

NTPC NABINAGAR 4x250 MW FGD – TECHNICAL INFORMATION OF MIST ELIMINATORS

00	11-03-2020	Fresh Release	-sd-	-sd-
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REV	DATE	DESCRIPTION	Prepared	Checked & Approved

1.0 TECHNICAL INFORMATION

Sl. No.	Description	Requirement
1.	End Customer	NTPC is setting up the project for Bhartiya Rail Bijlee Company Ltd.(BRBCL)
2.	Project Name	BRBCL NABINAGAR 4X250 MW
3.	Location	Nabinagar, Aurangabad Dist,Bihar State, India
4.	Type	Three stage chevron type (First Stage shall be Flat or Roof Type, Second and Third stages shall be Diamond/Roof type)
5.	Quantity	
i.	Quantity of Mist Eliminators for Unit-1,2,3,4	4 sets (1 set for each unit) 1 set means Complete Mist Eliminators, Washing with supports.
6.	MOC	
i.	ME Panel	Polysulfone (Or) Super austenitic stainless steel (254 SMO)
ii.	Washing Pipe	FRP with corrosion and erosion resistant in the inner and outer side (Silicon Carbide coating on FRP surface exposed to slurry)
iii.	Wash Pipe Supports	Shall be lined with min 2mm thk Alloy 59/C276 or entire Material in Alloy 59/C276
iv.	Washing Nozzles	PVDF or PP as per bidder's proven practice
v.	Hardware inside absorber	a) Alloy 59/ C276 for load bearing applications b) All metallic fasteners provided shall be of Alloy 59/C276 c) For pipe clamps, C276 Bolt, C276 Nut, C276 washer and C276 spring washer to be provided
vi.	Enclosure Plate	Same as that of ME Panel if it is part of Mist Eliminator (or) C276 material.
7.	Parameters	
i.	Gas flow	Vertical
ii.	Casing Dimension	Length : 7900 mm Width:13900 mm
iii.	Design Pressure of Mist Eliminator Panel	660 mmH ₂ O (G)
iv.	Max Allowable Pressure drop across Mist Eliminator element	20 mmH ₂ O (G) at Design point 16 mmH ₂ O (G) at Guarantee point
v.	Design Temperature	• 70 Deg C (Continuous) • 80 – 90 Deg C (30 minutes) • 90 – 110 Deg C (5 min)

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8.	Gas condition at ME Inlet	Guarantee Point	Design Point
i.	Gas Flow Rate (Nm ³ /s-wet)	298.40	329.60
ii.	Gas Flow Rate (m ³ /s-wet)	361.54	403.96
iii.	Gas Temperature (Deg C)	57.8	61.6
iv.	Density (kg/m ³)	1.03177	1.00502
v.	Operating Pressure at Mist Eliminator inlet (mm H ₂ O (G))	56	77
vi.	Gas Flow Distribution	+ or - 20%	
9.	Gas Composition at ME Inlet		
i.	SO ₂ (Vol%-wet)	0.0021	0.0020
ii.	H ₂ O (Vol%-wet)	17.57	20.98
iii.	O ₂ (Vol%-wet)	5.92	5.67
iv.	CO ₂ (Vol%-wet)	9.44	9.05
v.	N ₂ (Vol%-wet)	67.06	64.3
vi.	HCl (ppm-Dry)	<2	<2
vii.	HF (ppm-Dry)	<1	<1
viii.	Dust (mg/Nm ³ -wet)	<50	<200
10.	Gypsum Slurry Density (t/m3)	1.212	1.210
11.	Entrained Mist Condition:		
i.	Mist Concentration at Inlet –at Guarantee & Design Point	200 g/Nm ³ -dry	
ii.	Mist Concentration at Outlet –at Guarantee & Design Point	≤20 mg/Nm ³	
12.	Mist Composition		
i.	Solid	30 wt.%	
ii.	Cl ⁻	18383.4 ppm	
iii.	Mg ²⁺	7956.0 ppm	
iv.	Ca ²⁺	824.12 ppm	
v.	Na ⁺	2340.32 ppm	
vi.	SO ₄ ²⁻	12267.0 ppm	

1.1 WASHING ARRANGEMENT

I.	Washing water condition	
a.	Flow rate - Average	13.77 m ³ /hr *1)
b.	Flow rate at M/E Inlet – Instantaneous Allowable Max	96 m ³ /hr
c.	Flow rate at M/E Inlet – Instantaneous Min	80 m ³ /hr
d.	Feed Pressure (at inlet flange of ME Wash header)	0.2 MPa (Max)
e.	Spray Nozzle –Top washing	90 ° , Full Cone(recommended)
f.	Spray Nozzle –Bottom washing	120 ° , Full Cone(recommended)
g.	Spray pipe level from ME Panel	< 700 mm

1.2 WATER ANALYSIS

Process water is envisaged for Mist Eliminator washing. Process water analysis is provided below.

S.No	Constituent	As	mg/l (except pH & turbidity)
1.	Calcium	CaCO ₃	131
2.	Magnesium	CaCO ₃	52
3.	Sodium + Potassium	CaCO ₃	65
4.	Total Cations	CaCO ₃	248
5.	Chloride	CaCO ₃	20
6.	Sulphate	CaCO ₃	93
7.	Nitrate	CaCO ₃	10
8.	Alkalinity	CaCO ₃	125
9.	Total Anions	CaCO ₃	248
10.	Iron(total)	Fe	0.3
11.	Total Silica	SiO ₂	22
12.	pH value	---	7.0-8.2
13.	Turbidity	NTU	10

Note: Clarified water is used for CW system as make up & the CW system is expected to operate at about 5.0 – 5.5 Cycles of Concentration (COC) with suitable chemical treatment program using acid, scale & corrosion inhibitor dosing. As CW blow down water is tapped from CW system, the water quality of CW blow down shall accordingly be arrived by the bidder.

- Water Quality shall be arrived by the bidder considering the COC – 5.5

1.3 MIST PARTICLE SIZE DISTRIBUTION:

- a) Bidder shall note there is a tie beam located at the centre line of Absorber (Bidder shall refer to Note 01 :B in the typical drawing enclosed). This tie beam is fixed and it has to be used as Mist Eliminator support beam.
- b) Overall wash arrangement shall be as per the drawing (typical) enclosed.

The Mist Particle Size Distribution shall be as per below fig

Fig. 2 Mist Particle Size Distribution(EXPECTED VALUE)



