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50-388 Susquehanna Steam Electric Station, Unit 2, Pennsylva 05000388
AUTH.NAME AUTHOR AFFILIATION
KEISER,H.W. Pennsylvania Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
RUSSELL,W.T. Region 1, Ofc of the Director

SUBJECT: Forwards response to NRC Bulletin 88-005.

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

SEP 6 2 1988

Harold W. Keiser
Senior Vice President-Nuclear
215/770-4194

Mr. William T. Russell
Regional Administrator, Region 1
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

SUSQUEHANNA STEAM ELECTRIC STATION
RESPONSE TO BULLETIN 88-05
PLA-3076 FILE R41-2, R41-1A

Docket Nos. 50-387
and 50-388

Dear Mr. Russell:

Attached is PP&L's complete response to NRC Bulletin 88-05 including Supplements 1 and 2. If you have any questions, please contact Mr. R.M. Harris at (215) 770-7918.

Very truly yours,

H. W. Keiser

Attachments
Affidavit

cc: NRC Document Control Desk (original)
NRC Region I
Mr. F. I. Young, NRC Sr. Resident Inspector
Mr. M. C. Thadani, NRC Project Manager
Mr. B. Bradley, NUMARC
1776 Eye Street, N.W.
Suite 300
Washington, D.C. 20006-2496

A011
1/1

AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA)
: SS
COUNTY OF LEHIGH)

I, HAROLD W. KEISER, being duly sworn according to law, state that I am Sr. Vice President - Nuclear of Pennsylvania Power & Light Company and that the facts set forth on the attached response to IE Bulletin 88-05 including Supplement 1 and 2, are true and correct to the best of my knowledge, information and belief.

H. Keiser

Harold W. Keiser
Sr. Vice President - Nuclear

Sworn to and subscribed
before me this 1st day
of September, 1988.

Notary Public
ALLENTOWN, LEHIGH COUNTY
MY COMMISSION EXPIRES JAN. 15, 1990

rmh/msc200368i

RESPONSE TO NRC BULLETIN 88-05

1. Document Reviews

PP&L conducted reviews of PP&L and Bechtel QC receipt inspection reports to determine if WJM and PSI supplied flanges or fittings had been received for use at Susquehanna SES Units 1 and 2. Part of the way through the reviews, they were extended to include Chew's Landing. So far, about 1100 flanges have been identified. No fittings were identified and no material from Chew's Landing was identified. Attachment 1 lists flanges that were identified during review of PP&L receipt inspection records. This includes considerable surplus material turned over by Bechtel around the time construction was completed. Most of this material is in the warehouse.

Attachment 2 lists loose flanges that were purchased by Bechtel during construction. Surplus flanges which were turned over to PP&L for warehouse inventory have been subtracted so that they do not duplicate items on Attachment 1. To the best of our knowledge, the flanges in Attachment 2 were probably installed although some may have been disposed of at the end of construction.

Determining the locations of the material in Attachment 2 required reviewing construction "as-built" piping isometrics. Reviews were completed for nearly all safety-related piping in both units. About 400 of the flanges listed in Attachment 2 have still not been located, but we believe that it is unlikely that these are installed in safety-related systems. Reviews of non-safety system piping were not completed at the time Supplement 2 was issued. In any event, construction documentation for non-safety systems rarely included heat numbers and would be unlikely to lead to identification of many additional installations of these flanges.

Reviews were also conducted of material purchased by Morrison-Knudson for the "E" diesel generator project. This review identified 34 flanges installed in the "E" diesel. Attachment 3 lists these flanges.

PP&L also reviewed Bechtel piping sub-assembly procurement records and found no additional suspect material for the Susquehanna projects. Reviews which would have sought to identify suspect flanges in Dravo and GE scopes of supply, skid mounted equipment, etc. were planned but had not been started when Supplement 2 was received.

2. Findings

Attachments 1, 2 and 3 summarizes the results to date of PP&L's record search. Material is listed in heat number sequence as requested by NRC's Mr. Ed Baker. These lists provide the information requested in items 2a and 3a of the bulletin except for the application of installed flanges.

Attachment 3 provides the application's for flanges in the "E" diesel. Attachment 4 provides a key for the suppliers identified on Attachments 1, 2 and 3. Attachment 5 lists flanges identified as being installed in safety-related systems (except for the "E" diesel) and includes their applications. Attachment 6 does the same for flanges identified as being installed in non-safety systems.

3. Test Results

Several flanges from the warehouse were sent to an independent lab for analysis. This was done early (before the NUMARC program was in place) to provide an initial indication of flange strength and conformance to code requirements. These flanges are identified on Attachment 1 with a footnote. The lab report is included as Attachment 7.

Hardness testing using the Equotip equipment recommended by NUMARC was conducted by PP&L on 48 flanges in safety-related applications. Attachment 8 provides the results of these field tests. Testing was conducted in accordance with PP&L specification C1084 which was based on information provided at the EPRI workshop on June 29, 1988 and included corrections for temperature as recommended by EPRI subsequent to the workshop. Six of these tests resulted in hardness readings below Brinell 137. These were reported to NRC within 48 hours as required by Supplement 1 to the bulletin. Samples from these six flanges and two others with borderline hardness were sent to an independent lab for chemical analysis. The results are included as Attachment 9 and show that all eight flanges meet the specified chemical composition for SA-105 material.

In addition, 21 flanges from the warehouse were provided to Bechtel for testing under the direction of NUMARC. These are identified in Attachment 1 with a footnote and are listed in Attachment 10. Written test results from Bechtel have not been received. Per discussions with NRC's Mr. Ed Baker, PP&L need not supply these results since NRC expects to get these results through NUMARC.

4. Disposition of Flanges

All installed flanges which were tested (see Attachment 8) have been determined to be acceptable based on test results. Based on PP&L and industry test results provided in Supplement 2 to the bulletin, continued use of installed flanges which have not been tested does not present a safety problem. Flanges identified as installed in safety-related systems but inaccessible were reported to NRC within 48 hours and had been justified for continued operation prior to receipt of Supplement 2. Flanges in the warehouse have been identified as nonconforming and are on hold pending resolution of the need for additional action per NRC. No material with heat number 7218 has been identified at PP&L.

