

Item	Unit	Measuring Point	Recording				ANN High	ANN Low
			E-1	E-2	E-3(a)	E-4(a)		
Test Number			8/6	8/6	8/6	8/6		
Date			08:30	11:30	14:30	16:30		
Time								
RH out tube metal temp.	°C	DL E71T10	498.4	514.0	511.6	512.2	599	
RH out tube metal temp.	°C	DL E71T11	482.0	496.1	493.3	493.0	599	
RH out tube metal temp.	°C	DL E71T12	573.2	627.2	613.3	616.3	599	
RH out tube metal temp.	°C	DL E71T13	554.7	604.1	588.5	593.7	599	
RH out tube metal temp.	°C	DL E71T14	525.6	586.5	567.2	574.2	599	
RH out tube metal temp.	°C	DL E71T15	522.6	587.9	563.6	573.2	599	
RH out tube metal temp.	°C	DL E71T16	495.6	536.9	524.5	531.9	599	
RH out tube metal temp.	°C	DL E71T17	473.1	516.8	506.2	514.1	599	
RH out tube metal temp.	°C	DL E71T18	500.7	494.7	489.7	488.1	599	
RH out tube metal temp.	°C	DL E71T19	478.7	477.4	472.1	473.3	599	
RH out tube metal temp.	°C	DL E71T20	490.9	492.8	489.5	483.8	599	
RH out tube metal temp.	°C	DL E71T21	474.5	478.1	474.0	468.8	599	
RH out tube metal temp.	°C	DL E71T22	496.1	509.5	511.1	501.2	599	
RH out tube metal temp.	°C	DL E71T23	475.9	492.1	491.6	482.9	599	
RH out tube metal temp.	°C	DL E71T24	504.3	521.0	516.9	510.4	599	
RH out tube metal temp.	°C	DL E71T25	522.8	560.9	556.8	543.4	599	
RH out tube metal temp.	°C	DL E71T26	570.6	615.4	608.5	594.9	599	
RH out tube metal temp.	°C	DL E71T27	563.4	609.3	599.6	586.1	599	
RH out tube metal temp.	°C	DL E71T28	543.9	581.1	578.0	562.2	599	
RH out tube metal temp.	°C	DL E71T29	512.2	532.5	525.2	519.7	599	

FURNACE TEMPERATURE

(IV-1)

Test Number	Item	Unit	Measuring Point	Recording				ANN High	ANN Low
				E-1	E-2	E-3(a)	E-4(a)		
Date				8/6	8/6	8/6	8/6		
Time				08:30	11:30	14:30	16:30		
3F	Left near S/B C-3	°C	local	1,260	1,260	1,260	1,270		
3F	Right near S/B C-1	°C	local	1,245	1,255	1,255	1,230		
3F	Mezz. Rear Right near S/B F-2	°C	local	1,420	1,365	1,365	1,340		
3F	Mezz. Rear Left near S/B F-5	°C	local	1,405	1,365	1,365	1,390		
4F	Mezz. Right Rear near S/B D-2	°C	local	1,435	1,460	1,460	1,460		
4F	Mezz. Left Rear near S/B D-7	°C	local	1,430	1,445	1,445	1,420		
5F	Left Rear near S/B C-3	°C	local	1,440	1,440	1,440	1,410		
5F	Right Rear near S/B C-2	°C	local	1,440	1,460	1,460	1,460		
7F	Mezz. Front Right 2nd Port	°C	local	1,290	1,290	1,290	1,290		
7F	Mezz. Front Center Port	°C	local	1,290	1,260	1,260	1,280		
7F	Mezz. Front Left 2nd Port	°C	local	1,260	1,255	1,255	1,250		
8F	Left near S/B 6-L	°C	local	1,145	1,140	1,140	1,140		
8F	Right near S/B 6-R	°C	local	1,130	1,125	1,125	1,110		
8F	Rear Left 2nd Port	°C	local	1,020	1,015	1,015	1,000		
9F	Left near S/B 4-L	°C	local	1,035	1,040	1,040	1,025		
9F	Right near S/B 4-R	°C	local	1,020	1,010	1,010	1,010		
9F	Front Left 2nd Port	°C	local	1,020	1,040	1,040	1,020		
9F	Front Center Port	°C	local	1,015	1,010	1,010	1,010		
9F	Front Right 2nd Port	°C	local	1,015	1,045	1,045	1,010		

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Item	Unit	Measuring Point	Recording				ANN High	ANN Low
			E-1	E-2	E-3(a)	E-4(a)		
Test Number			8/6	8/6	8/6	8/6		
Date			08:30	11:30	14:30	16:30		
Time								
A-1 Air resistor open		Local	5.0	5.0	5.0	5.0		
A-2 Air resistor open		Local	4.8	4.8	4.8	4.8		
A-3 Air resistor open		Local	4.0	4.0	4.0	4.0		
A-4 Air resistor open		Local	3.8	3.8	3.8	3.8		
B-1 Air resistor open		Local	5.0	5.0	5.0	5.0		
B-2 Air resistor open		Local	4.5	4.5	4.5	4.5		
B-3 Air resistor open		Local	4.7	4.7	4.7	4.7		
B-4 Air resistor open		Local	4.5	4.5	4.5	4.5		
C-1 Air resistor open		Local	5.0	5.0	5.0	5.0		
C-2 Air resistor open		Local	4.9	4.9	4.9	4.9		
C-3 Air resistor open		Local	5.0	5.0	5.0	5.0		
C-4 Air resistor open		Local	4.0	4.0	4.0	4.0		
D-1 Air resistor open		Local	1.4	1.4	1.4	1.4		
D-2 Air resistor open		Local	2.5	2.5	2.5	2.5		
D-3 Air resistor open		Local	2.2	2.2	2.2	2.2		
D-4 Air resistor open		Local	2.9	2.9	2.9	2.9		
Airport damper open (Right)		Local	1.8	2.0	1.5	1.0		
Airport damper open (Left)		Local	1.8	1.9	1.4	1.0		

Item	Unit	Measuring Point	Recording				B.E.T.		ANN High	ANN Low
			E-1 8/6	E-2 8/6	E-3(a) 8/6	E-4(a) 8/6				
Test Number										
Date			08:30	11:30	14:30	16:30				
Time										
Burner Barrel A-1	°C	DL B60T10	275.1	294.5	295.5	298.1		400		
Burner Barrel A-1	°C	DL B60T11	178.4	201.7	203.1	205.2		400		
Burner Barrel A-1	°C	DL B60T12	268.1	288.7	289.3	291.7		400		
Burner Barrel A-1	°C	DL B60T13	258.2	276.7	278.6	280.7		400		
Burner Barrel A-2	°C	DL B60T20	280.7	301.5	302.0	303.0		400		
Burner Barrel A-2	°C	DL B60T21	211.9	232.2	231.7	233.2		400		
Burner Barrel A-2	°C	DL B60T22	236.9	255.6	256.5	257.8		400		
Burner Barrel A-2	°C	DL B60T23	255.7	278.1	279.6	280.9		400		
Burner Barrel A-3	°C	DL B60T30	238.0	261.9	264.1	265.9		400		
Burner Barrel A-3	°C	DL B60T31	200.1	227.8	229.5	230.8		400		
Burner Barrel A-3	°C	DL B60T32	263.4	286.8	288.1	289.8		400		
Burner Barrel A-3	°C	DL B60T33	270.8	293.9	294.9	296.2		400		
Burner Barrel A-4	°C	DL B60T40	278.8	301.4	302.1	302.3		400		
Burner Barrel A-4	°C	DL B60T41	157.9	174.3	174.0	174.5		400		
Burner Barrel A-4	°C	DL B60T42	270.1	290.2	291.5	292.5		400		
Burner Barrel A-4	°C	DL B60T43	281.9	301.6	303.1	304.3		400		
Burner Barrel B-1	°C	DL B61T10	226.7	245.9	248.7	250.3		400		
Burner Barrel B-1	°C	DL B61T11	238.5	264.7	264.8	266.6		400		
Burner Barrel B-1	°C	DL B61T12	276.5	296.5	298.4	300.0		400		
Burner Barrel B-1	°C	DL B61T13	255.7	272.3	274.1	275.5		400		
Burner Barrel B-2	°C	DL B61T20	249.3	270.5	273.2	274.8		400		
Burner Barrel B-2	°C	DL B61T21	206.6	229.2	229.7	231.9		400		
Burner Barrel B-2	°C	DL B61T22	277.7	294.7	296.6	298.8		400		
Burner Barrel B-2	°C	DL B61T23	254.6	273.3	274.8	276.1		400		
Burner Barrel B-3	°C	DL B61T30	253.2	267.6	269.8	271.4		400		
Burner Barrel B-3	°C	DL B61T31	192.0	214.1	214.9	216.4		400		
Burner Barrel B-3	°C	DL B61T32	278.3	290.3	291.7	292.8		400		
Burner Barrel B-3	°C	DL B61T33	251.9	269.6	273.0	274.4		400		
Burner Barrel B-4	°C	DL B61T40	242.8	261.9	263.1	264.3		400		
Burner Barrel B-4	°C	DL B61T41	231.6	257.4	257.8	258.9		400		
Burner Barrel B-4	°C	DL B61T42	263.1	278.9	280.0	281.5		400		
Burner Barrel B-4	°C	DL B61T43	262.3	282.0	283.0	283.9		400		

Test Number	Date	Time	Item	Unit	Measuring Point	Recording				B.E.T.		ANN
						E-1	E-2	E-3(a)	E-4(a)	High	Low	ANN
						8/6	8/6	8/6	8/6			
		08:30				11:30	14:30	16:30				
Burner Barrel C-1			DL B62T10	°C		252.7	271.9	273.8	276.1			400
Burner Barrel C-1			DL B62T11	°C		242.9	268.0	268.3	270.8			400
Burner Barrel C-1			DL B62T12	°C		252.7	275.8	276.5	279.1			400
Burner Barrel C-1			DL B62T13	°C		247.2	267.2	268.8	270.5			400
Burner Barrel C-2			DL B62T20	°C		272.7	297.1	298.7	300.8			400
Burner Barrel C-2			DL B62T21	°C		219.5	243.0	243.2	244.8			400
Burner Barrel C-2			DL B62T22	°C		257.6	282.1	283.7	285.6			400
Burner Barrel C-2			DL B62T23	°C		301.7	323.6	323.1	323.7			400
Burner Barrel C-3			DL B62T30	°C		44.2	56.8	57.9	50.2			400
Burner Barrel C-3			DL B62T31	°C		51.8	63.1	63.8	60.9			400
Burner Barrel C-3			DL B62T32	°C		284.0	308.8	310.3	311.7			400
Burner Barrel C-3			DL B62T33	°C		234.9	257.7	259.3	261.1			400
Burner Barrel C-4			DL B62T40	°C		250.3	274.1	276.1	277.6			400
Burner Barrel C-4			DL B62T41	°C		246.2	271.9	273.0	274.3			400
Burner Barrel C-4			DL B62T42	°C		257.7	281.6	282.9	284.0			400
Burner Barrel C-4			DL B62T43	°C		271.8	295.8	297.1	298.0			400
Burner Barrel D-1			DL B63T10	°C		331.3	346.0	349.6	351.2			400
Burner Barrel D-1			DL B63T11	°C		294.8	316.8	317.4	318.9			400
Burner Barrel D-1			DL B63T12	°C		346.3	356.8	359.8	358.8			400
Burner Barrel D-1			DL B63T13	°C		347.5	359.0	362.6	362.2			400
Burner Barrel D-2			DL B63T20	°C		347.0	359.5	363.4	361.9			400
Burner Barrel D-2			DL B63T21	°C		277.2	301.9	302.4	303.4			400
Burner Barrel D-2			DL B63T22	°C		369.4	375.8	373.9	373.2			400
Burner Barrel D-2			DL B63T23	°C		339.5	355.1	357.9	358.2			400
Burner Barrel D-3			DL B63T30	°C		-	-	-	-			400
Burner Barrel D-3			DL B63T31	°C		278.8	303.5	304.1	303.6			400
Burner Barrel D-3			DL B63T32	°C		321.7	337.2	339.1	337.9			400
Burner Barrel D-3			DL B63T33	°C		348.8	361.4	364.5	362.8			400
Burner Barrel D-4			DL B63T40	°C		332.2	346.7	349.7	348.4			400
Burner Barrel D-4			DL B63T41	°C		288.4	305.6	308.1	309.2			400
Burner Barrel D-4			DL B63T42	°C		356.9	361.9	364.4	361.5			400
Burner Barrel D-4			DL B63T43	°C		328.8	344.2	346.4	346.5			400

Combustion Test of Calaca Unit I Boiler

(I-1)

Item	Unit	Measuring Point	Recording				ANN High	ANN Low
			E-5 8/7	E-6(a) 8/7	E-8(a) 8/7	E-9(a) 8/7		
Test Number			60/40	60/40	60/40	60/40		
Date			09:00	10:30	13:00	14:30		
Time								
Coal blend ratio	(S/A)		60/40	60/40	60/40	60/40		
Generator load	MW	DL Q20W10	293.3	292.8	295.5	304.7	300	
Main steam flow	T/H	DL G21H10	929	904	939	960	913.3	
Feed water flow	T/H	DL E15F10	838	822	864	886	881.5	
SH spray flow	T/H	DL E55F10	90.2	89.2	74.8	90.4	56.4	
Drum level	mm	DL E20L10	10.1	8.1	-7.4	38.6	-11.7 127 -203	
Drum pressure	kg/cm <sup>2</sup>	DL E20P10	178.7	176.8	180.4	184.6	187.2 200	
Turbine inlet steam press.	kg/cm <sup>2</sup>	DL G21P10	164.8	163.3	166.7	170.6	171	
Final SH outlet temperature	°C	DL E60T10	539.5	548.9	535.8	536.7	542.5	
RH outlet temperature	°C	DL E74T10	542.2	550.0	529.1	537.2	541.6	
Eco. inlet feedwater temp.	°C	DL E10T10A	275.1	274.4	275.0	276.4		
A Hot primary air flow	T/H	DL A42F10	110	120	124	111		
B Hot primary air flow	T/H	DL A46F10	114	112	136	132		
A Tempering air flow	T/H	DL A42F20	56	52	30	39		
B Tempering air flow	T/H	DL A46F20	53	55	30	36		
A Secondary air flow	T/H	DL A52F10	419	397	395	415		
B Secondary air flow	T/H	DL A52F10	437	449	446	454		
Total air flow	T/H	DL A60G10	1,194	1,181	1,146	1,182		
Boiler exit gas O <sub>2</sub>	% (A)	DL A80C10	3.14	3.21	3.40	3.20	- 5.88 2.94	
Boiler exit gas O <sub>2</sub>	% (B)	DL A80C20	-	-	-	-	3.22 5.88 2.94	
Total fuel flow	T/H	DL B10G10A	139.85	139.85	139.78	139.75	110.4	
A FDF discharge draft	mmAq	DL A12F10	179.8	174.3	162.1	185.7	233.7	
B FDF discharge draft	mmAq	DL A16F10	179.1	173.7	159.8	184.9	231.1	
Wind box draft	mmAq	DL A70F10	64.3	69.2	59.1	67.5	114.3	
Furnace draft	mmAq	DL A80F10	-10.7	-9.0	-14.0	-12.1	-20.3	

