

## Annexure-XI

## MANDATORY SPARES FOR FGD ABSORBER AGITATOR- KAHALGAON FGD PROJECT

Project Name: NTPC KAHALGAON FGD STAGE I, 4x210 MW								
Agitator Model:								
S.NO	BHEL MATERIAL CODE	ITEM DESCRIPTION	REQUIRED QUANTITY	APPLICABILITY	Bidder Item Description	Model/Part no/Type	SET Details indicating the qty in nos.	Remarks
1	L8209SFJ36502001	Impeller Assembly	1 set = 1 No. of each type and size					
2	L8209SFJ36502002	Bearing Assembly	1 Set = 1 no. of each type and size					
3	L8209SFJ36502003	Motor	1 Set = 1 no. of each type and size					
4	L8209SFJ36502004	Belt and Pulley if applicable	1 set = 1 no. of each type and size					
5	L8209SFJ36502005	Gear Box Assembly (If Applicable)	1 Set = 1 no. of each type and size					
6	L8209SFJ36502006	Agitator Shaft Assembly	1 Set = 1 no. of each type and size					
7	L8209SFJ36502007	Shaft Seal	1 Set = 1 no. of each type and size					
8	L8209SFJ36502008	Complete Agitator assembly	1 Set = 1 no. of each type and size					

Project Name: NTPC KAHALGAON STPS STAGE II (3x500 MW)								
Agitator Model:								
S.NO	BHEL MATERIAL CODE	ITEM DESCRIPTION	REQUIRED QUANTITY	APPLICABILITY	Bidder Item Description	Model/Part no/Type	SET Details indicating the qty in nos.	Remarks
1	L8213SFJ36502001	Impeller Assembly	1 set = 1 No. of each type and size					
2	L8213SFJ36502002	Bearing Assembly	1 Set = 1 no. of each type and size					
3	L8213SFJ36502003	Motor	1 Set = 1 no. of each type and size					
4	L8213SFJ36502004	Belt and Pulley if applicable	1 set = 1 no. of each type and size					
5	L8213SFJ36502005	Gear Box Assembly (If Applicable)	1 Set = 1 no. of each type and size					
6	L8213SFJ36502006	Agitator Shaft Assembly	1 Set = 1 no. of each type and size					
7	L8213SFJ36502007	Shaft Seal	1 Set = 1 no. of each type and size					
8	L8213SFJ36502008	Complete Agitator assembly	1 Set = 1 no. of each type and size					

## NOTE:

1. Bidder to clearly mention the SET details in against each item, indicating item description & Qty in nos.
2. Bidder shall furnish item covered in an assembly with item description, qty in nos.

## ANNEXURE –XII - FGD ABSORBER AGITATOR – Checklist Cum Datasheet

PROJECT: NTPC KAHALGAON STPS STAGE I (4x210 MW)

ENQUIRY NO:

### A. MANDATORY DOCUMENTS TO BE SUBMITTED ALONG WITH OFFER

SL. NO	PURPOSE	DESCRIPTION	VENDOR ACCEPTANCE/ COMMENTS
1	Qualification requirements	Supporting Documents for meeting the <b>PQR as per Annexure - X</b>	
2	Compliance to the technical specification	The following technical documents provided along with the enquiry shall be <b>signed with seal</b> , indicating the full compliance of the bidder. i. Complete Specification along with Annexures ii. Typical Arrangement of side entry agitator drawing iii. Technical Information for sizing of Absorber Agitators iv. C&I Technical Specification of Motors - Annexure-VII v. Quality Plan (Annexure – VIII) vi. CQR for LT motors (Annexure - IX)	
3	Deviations	Deviation in specification shall not be entertained, however in case of any deviation, the same shall be listed in <b>“List of Deviations”- Annexure-VI</b> . Deviation mentioned in any other document shall not be considered applicable.	
4	Technical Evaluation	<b>GA drawing</b> with exploded view with dimensions, material of construction, total weight etc. Bidder to comply the Agitator assembly <b>“Height Limitation”</b> in line with the <b>“Typical Arrangement of side entry agitator drawing”</b> .	
5		Duly filled, <b>Schedule of Guarantees</b> as per <b>Annexure-V</b>	
6		Duly filled, <b>Mandatory Spare list</b> as per <b>Annexure-XI</b>	
7		List of <b>Start-up &amp; Commissioning Spares</b>	
8		List of <b>Special Tools</b>	
<b>Important Note: Offers containing partial or Incomplete documents are liable for rejection.</b>			