RMH:tah
rmhmeh125a

PP&L QC Receipt Inspection Report (RIR) Results

PP&L RIR #	Material	Heat #	Quantity Received	Quantity Warehouse	Installed Safety	Installed NonSafety	Quantity Unlocated		Size/Type	Chain of Supply		
86-0170	SA105	AAY-84	2	2			0		1" 150# Threaded RF	Lonergan	Canuso	WJM
86-0170	SA105	AAY-84	4	4			0		0.75" 150# Threaded RF	Lonergan	Canuso	WJM
86-0630	SA105	AAY-84	1	1			0		1" 150# Threaded RF	Lonergan	Canuso	WJM
86-0630	SA105	AAY-84	1	1			0		0.75" 150# Threaded RF	Lonergan	Canuso	WJM
88-0423	SA181	AAY-84	12	12			0	F	1" 150# RF class 70 Blind	DuBose		PSI
88-0423	SA105	AAY-84	8	8			0	F	1" 150# RF Blind	DuBose		PSI
86-0170	SA105	AAZ-84	3	3			0		1" 1500# Threaded RF	Lonergan	Canuso	WJM
84-5451	SA105	A16	17	17			0		1" 1500# Ring Joint SW	Bechtel	Liberty	WJM
84-5883	SA105	A16	1				1		1" 1500# Blind	Bechtel	Guyon	WJM
84-5502	SA105	A23	4	4			0		1" 300# FFSW	Bechtel	Liberty	WJM
84-5511	SA105	A23	15	15			0	*	0.75" 1500# Ring Joint SW	Bechtel	Guyon	WJM
84-5527	SA105	A23	39	38			1		0.75" 1500# Blind	Bechtel	Guyon	WJM
84-5878	SA105	A23	6	5			1	*	1" 300# FFSW	Bechtel	Liberty	WJM
84-4146	SA105	A29	10	10			0		1.5" 600# Ring Joint SW	Bechtel	Guyon	WJM
84-5829	SA105	A29	5	5			0	*	2" 600# Blind	Bechtel	Liberty	WJM
84-5551	SA105	A94	1	1			0		2" 1500#	Bechtel	Guyon	WJM
84-5511	SA105	A97	10	10			0		0.75" 600# Ring Joint SW	Bechtel	Guyon	WJM
84-5521	SA105	B34	4	4			0		1" 900# RFSW	Bechtel	CP&S	WJM
84-5718	SA105	B4	4	2			2	*	1" 600# SW	Bechtel	Guyon	WJM
85-2235	SA105	CFY	2				2		4" 150# RF Blind	CP&S		WJM
85-2236	SA105	CFY	1				1		4" 150# RF Blind	CP&S		WJM
88-0009	SA105	CHN	2	2			0	F	2" 1500# RF Blind	DuBose		PSI
86-0630	SA105	COL	1	1			0		2" 150# Threaded RF	Lonergan	Canuso	WJM
84-2392	A105	COX	16			16	0		3" 150# RFBW	CP&S		WJM
85-2221	SA105	COX	22	6		14	2	F	1" 600# SW	CP&S		WJM
85-2222	SA105	COX	20	1		12	7	F	1" 600# SW	CP&S		WJM
82-1549	SA105N	ETOO	4	4			0	*	4" 1500# Blind	CP&S		WJM
82-1549	SA105N	ETOO	4	4			0		4" 1500# Threaded	CP&S		WJM
83- 517	SA105	EUHJ	2		2		0		20" 300# RFWN	Bechtel	CP&S	WJM
82-1549	SA105N	GDCH	12	12			0		0.75" 1500# Blind	CP&S		WJM
82-1549	SA105N	GDCH	12	12			0		0.75" 1500# Threaded	CP&S		WJM
82-1549	SA105N	GDDN	4	3			1	*	2.0" 1500# Blind	CP&S		WJM
82-1549	SA105N	GDDN	6	5			1	*	2.0" 1500# Threaded	CP&S		WJM
82-1549	SA105N	GDDO	6	6			0		1.25" 1500# Blind	CP&S		WJM
82-1549	SA105N	GDDO	6	6			0	*	1.5" 1500# Blind	CP&S		WJM
82-1549	SA105N	GDDO	6	6			0		1.25" 1500# Threaded	CP&S		WJM
82-1549	SA105N	GDDO	6	6			0		1.5" 1500# Threaded	CP&S		WJM
82-1549	SA105N	GDED	12	12			0		0.5" 1500# Blind	CP&S		WJM
82-1549	SA105N	GDED	12	12			0		0.5" 1500# Threaded	CP&S		WJM
82-1549	SA105N	GDFS	12	11			1	*	1.0" 1500# Blind	CP&S		WJM
82-1549	SA105N	GDFS	12	12			0		1.0" 1500# Threaded	CP&S		WJM
82-1549	SA105N	GDKR	4	3			1	*	2.5" 1500# Blind	CP&S		WJM
82-1549	SA105N	GDKR	4	4			0	*	3" 1500# Blind	CP&S		WJM
82-1549	SA105N	GDKR	2	2			0		2.5" 1500# Threaded	CP&S		WJM
82-1549	SA105N	GDKR	4	4			0		3" 1500# Threaded	CP&S		WJM
84-2063	SA105	S21053	6		4		2		8" 150# RFWN	CP&S		WJM
84-5530	SA105	T433	1	1			0		1.5" 300# FFSW	Bechtel	Liberty	WJM
84-5904	SA105	VP	6	2	4		0	*	0.5" 150# RFSW	Bechtel	Guyon	WJM
84-5530	SA105	VS	4	4			0	*	1.5" 300# FFSW	Bechtel	Liberty	WJM
84-4134	SA105	202X	14	14			0		2" 1500# Ring Joint	Bechtel	Guyon	WJM
84-4845	SA105	202X	5	5			0	*	2" 1500# RFSW	Bechtel	Liberty	WJM
84-5551	SA105	202X	19	18			1	*	2" 1500#	Bechtel	Guyon	WJM
84-5824	SA105	2059	15	15			0	*	2" 300# RFWJ Orifice	Bechtel	Liberty	WJM

PP&L QC Receipt Inspection Report (RIR) Results

PP&L RIR #	Material	Heat #	Quantity Received	Quantity Warehouse	Installed Safety	Installed NonSafety	Quantity Unlocated		Size/Type	Chain of Supply		
84-5883	SA105	2095	8	8			0		1" 1500# Blind	Bechtel	Guyon	WJM
83-1430	SA105	23804	1		1		0		12" 150# RFWN	Bechtel	CP&S	WJM
87-0800	SA182	243450	4	1		1	2	F	1" 150# RF Threaded	Canuso		PSI
84-6074	SA105	34L	2	2			0		4" 600# Orifice	Bechtel	GE	WJM
83- 517	SA105	3426	6		6		0		20" 150# RFWN	Bechtel	CP&S	WJM
83-1458	SA105	3426	2		2		0		20" 150# RFWN	Bechtel	CP&S	WJM
84-5511	SA105	39E	24	21		2	1	*	1" 600# Ring Joint SW	Bechtel	Guyon	WJM
84-5503	SA105	43B	4	4			0	*	1.5" 150# FFSW	Bechtel	Liberty	WJM
82-1054	SA105	44266	4	4			0		3" 300# Lap Joint	CT&I	AAF	WJM
83- 818	SA105	6026843	2	2			0		2.5" 1500# RF Threaded	CP&S		WJM
84-5504	SA105	64C	5	5			0		0.75" 150# FFSW	Bechtel	Liberty	WJM
83-1456	SA105	69	1		1		0		12" 150# RFWN	Bechtel	CP&S	WJM
84-5559	SA105	80508	13	13			0	*	2" 600# SW	Bechtel	Guyon	WJM
84-5898	SA105	80508	4	4			0	*	1" 900# SW	Bechtel	Liberty	WJM
		Totals:	491	399	20	45	27					

* Sample sent to Bechtel for ASME Testing
F Sample sent to Franklin for ASME Testing