Item	Unit	Measuring Point	Recording				B.E.T.		ANN High	ANN Low
			E-5	E-6(a)	E-8(a)	E-9(a)				
Test Number			8/7	8/7	8/7	8/7				
Date			09:00	10:30	13:00	14:30				
Time										
A Lower Eco outlet draft	mmAq	DL E10F10	-95.8	-99.3	-99.6	-97.0			-94	
B Lower Eco outlet draft	mmAq	DL E10F20	-97.3	-96.7	-98.8	-96.4			-96.5	
A AH gas side diff. press.	mmAq	DL A53D10	141.3	148.0	147.4	144.8			119.4	
B AH gas side diff. press.	mmAq	DL A57D10	137.9	137.2	139.0	134.1			114.3	
Primary air press.	mmAq	DL A40P10	1,609	1,601	1,527	-7			1,496.2	
A IDF inlet draft	mmAq	DL A22F10	-332.6	-333.4	-335.9	-332.4			-297.2	
B IDF inlet draft	mmAq	DL A26F10	-331.5	-331.6	-333.8	-330.1			-294.6	
A AH inlet air temp.	°C	DL A52T10	34.8	35.4	36.7	36.6			35.1	
B AH inlet air temp.	°C	DL A56T10	35.0	35.7	37.2	36.9			33.9	
A AH outlet air temp.	°C	DL A52T20	333.5	338.5	333.9	334.1			338.3	
B AH outlet air temp.	°C	DL A56T20	325.8	331.4	330.7	329.9			337.4	
A AH inlet gas temp.	°C	DL A53T10	369.3	374.6	371.5	371.3			365.4	
B AH inlet gas temp.	°C	DL A57T10	361.7	367.7	367.9	366.0			367.9	
A AH outlet gas temp.	°C	DL A53T20	144.2	145.4	140.9	141.8			147.4	
B AH outlet gas temp.	°C	DL A57T20	148.7	150.4	147.6	148.6			150.3	
A Precip outlet gas temp.	°C	DL C10T10	139.6	141.1	136.6	138.8			143.6	
B Precip outlet gas temp.	°C	DL C10T20	140.0	141.7	138.8	140.7			144.4	
A IDF motor amp.	A	CR indicator	248	247	245	250			236	
B IDF motor amp.	A	CR indicator	248	244	245	247			230	
A FDF motor amp.	A	CR indicator	84	84	83	85			85	
B FDF motor amp.	A	CR indicator	85	83	83	84			86	
A Pri. air fan motor amp.	A	CR indicator	230	229	230	230			183	
B Pri. air fan motor amp.	A	CR indicator	230	228	230	232			196	
A IDF inlet vane open	%	CR controller	72	72	71	72.5			70	
B IDF inlet vane open	%	CR controller	73.5	77.5	77.5	77.5			73	
A FDF inlet vane open	%	CR controller	69	70	69	71			74	
B FDF inlet vane open	%	CR controller	66	65	64	65			70	
SH pass damper open	%	CR controller	80	79	72.5	68			74	
RH pass damper open	%	CR controller	39	40	46.5	51.5			75	
Pri. air capacity damper open	%	CR controller	97.5	97.5	97.5	97.5				
O <sub>2</sub> analysis by Orsat (A)	%		4.0	4.6						
O <sub>2</sub> analysis by Orsat (B)	%		3.8	4.2						

Item	Unit	Measuring Point	Recording				B.E.T.		ANN High	ANN Low
			E-5 8/7	E-6(a) 8/7	E-8(a) 8/7	E-9(a) 8/7				
Test Number			E-5 8/7	E-6(a) 8/7	E-8(a) 8/7	E-9(a) 8/7				
Date			09:00	10:30	13:00	14:30				
Time										
A Mill coal fineness	%									
A Mill coal feeder flow	T/H	DL B11F10	41.41	41.19	41.27	41.36		36.7		
A Mill inlet air temp.	°C	DL B13T10	221	230	289	276		196.2		
A Mill air coal outlet temp.	°C	DL B13T20	68	69	80	80		77.9		
A Mill diff. draft	mmAq	CR indicator	530	550	500	500		527.8		
A Mill primary air flow	T/H	DL B13F10	99.2	97.9	95.1	95.4		86.0	31.3	
A Mill hot air damper open	%	local	20	24	34	30				
A Mill cold air damper open	%	local	25	25	27	19				
A Mill capacity damper open	%	local	57	57	42	40				
A Mill motor amp.	A	CR indicator	80	80	80	80		86		
A Mill classifier open	%							60		
B Mill coal fineness	%									
B Mill coal feeder flow	T/H	DL B21F10	49.16	48.97	49.53	49.64		36.0		
B Mill inlet air temp.	°C	DL B23T10	253	261	283	282		174.6		
B Mill air coal outlet temp.	°C	DL B23T20	69	69	80	81		78.9		
B Mill differential draft	mmAq	CR indicator	600	620	630	620		500.0		
B Mill primary air flow	T/H	DL B23F10	108	109	110.5	106.6		86.7	31.3	
B Mill hot air damper open	%	local	27	32	38	35				
B Mill cold air damper open	%	local	12	12	10	10		40		
B Mill capacity damper open	%	local	98	98	98	98				
B Mill motor amp.	A	CR indicator	92	90	90	90		90		
B Mill classifier open	%							60		



Item	Unit	Measuring Point	Recording				ANN High	ANN Low
			E-5 8/7	E-6(a) 8/7	E-8(a) 8/7	E-9(a) 8/7		
Test Number								
Date								
Time								
C Mill coal fineness	%		49.62	49.38	49.34	49.45	37.1	
C Mill coal feeder flow	T/H	DL B31F10	246	249	285	273	174.2	
C Mill inlet air temp.	°C	DL B33T10	69	69	81	80	80.0	
C Mill air coal outlet temp.	°C	DL B33T20	580	570	620	600	507.4	
C Mill differential draft	mmAq	CR indicator	108.9	108.9	109.7	109.7	82.5	31.3
C Mill primary air flow	T/H	DL B33F10	32	32	72	54		
C Mill hot air damper open	%	local	20	20	8	12	62	
C Mill cold air damper open	%	local	52	58	55	56		
C Mill capacity damper open	%	local	92	95	75	75	92	
C Mill motor amp.	A	CR indicator						60
C Mill classifier open	%							
D Mill coal fineness								
D Mill coal feeder flow	T/H	DL B41F10						
D Mill inlet air temp.	°C	DL B43T10						
D Mill air coal outlet temp.	°C	DL B43T20						
D Mill differential draft	mmAq	CR indicator						
D Mill primary air flow	T/H	DL B43F10						31.3
D Mill hot air damper open	%	local						
D Mill cold air damper open	%	local						
D Mill capacity damper open	%	local						
D Mill motor amp.	A	CR indicator						
D Mill classifier open	%							

Item	Unit	Measuring Point	Recording				B.E.T.		ANN	
			E-5 8/7	E-6(a) 8/7	E-8(a) 8/7	E-9(a) 8/7	High	Low	High	Low
Test Number										
Date										
Time			09:00	10:30	13:00	14:30				
A Mill hot air damper open	%	local	20	24	34	30				
A Mill cold air damper open	%	local	25	25	27	19				
A Mill capacity damper open	%	local	57	57	42	40				
A Mill classifier vane open	%	local								
B Mill hot air damper open	%	local	27	32	38	35				
B Mill cold air damper open	%	local	12	12	10	10				
B Mill capacity damper open	%	local	98	98	98	98				
B Mill classifier vane open	%	local								
C Mill hot air damper open	%	local	32	32	72	54				
C Mill cold air damper open	%	local	20	20	8	12				
C Mill capacity damper open	%	local	52	58	55	56				
C Mill classifier vane open	%	local								
D Mill hot air damper open	%	local								
D Mill cold air damper open	%	local								
D Mill capacity damper open	%	local								
D Mill classifier vane open	%	local								

BOILER METAL TEMPERATURE

(III-1)

Test Number	Item	Unit	Measuring Point	Recording				ANN High	ANN Low
				B.E.T.	E-8(a)	E-9(a)	E-9(a)		
Date	E-5 E-6(a) E-8(a) E-9(a)			8/7	8/7	8/7			
Time				09:00	10:30	13:00	14:30		
Div. wall out tube metal temp.	1	°C	DL E51T10	472.5	479.8	451.1	454.7	538	
Div. wall out tube metal temp.	2	°C	DL E51T11	500.5	508.4	486.5	485.0	538	
Div. wall out tube metal temp.	3	°C	DL E51T12	531.0	535.4	522.7	526.3	538	
Div. wall out tube metal temp.	4	°C	DL E51T13	479.6	486.3	459.8	463.4	538	
Div. wall out tube metal temp.	5	°C	DL E51T14	470.2	478.1	456.5	455.1	538	
Div. wall out tube metal temp.	6	°C	DL E51T15	476.7	481.4	459.2	463.8	538	
Div. wall out tube metal temp.	7	°C	DL E51T16	462.6	469.9	460.9	457.0	538	
Div. wall out tube metal temp.	8	°C	DL E51T17	479.3	485.6	469.1	471.6	538	
Div. wall out tube metal temp.	9	°C	DL E51T18	469.6	476.4	464.4	462.4	538	
Div. wall out tube metal temp.	10	°C	DL E51T19	496.9	502.2	498.9	491.1	538	
Final SH tube metal temp.	1	°C	DL E61T10	545.9	553.6	541.4	541.2	602	
Final SH tube metal temp.	2	°C	DL E61T11	523.1	529.0	520.3	518.7	602	
Final SH tube metal temp.	3	°C	DL E61T12	567.9	572.6	555.7	565.0	602	
Final SH tube metal temp.	4	°C	DL E61T13	541.4	546.3	535.5	541.9	602	
Final SH tube metal temp.	5	°C	DL E61T14	545.6	551.3	531.3	540.3	602	
Final SH tube metal temp.	6	°C	DL E61T15	481.8	489.1	455.3	459.1	602	
Final SH tube metal temp.	7	°C	DL E61T16	522.7	529.2	517.4	515.9	602	
Final SH tube metal temp.	8	°C	DL E61T17	509.5	516.1	508.5	504.0	602	
Final SH tube metal temp.	9	°C	DL E61T18	511.4	518.4	506.0	504.2	602	
Final SH tube metal temp.	10	°C	DL E61T19	510.7	516.5	504.1	502.8	602	
Final SH tube metal temp.	11	°C	DL E61T20	537.4	544.5	534.6	536.3	602	
Final SH tube metal temp.	12	°C	DL E61T21	512.4	519.2	511.2	511.1	602	
Final SH tube metal temp.	13	°C	DL E61T22	568.3	574.1	566.8	568.1	602	
Final SH tube metal temp.	14	°C	DL E61T23	538.2	544.3	539.6	539.4	602	
Final SH tube metal temp.	15	°C	DL E61T24	551.6	560.5	548.5	546.5	602	
Final SH tube metal temp.	16	°C	DL E61T25	527.0	534.5	526.2	524.4	602	

Test Number	Item	Unit	Measuring Point	Recording				ANN High	ANN Low
				E-5	E-6(a)	E-8(a)	E-9(a)		
Date			8/7	8/7	8/7	8/7			
Time			09:00	10:30	13:00	14:30			
RH out tube metal temp.	1	°C	DL E71T10	504.0	508.9	494.6	500.1	599	
RH out tube metal temp.	2	°C	DL E71T11	484.3	489.0	478.4	482.2	599	
RH out tube metal temp.	3	°C	DL E71T12	602.4	601.4	575.7	588.8	599	
RH out tube metal temp.	4	°C	DL E71T13	580.3	584.5	559.8	570.0	599	
RH out tube metal temp.	5	°C	DL E71T14	563.6	565.4	533.7	548.4	599	
RH out tube metal temp.	6	°C	DL E71T15	560.8	563.3	532.3	545.4	599	
RH out tube metal temp.	7	°C	DL E71T16	527.4	530.9	497.8	506.6	599	
RH out tube metal temp.	8	°C	DL E71T17	508.2	508.4	480.3	490.4	599	
RH out tube metal temp.	9	°C	DL E71T18	478.4	480.1	476.5	476.6	599	
RH out tube metal temp.	10	°C	DL E71T19	462.9	465.1	458.2	459.9	599	
RH out tube metal temp.	11	°C	DL E71T20	478.9	481.0	480.5	479.2	599	
RH out tube metal temp.	12	°C	DL E71T21	461.3	463.6	466.6	466.7	599	
RH out tube metal temp.	13	°C	DL E71T22	498.4	501.6	510.5	510.4	599	
RH out tube metal temp.	14	°C	DL E71T23	478.7	482.6	493.4	493.7	599	
RH out tube metal temp.	15	°C	DL E71T24	509.4	511.7	514.0	513.2	599	
RH out tube metal temp.	16	°C	DL E71T25	543.2	545.5	550.4	552.6	599	
RH out tube metal temp.	17	°C	DL E71T26	593.2	594.3	602.1	601.5	599	
RH out tube metal temp.	18	°C	DL E71T27	583.5	586.6	595.0	594.6	599	
RH out tube metal temp.	19	°C	DL E71T28	563.6	564.3	568.5	570.9	599	
RH out tube metal temp.	20	°C	DL E71T29	516.7	518.5	522.7	523.3	599	

FURNACE TEMPERATURE

(IV-1)

