TOTAL HRS. PER WK.		WAGE RATE	$ PER WK.	DURATION	TOTAL MHRS	T C (@
Direct.	Manual	foc.						
Equipment Maintenance								
Unit 2 Only								
20 Dewatering		800		16.80	13,400	24 weeks	19,000	3
							7,000	1
Engineering								
Unit 1								
27		1080		38	41,000	33 weeks	36000	1,3
Unit 2								
150		6000		38	228,000	24 weeks	144,000	5,5
Other	Home Office							
Unit 1								
45		1800		38	68400	33	60,000	2,2
Unit 2								
125		5000		38	190,000	24	120,000	46
Subtotal	Page 2							10,(
=	Page 1							23,(
Subtotal								37,5
Contingency -15%								5,6
	Subtotal							43,1
Exclusion								
				33+24 = 57		= 28.5 weeks		13,5
				2	2			
Thru Trend #9		1,728						
Misc Trends Scheduled		45						
total		1,773		28.5 Weeks @ 10% annualized				5
Committed to date 6/81		(1,550)		→ = 0.6				57,0
		223						

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 and 2 - JOB 8856

CONSTRUCTION COMPLETION DELAY - ENGINEERING

Unit 1 - Time Related Personnel	No. of Persons
Project Engineer, APE's, Group Supervisors, Staff, Software Closeout	20
Deputy Group Supervisors, Group Leaders, etc.:	
Mechanical Group	4
Electrical Group	4
Control Systems Group	2
Architectural Group	1
Civil Group	5
Plant Design Group	10
Configuration Control Group	15
Quality Engineers	4
Resident Engineer Group - Construction Support	30
Allowance for FCR/FCN Disposition	20
Allowance for Startup and construction support (answer questions, telephone calls, small SFR's)	20
Allowance for exposure to studies	5
Allowance for Reg. Guide disposition evaluations	2
Chief Engineers and staff	33
Total Unit 1	175

Unit 2 - Time Related Personnel	
Consider decrease in APE's, R.E. & Q.E.	
Total Unit 2	150

(CS32/2)

BECHTEL

NO. OF MEN	@ 40 HR PER WEEK	TOTAL HRS. PER WK.		WAGE RATE	# PER WK.	DURATION	TOTAL MHRS	TOT COS (3 INI
OTHER HOME OFFICE								
ADMINISTRATION (7PB)								
UNIT 1								
25		1000		38	38,000	33 WKS	33,000	1,25
UNIT 2								
~~50~~ 60		~~2,000~~ 1,600		38	76,000 ~~1,600~~	~~48~~ WKS 24	~~96,000~~ 56,000	~~3,65~~ 2,2
DIVISION SERVICES (7PC)								
UNIT 1								
10		400		38	15,200	33 WKS	13,000	50
UNIT 2								
15		600		38	22,800	~~48~~ WKS 24	~~29,000~~ 14,500	1,100
PROJECT OPERATIONS + MGMT (7PD + 7PR)								
UNIT 1								
1		40		38	1,500	33 WKS	1,300	50
UNIT 2								
4		160		38	6,100	~~48~~ WKS 24	~~7,700~~ 3850	300
PERSONNEL (7PG)								
COMMON								
1		40		38	1500	~~48~~ WKS 24	~~1900~~ 950	70
HOME OFC. START UP (7PH)								
COMMON								
4		160		38	6,100	~~48~~ WKS 24	~~7,700~~ 3850	300
QUALITY ASSURANCE (7PK)								
COMMON								
10		400		38	15,200	~~48~~ WKS 24	~~19,200~~ 9600	730

BECHTEL

NO. OF MEN	@ 40 HR PER WEEK	TOTAL NRS. PER WK.		WAGE RATE	# PER WK.	DURATION	TOTAL MHRS	TOTA COST ($/U
OTHER HOME OFFICE (CONT.)								
HOME OFC. CONSTRUCTION (7A)								
COMMON								
7		280		38	10,650	~~48~~ WKS. 24	13,400 ~~17,800~~	510
FINANCE & ACCTG. (8XA)								
COMMON								
3		120		38	4,550	~~48~~ WKS. 24	~~5,800~~ 1,900	220
PROCUREMENT (8X6)								
UNIT 1								
5		200		38	7,600	33 WKS	6,600	250
UNIT 2								
15		600		38	22,800	~~46~~ WKS 24	~~29,000~~ 14,500	1,100
MISC. (8X5, 8XN, 8XP, 8XR, 8XT, 8XG)								
COMMON								
4		160		38	6,100	~~48~~ WKS 24	~~7,700~~ 3,850	300
			S/T	OTHER HOME OFC.			27,300	10,330
						say	~~27,000~~	10,300
							~~29,000~~ 160,000	
							172,200	
							Sheet = FC	
							(w/	
							3/10/87	

BECHTEL

Job 8856
Susquehanna SES

6/04
①

Other Home Office Schedule Delay Manhours

✓ 7PB Administration - Level of effort - most people are time related rather than schedule related schedule slip is at peak size of group (883 people in May)

Use 75 for Both Units 48 wks

25 for Unit 1 for 33 weeks 33,000

50 for Unit 2 for ~~44~~ 24 weeks 48,000

81,000

7PC Division Services - Level of effort - (25.2 in Ma

C/S Supervisor & Mgt. 1
PCE, CTE's, CE
P.P.
E.P. & Group E.P.'S
Drafter

Use; ~~25~~ 10 people for Unit 1 + common 33 wks

15 people for Unit 2 ~~44~~ 49 wks

BECHTEL

Job 8856
Susquehanna SES

6/04/8
(2)

✓ 7PD, 7PA Project Operations Mgt All schedule Related except fewer people required for Unit 2
5.4 for May
JBV, JGB, FGB

Mgt. 2.4
Project 3.0

Unit 1 - use ~~5.0~~ 1 33

Unit 2 use 4.0 48 ~~+5~~

✓ 7PG Personnel Level of effort

1.3 people for May

use 1.0 for both units

✓ 7PH Home Office Start Up Level of effort
4.4 for May

Use 4.0 for both units

✓ 7PK Quality Assurance Level of effort
12.3 for May

Use ~~12.0~~ 10.0 for ~~Unit 1~~ Both units 7-Fi-8
3-H.O.

✓ 7PT Construction Home Office Level of effort
7.0 for May

Use 7 for both units

BECHTEL

Job 8856
Susquehanna

6/04/8
(3)

8XA Finance + Accounting — Level of effort 3.8 in May

Use 3 for both Units

8XB Procurement — Level of effort 24.8 in May

Use	20	for Unit 1	33	IPM	E.S.
Use	15	for Unit 2	49	C.S.	
				S	

8XJ, 8XN, 8XP, 8XR 8XT 8XG — 3.87 in May

Use 4 for Both Units

	materials.			rials identified or required. This trend adds current to date pricing increase costs (overruns) and projected to go estimated costs for bulk hanger materials from ITT Grinnell for Phase III requirements.	4/7/82 BLP-20110 4/20/82	future exposure. Previous Trends: 11-1-17 11-4-39 12-1-18 11-2-39
4	Field walkdown of unacceptable non Q anchors. Engr. Mhrs. 300 Other SFHO: 120 Field N/M: 300 Note: Manhours are all Unit 1.	20	None	Walkdown will result in reduction of identified anchors to be fixed through detailed analysis.	DCR-700 as BLP 19485 3/11/82	Note: Current schedule date for walkdown is May, 1982

ss U = Uneval.
4B/3-5)

12-2-81
42

MEMORANDUM

L. E. Shipley

C.

J. F. Warren

LOCATION

M C. W. Heusser

DATE April 30 19

ECT Commitment Value and Cost Trend for P3A

JOB NO 8856

FILE P3A

Per telcon with Jim Tevis:

The latest CCA for P3A was overstated the jobsite as at least half of the material is already committed

Cost to date and anticipated escalation invoices total $13,700,000 thus leavi 4,300,000 to go on approved commitm value of $18,000,000. This appears to enough to cover all remaining uni requirements.

It was agreed that Home Office wou trend $2,000,000 in Trend 12-2-42 and fie would trend ($2,000,000) out of T/G storag allowance of $2,700,000 thus leaving $700, as a future source of funding if requir C/L is already aware of the $2,000,000 incr P3A and not trending this would raise quest

CWH

(6-75)

CME-6244

Boeing [illegible] Corporation

APR 9 10 PM '82

Interoffice Memorandum

To E. B. Poser

Subject Additional Funding for P3-AC Purchase Order

File No. P3-AC

Date April 7, 1982

From W. E. Mourer

Of SFPD - Construction

At Job 08856 Ext. ~~1120~~
Berwick, Pa.

Copies to J. B. Violette
A. Tiongson
A. Battaglia
B. Stojkov

Reference: P.O. 8856-P3-AC

Subject order is presently funded to $12,017,000 by Revision 36. This funding covers orders through P3 Release 846.

At the present time, Release 874 has been issued to ITT Grinnell and the purchase order is now under-funded by approximately $850,000. Release 874 essentially completes the bulk releases for Unit 2, but additional releases for special items will be required as Unit 2 design is received.

Based on the above information, it is suggested that the purchase order be funded to $13,500,000.

Your reply is requested by April 9, 1982.

W. E. Mourer

WEM/PJO/rah
Written Reply Reqd: Yes
Due Date: 4/9/82

8024, REV 1/78

IN REPLY PLEASE REFER

BLP 20110

F. Warren
C. W. Heusser
G. D. Smith
B. T. Stojkov
A. Battaglia
W. E. Mourer (Field)

Mr. T. M. Crimmins, Jr.
Pennsylvania Power & Light Co.
P.O. Box 1870
Allentown, Pennsylvania 18105

PP&L 20 82 0164122

Attention: Dale Sattar

Subject: Susquehanna Steam Electric Station
Units 1 and 2 Job 8856
P.O. 8856-P3-A, Piping Supports

Dear Tom:

This constitutes our request to increase the face value of the subject purchase order to $13,500,000, an increase of $1,483,000 over the base amount approved in PLB-13900 dated December 22, 1981. The increase is primarily for Unit 2 pipe supports. We have previously indicated in our letter, BLP-17661 dated November 12, 1981, that additional funding may be necessary as Unit 2 pipe supports are released for manufacture.

The commitment amount for the above change will be $2,910,000 which includes $1,427,000 in escalation. The new total commitment amount for the subject purchase order will be $18,000,000 which includes $4,499,500 in escalation and $500 in freight. Forecast 12 for this P.O. is $16,000,000. The balance will be trended in Trend Report 12-2.

May we please have your authorization to issue the change order by May 7, 1982.

Very truly yours,

W. E. Mourer

for E. B. Poser
Project Engineer

Reply Req'd: Yes
Date Due: 5-7-82
LBP/APT/cmf

PD
ORJ
CWH

F66/4/1

Class	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
1C	Increase in manual labor for Unit 1 and Common Piping Accounts. Direct MHRS: 250,000	5,000		Additional manhours for implementation of Phase III Loads. Additional 400 new hangers and 900 revisions were added over Forecast II plus trends. Item / Scope (1,000's) MHRS: Hangers 190 Combo Shop 50 ISI grinding 10 250		
1C	Increase in manual labor for Unit 2 Piping Accounts. Direct MHRS: 200,000	4,000		Majority increase of large and small pipe in hanger quantities and unit rate based on Unit 1 experience. The new unit rate still reflects a 30% improvement over Unit 1. (1,000's) MHRS: Hangers 160 ISI 20 Total 180 AIWS 20 Grand Total 200		

= Uneval.

HBR 11.32016 6235

12-1-16

TREND NO. [illegible]

TITLE MANUAL LABOR INCREASE - UNIT 1 & COMMON PIPING ACCOUNT

TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 0856

PENNSYLVANIA POWER AND LIGHT COMPANY

AREA BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED SLC DATE _____

CHECKED _____ SHEET _____ OF _____

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	MAN HOURS $/HR	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
IECT ACCOUNTS:											
VIL											
CHANICAL											
ING						250,000			5000000		
STRUMENTATION											
CTRICAL											
DIRECT COSTS											
TRIBUTABLES:											
NUAL											
TERIAL											
IMANUAL											
DISTRIBUTABLE COSTS											
FIELD COST											
GINEERING											
ME OFFICE											
ENGINEERING & HOME OFFICE											
TINGENCY											
ALATION											

SAY $5,000,000

| | | |

FORECAST 12 - MISC.

NET	DESCRIPTION	TO-GO QTY	MAN HOURS TO-DATE	MAN HOURS FC/11	MAN HOURS Δ	TO-GO	FC/12	Δ 11→12	COMMENTS
52.00	Combo LP Welders		131024	1317286	33287	33287	1317286	0	
54.11	Combo LP Managers		262003	272201	10198	33998	288000	33296	UNIT 2 # 1000 FWD's @ 10.111
54.15	CRAFT MANAGER, INSP		21687	0	21687	33312	54000	21000	33 MEN/60 HRS/5 DAYS
	TOTALS:		396782	435014	27371	99567	475532	58296	
						* 50,000 FOR UNIT 2			
						TOTAL = 5,000 TO-GO UNIT 1			

		TO-GO		MANHOURS TO-DATE	FC/11	Δ	TO-GO	FC/12		Δ 11-12	COMMENTS SPENT	
00	ERECT LARGE PIPE	—		270535	283165	-7360	5425	296000		13835	1000	UNIT COOLER COILS, S
00	SMALL PIPE	—		453884	345000	-108884	47005	493889		148889	15100	V.ALVS REWORKS 12 TRENDS + 9000 H
12	HANGERS	233	EA	397386	276300	-121086	8300	480386		304086	29000	314 HANGERS TO-GO COOLER & COILS
61	INSUL S/C ASSIST	30	%	3453	1000	-2453	6547	10000		9000	500	30 % CPT.
20	HYDRO	15	%	58675	47000	-11675	4325	63000		16000	1000	50 HYDROS TO-GO UNIT
60	ISI GRINDING	10	%	35681	32000	-3681	4700	40381		8381	500	
FR.				1792599	1731161	-61438	8493	1977572		14411	32500	COOLER EES 12 UCP'S 12 M/D YOKE & PLC. U1,2
				1414993	1157630	-261363	152335	1571228		413602	110000	

	TO-GO	MANHOURS TO-DATE	FC/11	Δ	TO-GO	FC/12	Δ 11→12	COMMENTS CREDIT	
SMALL PIPE	—	238644	227500	-11144	1871	2410165	12965	1500	18. HGRS TO-GO
VENDOR PIPE	—	42930	39726	-3204	2326	446511	4936	1.2.1	MSL HGR REWORKS
VALVES	—	115917	26042	141115	14115*	26042	0	400	BEF., CONT. NUCLEAR
HANGERS	33/34 EA	245691	256100	-29299	4600	290299	33879	2500	INSUL., TEST, CHIMNEY, PH, DT
ISI GRINDING	30 70	3546	5700	2154	1355*	17100	11400		MAIN STEAM TUNNEL CHANGE FROM SECT 3-7
		518266	590525	-7741	7298	605564	15036	2100	CORE BOR EI DXI'S WELD CLASSIFY WELDING
		1180062	1145816	-34196	41044	1224126	78230	7100	

* FIRST FUEL LOAD

12-1-17 INCREASE IN UNIT 1 & COMMON
PIPING ACCTS BY 300,000 M/
75% FOR HGRS AND 50,000
SPENT TO DATE. - FIELD TRE

300,000
X $ 20.00
$6,000,000

NO DISTRIB
N/M MILES

Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
C Increase in projected costs for subcontracts.	15,800		1. FSC-150, Bisco penetration seals up $5,600,000 due to: A. Increase in number of penetrations from F/C 11 quantity of 8500 to F/C 12 quantity of 14,000 (including repairs) B. Premium time for schedule support C. Sealing instrument penetrations thru drywells (DCR-66) 2. M-323C, Peabody & Wind HVAC up $2,800,000 due to: A. Additional work activities causing subcontract extension thru 1982 and 1983 1. DCP's 2. Phase III Hanger Work 3. Insulation repairs B. Premium time for schedule support 3. M-105A, AC&S thermal insulation up $3,500,000 due to: A. Rework insulation due to Phase III hanger work B. Premium time for schedule support		See trend 12-1-28 for other portion of this trend.

= Uneval.

NRC 11 '82 0166235

12-1-15

DATE

N BY JMG DATE 1/7/83 CHECKED BY SHEET NO. 1

TREND 12-1-15 BACKUP JOB NO.

ECT M-105 ACES CALCULATION NO. FILE NO.

MUCH OF THE THERMAL INSULATION HAD BEEN INSTALLED ON PIPE LINES PRIOR TO THE IMPLEMENTATION OF THE PHASE III HANGER PROGRAM. THE ADDITION AND MODIFICATION OF HANGERS NECESSITATED THE REMOVAL, MODIFICATION AND SUBSEQUENT REINSTALLATION OF THOUSANDS OF PIECES OF INSULATION. THE ESTIMATED COST FOR THIS WORK WAS DERIVED BY THE FOLLOWING:

UNIT-1

ACTUAL COST THRU 2/82 ...	540K
TO GO EST. AT 2/82:	
60 MEN @ 40 HR/WK @ $22/HR X 16 WK -	845K
12 MEN @ 40 HR/WK @ $22/HR X 8 WK -	85K
50 MEN @ 15 HR O.T./WK @ $42 X 24 WK -	756K
	$2226K

UNIT-2 — $0

THE PHASE III HANGERS (ALONG WITH OTHER MISCELLA ITEMS) CREATED AREAS WHERE THE FULL INSULA THICKNESS COULD NOT READILY BE INSTALLED. TH CONDITIONS CALLED "THERMAL INTERFERENCES" REQUIRED SPECIALIZED MODIFICATIONS USING "MIN-K THIS COST WAS ESTIMATED BY:

UNIT-1

COST THRU 2/82	55K
TO GO LABOR (INCLUDED WITH PHASE III ABOVE)	0
	$55K

UNIT-2

500 INTERFERENCES (EST) AT 16 HR X 24.20 =	200
"MIN-K" MATL. PODDLE @ $15.65 + 30% MARK-UP	125

DATE

N BY _____ DATE _____ CHECKED BY _____ SHEET NO. _____

C _____ JOB NO. _____

ECT _____ CALCULATION NO. _____ FILE NO. _____

I ISI AND PSI WELD INSPECTION REQUIRED THAT THE INSULATION BE REMOVED TO ALLOW INSPECTION AND LATER REINSTALLED. THIS WAS ESTIMATED BY:

NIT 1 COST THRU 12/82 . . . 179K

TO GO - 15 MEN X 40 HR/WK X $22/HR X 16 WK 211K

$390K

UNIT 2

$390K + 20% ESCALATION $468K

BECAUSE OF THE AMOUNT OF WORK ADDED BY PHASE III, THERMAL INTERFERENCES, AND WELD INSPECTIONS, IT WAS NECESSARY TO WORK A SECOND SHIFT AND ADD OVERTIME IN ORDER TO SUPPORT PROJECT SCHEDULES. THIS WAS ESTIMATED BY:

NIT 1

COSTS FOR PREMIUM TIME THRU 12/81 . . . $265K

TO GO EST:

DAY SHIFT - 15 MEN X 5 HR/OT X $20/HR X 26 WK 39K

NIGHT SHIFT - 35 MEN X 40 HR/ST X $4/HR X 26 WK 146K

NIGHT SHIFT (OT) - 35 MEN X 15 HR/OT X $27/HR X 26 WK 369K

$819K

NIT 2

DAY 38 MEN X 5 HR/OT X $22/HR X 24 WK $100K

(O.T.) NITE 38 MEN X 5 HR/OT X $20/HR X 20 WK 103K

NITE 38 MEN X 40 HR/ST X $4/HR X 20 WK 122K

$325K

TOTAL E/C 12 COST FOR I THRU IV $4,608,000

LESS F/C 11 VALUE FOR MODIFICATIONS 1,100,000

TREND $3,500,000

12-1-16 INCREASE IN COST OF
SUBCONTRACTS - NEED FIE
BACKUP — FIELD TREND

S/C	ACTIVITY	COS
M-323C	HVAC	$3,5
M-105A	INSULATION	4,2
M-105B	INSULATION	1,8
M-191	PRESERVICE INSPECTION	9
M-343/344	FIRE PROTECTION	4
M-164	CRD PIPE	4
M-390	IHSI	2,0
FSC-80	REACTOR INTERNALS	1,3
FSC-134	HVAC AIR TEST/BALANCE	1,5
FSC-150	PENETRATION SEALING	6,8
		$22,0

RESOLVED SCOPE TRENDS

Class	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
1C	Post Phase III hanger modifications and documentation update. Eng'r Mhrs: 4,800 Other SFHO: 1,920 Field R/E Mhrs: 6,000	500	(See remarks)	After completion of initial Phase III design (10/25/81), continued resident engineering activity has been required to update documentation and work out interferences and design changes caused by same.		(1) Forecast completion by 3/30/82 for engineering. (2) Field direct labor manhours are covered by Trends 11-2-39 and 11-4-39.
1C	Reactor Building unit cooler equipment (including flex hoses) and piping modifications in Units 1 and 2. *Schedule Comments: Will affect preops of S/U system 134 Eng'r Mhrs: 1,040 Other SFHO: 420 R.E. Mhrs: 240 Direct Mhrs: 15,400 Field N/M Mhrs: 7,200	840	(See * below)	Equipment must meet Phase III load requirements.	BLP-17752 11/20/81 BLP-18332 12/31/81	Cost does not cover any additional analysis by Buffalo Forge or Bechtel if results of SRSS method for combining the dynamic and negligible loads conclude that displacement levels are unacceptable.

= Uneval.

11-4-136

TITLE UNITS 1 & 2

SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED _____ DATE _____

CHECKED _____ SHEET _____ OF _____

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	MAN HOURS $/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL
CT ACCOUNTS:											
IANICAL											
G						15,400		143300	287000		
RUMENTATION											
TRICAL											
DIRECT COSTS						15,400		143300	287000		
RIBUTABLES:											
UAL 25% OF D M/H						3,850	16.93		65200		
ERIAL 3.00 PER DM/H								46200			
MANUAL 50% OF D M/H						7,200	13.65		97900		
DISTRIBUTABLE COSTS								46200	163100		
FIELD COST								189500	450100		639600
									→ +9200		
INEERING						840	46.00		38700		
E OFFICE						420	36.00		15100		
ELD R.E.						240	21.25		5100		
ENGINEERING & HOME OFFICE									68100		68100
NTINGENCY 1.5%											10460
ALATION 87.00 1/2 LABOR IN FIELD + SFHO											12270
											83520

ADD 200 MH (HS PER GDP (MP) REVIEW 10/18 1040 @ 11.00

$5K + 6K = 11K

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST		MAN HOURS			TOTAL COST			
			MAT'L	S/C	UNIT	TOTAL	$/MH	MATERIAL	LABOR	SUB-CONT.	TOTAL
T 1 R/B UNIT COOLER MODS											
OVE / REROUTE SMALL PIPE											
REMOVE 20X7 (SALVAGE 5')	140'				4	560	18.66				
DEPREP SALVAGE											
ALL 10' (NEW) PER UNIT											
X10 2&3" HRC PIPE	200'F (20X133.88)					2678	"		3000		
ME 40% SP, 60% LP & 4 WELDS PER 10')	133.88	EA									
ALL 2 NEW ANCHORS AND											
W HANGERS PER LINE											
SMIC / Q LISTED) 4X20	80		200.00		50	4,000	"		16000		
OTE:											
E S.P., 64F 3" HRC, 4-3" WELDS											
LINE FOR W/HS EA LINE											
LL 40 FLEX HOSES					8	320	"		52649		
S/T						7558					
ESTON/CONTINGENCY						142	"				
UNIT 1 COST						7,700	18.66		71649	114383	
UNIT 2 COST						7,700			71649	114383	
						15,400			143298	228766	

MANEK MULKANIE 12/11/81 -

40 NOZ - 16 LARGE & 24 SMALL

PIPE SUPPORTS AND PIPE TO BE REV
WILL HAVE ONE OF HIS PEOPLE COM
UP MONDAY 12/14 AND SCOPE THIS OU
QTY TO BE ESTIMATE WITH ALLOW.

STRESS (FOR 16 NOZZLES - LA
360 PROJ FOR CALCS (SFH

CRAS FOR STAFF & PIPE LAYOUT
& SUPPORTS
R.E. TIME - 24 NOZZLES

BOB FOUSAT - 16 X 12 M/HRS PER LINE E
TYPICAL HGR & ANCHOR DETAIL TO BE
APPLIED. SAY 40 M/HRS TOTAL SAY 240
M

2 PEOPLE 1½ MONTHS IN HOME OFFICE =

360 SFHO (CALCS)
480 " BOB FOUSATS GROUP
240 FIELD RE.

EE

PE ROUTING, SUPTS, ANCHORS

SM PIPE HRC-124 (TYP)
2 ANC / 2 SUPTS / 15' PER ES
7 90° EA

20 LINES @ 10' EA 200 L/F

SIMPLE DESIGN OF ANCHORS
PIPE SUPPORTS (50 M/HRS E

200 PER LINE X 20 4,00
FOR SUPTS DIRE

ALL IN R/B SAME IN U

[illegible] ELECTRIC STATION

ROUTING SHEET

BACK UP
11-3-

WRITTEN RESPONSE REQUIRED? YES ☐ NO ☐

DATE DUE: 12-29-81

DOC. CONTROL NO. _____

REGISTER: FILE 0260

REGISTER: SPEC/PO

	RESPONSIBLE	INFORMATION	ATTACHMENT	ROUTE	ADD'L DIST	
PROJECT MANAGEMENT						VIOLETTE
ASST PROJECT MANAGER						PERRA
						BISESTI
ENGINEERING						
PROJECT ENGINEER				1		POSER
PROJECT ENGINEERING				3		MEYANDT
				4		SHIPLEY
						MEHEGAN
						DAMERVAL
				2		TITUS
PP&L MANAGING ENGR						DERKACS
ADMINISTRATION						
DISCIPLINES						
ARCHITECTURAL						GIBBON
CIVIL		V				SHAH Rajagopal
CONTROL SYSTEM						EDLINGER
ELECTRICAL						CHAN
MECHANICAL	V	V				PEDERSEN Ganapathy
PLANT DESIGN						PAREKH
LICENSING						McDONNELL
QUALITY ENGINEERING						SPENSKO
CONFIG CONTROL						MOREY
GSA PROJ ENGR						WOLTERS
SERVICES						
COST & SCHEDULE						WARREN
COST TREND						SMITH
PROJECT PLANNER						MAURER
ENGINEERING PLANNER						MELVIN
PROCUREMENT						
PROCUREMENT MANAGER		V				STOJKOV
PURCHASING						MALLORY
EXPEDITING						DELONG
INSPECTION						JANUS
CONSTR COORDINATOR		V				FAZENDIN
QA/QC COORDINATOR						LINDSAY
FIELD						MOURER
FIELD QA						LILLIGH
RES ENGINEER						CRANSTON
SFHO-QA						BLOMQUIST
QC						
PP&L						
CHRON FILE		V				
READING FILE		V				

☒ PDCC HAS ENTERED THIS DOCUMENT AS A COMPLETE/PARTIAL RESPONSE TO:

BLP-17252
11-20-81

☐ PLEASE ADVISE PDCC IF THIS INFORMATION IS INACCURATE.

[illegible]

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

RECEIVED BECHTEL POWER CORP.
Dec 21 12 '81

DEC 18 1981

Mr. Eduard B. Poser
Project Engineer
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
REACTOR BUILDING UNIT COOLERS
ER 100450 File 160-M-315
PLB 13881

Dear Ed:

This is a complete response to your letter BLP 17752 dated November 20, 1981.

We have reviewed the above referenced letter and concur with your recommendation subject to the following comments and concerns:

It is to be noted that per PLB 17725 dated October 12, 1981 PP&L approved $37,036 to analyze and provide Phase III SQRT fixes for the subject unit cooler nozzles. At that time, a nozzle interceptor design was considered as the most viable fix and accordingly analysis of the design was pursued. However, we understand that the above design concept has been deleted as it has not solved the problem.

In order to come up with a comprehensive resolution of this problem, PP&L initiated several telephone conversations with Bechtel (messrs. Para Ganapathy, Rajagopal Manik Mulkani, Jack Weyandt) Bechtel also included Mr. John McMahon of McMahon Engr. who represents Buffalo Forge Company. During their telephone conversations, we have attempted to obtain clarification of the justification as to the need for these modifications recommended in BLP 17752 and their potential for success, particularly in view of the change from the previously approved fix. We have noticed that there is considerable confusion, regarding these nozzle fixes, between Buffalo Forge, Bechtel SFHO-SQRT group, Bechtel SFHO-piping analysis group and Bechtel field fix group which raises concerns regarding the necessity and adequacy of the proposed fixes.

We believe that the newly proposed nozzle fixes will require a substantial amount of field work.

However, we are not convinced that the subject modification is necessary to accomodate Phase III loads, particularly for the lower nozzles which are adjacent to the floor or to the structural base support memebers. We therefore request Bechtel to get this situation resolved at the earliest possible date.

However, in order to maintain the schedule on SQRT fixes we authorize you to proceed with the following:

> Purchase and qualify 40 flexible hoses for unit 1 only per your recommendation on BLP 17752.

We further authorize you to proceed with the implementation of these nozzle fixes, after you have verified that they are adequate to correct the Phase III load problem. Prior to implementation of the proposed fix for the lower nozzles, but not later than December 29, 1981, we request you to provide us with a response which indicates that you have investigated and verified the requirement for these nozzles. Bechtel should also verify that the nozzle analysis has considered the effects of the pipe supports, which are currently being installed in the field on the inlet and outlet pipe headers connected to the nozzles.

Very truly yours

T. M. Crimmins, Jr.
Project Manager- Nuclear Plant Engineering

SDP/jaa

Response Required: Yes
Date Due: 12/29/81

cc:

H. R. Clarke	N-5
T. M. Crimmins	N-5
F. Lahovski	N-5
E. M. Mead	N-5
R. W. McNamara	N-5
W. J. Rhoades	N-5
R. E. Moyer	N-5
S. D. Pai	N-5
SP&E File	N-3
Letter File	N-
Date File	N-5

ROUTING SHEET

GDS
BACK UP
TRGND
11-4-136

WRITTEN RESPONSE REQUIRED? YES ☐ NO ☐

DATE DUE: _____

DOC. CONTROL NO. _____

REGISTER: FILE M-315A-C

REGISTER: SPEC/PO M-315A-C

	RESPONSIBLE	INFORMATION	ATTACHMENT	ROUTE	ADDT'L DIST	
PROJECT MANAGEMENT						VIOLETTE
ASST PROJECT MANAGER						BERRA
						BISESTI
ENGINEERING						
PROJECT ENGINEER						POSER
PROJECT ENGINEERING						WEYANDT
						SHIPLEY
						MEHEGAN
						DAMERVAL
		✓				TITUS
PP&L MANAGING ENGR						DERKACS
ADMINISTRATION		✓				Martha Navarro
DISCIPLINES						
ARCHITECTURAL						GIBBON
CIVIL						SHAH
CONTROL SYSTEM						EDLINGER
ELECTRICAL						CHAN
MECHANICAL		✓	✓			PEDERSEN
PLANT DESIGN						PAREKH
LICENSING						McDONNELL
QUALITY ENGINEERING						SPENSKO
CONFIG CONTROL						MOREY
GSA PROJ ENGR						WOLTERS
SERVICES						
COST & SCHEDULE		✓				WARREN
COST TREND						SMITH
PROJECT PLANNER						MAURER
ENGINEERING PLANNER						MELVIN
PROCUREMENT						
PROCUREMENT MANAGER						STOJKOV
PURCHASING		✓				MALLORY
EXPEDITING						DELONG
INSPECTION						JANUS
CONSTR COORDINATOR						FAZENDIN
M&QS COORDINATOR						LINDSAY
FIELD						MOURER
FIELD QA						LILLIGH
RES ENGINEER						CRANSTON
SFHO—QA						BLOMQUIST
QC						
PP&L		✓				
CHRON FILE		✓				
READING FILE						

☐ PDCC HAS ENTERED THIS DOCUMENT AS A COMPLETE/PARTIAL RESPONSE TO:

_____

_____

_____

☐ PLEASE ADVISE PDCC IF THIS INFORMATION IS INACCURATE.

E.M.

SUSQUEHANNA STEAM ELECTRIC STATION

ROUTING SHEET

WRITTEN RESPONSE REQUIRED? YES ☐ NO ☒

DATE DUE: _____

DOC. CONTROL NO. _____

REGISTER: FILE 0260

REGISTER: SPEC/PO J-71

	RESPONSIBLE	INFORMATION	ATTACHMENT	ROUTE	ADDT'L DIST	
PROJECT MANAGEMENT		✓				VIOLETTE
ASST PROJECT MANAGER						BERRA
						BISESTI
ENGINEERING						
PROJECT ENGINEER						POSER
PROJECT ENGINEERING						WEYANDT
						SHIPLEY
		✓				MEHEGAN
						DAMERVAL
						TITUS
PP&L MANAGING ENGR						DERKACS
ADMINISTRATION		✓				Martha Navarro
DISCIPLINES						
ARCHITECTURAL						GIBBON
CIVIL						SHAH
CONTROL SYSTEM		✓				EDLINGER
ELECTRICAL						CHAN
MECHANICAL						PEDERSEN
PLANT DESIGN						PAREKH
LICENSING						McDONNELL
QUALITY ENGINEERING						SPENSKO
CONFIG CONTROL						MOREY
GSA PROJ ENGR						WOLTERS
SERVICES						
COST & SCHEDULE		✓				WARREN
COST TREND						SMITH
PROJECT PLANNER						MAURER
ENGINEERING PLANNER						MELVIN
PROCUREMENT						
PROCUREMENT MANAGER	✓	✓				STOJKOV
PURCHASING						MALLORY
EXPEDITING						DELONG
INSPECTION						JANUS
CONSTR COORDINATOR		✓				FAZENDIN
M&QS COORDINATOR						LINDSAY
FIELD						MOURER
FIELD QA						LILLIGH
RES ENGINEER						CRANSTON
SFHO-QA						BLOMQUIST
QC						
PP&L						
CHRON FILE		✓				
READING FILE						

BACK UP
11-4-136

☒ PDCC HAS ENTERED THIS DOCUMENT AS A COMPLETE/PARTIAL RESPONSE TO:

BLP-18162

☐ PLEASE ADVISE PDCC IF THIS INFORMATION IS INACCURATE.

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

DEC 23 1981

Mr. Eduard B. Poser
Project Engineer
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
P.O. J71 FLEXIBLE METAL HOSES
ER 100450 FILE 288-J71
PLB-13902

Dear Ed:

In response to BLP-18162, PL authorizes Bechtel to issue a revised purchase order, 8856-J71, to Metal Bellows Corporation for 50 flexible metal hoses for $55,000.00. This approval reflects a new face value of $355,000.00 consisting of:

Prior Approval per PLB-9036	$ 323,000.00
Subsequent changes not requiring PL approval:	
P.O. Rev 2	$ (23,000.00)
Approved change per this letter	$ 55,000.00
New Approved Face Value of Purchase Order:	$ 355,000.00

This approval reflects a new total commitment to this purchase order of $355,000.00 consisting of:

Face Value of Purchase Order	$ 355,000.00
Estimated charges not included in face value of Purchase Order:	$ 0.00
TOTAL COMMITMENT	$ 355,000.00

All future revisions to this purchase order require either prior approval (for changes greater than $10,000) or a letter of explanation (for changes less than $10,000).

Forecast No. 11 total for this Purchase Order is $300,000.00. This change will be trended in Trend 11-4.

Very truly yours,

T. M. Crimmins, Jr.
Manager-Nuclear Plant Engineering

DPG/mc

RESPONSE REQUIRED: NO

Copy to:

D. J. Cardinale	N-5
A. M. Male	N-5
J. B. Violette	BT
T. M. Crimmins, Jr.	N-5
D. P. Glockner	N-5
S. L. Denson	SSES
H. W. Keiser	SSES
C. L. Lombardi	N-4
D. F. Roth	N-5
Letter File	N-3
SP&E File	N-3
Date File	N-5

RESOLVED SCOPE TRENDS

er	Class	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
- 1	1C	Post Phase III hanger modifications and documentation update. Eng'r Mhrs: 4,800 Other SFHO: 1,920 Field R/E Mhrs: 6,000	500	(See remarks)	After completion of initial Phase III design (10/25/81), continued resident engineering activity has been required to update documentation and work out interferences and design changes caused by same.		(1) Forecast completion by 3/30/82 for engineering. (2) Field direct labor manhours are covered by Trends 11-2-39 and 11-4-39.
-136	1C	Reactor Building unit cooler equipment (including flex hoses) and piping modifications in Units 1 and 2. *Schedule Comments: Will affect preops of S/U system 134 Eng'r Mhrs: 1,040 Other SFHO: 420 R.E. Mhrs: 240 Direct Mhrs: 15,400 Field N/M Mhrs: 7,200	840	(See * below)	Equipment must meet Phase III load requirements.	BLP-17752 11/20/81 BLP-18332 12/31/81	Cost does not cover any additional analysis by Buffalo Forge or Bechtel if results of SRSS method for combining the dynamic and negligible loads conclude that displacement levels are unacceptable.

U = Uneval.

1)

11-4-39.1

TITLE POST PHASE III HGR ACTIVITY

TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

ON BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED _____ DATE _____

CHECKED _____ SHEET _____ OF _____

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST		MAN HOURS			TOTAL COST			
			MAT'L	S/C	UNIT	TOTAL	$/MH	MATERIAL	LABOR	SUB-CONT.	TOTAL
CT ACCOUNTS:											
ANICAL											
G											
UMENTATION											
TRICAL											
RECT COSTS											
IBUTABLES:											
AL											
RIAL											
ANUAL											
STRIBUTABLE COSTS											
ELD COST											
EERING											
OFFICE					4800	46.8			224800		
					1,920	36.8			69100		
GINEERING & HOME OFFICE					6,000	22.0			132000		
									421900		421900
GENCY											
TION											781000
											1202900

SAY 1200000

F. Lamenza
V. Kelly

PLANT DESIGN F/C II A REVIEW FOR DEC. 1981

1·13·82

SFHO F/C II A MHRS TO GO 103,680.

R.E. F/C II A MHRS TO GO 66,300.

INCREASE IN SFHO F/C II A MANHOURS IN DEC. 1981

ACTIVITY	INCREASE	
a) REVIEW/REVISE POST P-III ANCHORS	+ 840.	MHRS
b) POST P-III PIPE SUPPORTS PROBLEM RESOLUTION	+ 3960.	480
c) SQRT - EQUIPMENT QUALIFICATION (VALVE ACCELERATIONS)	+ 600.	
d) ADDED CALC SCOPE (CHILLED WATER, P&ID SEISMIC ANALYSIS REQ'T)	+ 600.	
e) RESPONSE SPECTRA DOCUMENTATION	+ 400.	
SFHO INCREASE	+ 6400.	

INCREASE IN R.E. F/C II A MANHOURS IN DEC. 1981

ACTIVITY	INCREASE	
a) DOCUMENTATION VERIFICATION AS REQUESTED BY FIELD	+ 1000.	6000

R. E. (CONT'D)

R. E. INCREASE +6000.

SUMMARY:

SF HO INCREASE	6400
R. E. INCREASE	6000
TOTAL	12,400. MH

NOTES:

This review does not account for changes in unit sales, exposure items (delayed as-built) or changes in scope anticipated for the work to go.