Bechtel QC Receipt Inspections Results

Bechtel MRR#	Material	Heat #	Quantity Received	Installed Safety	Installed NonSafety	Quantity Unlocated	Size/Type	Chain of Supply		
120815	SA105	A16	35		8	27	1" 1500# Blind	Liberty		WJM
120815	SA105	A16	12	8	4	0	1" 1500# RJT	Liberty		WJM
124733	SA105	A18	20			20	1.5" 1500# RJT SW	Guyon		WJM
120045	SA105	A18	8		2	6	1.5" 1500# RFSW	Liberty		WJM
124733	SA105	A23	11	1	1	9	1" 1500# RJT SW	Guyon		WJM
130679	SA105	A23	1			1	0.75" 1500# Blind	Guyon		WJM
120045	SA105	A23	5			5	1" 300# FFSW	Liberty		WJM
124733	SA105	A29	15	4		11	2" 600# RJT SW	Guyon		WJM
120045	SA105	A29	3		1	2	2" 600# Blind	Liberty		WJM
120045	SA105	A29	6			6	2" 600# RJT SW	Liberty		WJM
123551	SA105	A32	10	6		4	0.75" 300# NPT	Guyon		WJM
119580	SA105	A32	5	1		4	0.75" 300# FFSW	Liberty		WJM
120045	SA105	A59	8			8	1.5" 600# Blind	Liberty		WJM
120815	SA105	A79	12			12	1" 150# RF NPT	Liberty		WJM
127269	SA105	A91	8			8	2" 300# RFWN	Guyon		WJM
130679	SA105	A94	30			30	2" 1500# Blind	Guyon		WJM
119580	SA105	A97	11			11	0.75" 600# SW	Liberty		WJM
156350	SA105	B34	5	5		0	1" 900# RFSW	CP&S		WJM
156350	SA105	B34	1	1		0	1" 900# RFSW	CP&S		WJM
141804	SA105	B4	12			12	1" 600#	Guyon		WJM
141804	SA105	B4	16			16	1" 600# Blind	Guyon		WJM
141443	SA105	EUKA	1			1	18" 300# Orifice	Guyon		WJM
141443	SA105	EUKM	7			7	18" 300# Orifice	Guyon		WJM
161962	SA105	GDFE	2			2	2" 600# Blind	Canuso		WJM
163347	SA105	GDFS	2			2	1" 1500#	Guyon		WJM
161962	SA105	GDLD	2			2	1.5" 600# Blind	Canuso		WJM
164361	SA105	GDSF	1			1	1" 1500# Blind	Guyon		WJM
148874	SA105	H0795	8			8	3" 150# RFWN	Guyon		WJM
122102	SA105	H1614	1	1		0	30" 125# RFSO	Canuso	Guyon	WJM
121798	SA105	H2402	8	7		1	30" 125# RFSO	Guyon		WJM
122102	SA105	H3618	2	1		1	30" 125# RFSO	Canuso	Guyon	WJM
122102	SA105	H3736	3	2		1	30" 125# RFSO	Canuso	Guyon	WJM
148464	SA105	N85552	2	2		0	3" 900# Blind	Guyon		WJM
148464	SA105	N86006	2	2		0	4" 900# Blind	Guyon		WJM
119580	SA105	T2095	5			5	2" 300# FFSW	Liberty		WJM
129744	SA105	VP	24			24	0.5" 150# RFSW	Guyon		WJM
121020	SA105	03200	2		1	1	3" 900# WN	Canuso	Guyon	WJM
173362	SA105	03200	2	1		1	3" 900#	Guyon		WJM
127269	SA105	1830	8			8	2" 300# RFWN	Guyon		WJM
121798	SA105	202X	18		4	14	2" 1500# Blind	Guyon		WJM
124733	SA105	202X	11			11	2" 1500# RJT SW	Guyon		WJM
124710	SA105	202X	2			2	2" 1500# SW	Guyon		WJM
120815	SA105	202X	3			3	2" 1500# RFSW	Liberty		WJM
120815	SA105	2059	21	7		14	2" 300# RFSW Orifice	Liberty		WJM
129454	SA105	2095	52		2	50	1" 1500# Blind	Guyon		WJM
147209	SA105	212234	9	9		0	10"x12" 300# RFWN Expander	ITT		WJM
163327	SA105	22073	2			2	4" 600# RFWN Orifice	Guyon		WJM
156805	SA105	23804	4	4		0	12" 150# RFWN	CP&S		WJM
150104	SA105	31217	2			2	3" 150# RFWN	Guyon		WJM
124841	SA105	39E	20			20	1" 600# RJT SW	Guyon		WJM
119580	SA105	43B	1			1	1.5" 150# FFSW	Liberty		WJM
132002	SA105	4670	32	32		0	6" 300# RFWN	Guyon		WJM
138603	SA105	4670	32	32		0	6" 300# RFWN	Guyon		WJM

Bechtel QC Receipt Inspections Results

Bechtel MRR#	Material	Heat #	Quantity Received	Installed Safety	Installed NonSafety	Quantity Unlocated	Size/Type	Chain of Supply	
167860	SA105	4692	4	4		0	14" 150# RFWN	CP&S	WJM
167859	SA105	5183	8			8	20" 150# RFWN	Guyon	WJM
167664	SA105	5625	2	2		0	20" 300# RFWN Orifice	Guyon	WJM
167665	SA105	5625	2	2		0	20" 300# RFWN	Guyon	WJM
156805	SA105	69	8	6		2	12" 150# RFWN	CP&S	WJM
124733	SA105	80508	19			19	1" 1500# RJT SW	Guyon	WJM
127979	SA105	80508	6		1	5	2" 600#	Guyon	WJM
128692	SA105	80508	1			1	2" 600#	Guyon	WJM
120045	SA105	80508	8		1	7	1" 1500# RJT SW	Liberty	WJM
120045	SA105	80508	8	1		7	1" 900# RFSW	Liberty	WJM
120045	SA105	80508	4			4	1" 900# RFSW	Liberty	WJM
		Totals:	595	141	25	429			

Morrison-Knudson Supplied Components ("E" Diesel)

Material	Heat #	Code	Quantity		Size/Type	System	Chain of Supply			
SA105	A13711	ABUA	2	*	1.5" 150# RFWN	Exp. Stand Pipe	Appl Eng	CP&S		WJM
SA105	CIT		2	*	6" 150# RFSO	Lube Oil Filter	Kennecot	CT&I		WJM
SA105	CKS		2	*	1" 150# RFSW	Diesel Engine Fuel Oil	CP&S			WJM
SA105	CND		2	*	4" 150# FFSO	Jacket Water Cooling	Amer Std			WJM
SA105	CND		2	*	6" 150# FFSO	Lube Oil Cooler	Amer Std			WJM
SA105	M92091	ABTZ	2	*	1" 150# RFWN	Jacket Water	Appl Eng	CP&S		WJM
SA105	03575		4	*	4" 300# RFWN	Service Water	Powr Sys	CP&S	TubeT	WJM
SA350	17703		4	*	3" 300# Lap Joint	Starting Air	Guyon			WJM
SA105	222A9	ABTY	1	*	2" 150# RFWN	550 Gal. Fuel Oil	Appl Eng	CP&S		WJM
SA105	4631		6	*	4" 300# RFWN	Air Start	Powr Sys	CP&S		WJM
SA105	4631		1	*	4" 300# RFWN	Jacket Water	Powr Sys	CP&S		WJM
SA105	6X11010		2	*	10" 150# RFSO	Lube Oil Cooler	Amer Std			WJM
SA105	6011375		2	*	10" 150# RFSO	Jacket Water	Amer Std			WJM
SA105	661P018		2	*	6" 150# RFWN	Lube Oil	Metal B			WJM

Total Installed: 34

* Field Tested for Hardness

ATTACHMENT 3

Suppliers Key:

Supplier ID	Name	City & State
AAF	American Air Filter	Louisville, KY
Amer Std	American Standard	Buffalo, NY
Appl Eng	Applied Engineering	Orangeburg, SC
Bechtel	Bechtel Power	San Francisco, CA
Canuso	L. P. Canuso	Depyford, NJ
CP&S	Capitol Pipe & Steel Products	Bala-Cynwyd, PA
CT&I	Chicago Tube & Iron	Chicago, IL
DuBose	Dubose Steel	Roseboro, NC
GE	General Electric	San Jose, CA
Guyon	Guyon Alloys	Houston, TX & Wayne, PA
ITT	ITT Grinnel	Kernersville, NC
Kennecot	Kennecott	Lebanon, IN
Liberty	Liberty Equipment & Supply	Kennenick, MA
Lonergan	J. E. Lonergan	Philadelphia, PA
Metal B	Metal Bellows	Sharon, MA & Chatsworth, CA
Powr Sys	Power Systems	Rocky Mount, NC
TubeT	Tube Turns	Louisville, KY

