DOCUMENT TRANSMITTAL CONTROL	
PROJECT:	U5 I x 80 MWe FGD Treatment Solution
CLIENT:	W L Gore and Associates Pacific (Pte), india Branch
SMARTLUTH JOB NO.:	**S21001**
DOCUMENT TITLE:	Process Input Request from W L Gore to create the design basis for Basic and Detailed Engineering of FGD and SAC
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00	09/10/21	Process Input Request from W L Gore to create the design basis for Basic and Detailed Engineering of FGD and SAC	Suman Das	S Chakraborty	S Sen
Rev. No.	**Date**	**Description**	**Prepared By**	**Reviewed By**	**Checked By**

Process Input Request from W L Gore to create the design basis for Basic and Detailed Engineering of FGD and SAC for the FGD demonstration project at U5 Renusagar CPP

1.0 Intent:

HINDALCO RENUSAGAR intends to set up a demonstration plant for a Flue Gas De-sulphurisation system on Unit 5 1 x 80 MWe Coal Fired Captive Power Plant at Renusagar Power Division, Sonbhadra, Uttar Pradesh, India, in order to meet the present emission standard set by MOEF for SOx control, which is < 600 mg/Nm3 at 6 % O_2 dry. However, the target SOx emissions to be achieved by the demonstration project will be in the region of 500 mg/Nm3 @ 6% O2 dry measured at the outlet on the newly erected wet stack with space for future retrofit of modules and system to meet tighter emission regulatory need of 200 mg/Nm3 at 6% O2 dry.

In order to carry out the basic and detailed application engineering of the Gore SPC treatment solution for SOx abatment requirement stated above, Smartluth Solution and Service requires the process inputs from WL Gore & Associates(Pacific) Pte Ltd - India as a design basis of the system solution including the effluent treatment plant.

2.0 Design Basis of the FGD System:

We have taken cognizance of the actual performance data at BMCR, recorded using calibrated test equipment and DCS data during the **baseline testing** of the Unit on 6/7 March 2021, mentioned hereunder to form the design basis of the FGD treatment system for which the process data is being requested:

The following flue gas conditions at ID Fan Outlet form the design basis of the FGD process:

Ambient Temperature:	50˚C
Flue Gas Vol. Flow Rate at ID Fan Outlet (A+B sides):	586,669 Am3/Hr wet
Flue Gas Temp. at ID Fan Outlet (A/B sides):	141/154 ˚C; avg. 148 ˚C
Flue gas pressure at ID Fan Outlet to Chimney (A/B sides):	-25 / -21 mmWC
Inlet SOx at FGD:	</= 1590 mg/Nm^3 @ 6% O2 dry (at 0˚ C)
Target SOx at outlet:	**500 mg/Nm^3 @ 6% O2 dry (at 0˚ C) With future provision for 200 mg/Nm3@ 6% O2 dry**
SPM:	not to exceed 120mg/Nm3

The FGD absorber tower will be designed with a maximum Inlet dust emission burden of 120 mg/Nm^3 for excursions during operation.

Gas Composition at ID Fan Outlet (A/B side) as design basis:

Constituent	Unit	Value
CO_2	% by Vol. dry	11.5%/12.44%
O_2	**% by Vol. dry**	**7.9%/6.8%**
N_2	% by Vol. dry	80.67
CO	% by Vol. dry	Trace (not exceeding 15 ppm)
H2S	**% by Vol. dry**	**Not detectable**

Note: The boiler combustion should be in an oxidising atmosphere to achieve the above gas composition as design basis.

3.0 Inputs required for basic and detailed engineering by Smartluth Solution and Service:

The GSCS which will form the basis of design and sizing of other plants and equipment of the FGD solution including the SAC should take into account **the future emissions target of SOx at 200 mg/Nm3@ 6% O2 dry so** that the additional modules required to achieve this target from 500 mg/Nm3 at 500 mg/Nm3 @ 6% O2 dry can be easily retrofitted. The sizing of Booster fan, various pumps, vessels and SAC will have to be designed for the future requirements after making a commercial assessment of essential CAPEX for the present guarantee point and additional CAPEX required for the future requirement for components which can be easily retrofitted. The following data is required from WLGore:

FGTR		
Proposed dimensions	Length (approximate)	m
	Width (approximate)	m
	Area (approximate)	m^2
GORE Modules	No. of stacks	[]
	No. of layers	[]
	No. of modules	[]
	Weight	[kg]
Performance	Flue gas flow (before cooling)	[Nm^3/h, wet]
	Flue gas flow (after cooling)	[Nm^3/h, wet]
	Flue gas flow	[Am^3/h]
	Inlet Temperature	[°C]
	Operating Temperature	[°C]
	Inlet O2 conc.	[%]
	SO2 inlet conc.	[mg/Nm^3, dry @6% O2]
	SO2 inlet conc.	[mg/Nm^3, dry]
	SO2 inlet conc.	[mg/Nm^3, wet]
	SO2 outlet conc.	[mg/Nm^3, dry @6% O2]
	SO2 outlet conc.	[mg/Nm^3, dry]
	SO2 outlet conc.	[mg/Nm^3, wet]
	SO2 Efficiency	[%]
	GSCS Module Pressure Drop	[Pa]
	Acid dewpoint	[°C]
Water / Acid balance	Quench water	[m^3/h]
	MCU Blowdown	[m^3/h]
	Module wash water	[m^3/day]
	Washing Cycle	[1/day]
	Washing Recycle Rate	[%]
	Washing on time	[min]
	Washing Water Consumed	[m^3/cycle]
	Total acid effluent (including water wash)	[m^3/h]
		[m3/day]
		ton/day
	Concentrated Acid Produced at 95% by Weight	[m^3/h]
		[m3/day]
		ton/day

In addition to the GSCS data above, Smartluth Solution and Service would also require the FGTR module arrangement (with individual module dimensions, weight etc) and supporting philosophy within the FGTR showing allowable structural deflection, clearances, arrangement of gap closing to avoid short circuiting of gas, so that Smartluth can apply the same in detailing work of the FGTR. Also specify the maximum gas temperature the modules can sustain in case of a sustained 15 minutes transient excursion.