Item	Unit	Measuring Point	Recording				B.E.T.		ANN	
			E-5	E-6(a)	E-8(a)	E-9(a)	High	Low	High	Low
Test Number			E-5	E-6(a)	E-8(a)	E-9(a)				
Date			8/7	8/7	8/7	8/7				
Time			09:00	10:30	13:00	14:30				
7F Mezz. Front Right 2nd Port	°C	local	1,300	1,280	1,290	1,255				
7F Mezz. Front Center Port	°C	local	1,265	1,260	1,290	1,250				
7F Mezz. Front Left 2nd Port	°C	local	1,230	1,290	1,285	1,270				
8F Left near S/B 6-L	°C	local	1,145	1,160	1,120	1,150				
8F Right near S/B 6-R	°C	local	1,120	1,140	1,140	1,150				
8F Rear Left 2nd Port	°C	local	1,005	1,000	1,010	1,020				
9F Left near S/B 4-L	°C	local	1,015	1,035	1,000	1,010				
9F Right near S/B 4-R	°C	local	1,040	1,050	1,020	1,035				
9F Front Left 2nd Port	°C	local	1,005	1,040	1,000	1,015				
9F Front Center Port	°C	local	1,020	1,015	985	1,000				
9F Front Right 2nd Port	°C	local	1,015	1,020	1,010	1,030				

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Item	Unit	Measuring Point	Recording				B.E.T.		ANN	
			E-5	E-6(a)	E-8(a)	E-9(a)	High	Low	High	Low
Test Number			8/7	8/7	8/7	8/7				
Date			09:00	10:30	13:00	14:30				
Time										
A-1 Air resistor open		local	5.0	5.0	5.0	5.0				
A-2 Air resistor open		local	4.8	4.8	4.8	4.8				
A-3 Air resistor open		local	4.0	4.0	4.0	4.0				
A-4 Air resistor open		local	3.8	3.8	3.8	3.8				
B-1 Air resistor open		local	5.0	5.0	5.0	5.0				
B-2 Air resistor open		local	4.5	4.5	4.5	4.5				
B-3 Air resistor open		local	4.5	4.5	4.5	4.5				
B-4 Air resistor open		local	4.6	4.6	4.6	4.6				
C-1 Air resistor open		local	5.0	5.0	5.0	5.0				
C-2 Air resistor open		local	5.0	5.0	5.0	5.0				
C-3 Air resistor open		local	5.0	5.0	5.0	5.0				
C-4 Air resistor open		local	4.0	4.0	4.0	4.0				
D-1 Air resistor open		local	1.4	1.4	1.4	1.4				
D-2 Air resistor open		local	2.4	2.4	2.4	2.4				
D-3 Air resistor open		local	2.2	2.2	2.2	2.2				
D-4 Air resistor open		local	2.9	2.9	2.9	2.9				
Airport damper open (Right)		local	0.8	0.3	1.0	1.0				
Airport damper open (Left)		local	0.8	0.4	1.0	1.0				

Item	Unit	Measuring Point	Recording				B.E.T.		ANN High	ANN Low
			E-5	E-6(a)	E-8(a)	E-9(a)	8/7	8/7		
Test Number			8/7	8/7	8/7	8/7	8/7			
Date			09:00	10:30	13:00	14:30				
Time										
Burner Barrel A-1	°C	DL B60T10	297.7	302.5	299.8	302.4		400		
Burner Barrel A-1	°C	DL B60T11	204.3	206.9	210.0	211.5		400		
Burner Barrel A-1	°C	DL B60T12	291.7	296.0	294.3	296.5		400		
Burner Barrel A-1	°C	DL B60T13	281.4	285.6	284.3	286.1		400		
Burner Barrel A-2	°C	DL B60T20	303.0	307.7	304.9	306.9		400		
Burner Barrel A-2	°C	DL B60T21	231.6	235.2	235.5	237.7		400		
Burner Barrel A-2	°C	DL B60T22	258.1	261.7	262.2	264.1		400		
Burner Barrel A-2	°C	DL B60T23	281.6	285.8	283.9	285.7		400		
Burner Barrel A-3	°C	DL B60T30	265.4	270.5	272.3	273.2		400		
Burner Barrel A-3	°C	DL B60T31	229.6	233.0	235.9	237.3		400		
Burner Barrel A-3	°C	DL B60T32	289.6	294.3	295.1	295.6		400		
Burner Barrel A-3	°C	DL B60T33	295.6	300.4	300.7	301.6		400		
Burner Barrel A-4	°C	DL B60T40	300.6	305.4	305.7	306.6		400		
Burner Barrel A-4	°C	DL B60T41	173.6	176.4	181.8	183.2		400		
Burner Barrel A-4	°C	DL B60T42	291.0	296.0	296.9	298.2		400		
Burner Barrel A-4	°C	DL B60T43	302.4	307.4	306.6	308.2		400		
Burner Barrel B-1	°C	DL B61T10	248.2	251.8	252.4	255.4		400		
Burner Barrel B-1	°C	DL B61T11	264.2	267.6	267.0	268.9		400		
Burner Barrel B-1	°C	DL B61T12	298.3	302.3	300.0	302.0		400		
Burner Barrel B-1	°C	DL B61T13	273.4	277.1	277.4	279.5		400		
Burner Barrel B-2	°C	DL B61T20	271.4	275.4	275.1	277.1		400		
Burner Barrel B-2	°C	DL B61T21	230.2	234.0	234.4	236.6		400		
Burner Barrel B-2	°C	DL B61T22	296.5	300.8	298.5	300.5		400		
Burner Barrel B-2	°C	DL B61T23	272.7	276.4	276.3	278.4		400		
Burner Barrel B-3	°C	DL B61T30	267.6	272.6	273.9	275.5		400		
Burner Barrel B-3	°C	DL B61T31	214.1	217.7	221.6	223.1		400		
Burner Barrel B-3	°C	DL B61T32	287.8	292.8	293.2	293.9		400		
Burner Barrel B-3	°C	DL B61T33	271.0	275.7	277.0	279.3		400		
Burner Barrel B-4	°C	DL B61T40	261.3	265.7	268.6	270.1		400		
Burner Barrel B-4	°C	DL B61T41	255.8	260.0	262.3	263.2		400		
Burner Barrel B-4	°C	DL B61T42	279.4	283.9	285.7	286.2		400		
Burner Barrel B-4	°C	DL B61T43	281.5	284.7	288.0	289.1		400		

Item	Unit	Measuring Point	Recording				ANN High	ANN Low
			E-5	E-6(a)	E-8(a)	E-9(a)		
Test Number			8/7	8/7	8/7	8/7		
Date			09:00	10:30	13:00	14:30		
Time								
Burner Barrel C-1	°C	DL B62T10	273.7	276.6	277.8	278.8	400	
Burner Barrel C-1	°C	DL B62T11	268.1	271.3	270.6	272.0	400	
Burner Barrel C-1	°C	DL B62T12	276.5	279.9	281.3	282.0	400	
Burner Barrel C-1	°C	DL B62T13	268.2	271.3	272.5	274.1	400	
Burner Barrel C-2	°C	DL B62T20	298.4	302.1	301.2	302.2	400	
Burner Barrel C-2	°C	DL B62T21	242.5	244.8	246.0	247.4	400	
Burner Barrel C-2	°C	DL B62T22	282.8	286.7	287.0	288.2	400	
Burner Barrel C-2	°C	DL B62T23	321.6	323.8	322.2	322.4	400	
Burner Barrel C-3	°C	DL B62T30	57.5	57.5	56.4	58.2	400	
Burner Barrel C-3	°C	DL B62T31	63.5	64.0	68.2	69.3	400	
Burner Barrel C-3	°C	DL B62T32	308.6	312.7	314.5	313.8	400	
Burner Barrel C-3	°C	DL B62T33	257.7	261.4	266.8	267.1	400	
Burner Barrel C-4	°C	DL B62T40	274.2	277.9	281.7	282.2	400	
Burner Barrel C-4	°C	DL B62T41	270.5	274.6	276.4	276.8	400	
Burner Barrel C-4	°C	DL B62T42	280.0	284.1	287.4	287.4	400	
Burner Barrel C-4	°C	DL B62T43	294.2	298.6	301.2	301.2	400	
Burner Barrel D-1	°C	DL B63T10	352.9	358.7	351.2	354.5	400	
Burner Barrel D-1	°C	DL B63T11	317.6	321.8	317.1	318.5	400	
Burner Barrel D-1	°C	DL B63T12	361.1	366.5	358.1	361.2	400	
Burner Barrel D-1	°C	DL B63T13	365.2	370.5	363.0	366.4	400	
Burner Barrel D-2	°C	DL B63T20	364.4	370.5	364.6	366.4	400	
Burner Barrel D-2	°C	DL B63T21	302.3	305.6	304.3	306.4	400	
Burner Barrel D-2	°C	DL B63T22	376.9	378.0	377.5	379.6	400	
Burner Barrel D-2	°C	DL B63T23	359.9	365.0	360.3	363.0	400	
Burner Barrel D-3	°C	DL B63T30	-	-	-	-	400	
Burner Barrel D-3	°C	DL B63T31	301.8	304.3	304.2	306.3	400	
Burner Barrel D-3	°C	DL B63T32	336.7	341.4	340.9	341.0	400	
Burner Barrel D-3	°C	DL B63T33	364.4	371.5	369.8	370.8	400	
Burner Barrel D-4	°C	DL B63T40	348.7	355.4	353.7	354.3	400	
Burner Barrel D-4	°C	DL B63T41	306.8	310.3	310.9	307.7	400	
Burner Barrel D-4	°C	DL B63T42	361.4	368.1	365.4	365.3	400	
Burner Barrel D-4	°C	DL B63T43	346.4	354.5	353.1	354.1	400	



Combustion Test of Calaca Unit I Boiler

(I-1)

Item	Unit	Measuring Point	Recording				B.E.T.		ANN High	ANN Low
			C-0	C-1	C-4					
Test Number			8/8	8/8	8/8					
Date			09:00	11:00	18:30					
Time										
Coal blend ratio	(S/A)		70/30	70/30	70/30					
Generator load	MW	DL Q20W10	209.3	223.6	299.1			300		
Main steam flow	T/H	DL G21H10	651	707	936			913.3		
Feed water flow	T/H	DL E15F10	590	643	848			881.5		
SH spray flow	T/H	DL E55F10	58.2	61.1	91.3			56.4		
Drum level	mm	DL E20L10	4.6	1.8	6.1			-11.7	127 -203	
Drum pressure	kg/cm <sup>2</sup>	DL E20P10	174.3	173.1	181.9			187.2	200	
Turbine inlet steam press.	kg/cm <sup>2</sup>	DL G21P10	168.1	165.6	167.6				171	
Final SH outlet temperature	°C	DL E60T10	546.7	537.0	543.9			542.5		
RH outlet temperature	°C	DL E74T10	534.4	534.4	537.8			541.6		
Eco. inlet feedwater temp.	°C	DL E10T10A	253.5	257.9	275.2					
A Hot primary air flow	T/H	DL A42F10	111	117	144					
B Hot primary air flow	T/H	DL A46F10	116	127	141					
A Tempering air flow	T/H	DL A42F20	39	37	21					
B Tempering air flow	T/H	DL A46F20	34	31	28					
A Secondary air flow	T/H	DL A52F10	234	265	379					
B Secondary air flow	T/H	DL A52F10	254	299	432					
Total air flow	T/H	DL A60G10	791	862	1,145					
Boiler exit gas O <sub>2</sub>	(A)	DL A80C10	2.78	2.85	2.84				5.88 2.94	
Boiler exit gas O <sub>2</sub>	(B)	DL A80C20	-1.74	-1.74	-1.74			3.22	5.88 2.94	
Total fuel flow	T/H	DL B10G10A	100.72	111.86	149.94			110.4		
A FDF discharge draft	mmAg	DL A12F10	35.7	49.3	158.5			233.7		
B FDF discharge draft	mmAg	DL A16F10	31.1	48.9	157.0			231.1		
Wind box draft	mmAg	DL A70F10	1.7	6.9	56.1			114.3		
Furnace draft	mmAg	DL A80F10	-10.9	-11.3	-12.9			-20.3		

Item	Unit	Measuring Point	Recording				B.E.T.		ANN	ANN
			C-0	C-1	C-4		High	Low		
Test Number										
Date			8/8	8/8	8/8					
Time			09:00	11:00	18:30					
A Lower Eco outlet draft	mmAq	DL E10F10	-60.2	-67.4	-99.4				-94	
B Lower Eco outlet draft	mmAq	DL E10F20	-58.0	-66.0	-98.5				-96.5	
A AH gas side diff. press.	mmAq	DL A53D10	77.5	91.4	142.0				119.4	
B AH gas side diff. press.	mmAq	DL A57D10	74.8	84.4	135.5				114.3	
Primary air press.	mmAq	DL A40P10	1,531	1,527	1,528				1,496.2	
A IDF inlet draft	mmAq	DL A22F10	-181.4	-209.0	-332.1				-297.2	
B IDF inlet draft	mmAq	DL A26F10	-179.5	-206.5	-330.2				-294.6	
A AH inlet air temp.	°C	DL A52T10	37.3	37.0	34.7				35.1	
B AH inlet air temp.	°C	DL A56T10	38.0	36.8	34.4				33.9	
A AH outlet air temp.	°C	DL A52T20	300.5	308.8	336.4				338.3	
B AH outlet air temp.	°C	DL A56T20	292.5	300.2	326.3				337.4	
A AH inlet gas temp.	°C	DL A53T10	326.7	338.1	375.0				365.4	
B AH inlet gas temp.	°C	DL A57T10	316.0	327.6	364.5				367.9	
A AH outlet gas temp.	°C	DL A53T20	129.3	131.6	140.4				147.4	
B AH outlet gas temp.	°C	DL A57T20	135.0	136.5	144.9				150.3	
A Precip outlet gas temp.	°C	DL C10T10	125.0	127.0	136.6				143.6	
B Precip outlet gas temp.	°C	DL C10T20	129.3	130.0	136.6				144.4	
A IDF motor amp.	A	CR indicator	215	219	246				236	
B IDF motor amp.	A	CR indicator	211	215	245				230	
A FDF motor amp.	A	CR indicator	72	73	82				85	
B FDF motor amp.	A	CR indicator	70	72	83				86	
A Pri. air fan motor amp.	A	CR indicator	226	222	231				183	
B Pri. air fan motor amp.	A	CR indicator	210	221	232				196	
A IDF inlet vane open	%	CR controller	56	60	72				70	
B IDF inlet vane open	%	CR controller	64	65	77				73	
A FDF inlet vane open	%	CR controller	47	52	66.5				74	
B FDF inlet vane open	%	CR controller	42.5	49	64				70	
SH pass damper open	%	CR controller	57.5	57	82				74	
RH pass damper open	%	CR controller	62	63	38				75	
Pri. air capacity damper open	%	CR controller	30	80	97.5					
O <sub>2</sub> analysis by Orsat (A)	%									
O <sub>2</sub> analysis by Orsat (B)	%									