ATTACHMENT 4

Material Identified in Safety-Related Systems

PP&L Source Document	Susq Unit	Mfgr	Material	Heat #	Quantity		Size/Type	System
MRR 120815	2	WJM	SA105	A16	8		1" 1500# RJT	HPCI/RCIC Stop Vlv Seat Drains
MRR 124733	2	WJM	SA105	A23	1		1" 1500# RJT SW	HPCI Turbine Drains
MRR 124733	2	WJM	SA105	A29	4		2" 600# RJT SW	RCIC Pump Disch Bypass
MRR 123551	2	WJM	SA105	A32	3		0.75" 300# NPT RF	RHR Pump Shaft Seal Vent/Drain
MRR 123551	1	WJM	SA105	A32	4		0.75" 300# NPT RF	RHR Pump Shaft Seal Vent/Drain
MRR 156350	2	WJM	SA105	B34	2		1" 900# RFSW	MSIV Leakage Control
MRR 156350	2	WJM	SA105	B34	3		1" 900# RFSW	MSIV Leakage Control
RIR 83- 517	2	WJM	SA105	EUHJ	2	*	20" 300# RFWN	RHR Service Water
MRR 122102	C	WJM	SA105	H1614	1		30" 125# RFSO	Diesel Exhaust
MRR 121798	C	WJM	SA105	H2402	7		30" 125# RFSO	Diesel Exhaust
MRR 122102	C	WJM	SA105	H3618	1		30" 125# RFSO	Diesel Exhaust
MRR 122102	C	WJM	SA105	H3736	2		30" 125# RFSO	Diesel Exhaust
MRR 148464	1	WJM	SA105	N85552	1		3" 900# Blind	HPCI Aux Steam
MRR 148464	2	WJM	SA105	N85552	1		3" 900# Blind	HPCI Aux Steam
MRR 148464	1	WJM	SA105	N86006	1		4" 900# Blind	RCIC Aux Steam
MRR 148464	2	WJM	SA105	N86006	1		4" 900# Blind	RCIC Aux Steam
RIR 84-2063	1	WJM	SA105	S21053	4		8" 150# RFWN	Emergency Service Water
RIR 84-5904	1	WJM	SA105	VP	4	*	0.5" 150# RFSW	HPCI Lube Oil
MRR 173362	2	WJM	SA105	03200	1		3" 900#	RCIC Steam Supply
MRR 120815	2	WJM	SA105	2059	7		2" 300# RFSW Orifice	Emergency Service Water
MRR 147209	2	WJM	SA105	212234	9	**	10"x12" 300# RFWN Expander	SRV Discharge Lines
RIR 83-1430	2	WJM	SA105	23804	1	*	12" 150# RFWN	Emergency Service Water
MRR 156805	2	WJM	SA105	23804	2		12" 150# RFWN	Emergency Service Water
MRR 156805	2	WJM	SA105	23804	2		12" 150# RFWN	Emergency Service Water
RIR 83-1458	2	WJM	SA105	3426	1	*	20" 150# RFWN	RHR Service Water
RIR 83-1458	2	WJM	SA105	3426	1	*	20" 150# RFWN	RHR Service Water
RIR 83- 517	2	WJM	SA105	3426	6	*	20" 150# RFWN	RHR Service Water
MRR 132002	1	WJM	SA105	4670	32	**	6" 300# RFWN Sch. 80	SRV Discharge Lines
MRR 138603	2	WJM	SA105	4670	32	**	6" 300# RFWN Sch. 80	SRV Discharge Lines
MRR 167860	1	WJM	SA105	4692	4		14" 150# RFWN	Emergency Service Water
MRR 167664	2	WJM	SA105	5625	4		20" 300# RFWN	RHR Service Water
RIR 83-1456	2	WJM	SA105	69	1	*	12" 150# RFWN	Emergency Service Water
MRR 156805	2	WJM	SA105	69	6		12" 150# RFWN	Emergency Service Water
MRR 120045	2	WJM	SA105	80508	1		1" 900# RFSW	MSIV Leakage Control
MRR 120045	2	WJM	SA105	80508	1		1" 900# RFSW	MSIV Leakage Control
				Total:	161			

* Field Tested For Hardness
** Inaccessable. Reported to NRC

ATTACHMENT 5

Material Identified in Non-Safety-Related Systems

PP&L Source Document	Susq Unit	Mfgr	Material	Heat #	Quantity	Size/Type	System
MRR 120815	2	WJM	SA105	A16	8	1" 1500# Blind	Main Steam Drains
MRR 120815	2	WJM	SA105	A16	4	1" 1500# RJT	Main Steam Drains
MRR 120045	2	WJM	SA105	A18	2	1.5" 1500# RFSW	RWCU Flushing Connections
MRR 124733	2	WJM	SA105	A23	1	1" 1500# RJT SW	Main Steam Drains
MRR 120045	2	WJM	SA105	A29	1	2" 600# Blind	RWCU Flushing Connections
RIR 84-2392	C	WJM	SA105	COX	16	3" 150# RFBW	Spray Array Pumpdown Lines
RIR 85-2222	1	WJM	SA105	COX	16	1" 600# SW	RWCU Inst. Connections
RIR 85-2221	2	WJM	SA105	COX	10	1" 600# SW	RWCU Inst. Connections
MRR 121020	1	WJM	SA105	03200	1	3" 900# WN	RWCU Pump Discharge
MRR 121798	2	WJM	SA105	202X	4	2" 1500# Blind	RWCU Flushing Connections
MRR 129454	2	WJM	SA105	2095	2	1" 1500# Blind	Main Steam Drains
RIR 87-0800	C	PSI	SA182	243450	1	1" 150# NPT	Rad Waste Treatmet Caustic Tank
RIR 84-5511	2	WJM	SA105	39E	2	1" 600# RJT	Feed Pump Steam Vlv Drain
MRR 120045	2	WJM	SA105	80508	1	1" 1500# RJT SW	Main Steam Drains
MRR 127979	2	WJM	SA105	80508	1	2" 600#	RWCU Flushing Connections
				Total:	70		

ATTACHMENT 6

ATTACHMENT 7

FRANKLIN RESEARCH CENTER
DIVISION OF ARVIN/CALSPAN

July 14, 1988

Mr. Lou Willertz
Pennsylvania Power & Light Co.
Two North Ninth Street
Allentown, PA 18101

Subject: Mechanical and Chemical Analyses of Pipe Flanges

Reference: PP&L Service Request #S-04657-5
FRC Project P178-0001 (6227-018)

Dear Mr. Willertz:

In accordance with your Service Request, for a group of flanges identified in Table 1, the chemical composition and mechanical properties were determined and compared with the specified values in the following applicable standards:

SA 182 (ASTM A 182/A 182M-87a) "Standard Specification for Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service."

SA 181 (ASTM A 181/A 181M-87) "Standard Specification for Forgings, Carbon Steel, for General-Purpose Piping."

SA 105 (ASTM A 105/A 105M-87a) "Standard Specification for Forgings, Carbon Steel, for Piping Components."

Tensile tests were conducted on samples machined from pieces cut from the flanges. The size of each sample was dictated by the size of the flange, and in all cases the test sample was either a standard 2-in gage length tensile test specimen or the largest feasible specimen whose dimensions are proportional to the standard specimen, in accordance with ASTM A 370-87b.

The actual size of each test specimen along with the required test and tensile properties are presented in Table 2. In addition, hardness test results are also given in Table 2. Although such tests were not required for two of the samples, hardness can be correlated with tensile strength and, therefore, hardness data are useful for evaluating the uniformity of a flange as well as for comparison and reference purposes.

Mr. Lou Willertz
Pennsylvania Power & Light Co.

July 13, 1988

The data in Table 2 indicate that all but two flanges met or exceeded all the specified mechanical properties. The sample in test 718-3 had slightly low elongation (21% vs a specified 22% minimum), whereas the sample in test 718-5 was slightly deficient in ultimate tensile strength (68.9 ksi vs the specified 70 ksi) and hardness (72.8 R_B vs a specified minimum of 137 HB or 75 R_B).

The low elongation test result for sample 718-3 does not appear to reflect an inherent deficiency in the flange material, particularly since all the other tensile properties including reduction in area were well above the specified minimums. Thus, the value of 21% elongation versus the specified 22% likely can be explained by experimental inaccuracy in measuring the gage length after the sample had fractured.

For sample 718-5 the low hardness and tensile strength along with a yield strength that just met the minimum required value all indicate the sample was marginal at best. Additional testing of samples from the same batch as the test sample would be required to establish whether the batch as a whole is deficient.

The chemical requirements and test results are presented in Table 3. The data show that the composition of each of the carbon steel flanges (Tests 718-2 through 718-8) met the specified values. The sample in test 718-1 had too much carbon and too little molybdenum to satisfy the requirements for 316L stainless steel in ASTM A 182 (SA 182).

Enclosed are copies of the certified test reports and FRC's Report of Test Monitoring. All tests were performed in accordance with customer quality requirements and the Franklin Reseach Center quality assurance program.

We will be pleased to discuss any aspect of the testing or results with you.

Very truly yours,

L. Leonard

L. Leonard
Principal Engineer

LL/ih
Encl.