Raf

TITLE

SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED _____ DATE _____

CHECKED _____ SHEET _____ OF _____

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	MAN HOURS $/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
CT ACCOUNTS:											
ANICAL											
G											
UMENTATION											
TRICAL											
IRECT COSTS											
IBUTABLES:											
JAL											
RIAL											
IANUAL											
ISTRIBUTABLE COSTS											
IELD COST											
NEERING						1700	46.00		78200		
OFFICE						600	36.00		21600		
P.E.						38,300	22.00		842600		
NGINEERING & HOME OFFICE									942400		942
INGENCY 10%											
LATION 8% ON UNIT 2 LABOR											

(●IE) 266 2& ● HGRS

L.P. SUPPORTS: 78 REQUIRE MODS + 30 TO BE REMOVED. ASSUME R.E. RATIO @ 42% SP 58% LP ON 78. PER GENE THOMAS (1/7/82) 50/50 R ON HGR INFO., IE, 1/2 THE HGR FABED AND TAKEN TO THE HO FOR INSTALLATION WHERE IT THEN DETERMINED THAT THEY FIT AS DESIGNED. SO 1/2 OF M/HS TO INSTALL THESE HGRS FAB THE HARDWARE ARE REQ

REMOVE 30 LP SUPPORTS NOW INSTALLED AT SA M/HS EACH AS AN AVERAGE. SOME REQUIRE CU WHILE SOME ARE JUST CUT WITH STUBS LEFT

900 M/HS = #16,812

L.P. SUPPORTS: 153 REQUIRE MODS @ 150 = 229

S.P. SUPPORTS: 113 REQUIRE MODS @ 60 = 678

S.P. SUPPORTS: 32 REQ MODS @ 60 = 1,920
L.P. SUPPORTS: 46 " " @ 150 = 6,900

DIRECT MTL
LP @ 150 EA X 199 = 29850 ÷ 2 = 14925
SP @ 100 EA X 145 = 14,500 ÷ 2 = 7,250
22,175

MOD M/HS PER UNIT = 38550 ÷ 2 (50/50 SPL = 19,275 PER

UNIT 1 20,175
UNIT 2 = 19,275
39450

ORIGINATOR _____ DATE _____ CALC. NO. _____ REV. NO. _____

PROJECT _____ CHECKED _____ DATE _____

SUBJECT _____ JOB NO. _____

SHEET NO. _____

L.P. 78 HOME MODS

SF40 (L30 CANCELED SUPPORTS

DIRECT MTR
PER
#88,70

DIR LABOR
80,100 M
18.69 #1,4

DIST LABOR
20,000 M
#338

DIST MTL #2

N/M MHRS =
@ 13.60 = #5

RE 153 HOME MODS

S.P. 113 HOME MODS

REMOVE 30 LP SUPPORTS - UNIT 1 @ 50
EACH = 1,500

SF40 78 HGRS HAVE MODS 4290 SP 58

32 ~~24~~ SP ~~38~~ 46 LP

LP 199 X #150 ~~200~~ S.P. 145 X 100

32 @ 60 = 1920
46 @ 150 = 6900
DIRECT MTL

RE 153 LP @ 150 = 22950

113 SF @ 60 = 6780

UNIT 1 M/HS = 40,050

RE 6

TITLE POST PHASE II HANGER MODIFICATIONS

TLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

N BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED _____ DATE _____

CHECKED _____ SHEET _____ OF _____

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	MAN HOURS $/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
CT ACCOUNTS:											
ANICAL											
G						60,100 17,400	18.68	17400	325100		
UMENTATION									1 46		
TRICAL											
RECT COSTS						17,400		17400	325100		1565000
								88700			
IBUTABLES:									339000		
AL 25% OF D M/H						20,000 4,350	16.93	240000	99300		339000
RIAL 3.00 PER D M/H								52200			240000
ANUAL 50% OF D M/H						8,700	13.68		118300		51000
						40,000					
STRIBUTABLE COSTS								52200	192000		114000
ELD COST								69600	517100		586700
EERING						1700	46.00		78200		
OFFICE						600	36.00		21600		
						38,300	21.99		842600		
GINEERING & HOME OFFICE									941400		941400
NGENCY 10%											1527800
ATION 8% on 1/2 LABOR (FIELD) UNIT 2											209800
											1170160

LINGOD MEMULA SEE BUTCH 12/18/81

PER BUTCH NARANJA (PIPE SUPT GRP LEA

FIELD SUPPORT FOR HGR CHANGES

TO DATE - 6 MEN-2 WKS

TO GO (WHAT IS CURRENTLY AVAILABLE WITH
COMING FROM THE FIELD) 6 ME

ALLOW FOR TO GO - YET TO COME 6 MEN - 4

SAY 6 MEN-7 WKS = 1680 SFHO M/HS RO

TO DATE QTY INFO BY PACKAGE:

NO.	HGRS	LG	SM	REWORKS LG	REWORKS SM	PENDING
	14	14	-	1	-	-
	35	5	30	-	-	-
	26	26	-	13	-	1
	9	9	-	1	-	-
	90	90	-	32	-	19
	3	3	-	-	-	-
	2	2	-	1	-	-
	179	149	30	48	-	20

ASSUME 1/2 OF PENDING REQUIRES REWORK

CURRENT LG PIPE SUPPORT REWORKS = 58 X 15

CHECK IN UNIT 1 - DOUBLE FOR UNIT 2 MR

FIELD R.E. TO PROVIDE M/H INFO BY ADLEN AYAD

12/18/81 PER ADLEY AMAD

P.D. RAS PEREK LP/SP DETAILED

TO VINCE KELLY / RAS / MEMULA

FROM 10/25 TO DATE

JOB SHOPPER (81) FINISHED TODAY

90 LEFT 15 - OTHER / UNIT 2

75 R.E. (QUADREX, JOB SHOPPERS)

NO WORK FOR 2 WEEKS (MCAR 77

M/HS SINCE 10/25/81: FOR POST PHAS

III PIPE SUPPORTS

BY GAYLE MELVIN TO FIELD

PEOPLE 30 LG PIPE SUPPORTS - HENRY C

↓ 45 SM PIPE SUPPORTS - LEO HAN

RK AYS 23 DAYS THRU 11/30 14 DAYS THRU 12/18

ALLOW 3 OR 4 MORE WEEKS TO GO

OTE: PER GAYLE MELVIN "G. CRANSTON SAYS

NEEDS 80,000 M/HS TO RESOLVE PI

III HER PROBLEMS."

WORKING DAYS SINCE 10/25

SAY 55 DAYS X 8 = 440 X 75 MEN = 33,0

ADD 16% OT. 38,280 M/HS SAY 38

RESOLVED SCOPE TRENDS

Basis	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
1B	Additional cost reduction to previously trended emergency switchgear room cooling modifications. Engr. Mhrs: <500> Other SFHO: <150> Direct Mhrs: <2,630> Field N/M Mhrs: <1,315> Subcontract Mhrs: <3,025>	<150>	None	Previous trend allowed credit for removal of half of the manhours estimated for the auto flow control part of original cost study.		
	Reevaluation of estimate for structural steel beam fixes for pipe hangers in Units 1 and 2. Eng'r Mhrs: 8,500 Other SFHO: 3,000	500	None	Phase III pipe hanger loads have caused overstress in some structural beams in Unit 1. This trend refines engineering manhours to accomplish the calc reviews.		(1) Engineering evaluations now complete. (2) Field fixes and associated direct labor in Trend 11-3-70.
1C	Implementation of low pressure coolant injection (LPCI) fix in Unit 2. Eng'r Mhrs: 2,900 Other SFHO: 1,200 Direct Mhrs: 4,000 Field N/M Mhrs: 2,000 RE Mhrs: 670	440	None	G.E. issue of FDI-MDBL and FDDR KR 2-513-5 to improve the LPCI function of the RHR, core spray and reactor recirc systems.	DCR-565 as BLP-17118 10/5/81	DCP-565 issued for construction on 10/8/81.

= Uneval.

FEB 19 '82 15878

11-4-70

TO THEM

E SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED KNB DATE 12/4/81

CHECKED _____ SHEET 1 OF 1

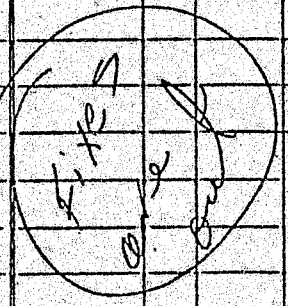
ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST		MAN HOURS			TOTAL COST			
			MAT'L	S/C	UNIT	TOTAL	$/MH	MATERIAL	LABOR	SUB-CONT.	TOTAL
T ACCOUNTS:											
ANICAL											
UMENTATION											
RICAL											
RECT COSTS											
IBUTABLES:											
AL											
RIAL											
ANUAL											
STRIBUTABLE COSTS											
ELD COST											
IN 11-3-70											
EERING TOTAL USED 12,100-3600 TRENDED						8,500	46		391000		
OFFICE @ 30%						3,000	36		108000		
GINEERING & HOME OFFICE									499000		
NGENCY 15%											
ATION											

SPK 500,000

5,000,000

ION BERWICK, PA CHECKED SHEET 2 OF

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
p for Civil Engineering											
urs To Evaluate Platforms											
ngers ON Them.											
inment : per Rich Roberts Act. ~6 wks. other ~ 2 months ~ 9 wks											
Engrs x 3 mos x 4.6 wk/mo. x 40 Hrs/wk = 8280											
+ 20% O. Time 1656											
Engr HOURS IN Containment 9936											
Buildings : Morden Renslow											
III hangers.											
1270											
390											
361											
239											
2260 assume 10% pertained to											
platforms ~ 250 Hangers											
ume 2 mhrs/Hanger = 500 mhrs											
ield Fixes Associated @ 40 mhr/Fix = 400											
olution.											
Fixes Floor Platforms 2 x 40 = 1200											
Total 2100											
6/4											
Rd9											



8856

11-4-70

1/23/81 Talked w/ Rich Roberts and Mort Renslow to find mhrs for (CO) evaluation of Platforms w/ hangers on them

Rich Roberts. ~ 15 engineers for Phase III Re evaluations / pl on for ~ 3 mos. w/ 20% for O.T.

15 Engr. x 3 mos. x $\frac{4.6\ wk}{Mon.}$ (4 wk + 2 other months) x $\frac{40\ hr}{wk}$ = 8280

20% OT 1656

9936 ← Engr'g effort for Containment.

Other Bldgs. w/ Phase III hangers – Mort Renslow.

Total of 2260 Hgrs, assume 10% pertained to small platfo

~ 250 Hgrs x $\frac{2\ mhrs}{Hgr}$ = 500 Mhrs

* Note Fixes regd engr to go to field to get scope of fixs.

10 Field Fixes* x $\frac{40\ mhr}{Fix}$ = 400

+ 30 Fixes* on floor Platform x 40 = 1200

S/T 2100

TOTAL ~ 12,100 – 3600 (Previously transfd for steel Beams) = 8,500

Back-up sheet for ~ Hgrs/Bldg. breakdown

Description	Status $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
Re evaluation of platforms that currently have hanger attached.	800		Seismic capability of miscellaneous structural components (platforms, stairs and ladders) required re-calculation to verify structural integrity with additional load capacity.		1) Engineering evaluation complete. 2) 30 Fixes identified by engineering. 3) Field Fixes similar to
ENGINEERING MH's: 12,100					
OTHER SFHO MHs: 4,000					
ADD DIRECTS FOR FIXES	80				
	880				

solved
resolved

ORIGINATOR Kirk DATE 11/23/81 CALC. NO. REV. NO.

CHECKED DATE

PROJECT JOB NO.

SUBJECT SHEET NO.

JOHN BANKERT CIVIL EVAL OF PLATFS
WITH HGRS ON THEM.

SEE MORT REDSCAW & RICH ROB

12-A-15 ↓ TURBINE. 12-A-6 ↓

11/23/81
~1:00 PM

Reactor # of HGRS

~ 15 engr
PL

TO GO PHASE III

George going on for

PLATFORM → T

20

Phase III WORK Completed

IGER Reactor 1186

~~Duct~~ 84

1270.

to revaluate platforms
to Q PHASE III Loads

Diesel Gen. 342
48
390

Hangers in ~~Diesel~~ Control
953
197

TOTAL PHASE III 1050

TURBI 342
19
361.

Control 216
23
239

Floor

30 Fixes Civil Platforms ~~Flooring~~

→ Small platform ~10% = 250 Hangers
10 Fixes (40 Hrs)

ring

as s	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
9 -39)	N/A Additional manual man-hours and material are needed to complete Phase III pipe hangers in Unit 1 and common. *Schedule Comment: May have impact on systems preops testing in Unit 1 and common facilities. Direct Mhrs: 170,000 Field N/M Mhrs: 50,000	7,000	(See * below)	Higher unit rates than previously estimated (150 Mhrs per large, 60 Mhrs per small) in Forecast 11 and subsequent trends, are now required for complicated design, installation and varied overtime requirements. Additional material costs are also required (see remarks).	BLP-19066 2/10/82 BLP-19067 2/10/82	Cost includes $550,000 material cost for P.O. P-3B new pipe snubbers to date, and an allowance of of $130,000 for P.O. P-3A for brackets and accessories. Additional cost of escalation since 1974 for $1,000,000 on P.O. P-3A. Total material cost to date is $20,100,000 P-3A: $15,100,000 P-3B: 5,000,000
2 82))	N/A Decrease in previously trended manual overtime rate for 1981.	<800>	None	Trend 11-3-82 projected $4,000,000 for manual overtime over Forecast 11. Subsequent to December 1981, that rate of overtime has been cut. This detrend reflects actual cost savings thru 1981 less than Trend 11-3-82.		See Trend 11-4-83 for other portion of this trend.

J = Uneval.

Unit 2 11-4-39 Material FEB 19 '82 C 15 8788

TITLE SUSQUEHANNA STEAM ELECTRIC STATION
PENNSYLVANIA POWER AND LIGHT COMPANY
TION BERWICK, PA

TAKEOFF _____ APPROVED _____
PRICED _____ DATE _____
CHECKED _____ SHEET _____ OF _____

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
ECT ACCOUNTS:											
IL											
CHANICAL								700000			
NG * Per civil addtl matl cost. P-3BC mechanical Snubbers						170,000	20	450000 -k	3,400,000		
TRUMENTATION											
CTRICAL											
DIRECT COSTS								4500000	3400000		3400000
TRIBUTABLES:											
NUAL 25% OF DIRECTS						42500	17		723000		
TERIAL 3.00 PER DIRECT MH								510000			
MANUAL PER J. TELLIS						50,000	13.6		680000		
DISTRIBUTABLE COSTS								510000	1403000		1913000
FIELD COST											5313000
INEERING											
ME OFFICE											
ENGINEERING & HOME OFFICE											
NTINGENCY											
ALATION								1000000			

SAY
5300000
1000,000

UNIT 1 & COMMON PIPE HANGERS

	To Date Manhours 12-7-81	FIC II Manhours	Overrun To Date
Large Pipe Hangers	983,010	943,125	39,885
Small Pipe Account	1,147,534	1,084,789	62,745
Total Overrun To Date			102,630
			say 110,000 *

TO GO HANGERS

	Large Pipe			Small Pipe		
Bldg	Quantity	U. Rate	Manhours	Quantity	U. Rate	Manhours
Containment	200	150/ea.	30,000	625	70	43,750
Reactor	425	150	63,750	770	70	53,900
Turbine	90	100	9,000	65	50	3,250
Dies. Gen.	90	100	9,000	55	50	2,750
Radwaste	2	100	200	11	50	550
Misc	80	100	8,000	90	50	4,500
	887 Large		119,950	1616 Small		108,700
		say	120,000 **		say	110,000 **

TREND MANHOURS

* To Date Overrun	110,000
** To Go Manhours	230,000
Hanger Trend 11-2-39	(140,000)
Small Pipe Trend 11-2-69	(30,000)
Add Manhours This Trend	170,000

DESIGN BY ALH DATE 12/16/81 CHECKED BY SHEET NO.

PROJECT UNIT 1 & COMMON SSES JOB NO. 8

SUBJECT HANGER TREND CALCULATION NO. FILE NO.

	MANHOURS AS OF 12-7-81	FORECAST 11 MANHOURS	Δ (+) = HOURS RE (−) = HOURS C
LARGE PIPE	983,010	943,125	−39885
SMALL PIPE	1,147,534	1,084,789	−62745
			−102,630 M
			SAY→ −110,000

HANGERS TO-GO (12-10-81)

FACILITY	QUANTITY	U. RATE	MANHOURS	QTY	U.R.	
	LARGE PIPE			SMALL PIP		
1M	200	150/ea	30,000	625	70/ea	43
1R	425	150	63,750	770	70	53
1T	90	100	9000	65	50	3
9G	90	100	9000	55	50	2
9W	2	100	200	11	50	
9-MISC.	80	100	8000	90	50	4
			119,950			108
		SAY→	120,000		SAY→	11

TO-DATE OVER-RUN → 110,000 MH

TO-GO MANHOURS → 230,000

PHASE III TREND → −140,000 −30,000 QTY

THIS TREND 8 ~~200,000~~ MH

T. MIHOR K. BUCHANAN G. OWEN R. ROGERS R. WERT

DAILY HANGER RELEASE / INSTALLATION REPORT

LP TOTAL 10,342
SP TOTAL 8800

- DWS. RELEASED TO CONST. -

MON.	TUES.	WED.	THUR.	FRI.	SAT.	SUN.	WK'LY NET
9 LP / 44 SP							L.P.

- ACCEPTED INSTALLATIONS -

516							L.P.

I. FIELD ENGR. RELEASES

A. TOTAL BACK LOG
B. ON HOLD (INCLUDED IN I-A)
C. DWGS. IN RELEASE CYCLE
D. DAILY RELEASED TO CONSTRUCTION

II. ADDITIONAL

A. HANGERS REVISED BY S.F.H.O. / R.E. (DSN REC'D
B. HANGERS RE-CYCLED BY CONST. ("C" AFTER 10/25)
C. NEW HANGERS FROM REMOVED FROM MAPPER)
S.F.H.O./R.E. (DSN REC'D AFTER 10/25) DAILY / TOTAL

III. INSTALLATION

A. TOTAL INSTALLATION BACK LOG (WORKABLE + I-D-
DAILY ACCEPTS & III B & III C & III D) 674
B. ON HOLD (IN III A)
C. REPORTED COMPLETE (BY SUPERVISION)
D. BACK LOG F.E. INSPECT (AFTER TURNED IN F/C BY SUPERVISION BEFORE TRANSMIT TO DRAFTING)
E. BACK LOG GROUT/TORQUING
F. ACCEPTED/DRAFTED/TO Q.C. (TRANSMITTED BY 743
G. ACCEPTED HGRS. RETURNED TO CONST. DRAFTING)
(Q ACCEPTS DELETED FROM MAPPER)

IV. TOTAL HGRS. TO BE CONST. A+6

V. TOTAL HGRS CONST. A-6

Q		NON	
L.P.	S.P.	L.P.	S
705	858	64	
609	42	71	
0	20	0	
9	41	0	
	918		
0	0	0	
15	0	0	
0	0/151	0	
269	653	89	
0	96 1970	0	
10	30	3	
45	75	17	
28/41	66/27	0	
N/R	N/R 1600	N/R	
0	0	0	
743	1600 A-3	183	
35	3878 A-6	7381	3

FROM J. PECKS

ctor Elv.	Not Released Large Pipe	Not Released Small pipe	Released Large Pipe	Released Small Pipe
645	92	129	68	111
670	34	52	21	40
683	47	62	67	30
719	35	64	11	65
749	18	154	18	43
779	4	3	4	9
718	1	—	1	2
	231	464	190	305
Turbine	43	25	46	39
Containment	93	416	95	209
Radwaste	2	2	—	9
Diesel	67	14	27	40
Misc.	62	71	14	66
	498	(992)	372	(668)

2530
13
2517

11-4-39 sold

Description	Status $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
Increase ~~in cost~~ IN	450	NONE	Results of Phase III		Total Committed
@ Purchase ORDER			analysis requires additional		(including this change)
P-3 BC, Mechanical			mechanical snubbers for	Forecast II P.O Workshop	$4879,000
Snubbers.			Units 1 & 2.	New Load Analysis / Equipment qualification cost / Forecast to 12/81	FIC 10 4430,000
					Δ = $449,000
			Rec'd C.W.I 12/30/81		
			Put in Mat'l $)		
					Field Trend (J. Tellis)
			Include this w/		
			Phase III manhours.		
			on		

17

olved
esolved

FOR DRAFTS ONLY

(Originator indicates copies required with or w/out attachment)

bcc: R.V. Persha
L.B. Pulley
B.T. Stojkov
G. Gobel
J. Warren
C.W. Heusler

Mr. T. M. Crimmins, Jr.
Pennsylvania Power & Light Co.
P. O. Box 1870
Allentown, Pennsylvania

Subject: Susquehanna Steam Electric Station
Units 1 and 2 Job 8856
P.O. 8856-P3-BC, Mechanical Snubbers

Dear Tom:

The/following (is a complete/is a/partial/completes the) reply to your letter(s) No.(s) _____ dated _____ our corresponding Document Control No. _____.

— See Attached —

Very truly yours,

E. B. Poser
Project Engineer

Written Response Req'd: (Yes) No
Due Date: 1-11-82

TOTAL Committed (includes this Δ) 12/81 4878,938.

APT / LBP
initials

Location

cc: _____ ( )
_____ ( )
_____ ( )

F/C 10 4420,400-

448,538

To be 11-2-39 Trans

Attachments: 1.
2.
3.

8856/S-2-(6/81)
1F/11
ENG/cgs

Results of Phase III analysis revealed that add
mechanical snubbers are required for Units 1 &
as follows:

Glenn, were you able to get confirmation from Field?

Unit No.	Size	Qty	Unit Price	Extension	
1	PSA-1/4	200	$ 435	$ 87,000	
1	PSA-1/2	50	448	22,400	
		Subtotal Unit 1		109,400	$10
2	PSA-1/4	350	435	152,250	
2	PSA-1/2	200	448	89,600	
2	PSA-1	100	621	62,100	
2	PSA-10	125	949	118,625	
2	PSA-35	75	3124	234,300	
2	PSA-100	20	6289	125,780	
2	PSA-100 End Caps	17	340	5780	
		Subtotal Unit 2		788,435	$ 789
		TOTAL UNITS 1 & 2			$ 897,

Please note that our pricing agreement with Pac
Scientific Co. expires on MAY 31, 1982. To ensure
the above critical requirements are included under our pricing
(currently except 1" 2" which is due to Feb 28, 1982 and PSA 35's prior to Jan 11, 1982). For this reason, we recommend
that the order for the above mentioned mechanical
snubbers be placed prior to the above expiration
date to take advantage of the existing pri
Otherwise prices for all mechanical

have ~~to be renegotiated with~~ Pacific Scientific Company at anticipated higher price

The commitment amount . . . . . .

May we please have your approval to pro
with the change order by January 11, 198

VTY

4

The current pricing structure with Pacific Scientific expires May 31, 1982. It is anticipated that the pricing structure that will be re-negotiated will be significantly higher than the existing structure. Therefore, to take advantage of the current prices, all doubles except the PSA 35's should be ordered by Feb 22, 1982 (14 wks from May 31, 1982) and PSA 35's should be ordered by Jan 11, 1982 (20 wks from May 31, 1982)

19066

C. H. Nichols
L. B. Pulley
B. T. Stojkov
G. Gabel
J. F. Warren
C. W. Heusser
G. D. Smith

FEB 10 '82 8201580013

Mr. T. N. Crimmins, Jr.
Pennsylvania Power & Light Co.
P.O. Box 1870
Allentown, Pennsylvania 18105

Subject: Susquehanna Steam Electric Station
Units 1 and 2 Job 8856
P.O. 8856-P3-MC, Mechanical Snubbers

Dear Tom:

This is a supplement to our letter, BLP-18349, dated January 5, 1982, Document Control Number 155486.

We wish to correct the error we made in the estimated quantity of mechanical snubbers required for Unit No. 2. The PSA-100 end caps (quantity of 17) shown in the above letter are in actuality PSA-100 mechanical snubbers with extension pipe and weld adapters. It is therefore necessary to delete seventeen (17) PSA-100 end caps and add seventeen (17) PSA-100 snubbers, bringing the total number of PSA-100 snubbers up to thirty seven (37) at a net increase of $101,133.

The commitment amount for the above change will be $121,133, which includes $20,000 in escalation. The total commitment for this purchase order will be $5,000,071 (including $562,967 in escalation, $27,458 for freight and $5,000 for vendor representative). The forecast No. 10 total for this purchase order is $4,000,000. The amount of $430,400 is covered by New Loads (stated as Equipment Qualification in BLP-18349) allowance and the remaining $570,000 will be transfer in Trend No. 11-4.

May we please have your approval to proceed with the change order by February 16, 1982.

Very truly yours,

EBPoser/FO

F. B. Poser
Project Engineer

Written response required: Yes
Due Date: February 16, 1982
APT/LBP:sla

PE40/2

Resp. Code	PD
Engr.	OD
Grp. Ldr.	[illegible]
Grp. Supvr.	[illegible]
APE	

IN REPLY PLEASE REF:

C 19067

F. Warren
C. W. Heusser
G. D. Smith
B. T. Stojkov
G. Gabel

FEB 10 '82 8201580144

Mr. T. M. Crimmins, Jr.
Pennsylvania Power & Light Co.
P.O. Box 1870
Allentown, Pennsylvania

Subject: Susquehanna Steam Electric Station
Units 1 and 2 - Job 8856
P.O. 8856 - P3-A, Piping Supports.

Dear Tom:

This is a supplement to our letter, BLP-17661, dated November 12, 1981, that addressed our request for additional $1,128,000 funding (subsequently approved by PL) to the base price of subject purchase order. We inadvertently omitted in that letter the amount of escalation applicable for the requested increase, the value of which is $1,038,000. This represents 92% of base price, the base date of which is 1974. The $2,035,000 escalation noted in the above letter applies to the base price prior to BLP-17661.

Reference your approval letter, PLB-13900, dated December 22, 1981, the new commitment amount for this purchase order, with the above change, will be $15,090,000, which includes a total escalation of $3,073,000. Forecast 11 for this P.O. is 13,320,000. The remainder of this increase will be covered by Trend 11-4-39.

May we please have your approval by February 15, 1982 to incorporate the $1,038,000 escalation in the total commitment amount for this purchase order.

Very truly yours,

E B Poser /FJ

E. B. Poser
Project Engineer

Written Response Req'd: Yes
Due Date: 2/15/82

LBP/APT/lrm

cc: Dale Sattar, PP&L, NPE

Grp. Resp. Cont.	P.D.
	QA
	HL FH LP
	CWH ccs

L. B. Pulley
B. T. Stojkov
G. Gabel
J. F. Warren
C. W. Heusser
G. D. Smith

FEB 10 '82 8201580 13

Mr. T. N. Crimmins, Jr.
Pennsylvania Power & Light Co.
P.O. Box 1870
Allentown, Pennsylvania 18105

Subject: Susquehanna Steam Electric Station
Units 1 and 2 Job 8856
P.O. 8856-P3-NC, Mechanical Snubbers

Dear Sir:

This is a supplement to our letter, PLA-1734C, dated January 5, 1982, Document Control Number 155416.

We wish to correct the error we made in the estimated quantity of mechanical snubbers required for Unit No. 2. The PSA-100 end caps (quantity of 17) shown in the above letter are in actuality PSA-100 mechanical snubbers with extension pipe and weld adapters. It is therefore necessary to delete seventeen (17) PSA-100 end caps and add seventeen (17) PSA-100 snubbers, bringing the total number of PSA-100 snubbers up to thirty seven (37) at a net increase of $101,133.

The commitment amount for the above change will be $101,133, which includes $20,000 in escalation. The total commitment for this purchase order will be $5,000,071 (including $562,907 in escalation, $27,456 for freight and $5,000 for vendor representative). The Forecast No. 16 total for this purchase order is $4,000,000. The amount of $430,400 is covered by New Loads (stated as Equipment Qualification in PLA-10349) allowance and the remaining $570,000 will be transferred in Trend No. 11-4.

May we please have your approval to proceed with the change order by February 16, 1982.

Very truly yours,

E B Poser /ko

E. B. Poser
Project Engineer

Written response required: Yes
Due Date: February 16, 1982
APT/LBP:sla

PD40/2

	PD
	QA
Dep. Dir.	[illegible]
Chf. Engr.	[illegible]
[illegible]	[illegible]

RESOLVED SCOPE TRENDS

	Class	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
7)	1C	Increase in manhours for pipe hydros in Unit 1. Direct Mhrs: 15,000 Field N/M Mhrs: 7,500	500	None	Increased estimate over Forecast 11 manhour estimated (8,000) and projected to go manhours (7,000). Previous trends covering piping additions and changes did not include manhours for new and rehydro for Phase III line testing.		See Trend 11-3-106 for other portion of this trend.
8)	1C	Increase in material and labor for heating tracing in systems 168, 169 and 173. Direct Mhrs: 6,000 Field N/M Mhrs: 3,000 Note: Affects start up systems 168, 169 and 173.	400	None	Addition of redundant heat tracing to act as back up. Decision was made to apply redundant tracing as some pipe will become inaccessible and insulated.	PLB-9370 12/28/78 BCLPC-9718 10/14/81	

REFERENCE FOR BACK-UP

U = Uneval.

11-3-107

	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
1C	Structural steel beam fixes for pipe hangers in Units 1 and 2. *Schedule Comment: Components may have to be removed for access for beam fixes. Could cause retesting of system components by ISG. Eng'r Mhrs: 3,600 Other SFHO: 1,200 Direct Mhrs: 25,000 Field N/M Mhrs: 12,500	1,300	(See * below)	Phase III pipe hanger loads have caused overstress in some structural beams in Unit 1. Containment (30 fixes), Reactor Building (38 fixes) and Turbine Building (2 fixes). Assumed same fixes for Unit 2.	DCR-613 10/30/81 as BLP-17492	Engineering to issue all fixes by 12/15/81.

Uneval.

11-3-70

DUE TO PHASE II RECIRC

TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856 | TAKEOFF | APPROVED
PENNSYLVANIA POWER AND LIGHT COMPANY | PRICED | DATE DCR-613
ION BERWICK, PA | CHECKED | SHEET OF

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
ECT ACCOUNTS:											
L 5,400 UNIT 1 - 3,240 UNIT 2	70	EA	200			25,000	19.77	14000	494300		
CHANICAL											
NG HIGH						40,000			791000		
TRUMENTATION											
CTRICAL											
DIRECT COSTS						25,000		14000	494300		
						22,000			372500		
TRIBUTABLES: DUE TO EXCESSIVE SCAFFOLDING											
NUAL USE 55% OF D M/H						13,750	16.93		232800		
TERIAL 3.[illegible] PER D.M/H						20,000			272000		
NMANUAL 50% OF D. M/H						12,500	13.60		170000		
DISTRIBUTABLE COSTS								75000	402800		
								134000	1435500		
FIELD COST								89000	897100		
						3,600	46.00		165600		
GINEERING						1,200	36.00		43200		
ME OFFICE											
ENGINEERING & HOME OFFICE									208800		
NTINGENCY 10%											
CALATION 8% ON 37½ LABOR ONLY 2									9300		

IN REPLY PLEASE REF:

OCT 30 8101512 76

BLP A7492

Mr. T. M. Crimmins, Jr.
Pennsylvania Power & Light Co.
P. O. Box 1870
Allentown, Pennsylvania 18105

Subject: Susquehanna Steam Electric Station
Units 1 and 2 - Job 8856
Design Change Requests (DCRs)

Dear Tom:

The following attached copy of Design Change Request is submitted for your information.

DCR	Rev.	Class	Description
613	0	1C	Beam Fixes for Pipe Hangers.

Very truly yours,

E. B. Poser
Project Engineer

Written Response Req'd: No
EBP/FMM/cgs

Attachment: DCR as Listed Above

cc: J. M. Kenny (PL) w/a

Grp. Resp. Code	C.C.G.
Grp.	F.C.
Grp. Ldr.	O.T.S.
Grp. Supvr.	F.M.
[illegible]	
[illegible]	

PF10/24-1

39p

CHANGE REQUEST

LOG NO. D 01194

DESIGN (DCR) NO. 613

REV. 0

AFETY RELATED ☒ YES ☐ NO

ROM EST <1000 KS

SHEET 1 OF 1

TITLE OF CHANGE: BEAM FIXES FOR PIPE HGRS

DESCRIPTION OF CHANGE

Increase strength of structural beams inside & outside containment that support pipe hangers.

BASIS FOR CHANGE

PP&L DCA LOG NO.

Phase III pipe hanger loads cause overstress in some structural beams

N. Roberts / 10/27/81 / CD
ORIGINATOR SIGNATURE DATE DISCIPLINE

SUPERVISOR SIGNATURE DATE

RECOM. C 1C

CLASSIFICATION/PRIORITY LOG

RECOMMENDED CLASS 1C

SIGNATURE DATE 10/27/81

APPROVED CLASS 1C LOG F.C.

SIGNATURE DATE 10/27/81

COMMENTS

THIS CHANGE APPLIES TO:

BOTH UNITS ☒ UNIT 1 ONLY ☐ UNIT 2 ONLY ☐

AFF	DIS	CDL REC INITIAL
	AD	
X	CD	
	ED	
	JD	
	MD	
	PD	

DISPOSITION INSTRUCTIONS

DISAPPROVED ☐

DEFERRED ☐

PROCEED WITH:

ENGINEERING ☒

PROCUREMENT ☒

CONSTRUCTION ☒

BECHTEL 10/27/81

PP&L SIGNATURE DATE

SUS	T/O DATE	DCP
N/A		NO

CR-613

RICH ROBERTS - CD 11/4/81 22 FIXES IN COST TO DATE. ASSUME WE WILL GET TO 30. ADDIN GUSSETS, RIBS, PLATES ETC TO BEAMS. ACCES ILITY TO BE A PROBLEM IN MANY CASES. ASSUME AVERAGE FIELD LABOR RATE OF 80 M/HS FOR FAB, INSTALLATION WITH EACH ITEM PROBABLY REQUIRING SCAFFOLDING. SAM 2400 DIRECT DIR M/HS PER UNIT. ENG M/HS AS FOLLOWS: 6 PEOPLE IN FIELD NOW FOR 2 WKS @ 480 M/ 2ND TRIP TO FIELD BY SAME CREW = 480 M/H PREP FOR 1ST TRIP WAS SAM 600 M/HS ASSUME ANOTHER 600 M/HS IN SFHO PRIOR T SECOND TRIP TOTAL ENGR M/HS = 2160 ENGR ADD 15% FOR → SAM 3600 ENGR M/HS → 24

MORT RENSLO - CD 11/4/81 40 FIXES TO DATE IN T/B 17 MINOR FIXES @ SAM 40 M/HS FOR FAB/INSTAL =680 M/HS. 23 MAJOR FIXES AT SAM 100 M/HS EA = 2300 + 680 = 2980 SAM 3000 DIRECTS M/HS. ENGR TIME: NOW HAS 3 PEOPLE FOR 3+ WKS IN FIELD SAM 400 M/HS BACK TO S.F. FOR 3 WKS COMPILIATION @ 360 M/HS. PREP TO GO TO FIELD WAS 240 M/HS TOTAL 1000 + 15% OT = 1150 EN TOTAL OF 3634 ROUND UP TO 3,650 TOTAL EN M/HS FOR UNIT 2 ADD NO ENGR M/HS AND ASSUME 30% BETTER DIRECT M/HR (NO CHANGES)

RESOLVED SCOPE TRENDS

Class	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
1C	Increase in manhours to install Phase III hangers on the diesel generator intake lines. *Schedule Comment: Critical - impacting preops testing and system turnover S/U system 24. Direct Mhrs: 12,000 Field N/H Mhrs: 6,000	400	(See * below)	These are platform type hangers which were not considered as such in Phase III hanger estimate. Phase III loads prevent these hangers from being attached to the walls.		(1) Engineering manhours were covered in Forecast 11. (2) Each diesel generator bay requires 3,000 manhours for these double hangers.

= Uneval.

NRC 15 2015615 5

OF THE DIESEL GENERATORS

NO. & TITLE SUSQUEHANNA STEAM ELECTRIC STATION

ENT PENNSYLVANIA POWER AND LIGHT COMPANY

LOCATION BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED _____ DATE _____

CHECKED _____ SHEET _____ OF _____

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
DIRECT ACCOUNTS:											
CIVIL											
MECHANICAL											
PIPING 8' HANGERS, 4' PLATFORM -						12000	18.68	20000	224000		
INSTRUMENTATION											
ELECTRICAL											
S/T DIRECT COSTS								20000	224000		
DISTRIBUTABLES:											
MANUAL 25% OF DIRECTS						3000	17		51000		
MATERIAL 300 PI DIRECT								36000			
NONMANUAL 50% OF DIRECTS						6000	13.60		82000		
S/T DISTRIBUTABLE COSTS									133000		
S/T FIELD COST								56000	357000		
ENGINEERING											
HOME OFFICE											
S/T ENGINEERING & HOME OFFICE											
CONTINGENCY											
ESCALATION											
CODE											

SAY #400,000

MEMORANDUM

TO TRUNZO / GREEN / TEVIS LOCATION

FROM LEN HOLM DATE 11/19/81 19

SUBJECT D.G. HANGERS JOB NO 9856

FILE

2 NEW HANGERS, 1 PLATFORM, PER BAY ARE ADDED TO THE INTAKE LINES OF THE DIESEL GENERATOR. THESE ARE THE RESULT OF PHASE III ANALYSIS ; REF: DCR 010.

7000# (+) each
21' OFF THE FLOOR
50 LF OF W10 x 89
2 MECH. SNUBBERS
VARIOUS PLATES, & ANCHOR BOLTS.

} MEASURE OF COMPLEXITY

FEW DRAWINGS HAVE BEEN ISSUED TO-DATE
- ATTACHED

EXTENT OF WORK ON EXHAUST LINES IS VAGUE
- ATTACHED

(APPROX 50 MH/ea. - REWORK)
(APPROX 200 MH/ea. - NEW)

☆ INTAKE ESTIMATE

3000 MH/BAY (INCL'S 2 HANGERS)
= 12,000 MH TOTAL

U043 (6-75)

Class	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
1B	Replacement of ten (10) Containment vacuum relief valve internals; and the capping of five downcomers (with drain lines) in Units 1 and 2. *Schedule Comment: Unit 1 field installation completed during wetwell window. No schedule impact as of now. This is subject to NRC review for acceptability. Eng'r Mhrs: 1,800 Other SFHO: 900 Direct Mhrs: 8,000 Field N/M Mhrs: 4,000	470	None (see * below)	(1) Preliminary Phase III analysis indicates valve internals should be replaced. (2) Based on preliminary information on Post LOCA, downcomers should be capped. (3) Preparation and review of calcs for FSAR and DSAR update.	EMC-7080 and Supplement 10/10/81 DCR-606 as BLP-17524 11/3/81	(1) Work proceeding based on telephone directive of E. Mead 10/19/81. To be completed 11/1/81. (2) Material on site. (3) Analysis and design to be completed by Creare, Inc. by 11/16/81.

J = Uneval.

11-2-81

TREND NO. 11-2-68

TITLE REPLACE CONTAINMENT RELIEF VALVE (S). INTERNALS & CAP & DOWNCOMERS

TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

TAKEOFF _____ APPROVED _____

PENNSYLVANIA POWER AND LIGHT COMPANY

PRICED _____ DATE _____

CATION BERWICK, PA

CHECKED _____ SHEET _____ OF _____

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
IRECT ACCOUNTS:											
IVIL											
ECHANICAL											
PING						8000	18.66	73500	149500		
NSTRUMENTATION											
LECTRICAL											
T DIRECT COSTS								73500	149500		223000
ISTRIBUTABLES:											
ANUAL 25% OF D M/H						2000	16.93		33900		
ATERIAL 3.92 PER D M/H								24000			
ONMANUAL 50% OF D M/H						4000	13.60		54400		
T DISTRIBUTABLE COSTS								24000	88300		112300
T FIELD COST								97500	237800		335300
NGINEERING						1800	46.00		82800		
OME OFFICE						900	36.00		32400		
T ENGINEERING & HOME OFFICE									115200		115200
ONTINGENCY											6100
SCALATION 8% 6% 1/2 FCA LABOR - UNIT 2								3900	9500		13400
											476000

ROUTING SHEET

WRITTEN RESPONSE REQUIRED? YES ☐ NO ☐

DATE DUE: _____

DOC. CONTROL NO. _____

REGISTER: FILE 0250/0195

REGISTER: SPEC/PO

	RESPONSIBLE	INFORMATION	ATTACHMENT	ROUTE	ADDT'L DIST	
PROJECT MANAGEMENT						VIOLETTE
ASST PROJECT MANAGER						BERRA
						BISESTI
						DAMERVAL
ENGINEERING						
PROJECT ENGINEER				1		POSER
ASST PROJECT ENGINEER	✓			2		
						McDANIEL
						MEHEGAN
						HEMPE
						TITUS
		✓✓				B.E. Harper
ADMINISTRATION						
DISCIPLINES						
ARCHITECTURAL						GIBBON
CIVIL		✓				SHAH
CONTROL SYSTEM						DAVIS
ELECTRICAL						REMALEY
MECHANICAL		✓				PEDERSEN
PLANT DESIGN						PAREKH
LICENSING						McDONNELL
QUALITY ENGINEERING						SPENSKO
CONFIG CONTROL						MOREY
SERVICES						
COST & SCHEDULE		✓✓				WARREN
COST TREND						SMITH
PROJECT PLANNER						MAURER
ENGINEERING PLANNER						MELVIN
PROCUREMENT						
PROCUREMENT MANAGER						STOJKOV
PURCHASING						MALLORY
EXPEDITING						DELONG
INSPECTION						GUARDINEER
CONSTR COORDINATOR						FAZENDIN
M&QS COORDINATOR						LINDSAY
FIELD						TURNBOW
FIELD QA						LILLIGH
RES ENGINEER						CRANSTON
SFHO-QA						BLOMQUIST
QC						
PP&L						
CHRON FILE		✓	✓			
READING FILE		✓				

GDS

PMN

BACK UP

11-2-68

☐ PDCC HAS ENTERED THIS DOCUMENT AS A COMPLETE/PARTIAL RESPONSE TO:

_____

_____

_____

☐ PLEASE ADVISE PDCC IF THIS INFORMATION IS INACCURATE.

8858-S-9

REVIEWED & DISTRIBUTED BY E.M.

Nov 13 10 51 AM '81

Creare INC.

SCIENCE AND TECHNOLOGY
TEL. 603 643-3800

GREAT HOLLOW ROAD
P.O. BOX 71
HANOVER, NEW HAMPSHIRE 03755

November 9, 1981

Mr. E. B. Poser
Bechtel Power Corporation
221 Main Street
San Francisco, CA 94119

Dear Ed:

SUBJECT: PROGRESS REPORT FOR OCTOBER 1981; SSES VACUUM BREAKER LOAD EVALUATIONS; CREARE PROJECT 3817

On October 2, 1981, we met with Bechtel, PP&L and Anderson Greenwood in Houston, TX. Based on the information provided by NUS on the structural analysis of the valve, we recommended that PP&L seriously consider capping the five vents with vacuum breakers. We were then asked to provide the necessary support to Bechtel in the design of the 3 inch drain line to be installed in the capped vents.