Item	Unit	Measuring Point		Recording		ANN High	ANN Low
		C-0	C-1	C-4	B.E.T. Point		
Test Number		8/8	8/8	8/8			
Date		09:00	11:00	18:30			
Time							
A Mill coal fineness %							
A Mill coal feeder flow	T/H	DL B11F10	32.46	34.37	49.84	36.7	
A Mill inlet air temp.	°C	DL B13T10	227	248	307	196.2	
A Mill air coal outlet temp.	°C	DL B13T20	75	75	77	77.9	
A Mill diff. draft	mmAq	CR indicator	400	420	600	527.8	
A Mill primary air flow	T/H	DL B13F10	86.8	83.4	103.2	86.0	31.3
A Mill hot air damper open	%	local	25	28	44		
A Mill cold air damper open	%	local	21	18	11		
A Mill capacity damper open	%	local	36	36	69		
A Mill motor amp.	A	CR indicator	50	50	62	86	
A Mill classifier open	%					60	
B Mill coal fineness %							
B Mill coal feeder flow	T/H	DL B21F10	35.96	38.32	49.77	36.0	
B Mill inlet air temp.	°C	DL B23T10	246	264	283	174.6	
B Mill air coal outlet temp.	°C	DL B23T20	75	75	76	78.9	
B Mill differential draft	mmAq	CR indicator	520	560	600	500.0	
B Mill primary air flow	T/H	DL B23F10	98.7	101	106	86.7	31.3
B Mill hot air damper open	%	local	33	37	39		
B Mill cold air damper open	%	local	12	10	9	40	
B Mill capacity damper open	%	local	55	48	77		
B Mill motor amp.	A	CR indicator	60	60	82	90	
B Mill classifier open	%					60	

Item	Unit	Measuring Point	Recording				ANN High	ANN Low
			B.E.T.	C-0	C-1	C-4		
Test Number			8/8	8/8	8/8			
Date			09:00	11:00	18:30			
Time								
C Mill coal fineness	%							
C Mill coal feeder flow	T/H	DL B31F10	32.22	39.59	49.82	37.1		
C Mill inlet air temp.	°C	DL B33T10	257	266	290	174.2		
C Mill air coal outlet temp.	°C	DL B33T20	74	71	75	80.0		
C Mill differential draft	mmAq	CR indicator	440	420	620	507.4		
C Mill primary air flow	T/H	DL B33F10	93.2	97.6	114.3	82.5	31.3	
C Mill hot air damper open	%	local	100	100	100			
C Mill cold air damper open	%	local	2	2	2	62		
C Mill capacity damper open	%	local	55	33	62			
C Mill motor amp.	A	CR indicator	60	60	60	92		
C Mill classifier open	%					60		
D Mill coal fineness	%							
D Mill coal feeder flow	T/H	DL B41F10						
D Mill inlet air temp.	°C	DL B43T10						
D Mill air coal outlet temp.	°C	DL B43T20						
D Mill differential draft	mmAq	CR indicator						
D Mill primary air flow	T/H	DL B43F10					31.3	
D Mill hot air damper open	%	local						
D Mill cold air damper open	%	local						
D Mill capacity damper open	%	local						
D Mill motor amp.	A	CR indicator						
D Mill classifier open	%							

Item	Unit	Measuring Point		Recording	B.E.T.		ANN High	ANN Low
		C-0	C-1		C-1	C-4		
Test Number		C-0	C-1	C-4				
Date		8/8	8/8	8/8				
Time		09:00	11:00	18:30				
A Mill hot air damper open	%	local	25	28	44			
A Mill cold air damper open	%	local	21	18	11			
A Mill capacity damper open	%	local	36	36	69			
A Mill classifier vane open	%	local						
B Mill hot air damper open	%	local	33	37	39			
B Mill cold air damper open	%	local	12	10	9			
B Mill capacity damper open	%	local	55	48	77			
B Mill classifier vane open	%	local						
C Mill hot air damper open	%	local	100	100	100			
C Mill cold air damper open	%	local	2	2	2			
C Mill capacity damper open	%	local	25	33	62			
C Mill classifier vane open	%	local						
D Mill hot air damper open	%	local						
D Mill cold air damper open	%	local						
D Mill capacity damper open	%	local						
D Mill classifier vane open	%	local						

BOILER METAL TEMPERATURE

(III-1)

Test Number	Item	Unit	Measuring Point				Recording	B.E.T.	ANN High	ANN Low
			C-0	C-1	C-4	C-4				
Date			8/8	8/8	8/8	8/8				
Time			09:00	11:00	18:30					
Div. wall out tube metal temp.	1	°C	DL E51T10	468.7	447.7	476.8		538		
Div. wall out tube metal temp.	2	°C	DL E51T11	505.6	481.6	502.4		538		
Div. wall out tube metal temp.	3	°C	DL E51T12	530.4	519.1	533.3		538		
Div. wall out tube metal temp.	4	°C	DL E51T13	477.6	458.8	488.1		538		
Div. wall out tube metal temp.	5	°C	DL E51T14	454.6	448.2	471.4		538		
Div. wall out tube metal temp.	6	°C	DL E51T15	479.7	467.6	484.0		538		
Div. wall out tube metal temp.	7	°C	DL E51T16	449.6	451.0	464.3		538		
Div. wall out tube metal temp.	8	°C	DL E51T17	473.8	470.0	479.1		538		
Div. wall out tube metal temp.	9	°C	DL E51T18	449.8	459.7	469.8		538		
Div. wall out tube metal temp.	10	°C	DL E51T19	492.8	490.9	499.0		538		
Final SH tube metal temp.	1	°C	DL E61T10	548.4	541.5	543.1		602		
Final SH tube metal temp.	2	°C	DL E61T11	525.4	519.7	521.3		602		
Final SH tube metal temp.	3	°C	DL E61T12	562.2	553.7	565.9		602		
Final SH tube metal temp.	4	°C	DL E61T13	541.1	533.1	539.1		602		
Final SH tube metal temp.	5	°C	DL E61T14	539.2	527.2	546.8		602		
Final SH tube metal temp.	6	°C	DL E61T15	464.9	447.2	479.5		602		
Final SH tube metal temp.	7	°C	DL E61T16	539.9	527.2	534.9		602		
Final SH tube metal temp.	8	°C	DL E61T17	523.8	512.9	520.1		602		
Final SH tube metal temp.	9	°C	DL E61T18	531.5	522.1	522.7		602		
Final SH tube metal temp.	10	°C	DL E61T19	528.4	515.7	519.6		602		
Final SH tube metal temp.	11	°C	DL E61T20	532.2	527.9	534.7		602		
Final SH tube metal temp.	12	°C	DL E61T21	516.2	509.9	513.4		602		
Final SH tube metal temp.	13	°C	DL E61T22	560.9	557.8	570.7		602		
Final SH tube metal temp.	14	°C	DL E61T23	537.0	532.9	540.4		602		
Final SH tube metal temp.	15	°C	DL E61T24	558.0	548.9	557.3		602		
Final SH tube metal temp.	16	°C	DL E61T25	538.1	528.7	531.7		602		

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B.E.T.: Boiler Efficiency Test

Item	Unit	Measuring Point	Recording				ANN High	ANN Low
			C-0	C-1	C-4	B.E.T.		
Test Number								
Date			8/8	8/8	8/8			
Time			09:00	11:00	18:30			
RH out tube metal temp.	°C	DL E71T10	509.8	509.5	502.2	599	599	
RH out tube metal temp.	°C	DL E71T11	489.1	489.8	479.9	599	599	
RH out tube metal temp.	°C	DL E71T12	581.6	582.7	602.2	599	599	
RH out tube metal temp.	°C	DL E71T13	559.5	563.7	581.0	599	599	
RH out tube metal temp.	°C	DL E71T14	531.6	532.9	562.2	599	599	
RH out tube metal temp.	°C	DL E71T15	524.1	528.7	560.1	599	599	
RH out tube metal temp.	°C	DL E71T16	514.2	494.0	524.7	599	599	
RH out tube metal temp.	°C	DL E71T17	491.5	473.1	503.3	599	599	
RH out tube metal temp.	°C	DL E71T18	528.8	511.8	493.0	599	599	
RH out tube metal temp.	°C	DL E71T19	506.5	492.6	476.1	599	599	
RH out tube metal temp.	°C	DL E71T20	504.4	508.8	472.8	599	599	
RH out tube metal temp.	°C	DL E71T21	489.6	498.0	461.3	599	599	
RH out tube metal temp.	°C	DL E71T22	491.5	489.3	480.1	599	599	
RH out tube metal temp.	°C	DL E71T23	472.7	471.9	460.1	599	599	
RH out tube metal temp.	°C	DL E71T24	507.4	510.9	513.2	599	599	
RH out tube metal temp.	°C	DL E71T25	509.8	529.6	517.9	599	599	
RH out tube metal temp.	°C	DL E71T26	573.3	589.7	588.0	599	599	
RH out tube metal temp.	°C	DL E71T27	557.1	578.9	575.8	599	599	
RH out tube metal temp.	°C	DL E71T28	533.2	550.8	540.6	599	599	
RH out tube metal temp.	°C	DL E71T29	512.6	520.3	519.0	599	599	

FURNACE TEMPERATURE

(IV-1)

Item	Unit	Measuring Point	Recording				B.E.T.		ANN	
			C-0	C-1	C-4		High	Low	High	Low
Test Number										
Date			8/8	8/8	8/8					
Time			08:30	10:30	18:00					
3F Left near S/B C-3	°C	local	1,220	1,220	1,250					
3F Right near S/B C-1	°C	local	1,220	1,200	1,240					
3F Mezz. Rear Right near S/B F-2	°C	local	1,330	1,320	1,350					
3F Mezz. Rear Left near S/B F-5	°C	local	1,310	1,320	1,350					
4F Mezz. Right Rear near S/B D-2	°C	local	1,400	1,430	1,435					
4F Mezz. Left Rear near S/B D-7	°C	local	1,400	1,385	1,420					
5F Left Rear near S/B C-3	°C	local	1,400	1,380	1,410					
5F Right Rear near S/B C-2	°C	local	1,390	1,400	1,465					
7F Mezz. Front Right 2nd Port	°C	local	1,180	1,150	1,240					
7F Mezz. Front Center Port	°C	local	1,210	1,190	1,245					
7F Mezz. Front Left 2nd Port	°C	local	1,230	1,200	1,260					
8F Left near S/B 6-L	°C	local	1,000	1,080	1,135					
8F Right near S/B 6-R	°C	local	1,040	1,070	1,135					
8F Rear Left 2nd Port	°C	local	935	950	1,040					
9F Left near S/B 4-L	°C	local	990	940	1,020					
9F Right near S/B 4-R	°C	local	995	950	1,005					
9F Front Left 2nd Port	°C	local	960	950	1,040					
9F Front Center Port	°C	local	950	940	990					
9F Front Right 2nd Port	°C	local	960	950	990					



Item	Unit	Measuring Point		Recording	B.E.T.		ANN High	ANN Low
		C-0	C-1		C-1	C-4		
Test Number		8/8	8/8	8/8	8/8			
Date		09:00	11:00	18:30				
Time								
A-1 Air resistor open	local	4.9	4.9	4.9				
A-2 Air resistor open	local	4.8	4.8	4.8				
A-3 Air resistor open	local	4.0	4.0	4.0				
A-4 Air resistor open	local	3.8	3.8	3.8				
B-1 Air resistor open	local	5.0	5.0	5.0				
B-2 Air resistor open	local	4.5	4.5	4.5				
B-3 Air resistor open	local	4.6	4.6	4.6				
B-4 Air resistor open	local	4.6	4.6	4.6				
C-1 Air resistor open	local	5.0	5.0	5.0				
C-2 Air resistor open	local	4.9	4.9	4.9				
C-3 Air resistor open	local	5.1	5.1	5.1				
C-4 Air resistor open	local	4.0	4.0	4.0				
D-1 Air resistor open	local	1.2	1.2	1.2				
D-2 Air resistor open	local	2.5	2.5	2.5				
D-3 Air resistor open	local	2.2	2.2	2.2				
D-4 Air resistor open	local	2.9	2.9	2.9				
Airport damper open (Right)	local	0.4	1.0	1.0				
Airport damper open (Left)	local	0.4	1.0	1.0				