0723C

Table 1 - Flange Identification

FRC Test No.		PP&L Description	Markings on Flange
718-1	a)	Flange, 1" NPS; raised face, ANSI Class 150, ASME SA182, Gr. F316L, HT.# 243450, C/N 214090.	1-150 PS SA182-F316L CL 2 243450 B16.5 7-14360-1
718-2	b)	Flange, 1" NPS Blind; ANSI Class 150, ASME SA181, Class 70, HT.# AAY84, C/N 210223.	1-150-PS-SA181 C1 70 CL.2 - AAY 84 7-46319-1 CAT #210223
718-3	c)	Flange, 1" NPS Blind; ANSI Class 150, ASME SA105, HT.# AAY84, C/N 214098.	1-150-PS-SA 150-CL-2 AAY 84 7-46319-1 CAT #214098
718-4	d)	Flange, 2" NPS; ANSI Class 600, ASME SA105, HT.# 395 CNF, C/N 214438.	2B16600 #S/40 SA 150 395 CNF (WF I) PO# 7-46319-1 CATALOG #414438
718-5	e)	Flange, 2" NPS Blind; ANSI Class 1500, ASME SA105N, HT.# CHN, C/N 25355.	.21500 PS SA105 C12 OHN B16.5 PO 7-50730-1
718-6	f)	Flange, 4" NPS; ANSI Class 150, ASME SA105, HT.# YJI-6, C/N 214662.	Cc B164" 150 SA 105 S 80 YJY-6 6-16273-1
718-7	g)	Flange, 1" NPS; ANSI Class 600, ASME SA105, HT.# COX, C/N 216006.	1"-WJ-600-SA105 CL 8/COX/STD/S/ 346-23
718-8	h)	Flange, 1" NPS; ANSI Class 600, ASME SA105, HT.# COX, C/N 216076.	1"-WJ-600-SA105 CL B/COX/STD/S/ 346 26 1

NOTE ADDED BY PP&L FOR RESPONSE TO NRC:

SAMPLES 1, 2, 3, and 5 WERE FROM PSI

SAMPLES 7 and 8 WERE FROM WJM

SAMPLES 4 and 6 WERE NOT SUSPECT MATERIAL

Table 2. Flange Mechanical Requirements and Test Results

			Tensile Sample[3]		Tensile Properties[1][2]								Hardness[5]	
t No.	PP&L Sample No.	Specification	Diameter (in)	Gage Length (in)	Minimum Ultimate (ksi)	Test Ultimate (ksi)	Minimum Yield[4] (ksi)	Test Yield[4] (ksi)	Minimum Elongation (%)	Test Elongation (%)	Minimum Reduction of Area (%)	Test Reduction of Area (%)	Required[6] R_B	Test[7] R_B
3-1	214090	A 182	0.253	1.00	70	86.6	25	43.7	30	58.0	50	80.8	None	90.9
3-2	210233	A 181	0.252	1.00	70	78.9	36	45.5	18	21.0	24	70.9	None	85.9
3-3	214098	A 105	0.253	1.00	70	84.2	36	49.2	22	21.0	30	58.5	75-90.5	87.0
3-4	214438	A 105	0.249	1.00	70	71.8	36	54.4	22	36.0	30	76.0	75-90.5	79.6
3-5	25355	A 105	0.506	2.00	70	68.9	36	36.0	22	32.0	30	61.5	75-90.5	72.8
3-6	214662	A 105	0.506	2.00	70	79.0	36	43.5	22	28.5	30	57.0	75-90.5	83.1
3-7	216006	A 105	0.252	1.00	70	76.9	36	43.0	22	25.0	30	51.8	75-90.5	80.8
3-8	216076	A 105	0.254	1.00	70	75.7	36	47.3	22	27.0	30	56.3	75-90.5	84.6

1 Tests conducted in accordance with ASTM A 370-87b.

2 Minimum values specified in Tables in respective standards: ASTM A 105, A 181, or A 182.

3 Samples machined with standard 2-in gage length per ASTM A 370 or as large as feasible with dimensions proportional to the standard. The gage length must be four times the sample's diameter.

4 Determined by the 0.2% offset method.

5 Hardness tests not required for A 181 and A 182; in A 105 a hardness of 137-187 HB (75-90.5 R_B) is required if the part is too small for machining tensile specimens. If tensile tests are carried out, the specified hardness is 187 HB (90.5 R_B) max.

6 Values are converted from Brinell, HB, to Rockwell B, R_B.

7 Average of three readings except for Test 718-8 where six readings were taken because of scatter in data (82.3-88.6 R_B).

Table 3. Flange Chemical Requirements and Test Results

RC Test No.	PP&L Sample No.	Chemical Elements (%)[1]															
		C		Mn		P		S		Si		Cr		Mo		Ni	
		Max	Test	Min - Max	Test	Max	Test	Max	Test	Max	Test	Range	Test	Range	Test	Range	Test
18-1	214090	0.035	0.066	2.0	1.55	0.040	0.031	0.030	0.006	1.00	0.70	16.00-18.00	17.07	2.00-3.00	1.85	10.00-15.00	12.86
18-2	210233	0.35	0.30	1.10[2]	0.74	0.05	0.018	0.05	0.014	0.35	0.24						
18-3	214098	0.35[3]	0.31	0.60-1.05[3]	0.75	0.040	0.015	0.050	0.017	0.35	0.23						
18-4	214438	0.35[3]	0.14	0.60-1.05[3]	1.00	0.040	0.015	0.050	0.004	0.35	0.25						
18-5	25355	0.35[3]	0.19	0.60-1.05[3]	1.02	0.040	0.011	0.050	0.013	0.35	0.26						
18-6	214662	0.35[3]	0.29	0.60-1.05[3]	0.91	0.040	0.010	0.050	0.020	0.35	0.22						
18-7	216006	0.35[3]	0.30	0.60-1.05[3]	0.73	0.040	0.017	0.050	0.018	0.35	0.24						
18-8	216076	0.35[3]	0.30	0.60-1.05[3]	0.74	0.040	0.012	0.050	0.018	0.35	0.24						

(1) Specified in Tables in appropriate standards: ASTM A 182, A 131, or A 105. Blanks indicate no values are specified.
(2) Manganese may be increased to 1.35% maximum, provided the carbon is reduced 0.01% for each 0.06% increase in manganese over this limit.
(3) For each reduction of 0.01% below the specified carbon maximum, an increase of 0.06% manganese above the specified maximum is permitted up to a maximum of 1.35%.

FRANKLIN RESEARCH CENTER
DIVISION OF ARVIN/CALSPAN

July 14, 1988

Mr. Lou Willertz
Pennsylvania Power & Light Co.
Two North Ninth Street
Allentown, PA 18101

Dear Mr. Sutton:

This letter certifies that all activities performed during the operation of FRC Project P718-0001 (PP&L P.O. #S-04657-7), were in compliance with the FRC Quality Assurance Program, 10CFR50 Appendix B, ANSI N45.2 and 10CFR21.

Sincerely,

Janet Forman

Janet Forman
Q.A. Auditor

JF/ih

FRANKLIN RESEARCH CENTER
DIVISION OF ARVIN/CALSPAN

Document No. DTS-002

Date 7/15/88
Contract No. _____
Project No. D718-0001

Document Transmittal Sheet

To: Lou Willertz

From: Larry Leonard

Form of Documents

Prints _____
Memorandum _____
Reproducibles _____
Instructions/Procedures _____
Data Sheets _____
Report ✓
Test Plan _____
Other _____

Purpose

For Approval [ ]
For Comments [ ]
For Information [✓]

Description of Transmittal

Report of Flange Tests

Comments by Recipient

Approval (if applicable) N/A

[ ] Approved
[ ] Not Approved

Signature of Recipient _____ Date _____

SPS TECHNOLOGIES

Test Certification

SPS Laboratories

TO: Franklin Research Center
2600 Monroe Blvd.
Norristown, Pa 19403

Attn: Janet Forman

DATE: June 30, 1988

CERTIFICATION NO. 880702

PURCHASE ORDER NO. 77736

PART NO. See Below

TEST PERFORMED: One eight (8) supplied pipe flanges:

* Room temperature, ultimate tensile tests
* Surface Hardness
  Hardness Tester Calibration:
  Test Block: R_B 74.2 ± 1.0
  Actual: 74.2, 74.4, 74.1, 74.2, 74.4
  Test Block: R_B 86.1 ± 1.0
  Actual: 86.7, 86.9, 86.4, 86.7, 86.5

RESULTS:

Spec. No.	U.T.S. (psi)	Yield (psi)	% R.A.	% Elong.	Surface Hardness R_B		
718-1	86,600	43,700	80.8	58.0	89.9	91.2	91.7
718-2	78,900	45,500	70.9	21.0	86.0	86.3	85.4
718-3	84,200	49,200	58.5	21.0	86.8	87.3	86.9
718-4	71,800	54,400	76.0	36.0	80.0	79.4	79.3
718-5	68,900	36,000	61.5	32.0	72.1	73.7	72.7
718-6	79,900	43,500	57.0	28.5	83.3	82.9	83.2
718-7	76,900	43,000	51.8	25.0	81.4	80.0	81.0
718-8	75,700	47,300	56.3	27.0	88.6	83.8	82.3
718-8	- - -	- - -	- -	- -	84.1	85.0	83.6

(HARDNESS)

TESTED BY

Subscribed and sworn to before me this
6 day of July, 1988.