In October therefore, we modified our existing analytical model for water motion in the vent during chugging to analyze the water dynamics in the 3 inch drain line. Actual GKMIIM drywell and wetwell airspace pressure data were used as inputs to the analytical model and water motion in the 3 inch drain line was obtained. The results of this analysis shows that based on the GKMIIM data, a 4 ft. extension of the drain line below the present vent exit elevation is adequate to prevent water from exiting the drain line during chugging.

Further, the analysis showed that a 7½ ft extension of the drain line into the vent should be adequate to prevent the water from "fountaining" into the vent. Again, this conclusion is obtained using the GKMIIM data. Finally calculations were performed to determine the flow capabilities of the 3 inch schedule 160 drain line. These calculations show that with the water level in the vent just below the vacuum breaker elevation, the drain line is capable of draining 500 gpm of water This is far in excess of the water accumulation rate in the capped vents due to stam condensation on the vent walls. However, the adequacy of this draining capacity with respect to water flow into the vent due to ECCS needs to be assessed.

In parallel with the evaluation of the drain line design, we continued work on the SSES vacuum breaker load definition. However, due to the drain line design evaluation work which was given first priority as per Bechtel's and PP&L's instructions, the load definition effort is approximately two to three weeks behind schedule. At this point, we have derived the condensation source for the worst vent transient from the GKMIIM data.

Using this bounding source in an uncoupled model of the vent and vacuum breaker, disc opening and closing impact velocities have been computed. These impact velocities are quite sensitive to the value of the restitution coefficient used. For the bounding case with a restitution coefficient of 1, the maximum value of the opening and closing impact velocities was 100 rads/sec. With a restitution coefficient of zero, the maximum opening impact velocity drops to 40 rads/sec, and the maximum closing impact velocity drops to 65 rads/sec.

In November we will couple the vent and valve model and predict the reduction factor on valve impact velocities. Also in November, we will start developing a statistical load definition.

Sincerely yours,

CREARE INCORPORATED

Bharatan R. Patel
Project Director

BRP/se
cc: J. A. Weyandt, Bechtel
P. Furman, PP&L

Creare INC.
SCIENCE AND TECHNOLOGY
TEL. 603 643-3800

1 861.49 +
1 168.69 +
355.00 +
185.90 +
3 571.08 T

INVOICE

Bechtel Power Corporation
Box 3965
San Francisco, CA 94119

Attn: Mr. E. B. Poser, Project Engineer

Reference: Job No. 8856-001, Susquehanna

Period: October 1 - 31, 1981

Services*	$14,161.34
Materials & Supplies*	3,943.98
Travel	10.29
Handling Charge (20% of M&S and Travel)	790.85
Total	$18,906.46

CREARE INCORPORATED

Robert A. Hickin
Treasurer

RAH:pg
3817

*Details Attached

Invoice No. 2-3817 October 31, 1981

Breakdown of Services

Name or Work Classification	Hours	Total
B. R. Patel	48.0	$ 3,855.28
C. J. Crowley	75.0	4,517.91
P. S. Kamath	7.0	327.89
Analysts	155.0	4,988.65
Engineering Assistants	14.0	288.28
Secretaries	4.0	111.36
Draftspersons	2.0	71.97
		$14,161.34

Breakdown of Materials & Supplies

G. B. Wallis, Consultant	$ 309.38
Computer Charges	3,571.00
New England Telephone-toll calls	16.90
Xerox Charges (85 Copies)	8.50
Literature	38.20
	$ 3,943.98

2210.1	ACCDEV	95	40.53	87.1	356.06	+						(0.99)	+	21.87	164.04	0	=	520.10
2210.1	ACCDK	5	17.10	64.3	122.67	+						(0.49)	+	0.01	0.10	0	=	122.77
2210.1	CPI2	30	4.33	10.4	40.77	+						(0.96)	+				=	40.77
2210.1	<TOTAL>	396	299.95	607.3	2269.40	+						(0.90)	+	88.89	666.71	0	=	2936.10
345-112	REFILL	3	0.68	0.3	1.76	+						(1.00)	+	15.78	118.36	0	=	120.12
345-112	<TOTAL>	3	0.68	0.3	1.76	+						(1.00)	+	15.78	118.36	0	=	120.12
3532.1	EPRI	98	28.93	78.3	294.77	+						(0.94)	+	14.77	110.75	0	=	405.52
3532.1	<TOTAL>	98	28.93	78.3	294.77	+						(0.94)	+	14.77	110.75	0	=	405.52
3532.2	MIX	15	11.98	16.4	69.75	+						(0.97)	+	0.69	5.19	0	=	74.93
3532.2	<TOTAL>	15	11.98	16.4	69.75	+						(0.97)	+	0.69	5.19	0	=	74.93
3815	CREEK					+						(1.00)	+	0.26	1.95	0	=	1.95
3815	<TOTAL>					+						(1.00)	+	0.26	1.95	0	=	1.95
3817	BREAKER	209	100.32	235.3	934.39	+	68	22.85	933.4	838.46		(0.40)	+	11.82	88.63	0	=	1861.49
3817	<TOTAL>	209	100.32	235.3	934.39	+	68	22.85	933.4	838.46		(0.40)	+	11.82	88.63	0	=	1861.49
3936	P3936	90	34.93	46.3	185.17	+	1	0.02	0.0	0.01		(0.91)	+	11.95	89.63	0	=	274.81
3936	<TOTAL>	90	34.93	46.3	185.17	+	1	0.02	0.0	0.01		(0.91)	+	11.95	89.63	0	=	274.81
3939	FMD3939					+						(1.00)	+	0.22	1.64	0	=	1.64
3939	<TOTAL>					+						(1.00)	+	0.22	1.64	0	=	1.64
5294	P5294					+						(1.00)	+	0.01	0.10	0	=	0.10
5294	<TOTAL>					+						(1.00)	+	0.01	0.10	0	=	0.10
5375	NATIVES	51	63.87	57.3	221.21	+						(0.81)	+	14.76	110.73	0	=	331.94
5375	<TOTAL>	51	63.87	57.3	221.21	+						(0.81)	+	14.76	110.73	0	=	331.94
5433.2	P54332	65	25.57	63.8	243.74	+	41	1.38	27.1	25.04		(0.75)	+	1.98	14.83	0	=	283.61
5433.2	<TOTAL>	65	25.57	63.8	243.74	+	41	1.38	27.1	25.04		(0.75)	+	1.98	14.83	0	=	283.61
5433.3	P54333	12	3.98	8.4	32.22	+	5	0.27	7.2	6.67		(0.63)	+	5.30	39.76	0	=	78.65
5433.3	<TOTAL>	12	3.98	8.4	32.22	+	5	0.27	7.2	6.67		(0.63)	+	5.30	39.76	0	=	78.65
5433.4	P54334	9	1.23	4.7	18.27	+	2	0.07	1.4	1.26		(0.84)	+	4.63	34.69	0	=	54.22
5433.4	<TOTAL>	9	1.23	4.7	18.27	+	2	0.07	1.4	1.26		(0.84)	+	4.63	34.69	0	=	54.22

1/30

ITEM	RATE PER UNIT IN DOLLARS	UNITS CONSUMED	CHARGES FOR ITEM
TERMINAL CONNECT TIME	1.00 PER HOUR	43.25	43.25
TERMINAL SPEED SURCHRG	0.00 PER HOUR	1.00	0.00
LOGON	0.00 PER LOGON	37	0.00
CPU TIME	2.50 PER MINUTE	250.32	625.79
I/O	0.0000 PER KILO I/O'S	1352.58	0.00
MEMORY DEMAND	0.5500 PER KW-HOUR	908.45	499.65
ON-LINE STORAGE	0.0075 PER BLOCK-WK	0.	0.00
			1168.69

✓ + $355 disk use chgs.

MAY-31-2015217

ACCOUNT# 123,002

ITEM	RATE PER UNIT IN DOLLARS	UNITS CONSUMED	CHARGES FOR ITEM
TERMINAL CONNECT TIME	1.00 PER HOUR	5.83	5.83
TERMINAL SPEED SURCHRG	0.00 PER HOUR	1.00	0.00
LOGON	0.00 PER LOGON	115	0.00
CPU TIME	2.50 PER MINUTE	49.02	122.55
I/O	0.0000 PER KILO I/O'S	142.94	0.00
MEMORY DEMAND	0.5500 PER KW-HOUR	104.57	57.52
ON-LINE STORAGE	0.0075 PER BLOCK-WK	0.	0.00
			185.90

MM 3,310,152,176

B.E. HARPER

IN REPLY PLEASE REF:

BLG 2713

BGM B
Cent CWH
GDS
F/a with Trend

8105310151681

Mr. J.W. Millard
Project Manager
General Electric
175 Curtner
San Jose, CA 95125

Subject: Susquehanna Steam Electric Station
Units 1 and 2 Job 8856
Containment Downcomer Capping

Reference: GE-81-168, dated October 20, 1981 (our DCN 150828)

Dear Bill:

We appreciate your quick response in providing your preliminary assessment of the effect that blocking-off 5 containment downcomers will have on the containments transients. The information enabled us to make a decision quickly enough to cap the downcomer in the few weeks that the wetwell is drained.

The 5 downcomers contain vacuum breakers are now capped. Capping the downcomers appears to be the only practical way to protect the vacuum breakers from cycling during chugging.

A 3" pipe, which penetrates the cap, serves as a drain line while preventing the downcomer from chugging and the vacuum breaker from cycling.

As pointed out in your letter, it will be necessary to rerun certain containment response analyses to obtain new containment response time histories, for the reduced number of vents. It is our understanding that these analyses can be rerun at no added cost if included in the Load Line Limit Analysis (LLLA) now planned for SSES. Please advise when this could be done and what information is needed from Bechtel for GE to initate this work.

NOV -6 '81 8151681

We consider this activity to be very important as our pool swell calculations cannot be started until the containment pressure-time histories are available.

Please expedite this as much as possible.

Very truly yours,

Jack A. Wyandt

E. B. Poser

Written reply req'd: Yes

Date due: November 9, 1981

JAW/sla

PE33/10

cc: T. Crimmins (PP&L)
D. Roth (PP&L)

Grp. Resp. Code	MD
Orig.	JAW
Chron.	
Circ.	gpglon
APE	
Offic. Discp.	

E B Poser
L E Shipley

R

NOV 20 '81 0151889

BACKUP FOR CAPPING & DOWNCOMMERS
LL-2

Dr. B. R. Patel
Creare Inc.
Science and Technology
Great Hollow Road
P.O. Box 71
Hanover, New Hampshire 03755

Subject: Susquehanna Steam Electric Station
Units 1 and 2 Job 8856

Dear Bart:

We have been requested by PP&L to obtain a reduced chugging load definition by generating new chug sources designated the KWU 400 Series. These sources are to be as free as reasonably possible from influences unique to the GKM II-M test facility while preserving those source elements due to the steam-bubble collapse. Since both you and Dr. G. K. Ashley from our nuclear staff have been intimately involved with chugging, both we and PP&L believe this task can best be accomplished via a Bechtel-Creare collaboration. We are thus soliciting your participation under an existing consulting agreement between Bechtel and Creare with regard to the wetwell/drywell vacuum breaker work you are pursuing. Since this effort has already been authorized by PP&L, no proposal is necessary. It is, however, important that this task be accomplished as soon as possible.

In our opinion, this chugging load reduction effort is naturally divisible into the following subtasks:

1. New Source Generation

The KWU 400 Series sources will be obtained empirically in the frequency domain using Bechtel's acoustic model of a flexible GKM II-M tank. These sources are to be for the same chugging events as the previous KWU 300 Series sources; however, we intend to use pressure transducer P6.7 instead of P6.8 which was used for determing the KWU 300 Series sources.

PE33/34

8701151889

In determination of new chug sources, we intend to obtain a better value for the effective speed of sound. To aid us in this, we require information regarding the vent response in order to avoid inadvertantly selecting a vent response frequency as the fundamental acoustic mode in the pool. In addition, we wish to compare the calculated with the measured pressure response at another pool location.

Although in the sourcing procedure a flexible-wall transfer function will be used, we are aware of the fact that our transfer function is imperfect and cannot account for all of the fluid-structure interaction and noise possibly contained in the pressure traces. Since the fluid-structure interaction and noise contamination of the chug sources is expected to increase with frequency, we propose to filter the source functions above some cutoff frequency. A preliminary value of 90 Hz has been selected because the lowest mode of oscillation of a dry GKM II-M tank is apparently at 92 Hz.

2. JAERI Comparisons

The verification of the adequacy of chug sources has been deemed by the NRC to be a favorable comparison with JAERI test data; these new sources must therefore be subjected to this adequacy criterion.

Once the KWU 400 Series sources have been determined, they will be transmitted to Creare for this comparison. It is vital this be done as soon as possible in order to assess the adequacy of these new sources. We believe this comparison should be made in the same manner as was done for the KWU 300 Series sources in order to facilitate comparison. In the unlikely event this comparison of the KWU 400 Series sources with the JAERI data is unfavorable, our criterion that a chug source have no frequency content above a cutoff frequency may have to be relaxed, new sources determined, and another comparison performed.

3. Technical Justification

While it is not possible to show, nor do we claim, that filtering the chug sources will remove frequency components due only to fluid-structure interaction and noise, we believe that it is possible to demonstrate that filtering the source above a certain frequency will eleminate most of the fluid-structure interaction and noise contamination while not significantly altering the true chug sources itself. This would be a plausability agrument

showing that under certain conditions filtering is a reasonable way in which to remove spurious source contamination. In addition, it would support a choice for a particular cutoff frequency. We are aware that the combination of more realistic transfer function for GKM II-M and use of pressure traces from a sensor attached to the stiffer wall instead of the more flexible tank bottom may reduce the spurious source components to a level which will obviate filtering of the source and thus any technical justification of such. This tasks would then be reduced to justification of the transfer function used and any modifications made such as a more realistic treatment of damping.

We suggested that Bechtel should be primarily responsible for the source generation and technical justification of filtering, if any, and modifications to the transfer function and Creare should provide support; since Creare alone has the necessary expertise to make the JAERI comparisons, this should be their responsibility.

Unfortunately, Bechtel does not have a useable set of pressure traces. Therefore, we request that Creare transmit to Bechtel a magnetic tape containing the digital pressure traces at sensor locations P6.5, P6.7, P5.2 and P5.4 for the SSES design chugs designated PTH3, PTH5, PTH6, PTH9, PTH14.

In addition to the chugging load reduction task, we are requesting your support in assistance in another chugging-related matter. As you are aware, Bechtel is capping five vents in order to isolate the wetwell/drywell vacuum breaker from the effects of chugging as much as possible. This will undoubtedly increase the vent steam flux in the remaining downcomers vents and in addition the chug sources strength. Will you provide for us a multiplication factor to be applied to the chug sources to account for the increased flux.

Please submit all billing for this work described above in the same manner as that for the vacuum-breaker work but to the attention of E. B. Poser and identify it as a separate activity.

We appreciate your valued assistance in this effort. If you have any questions, please contact either J. A. Weyandt of the SSES or G. K. Ashley of Nuclear Staff.

Very truly yours,

WC McDaniel

E. B. Poser
Project Engineer

Written response req'd: No
PE33/
JAW/ala

cc: T. M. Crimmins (PP&L)
D. Roth (PP&L)

D. M. O'Connor (LGS)

OCT 23 '81 0150781

Creare Inc.
Science and Technology
Great Hollow Road
P.O. Box 71
Hanover, New Hampshire 03755

Attn: Mr. B. R. Patel

Subject: Susquehanna Steam Electric Station
Units 1 and 2 Job 8856
Consulting Services Agreement
on Vacuum Breakers

Dear Bart:

This will confirm the telephone conversation with you and Paul Furman on October 19, 1981.

As agreed, we will change the scope of Item 2 of the subject agreement to include a study of various configurations for capping the five vents which have vacuum breakers to determine the effect of capping on the vacuum breaker loading. The study will recommend a configuration and the size, location and length of the drain line in the cap.

The timing of this work is critical as modifications to the vents must be completed within a few weeks. Your final report should be submitted no later than November 16, 1981.

It is our understanding that this work can be accomplished within the present dollar limit for Item 2 of the agreement. Except as described above, all parts of the agreement remain in effect.

Please let us know if you have any question.

Very truly yours,

E. B. Poser
Project Engineer

Written Response Req'd: No
JAW/vw
PE21/13

cc: E. Mead (PP&L)
D. Roth (PP&L)

F. B. [illegible]erval
T. P. Lee

IN REPLY PLEASE REF:

BLG 2693

OCT 13 '81 0149993

Mr. J. W. Millard M/C 394
General Electric Company
175 Curtner Avenue
San Jose, California 95125

Subject: Susquehanna Steam Electric Station
Units 1 and 2 Job 8856
Containment Vacuum Breaker Cycling

Dear Bill:

We are planning to cap the five (5) downcomers equipped with vacuum breaker valve assemblies. This modification is being made to reduce vacuum breaker cycling.

Please confirm that the reduction from 87 downcomers to 82 downcomers will have a negligible effect on the containment analysis, by October 19, 1981.

Very truly yours,

Jas. E. Wyandt

E. B. Poser
Project Engineer

Written Response Req'd: Yes
Due Date: October 19, 1981
GDP/SP/cgs

cc: Mr. T. M. Crimmins, Jr. (PL)
Mr. A. M. Male (PL)
Mr. P. Furman (PL)

Grp. Resp. Code	MD
Orig.	10/9/81
Grp. Ldr.	
Grp. Supv.	
[illegible]	
[illegible]	

WP45/12-1

Mr. T. M. Crimmins, Jr.
Pennsylvania Power & Light Co.
P. O. Box 1870
Allentown, Pennsylvania 18105

Subject: Susquehanna Steam Electric Station
Units 1 and 2 - Job 8856
Design Change Requests (DCRs)

Dear Tom:

The following attached original Design Change Request is submitted for your approval.

DCR	Rev.	Class	Description
606	0	1B	Vacuum Relief Valve Modification and Cap Downcomers.

Very truly yours,

E. B. Poser
Project Engineer

Written Response Req'd.: Yes
Due Date: November 12, 1981

EBP/FMM/cgs

Attachment: DCR as Listed Above

cc: J. M. Kenny (PL) w/a

Grp. Resp. Code	
Orig.	
Grp. Ldr.	
Grp. Supv.	
Cons.	

PF10/25-1

CHANGE REQUEST

LOG NO. _____ C.W/H ~~ADMINISTRATIVE (CRA)~~ SIGN (DCR) NO. 606 REV. 0

SAFETY RELATED ☒ YES ☐ NO | ROM EST 4,500 KS | SHEET | OF 2

TITLE OF CHANGE: CONT. VACUUM RELIEF VALVES

DESCRIPTION OF CHANGE

1. THE CONTAINMENT VACUUM RELIEF VALVES (8856-M149) SHALL HAVE THE PARTS LISTED BELOW REPLACED WITH NEW HIGH STRENGTH PARTS SUPPLIED BY ANDERSON, GREENWOOD CO. SHAFT (3-7915), ARM KEY (5KA-DOH-22), SPRING KEY (9KA-DOH-10), COLUMN (3-8180-1) ARM SHANK (4-3005-001).
2. CAP THE FIVE DOWNCOMERS THAT HAVE VACUUM RELIEF VALVE ASSEMBLIES.

BASIS FOR CHANGE

PP&L DCA LOG NO.

1. BASED ON THE PRELIMINARY PHASE II ANALYSIS THE VALVE PARTS ABOVE SHOULD BE REPLACED.

Ref. EC 13[illegible]

2. BASED ON THE PRELIMINARY INFORMATION ON POST LOCA CHUGGING CYCLE LOADS; THE DOWNCOMERS SHOULD BE CAPPED TO PREVENT CHUGGING

S Presse / 10/19/81 / MD — ORIGINATOR SIGNATURE / DATE / DISCIPLINE

ecc JD Peder / 10/21/81 — SUPERVISOR SIGNATURE / DATE

RECOM. CLASS 1B

CLASSIFICATION/PRIORITY LOG

RECOMMENDED CLASS 1B

JPW EBP 10/21/81

SIGNATURE / DATE

APPROVED CLASS LOG

SIGNATURE / DATE

COMMENTS

WORK PROCEEDING BASED ON TELEPHONE DIRECTIVE OF E. MEAD 10/19/81, THE DCP REQUIREMENT IS WAIVED BASED ON THE WORK COMPLETION. (SEE SHEET 2)

THIS CHANGE APPLIES TO:

BOTH UNITS ☒ UNIT 1 ONLY ☐ UNIT 2 ONLY ☐

AFF	DIS	CDL RECEIVED INITIAL	CDL RECEIVED DATE
	AD		
✓	CD		
	ED		
	JD		
✓	MD		
	PD		

DISPOSITION INSTRUCTIONS

DISAPPROVED ☐

DEFERRED ☐

PROCEED WITH:

ENGINEERING ☐

PROCUREMENT ☐

CONSTRUCTION ☐

SUS	T/O DATE	DCP	IDCN
59C			

BECHTEL / /

PP&L SIGNATURE / DATE

8856-S-90 REV 9 11/80

SUSQUEHANNA STEAM ELECTRIC STATION

CHANGE REQUEST

(CONTINUATION SHEET)

DESIGN (DCR) NO. 60

ADMINISTRATIVE (CRA) REV. 0

LOG NO.

SHEET 2 OF 2

SUS	T/Q DATE	DCP

THE WORK APPROVED BY THIS DCR HAS BEEN COMPLETED AND THE DCP IS WAIVED.

THE WORK WAS PERFORMED PER THE DIRECTION OF OF EMC 7157 AND CIVIL DRAWING 8856-C-372 SH-1 REV. 18.

8856-S-90-1 (2/80)

Bechtel Power Corporation

Interoffice Memorandum

184

To C. Turnbow

File No.

Subject Susquehanna Steam Electric Station
Units 1 and 2 - Job 8856
CONTAINMENT VACUUM
RELIEF VALVES (M-149)
J.A. WEYANOT W/A

Date 10/16/81

From E. B. Poser

Of SFPD - Engineering

At 221/11/E1 Ext. 2753

Copies to G.H. SHAH
C. FAZENDIN
T. MINOR (FIELD)
G.D. PEDERSEN
JIM. JOHANSON (FIELD)

THIS I.O.M. IS A SUPPLEMENT TO OUR EMC-7080 DATED OCT. 7 '81.

1.0 VALVE WORK

1.1 THE CONTAINMENT VACUUM RELIEF VALVES PURCURED BY P.O. 8856-M149 SHALL BE REMOVED FROM THE DOWNCOMER AND MOVED TO A SUITABLE LOCATION FOR VALVE WORK.

Written Reply Req'd.: Yes No

Date Due:

Initials

E. B. Poser
Project Engineer

8856-S-17 (6/80)
P118/8

8424. REV 1/78

Continuation

1.2 REPLACE THE PARTS LISTED BELOW WITH NEW HIGH STRENGTH PARTS SUPPLIED BY ANDERSON, GREENWOOD & CO ACCORDING TO THE REQUIREMENTS OF SPECIFICATION 8856-M149 FOR NON PRESSURE BOUNDARY PARTS.

1.2.1 SHAFT - 3-7915

1.2.2 COLUMN - 3-8180-1

1.2.3 ARM KEY 5 KA-DDH-22

1.2.4 SPRING KEY 9 KA-DDH-10 (TWO)

1.2.5 ARM SHANK 4-3005-001

NOTE: THE ABOVE PART NO. ARE FOR THE PARTS NOW INSTALLED IN THE VALVES. THE NEW PARTS WILL HAVE NEW PART NO.

1.2.6 MINIMUM DOCUMENTATION FOR NEW PARTS SHALL BE THE SAME AS PARTS REPLACED. REFER TO 8856-M149

Initials

Attachments.

Continuation

1.3 THE NEW SPRING WILL NOT BE INSTALLED AND THE VALVE SET POINT WILL NOT CHANGED.

1.4 AS PART OF THIS WORK EACH VALVE SHALL HAVE THE TURNBUCKLE LOCKED PER AGCO INSTRUCTIONS.

1.5 EACH VALVE SHALL BE LEAK TESTED PER 8856-M149-12-3.

1.6 A SET PRESSURE TEST IS NOT REQUIRED IF THE SET PRESSURE LOCK NUTS ARE NOT MOVED.

E. B. Poser
Project Engineer

Written Response Req'd: Yes No
Design Doc. Changes Yes No
Spec. No. or Dwg. No.

Due date

Initials
Attachments:

8856-S17-1 (6/80)

H-16-1

Continuation

2.0 DOWNCOMER MODIFICATION

2.1 THE FIVE(5) DOWNCOMERS WITH A VACUUM RELIEF VALVE ASSEMBLY SHALL BE CAPPED AS SHOWN ON DRAWING 8856-C-372 SH-1 REV. 18

Jack A Weyandt
for E. B. Poser
Project Engineer

Written Response Req'd: Yes No
Design Doc. Changes Yes No
Spec. No. or Dwg. No. Due date

Initials
Attachments: [MD]

8856-S17-1 (6/80)

H-16-1

Bechtel Power Corporation

10-8-28 New Loads

ETC 7080 → No. mhrs Mat'l - $10,000

Interoffice Memorandum

1 OF N.

To C. Turnbow

File No.

Subject Susquehanna Steam Electric Station
Units 1 and 2 - Job 8856
CONTAINMENT VACUUM
RELIEF VALVES (M149)

Date 10/6/81

OCT -7 '81 0149599

From E. B. Poser

Of SFPD - Engineering

Copies to J-A. WEYANDT
G-H. SHAH Civil - Add'l mhrs
C. FAZENDIN
TIM. MINOR (FIELD)
G-D. PEDERSEN MECH
B-T. STOJKOV

At ENG 221/11/E1 Ext. 2753

100M

LEAD MECH.
Barry Price
11:00

Jon Holesmake + PIPING

BASED ON THE INFORMATION TO DATE ON PHASE III AND CHUGGING CYCLE LOADS THE FIELD IS REQUESTED TO TAKE THE FOLLOWING ACTION:

1.0 VALVE WORK. 3 mH days/valve Elongate Valve

1.1 REMOVE THE VACUUM RELIEF VALVES FROM THE DOWNCOMERS AND MOVE TO A SUITABLE LOCATION FOR VALVE WORK. COMBO SHOP. AGCO is reassembling Whole Job -

1.2 INSTALL NEW MAIN VALVE SHAFTS OF HIGH STRENGTH AND NEW VALVE SPRINGS.

Must be carefully move Limit switch bolt

Completion 10 valves/UNIT.

Written Reply Req'd.: Yes No

Date Due:

Initials

E. B. Poser
Project Engineer

Must Be done in 2wks.

8856-S-17 (6/80)
P118/8

8824, REV 1/73

Continuation

1.3 RE-SET VALUE AT 0.5PSID OR LESS AS DETERMINED BY THE PHASE II ANALYSIS (SEHO WILL INFORM THE FIELD OF THE SET POINT TO USE).

1.4 RE-TEST VALVE AS REQUIRED BY THE ANDERSON GREENWOOD AND Co. (AG-CO) MANUAL. 3 days include test's

FOR ALL THE ABOVE WORK THE FIELD SHOULD CONTACT Mr. ALLEN WEST AT AG-CO (713-668-0631) FOR THE REQUIRED FIELD SUPPORT. AG-CO MUST OVER SEE AND DIRECT ALL WORK ON THE VALVES.

THE SHAFTS AND SPRINGS ARE ON ORDER WITH AGCO.

# of days AGCO will Be IN FIELD

2 WKS
UNIT 1 -10 values
UNIT 2 -10 values

E. B. Poser
Project Engineer

two weeks finish or no. power

Written Response Req'd: Yes No
Design Doc. Changes Yes No
Spec. No. or Dwg. No.

Due date

Initials
Attachments:

8856-S17-1 (6/80)

H-16-1

Continuation

Dennis Shaw x2302

FAB Q-listed Hanger

5 OF 3

OCT -7 '81 0149599

2.0 DOWNCOMER MODIFICATION

2.1 ORDER FIVE (5) PIPE CAPS cost ? Instl type
ONE FOR EACH OF THE DOWNCOMERS
WITH A VACUUM RELIEF VALVE
ASSEMBLY. (SAME CLASS AND CODE AS PIPE)

2.2 THE CAPS SHALL BE INSTALLED
WITH A 2" OR 3" DRAIN LINE
AS REQUIRED (SFNG WILL INFORM
THE FIELD OF THE DRAIN LINE
REQUIREMENTS)

WORK PER DCR-10

lowered through
Hatch way 12 hr shifts 2 days for five CAPS.
chain ball it up hook it to shaft.
partial penetration vessel hydro is holding up scaffolding
CAP 37° bevel prep 4 hr ea
12 hr. weld

Jack Fred Yandell
for E. B. Poser
Project Engineer

Written Response Req'd: Yes (NO)
Design Doc. Changes Yes (NO) or Dwg. No.
Spec. No.
GDP / SAP
initials
Attachments:

Due date - 3000 DIR M/H

8856-S17-1 (6/80)

H-16-1

CHECKED _____ SHEET 3 OF 3

ATION BERWICK, PA

ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
Field per. Len Holm assumed 400 MHRS/Valve Removal & Install											
OR & Valves						960	A 6.3				
val: 2 valve/day x 10 valves x 24 hr/day x 8 MEN						1060					
tl: 960 + 150 Q.C. support						160					
Premium @ Normal Wage Rate						120					
estion / Contin.											
10 CAPS. 5 caps ea. UNIT.											
APS Pipe Prep (8 MHRS x 10 CAP) + 40 supervision						120					
70 MHRs/Weld x 10 welds/CAP						700					
3" STAND PIPE 31 MHRS/weld x 10						310					
ging / Handling - GOV'T 16 hrs x 10						160					
s & Reinstl; elect connections TO VALVE 1 WIRE/VALVE x 10 VALVE x 2 MHR/WIRE						20					
N. Whole Job						120					

Steve Presser 0864 1C 545

MESSAGE FORM

Bechtel Communications Network (BECNET)

SPECIAL INSTRUCTIONS:

☒ URGENT ☒ CONFIDENTIAL
MULTIPLE ADDRESSES ☐ STRICTLY CONFIDENTIAL
ARE TO BE:
☐ SHOWN ☒ NOT SHOWN

Rcvd 8:45 Cont 4:15 GIT Transd AGCO via Telex Already Transd

TIMESTAMP

DATE AND TIME PREPARED 9/24/81 4:00

PR

JOB NUMBER/SUBNUMBER-ORGANIZATION CODE — ORIGINATOR'S EMPLOYEE NUMBER

CHG 8,856, ,8XB, 1640 ,4526,14,

LECY
LLON
LKOR
LMAD
LPAR
LPRS
LRIO
LSAO

MAUB (22463)
MAUH (23604)
MBUH (23668)

MJUB
MRIY
MRUW (23712)
MSAU

SANH
SBGA
SCMS
SGAI
SHOU
SMEL
SNOR
SSFO
STKO
SWPL
STRL

NOTE: STANDARD PROCEDURE IS: ALL ACTION & CC: ADDRESSES WILL BE SHOWN (EXCEPT IN CASE OF BIDDERS) UNLESS INDICATED DIFFERENTLY IN "SPECIAL INSTRUCTIONS"
LIST ALL ADDRESSES BEFORE TEXT

ANDERSON GREENWOOD CO.
HOUSTON, TX 77081

TELEX # 77-5219

SEP 25 '81 0148

ATTENTION: MR. ALLEN WEST

SUBJECT: SUSQUEHANNA STEAM ELECTRIC STATION
JOB-8856, UNIT 1 & 2
P.O. 8856-M-149-AC
CONTAINMENT VACUUM BREAKER VALVES

AGCO IS HEREBY AUTHORIZED TO PROCEED PER AGCO's TELEX OF 9/24/81 TO SUPPLY (20) NEW SPRINGS AND (20) HIGH STRENGTH SHAFTS TO REPLACE THOSE SUPPLIED ON ORIGINAL ORDER FOR A TOTAL FIRM PRICE OF $15,300.00. EXPEDITED DELIVERY FOR SPRINGS BY 10/15/81 AND THE SHAFTS BY 10/1/81.

A P.O. REVISION WILL FOLLOW.

ORIGINATOR	SIGNATURE	LOCATION	PHONE	PAGE	OF
A. H. JADGRAB		221/5/A-27	3169	1	1

MAILING ADDRESS:
P. O. BOX 1097
BELLAIRE, TEXAS 77401

MAIN OFFICE AND PLANT
5425 SOUTH RICE AVE.
HOUSTON, TEXAS 77081

ACCOUNTING
5234 GLENMONT
HOUSTON, TEXAS 77081

TEL.: 713-668-0631
TWX.: 910-881-2652
TELEX: 77-5219

INDUSTRIAL PRODUCTS
SAFETY RELIEF VALVES
HAND & GAGE VALVES
INSTRUMENT MANIFOLDS
CHECK VALVES
PRESSURE REGULATORS
NUCLEAR VALVES

AEROSPACE PRODUCTS
TARGET TOW EQUIPMENT

Flow Sm
CS
AGCO Front

September 25, 1981

SEP 30 1981

KELLY TO
GET BACK

ASK PEGGY —
$ ID THIS P.O

BECHTEL POWER CORPORATION
P.O. Box 3965
San Francisco, CA 94119

Attention: Mr. J. H. Jadelrab

Reference: AGCO Quote No. N-445 M-149AC

Dear Mr. Jadelrab:

Enclosed please find AGCO Quote N-445 which you requested per telecon with Alan West on 9-25-81. If you require additional information regarding this quote, please contact myself or Alan West.

Regards,

W. T. Ristau jb

William T. Ristau
Product Specialist
Power Industry Valves

WTR:jb
Encl.

cc: Alan West

C.C.A #4 Purchase of New Spring
AND shafts $15,300

9/25/81 INCNT TO ENGR

covered by F/C

Design Allow. For Mech.

#4 (20) VALVES
SIZE
TIME ON GA. VALVE

r	s	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action
99 -41) -41) -41)	IC	Additional scope (increase in hanger quantity) for Phase III new loads in Units 1 & 2 *Schedule comment: Will impact construction completion date.	12,500	Critcl (see* below)	F/C #11 detailed and simplified analysis basis for hanger quantity for Phase III new loads (Trend 10-7-41) was a total of 920 new and revised hangers. To date, the quantity has increased to 1,676 from detailed analysis per unit. Simplified analysis on small pipe 3,181 per unit.	BLP-17516 11/2/81	(1) Design completion delayed from 10/4/81 to 10/25/81. (2) See Trend 11-2-69 for other additional direct manhours associated with small pipe/small pipe hanger quantity

Detailed Analysis

F/C 11

Old Scope:	New	Revised	Total
Large Pipe	214	400	614
Small Pipe	106	200	306
	320	600	920

New Scope:			
Large Pipe	402 (up 188)	947 (up 547)	1,349 (up 735)
Small Pipe	214 (up 108)	113 (down 87)	327 (up 21)
	616	1,060	1,676

Eng'r Mhrs:	10,375
Other SFHO:	5,185
Field R.E. Mhrs:	720
Direct Mhrs:	280,800
Field N/M Mhrs:	200,000

(Continued on page 2)

= Uneval.

11-2-39

r	a s s	Description	Cost $1,000	Sched. Effect	Reason for Trend	Ref.	Remarks/Action

(Continued)

Simplified Analysis

F/C 11

Old Scope:	New	Revised	Total
Large Pipe	-	-	-
Small Pipe	1,350	1,350	2,700
New Scope:			
Large Pipe	-	-	-
Small Pipe	1,782 (up 432)	1,399 (up 49)	3,181 (up 481)

1,060
1,399
2,459

U = Uneval.

)

ALPHONSO

TREND NO. 11-2-39

TITLE PHASE III HANGER INCREASE

& TITLE SUSQUEHANNA STEAM ELECTRIC STATION - 8856

PENNSYLVANIA POWER AND LIGHT COMPANY

CATION BERWICK, PA

TAKEOFF _____ APPROVED _____

PRICED _____ DATE _____

CHECKED _____ SHEET _____ OF _____

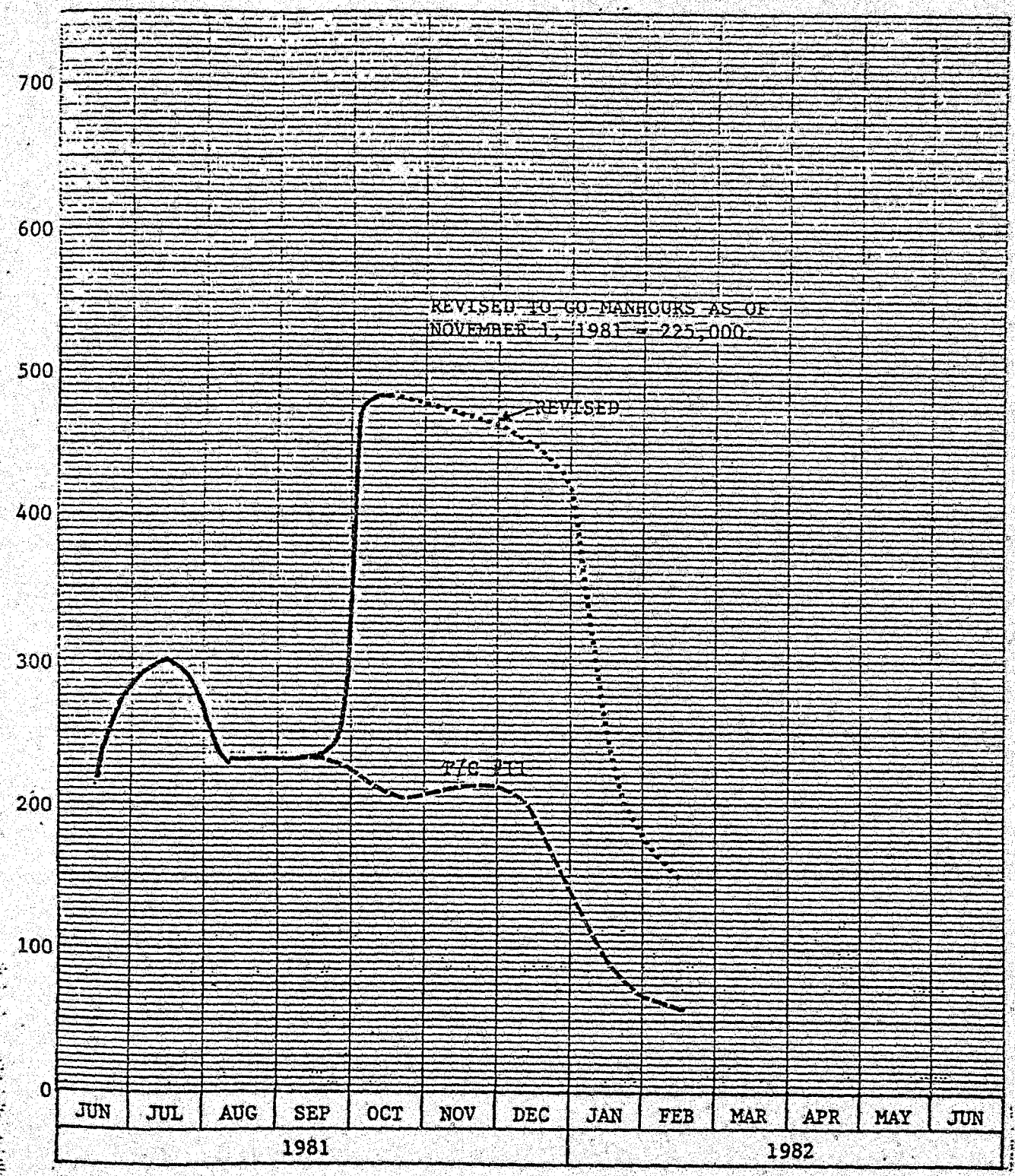
ITEM AND DESCRIPTION	QUANTITY	UNIT	UNIT COST MAT'L	UNIT COST S/C	MAN HOURS UNIT	MAN HOURS TOTAL	$/MH	TOTAL COST MATERIAL	TOTAL COST LABOR	TOTAL COST SUB-CONT.	TOTAL COST TOTAL
RECT ACCOUNTS:											
VIL											
ECHANICAL											
PING P.O. P-3A						280,800	18.68	4200009	5245400		
STRUMENTATION	P-3A				ADD 32,000			MTL TO MATCH LETTER			
LECTRICAL					-212,000						
						180,000		TO COVER POTENTIAL ALLOW.			
T DIRECT COSTS								4200009	5245400		
STRIBUTABLES:											
ANUAL 25% OF D M/H						70,200	16.93		1188500		
ATERIAL 3.00 PER D M/H								842400			
ONMANUAL 50% OF D M/HS						200,000	13.60		2720000		
NORMALLY WOULD BE 140,400 M/H FIELD REQUEST TO INCREASE TO 200,000 FOR ABOVE QC INTERFACE											
T DISTRIBUTABLE COSTS								842400	3908500		
T FIELD COST								12624009	15335009		10415900
GINEERING						10,375	46.00		477300		
OME OFFICE						5,185	36.00		186700		
R.E.						720	21.00		15100		
T ENGINEERING & HOME OFFICE									679100		679100
ONTINGENCY 5%											525800
CALATION 8% ON 1/2 LABOR UNITZ											366200
											11970000

12,500,000

EXPLAIN

BG
JMA

UNIT 1 & COMMON HANGER MANPOWER



46 3093
KEUFFEL & ESSER CO. MADE IN U.S.A.