Test Number	Item	Unit	Measuring Point	Recording				B.E.T.		ANN
				C-0	C-1	C-4	High	Low		
Date				8/8	8/8	8/8				
Time				09:00	11:00	18:30				
Burner Barrel A-1	°C	DL B60T10		265.6	271.8	299.1	400			
Burner Barrel A-1	°C	DL B60T11		175.2	180.9	207.3	400			
Burner Barrel A-1	°C	DL B60T12		258.1	264.1	291.6	400			
Burner Barrel A-1	°C	DL B60T13		249.8	255.5	281.9	400			
Burner Barrel A-2	°C	DL B60T20		269.0	274.4	303.9	400			
Burner Barrel A-2	°C	DL B60T21		198.1	205.1	233.8	400			
Burner Barrel A-2	°C	DL B60T22		229.6	234.4	257.9	400			
Burner Barrel A-2	°C	DL B60T23		245.6	252.0	281.5	400			
Burner Barrel A-3	°C	DL B60T30		227.5	234.6	262.7	400			
Burner Barrel A-3	°C	DL B60T31		192.0	200.2	230.0	400			
Burner Barrel A-3	°C	DL B60T32		253.0	259.5	288.6	400			
Burner Barrel A-3	°C	DL B60T33		260.4	266.0	294.4	400			
Burner Barrel A-4	°C	DL B60T40		269.6	275.6	305.6	400			
Burner Barrel A-4	°C	DL B60T41		151.5	155.8	173.3	400			
Burner Barrel A-4	°C	DL B60T42		260.7	267.3	295.9	400			
Burner Barrel A-4	°C	DL B60T43		273.8	279.9	306.4	400			
Burner Barrel B-1	°C	DL B61T10		213.1	221.2	249.2	400			
Burner Barrel B-1	°C	DL B61T11		224.8	233.9	266.5	400			
Burner Barrel B-1	°C	DL B61T12		263.4	271.9	299.3	400			
Burner Barrel B-1	°C	DL B61T13		244.3	250.9	275.6	400			
Burner Barrel B-2	°C	DL B61T20		237.2	244.7	272.4	400			
Burner Barrel B-2	°C	DL B61T21		196.2	203.8	233.3	400			
Burner Barrel B-2	°C	DL B61T22		264.9	272.3	298.6	400			
Burner Barrel B-2	°C	DL B61T23		239.6	247.0	275.2	400			
Burner Barrel B-3	°C	DL B61T30		242.4	249.1	268.0	400			
Burner Barrel B-3	°C	DL B61T31		182.2	189.4	216.1	400			
Burner Barrel B-3	°C	DL B61T32		265.7	272.5	287.6	400			
Burner Barrel B-3	°C	DL B61T33		241.1	247.7	270.9	400			
Burner Barrel B-4	°C	DL B61T40		229.5	237.3	262.5	400			
Burner Barrel B-4	°C	DL B61T41		216.7	226.1	256.8	400			
Burner Barrel B-4	°C	DL B61T42		250.9	258.0	280.0	400			
Burner Barrel B-4	°C	DL B61T43		247.1	254.0	279.7	400			

Item	Unit	Measuring Point	Recording				B.E.T.		ANN High	ANN Low
			C-0	C-1	C-4					
Test Number										
Date			8/8	8/8	8/8					
Time			09:00	11:00	18:30					
Burner Barrel C-1	°C	DL B62T10	241.8	246.8	276.2			400		
Burner Barrel C-1	°C	DL B62T11	229.0	236.3	269.9			400		
Burner Barrel C-1	°C	DL B62T12	240.6	247.1	281.0			400		
Burner Barrel C-1	°C	DL B62T13	235.2	240.1	270.4			400		
Burner Barrel C-2	°C	DL B62T20	261.1	265.6	300.5			400		
Burner Barrel C-2	°C	DL B62T21	205.9	212.6	244.4			400		
Burner Barrel C-2	°C	DL B62T22	245.3	249.3	285.6			400		
Burner Barrel C-2	°C	DL B62T23	284.6	291.7	322.7			400		
Burner Barrel C-3	°C	DL B62T30	46.1	51.3	44.9			400		
Burner Barrel C-3	°C	DL B62T31	54.6	57.4	54.1			400		
Burner Barrel C-3	°C	DL B62T32	271.4	279.0	310.5			400		
Burner Barrel C-3	°C	DL B62T33	224.0	227.4	259.9			400		
Burner Barrel C-4	°C	DL B62T40	237.2	242.7	276.0			400		
Burner Barrel C-4	°C	DL B62T41	231.2	238.9	271.3			400		
Burner Barrel C-4	°C	DL B62T42	246.1	250.3	280.8			400		
Burner Barrel C-4	°C	DL B62T43	258.4	264.7	295.7			400		
Burner Barrel D-1	°C	DL B63T10	323.8	330.2	352.1			400		
Burner Barrel D-1	°C	DL B63T11	281.3	289.1	318.5			400		
Burner Barrel D-1	°C	DL B63T12	336.1	343.3	358.2			400		
Burner Barrel D-1	°C	DL B63T13	339.7	346.8	363.7			400		
Burner Barrel D-2	°C	DL B63T20	337.1	344.5	361.6			400		
Burner Barrel D-2	°C	DL B63T21	263.7	273.0	303.8			400		
Burner Barrel D-2	°C	DL B63T22	360.5	359.9	374.2			400		
Burner Barrel D-2	°C	DL B63T23	329.4	336.3	361.4			400		
Burner Barrel D-3	°C	DL B63T30	-	-	-			400		
Burner Barrel D-3	°C	DL B63T31	262.2	272.6	302.8			400		
Burner Barrel D-3	°C	DL B63T32	305.0	313.8	336.5			400		
Burner Barrel D-3	°C	DL B63T33	340.0	345.4	364.5			400		
Burner Barrel D-4	°C	DL B63T40	321.9	327.7	348.4			400		
Burner Barrel D-4	°C	DL B63T41	271.9	280.2	306.9			400		
Burner Barrel D-4	°C	DL B63T42	340.0	344.1	358.2			400		
Burner Barrel D-4	°C	DL B63T43	322.3	325.6	346.8			400		

Combustion Test of Calaca Unit I Boiler

(I-1)

Item	Unit	Measuring Point	Recording	B.E.T. High	ANN High	ANN Low
Test Number		E-11	E-13			
Date		8/11	8/11			
Time		09:30	11:30			
Coal blend ratio	(S/A)	60/40	60/40			
Generator load	MW	DL Q20W10	298.8	293.3	300	
Main steam flow	T/H	DL G21H10	942	942	913.3	
Feed water flow	T/H	DL E15F10	888	842	881.5	
SH spray flow	T/H	DL E55F10	64.9	90.2	56.4	
Drum level	mm	DL E20L10	4.6	9.1	-11.7	127 -203
Drum pressure	kg/cm <sup>2</sup>	DL E20P10	182.8	177.6	187.2	200
Main steam pressure	kg/cm <sup>2</sup>	CRT	-	-		
Turbine inlet steam press.	kg/cm <sup>2</sup>	DL G21P10	168.5	163.6		171
Final SH outlet temperature	°C	DL E60F10	537.7	540.2	542.5	
Main steam temperature	°C	CRT	-	-		
RH outlet temperature	°C	DL E74F10	533.8	538.8	541.6	
Eco. inlet feedwater temp.	°C	DL E10T10A	275.1	274.8		
A Hot primary air flow	T/H	DL A42F10	120	117		
B Hot primary air flow	T/H	DL A46F10	134	134		
A Tempering air flow	T/H	DL A42F20	30	40		
B Tempering air flow	T/H	DL A46F20	42	32		
A Secondary air flow	T/H	DL A52F10	381	413		
B Secondary air flow	T/H	DL A52F10	445	472		
Total air flow	T/H	DL A60G10	1,156	1,208		
Boiler exit gas O <sub>2</sub>	(A) %	DL A80C10	2.76	3.65		
Boiler exit gas O <sub>2</sub>	(B) %	DL A80C20	-	-	3.22	5.88 2.94
Total fuel flow	T/H	DL B10G10A	142.17	142.76	110.4	
A FDF discharge draft	mmAq	DL A12F10	173.8	198.7	233.7	
B FDF discharge draft	mmAq	DL A16F10	173.5	198.2	231.1	
Wind box draft	mmAq	DL A70F10	69.6	77.3	114.3	
Furnace draft	mmAq	DL A80F10	-10.2	-15.2	-20.3	

Item	Unit	Measuring Point	Recording		ANN High	ANN Low
			B.E.T.			
Test Number		E-11	E-13			
Date		8/11	8/11			
Time		09:30	11:30			
A Lower Eco outlet draft	mmHg	DL E10F10	-93.2	-107.3	-94	
B Lower Eco outlet draft	mmHg	DL E10F20	-93.5	-105.2	-96.5	
A AH gas side diff. press.	mmHg	DL A53D10	138.8	159.2	119.4	
B AH gas side diff. press.	mmHg	DL A57D10	133.4	141.5	114.3	
Primary air press.	mmHg	DL A40P10	1,585	1,561	1,496.2	
A IDF inlet draft	mmHg	DL A22F10	-321.8	-353.3	-297.2	
B IDF inlet draft	mmHg	DL A26F10	-319.5	-352.6	-294.6	
A AH inlet air temp.	°C	DL A52T10	34.7	37.2	35.1	
B AH inlet air temp.	°C	DL A56T10	34.8	37.5	33.9	
A AH outlet air temp.	°C	DL A52T20	330.6	339	338.3	
B AH outlet air temp.	°C	DL A56T20	322.5	332.6	337.4	
A AH inlet gas temp.	°C	DL A53T10	366.8	337.4	365.4	
B AH inlet gas temp.	°C	DL A57T10	357.6	370.4	367.9	
A AH outlet gas temp.	°C	DL A53T20	139.8	144.3	147.4	
B AH outlet gas temp.	°C	DL A57T20	144.4	150	150.3	
A Precip outlet gas temp.	°C	DL C10T10	136.3	140.2	143.6	
B Precip outlet gas temp.	°C	DL C10T20	136.6	140.8	144.4	
A IDF motor amp.	A	CR indicator	245	257.5	236	
B IDF motor amp.	A	CR indicator	240	250	230	
A FDF motor amp.	A	CR indicator	82.5	85	85	
B FDF motor amp.	A	CR indicator	82.5	85	86	
A Pri. air fan motor amp.	A	CR indicator	230	230	183	
B Pri. air fan motor amp.	A	CR indicator	230	230	196	
A IDF inlet vane open	%	CR controller	70	75	70	
B IDF inlet vane open	%	CR controller	75	77.5	73	
A FDF inlet vane open	%	CR controller	67.5	70	74	
B FDF inlet vane open	%	CR controller	65	67.5	70	
SH pass damper open	%	CR controller	70	75	74	
RH pass damper open	%	CR controller	47.5	40	75	
Pri. air capacity damper open	%	CR controller	95	95		
O <sub>2</sub> analysis by Orsat (A)	%					
O <sub>2</sub> analysis by Orsat (B)	%					

Item	Unit	Measuring Point	Recording	B.E.T.	ANN High	ANN Low
Test Number		E-11	E-13			
Date		8/11	8/11			
Time		09:30	11:30			
A Mill coal fineness	%					
A Mill coal feeder flow	T/H	DL B11F10	46.80	47.98	36.7	
A Mill inlet air temp.	°C	DL B13T10	260	278	196.2	
A Mill air coal outlet temp.	°C	DL B13T20	75	75	77.9	
A Mill diff. draft	mmAq	CR indicator	560	570	527.8	
A Mill primary air flow	T/H	DL B13F10	100	102.2	86.0	31.3
A Mill hot air damper open	%	local	28	26		
A Mill cold air damper open	%	local	18	17		
A Mill capacity damper open	%	local	60	67		
A Mill motor amp.	A	CR indicator	80	85	86	
A Mill classifier open	%				60	
B Mill coal fineness	%					
B Mill coal feeder flow	T/H	DL B21F10	48.59	49.27	36.0	
B Mill inlet air temp.	°C	DL B23T10	275	286	174.6	
B Mill air coal outlet temp.	°C	DL B23T20	75	75	78.9	
B Mill differential draft	mmAq	CR indicator	600	620	500.0	
B Mill primary air flow	T/H	DL B23F10	103.1	104.9	86.7	31.3
B Mill hot air damper open	%	local	36	38		
B Mill cold air damper open	%	local	10	10	40	
B Mill capacity damper open	%	local	76	76		
B Mill motor amp.	A	CR indicator	85	85	90	
B Mill classifier open	%				60	

Item	Unit	Measuring Point	Recording	B.E.T.		ANN	
				High	Low	High	Low
Test Number	E-11	E-13					
Date	8/11	8/11					
Time	09:30	11:30					
C Mill coal fineness	%						
C Mill coal feeder flow	T/H	DL B31F10	46.93	45.71	37.1		
C Mill inlet air temp.	°C	DL B33T10	267	268	174.2		
C Mill air coal outlet temp.	°C	DL B33T20	74	75	80.0		
C Mill differential draft	mmAq	CR indicator	580	580	507.4		
C Mill primary air flow	T/H	DL B33F10	99	98.6	82.5	31.3	
C Mill hot air damper open	%	local	46	40			
C Mill cold air damper open	%	local	12	15	62		
C Mill capacity damper open	%	local	50	48			
C Mill motor amp.	A	CR indicator	85	85	92		
C Mill classifier open	%				60		
D Mill coal fineness	%						
D Mill coal feeder flow	T/H	DL B41F10			-		
D Mill inlet air temp.	°C	DL B43T10			-		
D Mill air coal outlet temp.	°C	DL B43T20			-		
D Mill differential draft	mmAq	CR indicator			-		
D Mill primary air flow	T/H	DL B43F10			-	31.3	
D Mill hot air damper open	%	local			-		
D Mill cold air damper open	%	local			-		
D Mill capacity damper open	%	local			-		
D Mill motor amp.	A	CR indicator			-		
D Mill classifier open	%				-		

Item	Unit	Measuring Point	Recording	B.E.T. High	ANN High	ANN Low
Test Number		E-11	E-13			
Date		8/11	8/11			
Time		09:30	11:30			
A Mill hot air damper open	%	local	28	26		
A Mill cold air damper open	%	local	18	17		
A Mill capacity damper open	%	local	60	67		
A Mill classifier vane open	%	local				
B Mill hot air damper open	%	local	36	38		
B Mill cold air damper open	%	local	10	10		
B Mill capacity damper open	%	local	76	76		
B Mill classifier vane open	%	local				
C Mill hot air damper open	%	local	46	40		
C Mill cold air damper open	%	local	12	15		
C Mill capacity damper open	%	local	50	48		
C Mill classifier vane open	%	local				
D Mill hot air damper open	%	local				
D Mill cold air damper open	%	local				
D Mill capacity damper open	%	local				
D Mill classifier vane open	%	local				



BOILER METAL TEMPERATURE

(III-1)