Michael A. Coladonato

MICHAEL A. COLADONATO
Notary Public, Jenkintown, Montg. Co.
My Commission Expires March 23, 1992

Lehigh Testing Laboratories, Inc.
308 WEST BASIN ROAD • P.O BOX 903 • NEW CASTLE, DELAWARE 19720 • (302) 328-0500

TEST REPORT

FRANKLING RESEARCH CENTER
ATTN JANET FOREMAN
2600 MONROE BOULEVARD
NORRISTOWN PA 19401

DATE June 30, 1988

P.O. NO. K 10935

LEHIGH NO. E-1-17 Pcs 1 thru 4

MATERIAL:
SPECIFICATION:
SAMPLE DESIGNATION: (4) Samples Marked: 718-1, 718-2, 718-3 and 718-4

CHEMICAL ANALYSIS (%)	E-1-17-1 718-1	E-1-17-2 718-2	E-1-17-3 718-3	E-1-17-4 718-4
Carbon	0.066	0.30	0.31	0.14
Manganese	1.55	0.74	0.75	1.00
Phosphorus	0.031	0.018	0.015	0.015
Sulfur	0.006	0.014	0.017	0.004
Silicon	0.70	0.24	0.23	0.25
Nickel	12.86			
Chromium	17.07			
Molybdenum	1.85			

Lehigh Testing Laboratories, Inc.

Jung-chen Johnson

Jung-chen Johnson, Ph.D.

Lehigh Testing Laboratories, Inc.
308 WEST BASIN ROAD • P.O. BOX 903 • NEW CASTLE, DELAWARE 19720 • (302) 328-0500

TEST REPORT

FRANKLIN RESEARCH CENTER
ATTN JANET FOREMAN
2600 Monroe Blvd.
Norristown PA 19401

DATE June 30, 1988

P.O. NO. K 10935

LEHIGH NO. E-1-17 Pcs 5 thru 8

MATERIAL:
SPECIFICATION:
SAMPLE DESIGNATION: (4) Samples Marked: 718-5, 718-6, 718-7 and 718-8

CHEMICAL ANALYSIS (%)	E-1-17-5 718-5	E-1-17-6 718-6	E-1-17-7 718-7	E-1-17-8 718-8
Carbon	0.19	0.29	0.30	0.30
Manganese	1.02	0.91	0.73	0.74
Phosphorus	0.011	0.010	0.017	0.012
Sulfur	0.013	0.020	0.018	0.018
Silicon	0.26	0.22	0.24	0.24

Lehigh Testing Laboratories, Inc.

Jung-chen Johnson

Jung-chen Johnson, Ph.D.

FRANKLIN RESEARCH CENTER
DIVISION OF ARVIN/CALSPAN

Date June 24, 1988

TO: Distribution FROM: Janet Forman

SUBJECT: Report of Test Monitoring at SPS Technologies, PP&L - Project 701-P718-0001

Project:	Flange Testing - Project 701-P718-0001
Location:	SPS Technologies, Jenkintown, PA
Date:	6/20/88 & 6/24/88
Offical Contacted:	Mike Coladonato, Supervisor of Contract Research Phone No. 572-3557
Test Witnessed:	Hardness Tests Tensile Tests
Procedures:	*ASTM A 370-87b, paragraphs 13 & 18, *ASTM A 181/A 181M-87 *ASTM A 182/A 182M-87a, & *ASTM A 105/A 105M-87a
Operators:	Christopher Casey, Lenard Croissette
FRC Q.A. Witness:	Janet Forman
Items Tested:	ASME Flanges (See Table 1 for I.D. numbers and corresponding specifications)

HARDNESS TESTS:

FRC Quality Assurance Auditor, Janet Forman witnessed the hardness tests of the eight ASME Flanges. Three readings were taken on the surface of the flanges except for specimen #718-8. Six readings were taken on this specimen because of the broad range of hardness values (82 R_B-88 R_B). Readings were taken prior to tensile testing. (Note: Hardness is not a specified requirement in ASTM A 181 or ASTM A 182 but was performed at the customer's request.)

* Identical with corresponding ASME standards

DISTRIBUTION: ALR, SPC, LL, QA, (6227-018, P718-0001)

Tests were performed under the following conditions:

- o calibrated equipment - NBS traceability
- o adequate environmental conditions
- o qualified test operators
- o in accordance with ASTM A 370 paragraph 18

TENSILE TESTING

Machined specimens #718-1→ #718-8 were inspected prior to tensile testing to determine that diameter vs gage length proportions were correct. See Attachment 1. FRC Quality Assurance Auditor, Janet Forman witnessed the tensile testing of eight ASME flanges.

Test were performed under the following conditions:

- o calibrated equipment - NBS tracebility
- o adequate environmental conditions
- o a qualified test operator
- o in accordance with ASTM A 370 paragraph 13

CONCLUSIONS AND COMMENTS:

Test methods were in accordance with those specified in PP&L Order No. S 04657-5 and 'Request for Deviation from Test Specification', No. 718-1 (Attachment 2).

Specifically, the following requirements were met for all testing at SPS Technologies:

- o All test equipmemt was calibrated and traceable to NBS
- o All test personnel were qualified
- o Testing was performed in an adequate environment
- o procedures were in accordance ASTM A 370-87 paragraphs 13 & 18

The hardness tests and tensile tests at SPS Technologies were performed in accordance with the FRC quality assurance program, and the contractual requirements of the customer.

TABLE 1. FLANGE IDENTIFICATION

PP&L Sample No.	FRC Sample No.	Standard	Flange Size
214090	718-1	ASME SA 182 Gr. F316L	1"
210223	718-2	ASME SA 181 Cl.70	1"
214098	718-3	ASME SA 105	1"
214438	718-4	ASME SA 105	2"
25355	718-5	ASME SA 105 N	2"
214662	718-6	ASME SA 105	4"
216006	718-7	ASME SA 105	1"
216076	718-8	ASME SA 105	1"

ATTACHMENT 1.

	FRANKLIN RESEARCH CENTER DIVISION OF ARVIN/CALSPAN	PAGE 1 of 1 PROJECT P718-1000

VISUAL INSPECTION REPORT

EVENT IMMEDIATELY PRECEDING INSPECTION

Test specimens machined.

ITEM	COMMENTS & OBSERVATIONS		OBS.	DATE
	SPECIMEN DIAMETER	GAGE LENGTH		
817-1	.253	1.00	JEF	6/24/88
817-2	.252	1.00	JEF	6/24/88
817-3	.254	1.00	JEF	6/24/88
817-4	.249	1.00	JEF	6/24/88
817-5	.508	2.00	JEF	6/24/88
817-6	.506	2.00	JEF	6/24/88
817-7	.253	1.00	JEF	6/24/88
817-8	.254	1.00	JEF	6/24/88

DISPOSITION:

To Tensile Testing

SUPERVISOR:	SIGNATURE:	DATE: 6/24/88

ATTACHMENT 2.