END 10-7-41 HAD 2900 NEW/REV SP SUPRD
600 " " LP "

OLD SCOPE: DETAILED ANAL
LARGE PIPE NEW/REV = 614 @ 150 = 92,1
SMALL PIPE " " = 306 @ 60 = 18,3
M/HS = 110,4

SIMPLIFIED ANAL
SMALL PIPE NEW/REV = 2700 @ 60 = 162,0
F/C #11 TOTAL 272,460 M/H

NEW SCOPE: DETAILED ANAL
LARGE PIPE NEW/REV = 1349 @ 150 = 202,3
SMALL PIPE " " = 327 @ 60 = 19,6
M/HS = 221,9

SIMPLIFIED ANAL.
3,181 NEW/REV SMALL PIPE @ 60 = 190,86
NEW REQD TOTAL DIRECT M/H = 412,86
NEW M/H 412,860 - F/C #11 M/H 272,460 = NEW M/H PER UN
140,400

UNIT COST: PER UNIT

OLD SCOPE - 614 X 500 = #307,000
306 X 200 = 61,200
2700 X 100 = 270,000
#638,200

NEW SCOPE 1349 X 500 = 674,500
327 X 200 65,400
3,181 X 100 318,100
#1,058,600

1,058,00
638,20
Δ #419,800

SAM
#420,00

Bechtel Power Corporation
Engineers—Constructors

Fifty Beale Street
San Francisco, California
Mail Address: P.O. Box 3965, San Francisco, CA 94119

JBV-81-391

Mr. Norm Curtis
Pennsylvania Power and Light Company
P. O. Box 1870
Allentown, PA 18105

BLP-1756
11/2/81

Subject: Susquehanna Steam Electric Station
Unit 1 - Job 8856
Phase III Hanger Status Report
(Week Ending 10/25/81)

Dear Norm:

Attached is subject status report. This is the final issue of this report.

DETAILED ANALYSIS

The Phase III detailed analysis pipe support effort was completed on schedule 10-25-81. 197 new supports and 344 pipe support revisions were signed-off and issued during the final week. The total scope of the detailed effort is shown below.

	Large Pipe	Small Pipe	
New Supports	402	214	- 616
Support Revisions	947	113	- 1060*
			1676

*47 of these 1060 revisions are spring setting adjustments and do not require hardware changes.

SIMPLIFIED ANALYSIS

The Phase III simplified analysis pipe support effort was completed per our reforecasted schedule on 10-25-81. 135 new supports and 171 pipe support revisions were signed off and issued during the final week. The total scope of the simplified effort is shown below (all small pipe).

New Supports	1,782
Support Revisions	1,399
	3,181

5026

Pipe support fixes (44) resulting from large pipe movements are included in the above totals.

Very truly yours,

J. B. Violette

Written Response Req'd: No
JBV/JVK/azc
(CS24/9)

cc: R. Mazzini w/a
J. Gordon w/a
E. Mead w/a
S. Denson w/a

SUTCH NARANJA – P.D. HGR GROUP

69 TOTAL PEOPLE

16 ON LOAN OR ON UNIT 2

53 ON UNIT 1

53 PEOPLE FOR 3 EXTRA WEEKS (10/4/81 TO 10/25/81) WITH 20% FOR O.T.

48 M/HS NOTE: R.E. TO DO DESIGN AL

X53 PEOPLE

2544 M/HS WEEKLY X3 = 7,632 M/HS

M. MEGHANI – P.D. STRESS GROUP

(11 MAN MONTHS + 20% O.T. = 1903 + 381 =

2284 M/HS (TO DATE) ALLOW 20% FOR

UNFORSEEN "TO GO" ACTIVITIES = 457 = 2,74

SURESH CHITNIS – P.D. R.E. GROUP X236

P.

4 PEOPLE/THREE WKS 15/20 M/HS PER WK O.T.

S.P. NO CHANGE

480

240 O.T.

720 RE M/HS

EPLY PLEASE REF:

17254

BLP

S. [illegible]itnis (RE)	w/a	V. Kelly (6)	w/a	E. Poser	w/a		
G. Cranston	w/a	C. Long	w/a	R. Powell	w/a		
C. Fazendin	w/a	J. Melvin	w/a	C. Statton	w/o		
H. Friend	w/o	L. Milman	w/a	J. Violette	w/o		
J. Galley	w/a	W. McDaniel	w/a	J. Warren	w/a		
F. Hollenbach	w/o	F. Naranja	w/a	E. Cecil (RE)	w/a		
R. Rogers (FE)	w/a	S. Owen (RE)	w/a	A. Ayad (RE)	w/a		
M. Malkani	w/a	L. Memula	w/a	J. Anderson	w/a		

JEV-81-379

R

Mr. Norm Curtis
Pennsylvania Power and Light Company
P. O. Box 1870
Allentown, PA 18105

OCT 14 '81 8101501400

Subject: Susquehanna Steam Electric Station
Unit 1 - Job 8856
Phase III Hanger Status Report
(Week Ending 10/11/81)

Dear Norm:

Attached is the subject status report.

A. HANGERS

1. Detailed Stress Analysis

Status of Phase III stress calcs requiring re-analysis is as follows:

Reason for Re-Analysis	Completed To Date	To-Go	Scheduled** Completion
- Pipe Support Changes subsequent to the feasibility check and issue of hanger guidance	14	0	Complete
- Stress Report Evaluation Iterations	3	1	10-19-81
- Configuration Change/ Added Scope	16	2	10-23-81
- Difference between as-built used for analysis and latest as-built revision	*	*	*

*This scope is being determined, and we expect to have an action plan on this item by 10-16-81.

**Hanger adequacy review of these calculations is in progress. There is some exposure on completing hangers in added scope (29 hangers).

OCT 14 '81 8101501400

Included in the configuration change/added scope are the jet pump piping lines and diesel generator lines.

The remaining head vent piping calc was completed this week.

New Supports

Total Scope	600
Issued to Date	323
To Go	277

Last week 53 new pipe supports were designed and 68 new supports were issued to construction. 161 of the 277 new supports to go are estimated on the jet pump and diesel generator lines.

Revised Supports

Total Scope	779
Issued to Date	623
To Go	156

Last week 29 revised supports were designed, and 37 revisions were issued to construction.

On Hold Supports

Non-Standard Clamps	39
Local Pipe Stress	20
Pipe Anchors	82
Multiple baseplate attachments	30
Awaiting GE final load data	116
Total	287

Of the 287 pipe supports on hold, we estimate a total of 28 revisions. This estimate is included in the 206 pipe support revisions to go.

We are still forecasting Phase III hanger design completion by 10-25-81. However, there appears to be exposure on the jet pump and diesel generator new supports.

2. Simplified Analysis

58 new designs and 63 revisions were identified and issued out of the 350 supports reviewed.

Of the total scope of 4845 pipe supports we have reviewed 4194 to date, and have 651 supports to go for review.

We are still forecasting the completion of simplified analysis pipe support designs for 10-25-81, however, there is exposure due to DCP's 241, 398.1, and 522.1.

3. Small pipe study for ANCO and large pipe movements

Based on 18 calculations completed out of 32 calculations in the study, preliminary conclusions are:

a) Increased support loads resulting from ANCO test will not result in any hardware modifications and

b) Phase III large pipe movement effect on small pipe will require deletion of some supports near large pipe connections. Action plan for implementing this change is being generated.

Completion of the study is on schedule per PS-1094 and conclusions will be finalized 11-6-81.

Very truly yours,

J. B. Violette

Written Response Req'd: No
JBV/JVK/azc
(CS24/9)

cc: R. Mazzini w/a
J. Gordon w/a
E. Mead w/a
S. Denson w/a

Grp. Resp. Code	C/S
Orig.	CM
Grp. Ldr.	
Grp. Supvr.	
APE	
Oth. Discp.	

SUSQUEHANNA STEAM ELECTRIC STATION

ROUTING SHEET

SEP 29 '81 0149106

WRITTEN RESPONSE REQUIRED? YES ☐ NO ☑

DATE DUE: _____

DOC. CONTROL NO. _____

REGISTER: FILE 0260A

REGISTER: SPEC/PO

	RESPONSIBLE	INFORMATION	ATTACHMENT	ROUTE	ADDT'L DIST	
PROJECT MANAGEMENT		✓	✓			VIOLETTE
ASST PROJECT MANAGER						BERRA
						BISESTI
						DAMERVAL
ENGINEERING						
PROJECT ENGINEER						POSER
ASST PROJECT ENGINEER				✓		WEYANDT
		✓	✓			McDANIEL
		✓	✓			MEHEGAN
						HEMPE
						TITUS
		✓	✓			Shipley
ADMINISTRATION						
DISCIPLINES						
ARCHITECTURAL						GIBBON
CIVIL						SHAH
CONTROL SYSTEM						DAVIS
ELECTRICAL						REMALEY
MECHANICAL						PEDERSEN
PLANT DESIGN	✓	✓	✓			PAREKH
LICENSING						McDONNELL
CONTAINMENT						PILLAI
QUALITY ENGINEERING						SPENSKO
CONFIG CONTROL						MOREY
SERVICES						
COST & SCHEDULE						WARREN
COST TREND						SMITH
PROJECT PLANNER						MAURER
ENGINEERING PLANNER						MELVIN
PROCUREMENT						
PROCUREMENT MANAGER						STOJKOV
PURCHASING						MALLORY
EXPEDITING						DELONG
INSPECTION						GUARDINEER
CONSTR COORDINATOR						FAZENDIN
M&QS COORDINATOR						LINDSAY
FIELD						TURNBOW
FIELD QA						LILLIGH
RES ENGINEER						CRANSTON
SFHO-QA						BLOMQUIST
QC						
PP&L						
CHRON FILE		✓	✓			
READING FILE		✓				

☐ PDCC HAS ENTERED THIS DOCUMENT AS A COMPLETE/PARTIAL RESPONSE TO:

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_____

_____

☐ PLEASE ADVISE PDCC IF THIS INFORMATION IS INACCURATE.

8856-S-9

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Project Construction - Susquehanna [redacted] POWER CORP
P.O. Box 451; Berwick, PA 18603-0451

SEP 29 2 52 PM '81

September 25, 1981

Mr. Norman W. Curtis
N-4 General Office
Allentown, PA 18101

SEP 29 '81 8109149106

SUSQUEHANNA STEAM ELECTRIC STATION
Weekly Hanger Report
ER 100450 PLIS-1313 FILE 285

Dear Mr. Curtis:

Attached for your information is the Hanger Program Report for the week ending September 11, 1981.

QC hanger acceptance quantities remain essentially unimproved at this time. Bechtel has committed to improve the performance of this group, hence, we anticipate substantial performance improvements in the near term. See Section 3 for additional details.

Bechtel has increased craft support for both hanger installation and preparation for QC inspection. However, the total pipefitter force remains unchanged, although steps are being taken to augment this craft force. See Section 6.

Very truly yours,

S. L. Denson
Project Construction Manager

RAB:SLD:pjm

Attachment

cc:

R. A. Breslin	w/a	SSES
C. R. Campbell	w/a	N-4
James Coughlin	w/a	So. Engr. Co.
T. M. Crimmins	w/a	N-4
R. H. Featenby	w/a	SSES
J. Gordon	w/a	N-5
M. S. Gorski	w/a	SSES
R. A. Mazzini	w/a	N-4
E. M. Mead	w/a	N-4
N. E. Mehegan	w/a	Bechtel
T. Minor	w/a	Bechtel
W. Mourer	w/a	Bechtel
J. Peckis	w/a	Bechtel
E. B. Poser	w/a	Bechtel
R. Shovlin	w/a	N-4
G. Thomas	w/a	Bechtel
C. Turnbow	w/a	Bechtel
J. Violette	w/a	Bechtel
J. Zelechoski	w/a	SSES
Corres. File	w/o	N-3
Letter File	w/o	N-3
DCC	w/a	SSES
File	w/a	

Cranston	w/a	C. Long	w/a	R. Powell	w/
Fazendin	w/a	J. Melvin	w/a	C. Statton	w/
H. Friend	w/o	L. Milman	w/a	J. Violette	w/
J. Galley	w/a	W. McDaniel	w/a	J. Warren	w/
F. Hollenbach	w/o	F. Naranja	w/a	E. Cecil (RE)	w/
R. Rogers (FE)	w/a	S. Owen (RE)	w/a	A. Ayad (RE)	w/
T. Pao	w/a	L. Memula	w/a		

REPLY PLEASE REF:

BLP 16948

SEP 23 '81 8148643

JBV-81-348

Mr. Norm Curtis
Pennsylvania Power and Light Company
P. O. Box 1870
Allentown, PA 18105

Subject: Susquehanna Steam Electric Station
Units 1 and 2 - Job 8856
Phase III Hanger Status Report
(Week Ending 09/20/81)

Dear Norm:

Attached is the subject status report.

A. HANGERS

1. Detailed Analysis

The stress analysis, hanger adequacy and issue of formal hanger guidance are now essentially complete. The remaining work on these activities is covered by the flow sheet and the spread sheets have been dropped.

The remaining stress work includes completion of head vent piping stress analysis, reanalysis of the jet pump piping (4 calcs), clean-up and reconciliation of the final as-builts. We expect to complete analysis on the head vent piping calcs and jet pump piping calcs by 9-31-81. The remaining SFHO hanger work includes local stress, special clamps, anchors and expansion bolts on hold, and any changes will be issued to the field by 10-25-81.

The issue of detailed hanger changes is continuing. To date 185 new designs and 429 revisions have been released to Construction. The scope of detailed analysis new designs and revisions has been re-evaluated based on 100% completion of ME-101, 90% completion of AP/ME-101, preliminary results of the remaining AP/ME-101, and estimated revisions of the on-hold hangers:

CS24/9-1

File No. 0361
7

	New		Rev'd		
Large Pipe	361		700		
Small Pipe	239		79		
	600	+	779	=	1379

Old Scope

Large Pipe	288		400		
Small Pipe	151		200		
	439	+	600	=	1039

2. Simplified Analysis

The simplified stress review and issue of hanger change designs is continuing. 80 new designs and 78 revisions were identified of the 377 supports reviewed and issued. For the week reporting 480 pipe supports were actually reviewed but 103 could not be issued because the summary sheet mylars were in SHNO. Most of the 125 pipe supports mentioned in last week's report with this problem were released.

As reported in last week's letter, 20 skms are on hold due to DCP's and DCP's. Half of these will be as-built and issued to RE for analysis in two weeks, while the remainder we expect will be as-built and issued to RE for analysis in about four weeks. Analysis on the 18 skms which were on hold due to split flange problems has been completed.

Of the total scope of 4845 pipe supports we have reviewed 3042 to date, and we have 1803 pipe supports to go for review purposes. About 1000 of these supports will be given to SHNO for hanger review and design of any new supports or revisions. The remainder will be done by the RE Group. We are forecasting the completion of the simplified analysis pipe support relaese by October 25, 1981. The original schedule of October 4, 1981 will remain our target completion date.

We have reviewed about 8 piping systems in the Reactor Building. For increased support loads resulting from ANCO tests and also for increased large pipe movements from P-III analysis. This review indicates that it is possible to eliminate hardware modifications to piping systems and pipe supports by doing detailed analysis of 30 selected representatives piping systems. This evaluation will be on a generic basis and is scheduled to be completed by 11/6/81. An update of this study will be provided in the 10/11/81 report.

Very truly yours,

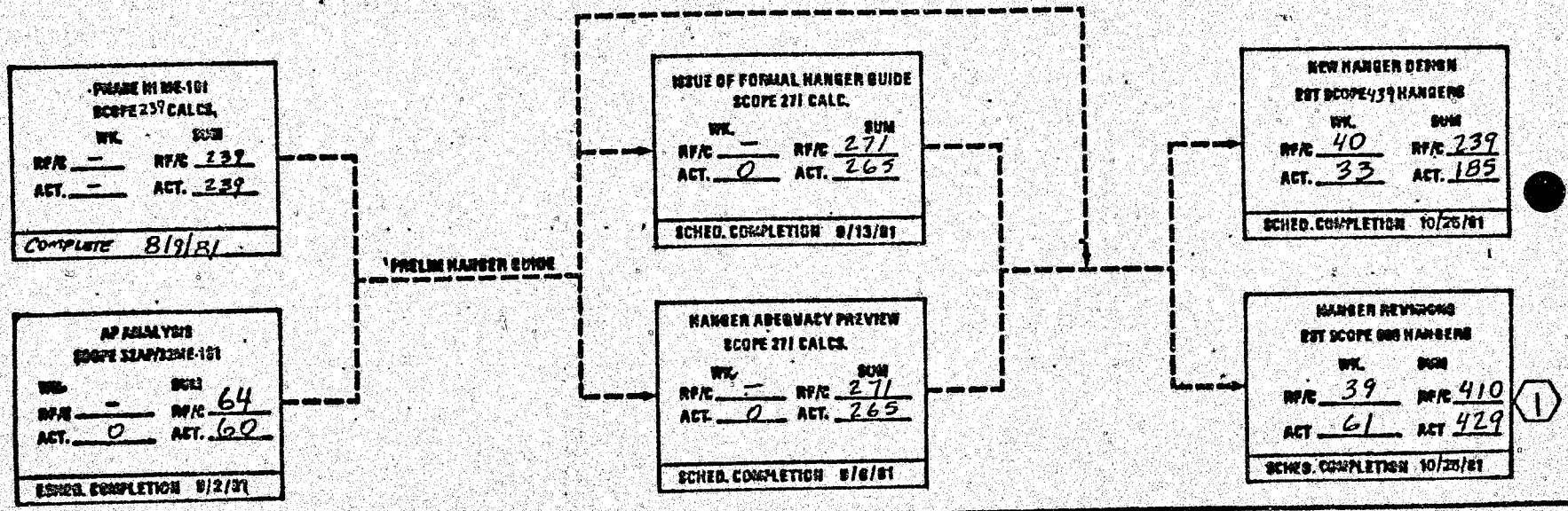
J. E. Violette

Grp. Resp. Code	C/S
Orig.	JWK
Grp. Ldr.	
Grp. Supvr.	
APE	
Oth Disp	

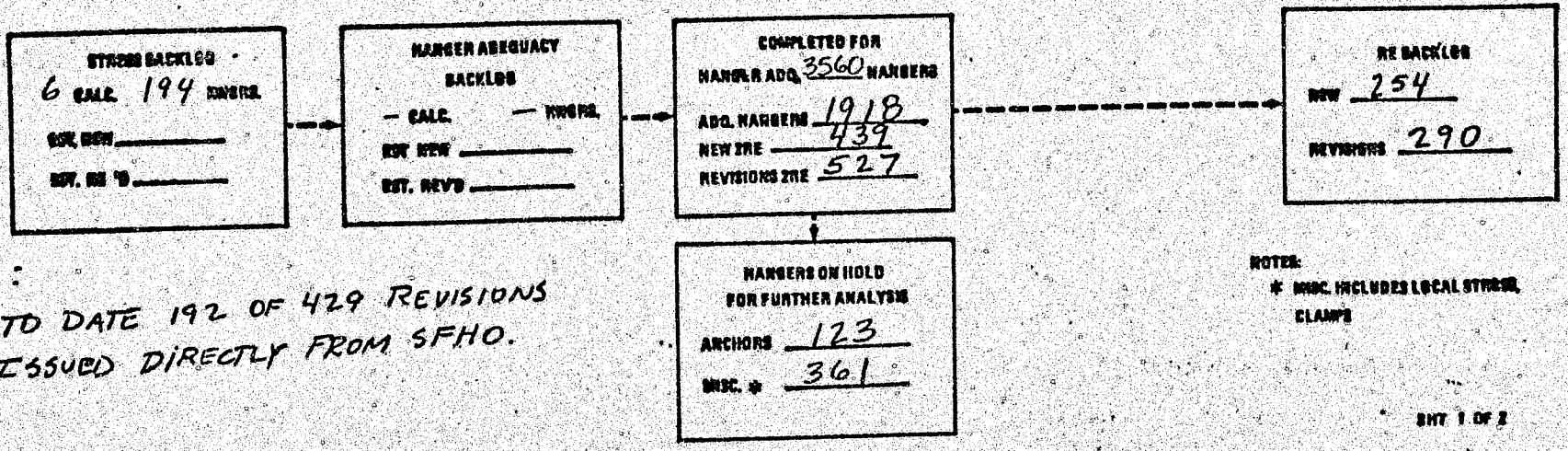
Written Response Req'd: No
JBV/JVK/vw
CS24/5-2

DETAIL STATUS

WEEK ENDING 9/20/81

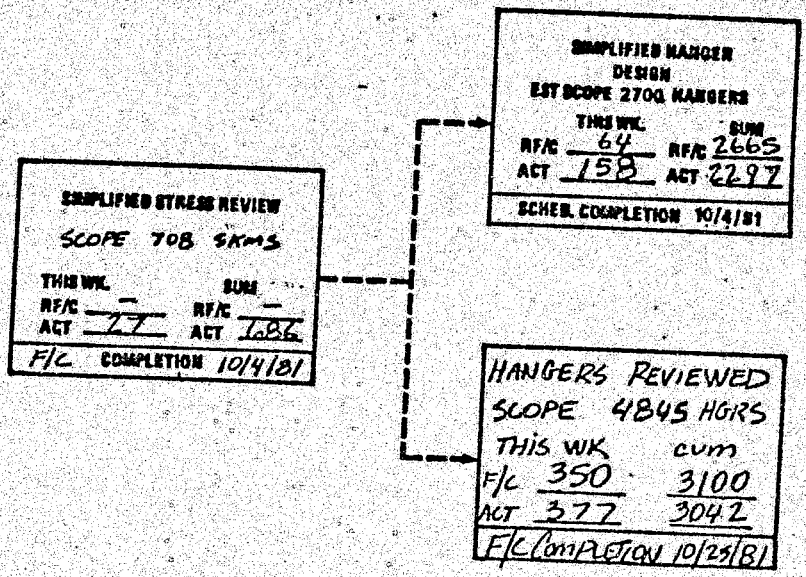


HANGER BACKLOG



NOTES:

1. TO DATE 192 OF 429 REVISIONS ISSUED DIRECTLY FROM SFHO.


SIMPLIFIED STRESS REVIEW
SCOPE 708 SKMS
THIS WK.
RF/C —
ACT 77
SUM
RF/C —
ACT 1086
F/C COMPLETION 10/4/81
SIMPLIFIED HANGER DESIGN
EST SCOPE 2700 HANGERS
THIS WK.
RF/C 64
ACT 158
SUM
RF/C 2665
ACT 2297
SCHED. COMPLETION 10/4/81
HANGERS REVIEWED
SCOPE 4845 HGRS
THIS WK
cum
F/C 350
3100
ACT 377
3042
F/C COMPLETION 10/23/81

SHT 2 OF 2

SEP 23 '81 0148643

SUSQUEHANNA STEAM ELECTRIC STATION
PHASE III STATUS REPORT

	MONTH	JUNE				JULY				AUGUST					SEPTEMBER				OCTOBER				NOVEMBER		
	WEEK ENDING	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4	11	18	25	1	8	15
DETAILED PHASE III HANGERS ISSUED TO F.E. (NEW) (ESTIMATED 439)	WK F/C (7/5/81)					8	12	16	18	18	22	22	22	22	22	22	22	20	20	18	18	13			
	WK R/FC (8/30/81)													40	40	40	40	40	40	40	40	40			
	WK ACT	0	0	0	5	3	2	5	8	6	12	15	23	11	23	39	53								
	R/FC MPR (8/30/81)													44	44	44	44	44	44	44	30	15			
MPR APPLIES TO NEW DESIGNS AND REVISIONS	ACT MPR	6	6	13	18	20	24	31	35	35	35	41	37	44	44	44	44								
	CUM F/C (7/5/81)					15	25	41	59	77	99	121	143	165	187	209	231	251	271	289	307	320			
	CUM R/FC (8/30/81)													119	159	199	239	279	319	359	399	439			
	CUM ACT	0	0	0	5	8	10	15	23	29	41	56	79	90	113	152	185								
	INSIDE CONT																								
	OUTSIDE CONT																								

DETAILED PHASE III ISSUED TO F.E. (REVISED) (ESTIMATED 600)	WK F/C (7/5/81)					22	34	38	38	38	38	40	40	38	38	38	38	36	32	32	30	24			
	WK R/FC (8/30/81)													39	39	39	39	39	39	39	37	34			
	WK ACT	0	0	0	6	40	8	43	22	28	29	50	26	15	77	22	61								
	CUM F/C (7/5/81)					28	62	100	138	176	214	254	294	332	370	408	446	482	514	546	576	600			
	CUM R/FC (8/30/81)													293	332	371	410	449	488	527	566	600			
	CUM ACT				6	46	54	99	121	149	178	228	254	269	316	360	429								
	INSIDE CONT																								
	OUTSIDE CONT																								

NOTE: MPR INCLUDES CONSULTANTS, SUPERVISION & OVERTIME (15%)

WEEK ENDING 9/20/81

PHASE . . TATUS REPORT

SLF 25 6101466 43

	MONTH	APRIL			MAY					JUNE				JULY				AUGUST					SEPTEMBER				OCT
	WEEK ENDING	12	19	21	3	10	17	24	31	7	14	21	28	5	12	19	26	2	9	16	23	30	6	13	20	27	4
SIMPLIFIED ANALYSIS REVIEW 708 SKM	WK SCH	30	30	35	40	40	40	40	43	45	45	45	40	40	35	35	30	30									
	WK R/FC													36	40	40	40	40	40	34	10						
	WK ACT	5	24	35	53	53	41	34	35	35	29	30	30	24	27	26	33	32	32	5	7	15	19	23	27		
	R/C MPR																					131	131	131	131		
MPR APPLIES TO REVIEW AND ISSUES)	ACT MPR	24	24	30	30	30	30	30	30	30	38	38	30	30	30	82*	82	82	82	87							
	CUM SCH	150	180	215	255	295	335	375	418	463	508	553	593	633	668	703	733	763									
	CUM R F/C													557	597	639	679	719	759	793	803						
	CUM ACT	120	153	188	241	294	335	369	404	439	463	493	523	547	574	600	633	665	697	702	709	617	636	659	686		
SIMPLIFIED NEW DESIGNS ISSUED TO F.E. (EST. 1727)	WK SCH	35	38	40	43	48	48	53	53	53	58	58	68	68	68	68	68	60	60	60	57	45	45	40	30	18	5
	WK R/FC													51	70	86	108	108	108	108	108	86	64	51	38	12	9
	WK ACT	125	42	57	27	88	19	53	66	51	58	63	61	60	65	56	25	32	48	54	93	97	47	21	80		
	CUM SCH	103	141	181	224	272	320	373	426	479	537	595	663	731	799	867	935	995	1055	1115	1172	1217	1263	1302	1332	1350	1355
	CUM R/FC													761	831	927	1035	1143	1251	1359	1467	1553	1617	1668	1706	1718	1727
	CUM ACT	125	167	224	251	339	358	411	477	528	586	649	710	770	835	891	916	948	996	1050	1143	1240	1287	1308	1388		
SIMPLIFIED REVS. ISSUED TO F.E. (EST. 823)	WK SCH	35	37	40	42	47	47	52	52	52	57	57	67	67	67	67	67	60	60	60	56	45	45	40	30	17	5
	WK R/FC													34	47	64	72	72	72	72	72	57	42	34	26	8	5
	WK ACT	14	8	101	4	25	32	14	23	20	17	8	23	40	37	69	26	48	54	59	73	77	43	20	78		
	CUM SCH	102	139	179	221	268	315	367	419	471	528	585	652	719	786	853	910	980	1040	1100	1156	1201	1246	1286	1316	1333	1338
	CUM R/FC													323	370	434	506	578	650	722	794	851	893	927	959	961	966
	CUM ACT	14	22	123	127	152	184	198	221	241	258	266	289	329	366	435	461	509	563	622	695	768	811	831	909		

NOTE: MPR INCLUDES CONSULTANTS, SUPERVISION, OVERTIME (25%)

WEEK ENDING 9/20/81

SUSQUEHANNA STEAM ELECTRIC STATION

PHASE III STATUS REPORT

SMALL PIPE SIMPLIFIED HANGER REVIEW P.S

	SEPT		OCT.				
	20	27	4	11	18	25	
WK F/C	350	400	400	400	300	245	
WK ACT	377						
CUM F/C	3100						
CUM ACT	3042						

WEEK ENDING 9/20/81

SEP 23 '81 01486643

"NO HGRS ORIGINALLY ON LINES"

UNIT 1 DUE TO SYSTEM REROUT & CONCEPTUAL DESIGN CHAN

"160 NEW PIPE SUPPORTS (Q AND EXTENSIVE M
FOR INSTALLATION) ON JET PUMP LINES (SP) IN
R/B. STRESS ANALYSIS @ 300 M/HS PER CAL
FOUR (4) CALCS REQUIRED. 1200 M/HS FOR
STRESS ON THE 160 HGRS. R.E. TO DO DESI
TO BE GANG BLOCK TYPES SAY MAYBE ONLY
40-50 ACTUAL HANGERS. ALLOW 32 M/HS PE
DESIGN 32 x 45 = 1,440 M/HS (R.E.) SOME
SFHO ENGR M/HS FOR HGR GUIDANCE. SAY 8
M/HS PER HGR = 8 x 45 = 360 M/HS M/HS FOR
THIS PHASE R.E. = 1440, SFHO ENGR = 1,560
SFHO OTHER = 730 ALLOW 60/24 DIRECT M/HS PE
B/INSTALLATION AS AN AVERAGE @ 160 x 60/24 = 960
M/HS.

"3"

AN ADDED 140 HGRS REQUIRE MODIFICATIONS O
OTHER SYSTEMS @ 20 ENGR M/HS PER (INCLUDES
R.E. FIELD VERIFICATIONS) = 140 x 20 = 2800 M/HS. MO
ALLOWANCE AT 16 M/HS FOR EA HGR = 2240 DIRE

COULD ALL BE PART OF HYDRO DYNAMIC LOADS
FOR PHASE III.

DOUBLE FOR UNIT 2

535,000 DIRECT
162,000 ENGR M/HS

BECHTEL

9/23/81

8856

10/05/8

per Unit

Phase III thru 10-9-41

Detailed Analysis	LP	SP	To
New	214	105	3
Revised	400	200	6
	614	306	9

+2,700 Simplified Analysis Small Pipe Hangers

	LP	SP	To
New	361	239	60
Revised	700	79	77
	1061	318	13

New	147	133	
Δ Revised	300	(121)	

BECHTEL

447 TOTAL LP HBR CHANGER

~~300 1260 147~~ 300 REUSED

2 147 NEW @ 150 M/HRS

= 67,050 DIRECT

12 X 60 FOR SMALL PIPE = 7

M/HRS

SUSQUEHANNA STEAM ELECTRIC STATION

ROUTING SHEET

SEP 28 '91 0148936

WRITTEN RESPONSE REQUIRED?
YES ☐ NO ☑

DATE DUE: _____

DCS. CONTROL NO. _____
REGISTER: FILE 0260 S
REGISTER: SPEC/PO

	RESPONSIBLE	INFORMATION	ATTACHMENT	ROUTE	ADDT'L DIST	
PROJECT MANAGEMENT		✓	✓			VIOLETTE
ASST PROJECT MANAGER			✓	✓		BERRA
		✓	✓			BISESTI
						DAMERVAL
ENGINEERING						
PROJECT ENGINEER						POSER
ASST PROJECT ENGINEER						WEYANDT
		✓	✓			McDANIEL
						MEHEGAN
						HEMPE
						TITUS
		✓	✓			Shipley
ADMINISTRATION						
DISCIPLINES						
ARCHITECTURAL						GIBBON
CIVIL						SHAH
CONTROL SYSTEM						DAVIS
ELECTRICAL						REMALEY
MECHANICAL			✓	✓		PEDERSEN
PLANT DESIGN	✓	✓	✓			PAREKH
LICENSING						McDONNELL
CONTAINMENT						PILLAI
QUALITY ENGINEERING						SPENSKO
CONFIG CONTROL						MOREY
SERVICES			✓	✓		
COST & SCHEDULE		✓	✓			WARREN
COST TREND						SMITH
PROJECT PLANNER						MAURER
ENGINEERING PLANNER						MELVIN
PROCUREMENT						
PROCUREMENT MANAGER						STOJKOV
PURCHASING						MALLORY
EXPEDITING						DELONG
INSPECTION						GUARDINEER
CONSTR COORDINATOR						FAZENDIN
M&QS COORDINATOR						LINDSAY
FIELD						TURNBOW
FIELD QA						LILLIGH
RES ENGINEER						CRANSTON
SFHO–QA						BLOMQUIST
QC						
PP&L						
CHRON FILE		✓	✓			
READING FILE		✓				

☐ PDCC HAS ENTERED THIS DOCUMENT AS A COMPLETE/PARTIAL RESPONSE TO:

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☐ PLEASE ADVISE PDCC IF THIS INFORMATION IS INACCURATE.

8856-S-9

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P O Box [redacted] Berwick, Pa. 18603-0451

Sep 28 - 9 19 AM '81

Mike cc: Power
Mehagen
Warren
Crapsey
McDaniel
Faulkner
} SSES
} Field

tember 18, 1981

Mr. Norman W. Curtis
N/4 General Office
Allentown, Pa. 18101

SUSQUEHANNA STEAM ELECTRIC STATION
WEEKLY HANGER PROGRAM REPORT
ER-100450 PLIS-1256 FILE #285

Return to JKV

Dear Mr. Curtis:

Attached for your information is the Hanger Program Report for the week ending September 4, 1981.

QC hanger acceptances continues to dictate overall program progress. Bechtel has realized performance improvements in this area, particularly in the field engineering aspect of hanger acceptance. However, the present status of this effort makes the possibility of program completion by January 18, 1982 remote. Additionally, continued performance at the present level seriously jeopardizes hanger program completion by April 15, 1981.

The attached report summarizes average QC performance improvements which must be realized in the near term, see Section 3 and Attachment 1.

Also included herein is a commentary on the proposed N-5 data report completion sequence and a discussion of the detail planning still required.

Very truly yours,

S. L. Denson

S. L. Denson
Project Construction Manager
Susquehanna SES

SLD/RAB:pjm

Attachment

cc: R. A. Breslin w/a SSES
C. R. Campbell w/a N/4
James Coughlin w/a So Eng Co
T. M. Crimmins w/a N/4
R. H. Featenby w/a SSES
J. Gordon w/a N/5
M. S. Gorski w/a SSES
R. A. Mazzini w/a N/4
E. M. Mead w/a N/4
T. Minor w/a Bechtel
W. Mourer w/a Bechtel
J. Peckis w/a Bechtel
R. Shovlin w/a N/4
G. Thomas w/a Bechtel
C. Turnbow w/a Bechtel
J. Violette w/a Bechtel
J. Zelechoski w/a SSES
Corresp. File w/o N/3
Letter File w/o N/3
PCC w/a SSES

File w/a

SUSQUEHANNA STEAM ELECTRIC STATION

- ROUTING SHEET

WRITTEN RESPONSE REQUIRED? YES ☐ NO ☑

DATE DUE: _____

DOC. CONTROL NO. _____

REGISTER: FILE 0930

REGISTER: SPEC/PO

	RESPONSIBLE	INFORMATION	ATTACHMENT	ROUTE	ADDT'L DIST	
PROJECT MANAGEMENT						
ASST PROJECT MANAGER						VIOLETTE
						BERRA
						BISESTI
						DAMERVAL
ENGINEERING						
PROJECT ENGINEER						POSER
ASST PROJECT ENGINEER						WEYANDT
		✓				McDANIEL
						MEHEGAN
						HEMPE
		✓				TITUS
						Shipley
ADMINISTRATION						
DISCIPLINES						
ARCHITECTURAL						GIBBON
CIVIL						SHAH
CONTROL SYSTEM						DAVIS
ELECTRICAL						REMALEY
MECHANICAL						PEDERSEN
PLANT DESIGN	✓	✓				PAREKH / L. Berrla
LICENSING						McDONNELL
CONTAINMENT						PILLAI
QUALITY ENGINEERING						SPENSKO
CONFIG CONTROL						MOREY
SERVICES						
COST & SCHEDULE						WARREN
COST TREND						SMITH
PROJECT PLANNER						MAURER
ENGINEERING PLANNER						MELVIN
PROCUREMENT						
PROCUREMENT MANAGER						STOJKOV
PURCHASING						MALLORY
EXPEDITING						DELONG
INSPECTION						GUARDINEER
CONSTR COORDINATOR						FAZENDIN
M&QS COORDINATOR						LINDSAY
FIELD						TURNBOW
FIELD QA						LILLIGH
RES ENGINEER						CRANSTON
SFHO-QA						BLOMQUIST
QC						
PP&L						
CHRON FILE		✓				
READING FILE		✓				

☐ PDCC HAS ENTERED THIS DOCUMENT AS A COMPLETE/PARTIAL RESPONSE TO:

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☐ PLEASE ADVISE PDCC IF THIS INFORMATION IS INACCURATE.

8856-S-9

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...HEL ...ER CORP

SEP 22 | 20 PM '81

MEMORANDUM

G. Cranston
S. Owen
L. Memula
A. Ayad
V. Chhabra

TO R. V. Parekh LOCATION SFHO - 221-10-B9

FROM S. Chitnis DATE September 15, 19

SUBJECT Phase III Work Progress JOB NO 08856

FILE

Reference: (1) Memorandum from S. Chitnis to R. Parekh dated 8-18-81 (Phase III Schedule Recovery Plan).

A) Large Pipe and Small Pipe with Detailed Analysis

Scope = 1039 hangers (new and modified) revised by SFHO.

	Recovery Plan		Actual Performance	
WK ENDING	DESIGNS COMPLETED	ISSUE TO F.E.	DESIGNS COMPLETED	ISSUE TO F.E.
8-23-81	65	63	65	44
8-30-81	70	63	106	21
9-6-81	75	63	63	50
9-13-81	60	63	60	61

Cumulative Completion

Hanger designs completed by R.E. = 638

Hanger designs completed by SFHO = 167

TOTAL = 805

805/1039 = 77%

Hangers issued to Construction by R.E. = 360

Hangers issued to Construction by SFHO = 167

TOTAL = 527

527/1039 = 51%

3 (6-75)

MEMORANDUM

TO _____ LOCATION _____

FROM _____ DATE _____ 19__

SUBJECT _____ JOB NO _____

FILE

Hangers designed but not issued = 805 - 527 = 278

The breakdown on these 278 hangers is as shown in attachment I.

B) Small Pipe Simplified Analysis

Scope = 4845 hangers to be reviewed.

Recovery Plan		Actual Performance
WK ENDING	HANGERS TO BE REVIEWED	ACTUAL REVIEWED
8-23-81	300	310
8-30-81	400	412
9-06-81	450	468
9-13-81	300	175

Another 120 hangers were reviewed but were not processed to issue to F.E. due to Summary sheet problems such as incorrect summary sheets, missing original summary sheets etc. These problems will be resolved during this week and these hangers will be issued. Out of 175 hangers reviewed 21 hangers were new and 20 hangers were modified existing hangers.

Cumulative Completion of Hanger Review:

Hangers reviewed = 2665 (2665/4845 = 55%)

Hangers to Go = 2180 (2180/4845 = 45%)

MEMORANDUM

LOCATION

DATE 19

JOB NO

FILE

C) Small Pipe Simplified Analysis Status

Total Scope = 720 SKM's per latest Lexitron Count.

(i)	Stress review complete - Hanger review complete	= 300
(ii)	Stress review complete - Require hanger review	= 120
(iii)	Stress review complete - Hangers by field based on loads and locations - Require hanger review	= 76
(iv)	Stress review complete - No hangers required (vents, and drains, etc.)	= 163
(v)	In process - Preparing for detailed analysis	= 6
(vi)	Assigned to EDS (NY & SF)	= 26
(vii)	Assigned to GPD in GPD	= 11
(viii)	Assigned to J. Blume (SF)	= 1
(ix)	On hold due to DCP, DCR, etc.	= 17
TOTAL		= 720

Stress analysis complete = (i) thru (iv) = 659 (659/720 = 92%)

If you have any questions please call,

Thanks,

ATTACHMENT - I

SMALL PIPE DETAILED ANALYSIS BY SFHO
AS OF 9/17/81

SUBJECT: EXPLANATION FOR DIFFERENCE BETWEEN ISSUED & DESIGNED (278)

	DISCRIPTION	# OF HANGERS	ACTION
1	SMALL PIPE SUPPORT:		
	A) No SD/transmittal missing	25	Has put a tracer on missing transmittal. Butch claims he has mailed these SD's.
	B) On hold as waiting for new hangers to be completed on the same SD's (total 3). these new hangers were not identified previously by SFHO	19	Putting new design on priority.
	C) In coordination	2	
	D) Waiting for stress info from SFHO- PSG.	3	
	E) Misc.	4	
	F) In process of issuing	4	
	SUBTOTAL	57	

SEP 22 '81 01485 86

R.V. Parekh
C.H. Nichols
L.B. Pulley
J.F. Warren
C.W. Reusser
B.T. Stojkov
G. Gabel

R

BACK UP TREND 11-2-

NOV 12 '81 0152133

IN REPLY PLEASE REF:

BLP 17661

Mr. T. M. Crimmins, Jr.
Pennsylvania Power & Light Co.
P. O. Box 1870
Allentown, Pennsylvania 18105

Subject: Susquehanna Steam Electric Station
Units 1 and 2 — Job 8856
P. O. 8856-P3-A, Piping Supports

Dear Tom:

Actual billing against the subject purchase order through August 1981, plus the cost of material on open order but not yet billed indicate that the face value of the purchase order should be increased to $12,017,000, an increase of $1,128,200 over the base amount approved in PLB-13357 dated July 14, 1981. The increase is primarily due to the new pipe supports and revision to existing pipe supports necessitated by Phase III detailed and simplified analysis, which concluded on October 25, 1981. The Phase III pipe support requirements are shown on the Phase III Hanger Status Report which was sent to you via BLP-17516 dated November 2, 1981, DCN 151416.