Test Number	Item	Unit	Measuring Point	Recording		ANN High	ANN Low
				E-11	E-13		
Date			8/11	8/11			
Time			09:30	11:30			
Div. wall out tube metal temp.	1	°C	DL E51T10	451.5	469.5	538	538
Div. wall out tube metal temp.	2	°C	DL E51T11	477.1	497.7	538	538
Div. wall out tube metal temp.	3	°C	DL E51T12	530.2	532.0	538	538
Div. wall out tube metal temp.	4	°C	DL E51T13	458.8	482.2	538	538
Div. wall out tube metal temp.	5	°C	DL E51T14	448.2	473.5	538	538
Div. wall out tube metal temp.	6	°C	DL E51T15	458.0	482.4	538	538
Div. wall out tube metal temp.	7	°C	DL E51T16	444.4	471.1	538	538
Div. wall out tube metal temp.	8	°C	DL E51T17	460.4	490.6	538	538
Div. wall out tube metal temp.	9	°C	DL E51T18	450.3	473.0	538	538
Div. wall out tube metal temp.	10	°C	DL E51T19	478.7	500.7	538	538
Final SH tube metal temp.	1	°C	DL E61T10	542.0	546.2	602	602
Final SH tube metal temp.	2	°C	DL E61T11	521.9	523.6	602	602
Final SH tube metal temp.	3	°C	DL E61T12	558.9	563.5	602	602
Final SH tube metal temp.	4	°C	DL E61T13	541.1	541.5	602	602
Final SH tube metal temp.	5	°C	DL E61T14	540.6	541.0	602	602
Final SH tube metal temp.	6	°C	DL E61T15	456.5	483.1	602	602
Final SH tube metal temp.	7	°C	DL E61T16	521.1	529.0	602	602
Final SH tube metal temp.	8	°C	DL E61T17	510.0	516.4	602	602
Final SH tube metal temp.	9	°C	DL E61T18	513.1	518.3	602	602
Final SH tube metal temp.	10	°C	DL E61T19	509.1	515.9	602	602
Final SH tube metal temp.	11	°C	DL E61T20	535.4	535.8	602	602
Final SH tube metal temp.	12	°C	DL E61T21	513.9	512.0	602	602
Final SH tube metal temp.	13	°C	DL E61T22	561.7	564.8	602	602
Final SH tube metal temp.	14	°C	DL E61T23	536.4	535.5	602	602
Final SH tube metal temp.	15	°C	DL E61T24	548.6	550.2	602	602
Final SH tube metal temp.	16	°C	DL E61T25	527.5	526.1	602	602

Test Number	Item	Unit	Measuring Point	Recording	B.E.T.	ANN	
						High	Low
			E-11 E-13				
Date			8/11 8/11				
Time			09:30 11:30				
RH out tube metal temp.	1	°C	DL E71T10 501.0	501.5		599	
RH out tube metal temp.	2	°C	DL E71T11 483.2	484.1		599	
RH out tube metal temp.	3	°C	DL E71T12 598.6	597.9		599	
RH out tube metal temp.	4	°C	DL E71T13 579.1	580.1		599	
RH out tube metal temp.	5	°C	DL E71T14 554.9	550.5		599	
RH out tube metal temp.	6	°C	DL E71T15 554.5	549.1		599	
RH out tube metal temp.	7	°C	DL E71T16 513.9	513.4		599	
RH out tube metal temp.	8	°C	DL E71T17 492.4	497.0		599	
RH out tube metal temp.	9	°C	DL E71T18 468.5	487.6		599	
RH out tube metal temp.	10	°C	DL E71T19 454.1	468.6		599	
RH out tube metal temp.	11	°C	DL E71T20 475.3	490.4		599	
RH out tube metal temp.	12	°C	DL E71T21 457.2	473.3		599	
RH out tube metal temp.	13	°C	DL E71T22 489.8	499.1		599	
RH out tube metal temp.	14	°C	DL E71T23 472.0	481.5		599	
RH out tube metal temp.	15	°C	DL E71T24 510.7	518.4		599	
RH out tube metal temp.	16	°C	DL E71T25 534.4	541.3		599	
RH out tube metal temp.	17	°C	DL E71T26 592.6	598.2		599	
RH out tube metal temp.	18	°C	DL E71T27 583.4	588.5		599	
RH out tube metal temp.	19	°C	DL E71T28 554.1	560.8		599	
RH out tube metal temp.	20	°C	DL E71T29 519.4	526.8		599	

FURNACE TEMPERATURE

(IV-1)

Item	Unit	Measuring Point	Recording	B.E.T.	ANN High	ANN Low
Test Number		E-11	E-13			
Date		8/11	8/11			
Time		09:30	11:30			
7F Mezz. Front Right 2nd Port	°C	local	1,200	1,210		
7F Mezz. Front Center Port	°C	local	1,250	1,240		
7F Mezz. Front Left 2nd Port	°C	local	1,300	1,275		
8F Left near S/B 6-L	°C	local	1,120	1,140		
8F Right near S/B 6-R	°C	local	1,125	1,120		
8F Rear Left 2nd Port	°C	local	990	1,015		
9F Left near S/B 4-L	°C	local	1,000	1,000		
9F Right near S/B 4-R	°C	local	1,010	990		
9F Front Left 2nd Port	°C	local	1,010	1,020		
9F Front Center Port	°C	local	1,005	1,015		
9F Front Right 2nd Port	°C	local	1,010	1,010		

Item	Unit	Measuring Point	Recording	B.E.T.	ANN High	ANN Low
Test Number		E-11	E-13			
Date		8/11	8/11			
Time		09:30	11:30			
A-1 Air resistor open		local	5.0	5.0		
A-2 Air resistor open		local	5.2	4.8		
A-3 Air resistor open		local	4.0	4.0		
A-4 Air resistor open		local	3.9	3.9		
B-1 Air resistor open		local	5.0	5.0		
B-2 Air resistor open		local	4.3	4.5		
B-3 Air resistor open		local	4.5	4.3		
B-4 Air resistor open		local	5.0	5.0		
C-1 Air resistor open		local	5.1	4.9		
C-2 Air resistor open		local	5.1	4.9		
C-3 Air resistor open		local	5.2	5.1		
C-4 Air resistor open		local	4.0	4.0		
D-1 Air resistor open		local	2.5	2.5		
D-2 Air resistor open		local	0.5	0.5		
D-3 Air resistor open		local	0.5	0.5		
D-4 Air resistor open		local	1.0	1.0		
Airport damper open (Right)		local	25	25		
Airport damper open (Left)		local	25	25		

Item	Unit	Measuring Point	Recording	B.E.T.		ANN High	ANN Low
				Point	Low		
Test Number		E-11	E-13				
Date		8/11	8/11				
Time		09:30	11:30				
Burner Barrel A-1	°C	DL B60T10	296.0	305.0		400	
Burner Barrel A-1	°C	DL B60T11	205.0	211.4		400	
Burner Barrel A-1	°C	DL B60T12	288.2	296.8		400	
Burner Barrel A-1	°C	DL B60T13	277.3	285.2		400	
Burner Barrel A-2	°C	DL B60T20	299.5	308.3		400	
Burner Barrel A-2	°C	DL B60T21	232.0	240.1		400	
Burner Barrel A-2	°C	DL B60T22	255.7	263.4		400	
Burner Barrel A-2	°C	DL B60T23	277.1	285.4		400	
Burner Barrel A-3	°C	DL B60T30	262.2	271.8		400	
Burner Barrel A-3	°C	DL B60T31	227.5	236.6		400	
Burner Barrel A-3	°C	DL B60T32	284.3	293.4		400	
Burner Barrel A-3	°C	DL B60T33	290.5	300.2		400	
Burner Barrel A-4	°C	DL B60T40	294.6	303.7		400	
Burner Barrel A-4	°C	DL B60T41	174.1	179.8		400	
Burner Barrel A-4	°C	DL B60T42	286.2	295.8		400	
Burner Barrel A-4	°C	DL B60T43	299.3	309.0		400	
Burner Barrel B-1	°C	DL B61T10	248.1	258.5		400	
Burner Barrel B-1	°C	DL B61T11	262.6	272.0		400	
Burner Barrel B-1	°C	DL B61T12	296.0	305.8		400	
Burner Barrel B-1	°C	DL B61T13	273.0	282.4		400	
Burner Barrel B-2	°C	DL B61T20	269.8	280.4		400	
Burner Barrel B-2	°C	DL B61T21	232.0	240.0		400	
Burner Barrel B-2	°C	DL B61T22	294.7	305.5		400	
Burner Barrel B-2	°C	DL B61T23	271.5	282.1		400	
Burner Barrel B-3	°C	DL B61T30	267.3	279.0		400	
Burner Barrel B-3	°C	DL B61T31	214.6	223.7		400	
Burner Barrel B-3	°C	DL B61T32	286.2	297.4		400	
Burner Barrel B-3	°C	DL B61T33	271.0	282.7		400	
Burner Barrel B-4	°C	DL B61T40	260.1	271.3		400	
Burner Barrel B-4	°C	DL B61T41	254.0	264.3		400	
Burner Barrel B-4	°C	DL B61T42	276.6	288.3		400	
Burner Barrel B-4	°C	DL B61T43	277.0	287.8		400	

Item	Unit	Measuring Point	Recording	ANN	
				B.E.T. High	Low
Test Number		E-11	E-13		
Date		8/11	8/11		
Time		09:30	11:30		
Burner Barrel C-1	°C	DL B62T10	272.9	282.1	400
Burner Barrel C-1	°C	DL B62T11	265.9	275.3	400
Burner Barrel C-1	°C	DL B62T12	276.5	285.9	400
Burner Barrel C-1	°C	DL B62T13	267.5	276.9	400
Burner Barrel C-2	°C	DL B62T20	296.0	305.7	400
Burner Barrel C-2	°C	DL B62T21	239.6	248.8	400
Burner Barrel C-2	°C	DL B62T22	282.8	293.2	400
Burner Barrel C-2	°C	DL B62T23	314.3	323.2	400
Burner Barrel C-3	°C	DL B62T30	56.9	57.2	400
Burner Barrel C-3	°C	DL B62T31	67.1	67.6	400
Burner Barrel C-3	°C	DL B62T32	305.6	316.0	400
Burner Barrel C-3	°C	DL B62T33	256.3	266.1	400
Burner Barrel C-4	°C	DL B62T40	273.2	282.9	400
Burner Barrel C-4	°C	DL B62T41	268.2	279.1	400
Burner Barrel C-4	°C	DL B62T42	278.2	288.3	400
Burner Barrel C-4	°C	DL B62T43	291.7	302.0	400
Burner Barrel D-1	°C	DL B63T10	348.1	355.6	400
Burner Barrel D-1	°C	DL B63T11	313.4	322.4	400
Burner Barrel D-1	°C	DL B63T12	353.8	361.7	400
Burner Barrel D-1	°C	DL B63T13	359.3	366.3	400
Burner Barrel D-2	°C	DL B63T20	360.0	366.5	400
Burner Barrel D-2	°C	DL B63T21	305.3	314.1	400
Burner Barrel D-2	°C	DL B63T22	379.4	385.0	400
Burner Barrel D-2	°C	DL B63T23	358.9	364.4	400
Burner Barrel D-3	°C	DL B63T30	-	-	400
Burner Barrel D-3	°C	DL B63T31	299.9	308.8	400
Burner Barrel D-3	°C	DL B63T32	331.0	340.3	400
Burner Barrel D-3	°C	DL B63T33	364.1	369.8	400
Burner Barrel D-4	°C	DL B63T40	347.2	355.1	400
Burner Barrel D-4	°C	DL B63T41	302.9	311.6	400
Burner Barrel D-4	°C	DL B63T42	358.0	366.1	400
Burner Barrel D-4	°C	DL B63T43	349.9	357.5	400

Combustion Test of Calaca Unit I Boiler

(I-1)

Item	Unit	Measuring Point	Recording	B.E.T.	ANN High	ANN Low
Test Number		D-6	D-8			
Date		8/15	8/15			
Time		09:30	11:30			
Coal blend ratio	(S/A)					
Generator load	MW	DL Q20W10	218.9	218.0	300	
Main steam flow	T/H	DL G21H10	684	682	913.3	
Feed water flow	T/H	DL E15F10	629	617	881.5	
SH spray flow	T/H	DL E55F10	58.4	64.1	56.4	
Drum level	mm	DL E20L10	-1.9	-1.1	-11.7	127 -203
Drum pressure	kg/cm <sup>2</sup>	DL E20P10	174.7	173.6	187.2	200
Turbine inlet steam press.	kg/cm <sup>2</sup>	DL G21P10	167.6	166.8		171
Final SH outlet temperature	°C	DL E60T10	538.0	541.1	542.5	
RH outlet temperature	°C	DL E74T10	535.3	541.9	541.6	
Eco. inlet feedwater temp.	°C	DL E10T10A	255.5	256.1		
A Hot primary air flow	T/H	DL A42F10	172	159		
B Hot primary air flow	T/H	DL A46F10	150	157		
A Tempering air flow	T/H	DL A42F20	19	0		
B Tempering air flow	T/H	DL A46F20	22	25		
A Secondary air flow	T/H	DL A52F10	244	266		
B Secondary air flow	T/H	DL A52F10	268	287		
Total air flow	T/H	DL A60G10	876	895		
Boiler exit gas O <sub>2</sub>	(A) %	DL A80C10	3.09	3.59		5.88 2.94
Boiler exit gas O <sub>2</sub>	(B) %	DL A80C20	-	-	3.22	5.88 2.94
Total fuel flow	T/H	DL B10G10A	122.96	123.05	110.4	
A FDF discharge draft	mmAq	DL A12F10	34.6	51.2	233.7	
B FDF discharge draft	mmAq	DL A16F10	34.4	49.0	231.1	
Wind box draft	mmAq	DL A70F10	-4.7	7.6	114.3	
Furnace draft	mmAq	DL A80F10	-13.1	-9.6	-20.3	

Item	Unit	Measuring Point	Recording	B.E.T. High	ANN Low
Test Number		D-6 D-8			
Date		8/15	8/15		
Time		09:30	11:30		
A Lower Eco outlet draft	mmAq	DL E10F10	-71.1	-67.9	-94
B Lower Eco outlet draft	mmAq	DL E10F20	-69.7	-68.3	-96.5
A AH gas side diff. press.	mmAq	DL A53D10	83.1	95.6	119.4
B AH gas side diff. press.	mmAq	DL A57D10	82.0	93.2	114.3
Primary air press.	mmAq	DL A40P10	1,468	1,486	1,496.2
A IDF inlet draft	mmAq	DL A22F10	-210.6	-229.9	-297.2
B IDF inlet draft	mmAq	DL A26F10	-208.7	-227.4	-294.6
A AH inlet air temp.	°C	DL A52T10	36.9	36.9	35.1
B AH inlet air temp.	°C	DL A56T10	38.1	37.3	33.9
A AH outlet air temp.	°C	DL A52T20	305.3	311.6	338.3
B AH outlet air temp.	°C	DL A56T20	301.0	308.3	337.4
A AH inlet gas temp.	°C	DL A53T10	333.2	342.4	365.4
B AH inlet gas temp.	°C	DL A57T10	326.7	337.7	367.9
A AH outlet gas temp.	°C	DL A53T20	131.2	132.1	147.4
B AH outlet gas temp.	°C	DL A57T20	137.8	138.9	150.3
A Precip outlet gas temp.	°C	DL C10T10	127.5	128.3	143.6
B Precip outlet gas temp.	°C	DL C10F20	132.4	132.5	144.4
A IDF motor amp.	A	CR indicator	220	220	236
B IDF motor amp.	A	CR indicator	218	218	230
A FDF motor amp.	A	CR indicator	72	72	85
B FDF motor amp.	A	CR indicator	70	72	86
A Pri. air fan motor amp.	A	CR indicator	238	238	183
B Pri. air fan motor amp.	A	CR indicator	238	238	196
A IDF inlet vane open	%	CR controller	60	61	70
B IDF inlet vane open	%	CR controller	66	68	73
A FDF inlet vane open	%	CR controller	47	47	74
B FDF inlet vane open	%	CR controller	44	49	70
SH pass damper open	%	CR controller	57	68	74
RH pass damper open	%	CR controller	71	50	75
Pri. air capacity damper open	%	CR controller	96.93	96.94	
O <sub>2</sub> analysis by Orsat (A)	%				
O <sub>2</sub> analysis by Orsat (B)	%				