REQUEST FOR DEVIATION FROM TEST SPECIFICATION

NO. P718-1

DATE 6/21/88

TO (CUSTOMER)

Lou Willertz
PP&L
2 N. Ninth Street
Allentown, PA 18101

FROM

J. Forman
Franklin Research Center
Valley Forge Corporate Center
2600 Monroe Blvd.
Norristown, PA 19403

CRITICALITY

- [x] MINOR
- [ ] MAJOR
- [ ] CRITICAL

EVENT

- [ ] UNEXPECTED SPECIMEN FAILURE
- [ ] PERSONNEL ERROR
- [ ] FACILITY MALFUNCTION
- [ ] ACCIDENT
- [x] OTHER Absence of Brinell Tester

PROJECT NO.	PROJECT TITLE	CONTRACT/P.O. NO.
P178-0001	Flange Tests	S 04657-5

SPECIMEN I.D. NO.	EQUIPMENT TYPE
718-1 → 718-8	Flanges

SERIAL NO.	MANUFACTURER	MODEL NO.
N/A	N/A	N/A

TEST SPECIFICATION

ASTM A 105/A 105M-87a, paragrph 9.4.4 requires hardness testing of specimens using the Brinell method.

REASON FOR DEVIATION

SPS Technologies does not have a Brinell Tester, but equivalent readings can be taken using the Rockwell 'B' scale. FRC is requesting permission to make this substitution.

REQUESTED BY

ENGINEERING — DATE 6/21/88

QUALITY ASSURANCE — DATE 6/21/88

APPROVED BY (CUSTOMER)

NAME

TITLE Sr. Proj Engr — DATE 6/27/88

Field Hardness Test Results

Mfgr	Material	Heat #	Code	Size/Type	BHN	
WJM	SA105	A13711	ABUA	1.5" 150# RFWN	168	
WJM	SA105	A13711	ABUA	1.5" 150# RFWN	168	
WJM	SA105	CIT		6" 150# RFSO	156	
WJM	SA105	CIT		6" 150# RFSO	163	
WJM	SA105	CKS		1" 150# RFSW	160	
WJM	SA105	CKS		1" 150# RFSW	158	
WJM	SA105	CND		4" 150# FFSO	158	
WJM	SA105	CND		4" 150# FFSO	150	
WJM	SA105	CND		6" 150# FFSO	150	
WJM	SA105	CND		6" 150# FFSO	156	
WJM	SA105	EUHJ		20" 300# RFWN	157	
WJM	SA105	EUHJ		20" 300# RFWN	162	
WJM	SA105	M92091	ABTZ	1" 150# RFWN	174	
WJM	SA105	M92091	ABTZ	1" 150# RFWN	168	
WJM	SA105	VP		0.5" 150# RFSW	144	
WJM	SA105	VP		0.5" 150# RFSW	138	
WJM	SA105	03575		4" 300# RFWN	151	
WJM	SA105	03575		4" 300# RFWN	157	
WJM	SA105	03575		4" 300# RFWN	140	
WJM	SA105	03575		4" 300# RFWN	153	
WJM	SA350	17703		3" 300# Lap Joint	147	
WJM	SA350	17703		3" 300# Lap Joint	174	
WJM	SA350	17703		3" 300# Lap Joint	157	
WJM	SA350	17703		3" 300# Lap Joint	150	
WJM	SA105	222A9	ABTY	2" 150# RFWN	163	
WJM	SA105	23804		12" 150# RFWN	160	
WJM	SA105	3426		20" 150# RFWN	158	
WJM	SA105	3426		20" 150# RFWN	165	
WJM	SA105	3426		20" 150# RFWN	160	
WJM	SA105	3426		20" 150# RFWN	157	
WJM	SA105	3426		20" 150# RFWN	163	
WJM	SA105	3426		20" 150# RFWN	160	
WJM	SA105	3426		20" 150# RFWN	156	
WJM	SA105	3426		20" 150# RFWN	160	
WJM	SA105	4631		4" 300# RFWN	133	* See Chemical Analyses: Sample #3
WJM	SA105	4631		4" 300# RFWN	130	* See Chemical Analyses: Sample #1
WJM	SA105	4631		4" 300# RFWN	134	* See Chemical Analyses: Sample #2
WJM	SA105	4631		4" 300# RFWN	145	
WJM	SA105	4631		4" 300# RFWN	141	
WJM	SA105	4631		4" 300# RFWN	138	See Chemical Analyses: Sample #8
WJM	SA105	4631		4" 300# RFWN	132	* See Chemical Analyses: Sample #6
WJM	SA105	6X11010		10" 150# RFSO	148	
WJM	SA105	6X11010		10" 150# RFSO	141	
WJM	SA105	6011375		10" 150# RFSO	138	See Chemical Analyses: Sample #7
WJM	SA105	6011375		10" 150# RFSO	144	
WJM	SA105	661P018		6" 150# RFWN	134	* See Chemical Analyses: Sample #4
WJM	SA105	661P018		6" 150# RFWN	134	* See Chemical Analyses: Sample #5
WJM	SA105	69		12" 150# RFWN	180	

Total Tested: 48

* Reported to NRC

ATTACHMENT 8

PPR# 1584G Sheet 8 of 1

CERTIFICATE OF CONFORMANCE

ATTACHMENT 9

(Instructions on reverse of this form)

We certify that the listed items shipped and required documentation for same conforms to the requirements of the purchase order/release/contract and applicable codes, standards, specifications, and drawings unless otherwise noted below.

(1) Purchase Order/Release No. or Contract Title: S-04688-5

(2) Change Order Notice/Amendment No.: _____

(3) Supplier Name: LEHIGH TESTING LABORATORIES, INC.

(4) Supplier Address: 308 West Basin Road, New Castle, DE 19720

ITEM IDENTIFICATION

(5) PP&L Order Item No.	(6) PP&L Catalog No.	(7) Quantity Shipped	(8) Description
Sample #1			Carbon Steel Drillings
" #2			"
" #3			"
" #4			"
" #5			"
" #6			"

(9) PP&L Approved Exceptions (Attach PP&L Approval Documentation): _____

(10) J. Gary McCauley
Signature (Responsible Supplier Representative)

(11) General Manager
(Title)

(12) 7/29/88
Date

NDI-QA-2.4.7C
Rev. 1 (7/87)

PPR# 15846 Sheet 2 of 1

CERTIFICATE OF CONFORMANCE

(Instructions on reverse of this form)

We certify that the listed items shipped and required documentation for same conforms to the requirements of the purchase order/release/contract and applicable codes, standards, specifications, and drawings unless otherwise noted below.

(1) Purchase Order/Release No. or Contract Title: S-04688-5

(2) Change Order Notice/Amendment No.: _____

(3) Supplier Name: LEHIGH TESTING LABORATORIES, INC.

(4) Supplier Address: 308 West Basin Road, New Castle, DE 19720

ITEM IDENTIFICATION

(5) PP&L Order Item No.	(6) PP&L Catalog No.	(7) Quantity Shipped	(8) Description
Sample #7			Carbon Steel Drillings
" #8			"

(9) PP&L Approved Exceptions (Attach PP&L Approval Documentation): _____

(10) John McCauley
Signature (Responsible Supplier Representative)

(11) General Mgr.
(Title)

(12) 7/29/88
Date

NDI-QA-2.4.7C
Rev. 1 (7/87)

Lehigh Testing Laboratories, Inc.
308 WEST BASIN ROAD • P.O. BOX 903 • NEW CASTLE, DELAWARE 19720 • (302) 328-0500

TEST REPORT

- PENNSYLVANIA POWER AND LIGHT CO.
  Susquehanna Steam Electric Station
  P.O. Box 467
  Berwick, PA 18603
  Attention: Material Supervisor

DATE July 29, 1988

P.O. NO. S-04688-5

LEHIGH NO. E-7-1-1

MATERIAL: Carbon Steel Drillings
SPECIFICATION: ASME SA-105 Per Section II 1980 Edition
SAMPLE DESIGNATION: Sample #1 (NCR 88-0457), 4" Flange, South Side of Valve, OT535E1, S83826

CHEMICAL ANALYSIS (%)		SPECIFICATION REQUIREMENTS
Carbon	0.22	0.35X
Manganese	0.90	0.60-1.05
Phosphorus	0.024	0.040X
Sulfur	0.014	0.050X
Silicon	0.25	0.35X

Lehigh Testing Laboratories, Inc.