Please note that the pipe supports covered by the above report are for Unit 1 only and additional funding at a later date may be necessary for Unit 2.

With the above increase, the new commitment amount for this P.O. is $14,052,000 which includes $2,035,000 in escalation. Forecast 11 for this P.O. is $13,320,000. The remainder of this increase will be covered by Trend 11-2-39. #732,000/ONLY #420,000 IN 11-2-39

May we please have your authorization to increase the face value of the purchase order to $12,017,000 by November 30, 1981.

ADD $ + EXTRA 188K PER CWH 11/17/81

Very truly yours,

W C McDaniel

for E. B. Poser
Project Engineer

Written Reply Req'd: Yes
Due Date: November 30, 1981
APT/LBP/eat
cc: Dale Sattar (PP&L, NPE)
H2/29

Grp. Resp. Code	PD
Orig.	
Grp. Ldr	
Grp. Supv	
APE	
Oth. Discp.	CWH

IDP

ATTACHMENT - I

LARGE PIPE DETAILED ANALYSIS BY SFHO
AS OF 9/17/81

	DISCRIPTION	# OF HANGERS	ACTION
2	LARGE PIPE:		
	A) In process of sending for coordination	17	Put priority
	B) In coordination	69	Few of these has heavy loads they are sent to SFHO by Civil group (RE) for approv.
	C) Original out for signature (in process of issuing)	84	Need to put list together.
	D) Liner PL problem	4	Civil group is waiting on for solution.
	E) Need GE approval	1	Letter is sent to GE
	F) Needs redesign as disapproval by Civil Group	5	Working on it
	G) Diesel Exhaust pipe supports being redesigned	41	
	SUBTOTAL	221	

GRAND TOTAL ---------- 57 + 221 = 278

8322 8101148586

UNITS 1 AND 2
SUSQUEHANNA STEAM ELECTRIC STATION

DEC 29 '81 0155139

ROUTING SHEET

CADS
CWH

WRITTEN RESPONSE REQUIRED? YES ☐ NO ☐

DATE DUE: _____

DOC. CONTROL NO. _____

REGISTER: FILE 0260

REGISTER: SPSC/PO

	RESPONSIBLE	INFORMATION	ATTACHMENT	ROUTE	ADDT'L DIST	
PROJECT MANAGEMENT						VIOLETTE
ASST PROJECT MANAGER						BERRA
						BISESTI
ENGINEERING						
PROJECT ENGINEER				1		POSER
PROJECT ENGINEERING						WEYANDT
				2		SHIPLEY
						MEHEGAN
						DAMERVAL
						TITUS
PP&L MANAGING ENGR						DERKACS
ADMINISTRATION						
DISCIPLINES						
ARCHITECTURAL						GIBBON
CIVIL						SHAH
CONTROL SYSTEM						EDLINGER
ELECTRICAL						CHAN
MECHANICAL						PEDERSEN
PLANT DESIGN	✓	✓				PAREKH
LICENSING						McDONNELL
QUALITY ENGINEERING						SPENSKO
CONFIG CONTROL						MOREY
GSA PROJ ENGR						WOLTERS
SERVICES						
COST & SCHEDULE		✓				WARREN
COST TREND						SMITH
PROJECT PLANNER						MAURER
ENGINEERING PLANNER						MELVIN
PROCUREMENT						
PROCUREMENT MANAGER		✓				STOJKOV
PURCHASING						MALLORY
EXPEDITING						DELONG
INSPECTION						JANUS
CONSTR COORDINATOR						FAZENDIN
M&QS COORDINATOR						LINDSAY
FIELD						MOURER
FIELD QA						LILLIGH
RES ENGINEER						CRANSTON
SFHO-QA						BLOMQUIST
QC						
PP&L						
CHRON FILE		✓				
READING FILE						

BACK UP
TREND
11-2-3

☒ PDCC HAS ENTERED THIS DOCUMENT AS A COMPLETE/PARTIAL RESPONSE TO:

BLP-17661

☐ PLEASE ADVISE PDCC IF THIS INFORMATION IS INACCURATE.

0353-3-0

REVIEWED & DISTRIBUTED BY E.M.

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

DEC 22 1981

RECEIVED JOB 8356
POWER CORP.
DEC 29 9 11 AM '81

Confidential

Mr. E.B. Poser
Project Engineer
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
P.O. 8856-P3-A PHASE III PIPING SUPPORTS
ER 100450 FILE 285-P-3
PLB-13900

Reference: BLP-17661 dated Nov. 12, 1981

Dear Ed:

In response to BLP-17661, PL authorizes Bechtel to issue a revised Purchase Order, 8856-P3-A for additional services and material on Unit 1 Phase III piping supports in the amount of $14,051,916 consisting of:

Prior approval per PLB-13357	$12,923,716
Current change	1,128,200
New approval commitment	$14,051,916

The total commitment includes $2,035,000 in escalation. Forecast 11 for this P.O. is $13,320,000. The change will be trended by Trend 11-2-39 by Bechtel.

Very truly yours,

T.M. Crimmins, Jr.
Manager-Nuclear Plant Engineering

WKC/kes

RESPONSE REQUIRED: No
c.c.:

A.M. Male	N5
W.J. Rhoades	N5
D.Sattar	N5
A.R. Sabol	N4
W. Chan	N5
S.L. Denson	Susq. SES
R.A. Mazzini	N4
J. Stechel	N4
Letter File	N3
Date File	N5
SP&E File	N3

APR 12 1979

Mr. M.R. Muir
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

PA. PUBLIC UTILITY COMMISSION
DOCKET NO. R-822169 FOLDER NO.
C-14 EXHIBIT NO. 18
HEARING AT Hbg 2/23/83
REPORTER P. Hulbert

SUSQUEHANNA STEAM ELECTRIC STATION
ELASTOMERIC ROOFING
ER 100450 FILE 154-A8
PLB-9734

Dear Mel:

This is a partial reply to your letter BLP-10724, Document Control No. 102408, dated April 6, 1979.

RECEIVED
MAR 3 1983
SECRETARY'S OFFICE
Pa. Public Utility Commission

As indicated to you in our letter PLB-8738, dated July 14, 1978, as a result of the excessive inspection, management and overhead costs experienced as a result of the defective roof coating on the Radwaste Building and the efforts to repair it, we do not want any further use of this unacceptable roof coating system on the Susquehanna Project.

As discussed with your Messrs. J.A. Weyandt and A. Tjan on April 11, 1979, we request that a second alternative be recommended based on the three Elastomeric Roofing systems previously specified in specification 8856-A8. It is our understanding that you have not withdrawn your previous approval of these three systems and that you concur with this request. Please submit your recommended roofing system by April 23, 1979 as the continued delay in resolving this problem is resulting in unnecessary costs and schedule delay. A subsequent letter will address the deficiencies in the Radwaste Building Roofing material.

Very truly yours,
(Signed) R. J. SHOVLIN

R.J. Shovlin
Assistant Project Director

DOCKETED
MAR 4 1983

RWM
RMY
DP for RWM/RMY

RWM-RMY/kes

RESPONSE REQUIRED: Yes
DATE REQUIRED: April 23, 1979

Copy to:

W.L. Bohner	N-4	R.W. McNamara	N-5
R.H. Featenby	Susq. SES	T.F. Oldenhage	Susq. SES
J.M. Kenny	N-4	D.P. Parsons	N-5
A.M. Male	N-5	R.J. Shovlin	N-4
E.M. Mead	N-5	R.M. Yanochko	N-5
		Letter File	N-3
		SP&R File	N-3
		Date File	N-5

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

August 11, 1978

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
THERMOSETTING SURFACING MATERIAL
SPECIFICATION 8856-A-28
ER 100450 FILE 158-A-28 & 905-2
PLB 8591

Dear Mel:

By this letter, consistent with Article IX B.2 of the Bechtel/PL Contract, we are notifying you that we consider the recently identified problem with the thermosetting surfacing material to be caused by deficiencies in the services we have received from Bechtel. We consider all increased costs resulting from these deficiencies to be non-reimbursable.

Very truly yours,

R. J. Shovlin
Susquehanna Project Manager

DJW:po

cc:
D.S. Bast	N2
W.L. Bohner	N4
N.W. Curtis	N4
J.W. Geiling	N5
H.L. Harris	SSES
J.M. Kenny	N4
A.M. Male	N5
R.A. Mazzini	N4
R.W. McNamara	N5
E.M. Mead	N5
D.J. Walters	N4
SP&E File	N3

AUG 4 1977

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

cc: Messrs.

H. B. Barnes	TW-2
D. S. Bast	N-2
W. L. Bohner	N-4
N. W. Curtis	N-4
H. L. Harris	SSES
J. M. Kenny	N-4
A. M. Male	N-5
R. A. Mazzini	N-4
R. W. McNamara	N-5
E. M. Mead	N-5
A. R. Sabol	N-4
G. E. Shamis	N-2

SUSQUEHANNA STEAM ELECTRIC STATION
SUBCONTRACT 8856-A-50
NUCLEAR CONCRETE SURFACER
ER 100450 FILE 156-A-50, 905-2
PLB- 7575

Dear Mel:

PL has experienced excessive costs and schedule delays resulting from defective work on the Nuclear Concrete Surfacer for the Unit No. 1 Reactor Pedestal. This has resulted in damages to PL and the incidence of these damages is continuing due to unsatisfactory prosecution of this work.

By this letter, consistent with Article IX B 2 of the Bechtel/PL Contract, we are notifying you that we consider the above noted excessive costs to be caused by deficiencies in the services we have received from Bechtel.

We require that you exercise all necessary effort to resolve this unsatisfactory situation without further delay. We request that you furnish us with your schedule for accomplishing this objective not later than August 12, 1977.

Very truly yours,

[Signed] R. J. SHOVLIN

R. J. Shovlin
Project Manager - Susquehanna

JMK/RWM/sg

ACTION: YES
DATE DUE: AUGUST 12, 1977

CONFIDENTIAL

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P. O. Box 3965
San Francsico, CA 94119

bcc-Messrs.
T. M. Crimmins,Jr.-N4
S. L. Denson-Susq.SES
R. H. Featenby-Susq.SES
H. W. Keiser-Susq.SES
M. Kenny-N4
B. A. Snapp-TW2
R. J. Shovlin-N4
D. J. Walters-N4
Letter File-N3
Date File

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCIES IN SERVICE
BECHTEL CONTRACT
ER 100450 PLB-12786 FILE 905-2

Dear Joe:

For some time we have discussed with Mel Muir and yourself potential revisions to the Contract which would negate the formal notification requirements stipulated in Article IX for deficiencies in service. Based on recent conversations, it appears that little progress has been made in your shop and the concept may not be feasible. We continue to be concerned with the impact such notification may have on the completion of the Project given our mutual concern that available resources be dedicated to essential tasks rather than defense of contract positions. Such notifications are an obligation to preserve our contractual rights. For issues which Bechtel does not agree are contract deficiencies, we understand the need to establish your position but ask that this not be done in a manner disruptive to the essential tasks.

Attached are some of the items we consider to be deficiencies in service in accordance with Article IX, Section B.2 of the Bechtel/PP&L Contract which were held pending resolution of our discussions to modify the Contract. In addition to the attached, we have accumulated numerous potential deficiencies involving maintenanc provisions. Rather than listing each of these items, we believe it is in our mutual best interest to defer discussing plant maintenance until a later time. Examples would include provisions to remove condenser and feedwater tubing as well as valve accessibility concern

Very truly yours,

(Signed) N. W. CURTIS

N. W. Curtis
Project Director-Susquehanna

JMK:jm
Attachment

Deformed pipe sleeves for the makeup and discharge pipe.

Laminations of the 1½" plates at the weld joints of the turbine building exhaust vent stacks.

Delays in the resonant frequency testing of valves caused by a deficient test fixture clamping method and problems incurred in mounting the valves to be tested.

The use of non-Q solenoid valves as pilot valves for safety-related process valves.

Modifications to SRV discharge line restraints.

The conversion of Standby Liquid Control Inspection valve limit switches from two train to four train.

Voltage drops in power and control cables resulting from excessive runs of undersized cable.

Failure to incorporate into the Plant design, a reversing capabilit[illegible] the motor operated valves.

Increased costs for an off-gas system.

Project Manager
Bechtel Power Corporation
P. O. Box 3965
San Francisco, CA 94119

bcc-W. L. Bohner - N4
R. H. Featenby - SSES
J. M. Kenny - N4
A. M. Male - N5
E. M. Mead - N5
B. A. Snapp - TW2
D. J. Walters - N4

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCIES IN SERVICES
ER 100450 PLB-9748
FILES 905-2, 285-P-1, 535, 105-C-87, 264-1

Dear Mel:

In accordance with Article IX, Section B2 of the Bechtel/PL Contract, we hereby notify you that we consider the recent problems encountered in several activities to be the result of deficiencies in the services we have received from Bechtel. We consider all increased costs resulting from these deficiencies to be non-reimbursable.

The deficient services are as follows:

1. Administration of the purchase order for large pipe (P1) and related engineering services.

2. Engineering and Construction activities over the past several months that led to the recent stop work in cable pulling including replacement of damaged cables.

3. Engineering activities related to the ACR/PGCC which have caused excessive panel check out time as well as panel rework and cable shortening problems.

4. Engineering and subcontract administration activities related to excavation of the patrol road wherein explicit directives of PP&L were not followed.

Very truly yours,

(Signed) R. J. SHOVLIN

R. J. Shovlin
Assistant Project Director-Susquehanna

RJS:jm

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

October 11, 1977

M. R. Muir
Project Manager
Bechtel Power Corporation
P. O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
MODIFICATIONS TO FUEL POOL STRUCTURE
ER 100450 FILE 905-2, 222-C-51
PLB-7781

Dear Mel:

We have recently become aware of a number of substantial cost items which deal with modifications made to the fuel pool structure and the associated stainless steel liner plate.

Please refer to PLB-7570 and the Bechtel response, BLP-8276 for details of areas where extra costs were incurred. Our unanswered letter, PLB-7647 identifies other areas of increased cost. In addition, we anticipate that a substantial number of engineering, home office and field non-manual manhours were spent in conjunction with these modifications.

We understand that these modifications were initiated in order to facilitate revised construction procedures which would shorten the construction schedule for the fuel pool structure. Article XIII of the Bechtel/PL contract requires that all increases in cost associated with schedule make-up be approved, in writing, by PL. We are unaware of any such PL approval for these increases in cost.

By this letter and in accordance with Article IX of the Bechtel/PL contract, we are notifying you of this deviation from contract requirements by Bechtel. We request that Bechtel prepare a complete breakdown and

justification of these unauthorized expenditures, including field and home office manhours, incurred for the referenced modifications to the fuel pool and submit these to PL by October 31, 1977.

Very truly yours,

R. J. Shovlin
Project Manager

DFR:dah
0275

ACTION: Yes

DATE DUE: October 31, 1977

Copies to:

H.B.Barnes	-TW2
W.L.Bohner	-N4
C.R.Campbell	-N4
N.W.Curtis	-N4
J.W.Geiling	-N5
H.L.Harris	-SSES
J.M.Kenny	-N4
M.J.Lidl	-Bechtel
C.G.Lombardi	-N4
A.M.Male	-N5
R.A.Mazzini	-N4
R.W.McNamara	-N5
E.M.Mead	-N5
D.F.Roth	-N5
G.E.Shamis	-N2
R.J.Shovlin	-N4
Letter File	-N3
D. S. Bast	-N2

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

AUG 2 8 1978

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P. O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
MISALIGNMENT OF ANCHOR BOLTS -
REACTOR BUILDING SUPER STRUCTURE STEEL
ER 100450 PLB-8940 FILE 900, 905-2

Dear Mel:

We hereby notify you in accordance with Article IX, Section B2 of the Bechtel/PL Contract that we consider the recent problem related to misalignment of anchor bolts for the Reactor Building super structure steel (NRC #2815) to be caused by deficiencies in the services we have received from Bechtel. We consider all increased costs resulting from these deficiencies to be non-reimbursable.

Very truly yours,

R. J. Shovlin
Project Manager-Susquehanna

RJS:jm

cc-Messrs.
D. S. Bast - N2
H. R. Block - Susq.SES
W. L. Bohner - N4
N. W. Curtis - N4
H. L. Harris - Susq.SES
J. M. Kenny - N4
A. M. Male - N5
R. A. Mazzini - N4
A. R. Sabol - N4
B. A. Snapp - TW2
Letter File - N3
Date File

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

OCT 24 1979

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
CONTRACT DEFICIENCY-CASK POOL LINER PLATE
ER-100450 FILE 222-C-51
PLB-10529

Dear Mel:

In accordance with Article IX, Section B.2 of the Bechtel/PL Contract, we hereby notify you that we consider the damage to the Cask Pool Liner Plate to be the result of deficiencies in services received from Bechtel.

We consider all costs associated with this deficiency to be non-reimbursable.

Very truly yours,

R. J. Shovlin
Assistant Project Director-Susquehanna

DW:kll

cc: W. L. Bohner N-4
N. W. Curtis N-4
R. H. Featenby SSES
J. M. Kenny N-4
R. A. Mazzini N-4
B. A. Snapp TW-2
D. J. Walters N-4

P. P. & L.
NUCLEAR PLANT
JOB 8356

Mr. D. P. Schultz, Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
CIRCULATING WATER PIPE DRAWINGS
C-72, 73, 75, 76, REV 5
ER 100450 FILE 432
PLB-3055

Dear Gordon:

In our review of the Circulating Water pipe drawings, recently transmitted to us, we have noticed a complete re-design of the circulating water piping. We understand that this change was made as a result of comments transmitted to Bechtel by Ingersoll-Rand Company which indicated that the previous piping layout would result in deficient operation of the system. Since the Ingersoll Rand pumps are typical of horizontal centrifugal pumps made by other manufacturers and in view of their comments that the suction line should be modified, we feel that a significant error occurred in the layout and design of the circulating water suction line prior to the issuance of drawings C-75 & 76, Rev. 3. In addition, the change from a single 144" suction line to 2-108" diameter lines shown on C-75 & 76, Rev. 5 seems to emphasize this error by Bechtel in line layout and design.

As you know from our previous comments requesting a hydraulic analysis of this system, we are very much concerned that this error in the design of the piping manifold is not repeated in the re-design of the new layout. In order to avoid a possibility of revising the layout again at a later date, we require that you perform the full hydraulic analysis of the new system (Rev. 5) including evaluation of transients, vortex formation and cavitation. This analysis must be completed prior to commitment of this re-design order to the vendor for fabrication. Please provide us with a copy of the study or evaluation which is the basis for the change to the double suction lines prior to February 15, 1974.

JOB 8356
PENNSYLVANIA POWER & LIGHT COMPANY

In accordance with the terms of our contract, we are advising you that this design error represents a failure by Bechtel to perform its services in accordance with generally accepted standards and practices. The provisions of Article 1X.B of our contract are therefore applicable. We would like to meet with you in the near future to agree upon a procedure that will meet the requirements of Article 1X.B.

Very truly yours,

(Signed) W. A. FREDERICK

W. A. Frederick
Manager-Susquehanna Project

JRB/RWM:JKG

c-Messrs.
J.R.Biggar - TW-2
J.R.Buczynski - N-5
L.W.Kisthart - N-5
R.W.McNamara - N-5
E.M.Mead - N-5
M.E.Taylor - N-5
J.F.West,Jr. - N-5
R.A.Mazzini - N-5
G.L.Parkinson - Bechtel

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

Bicent
Pennsy
So your chil
chur

July 2, 1976

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P. O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
CONCRETE CONSTRUCTION PROBLEMS
ER 100450 FILE 903
PLB-6231

Dear Mel:

We hereby notify ycu in accordance with Article IX, Section B of the Bechtel/PL contract that we consider the recent concrete quality prcblems to be the result of deficiencies in Bechtel services and that they are not in accordance with generally accepted standards and practices applicable to the services being performed on the Susquehanna Project. Pursuant to Article IX, Section B we expect you to resolve the problems caused by the deficiencies in your services. Any costs associated with the resolution of these problems will, of course, be to Bechtel's account. Bechtel failed to take the proper corrective action and continued to place concrete utilizing materials previously identified as not conforming to project requirements.

We are hereby notifying you of this deficiency within 30 days of its discovery. It was brought to our attention on or about June 4, 1976.

Very truly yours,

R. J. Shovlin
Project Manager-Susquehanna

CGL/RWM/WLB:AAW

Copy to:

D.S.Bast	N2	R.W.McNamara	N5
W.L.Bohner	N5	E.M.Mead	N5
N.W.Curtis	N4	E.M.Nagel	N2
J.W.Geiling	N5	G.E.Shamis	N2
H.L.Harris	SSES	M.E.Taylor	N5
S.A.Krouse	N5	H.B.Barnes	TW-2

PP&L

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

JAN 24 1979

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICES
ER 100450 FILE 432,905-2
PLB-9425

Dear Mel:

In accordance with Article IX, Section B.2 of the Bechtel/PL Contract, we hereby notify you that we consider the recent damage to the epoxy coatings inside the circ water piping to be a result of deficiencies in Bechtel services. We consider all costs associated with these deficiencies to be non-reimbursable.

Very truly yours,

R. J. Shovlin
Assistant Project Director - Susquehanna

DW:pvm

Copy to:

W. L. Bohner	N4
N. W. Curtis	N4
J. M. Kenny	N4 ✓
A. M. Male	N5
R. W. McNamara	N5
B. A. Snapp	TW2
D. J. Walters	N4

AUG 4 1977

cc: Messrs.

R. L. Astleford	SSES
H. B. Barnes	TW-2
W. L. Bohner	N-4
N. W. Curtis	N-4
H. L. Harris	SSES
J. M. Kenny	N-4
R. A. Mazzini	N-4
E. M. Mead	N-5
A. R. Sabol	N-4

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
FUEL POOL POUR NO. 25S501
ER 100450 FILE 827-4, 905-2
PLB- 7576

Dear Mel:

We hereby notify you in accordance with Article IX, Section B.2 of the Bechtel/PL Contract that we consider the recent problem in the subject Fuel Pool pour to be caused by deficiencies in the services we have received from Bechtel. We consider all increased costs resulting from these deficiencies to be non-reimbursable.

Very truly yours,

(Signed) R. J. SHOVLIN

R. J. Shovlin
Project Manager - Susquehanna

JMK/sg

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

APR 28 1975

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P. O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
TURBINE BUILDING OUTSIDE PLENUM DUCTWORK
MATERIAL REQUISITION M-323
ER 100450 FILE 160-M-323
PLB-4663

Dear Mel:

It has come to our attention that the Turbine Building Outside Plenum Ductwork bid award has been delayed due to Field Construction and Bechtel Subcontract Group indecision. Our letter PLB-4485 authorized you to award this package to Peabody and Wind before the March 14, 1975 deadline for a firm fixed price of $229,390. We now understand that the quotation dates have expired and you have requested quotes based on revised construction schedules. Furthermore, we now understand that the Construction Department has not reviewed the schedules nor defined its HVAC requirements for the project as a whole nor has this work been scoped!

We have received no official word on any of these actions to date and we are waiting for an explanation. As the situation now stands, we feel that any increase in the cost of the purchase order must be held against Bechtel's account.

Very truly yours,

(Signed) E. M. MEAD

Earle M. Mead
Manager - Susquehanna Project

DPD:vjs
c-Messrs.

R.H.Bielecki	A1-2	M.J.Lidl	Bechtel
W.L.Bohner	N5	W.J.Rhoades	N5
H.L.Harris	SSES	M.E.Taylor	N5
L.W.Kisthart	N5	W.R.White	A3-4

2490

16

PP&L

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

AUG 2 8 1978

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P. O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
PURCHASE ORDER P-3A
ER 100450 PLB-8941 FILE 905-2

Dear Mel:

We hereby authorize you in accordance with Article IX, Section B2, of the Bechtel/PL Contract, that we consider the handling of subject purchase order for Grinnell supplied hangers to be caused by deficiencies in the services we have received from Bechtel. We consider all increased costs resulting from these deficiencies to be non-reimbursable.

Very truly yours,

R. J. Shovlin
Project Manager-Susquehanna

RJS:jm

cc-Messrs.
D. S. Bast - N2
H. R. Block - Susq.SES
W. L. Bohner - N4
N. W. Curtis - N4
H. L. Harris - Susq.SES
J. M. Kenny - N4
A. M. Male - N5
R. A. Mazzini- N4
A. R. Sabol - N4
B. A. Snapp - TW2
Letter File - N3
Date File

SEP 2 1981

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
CONTRACT DEFICIENCY
ER 100450 FILE 905-2
PLB-11798

Dear Mel:

We consider the lack of proper slope on installed piping and tubing to GE supplied equipment to be a deficiency in services received from Bechtel.

By this letter and in accordance with Article IX, Section B.2, we are notifying you that all increased costs resulting from this contract deficiency in service are considered to be non-reimbursable.

Very truly yours,

R. J. Shovlin
Assistant Project Director-Susq.

DJW:EJM

Copy to:
J.A.Bartos - N-4
N.W.Curtis - N-4
R.H.Featenby - SSES
[redacted] - [redacted]
A.M.Male - N-4
E.M.Mead - N-4
B.A.Snapp - TW-2
D.J.Walters - N-4

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

AUG 23 1979

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P. O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICE
PIPE HANGERS
ER 100450 PLB-10280 FILE 905-2

Dear Mel:

We consider the increased manhours required to investigate potential discrepancies between hanger stress isometrics and fabrication drawings to be a deficiency in service. At this point, it is uncertain as to the ultimate results of your investigation and what, if any, large and small pipe hanger modifications will be required or additional inspections will be needed to verify design adequacy.

By this letter, we are notifying you that all increased costs resulting from this contract deficiency in service are considered to be non-reimbursable.

Very truly yours,

R. J. Shovlin
Assistant Project Director-Susquehanna

JMK:jm

cc-Messrs.
W. L. Bohner - N4
N. W. Curtis - N4
R. H. Featenby - SSES
J. M. Kenny - N4
A. M. Male - N5
E. M. Mead - N5
B. A. Snapp - TW2
D. J. Walters - N4
Letter File - N3
Date File

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

JAN 9 1980

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P. O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICE
LOCATION OF RADIATION MONITORS
ER 100450 PLB-10788 FILE 905-2

Dear Mel:

In accordance with Article IX, Section B2 of the Bechtel/PL Contract, we hereby notify you that we consider the problem identified with the location of the radiation monitors for the RHR service water to be the result of deficiencies in the services we have received from Bechtel. We consider all increased costs resulting from this deficiency to be non-reimbursable.

Separate correspondence will be forwarded which addresses your letter BLP-11830 concerning proposed fixes to the above noted problem.

Very truly yours,

R. J. Shovlin
Assistant Project Director-Susquehanna

JMK:jm

cc-Messrs.
N. W. Curtis - N4
R. H. Featenby - SSES
J. M. Kenny - N4
A. M. Male - N5
E. M. Mead - N5
B. A. Snapp - TW2
D. J. Walters - N4
Letter File - N3
Date File

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

OCT 2 4 1974

Mr. M. R. Muir
Project Manager
Bechtel Power Corp.
P. O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
RAILROAD BRIDGE FABRICATION
ER 100450 FILE 111
PLB-3941

Dear Mel:

Our field office has brought to our attention the fact that the plug weld holes in the ballast pan of the railroad bridge did not conform to AWS or AREA standards, which are the basis for the railroad bridge design and fabrication. The failure on the part of Bechtel Engineering to design the bridge in accordance with these standards has resulted in extra field work which involved the drilling of approximately 970-3/4" diameter holes in the 1/2" thick bridge floor beams with about 1/3 of these holes also through the 7/8" ballast pan.

If this additional work results in a charge by the subcontractor, then we feel that it is Bechtel's responsibility to pay for the change. In accordance with the terms of our contract, we are advising you that this design error represents a failure by Bechtel to perform it's services in accordance with generally accepted standards and practices. The provisions of Article IX.B of our contract are, therefore, applicable.

Very truly yours,

(Signed) EARLE M. MEAD

E. M. Mead
Manager-Susquehanna Project

JRB/RWM:BSW

c-Messrs.

W.L.Bohner	N5	W.C.Roeger	TW-2
H.L.Harris	Susq.	M.E.Taylor	N5
L.W.Kisthart	N5	J.F.West,Jr.	N5
R.A.Mazzini	N5	G.L.Parkinson	Bechtel
R.W.McNamara	N5		

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

JUL 10 1979

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P. O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCIES IN SERVICES
SOCKET WELD FITTINGS
ER 100450 PLB-9920 FILE 905-2

Dear Mel:

In accordance with Article IX, Section B2 of the Bechtel/PL Contract, we hereby notify you that we consider the correction of installed compression fittings on instrument lines to welded fittings to be the result of deficiencies in the services we have received from Bechtel. We consider all increased costs resulting from this deficiency to be non-reimbursable.

Very truly yours,

R J Shovlin

R. J. Shovlin
Assistant Project Director-Susquehanna

JMK:jm

cc-Messrs.
W. L. Bohner - N4
N. W. Curtis - N4
R. H. Featenby - SSES
J. M. Kenny - N4
A. M. Male - N5
E. M. Mead - N5
B. A. Snapp - TW2
D. J. Walters - N4
Letter File - N3
Date File

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

APR 2 1980

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICES
ER 100450 FILE 905-2, 301-1
PLB-11132

Dear Mel:

In accordance with Article IX, Section B.2 of the Bechtel/PL Contract, we hereby notify you that we consider the design changes required to the spent resin transport system to be a result of deficient services received from Bechtel. We consider all cost associated with these changes to be non-reimbursable.

Very truly yours,

R. J. Shovlin
Asst. Project Director-Susquehanna

RJS/ejf

Copies to:
N.W. Curtis N4
J.M. Kenny N4
A.M. Male N5
E.M. Mead N5
B.A. Snapp TW2
[redacted]

920745

SEP 25 1980

Copy to:

N. W. Curtis	N4
J. M. Kenny	N4
S. B. Kuhns	N4
A. M. Male	N4
E. M. Mead	N4
D. P. Parsons	N4
B. A. Snapp	TW-2
[redacted]	[redacted]

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P. O. Box 3965
San Francisco, CA. 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICES
ER-100450 FILE 905-2
PLB-11987

Dear Mel:

In accordance with Article IX, Section B.2 of the Bechtel/PL contract we hereby notify you that we consider the recent purchase of two startup transformers to be the result of deficient service received from Bechtel.

The costs associated with these transformers, including purchase price, installation and contingency is $1,745,000.

Very truly yours,

(Signed) R. J. SHOVLIN

R. J. Shovlin
Assistant Project Director - Susquehanna

DW:jns
DW#]29:5

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

JUL 14 1977

Mr. M. R, Muir
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
STUD WELDING PROBLEM COSTS
ER 100450 FILE 905-2
PLB-7526

Dear Mr. Muir:

By this letter, consistent with Article IX B.2 of the Bechtel/PL Contract, we are notifying you that we consider the recently identified problem with stud welding to be caused by deficiencies in the services we have received from Bechtel. As documented in MCAR 1-18 this problem was caused by a Bechtel Quality Control program breakdown which was originally brought to Bechtel's attention on 3/25/77 by PL's Quality Assurance organization. The total increased costs resulting from this deficiency is dependent on the dispensation of previously installed studs and thus, the cost cannot be quantified at this time. We consider all increased costs resulting from this problem to be non-reimbursable.

Very truly yours,

R. J. Shovlin
Project Manager - Susquehanna

JMK/sg

cc: Messrs.

R. L. Astleford	SSES
H. B. Barnes	TW-2
W. L. Bohner	N-4
N. W. Curtis	N-4
H. L. Harris	SSES
J. M. Kenny	N-4
R. A. Mazzini	N-4
A. R. Sabol	N-4

PP&L

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

MAR 5 1979

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
SUPPLIER DOCUMENTATION
ER 100450 FILE 833
PLB-9035

Dear Mel:

We have concluded after lengthy analysis that the current site effort to review supplier documentation to have resulted from deficiencies in services received from Bechtel.

We, hereby, notify you, in accordance with Article IX, Section B2 of the Bechtel/PL Contract that we consider all increased costs resulting from this deficiency to be non-reimbursable.

Very truly yours,

R. J. Shovlin
Project Manager - Susquehanna

DJW:pvm

Copy to:

W. L. Bohner	N4
N. W. Curtis	N4
H. L. Harris	Susq.
J. M. Kenny	N4
A. R. Sabol	N4
B. A. Snapp	TW2
D. J. Walters	N4

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

NOV 21 1979

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P. O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICE
SWITCHGEAR SEPARATION
ER 100450 PLB-10639 FILE 905-2

Dear Mel:

In accordance with Article IX, Section B.2 of the Bechtel/PL Contract, we hereby notify you that we consider the rewiring necessary for the 4.16 KV Switchgear to meet separation requirements to be the result of deficiencies in services received from Bechtel.

We consider all costs associated with this deficiency to be non-reimbursable including, but not limited to, the impact of a schedule delay for the RPV hydro test.

Very truly yours,

R. J. Shovlin
Assistant Project Director-Susquehanna

JMK:jm

cc-Messrs.
K. H. Backenstoe - N5
N. W. Curtis - N4
J. M. Kenny - N4
A. M. Male - N5
E. M. Mead - N5
B. A. Snapp - TW2
D. J. Walters - N4
Letter File - N3
Date File

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

OCT 3 1979

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
TURBINE BUILDING SHIELDING WALL
ER-100450 FILE 905-2, 147
PLB-10066

Dear Mel:

In accordance with Article IX, Section B2 of the Bechtel/PL Contract, we hereby notify you that we consider the recent problem with the turbine building shielding wall to be the result of deficiencies in services received from Bechtel. We consider all increased costs resulting from this deficiency to be non-reimbursable.

Very truly yours,

R. J. Shovlin
Assistant Project Director-Susquehanna

cc: W.L. Bohner N4
N.W. Curtis N4
R.H. Featenby SSES
J.M. Kenny N4
A.M. Male N5
B.A. Snapp TW2
D.J. Walters N4

PP&L

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

Mr. M. R. Muir
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
MOTOR OPERATORS
ER 100450 FILE 905-2
PLB-9199

Dear Mel:

In accordance with Article IX, Section B2 of the Bechtel/PL Contract, we hereby notify you that we consider Bechtel to be deficient in services with regards to the shipment of valve motor operators.

SDDR #004, submitted by Borg-Warner, states that the motor operators supplied by Limitorque, do not comply with the requirements of IEEE 344. Bechtel authorized shipment without receiving the proper documentation, which we consider to be a deficiency in its service.

We consider all costs associated with this deficiency to be non-reimbursable.

Very truly yours,

RJ Shovlin

R. J. Shovlin
Project Manager-Susquehanna

DJW:po

cc: W.L. Bohner N4
N.W. Curtis N4
R.H. Featenby SSES
J.M. Kenny N4
A.R. Sabol N4
B.A. Snapp TW2
D.J. Walters N4
SP&E File N3

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

February 29, 1980

Mr. M. R. Muir
Project Manager
Bechtel Power Corporation
P. O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
UNAUTHORIZED ATTACHMENT TO UNIT #1 RPV
ER 100450 PLB-10932 FILE 821-1, 900, 905-2

Dear Mel:

The final PP&L report on the unauthorized attachment (PLI-7278) was transmitted to you by N. W. Curtis via PLB-11015, February 28, 1980.

We hereby notify you in accordance with Article IX, Section B2 of the Bechtel/PP&L Contract that we consider the problem of the unauthorized attachment to the Unit 1 RPV to be caused by deficiencies in the services we have received from Bechtel. We consider all increased costs resulting from these deficiencies to be non-reimbursable.

Very truly yours,

R. J. Shovlin
Assistant Project Director-Susquehanna

/jm

cc-Messrs.
N. W. Curtis - N4
R. H. Featenby - SSES
E. M. Mead - N5
J. M. Kenny - N4
A. R. Sabol - N4
B. A. Snapp - TW2
Letter File - N3
Date File

October 15, 1982

-CONFIDENTIAL-

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICES
PIPING SYSTEMS
ER-100450 FILE 905-02
PLB-15128

Dear Joe:

This letter is in addition to PLB-14639 in which we provided notification that the continuing problems being experienced in piping systems are considered deficiencies in service received from Bechtel.

Subsequent to the referenced letter, numerous technical concerns with large and small piping systems, some of which are noted below, have been raised and which we consider are the result of deficiency in services received from Bechtel.

- Inspection, evaluation and rework of Detail 600 and SPA 600 Friction Clamps.
- The inspections and evaluations associated with snubber support plates.
- The inspections, evaluations and rework of sway struts due to improper installation of the jam nuts.
- Evaluation of the Stress Intensification Factors used for weldolets and sockolets on small bore piping.
- Re-evaluation of as-built verification of trimmed clamps for snubbers.
- Evaluation of the as-built configuration of grouted pipe penetrations as it affected the stress analysis.

- Evaluation of undersized small pipe welds that were accepted using Engineering judgement.
- As-built reconciliation judgement on large pipe supports.

As a result of the above mentioned technical deficiencies, and others not mentioned herein, the adequacy of the small pipe design process, including the effectiveness of the design change control measures, was considered questionable. To resolve these concerns, an assessment of the small piping program was performed. Recently, the assessment was completed and PP&L submitted the results and findings to the NRC for review. As to large piping, investigations are continuing to resolve concerns.

This letter reaffirms our position that the recent inspections, evaluations, rework and those items identified in PLB-I4639 are the results of deficiencies in service received from Bechtel. Accordingly, pursuant to Article IX, Section B of the Contract between Bechtel and PP&L dated August 10, 1970, all costs associated with the inspections, evaluations, reworks and assessments of both large and small piping systems are non-reimbursable.

Very truly yours,

[signature] R. L. SHOVLIN

R. J. Shovlin
Assistant Project Director - Susquehanna

KLM/crc

bcc:

J. R. Calhoun	TW-16	B. D. Kenyon	N-4
T. M. Crimmins	N-5	A. R. Sabol	N-4
N. W. Curtis	N-4		
S. L. Denson	SSES		
R. H. Featenby	SSES		
J. T. Kauffman	TW-16		
J. M. Kenny	N-4		
A. M. Male	N-5		
K. L. Mortensen	N-4		
B. A. Snapp	TW-2		
Susq. SES Letter File	N-3		
Correspondence File	N-3		
Date File	N-4		
NPM File	N-4		

Two North Ninth Street • Allentown, PA 18101 • 215 / 770-5151

June 25, 1982

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICES
PIPING SYSTEMS
ER-100450 FILE 905-2
FLB-14639

Dear Joe:

This letter confirms previous communications between representatives of PP&L and Bechtel. We consider the countinuing problems in piping systems to be a deficiency in services received from Bechtel. The problems have included the design fabrication and installation of pipe and supports and have had significant adverse impacts on the timely completion of the Project. Recent concerns have included lack of management controls, failure to coordinate field and home office activities, and the inspection and "as building" program.

Accordingly, pursuant to Article IX, Section B of the Contract between Bechtel and PP&L dated August 10, 1970, all costs associated with the deficiencies in service for piping systems are considered to be non-reimbursable.

Very truly yours,

[Signed] R. J. SHOVLIN

R. J. Shovlin
Assistant Project Director - Susquehanna

JMK/crc

bcc: J. R. Calhoun TW-16
T. M. Crimmins N-5
N. W. Curtis N-4
S. L. Denson SSES
R. H. Featenby SSES
J. T. Kauffman TW-16
J. M. Kenny N-4
A. M. Male N-5
B. A. Snapp T-2
SSES Letter File N-3
Correspondence File N-3
Date File N-4

Two North Ninth Street • Allentown, PA 18101 • 215 / 770-5151

October 8, 1982

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICES
VERTICAL AND HORIZONTAL DYNAMIC MODELS
ER-100450 FILE 148, 905-02
PLB-15104

Dear Joe:

This letter is in addition to PLB-14709 in which we provided notification that both the Vertical and Horizontal Dynamic Models are considered deficiencies in service received from Bechtel.

As a result of the above modeling deficiencies, the NRC required that the calculations generated for the development of all stick models be rechecked and reviewed for accuracy. Bechtel performed the rechecking task (CRA-10008, Rev. 0) which involved all calculations associated with the mass, section properties and spring stiffnesses used in the stick models. In addition, the recheck covered the transposition of all calculation results to computer input.

We understand the recheck and review of the Containment, Diesel Generator Building and ESSW Pumphouse has been completed and that there were no errors to which the models are sensitive. However, during the rechecking/review of the Reactor/Control Building's Vertical Model, it became evident to both Bechtel and PP&L that further investigation was required. Specifically, the spring stiffnesses used to represent the floor system were calculated to capture the local response of the floor slabs and as a consequence the coupling stiffness between the two stick models was misrepresented. Also, the mass and stiffness of the Refueling Pool Girders was misrepresented. Subsequently, a new model was developed to assess the significance of the above misrepresentations. These tasks were performed under CRA-10015, Rev. 0.