Item	Unit	Measuring Point	Recording		ANN High	ANN Low
			D-6	D-8		
Test Number						
Date			8/15	8/15		
Time			09:30	11:30		
A Mill coal fineness %						
A Mill coal feeder flow	T/H	DL B11F10	33.65	33.62	36.7	
A Mill inlet air temp.	°C	DL B13T10	284	293	196.2	
A Mill air coal outlet temp.	°C	DL B13T20	77	79	77.9	
A Mill diff. draft	mmAq	CR indicator	480	480	527.8	
A Mill primary air flow	T/H	DL B13F10	92.3	93.9	86.0	31.3
A Mill hot air damper open	%	local	62	55		
A Mill cold air damper open	%	local	5	8		
A Mill capacity damper open	%	local	43	43		
A Mill motor amp.	A	CR indicator	70	70	86	
A Mill classifier open	%				60	
B Mill coal fineness %						
B Mill coal feeder flow	T/H	DL B21F10	43.44	43.63	36.0	
B Mill inlet air temp.	°C	DL B23T10	277	284	174.6	
B Mill air coal outlet temp.	°C	DL B23T20	68	69	78.9	
B Mill differential draft	mmAq	CR indicator	580	600	500.0	
B Mill primary air flow	T/H	DL B23F10	92.8	98.8	86.7	31.3
B Mill hot air damper open	%	local	96	96		
B Mill cold air damper open	%	local	2	2	40	
B Mill capacity damper open	%	local	58	58		
B Mill motor amp.	A	CR indicator	65	75	90	
B Mill classifier open	%				60	

Item	Unit	Measuring Point	Recording	B.E.T.	ANN High	ANN Low
Test Number		D-6	D-8			
Date		8/15	8/15			
Time		09:30	11:30			
C Mill coal fineness	%					
C Mill coal feeder flow	T/H	DL B31F10	45.56	45.58	37.1	
C Mill inlet air temp.	°C	DL B3T10	264	270	174.2	
C Mill air coal outlet temp.	°C	DL B3T20	66	67	80.0	
C Mill differential draft	mmAg	CR indicator	600	600	507.4	
C Mill primary air flow	T/H	DL B33F10	111.8	111.7	82.5	31.3
C Mill hot air damper open	%	local	100	98		
C Mill cold air damper open	%	local	2	5	62	
C Mill capacity damper open	%	local	63	45		
C Mill motor amp.	A	CR indicator	65	75	92	
C Mill classifier open	%				60	
D Mill coal fineness	%					
D Mill coal feeder flow	T/H	DL B41F10				
D Mill inlet air temp.	°C	DL B4T10				
D Mill air coal outlet temp.	°C	DL B4T20				
D Mill differential draft	mmAg	CR indicator				
D Mill primary air flow	T/H	DL B43F10				31.3
D Mill hot air damper open	%	local				
D Mill cold air damper open	%	local				
D Mill capacity damper open	%	local				
D Mill motor amp.	A	CR indicator				
D Mill classifier open	%					

Item	Unit	Measuring Point	Recording	B.E.T.	ANN High	ANN Low
Test Number			D-6	D-8		
Date			8/15	8/15		
Time			09:30	11:30		
A Mill hot air damper open	%	local	62	55		
A Mill cold air damper open	%	local	5	8		
A Mill capacity damper open	%	local	43	43		
A Mill classifier vane open	%	local				
B Mill hot air damper open	%	local	96	96		
B Mill cold air damper open	%	local	2	2		
B Mill capacity damper open	%	local	58	58		
B Mill classifier vane open	%	local				
C Mill hot air damper open	%	local	100	98		
C Mill cold air damper open	%	local	2	5		
C Mill capacity damper open	%	local	63	45		
C Mill classifier vane open	%	local				
D Mill hot air damper open	%	local				
D Mill cold air damper open	%	local				
D Mill capacity damper open	%	local				
D Mill classifier vane open	%	local				

BOILER METAL TEMPERATURE

(III-1)

Test Number	Item	Unit	Measuring Point	Recording		ANN High	ANN Low
				D-6	D-8		
Date				8/15	8/15		
Time				09:30	11:30		
Div. wall out tube metal temp.	1	°C	DL E51T10	438.9	457.8	538	538
Div. wall out tube metal temp.	2	°C	DL E51T11	464.8	481.3	538	538
Div. wall out tube metal temp.	3	°C	DL E51T12	516.9	532.5	538	538
Div. wall out tube metal temp.	4	°C	DL E51T13	450.8	467.2	538	538
Div. wall out tube metal temp.	5	°C	DL E51T14	449.5	467.9	538	538
Div. wall out tube metal temp.	6	°C	DL E51T15	466.0	482.3	538	538
Div. wall out tube metal temp.	7	°C	DL E51T16	459.4	477.6	538	538
Div. wall out tube metal temp.	8	°C	DL E51T17	473.0	487.9	538	538
Div. wall out tube metal temp.	9	°C	DL E51T18	463.4	479.9	538	538
Div. wall out tube metal temp.	10	°C	DL E51T19	486.6	499.4	538	538
Final SH tube metal temp.	1	°C	DL E61T10	534.3	549.8	602	602
Final SH tube metal temp.	2	°C	DL E61T11	513.4	527.8	602	602
Final SH tube metal temp.	3	°C	DL E61T12	551.4	567.9	602	602
Final SH tube metal temp.	4	°C	DL E61T13	530.3	543.7	602	602
Final SH tube metal temp.	5	°C	DL E61T14	525.6	543.0	602	602
Final SH tube metal temp.	6	°C	DL E61T15	438.7	458.3	602	602
Final SH tube metal temp.	7	°C	DL E61T16	523.9	536.4	602	602
Final SH tube metal temp.	8	°C	DL E61T17	509.2	523.1	602	602
Final SH tube metal temp.	9	°C	DL E61T18	529.3	523.1	602	602
Final SH tube metal temp.	10	°C	DL E61T19	516.7	513.7	602	602
Final SH tube metal temp.	11	°C	DL E61T20	535.4	530.6	602	602
Final SH tube metal temp.	12	°C	DL E61T21	514.6	509.7	602	602
Final SH tube metal temp.	13	°C	DL E61T22	556.1	556.8	602	602
Final SH tube metal temp.	14	°C	DL E61T23	530.3	528.7	602	602
Final SH tube metal temp.	15	°C	DL E61T24	547.4	546.5	602	602
Final SH tube metal temp.	16	°C	DL E61T25	524.4	521.9	602	602

Item	Unit	Measuring Point	Recording	B.E.T.		ANN	
				High	Low	High	Low
Test Number		D-6	D-8				
Date		8/15	8/15				
Time		09:30	11:30				
RH out tube metal temp.	1 °C	DL E71T10	457.2	505.0			599
RH out tube metal temp.	2 °C	DL E71T11	480.5	487.4			599
RH out tube metal temp.	3 °C	DL E71T12	576.0	585.7			599
RH out tube metal temp.	4 °C	DL E71T13	556.8	566.9			599
RH out tube metal temp.	5 °C	DL E71T14	526.7	536.4			599
RH out tube metal temp.	6 °C	DL E71T15	522.5	534.3			599
RH out tube metal temp.	7 °C	DL E71T16	486.4	490.0			599
RH out tube metal temp.	8 °C	DL E71T17	463.4	469.3			599
RH out tube metal temp.	9 °C	DL E71T18	497.0	503.1			599
RH out tube metal temp.	10 °C	DL E71T19	474.2	481.1			599
RH out tube metal temp.	11 °C	DL E71T20	526.1	527.5			599
RH out tube metal temp.	12 °C	DL E71T21	514.3	517.2			599
RH out tube metal temp.	13 °C	DL E71T22	524.3	516.7			599
RH out tube metal temp.	14 °C	DL E71T23	507.3	500.6			599
RH out tube metal temp.	15 °C	DL E71T24	523.5	530.8			599
RH out tube metal temp.	16 °C	DL E71T25	545.8	555.2			599
RH out tube metal temp.	17 °C	DL E71T26	603.3	610.7			599
RH out tube metal temp.	18 °C	DL E71T27	591.6	600.6			599
RH out tube metal temp.	19 °C	DL E71T28	566.2	574.0			599
RH out tube metal temp.	20 °C	DL E71T29	532.4	540.7			599

FURNACE TEMPERATURE

(IV-1)

Item	Unit	Measuring Point	Recording	B.E.T.	ANN High	ANN Low
Test Number		D-6	D-8			
Date		8/15	8/15			
Time		09:30	11:30			
7F Mezz. Front Right 2nd Port	°C	local	1,180	1,210		
7F Mezz. Front Center Port	°C	local	1,190	1,200		
7F Mezz. Front Left 2nd Port	°C	local	1,170	1,170		
8F Left near S/B 6-L	°C	local	1,040	1,060		
8F Right near S/B 6-R	°C	local	1,060	1,060		
8F Rear Left 2nd Port	°C	local	915	935		
9F Left near S/B 4-L	°C	local	965	980		
9F Right near S/B 4-R	°C	local	970	985		
9F Front Left 2nd Port	°C	local	965	985		
9F Front Center Port	°C	local	970	980		
9F Front Right 2nd Port	°C	local	970	995		

Item	Unit	Measuring Point	Recording				ANN High	ANN Low
			D-6	D-8	B.E.T. Point			
Test Number			D-6	D-8				
Date			8/15	8/15				
Time			09:30	11:30				
A-1 Air resistor open		local	4.8	4.8				
A-2 Air resistor open		local	4.6	4.6				
A-3 Air resistor open		local	4.0	4.0				
A-4 Air resistor open		local	3.7	3.7				
B-1 Air resistor open		local	2.3	2.3				
B-2 Air resistor open		local	4.4	4.4				
B-3 Air resistor open		local	4.8	4.8				
B-4 Air resistor open		local	3.4	3.4				
C-1 Air resistor open		local	4.9	4.9				
C-2 Air resistor open		local	4.9	4.9				
C-3 Air resistor open		local	5.2	5.2				
C-4 Air resistor open		local	4.0	4.0				
D-1 Air resistor open		local	2.2	2.2				
D-2 Air resistor open		local	0.2	0.2				
D-3 Air resistor open		local	0.3	0.3				
D-4 Air resistor open		local	1.0	1.0				
Airport damper open (Right)		local	2.0	2.1				
Airport damper open (Left)		local	2.1	2.1				

Item	Unit	Measuring Point		Recording	B.E.T.		ANN High	ANN Low
		D-6	D-8					
Test Number								
Date		8/15	8/15					
Time		09:30	11:30					
Burner Barrel A-1	°C	DL B60T10	268.7	276.8			400	
Burner Barrel A-1	°C	DL B60T11	179.3	183.5			400	
Burner Barrel A-1	°C	DL B60T12	262.4	269.5			400	
Burner Barrel A-1	°C	DL B60T13	253.3	261.1			400	
Burner Barrel A-2	°C	DL B60T20	276.7	283.4			400	
Burner Barrel A-2	°C	DL B60T21	206.0	212.2			400	
Burner Barrel A-2	°C	DL B60T22	236.4	243.1			400	
Burner Barrel A-2	°C	DL B60T23	253.1	260.0			400	
Burner Barrel A-3	°C	DL B60T30	241.5	299.6			400	
Burner Barrel A-3	°C	DL B60T31	201.2	208.3			400	
Burner Barrel A-3	°C	DL B60T32	267.0	275.4			400	
Burner Barrel A-3	°C	DL B60T33	272.6	239.7			400	
Burner Barrel A-4	°C	DL B60T40	278.0	286.1			400	
Burner Barrel A-4	°C	DL B60T41	156.6	160.6			400	
Burner Barrel A-4	°C	DL B60T42	270.2	278.5			400	
Burner Barrel A-4	°C	DL B60T43	279.4	288.1			400	
Burner Barrel B-1	°C	DL B61T10	215.3	223.9			400	
Burner Barrel B-1	°C	DL B61T11	225.4	233.0			400	
Burner Barrel B-1	°C	DL B61T12	262.6	270.0			400	
Burner Barrel B-1	°C	DL B61T13	242.3	249.7			400	
Burner Barrel B-2	°C	DL B61T20	244.4	247.1			400	
Burner Barrel B-2	°C	DL B61T21	195.4	201.8			400	
Burner Barrel B-2	°C	DL B61T22	270.9	274.0			400	
Burner Barrel B-2	°C	DL B61T23	245.6	249.7			400	
Burner Barrel B-3	°C	DL B61T30	246.8	254.3			400	
Burner Barrel B-3	°C	DL B61T31	182.4	189.2			400	
Burner Barrel B-3	°C	DL B61T32	269.4	276.1			400	
Burner Barrel B-3	°C	DL B61T33	243.9	251.3			400	
Burner Barrel B-4	°C	DL B61T40	231.7	239.9			400	
Burner Barrel B-4	°C	DL B61T41	220.7	229.1			400	
Burner Barrel B-4	°C	DL B61T42	251.8	259.6			400	
Burner Barrel B-4	°C	DL B61T43	252.2	260.4			400	