Jung-chen Johnson

Jung-chen Johnson, Ph.D.

Lehigh Testing Laboratories, Inc.
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TEST REPORT

PENNSYLVANIA POWER AND LIGHT CO.
Susquehanna Steam Electric Station
P.O. Box 467
Berwick, PA 18603
Attention: Material Supervisor

DATE July 29, 1988
P.O. NO. S-04688-5
LEHIGH NO. E-7-1-2

MATERIAL: Carbon Steel Drillings
SPECIFICATION: ASME SA-105 Per Section II 1980 Edition
SAMPLE DESIGNATION: Sample #2, S83826, NCR 88-0457, 4" Flange East Side of Valve 034343

CHEMICAL ANALYSIS (%)		SPECIFICATION REQUIREMENTS
Carbon	0.19	0.35X
Manganese	0.91	0.60-1.05
Phosphorus	0.024	0.040X
Sulfur	0.022	0.050X
Silicon	0.26	0.35X

Lehigh Testing Laboratories, Inc.

Jung-chen Johnson

Jung-chen Johnson, Ph.D.

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TEST REPORT

PENNSYLVANIA POWER AND LIGHT CO.
Susquehanna Steam Electric Station
P.O. Box 467
Berwick, PA 18603
Attention: Material Supervisor

DATE July 29, 1988
P.O. NO. S-04688-5
LEHIGH NO. E-7-1-3

MATERIAL: Carbon Steel Drillings
SPECIFICATION: ASME SA-105 Per Section II 1980 Edition
SAMPLE DESIGNATION: Sample #3, S83826, NCR 88-0457, 4" Flange West of Valve, 034341

CHEMICAL ANALYSIS	(%)	SPECIFICATION REQUIREMENTS
Carbon	0.22	0.35X
Manganese	0.91	0.60-1.05
Phosphorus	0.025	0.040X
Sulfur	0.016	0.050X
Silicon	0.25	0.35X

NOTE:

Lehigh Testing Laboratories, Inc.

Jung-chen Johnson

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TEST REPORT

• PENNSYLVANIA POWER AND LIGHT CO.
Susquehanna Steam Electric Station
P.O. Box 467
Berwick, PA 18603
Attention: Material Supervisor

DATE July 29, 1988
P.O. NO. S-04688-5
LEHIGH NO. E-7-1-4

MATERIAL: Carbon Steel Drillings
SPECIFICATION: ASME SA-105 Per Section II 1980 Edition
SAMPLE DESIGNATION: Sample #4, S83822, NCR 88-0452, West Flange Connected to Flex Hose Between OP523E and LF03463E

CHEMICAL ANALYSIS (%)		SPECIFICATION REQUIREMENTS
Carbon	0.25	0.35X
Manganese	0.90	0.60-1.05
Phosphorus	0.010	0.040X
Sulfur	0.025	0.050X
Silicon	0.23	0.35X

NOTE:

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TEST REPORT

• PENNSYLVANIA POWER AND LIGHT CO.
Susquehanna Steam Electric Station
P.O. Box 467
Berwick, PA 18603
Attention: Material Supervisor

DATE July 29, 1988
P.O. NO. S-04688-5
LEHIGH NO. E-7-1-5

MATERIAL: Carbon Steel Drillings
SPECIFICATION: ASME SA-105 Per Section II 1980 Edition
SAMPLE DESIGNATION: Sample #5, S83822, NCR 88-0452, East Flange Connected to Flex Hose Between OP523E and LF03463E

CHEMICAL ANALYSIS (%)		SPECIFICATION REQUIREMENTS
Carbon	0.31	0.35X
Manganese	0.86	0.60-1.05
Phosphorus	0.008	0.040X
Sulfur	0.028	0.050X
Silicon	0.21	0.35X

NOTE:

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TEST REPORT

PENNSYLVANIA POWER AND LIGHT CO.
Susquehanna Steam Electric Station
P.O. Box 467
Berwick, PA 18603
Attention: Material Supervisor

DATE July 29, 1988
P.O. NO. S-04688-5
LEHIGH NO. E-7-1 -6

MATERIAL: Carbon Steel Drillings
SPECIFICATION: ASME SA-105 Per Section II 1980 Edition
SAMPLE DESIGNATION: Sample #6, S83829, NCR 88-0461, 2ND Flange North of Pump OP530E

CHEMICAL ANALYSIS (%)		SPECIFICATION REQUIREMENTS
Carbon	0.19	0.35X
Manganese	0.98	0.60-1.05
Phosphorus	0.021	0.040X
Sulfur	0.021	0.050X
Silicon	0.27	0.35X

DATE:

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TEST REPORT

• PENNSYLVANIA POWER AND LIGHT CO.
Susquehanna Steam Electric Station
P.O. Box 467
Berwick, PA 18603
Attention: Material Supervisor

DATE July 29, 1988
P.O. NO. S-04688-5
LEHIGH NO. E-7-1-7

MATERIAL: Carbon Steel Drillings
SPECIFICATION: ASME SA-105 Per Section II 1980 Edition
SAMPLE DESIGNATION: Sample #7, WA#83831, NCR-88-0453, Flange North End of OE-507E, Jacket Water Heat Exchanger "E" Diesel

CHEMICAL ANALYSIS (%)		SPECIFICATION REQUIREMENTS
Carbon	0.28	0.35X
Manganese	0.93	0.60-1.05
Phosphorus	0.008	0.040X
Sulfur	0.021	0.050X
Silicon	0.24	0.35X

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TEST REPORT

• PENNSYLVANIA POWER AND LIGHT CO.
Susquehanna Steam Electric Station
P.O. Box 467
Berwick, PA 18603
Attention: Material Supervisor

DATE July 29, 1988
P.O. NO. S-04688-5
LEHIGH NO. E-7-1-8

MATERIAL: Carbon Steel Drillings
SPECIFICATION: ASME SA-105 Per Section II 1980 Edition
SAMPLE DESIGNATION: Sample #8, WA#S83826, NCR 88-0457, Flange East of Valve 034342

CHEMICAL ANALYSIS (%)		SPECIFICATION REQUIREMENTS
Carbon	0.19	0.35X
Manganese	0.95	0.60-1.05
Phosphorus	0.018	0.040X
Sulfur	0.021	0.050X
Silicon	0.27	0.35X

Lehigh Testing Laboratories, Inc.

Jung-chen Johnson

Jung-chen Johnson, Ph.D.

Samples of West Jersey Flanges tested by Bechtel for NUMARC

PP&L Sample #	PP&L RIR #	Mfgr	Material	Heat	Description
1	82-1549	WJM	SA105N	GDFS	1.0" 1500# Blind
2	82-1549	WJM	SA105N	GDDO	1.5" 1500# Blind
3	82-1549	WJM	SA105N	GDDN	2.0" 1500# Blind
4	82-1549	WJM	SA105N	GDKR	2.5" 1500# Blind
5	82-1549	WJM	SA105N	GDKR	3" 1500# Blind
6	82-1549	WJM	SA105N	ETOO	4" 1500# Blind
7	82-1549	WJM	SA105N	GDDN	2.0" 1500# Threaded
8	84-4845	WJM	SA105	202X	2" 1500# RFSW
9	84-5503	WJM	SA105	43B	1.5" 150# FFSW
10	84-5511	WJM	SA105	A23	0.75" 1500# Ring Joint SW
11	84-5511	WJM	SA105	39E	1" 600# Ring Joint SW
12	84-5530	WJM	SA105	VS	1.5" 300# FFSW
13	84-5551	WJM	SA105	202X	2" 1500#
14 (pr)	84-5559	WJM	SA105	80508	2" 600# SWWJ
15	84-5718	WJM	SA105	WJM-B4	1" 600# SW
16	84-5824	WJM	SA105	2059	2" 300# RFWJ Orifice
17	84-5829	WJM	SA105	A29	2" 600# Blind
18	84-5878	WJM	SA105	A23	1" 300# FFSW
19	84-5898	WJM	SA105	80508	1" 900# SWWJ
20	84-5904	WJM	SA105	VP	0.5" 150# RFSW

ATTACHMENT 10