Recently, Bechtel advised PP&L that reassessments of all safety-related systems and components to the newly generated spectra were complete and that no hardware modifications are required. Presently, the close-out of all the issues related to the dynamic model analyses, which include changes to the licensing documents, are being performed by Bechtel via PDCR-P0107.

October 8, 1982 ER-101010 FILE 101010

This letter reaffirms our position that the recent work efforts associated with the Vertical and Horizontal Dynamic Models are results of deficiencies in service received from Bechtel. Accordingly, pursuant to Article IX, Section B of the contract between Bechtel and PP&L dated August 10, 1970, all costs associated with the review, rechecking and reanalysis of the Dynamic Models plus the assessment programs and work required to close-out the modeling issues are non-reimbursable.

Very truly yours,

[Signed] R. J. SHOVLIN

R. J. Shovlin
Assistant Project Director - Susquehanna

KLM/crc

cc: Mr. N. W. Curtis - PP&L, N-4

bcc:

T. M. Crimmins	N-5
S. L. Denson	SSES
R. H. Featenby	SSES
J. M. Kenny	N-4
A. W. Metzger	N-5
W. J. Rhoades	N-5
K. L. Mortensen	N-4
B. A. Snapp	TW-2
Susq. SES Letter File	N-3
Correspondence File	N-3
Date File	N-4
NPM File	N-4

Jul 26, 1982

bcc: T. M. Crimmins N-5
J. M. Kenny N-4
A. W. Metzger N-5
W. J. Rhoades N-5
[redacted]
B. A. Snapp TW-2
S. L. Denson SSES
R. H. Featenby SSES
SSES Letter File N-3
Correspondence File N-3
Date File N-4

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICES
VERTICAL AND HORIZONTAL DYNAMIC MODELS
ER-100450 FILE 148, 905-02
PLB-14709

Dear Joe:

This letter confirms previous communications between representatives of PP&L and Bechtel. We consider both the Vertical and Horizontal Dynamic Analyses to be a deficiency in services received from Bechtel.

Accordingly, pursuant to Article IX, Section B of the Contract between Bechtel and PP&L dated August 10, 1970, all costs associated with the review, engineering and reanalysis of the Vertical/Horizontal Dynamic Models for all SSES Category I structures and the subsequent re-assessment of all Safety Related Components and systems are non-reimbursable.

Very truly yours,

/s/

R. J. Shovlin
Assistant Project Director - Susquehanna

KLM/crc

cc: Mr. N. W. Curtis - PP&L (N-4)

August 5, 1982

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICES
CONTAINMENT PURGE VALVES
ER-100450 FILE 172-03, 289-P31
PLB-14838

Dear Joe:

This letter confirms previous communications between representatives of PP&L and Bechtel. We consider the Containment Purge Valves (P-31) to be a deficiency in services received from Bechtel.

Accordingly, pursuant to Article IX, Section B of the Contract between Bechtel and PP&L dated August 10, 1970, all costs associated with the qualification of the Containment Purge Valves are non-reimbursable.

Very truly yours,

(Signed) R. J. SHOVLIN

R. J. Shovlin
Assistant Project Director - Susquehanna

KLM/crc

cc: Mr. N. W. Curtis - PP&L/N-4

bcc:

T. M. Crimmins	N-5
S. L. Denson	SSES
R. H. Featenby	SSES
J. M. Kenny	N-4
K. L. Mortensen	N-4
W. J. Rhoades	N-5
B. A. Snapp	TW-2
L. J. West	N-5
SSES Letter File	N-3
Correspondence File	N-3
Date File	N-4

bcc:

R. L. Baker	N-5
T. M. Crimmins, Jr.	N-5
J. M. Kenny	N-4
A. M. Male	N-5
C. A. Myers	SSES
W. J. Rhoades	N-5
M. D. Sattar	N-5
G. E. Shay	N-4
B. A. Snapp	TW-2
R. G. Wood	SSES
Susq. SES Letter File	N-3
Correspondence File	N-3
Date File	N-4

May 13, 1982

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICES
BECHTEL/BIF P.O. 8856-P25AC
ER-100450 FILE 905-2/289-P25
PLR-14241

Dear Joe:

This letter confirms previous communications between representatives of PP&L and Bechtel. We consider the following to be a deficiency in services received from Bechtel:

1. Bechtel's placement and overall administration of Purchase Order 8856-P-25AC.

Accordingly, pursuant to Article IX, Section B of the Contract between Bechtel and PP&L dated August 10, 1970, all costs associated with the engineering, procurement and installation of valves to replace the deficient BIF valves are considered to be non-reimbursable.

Very truly yours,

[Signed] R. J. SHOVLIN
R. J. Shovlin
Assistant Project Director - Susquehanna

GES/crc

cc: Mr. N. W. Curtis - PP&L (N-4)

cember 22, 1981

Copy to:

K.W.Brinckman	N-5
D.H.Cassel	SSES
H.R.Clarke	N5
T.M.Crimmins, Jr.	N5
H.W.Keiser	SSES
[redacted]	[redacted]
A.M.Male	N5
P.O.Moor	N5
W.J.Rhoades	N5
R.J. Fernandez	N2b
H.V. Oheim	N5
A.F. Sleva	N5
Date File	N5
Letter File	N3

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCIES IN SERVICE
ER 100450 FILE 905-2, 530, 288, 207-3
PLB-13898

Dear Joe:

In accordance with Article IX, Section B.2 of the Bechtel/PP&L Contract, the following are considered to be deficiencies in services received from Bechtel:

- Incorrect wiring ("sneak circuits") which would trip and lock open (until manually reset at the switchgear) the 4.16 kv circuit breakers for all RHR pumps, core spray pumps, emergency service water pumps, and reactor and turbine building chillers for loss of offsite power.

- Incorrect installation of the primary feedwater flow elements FE-1N001 A, B, and C and FE-2N001 A, B, and C due to improper clearance between the flow elements and attached instrumentation.

- Modifications to gate valves HV-141F011A and B and HV-241F011A and B necessary to function as stop valves for feedwater/reactor isolation.

All costs associated with these deficiencies are considered to be non-reimbursable.

Very truly yours,

(Signed) R. I. SHOVLIN

Robert J. Shovlin
Assistant Project Director - Susquehanna

RJS/crc

3

July 22, 1981

CONFIDENTIAL

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCIES IN SERVICE
ER 100450 PLE-13390 FILE 905-02

Dear Joe:

In accordance with Article IX, Section B.2 of the Bechtel/PP&L Contract, we hereby notify you that the following items are considered to be deficiencies in services received from Bechtel:

- Fixes resulting from inadequate stiffness of the pipe supports anchored on the primary containment liner plate.
- Undersized welds on the downcommer bracing system.
- Fixes necessary to qualify the piping systems within the primary containment and reactor building for jet impingement forces.

We consider all costs associated with these deficiencies to be non-reimbursable.

Very truly yours,

[redacted] R. J. SHOVLIN

R. J. Shovlin
Assistant Project Director-Susquehanna

SAK-DJW:jmr

bcc:

T. M. Crimmins	N-4
N. W. Curtis	N-4
A. M. Male	N-4
R. W. McNamara	N-5
J. M. Kenny	N-4
B. A. Snapp	TW-2
[redacted]	[redacted]
Letter File	N-3
Date File	

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 · PHONE: (215) 821-5151

JUL 01 1981

[illegible]

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFECIENCIES IN SERVICE
BECHTEL CONTRACT
ER 100450 FILE 905-2
PLB-13159

Dear Joe:

In accordance with Article IX, Section B.2 of the Bechtel/PP&L Contract, attached is a listing of items we consider to be deficiencies in services provided by Bechtel.

Very truly yours,

(Signed) R. J. SHOVLIN

R. J. Shovlin
Assistant Project Director-Susquehanna

DJW:jmr
Attachment

bcc:

T. M. Crimmins	N-4
N. W. Curtis	N-4
S. L. Denson	Susq. SES
R. H. Featenby	Susq. SES
H. W. Keiser	Susq. SES
[redacted]	[redacted]
D. J. Kohn	N-5
W. J. Rhoades	N-5
R. A. Snapp	TW-2
J. J. Walters	N-4
Letter File	N-3
Date File	

1. Construction of an enclosure around the acid feed equipment (including heating and ventilating) since original design and installation did not protect the equipment from the environment, including rerouting of concrete embedded service water pipe to prevent freezing.

2. Rework of dissimiliar socket welds which were made using a carbon-stainless weld procedure. The procedure was not indenti fied on the Bechtel construction weld specification, as noted i MCAR 1-67.

3. Failure to maintain fire protection design current with the plant design requires the reanalysis of Susquehanna SES's abili to accomplish and maintain a safe shutdown in the event of a fire. Substantial modifications may result.

4. Redesign and modify the HPCI, RCIS, and RHR Systems discharge lines to allow for proper venting of those lines.

5. Design and add isolation dampers in the elevator machine room exhaust duct, since the elavator shaft could not be isolated from the control structure.

6. A design error has resulted in modifications required to change the Reactor Building (Units 1 & 2) air supply ducts. Changes include revising from a system serviced by Zone III HVAV system to a system whereby the Unit 1 supply ducts are serviced by a Zone I HVAC system and Unit 2 by a Zone II system.

7. Review and possible modification of the layout and separation for instrument lines to assure required redundant lines are not disabled by a common hazard as identified in QAR-F-656.

8. Failure of Bechtel QC to properly document the required in-proc inspections on 600 volt power cable terminations which makes the quality of the associated cable indeterminate. Re-engineer rework, reinspection and retest may be required.

9. Plugging of equipment Drain Tank (IT-218) copper cooling coil to make displacement of this coil equal to that of the displace device, which is part of the tank cover.

10. A failure to incorporate GE specifications into original design will result in redesign and modifications of existing valve operators to meet GE specified opening/closing times and/or differential pressures. (P-31 - Cont. Purge Valves).

11. Changes necessary in specification M-105B to accomodate insulat of piping at Whip Restraints/EAC locations.

12. Redesign and modify interior siding of Reactor Building. Origi specifications was in error and siding allowed excess leakage, negating negative leak rate test.

13. Potential requalification, redesign, and reinstallation of

reactor building penetrations which were not specified "Q" but are included in negative leak rate test.

14. Redesign and modification to the Control Structure to permi a single positive pressure envelope, since original two env design committed in licensing documents for the control str control room cannot be maintained due to a design error.

15. Redesign, modifications and addition of HVAC Equipment in t reactor building, since a design error has resulted in insu cooling capacity for 2 unit operation.

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 PHONE: (215) 821-5151

CONFIDENTIAL

bcc: K. H. Backenstoe N-5
H. R. Clarke N-5
T. M. Crimmins N-5
J. M. Kenny N-4
H. V. Oheim N-4
A. M. Male N-5
S. D. Pai N-5
W. J. Rhoades N-5
A. R. Sabol N-4
B. A. Snapp TW-2
[redacted]

August 5, 1981

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICE
ER 100450 PLB-13441 FILE 905-2

Dear Joe:

In accordance with Article IX, Section B.2 of the Bechtel/PP&L Contract we herby notify you that we consider the need for a Q-listed chilled water system to cool the ESF switchgear room (both units) to be a deficiency in services received from Bechtel.

We also consider all costs associated with this deficiency to be non-reimbursable.

Very truly yours,

R J Shovlin

R. J. Shovlin
Assistant Project Director - Susquehanna

DJW/nd

cc: N. W. Curtis N-4

January 20, 1982

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICES
ER-100450 FILE 905-2
PLR-13953

Dear Joe:

This letter confirms previous communications between representatives of PP&L and Bechtel. We consider the improper installation of the Unit 2 suppression pool quenchers to be a deficiency in services received from Bechtel. Accordingly, pursuant to Article IX, Section B.2 of the contract between Bechtel and PP&L dated August 10, 1970, all costs associated with this deficiency are nonreimbursable.

Very truly yours,

(Signed) R. J. SHOVLIN

R. J. Shovlin
Assistant Project Director - Susquehanna

DJW/crc

cc: Mr. N. W. Curtis - PP&L - N-4

bcc: T. M. Crimmins - N-5
S. L. Denson - Susq. SES
R. H. Featenby - Susq. SES
J. M. Kenny - N-4
A. M. Male - N-5
R. W. McNamara - N-5
A. R. Sabol - N-4
B. A. Snapp - TW-2
R. A. Schwan - N-4
G. S. Wetzel - N-5
G. E. Shay - N-4
Susq. SES Letter File N-3
Correspondence File N-3
Date File N-4

Two North Ninth Street • Allentown, PA 18101 • 215 / 770-5151

SEP 30 1981

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICES
ER-100450 FILE 884-3, 905-2
PLB-13586

Dear Joe:

In accordance with Article IX, Section B.2, we formally notify you that we consider the review of all conduits with 4 or more conductors to assure that the ampacity of the cables is not exceeded to be a deficiency in services received from Bechtel.

Accordingly, all costs associated with this deficiency are non-reimbursable.

Very truly yours,

R. J. Shovlin
Assistant Project Director-Susquehanna

DJW:mp

cc: N. W. Curtis, N-4
T. M. Crimmins - N-5
J. M. Kenny - N-4
H. V. Oheim - N-5
B. A. Snapp - TW-2
D. J. Walters - N-4
Letter File - N-3
Date File - N-4

March 25, 1982

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCY IN SERVICES
ER-100450 FILE 884-3/905-2
PLB-14189

REF: PLB-14126 Dated March 11, 1982

Dear Joe:

The referenced Deficiency in Services letter lacked specificity in that it did not clearly define the problems identified in the AC electrical power distribution system. The purpose of this letter is to expand upon and further define the problem which we consider to be a deficiency of services received from Bechtel.

The deficiencies to which this letter and PLB-14126 refer have been identified as:

> Calculated equipment utilization voltages fall below specified limits during motor starts (not at the motor, but at other devices connected to the electrical distribution system); calculated connected loads exceed the continuous rated capability of the engineered safeguard transformers for certain conditions; and that diesel generator load sequence must be re-analyzed.

Accordingly, pursuant to Article IX, Section B of the Contract between Bechtel and PP&L dated August 10, 1970, all costs associated with these deficiencies are non-reimbursable.

Very truly yours,

(Signed) R. J. SHOVLIN
R. J. Shovlin
Assistant Project Director - Susquehanna

GES/crc

cc: Mr. N. W. Curtis - PP&L, N-4

42

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

July 2, 1981

CONFIDENTIAL

Mr. J. B. Violette
Project Manager
Bechtel Power Corporation
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
DEFICIENCIES IN SERVICE
ER 100450 FILE 905-2, 884-3
PLB-13319

Dear Joe:

In accordance with Article IX, Section B.2 of the Bechtel/PP&L Contract we hereby notify you that the following items are considered to be deficiencies in services received from Bechtel and all costs associated with these deficiencies are non-reimbursable

- Relocation of the hydrogen recombiner, located in the drywell, to an elevation above the post-LOCA floor level.

- Replacing the solenoid operated valves on the sample discharge lines and nitrogen supply (make-up) lines into the containment with double seated solenoid valves so as to provide positive containment isolation capability during a LOCA.

Very truly yours,

(Signed) R. J. SHOVLIN

R. J. Shovlin
Assistant Project Director-Susquehanna

DJW:jmr

bcc:

N. W. Curtis	N-4
A. M. Male	N-4
W. J. Rhoades	N-4
B. A. Snapp	TW2
J. M. Kenny	N-4
D. J. Walters	N-4
Letter File	N-3
Date File	

TWO NORTH NINTH STREET, ALLENTOWN, PA. 18101 · PHONE: (215) 821-5151

NOV 2 0 1979

RECEIVED
NOV 21 1979
SUSQUEHANNA PROJ.

Mr. J. R. Schmiedel
Project Engineer
Bechtel Power Corp.
P.O. Box 3965
San Francisco, CA 94119

SUSQUEHANNA STEAM ELECTRIC STATION
UNITS 1 AND 2
MAIN TURBINE GENERATOR MAINTENANCE CLEARANCES
ER 100450
PLB 10564 FILE 401 M-2

Dear John:

In response to your letter BLP 11556, we are greatly relieved to see that Bechtel decided to bring the above subject to a conclusion by recommending the design of a new lifting beam to be dimensionally compatible with the main turbine parts removal.

Judging by the correspondence exchanged between Bechtel and G.E. and your letter BLP 11556, it appears that G.E.'s decision to increase the generator cooler height from 11'-1½" to 12'-9 5/8" above the turbine generator base line, after Bechtel was far into the design of the plant, is the major reason for the clearance problems identified.

It is our understanding you have exhausted attempts to have G.E. correct the problem and thus, we have no option but to proceed with your recommendation of modifying the lifting beam. All charges incurred by Bechtel to correct this interference problem are to be accumulated for the purpose of a claim against G.E.

Please notify G.E. on the manner in which you are proceeding and of our intent to recover the cost expended to correct their problem.

Please keep us appraised of your progress.

Earle M. Mead

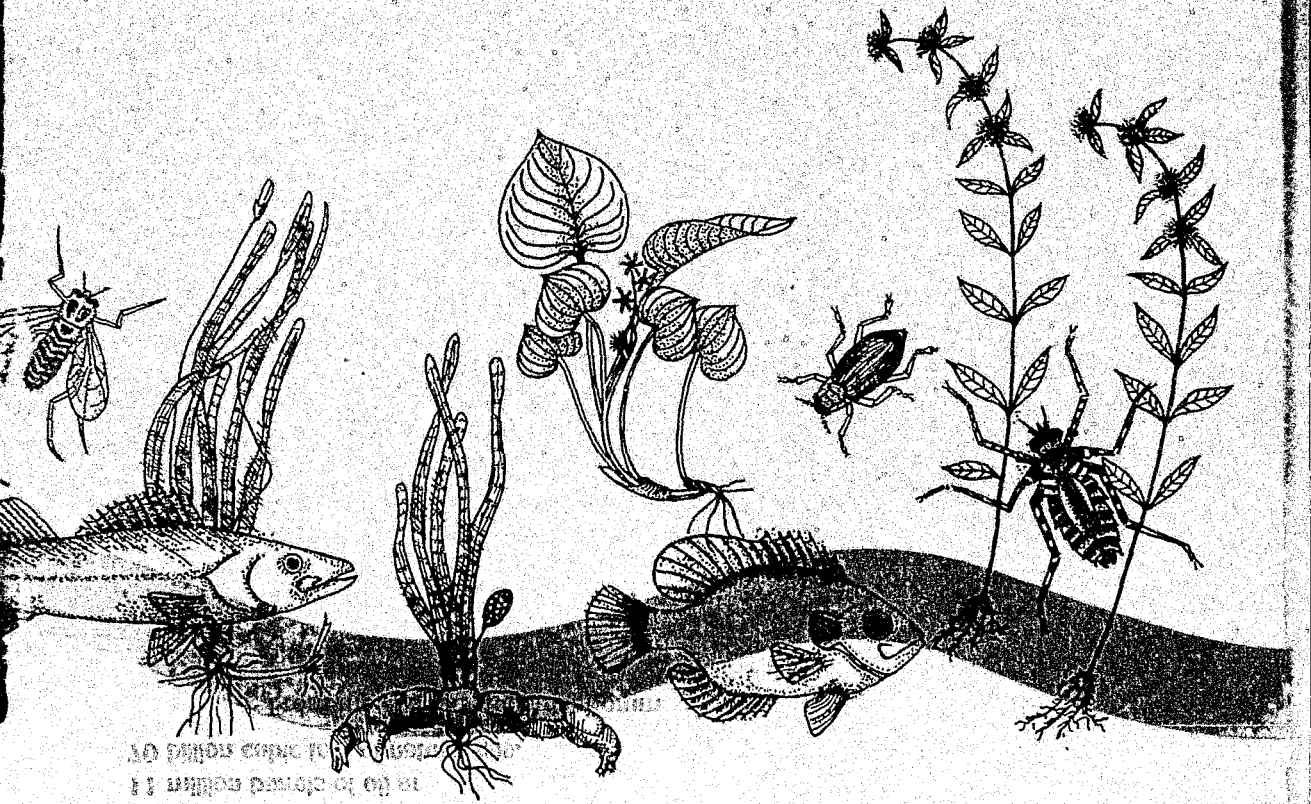
E. M. Mead
Manager-Nuclear Plant Engineering
WJR/SRH/kjk

Copies to:

E. M. Mead	N5	M. Gorski	Susq. Mech.
A. M. Male	N5	J. Anthony	Susq. Mech.
J. J. Rhoades	N5	D. Young	G.E. Susq. Mech.
J. A. Zola	N5	Letter File	N3
[redacted]	N4	Date File	N5
H. L. Webb	TW7	Paul Penzick	G.E. Allentown
W.W. Curtis	N4	R.J. Shovlin	N4
		M.R. Muir	Bechtel

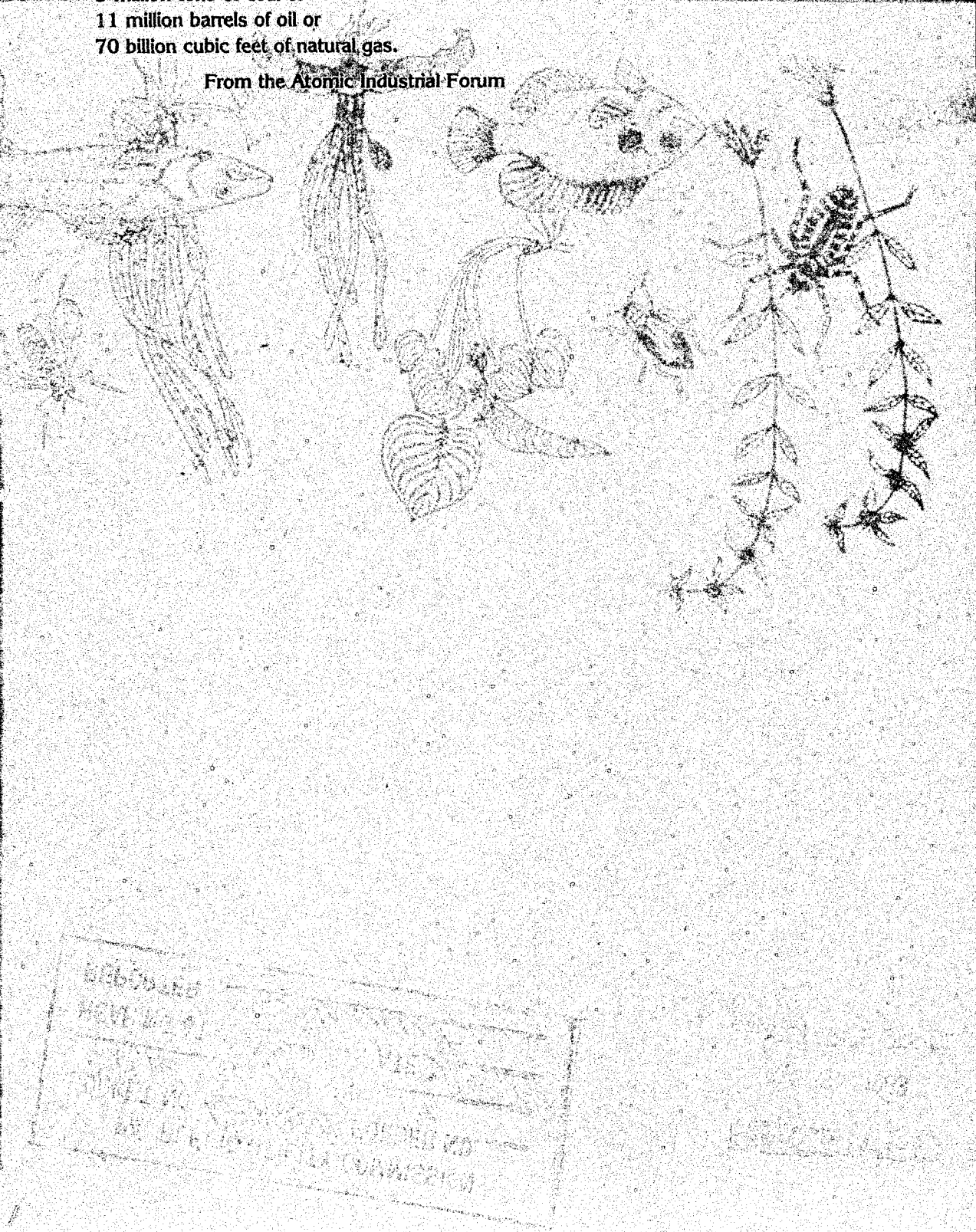
PA. PUBLIC UTILITY COMMISSION
DOCKET NO. R-832146 FOLDER NO. —
EXH NO. 19
HEARING AT — DATE 3/23/83
REPORTER C. Hallett

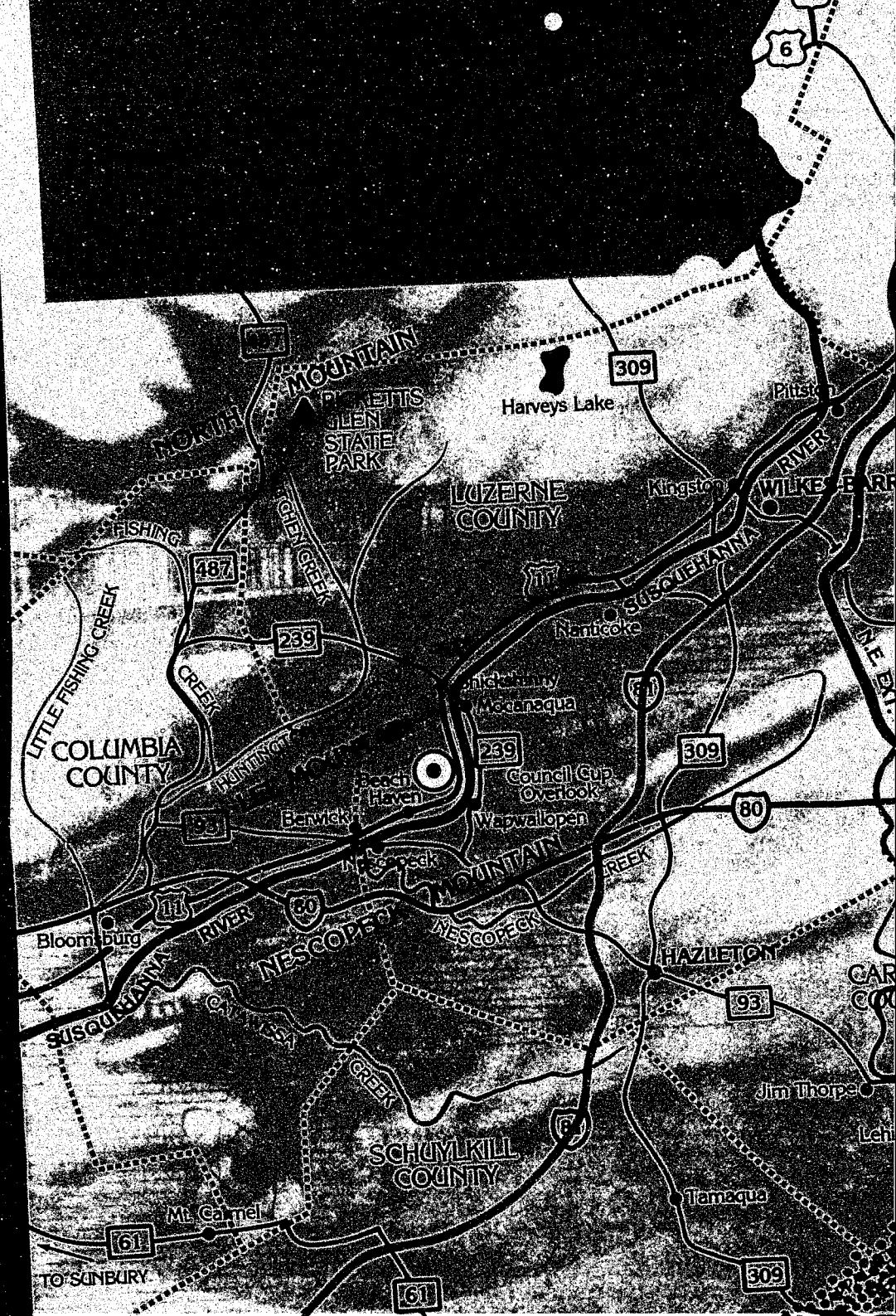
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MAR 3 1983
SECRETARY'S OFFICE
Public Utility Commission



11 million barrels of oil or
70 billion cubic feet of natural gas.

From the Atomic Industrial Forum




6
309
Harveys Lake
Pittston
RIVER
Kingston
WILKES-BARRE
MOUNTAIN
NORTH
RICKETTS GLEN STATE PARK
LUZERNE COUNTY
FISHING
CREEK
487
239
SUSQUEHANNA
Nanticoke
LITTLE FISHING CREEK
COLUMBIA COUNTY
Beach Haven
Council Cup Overlook
Wapwallopen
Berwick
80
MOUNTAIN
Bloomsburg
RIVER
NESCOPECK
HAZLETON
93
Jim Thorpe
SCHUYLKILL COUNTY
Tamaqua
Mt. Carmel
61
TO SUNBURY

High above the Susquehanna River, Council Cup overlooks a rich agricultural and forested valley and plateau where Pennsylvania Power & Light Co. built its only nuclear plant—Susquehanna Steam Electric Station.

The Susquehanna plant was named for the setting which initially attracted settlers to this valley as they headed west out of eastern Pennsylvania and Connecticut in the 17th and 18th centuries.

Popular legend says an Indian-settler land treaty at Council Cup gave the territory around Berwick and Wapwallopen to the Quakers and Germans during a combination feast and parley.

In the 200 years since that agreement, the valley economy changed as technology and enterprise changed. With the farmers, dairymen, millers, lumbermen and canalmen of the last century, coal was king. In the mid-1800s, coal kept homes warm, fired the iron and steel

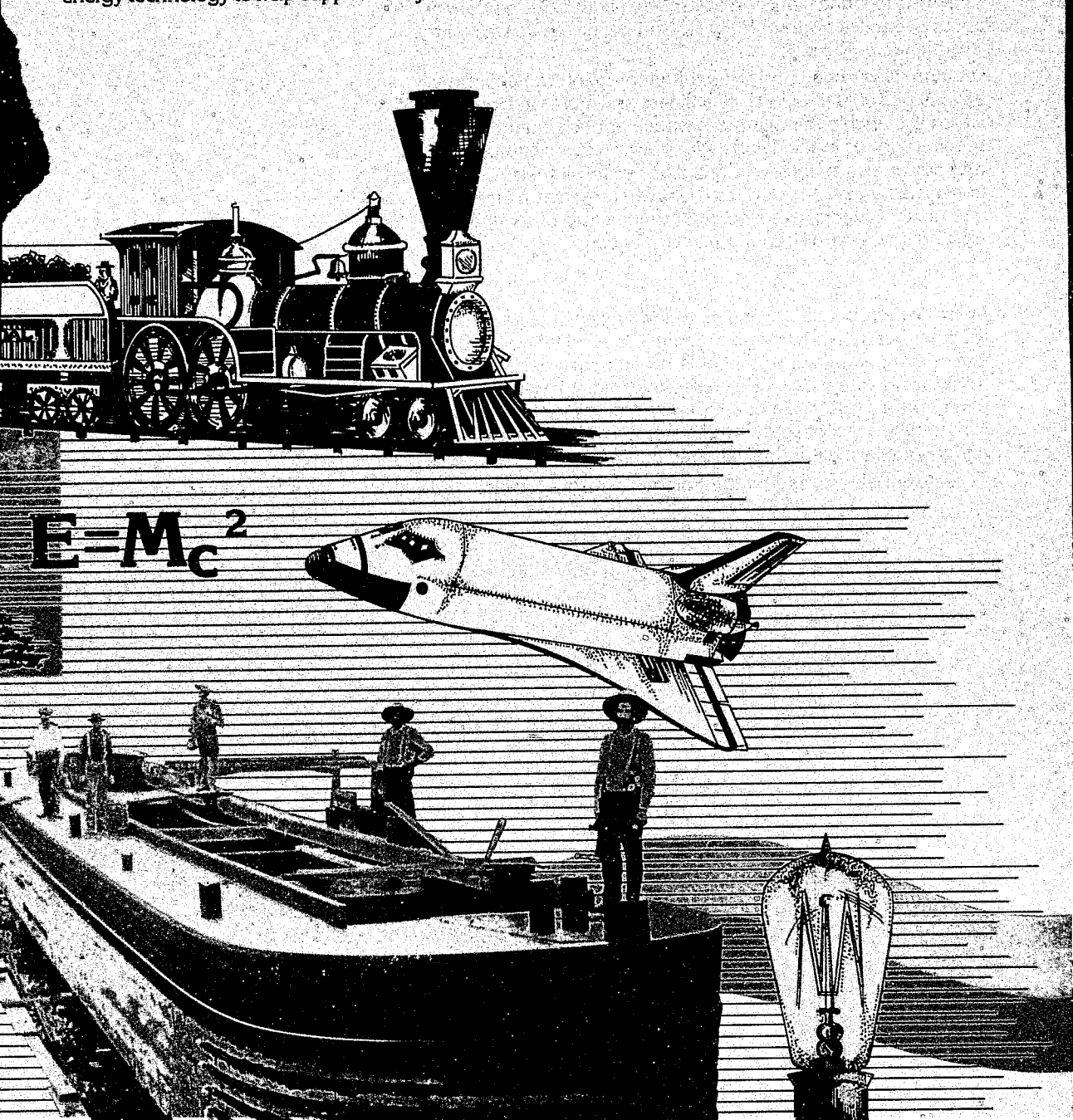


transportation system when the railroads took over and commerce grew between such towns as Wilkes-Barre, Hazleton, Bloomsburg and points south. Through World War I, anthracite mining provided jobs, invited immigrants, supplied residential heat and expanded industry in northeastern Pennsylvania before it, too, nearly died.

When the age of petroleum emerged in the 1940s, the cleanliness and convenience of oil, natural gas and electricity all but throttled the hard coal business in the greater Wilkes-Barre area.

Perceiving economic and resource shortages, and the threat of foreign control of petroleum, the American people now are turning back to coal and to a 20th Century fuel, uranium.

That's what Susquehanna Steam Electric Station is all about: energy technology to help support today's and tomorrow's economy.



PP&L is an investor-owned utility serving more than 1 million homes and businesses in 29 counties. In 1970, PP&L announced it would "go nuclear" with its first nuclear plant—two boiling water reactors capable of producing 2.1 million kilowatts of electrical energy.

Sale of a 10 percent interest in the plant to Allegheny Electric Cooperative (AE) was finalized January 11, 1978. With the agreement, AE—13 rural electric cooperatives in Pennsylvania and one in New Jersey—purchased 210,000 kilowatts of the plant's total capacity. Allegheny distributes electricity to more than 155,000 member-consumers in 47 counties. PP&L announced in November 1979 that Atlantic City Electric Co., a private utility serving customers in the Atlantic City and southern New Jersey area, had agreed to buy about 6 percent of the electricity produced by the plant until September 1991.

The Susquehanna plant is in Salem Township, Luzerne County, about five miles north of Berwick, and nearly a mile west of the Susquehanna River.

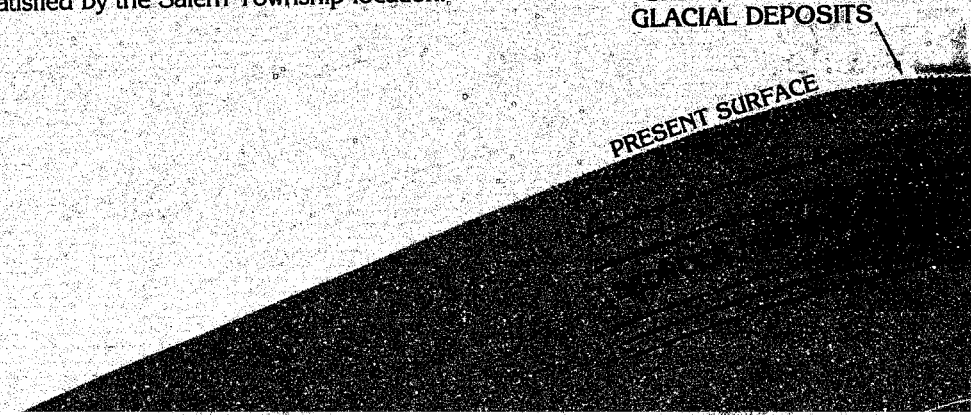
Uranium was chosen over fossil fuel for its overall economy, advantages of fuel savings, cleanliness and increased load capability, which will enable the plant to produce about a quarter of PP&L's required power in the 1980s. Nuclear power instead of fossil fuel power also means vast quantities of fossil fuels will not be consumed and so can be used elsewhere—such as for petro-chemical products, gasoline, the manufacture of fertilizers and for existing coal and oil-burning power plants.

Power for Tomorrow

Why Salem Township?

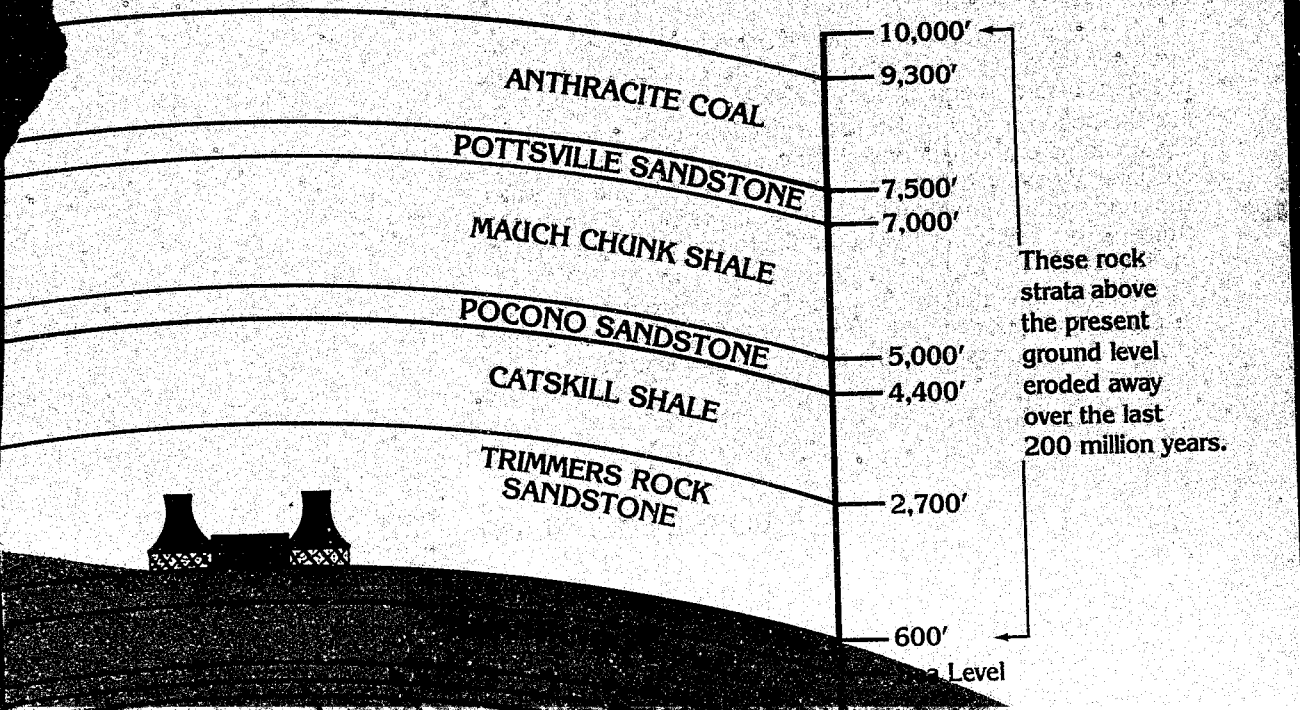
Many environmental, engineering and logistical factors must pull together before a nuclear power plant is sited. These include enough acreage, a nearby supply of cooling water such as is available from the Susquehanna River, accessible transmission lines to other parts of the PP&L system, a highway and rail system for bringing in materials, a labor supply, a rolling terrain with a stable rock structure and favorable meteorological conditions.

These were all satisfied by the Salem Township location.



millennia by erosion. That's what happened in the geological region of the plant site, making this land some of the oldest in the country—from the Paleozoic Era, 280 to 600 million years ago. Identifying the roughly 8,700 feet of rock which once existed above the site is possible since geologists have determined the layers of sediment from inland seas which formed and receded in this region. The pressure of successive layers over the ages turned these sediments to rock. Where the rocky strata downturned instead of heaving upward, the layers which did not erode away can still be found. Geologists say strata which remain near Berwick are more than sound enough to support the massive weight of a nuclear power plant. Studies at the time of excavation showed there had been no movement in the site's bedrock for at least 200 million years.

and Inactive Strata



What's Different about a Nuclear Power Plant?

A nuclear power plant produces steam for the turbine-generator as does a coal-fired plant. The essential difference about nuclear power lies in its technology and the use of fission as a heat source.

In the conventional (fossil-fueled) steam power plant, the heat for the steam is from combustion—burning coal, oil or natural gas. Combustion is a chemical reaction of fuels combining with oxygen in the air, releasing energy as heat and waste products.

In a nuclear power plant, the heat is produced by a nuclear process known as "fission" rather than by combustion.

Atoms of uranium-235 will fission, or split, when they are struck by neutrons. Each fission event produces about two "fission products" and 2.5 neutrons. Together these pieces weigh slightly less than the original uranium atom. This "missing" weight or mass has been converted into energy, which appears as heat.