Item	Unit	Measuring Point	Recording		ANN High	ANN Low
			B.E.T.			
Test Number			D-6	D-8		
Date			8/15	8/15		
Time			09:30	11:30		
Burner Barrel C-1	°C	DL B62T10	235.6	243.6	400	400
Burner Barrel C-1	°C	DL B62T11	228.2	235.5	400	400
Burner Barrel C-1	°C	DL B62T12	237.2	245.7	400	400
Burner Barrel C-1	°C	DL B62T13	228.6	236.8	400	400
Burner Barrel C-2	°C	DL B62T20	263.1	270.0	400	400
Burner Barrel C-2	°C	DL B62T21	205.1	211.9	400	400
Burner Barrel C-2	°C	DL B62T22	245.0	253.3	400	400
Burner Barrel C-2	°C	DL B62T23	290.5	269.6	400	400
Burner Barrel C-3	°C	DL B62T30	274.6	282.3	400	400
Burner Barrel C-3	°C	DL B62T31	209.7	218.6	400	400
Burner Barrel C-3	°C	DL B62T32	278.9	285.7	400	400
Burner Barrel C-3	°C	DL B62T33	227.3	232.4	400	400
Burner Barrel C-4	°C	DL B62T40	237.7	246.2	400	400
Burner Barrel C-4	°C	DL B62T41	234.7	243.5	400	400
Burner Barrel C-4	°C	DL B62T42	245.7	255.0	400	400
Burner Barrel C-4	°C	DL B62T43	260.3	269.3	400	400
Burner Barrel D-1	°C	DL B63T10	320.9	323.7	400	400
Burner Barrel D-1	°C	DL B63T11	284.0	289.1	400	400
Burner Barrel D-1	°C	DL B63T12	339.0	334.3	400	400
Burner Barrel D-1	°C	DL B63T13	336.8	339.8	400	400
Burner Barrel D-2	°C	DL B63T20	334.3	336.8	400	400
Burner Barrel D-2	°C	DL B63T21	270.3	277.1	400	400
Burner Barrel D-2	°C	DL B63T22	360.2	357.9	400	400
Burner Barrel D-2	°C	DL B63T23	332.1	334.5	400	400
Burner Barrel D-3	°C	DL B63T30	336.0	339.2	400	400
Burner Barrel D-3	°C	DL B63T31	266.5	275.1	400	400
Burner Barrel D-3	°C	DL B63T32	354.7	356.8	400	400
Burner Barrel D-3	°C	DL B63T33	345.7	340.5	400	400
Burner Barrel D-4	°C	DL B63T40	328.8	333.9	400	400
Burner Barrel D-4	°C	DL B63T41	276.3	287.9	400	400
Burner Barrel D-4	°C	DL B63T42	340.4	345.0	400	400
Burner Barrel D-4	°C	DL B63T43	327.0	331.3	400	400



添付資料 - 7

**Analytical Instruments for Fuel, Environment and Water**



## Analytical Instruments for the Fuel Laboratory

### 1. Existing Instrument

(1) Redwood No. 1 Type Viscometer	RW-11E	Yoshida Kagaku
(2) Flash Point Tester, Pensky Martens Cleveland Open Cup	PMF-EM COC-E	Yoshida Kagaku Yoshida Kagaku
(3) Centrifugal Separator	H-210A	Kokusan Enshinki Co., Ltd.
(4) Muffle Furnace	IMK-A	Ishizuka Denki
(5) Saybolt Colorimeter	SC-SP	Yoshida Kagaku
(6) Drying Oven	DS-62	Yamato Scientific Co., Ltd.
(7) Scale	W-500B	Nutix
(8) Electric Digital Hydrothermometer	AY-21	Yamato Scientific Co., Ltd.
(9) Moisture Determination Balance	F-2A	Kett Electric Laboratory
(10) Electric Furnace	IMKM	Ishizuka Denki
(11) Electric Furnace	ICKV	Ishizuka Denki
(12) Water Bath	BS-48	Yamato Scientific Co., Ltd.
(13) Calorimeter, Adiabstic Bomb Type	1013	Yoshida Seisakusho Co., Ltd.
(14) Roll Jaw Crusher	1023-B	Yoshida Seisakusho Co., Ltd.
(15) Coffee Mill Type Crusher	1023-A	Yoshida Seisakusho Co., Ltd.
(16) Sieve Shaker		Tyler Combustion Eng'g. Inc.
(17) Riffler		Fisher Scientific Co.
(18) Top Loading Scale		Murayama Seisakusho
(19) Top Loading Scale		
(20) Analytical Balance 200 g		Yamato Scientific Co., Ltd.
200 g		Sauter (Germany)

### 2. JICA Supply Instruments

(1) Atomic Absorption Spectrophotometer	AA-670	Shimadzu
(2) ASTM Colorimeter		Yoshida Kagaku
(3) Crucible Swelling Furnace		Yoshida Seisakusho
(4) Computer/Printer		IBM

## Analytical Instruments for the Environmental Laboratory

### 1. Existing Instrument

(1) Atomic Absorption Spectrophotometer Not Operational		Instrumentation Labo. Brand
(2) Water Quality Analyzer	TOS Brand	TOA Electronics, Ltd.
(3) PH Meter		Scott Gerate Brand
(4) Air Particulate Sampler High Volume		Staplex Brand
(5) Sulfur Dioxide Monitoring System		Sierra Misca Brand
(6) Noise Meter	452	Scott Instrumentation Labo. Brand
(7) Drying Oven		Herew Brand
(8) Conductivity Meter/Temperature Meter		Exttech Brand
(9) Laboratory Incubator		
(10) PDL-24 Meteorological Monitoring System		

### 2. JICA Supply Instruments

(1) Dissolved Oxygen Meter	DC-25	TOA Electronics, Ltd.
(2) Spectrophotometer	UV-120-01	Shimadzu
(3) Water Bath	LH-800	Toyo Scientific
(4) Middlevolume Air Sampler	M-100	Shibata Scientific
(5) Stack SO <sub>2</sub> Analyzer	ESDA-813	Horiba Seisakusho
(6) Fume Hoods	LFA-120	Toyo Scientific
(7) Gaseous Pollutant Sampler	HS-6N	Showa Sokki
(8) Water Quality Checker	WQC-2A	TOA Electronics, Ltd.
(9) Water Sampler VANDORN TYPE	5062A	Rigou

## Analytical Instruments for the Water Laboratory

### 1. Existing Instrument

(1) UV-VIS Spectrophotometer	HTC-100-10	Hitachi Ltd.
(2) PH Meter	HM-5ES	TOA Electronics Ltd.
(3) Conductivity Meter	32	TOA Electronics Ltd.
(4) Drying Oven	DS-62	Yamato Scientific Co., Ltd.
(5) Direct Reading Balance	7AG	Kensei Industrial Co., Ltd.
(6) Shaker	SA-31	Yamato Scientific Co., Ltd.
(7) Magnetic Stirrer	M-41	Yamato Scientific Co., Ltd.
(8) Dissolved Oxygen Meter	DO-18	TOA Electronics Ltd.
(9) Hot Plate	HK-21	Yamato Scientific Co., Ltd.
(10) Lab. Demineralizer	MA-1	Japan Organo Co.
(11) Microscope, Metallurgical	BHM-112	Olympus Optical Co., Ltd.
(12) Du. Nony's Surface Tentiometer	3012	Yoshida Seisakusho Co.
(13) Orsat Analyzer		
(14) Fume Hood	VKD-150	Yamato Scientific Co.
(15) Programmable Timer	151	Fisher
(16) Electrothermal Heating Mantle		Electrothermal
(17) Magnetic Stirrer with Heater	610T	Fisher
(18) Water Bath	BS-48	Yamato Scientific
(19) Centrifuge		Precision Universal
(20) Multi-Pen Recorder	R-53	Rikadenki Kogyo

### 2. JICA Supply Instruments

(1) Spectrophotometer	UV-120-02	Shimadzu
(2) Jar Tester	J-6	Toyo Keiryoki
(3) Electronic Analytical Balance	AEL-200	Shimadzu
(4) Flash Point Tester		Yoshida Seisakusho
Pensky Martens Closed	821	
Cleveland Open Cup	823	





添付資料 - 8

**Items of Education and Training at Calaca Power Plant**



ANNEX-8 Items of Education and Training at Calaca Power Plant

For the Freshman Training

4.10 SAFETY of personnel ~ application of Artificial Respiration and Mouth to Mouth/Heart Massage Resuscitation

4.11 SOP on equipment tagging

4.12 Fire Brigade and SOP on Fire Fighting System

For the Regular Training

4.2 Shift Refresher Course (ON THE JOB TRAINING)

Course content as follows:

A. PHYSICS FUNDAMENTALS relevant to Plant Operation

- a.1 Heat
- a.2 Mechanics
- a.3 Sound
- a.4 Optics
- a.5 Electricity/Magnetism
- a.6 Modern Physics

B. TURBINE - GENERATOR (TOSHIBA) AUXILIARY EQUIPMENT OPERATION

1. System lay - out (Flow diagram where possible) for each of the following:

- B.1.1 Bearing Cooling Water System
- B.1.2 Instrument Air Compressor System
- B.1.3 House Service Air Compressor System
- B.1.4 Boiler Auxiliary Air Compressor System
- B.1.5 Condensing System
- B.1.6 Chlorination System
- B.1.7 Screen House Equipment
- B.1.8 Condensate System
- B.1.9 Feedwater System

- B.1.10 Cathodic Protection System
- B.1.11 Ferrous Sulfate
- B.1.12 Machine Gas System (Hydrogen and CO<sub>2</sub>)
- B.1.13 Seal Oil System
- B.1.14 Stator Cooling Water System
- B.1.15 Oil Conditioning System  
(Turbine - Gen and Turb BFPs)
  - B.1.15.1 Turbine - Gen Oil Conditioning
  - B.1.15.2 Boiler Feed Pumps (Turbine - driven)

C. TURBINE:

1. Design/Construction Features

- C.1.1 Nozzle
- C.1.2 Moving blades - Impulse/Reaction blades -  
differentiate
- C.1.3 Cylinder/casing arrangement
- C.1.4 Shaft and wheels
- C.1.5 Thrust bearings
- C.1.6 Journal bearings
- C.1.7 Steam chest
- C.1.8.1 Main Stop Valve or Hydraulic Stop Valve
- C.1.8.2 Control Valves
- C.1.8.3 Combined Reheat - Intercept Valves
- C.1.8.4 High Press/Lo Press Bypass Valves
- C.1.9.1 Turning Gear
- C.1.9.2 Jacking Oil Pump
- C.1.10 Lubrication/Hydraulic Oil System/Oil  
Coolers
- C.1.11 Glands and Shaft Sealing System
- C.1.12 Turbine Protection Devices
  - C.1.12.a Speed Gov'r/Pre-emergency gov'r/Emergency  
gov'r
  - C.1.12.b Relay Dump Valve/Extraction Non-Return  
Valves
  - C.1.12.c Vac Trip Device
  - C.1.12.d Blowdown Valve
  - C.1.12.e Other Valves - (CV, MSV, CRV)

- C.1.12.f Diaphragm Valves
- C.1.12.g Aux Oil Pump/Emergency DC Oil Pump
- C.1.12.h TOOP/Jacking Oil Pump
- C.1.12.i Oil Trip Valve
- C.1.12.j Emergency Trip Valve
- C.1.12.k IPR (Initial Press Regulator)
- C.1.12.l Reverse Power Relay
- C.1.12.m Thrust bearing failure relay
- C.1.13 Auxiliary Steam System (TURBINE)
- C.1.14 E.H.C. (Electro Hydraulic Control)
- C.1.15 Automatic Turbine Start-Up (ATS)
  - C.1.15.1 Extraction Drain Valve Master by ATS
  - C.1.15.2 Extraction Stop Valve Master by ATS
  - C.1.15.3 Condenser Vacuum Raise/Break Master by ATS
  - C.1.15.4 Turbine Drain Valve Master
  - C.1.15.5 ATS - Cold, Warm, Hot and Very Hot Conditions
    - C.1.15.5.1 ATS as laid out in ATS Control Panel
      - a. CV chest warming
      - b. Load set (INC/DEC)
      - c. Load Limit Set Knob
      - d. Auto Turbine Start
      - e. Coordinated Control
      - f. IPR (initial pressure regulator)
      - g. Speed Set RPM
      - h. Starting Rate
      - i. Line Speed Matching
      - j. FA/PA transfer
    - C.1.15.5.2 ATS as laid out in ATS Tests Panel
      - a. MSV
      - b. CRV
      - c. LP - BP "A"
      - d. LP - BP "B"
      - e. Emergency Oil Trip Test
      - f. Over Speed Trip
      - g. Back-up D/S Test
      - h. Power/Load (P/L) Unbalanced Test
      - i. Lamp Test

D. Generator/System (22 kV to 230 kV) and Station Service Lay-out

- D.1 Excitation
- D.2 EHC
- D.3 CVCF
- D.4 Emergency Diesel Generator

E. BOILER (Foster Wheeler) Auxiliary Equipment Operation

E.1 System Lay - out (show FLOW DIAGRAM where possible for each of the following:

E.1.1 Burner Management System (BMS)

- E.1.1.a Light Oil System
- E.1.1.b Heavy Oil System
- E.1.1.c Coal System
  - c.1 Gravimetric Feeder
  - c.2 Pulverizer/Lube Oil System
  - c.3 Pyrite System

E.1.2 Interposing Logic System (ILS)

- E.1.2.a Air Flow - Secondary/Primary
- b Gas Flow
- c Ductworks/Dampers/Positioners
- d Furnace Draft/Furnace Aspirating Pipes
- e Tri-sector Air Heater
- f Electrostatic Precipitator
- g Fans (IDF/FDF/PAF)
- h Tertiary Air Fan/System
- i Seal Air Fan/System

E.1.3 Sootblowers

- E.1.3.a Retractable
- E.1.3.b Wall Blowers
- E.1.3.c Air Heaters
- E.1.3.d Water Blowers

E.1.4 Combustion Control/Temperature Control IMCC

F. BOILER:

- a. Design/Construction Features
- b. Principles of Operation
- c. Description/Purpose or Function of various parts/components
- d. Whys and Hows of Putting IN/OUT of service the various auxiliary equipment
- e. Sequence of Operation
- f. Blr Hydrostatic Testing/Safety Valves/Electromatic Valve
- g. Equipment troubles and remedial measures to apply

G. ASH HANDLING

H. COAL HANDLING







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