

BOILER INDUSTRIAL SYSTEMS CONSULTANTS

P.O. Box 1655
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3610

20 January 2003

Mr. Ricky Govender
Engineering manager
Tongaat Hulett Sugar
P.O.Box 1501
Durban
4000

CC.Isaac Ramu
Tom Roberts

ATTENTION: MR RICKY GOVENDER

Dear Sir,

RE: BOILER EVALUATION

This report is based purely on the conditions observed and measured during January 2003.

- 1) Average CV of coal was 27.5 MJ/kg.
 - 2) SO₂ emissions related to coal consumption is @ **1.53%** ,average **0.53%** above the Maximum.
 - 3) SO₂ ppm results down to 480ppm average.
 - 4) Boiler net efficiency at 84.94%.
 - 5) Steam to coal based on CV net efficiency
Test results reflect **8.94** tone steam to 1 tone of coal
 - 6) Average 11% carbon in ash for January tests.
 - 7) 261.63 Tons of Sulphur emitted for 9000 tons of coal during January.
SO₂ gas emissions 34.79 tons at 480 ppm
 - 9) 1368 Tons of ash in Coal.
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AFTER FURNACE

Boiler 1A	LOAD T/H	TEMP °C	EXCESS AIR%	O₂ %	CO PPM	NO PPM	SO² PPM	EFF %
14/01/03								
	40	317	22.5	4.5	36	164	590	79
	40	318	22.5	4.5	40	168	546	79
	40	320	22.5	4.6	31	182	451	76.5
	40	315	21.4	4.4	35	182	598	79.2
	40	315	22.5	4.5	34	178	461	79.2
	40	317	21.4	4.4	35	200	578	79.2

AVERAGE	40	317	22.1	4.5	35	179	537	78.7
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Comments: This entire test on even date was carried out without any form of fire side treatment taking place.

O₂ levels although low present a problem of oxygen starvation affecting the efficient combustion in the combustion chamber the preferred O₂ being between 5, 9% and 8% O₂. Complimenting the CO₂ at between 11.1% and 13%.

Sulphur levels after furnace are above the allowed 500ppm thereby raising concern to the levels of sulphur in the current coal being fired supported by the analytical data from M&L Laboratories.

BEFORE I D FAN

Boiler 1A	LOAD T/H	TEMP °C	EXCESS AIR%	O₂ %	CO PPM	NO PPM	SO² PPM	EFF %
14/01/03								
	40	167	48.9	6.9	44	164	546	85.2
	40	167	48.9	6.9	50	167	588	85.2
	40	168	46.7	6.7	49	182	478	85.2
	40	168	45.6	6.6	53	190	536	85.3
	40	166	47.8	6.8	41	178	444	85.2
	40	167	47.8	6.8	45	184	486	85.2

AVERAGE	40	167	47.6	6.8	47	178	513	85.2
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Comments: Sulphur levels after furnace are above the allowed 500ppm thereby raising concern to the levels of sulphur in the current coal being fired supported by the analytical data from M&L Laboratories.

AFTER FURNACE

Boiler 1A	LOAD T/H	TEMP °C	EXCESS AIR%	O₂ %	CO PPM	NO PPM	SO² PPM	EFF %
17/01/03								
	40	314	20.3	4.3	37	145	430	79.4
	40	310	23.6	4.6	45	180	566	79.4
	40	314	23.6	4.6	36	162	517	79.2
	40	312	23.6	4.6	45	182	440	79.3
	40	313	21.4	4.4	37	165	381	79.4

AVERAGE	40	313	22.5	4.5	40	167	467	79.3
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Comments: This entire test on even date was carried out with the CHINCO fireside Product on board

Sulphur levels after furnace are on average below the allowed 500ppm
 Interestingly enough the coal sample taken reflected a higher sulphur content than the first coal sample taken .
 Concern to the levels of sulphur in the current coal being fired supported by the analytical data from M&L Laboratories.

BEFORE I D FAN

Boiler 1A	LOAD T/H	TEMP °C	EXCESS AIR%	O₂ %	CO PPM	NO PPM	SO² PPM	EFF %
17/01/03								
	40	163	50	7	46	149	425	85.3
	40	164	48.9	6.9	51	180	503	85.4
	40	164	48.9	6.9	42	155	367	85.3
	40	165	48.9	6.9	46	171	462	85.3
	40	165	48.9	6.9	45	175	476	85.3

AVERAGE	40	164	49.1	6.9	46	166	447	85.3
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CALCULATION SHEET FOR MASS OF SO2 EMITTED

Mj.kg Energy Requirement for	9000.00	tons
Calorific value	27.50	MJ/kg
Efficiency	85.25	%
Total energy value:	210993.75	MJ/kg
Excess Air	47.90	%
Air needed for combustion:	32846.45	kg
Volume of air:	25371.05	m3
SO2 ppm	480.00	ppm
Volume of SO2	12.18	m3
Mass of SO2:	34.79	ton

CRAIG BOTHA
B.I.S. Consultants