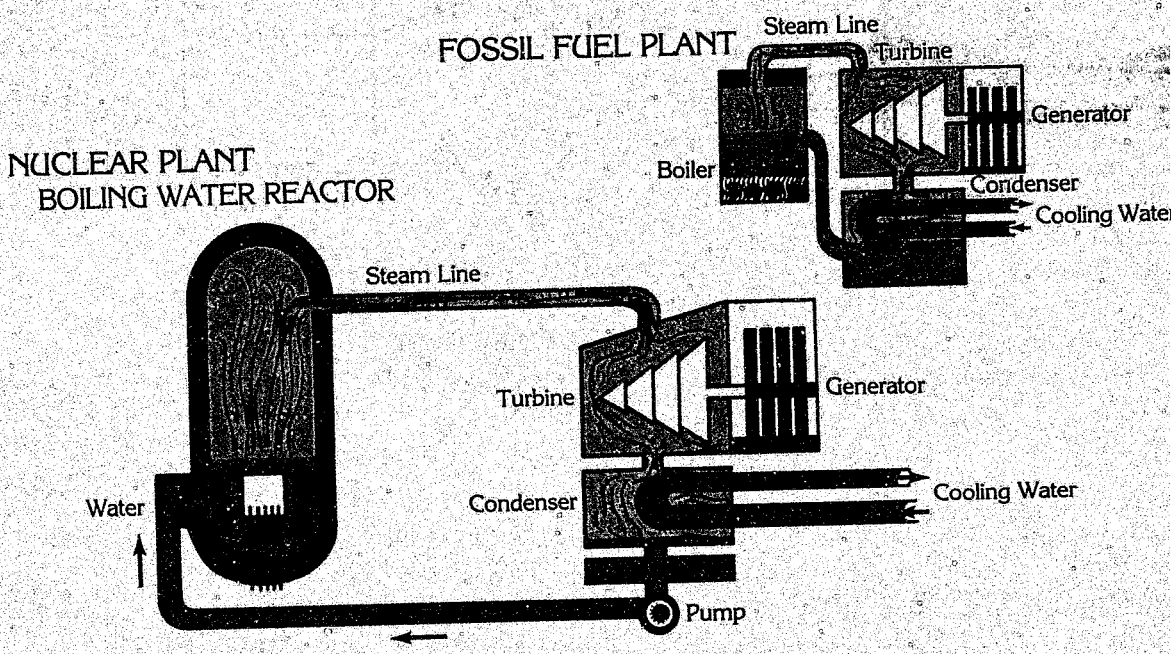
While each separate fission releases only a tiny quantity of heat, a hundred million trillion fissions can occur every second in each of the plant's two reactor vessels.

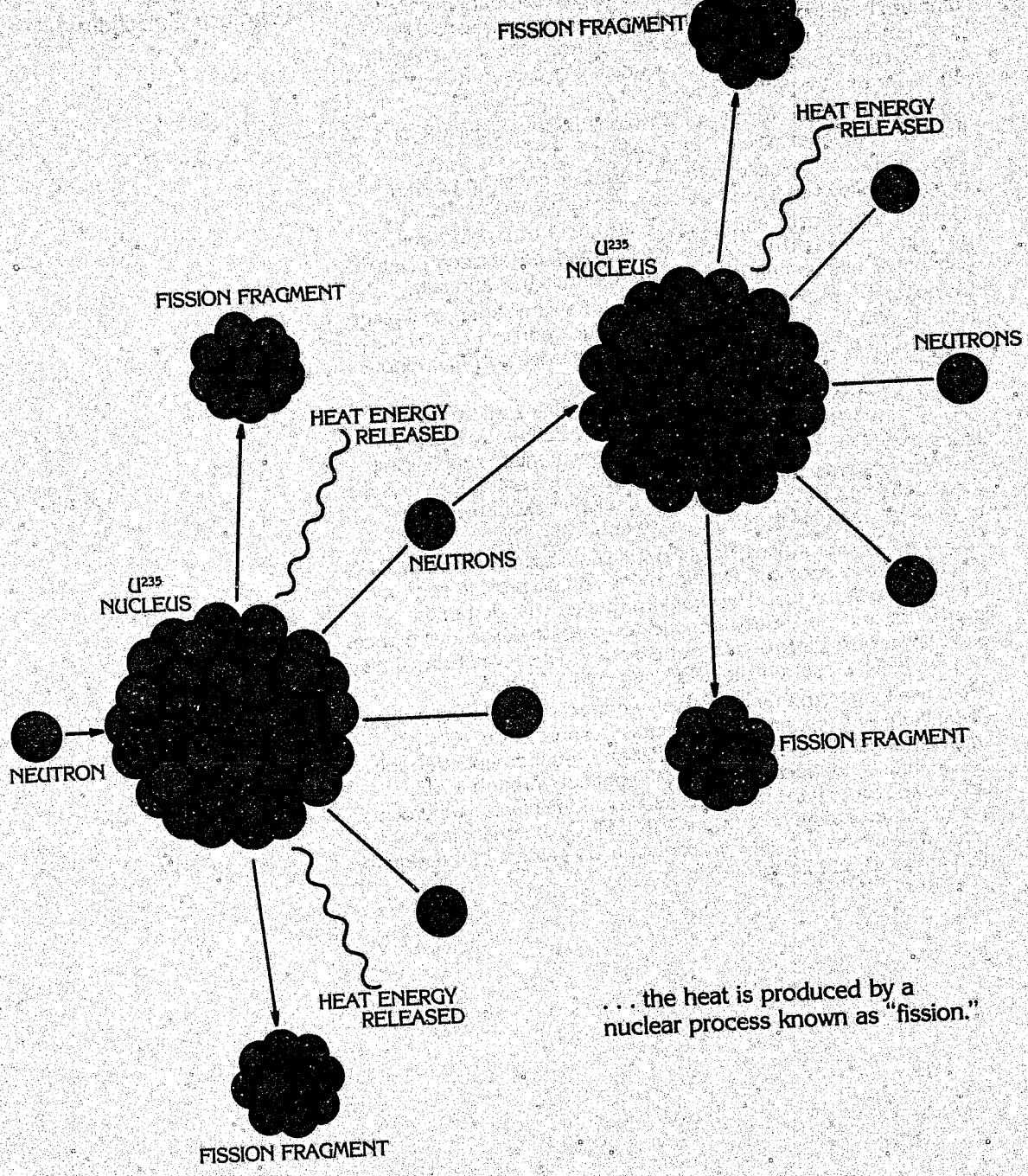
The system at the Susquehanna plant is the boiling water reactor. The inside is partially filled with water that circulates around clusters of fuel rods—known as the "fuel core."

The heat from the fuel core converts millions of gallons of water into steam during every hour of operation. This steam drives the turbine-generator much as does the steam from a coal plant.

Into the bottom of the fuel core are inserted "control rods" to absorb some of the neutrons which cause the fissioning process to continue. By absorbing neutrons, the control rods and the water surrounding them moderate the process, slowing it down and even stopping the reaction entirely when the rods are fully inserted into the fuel core.

As the rods are withdrawn, the rate of fission increases. The reactor responds very quickly to the position of the rods and can be shut down within seconds when the rods are fully inserted.





. . . the heat is produced by a nuclear process known as "fission."

Uranium Supplies

It must be purified, converted into a gas compound called uranium hexafluoride, and enriched. Enrichment means the uranium-235 concentration is increased from about seven-tenths of 1 percent to about 2-3 percent, which is necessary for optimum reactor performance.

Then, the enriched uranium is fashioned into pellet-like cylinders the size of a finger nail, about a half-inch high.

These pellets are placed in fuel assemblies consisting of a group of special alloy tubes, and sent to the Susquehanna plant.

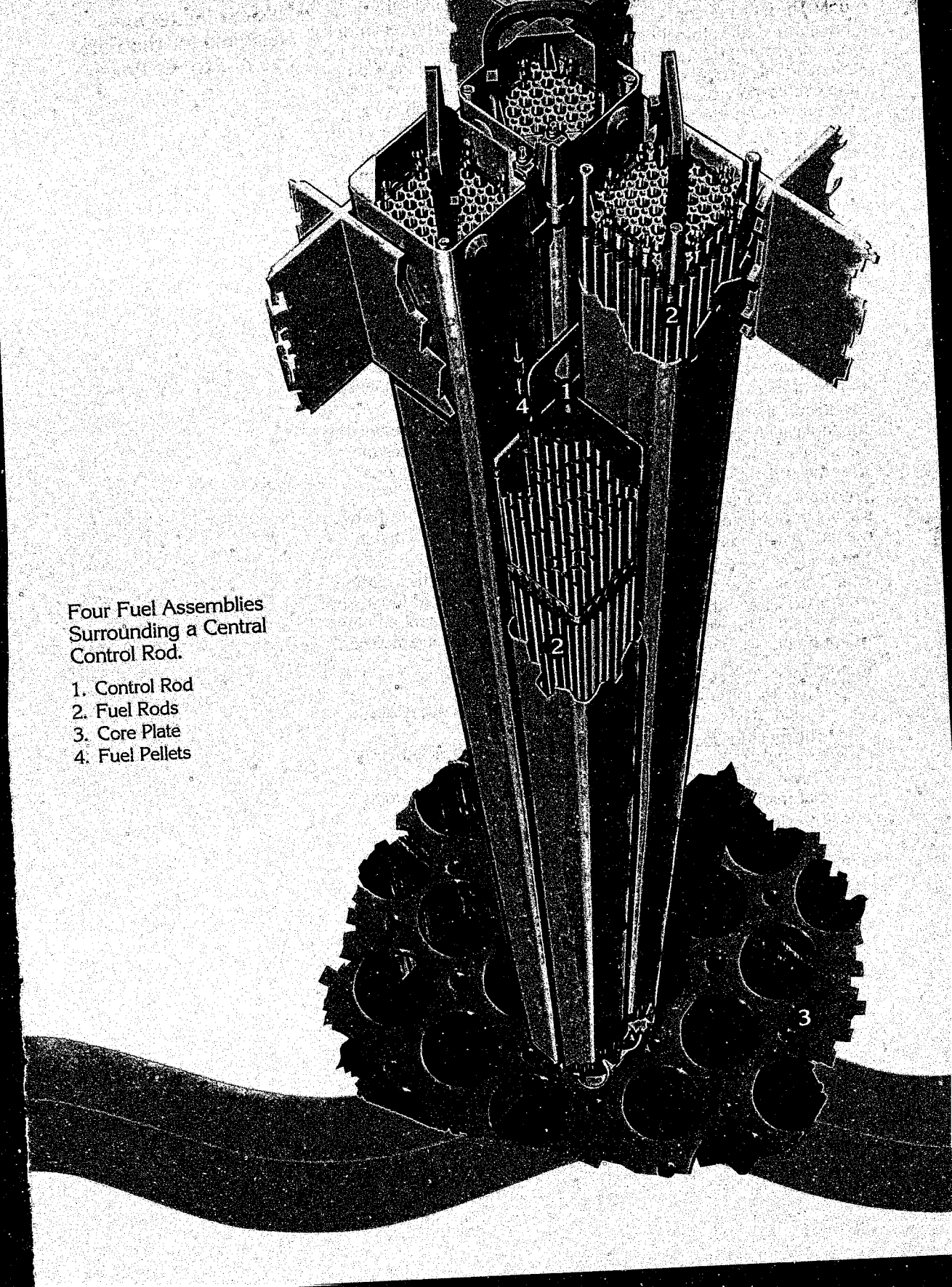
The fuel core of each unit is loaded with about 140 metric tons of uranium. Instead of the continual fueling needed for a coal plant, the reactor will use up only about a quarter of its fuel annually.

Compare this to the hourly fuel needs of a same-sized coal plant running at full capacity—708 tons. It would require 17,000 tons per day, or 170 railroad cars (with 100-ton capacities) of bituminous coal daily.

Although some critics suggest the United States will run out of uranium just when we need it most, Hans A. Bethe, 1967 Nobel laureate in physics, estimates that American uranium supplies will fuel American reactors built through 2000 to the end of their useful lives of 40 years. By that time, new technologies should be ready to replace the nuclear reactor as we know it today.

Years ago, PP&L formed a wholly owned subsidiary, called URADCO (Uranium Resources and Development Co.), to provide some of the plant's needed fuel. The uranium market changed in the late 1970s, and there were dramatic decreases in demand and price. Since it was possible to obtain the necessary fuel elsewhere in a timely fashion, PP&L dissolved URADCO and sold its assets.

PP&L has long-term uranium-supply contracts with United Nuclear Corp., Nufuels Corp. and Gulf Minerals Resources Co. (GMRC). These arrangements meet Susquehanna's requirements through 1987. Nufuels contract deliveries will continue through 1993, and provide for approximately 25 percent of the plant requirements. In addition, an option agreement with GMRC for continuing uranium deliveries provides an additional 35 percent of the requirements from 1988 through 1995.



Four Fuel Assemblies Surrounding a Central Control Rod.

1. Control Rod
2. Fuel Rods
3. Core Plate
4. Fuel Pellets

Nuclear Plants are Designed for the Safe Use of Atomic Power

The exterior of the plant belies the popular belief that industry must be ugly. The four interconnecting buildings of the central power complex are finished off with pebbled concrete panels. There are very few outside fixtures to break the smooth lines of the buildings. Complementing this central area are the adjacent administration building, the circulating water pumphouse and two 540-foot-high cooling towers, among the tallest reinforced-concrete towers in the world.

The concern for overall safety on a nuclear site results in stringent attention to the plant design, the licensing process, regulation by the Nuclear Regulatory Commission and operational procedures.

Thus, nuclear plants are designed according to the concept of "defense-in-depth." Without going into highly complicated descriptions and drawings, this simply means the installation of a diversity of safety equipment, along with the construction of numerous barriers to retain radioactivity.

Among the safety systems are the 23-foot-deep pools or "wetwells" beneath each reactor which receive the routine venting of steam from the reactors. In the event of an equipment breakdown—such as a pipe rupture—any escaping steam would be immediately condensed in one of these pools.

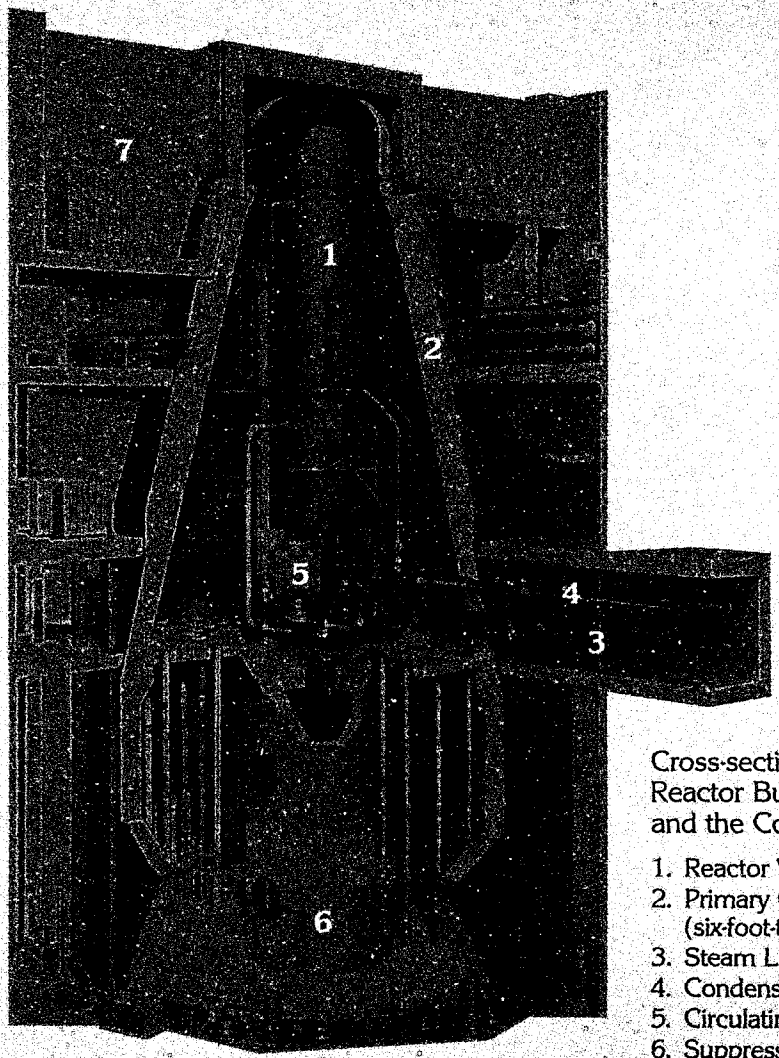
In addition, there are stringent quality control and quality assurance in the fabrication and installation of equipment. These features are strengthened by detailed testing and inspections of the various systems and subsystems that comprise the plant.

The most obvious design features of the Reactor Building are the two six-foot-thick reinforced concrete structures, the reactor "containments," which house the two reactor vessels.

The inside of each containment is lined with quarter-inch-thick carbon steel. This is a leak-tight plate forming the cavity of the 73-foot-high reactor vessel and the chamber below it. The containment and its liner are part of the defense-in-depth concept for containing radiation within the plant in the event of an accident.

Among the others are:

- The uranium fuel pellets have a natural tendency to retain the fission products.
- The fuel rod cladding, containing the uranium pellets, acts as a barrier.
- Water surrounding the fuel core captures fission products that might escape.
- The steel walls of the reactor vessel are four to eight inches thick.
- The reinforced concrete containment is six feet thick (described above).
- The primary containment system is housed inside the Reactor Building which would provide additional protection against the release of fission products in the unlikely event of an accident in the reactor.



Cross-section of the
Reactor Building
and the Containment.

1. Reactor Vessel
2. Primary Containment
   (six-foot-thick reinforced concrete)
3. Steam Lines
4. Condensate Return Lines
5. Circulating Water Pump
6. Suppression Pool
7. Spent Fuel Storage Pool





engineering and construction activities over a 10-year period.

It is the largest single construction project PP&L has ever undertaken. For Allegheny Electric Cooperative, Susquehanna will become the first power plant in which the cooperative has held ownership rights since AE was formed in the 1930s.

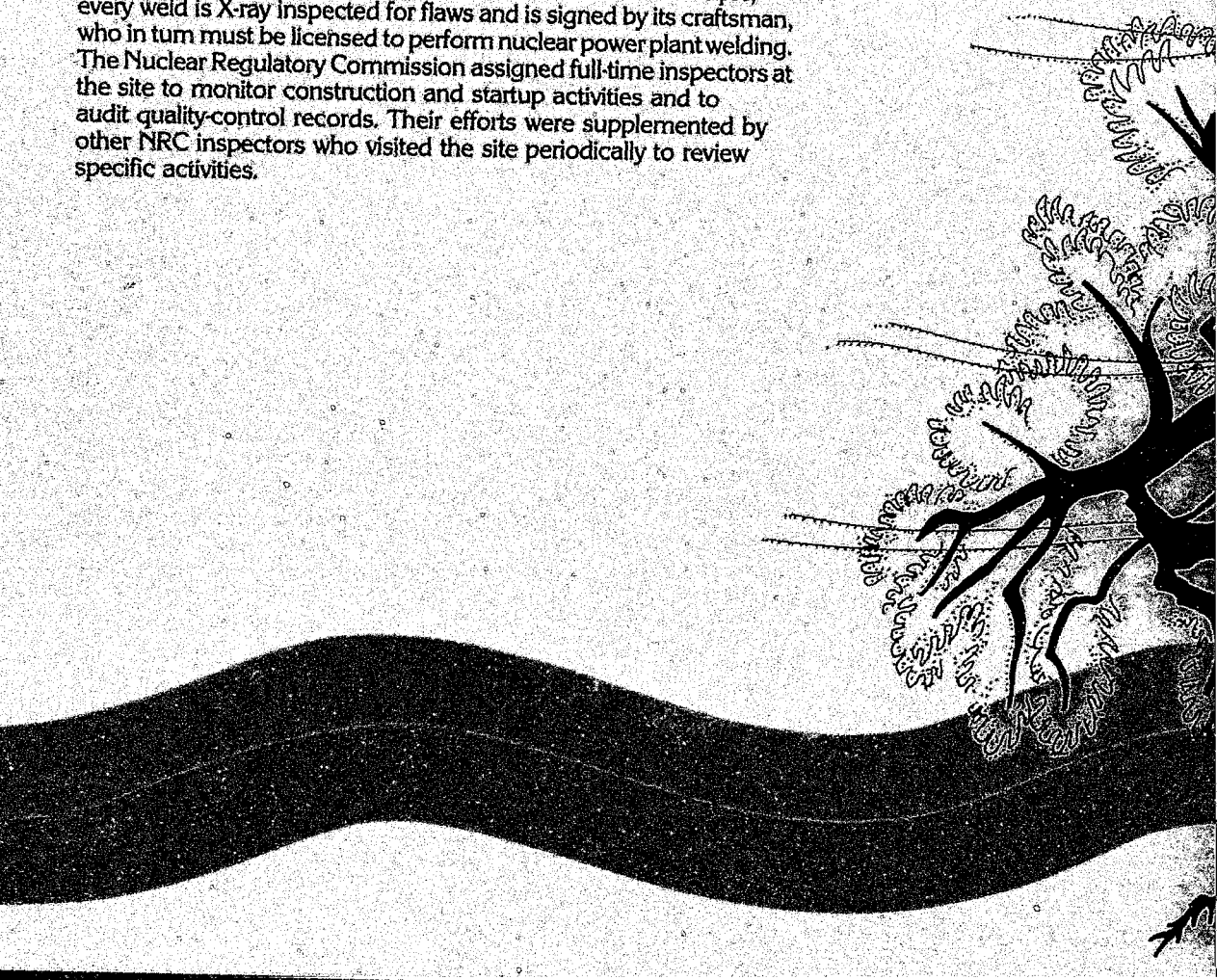
At the height of construction activity, a total of over 5,000 workers were employed on site—from laborers to engineers.

The more important tasks became known to supervisors and engineers as "milestones"—completion of a railroad spur line into the site, placement of concrete in the huge pedestal legs (supports for the turbine-generator platform), testing of the reactor containments for structural integrity and hundreds of other tasks.

During construction, PP&L assigned about 35 construction engineers to work with the overall plant builder, Bechtel Power Corporation, and with General Electric Company, designer and builder of the two boiling water reactors. In addition, another 200 employees at Allentown headquarters worked on plant design, fuel, transmission tie-in and other planning activities.

As the plant moved nearer to completion, a special group of PP&L and Bechtel employees—the "integrated startup group"—was assigned the task of helping to make the transition from construction to startup.

Procedures at a nuclear plant are subject to more thorough record-keeping and inspections than for other construction. For example, every weld is X-ray inspected for flaws and is signed by its craftsman, who in turn must be licensed to perform nuclear power plant welding. The Nuclear Regulatory Commission assigned full-time inspectors at the site to monitor construction and startup activities and to audit quality-control records. Their efforts were supplemented by other NRC inspectors who visited the site periodically to review specific activities.



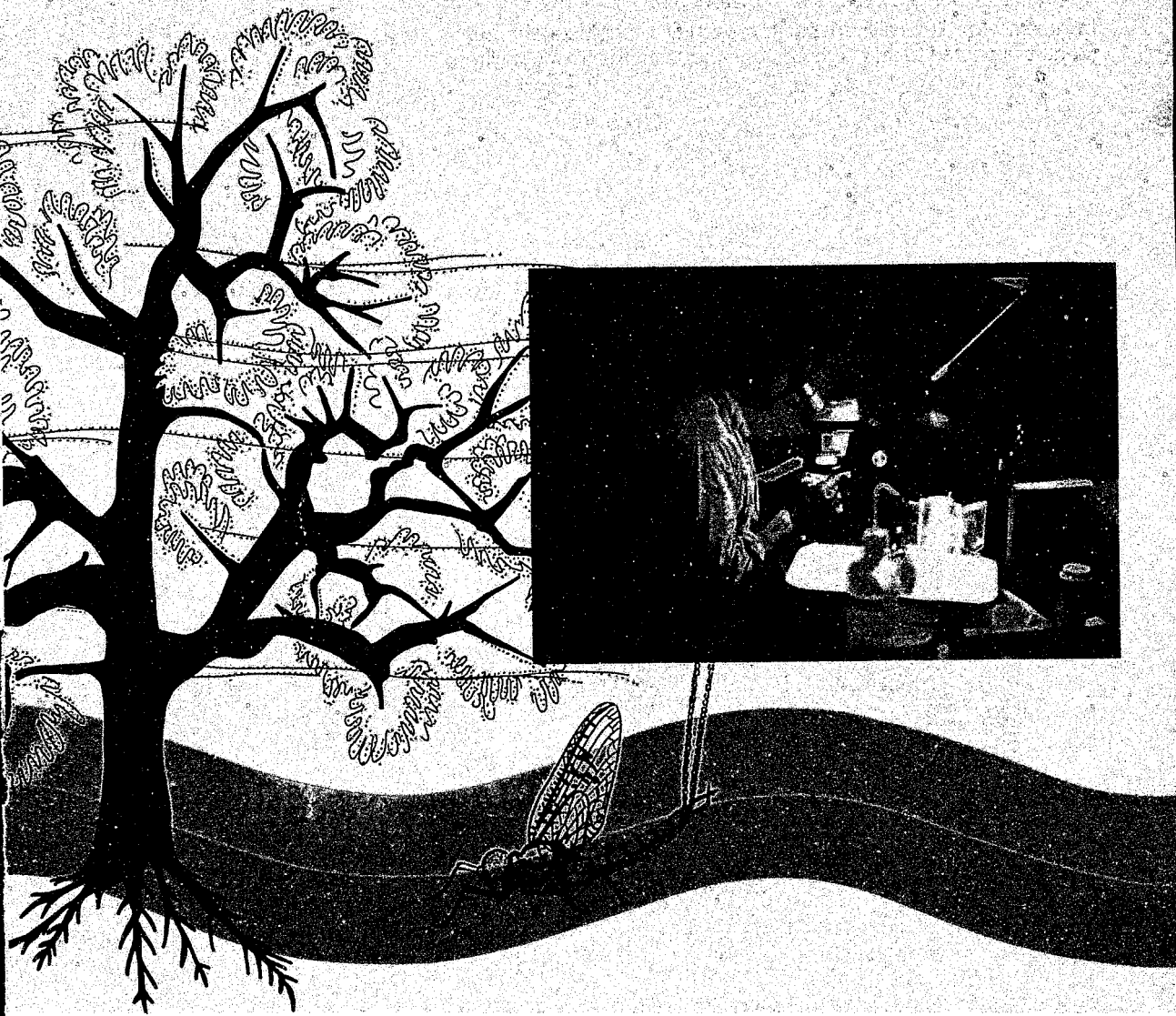
Environmental Concerns

Radiation is the chief environmental concern both for those who build a nuclear power plant and those who live near it. But radiation is not new with the Atomic Age. It has been part of the earth since it was formed.

Radiation is emitted from scores of natural and man-made objects. Since it was discovered in the last century, radiation has been measured in terms of "doses" or amounts of radiation absorbed by a human being and the effects of these doses on the body. A radiation dose can be measured in "millirems"—a fraction of a unit of ionizing radiation which produces the same biological effect as ordinary X-rays.

From both natural and man-made origins, such as medical and dental X-rays, the average American absorbs about 200 millirems per year. These come from the atmosphere and from radioactive minerals in the earth, food and water. Some, like radioactive potassium, are absorbed by human tissue and are emitted by the human body in very small doses.

Exposure varies with location, due to the reduced protection from the atmosphere at higher elevations. A resident of the mile-high city of Denver, Colo., receives an average dose of about 175 millirems from the atmosphere alone.



Even the materials used for housing and business and social enterprises may have traces of radioactive minerals. Standing beside Grand Central Station in New York City for a year would expose you to 325 millirems. Although it's hard to believe because you can't see, smell or taste it, the average American receives about 60 millirems of radiation annually—just from minerals in the earth.

Radiation Management Corporation, a Philadelphia consulting firm, has been analyzing food, water and air samples for radioactivity at the Berwick site since 1971. These data provide a catalog of normal environmental conditions so that any irregularities while the reactors are operating can be pinpointed easily. This monitoring will continue throughout the life of the plant.

Among the findings to date is that the background radiation level of the Berwick area is about 100 millirems per year. This is about 40 percent less background radiation than in Denver but about 25 percent more than in the Lehigh Valley. However, these levels seem modest compared to the "hottest" place in the world—Pocas de Caldas, Brazil—where the background radiation level is 7,000 millirems annually.

Variations in background radiation levels have negligible effects on the health of residents in different locales. Knowing these levels helps the scientific community to compute the statistical probability of cancer or genetic defects in a given area.

In contrast to a 100-millirem background level, the Susquehanna plant is expected to add eighteen one-thousandths of one millirem



(0.018 millirem) annually to the existing radiation within a 50-mile limit. This amounts to .018 percent of the existing radiation levels at Berwick, which is such a small amount that the effects are considered negligible.

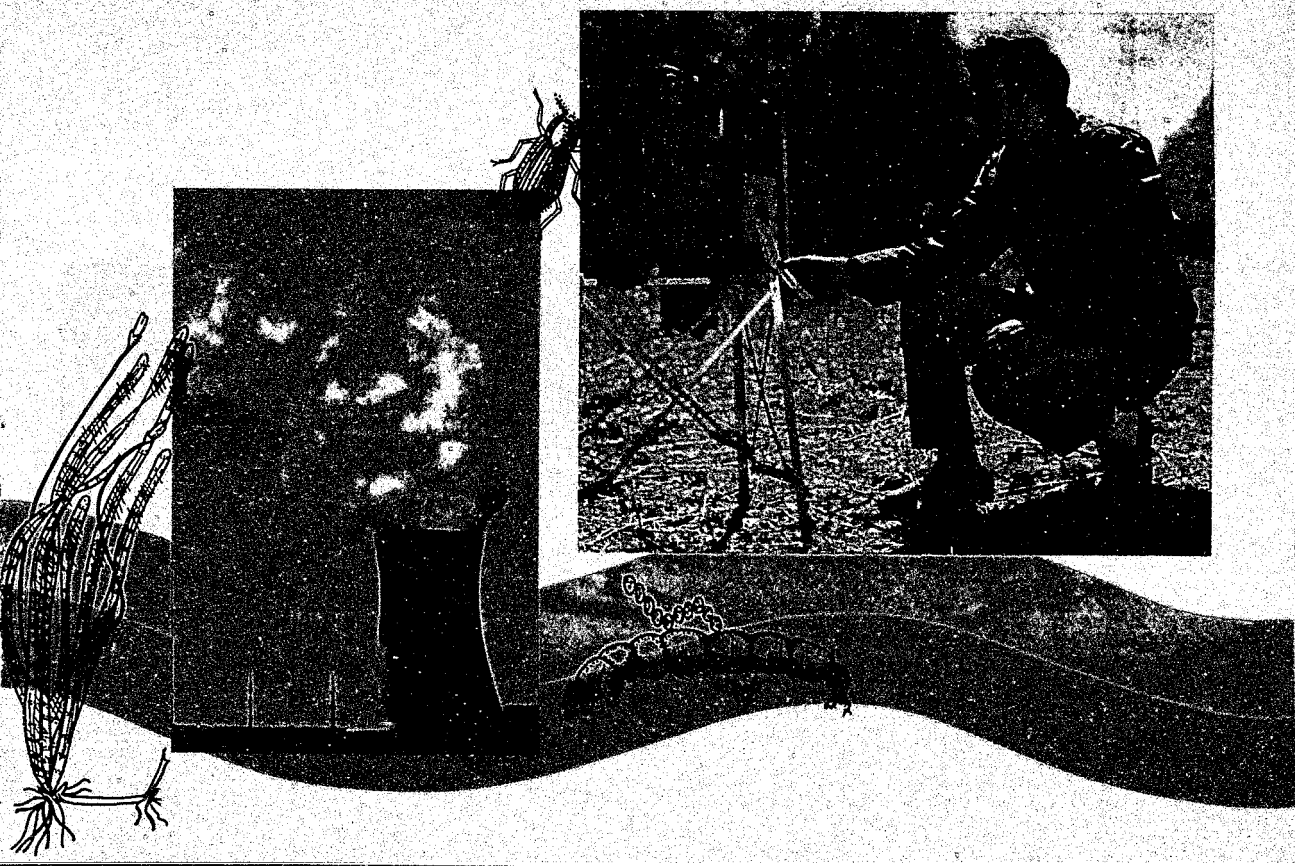
Another discovery made before startup was that squirrels that eat mostly acorns on and around the site are 100 times more radioactive than other local wild animals. It was found that the chemistry of the oak tree is such that it absorbs and retains concentrations of radioactive cesium-137, which fell in the area subsequent to nuclear weapons testing in the 1950s and 1960s.

Should these "hot" squirrels have been uncovered after the plant was in operation, the first conclusion might have been that radioactive materials from the Susquehanna site were responsible.

However, to the credit of a successful preliminary monitoring program, the squirrels' radioactivity was documented and understood long before plant startup.

To reassure squirrel hunters, it also was determined that while the squirrels are more radioactive than other forest animals, there is no cause for alarm for those who shoot and eat them. The quantity of radiation is so small that even a daily diet of squirrel meat would not add significantly to one's annual radiation dose.

Through a consultant, PP&L began preliminary studies on aquatic life in the Susquehanna River near the plant site more than 10 years before the projected startup date. Studies of terrestrial and freshwater life by Ichthyological Associates, Inc., (IA) of Ithaca, N.Y., yielded



a reservoir of information about the environment long before the plant went into commercial operation.

With a laboratory and a collection station on the west bank of the Susquehanna River, IA will continue its sampling and analysis for the life of the plant. Study areas include water chemistry, macro-invertebrates, fish life, waterfowl, plants, amphibians, reptiles and mammals.

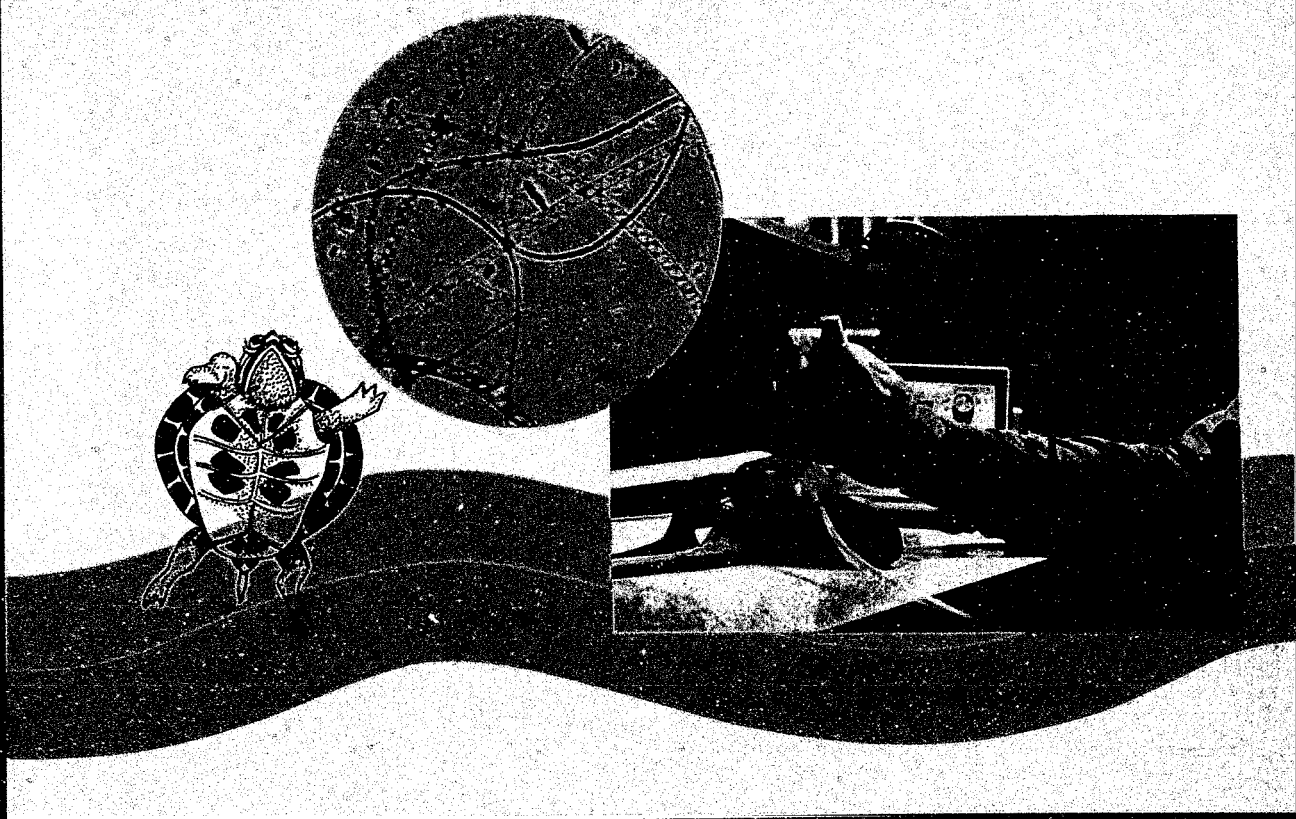
In addition to collecting and categorizing this baseline material, which will become a benchmark for future observations, the investigators made new discoveries which became the subjects of several scientific papers.

Technical papers were published on larval fish development, aquatic spawning habits and the technology of sampling from rivers.

This research, although a spinoff of PP&L's major concern—baseline data—is, on a broader level, a significant contribution to humankind's ever-expanding knowledge of freshwater biology.

Other data were collected in and around the site by Dames and Moore of Los Angeles on wind velocity and direction, geology, hydrology, seismology, geography and identification of population centers or demography.

Bolt, Beranek and Newman, Inc., of Cambridge, Mass., documented the noise levels associated with the construction period to ascertain conformity with Nuclear Regulatory Commission noise pollution standards.



ating plants—those in which a fuel is consumed to make heat—whether these plants use coal, oil or nuclear energy.

While much of the heat in the steam is converted into electrical energy in the plant's turbine generator, the spent steam leaving the turbine must be cooled and returned as water to the reactors or boilers.

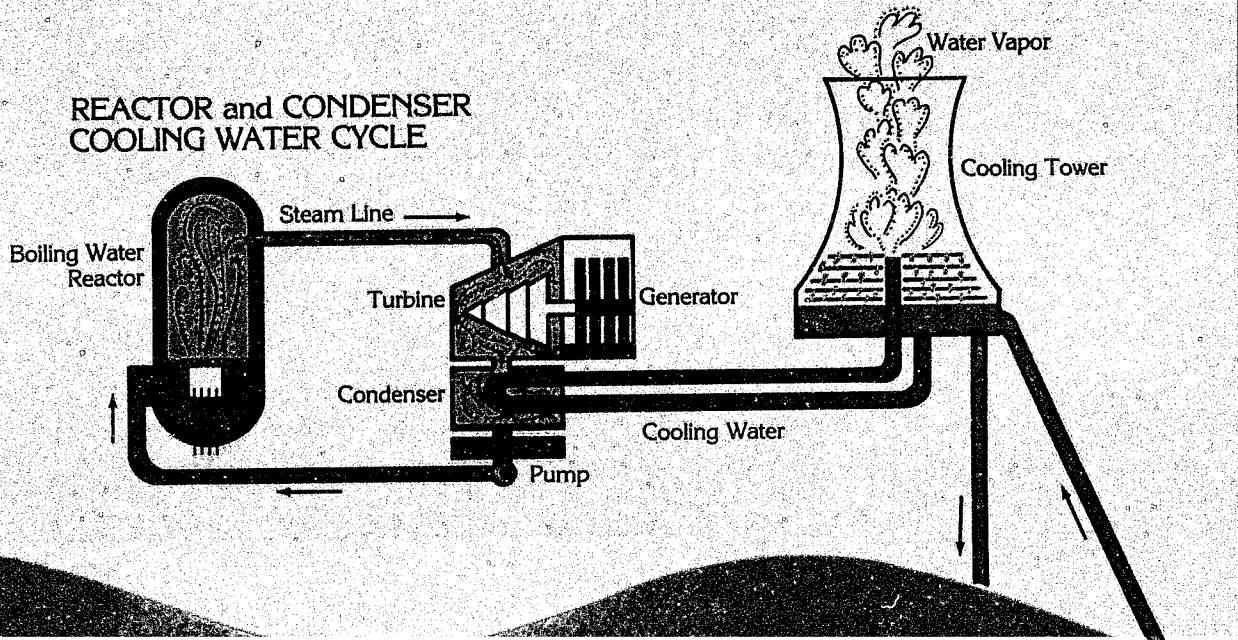
This cooling action takes place in a condenser. Simply, it is a water-cooled "radiator." The spent steam enters the condenser and contacts a collection of pipes through which cool water is flowing. Upon striking the "cool" pipes, the steam is condensed to water and is pumped back to the boiler for another cycle.

The cold water condenses the steam but becomes hot in the process. So the heated water is pumped into a cooling tower where it is released to cascade over the baffles. As the water sprinkles down over the baffles it is cooled by air passing through it, which carries off most of the excess heat through evaporation.

When both towers are in operation, more than 28,000 gallons of water per minute are evaporated, resulting in the white vapor plume associated with power plants today.

At the same time, about 10,000 gallons of water per minute are returned to the Susquehanna River through a discharge system from the plant. This amounts to about a fourth of what is removed from the river for use on site.

In fact, the water removed from the Susquehanna River for the plant amounts to less than one percent of the river's average flow.



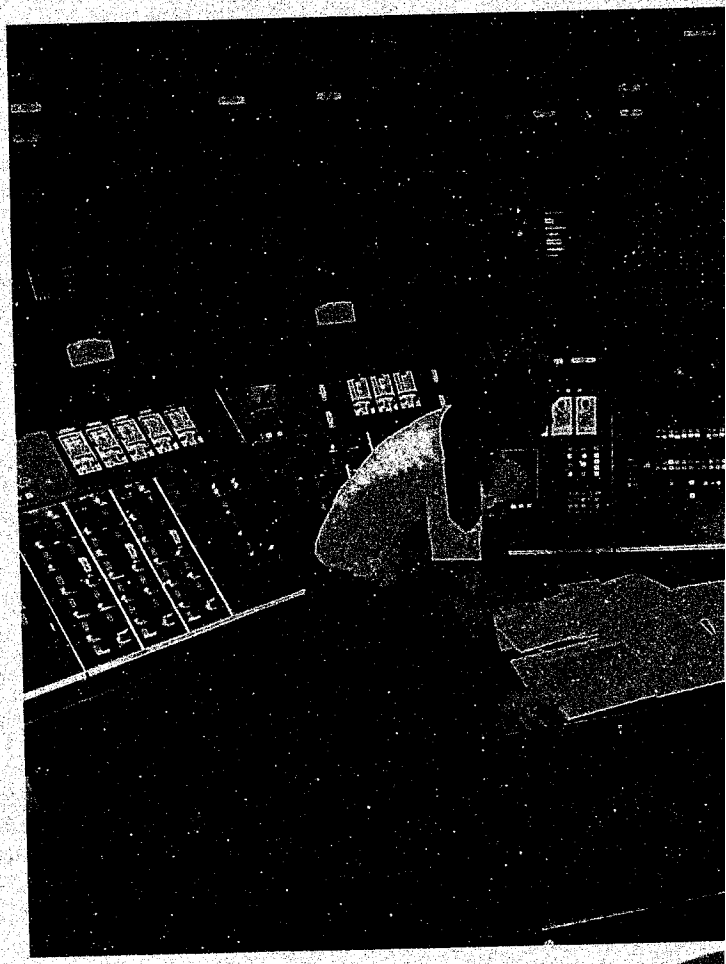
The Advanced Control Room

Plant control operators work at U-shaped computer console panels in a room at the heart of the Susquehanna facility. Their jobs: to operate the plant in a safe and efficient manner.

The control room and its consoles are laid out for the maximum alertness and comfort of the operators. Even the color scheme is coordinated to provide the most compatible interior for operator attentiveness.

This center is called the "advanced" control room because of the sophisticated development of the electronic equipment which, through television screens, gives the operators instantaneous and comprehensive data from inside the reactor vessel, the nuclear core, the turbine-generator where the electricity is being produced and in all other critical equipment.

This information is relayed on the screens through colored charts and graphs so that the operator can understand the data immediately.

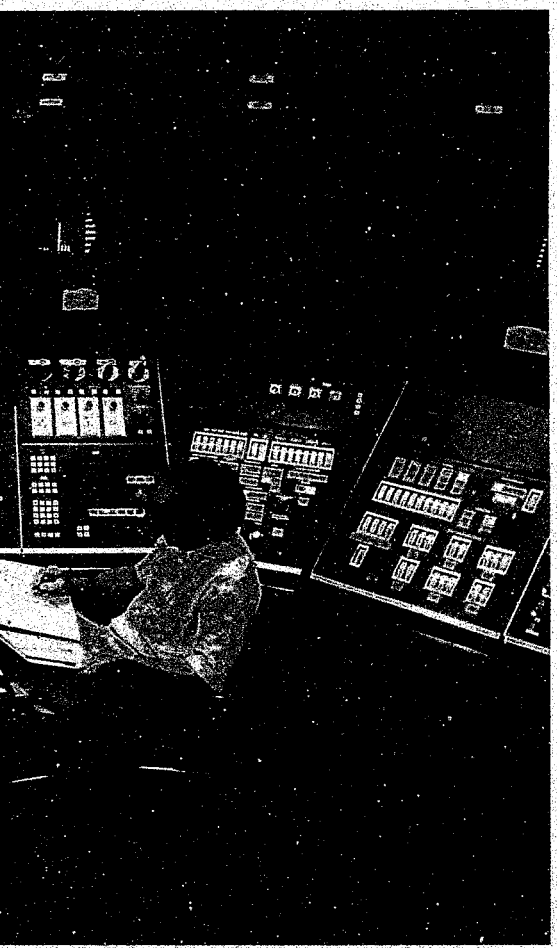


Plant Staff and Training

The Susquehanna plant staff includes about 600 men and women who operate and maintain the station. All employees receive various levels of training in such areas as health physics, quality assurance and control, the plant's emergency plan and overall site security. Those requiring the most extensive training are plant control operators, who must hold Nuclear Regulatory Commission reactor operators' licenses. Shift supervisors and their assistants must hold senior operators' licenses, which require additional management and overall plant-operating knowledge.

The capabilities of all operators and supervisors applying for a license are evaluated by Nuclear Regulatory Commission examiners during extensive written and oral examinations.

All operators have undergone more than two years of preparation before taking over the plant controls.



Advanced Control Room

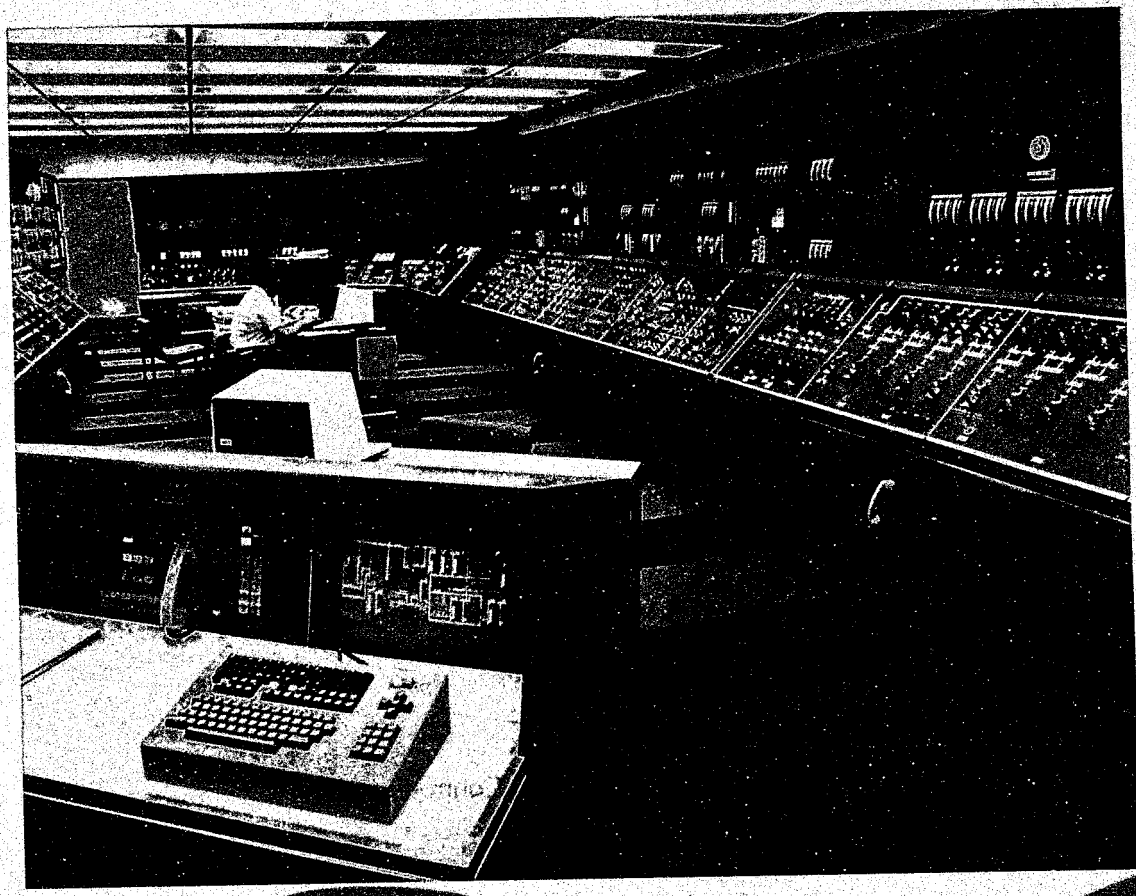
Simulator for Learning

ation, operators are required by law to train in a real reactor control room or, as an alternative, on very sophisticated equipment which duplicates the operations of the control room in which they will later work.

The facility is called a simulator because its consoles, display screens and computer systems can re-create almost all the conditions an operator may face in the "real" control room.

PP&L's operators train on the $6 million control-room simulator at the Susquehanna Training Center. After gaining their reactor operator licenses, they continue to receive simulator training on a regular basis, rehearsing for major plant operations and studying incidents that have happened at other nuclear plants as well as assessing and refreshing themselves on theory, radiation protection and other fundamentals.

Having a simulator cuts operating costs substantially, since it avoids the necessity of shutting down either unit for training and eliminates the cost of training elsewhere.



which result from producing energy. In fossil fuels these wastes are in the form of sulfur dioxide and nitrogen oxide releases, particulates, heat discharges, fly ash and sulfur.

A coal-fired unit of 1,000,000 kilowatts, slightly smaller than the nuclear units at Susquehanna, would produce annually, in addition to stack gases, about 100,000 tons of fly ash and 60,000 tons of sulfur, according to figures from the Atomic Industrial Forum.

In contrast, the spent-fuel assemblies used in a year in one nuclear reactor would occupy an oblong space seven feet long, seven feet wide and 14 feet high. Separated from its assembly, the uranium oxide from this spent fuel would occupy the volume of a six-foot-high cube.

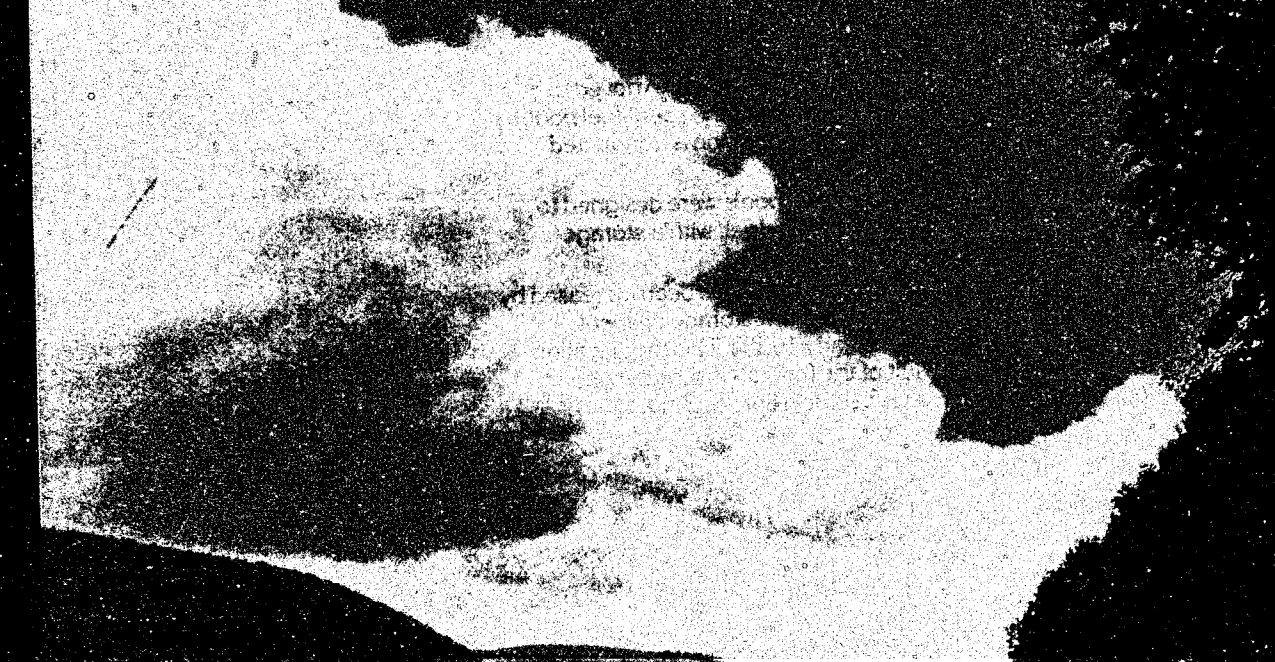
The biggest problem with wastes from nuclear fission, as seen above, is not the amount, but rather the high degree of radioactivity and heat from the spent-fuel rods. The radioactivity makes it necessary to keep used fuel rods submerged in water when they are being removed from the reactor.

During this removal, there is no danger to the public because the water around the fuel assemblies absorbs the radiation from the rods, acting as a protective blanket and moderator.

As the assemblies are transferred underwater, they are moved to an adjacent underwater storage area, known as the spent-fuel pool, to cool off. To protect personnel, the fueling operation is conducted by remote-control crane.

Originally, the two Susquehanna plant fuel pools were designed to hold the equivalent of several years of spent fuel, with a storage margin for additional assemblies.

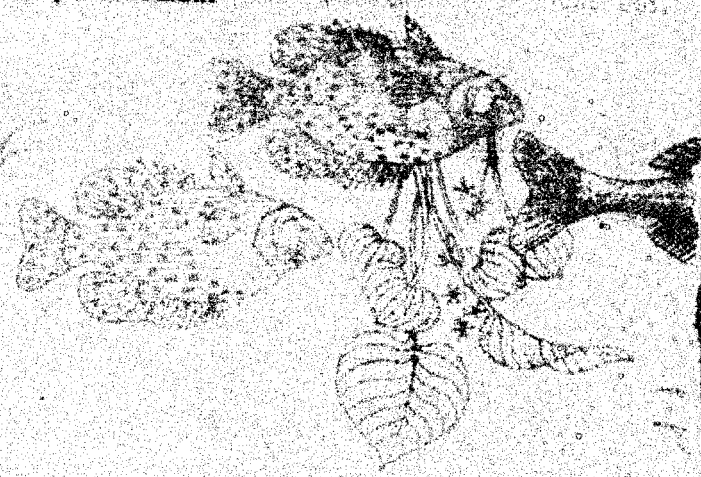
However, the holding capacity of the fuel pools has been increased by using a more compact design. This will allow storage of spent fuel assemblies at least through the early 1990s. This modification of the plant design was the result of the federal government's suspension, in 1977, of commercial fuel reprocessing.



electric distribution cooperatives serving more than 155,000 member-consumers in 47 counties. Thirteen cooperatives are in Pennsylvania and one is in New Jersey.

Pennsylvania Power & Light Co.
Two North Ninth Street
Allentown, PA 18101

Allegheny Electric Cooperative Inc.
P.O. Box 1266
Harrisburg, PA 17108



PP&L and AEC operate an educational center and a recreation area in conjunction with the Susquehanna plant.

The Susquehanna Energy Information Center is located along Route 11 about 5 miles north of Berwick. Open seven days a week, the center contains self-teaching displays on the nation's energy problems.

Special programs can be arranged by calling (717) 542-2131 or writing to:

Susquehanna Energy Information Center
R.D. 1, Box 348A
Berwick, PA 18603

Near the energy information center is the 400-acre Susquehanna Riverlands recreation area, with day-use facilities for fishing, picnicking, canoeing, bicycling, hiking, ball games and other forms of outdoor recreation. Like the information center, Riverlands is open seven days a week, and the staff is available for special group programs.

Inquiries or arrangements can be made by calling (717) 542-2306, or writing:

Susquehanna Riverlands
R.D. 1, Box 348A
Berwick, PA 18603

PA. PUBLIC UTILITY COMMISSION
DOCKET NO. R-822169 FOLDER NO. —
OCA EXHIBIT NO. 20
HEARING AT
REPORTER Hall Hallowell
DATE 2/
MAR 4 1983
DOCUMENT FOLDER

Susquehanna Steam Electric Station

RECEIVED
MAR 3 1983
SECRETARY'S OFFICE
Public Utility Commission



Owned and operated by Pennsylvania Power & Light Co.
and Allegheny Electric Cooperative Inc.
Designed and constructed by Bechtel Power Corporation

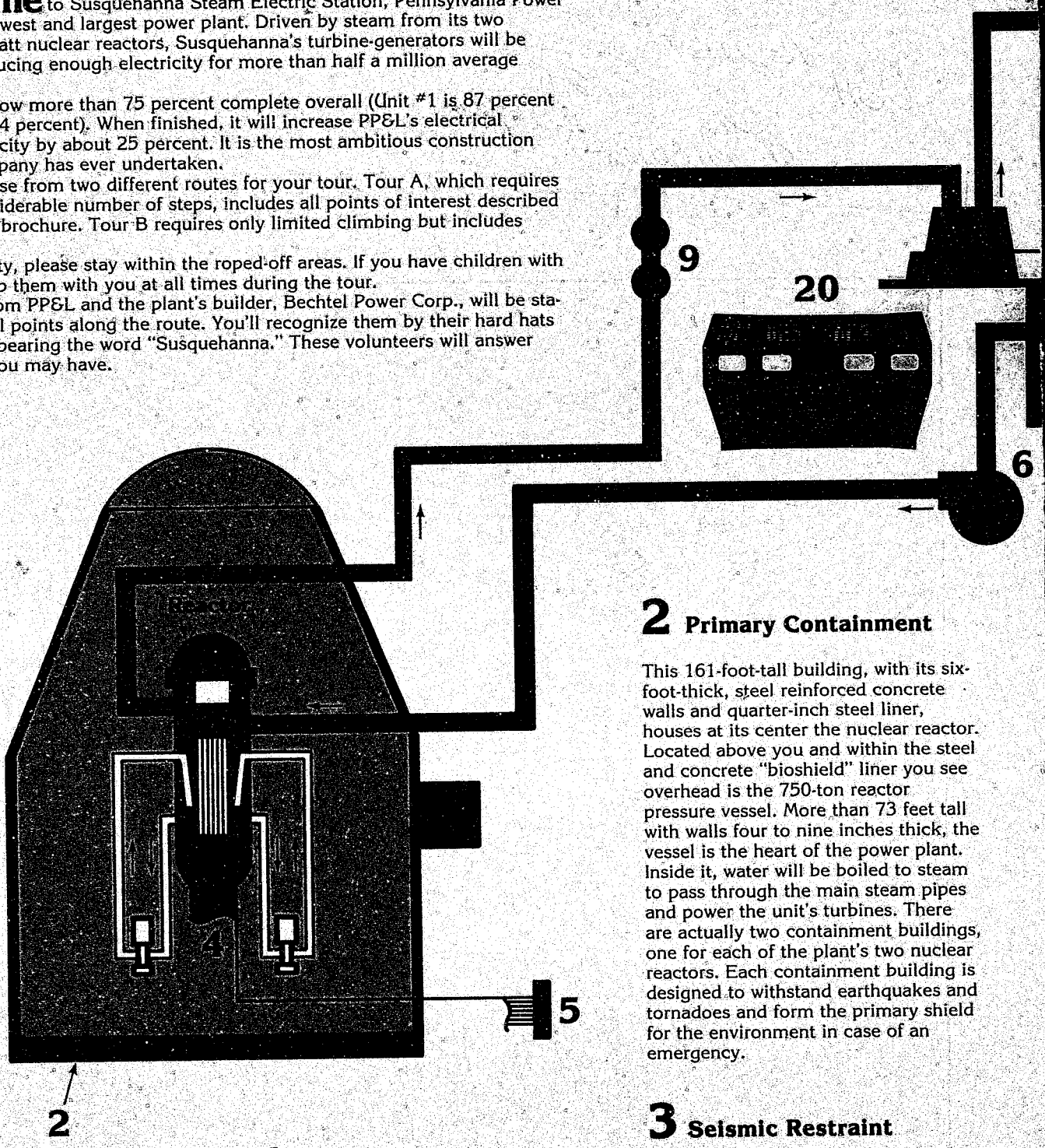
Welcome to Susquehanna Steam Electric Station, Pennsylvania Power & Light Co.'s newest and largest power plant. Driven by steam from its two 1,050,000-kilowatt nuclear reactors, Susquehanna's turbine-generators will be capable of producing enough electricity for more than half a million average homes.

The plant is now more than 75 percent complete overall (Unit #1 is 87 percent and Unit #2 is 54 percent). When finished, it will increase PP&L's electrical generating capacity by about 25 percent. It is the most ambitious construction project the company has ever undertaken.

You can choose from two different routes for your tour. Tour A, which requires climbing a considerable number of steps, includes all points of interest described in this souvenir brochure. Tour B requires only limited climbing but includes fewer points.

For your safety, please stay within the roped-off areas. If you have children with you, please keep them with you at all times during the tour.

Volunteers from PP&L and the plant's builder, Bechtel Power Corp., will be stationed at several points along the route. You'll recognize them by their hard hats and blue shirts bearing the word "Susquehanna." These volunteers will answer any questions you may have.



1 Personnel Access

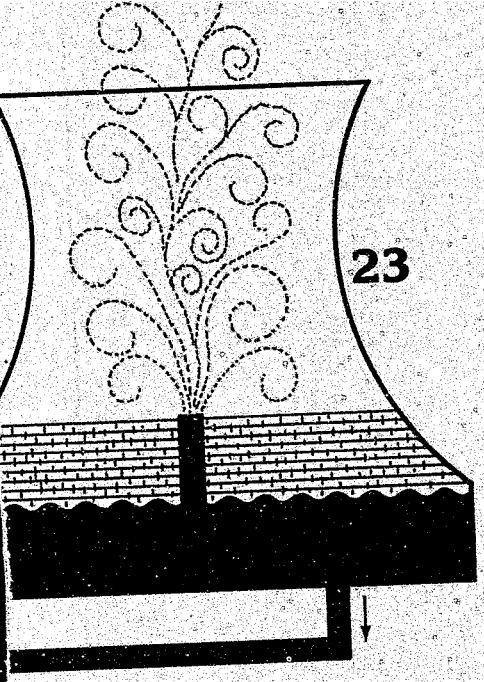
Anyone entering the primary containment will have to pass through this 10-ton, 12-foot-diameter personnel access hatch. It consists of two doors interlocked and alarmed so that only one can be opened at a time. When in position, the hatch will fit into the large opening you see near its temporary location.

2 Primary Containment

This 161-foot-tall building, with its six-foot-thick, steel reinforced concrete walls and quarter-inch steel liner, houses at its center the nuclear reactor. Located above you and within the steel and concrete "bioshield" liner you see overhead is the 750-ton reactor pressure vessel. More than 73 feet tall with walls four to nine inches thick, the vessel is the heart of the power plant. Inside it, water will be boiled to steam to pass through the main steam pipes and power the unit's turbines. There are actually two containment buildings, one for each of the plant's two nuclear reactors. Each containment building is designed to withstand earthquakes and tornadoes and form the primary shield for the environment in case of an emergency.

3 Seismic Restraint

This is an example of the seismic restraints used throughout the Susquehanna project. It's designed to keep the pipe in position in the unlikely event of an earthquake. (Studies made at the time of excavation showed there has been no movement in the Susquehanna site's bedrock for at least 200 million years. Indeed, it is one of the best sites in Pennsylvania in this respect.)



13 Heating, Ventilating and Air Conditioning (HVAC) Duct

This is some of the HVAC duct which will provide a continuous supply of filtered and heated or cooled air to all areas of the Susquehanna plant. The duct ranges in size from three inches in diameter to more than 12 feet by seven feet.

14 Turbine Building Overhead Crane

The overhead crane is used extensively during construction and during maintenance of the turbine-generator. The crane's main hook is capable of lifting 220 tons. The auxiliary hook's capacity is 25 tons.

Turbine-Generator

The 7-million-pound turbine-generator is mounted on an independent, reinforced concrete pedestal more than 50 feet tall. Nearly 14 million pounds of steam per hour will rush through the 208-foot-long giant, producing 1,050,000 kilowatts of power. There are two such units at Susquehanna.

The energy of steam will be converted to mechanical energy several times on its journey through the turbine. It will first take place inside the high-pressure turbine. As steam enters the turbine at more than 960 pounds per square inch and 540 degrees Fahrenheit, it will expand and push its way through the turbine blades, causing the turbine to rotate and turn the generator.

16 Moisture Separator

We want to use as much of the steam's energy as possible. So, in this heat exchanger, steam will be reheated and its moisture removed after it passes through the high-pressure turbine. The steam will then be ready for the low-pressure turbines.

17 Low-Pressure Turbines

Steam will enter the three low-pressure turbines simultaneously. There, its remaining energy will be used. The spent steam will then pass over the tubes in the condensers you saw earlier, and water flowing inside the tubes will cool it and condense it. Water from the condensed steam will return to the reactor to be boiled again. Water which flowed through the condenser tubes will return in a totally separate system to the cooling tower.

18 Main Generator

Driven by the turbine-generators at 1,800 revolutions per minute, the main generator will provide electricity at 24,000 volts. Later, transformers will increase the voltage so the electricity can be transmitted and distributed more efficiently and economically to homes and businesses.

19 Exciter

The smaller casing connected directly to the generator is called the "exciter." It will provide power to the electromagnet within the generator. That will create a magnetic field, through which a large coil of wire will rotate to generate an electrical current.

Often called the "Advanced Control Room," this is the nerve center of the Susquehanna plant. Here, operators will control the Susquehanna units with the help of information displayed on television monitors by eight computers per unit. The computers will supply information on plant conditions, but they won't run the plant. That's up to the operators, who will be among the best-trained people in the business. To make that a reality, each will receive thorough background and hands-on experience in a duplicate of this control room — a "simulator" — located near the plant in the Susquehanna Training Center.

21 Main Transformers

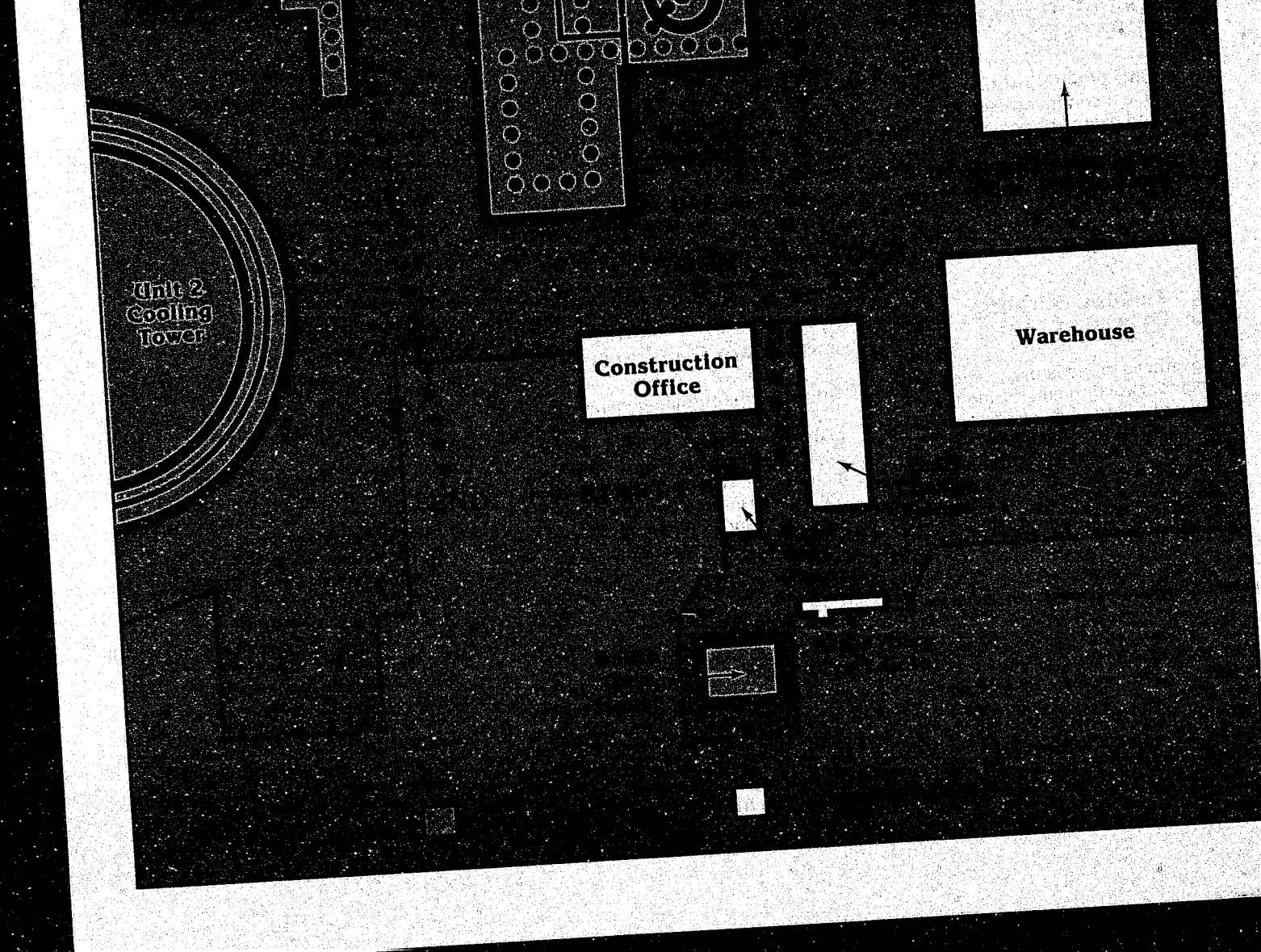
The main transformers will increase the voltage of electricity coming from the generator from 24,000 volts to as much as 500,000 volts for transmission.

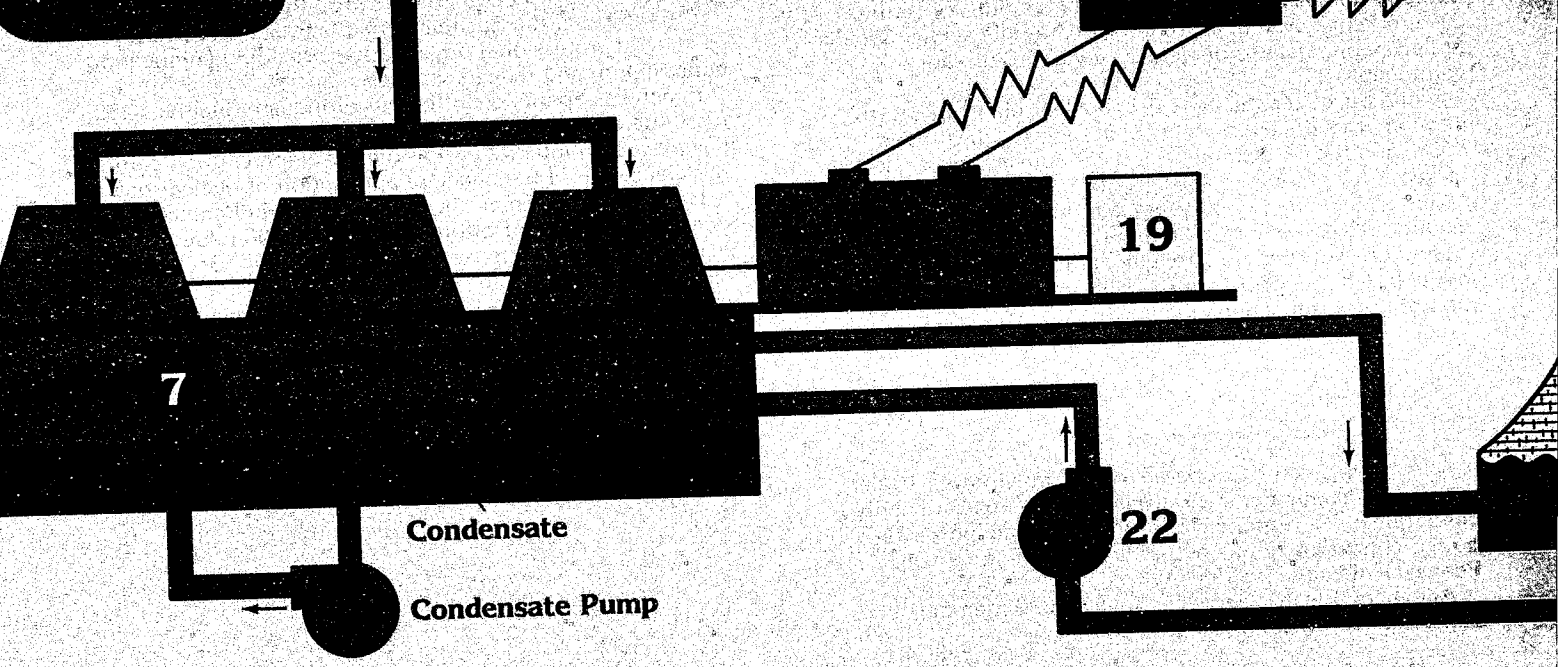
22 Circulating Water Pumps

These four pumps will force a total of more than 440,000 gallons of cooling water a minute from the cooling tower through the tubes in the condenser to cool and condense the steam so it can be returned to the reactor as water. There, it will cool the reactor as it is boiled again to steam. Meanwhile, the water which flowed through the condenser tubes will be returned to the cooling tower.

23 Cooling Tower

At 540 feet, the completed cooling tower will be one of the tallest such structures in the world. Warm water coming from the condenser will enter the tower and cascade down through cooler air which enters the base of the tower and rises because of the natural draft which is created. In this way, the excess heat in the circulating water will be removed by evaporation and given off into the atmosphere. (Water to make up for that which is evaporated will come from the nearby Susquehanna River.) The cooled circulating water will then return to the condenser. Similar cooling towers are used at many power plants, both nuclear and fossil-fueled.


Unit 2
Cooling
Tower
Construction
Office
Warehouse



4 Control Rod Drive Tubing

The "CRD" tubing will transmit the hydraulic pressure to insert and withdraw the 185 control rods. When inserted into the reactor core, the control rods' neutron absorbing material will slow and stop the nuclear reaction. Withdrawing the rods will allow the power level to increase.

5 Hydraulic Control Unit (HCU) Modules

These modules will provide the hydraulic pressure by which each of the unit's control rods will be independently inserted into or withdrawn from the reactor core. The modules allow slow adjustments to meet changes in the amount of electricity which must be generated or the prompt response needed for immediate reactor shutdown during an emergency.

6 Reactor Feed Pumps

"Feedwater" must be supplied to the reactor continuously as the water already there is boiled to steam. That's the job of these three reactor feed pumps. The pumps are driven by a steam turbine. Each is rated at 7,300 horsepower and can move nearly 17,000 gallons of water a minute.

7 Reactor Feedwater Heaters

These feedwater heaters use waste heat from the steam turbines to preheat the feedwater before it enters the reactor vessel. This makes the system more efficient and helps protect vital equipment.

8 Condensers

When we've used as much of the steam's energy as we can use economically, it will be turned back to water inside this condenser. Water, returning from the cooling tower in a piping system which keeps it separate from the steam, will flow through the more than 81,000 condenser tubes (that's more than 616 miles of tubing), condensing the used steam to feedwater. In one hour, the condenser can turn more than 8½ million pounds of steam back to water to be returned to the reactor, where it will again be boiled to make steam.

9 Main Steam Stop and Control valves

These sensitive valves will open and close to control the amount of steam entering the turbine-generator. The four-valve welded assembly weighs 100 tons. It can be adjusted either manually or automatically to meet the plant's needs.

10 Motor Control Centers

The motor control centers provide a central point from which electricity is distributed to motors and equipment in the plant. Except for their higher voltage and automatic controls, the "MCCs" are similar to a household electrical wiring panel.

11 Cable Tray/Conduit/Cable

The 25 miles of cable tray and 120 miles of conduit essentially provide the highway for 1,900 miles of electrical cable which will be used in plant operation.

12 Motor Generator Sets

Driven by electricity rather than steam, these motor generators provide electricity at frequencies which vary as needed by variable-speed motors which, like an automobile accelerator, speed up or slow down the flow of water in the recirculating water system.

PP&L is an investor-owned utility serving more than 950,000 homes and businesses in 29 counties of central eastern Pennsylvania. Its 10,000-square-mile service area is larger than the states of New Jersey and Delaware combined.

While Susquehanna is its first nuclear plant, PP&L isn't a newcomer to the large power plant arena. It has several of them, and they are among the most efficient in the United States.

Since its beginning 60 years ago in Allentown, Lehigh County, PP&L has worked continually to provide its customers with the most reliable, reasonably priced service possible. That effort continues with the building and operation of the Susquehanna plant.

Allegheny ELECTRIC COOPERATIVE, INC.

Allegheny Electric Cooperative Inc., which owns 10 percent of Susquehanna, is a Harrisburg-based power supply cooperative. It's responsible for the wholesale power requirements of 14 rural electric distribution systems in Pennsylvania and New Jersey.

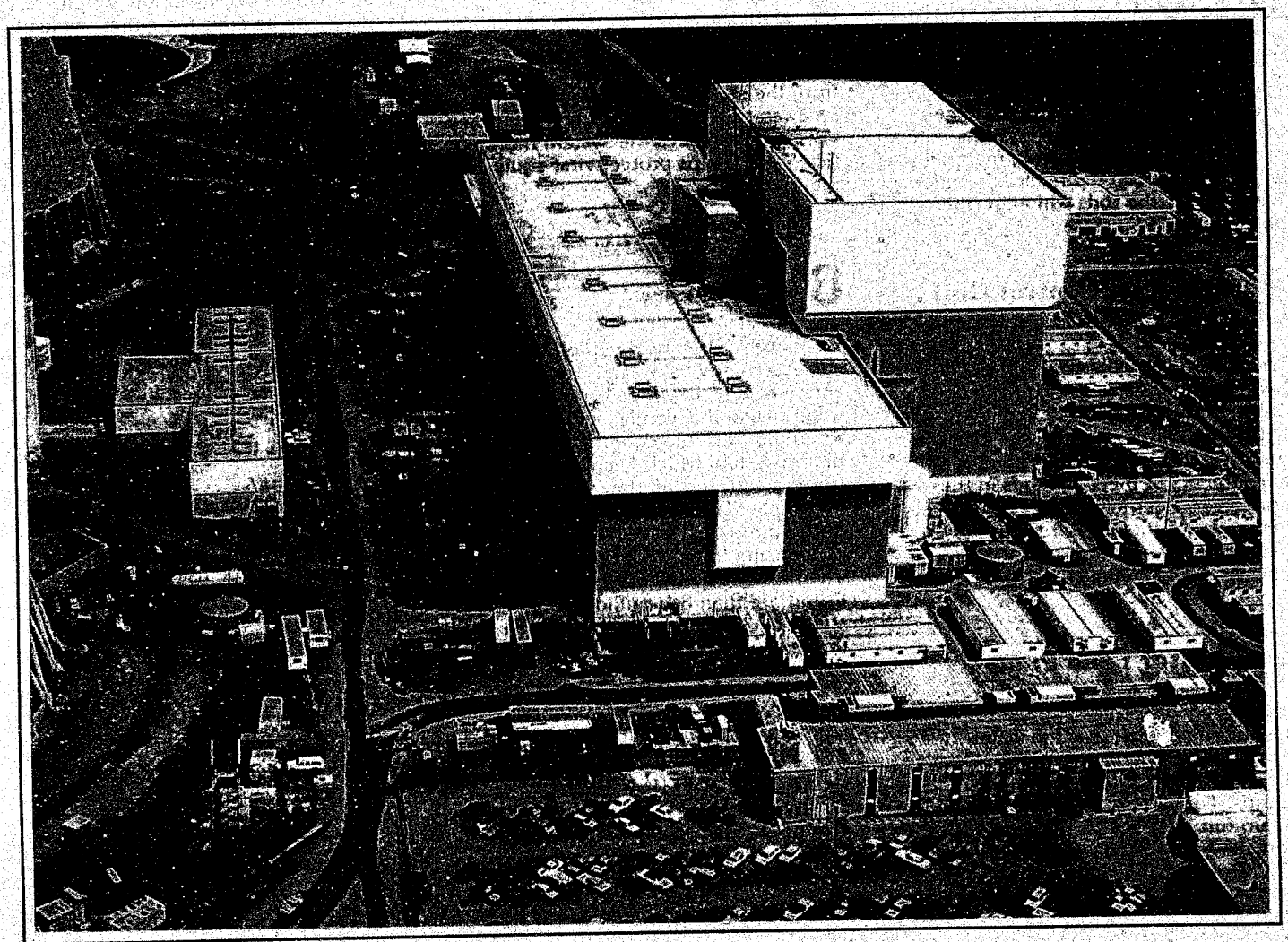
Allegheny Electric serves about 137,000 member-consumers in 42 counties.

of the Susquehanna plant, is a worldwide professional organization providing engineering, construction and related services.

Bechtel's experience in the power industry includes 233 fossil-fueled and 83 nuclear generating units. The company has played an integral part in the development and commercialization of the peaceful application of nuclear power.

Bechtel's involvement in nuclear power in Pennsylvania goes back to Peach Bottom Unit 1, a 40,000-kilowatt generating unit which went "on-line" in 1967. Bechtel was also the architect-engineer and builder of Peach Bottom units 2 and 3, which were added later with a generating capacity of 1,065,000 kilowatts each. Peach Bottom is located in southeastern Pennsylvania, near the Maryland border.

Bechtel is also involved in a number of other nuclear units still under construction in Pennsylvania.



BEFORE

THE PENNSYLVANIA PUBLIC UTILITY COMMISSION

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In re: R-822169 - Pennsylvania Power & Light Company. Investigation into a requested $315 million dollar annual rate increase. Hearing.

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Harrisburg, Pennsylvania

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Public Utility Commission

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