### B. DATASHEET

S.NO	PARAMETER	UNIT	DATA TO BE FILLED BY BIDDER
1	Tank Size [WXDXH]	Metres	15.9WX9.9DX5.0H
2	Tank Volume	m <sup>3</sup>	At Normal liquid level [5M]: 787.05M <sup>3</sup> At Maximum liquid Level [6M]: 944.46M <sup>3</sup>
3	No: of Agitator per Tank	No	2
4	Model no. of Agitator		
5	Type of Impeller		
6	No. of stages of Impellers	No	
7	No. of blades per impeller	No	
8	Impeller Diameter	mm	
9	Impeller Speed	RPM	
10	Agitator Pumping Capacity	m <sup>3</sup> /min	
11	Volume per Agitator	m <sup>3</sup>	
12	Mechanical seal Type		
13	Motor Rating	Kw	
14	<b>MOC of the following</b>		Bidder MOC
14.1	Blade of impeller	Alloy 926 or better material	
14.2	Hub of impeller		
14.3	Shaft		
14.4	Mounting base/Fasteners in Wetted parts		
14.5	Fasteners in Non Wetted parts	GI fastener (40 μ plated) /SS	
14.6	Mechanical seal	Super Duplex 2507 or better	
14.7	Flush pipe for Start-up with flanges	FRP or Alloy 926 or Alloy 59	

Bidder Sign with Seal and Date

## ANNEXURE –XII - FGD ABSORBER AGITATOR – Checklist Cum Datasheet

PROJECT: NTPC KAHALGAON STPS STAGE II (3x500 MW)

ENQUIRY NO:

### A. MANDATORY DOCUMENTS TO BE SUBMITTED ALONG WITH OFFER

SL. NO	PURPOSE	DESCRIPTION	VENDOR ACCEPTANCE/ COMMENTS
1	Qualification requirements	Supporting Documents for meeting the <b>PQR as per Annexure - X</b>	
2	Compliance to the technical specification	The following technical documents provided along with the enquiry shall be <b>signed with seal</b> , indicating the full compliance of the bidder. i. Complete Specification along with Annexures ii. Typical Arrangement of side entry agitator drawing iii. Technical Information for sizing of Absorber Agitators iv. C&I Technical Specification of Motors - Annexure-VII v. Quality Plan (Annexure – VIII) vi. CQR for LT motors (Annexure - IX)	
3	Deviations	Deviation in specification shall not be entertained, however in case of any deviation, the same shall be listed in <b>“List of Deviations”- Annexure-VI</b> . Deviation mentioned in any other document shall not be considered applicable.	
4	Technical Evaluation	<b>GA drawing</b> with exploded view with dimensions, material of construction, total weight etc. Bidder to comply the Agitator assembly <b>“Height Limitation”</b> in line with the <b>“Typical Arrangement of side entry agitator drawing”</b> .	
5		Duly filled, <b>Schedule of Guarantees</b> as per <b>Annexure-V</b>	
6		Duly filled, <b>Mandatory Spare list</b> as per <b>Annexure-XI</b>	
7		List of <b>Start-up &amp; Commissioning Spares</b>	
8		List of <b>Special Tools</b>	
<b>Important Note: Offers containing partial or Incomplete documents are liable for rejection.</b>			

### B. DATASHEET

S.NO	PARAMETER	UNIT	DATA TO BE FILLED BY BIDDER
1	Tank Size [WXDXH]	Metres	22.4WX9.9DX5.0H
2	Tank Volume	m <sup>3</sup>	At Normal liquid level [5M]: 1108.8M <sup>3</sup> At Maximum liquid Level [6M]: 1330.56M <sup>3</sup>
3	No: of Agitator per Tank	No	2
4	Model no. of Agitator		
5	Type of Impeller		
6	No. of stages of Impellers	No	
7	No. of blades per impeller	No	
8	Impeller Diameter	mm	
9	Impeller Speed	RPM	
10	Agitator Pumping Capacity	m <sup>3</sup> /min	
11	Volume per Agitator	m <sup>3</sup>	
12	Mechanical seal Type		
13	Motor Rating	Kw	
14	<b>MOC of the following</b>		Bidder MOC
14.1	Blade of impeller	Alloy 926 or better material	
14.2	Hub of impeller		
14.3	Shaft		
14.4	Mounting base/Fasteners in Wetted parts		
14.5	Fasteners in Non Wetted parts	GI fastener (40 μ plated) /SS	
14.6	Mechanical seal	Super Duplex 2507 or better	
14.7	Flush pipe for Start-up with flanges	FRP or Alloy 926 or Alloy 59	

Bidder Sign with Seal and Date

**ANNEXURE-TI-3**

**TECHNICAL INFORMATION FOR SIZING OF ABSORBER AGITATORS**  
**PROJECT: NTPC 2x210+2x210 MW AT KAHALGAON - FGD SYSTEM PACKAGE**

<b>1</b>	<b>Absorber Details</b>	
1.1	Tank shape	Rectangular
1.2	Dimension of tank (m)	15.9 W X 9.9 D X 5.0H
1.3	Capacity of tank (in m3)	787.1 m <sup>3</sup>
1.4	No. of absorber tank	1 no.
1.5	Total no. of tanks for Two units	2 nos.
<b>2</b>	<b>Agitator selection data</b>	
2.1	Type	Marine Propeller – Horizontal Type (Side Entry)
2.2	Medium to be handled	Gypsum slurry
2.3	Seal Type	Mechanical seal (emergency flush start ) required in case of side entry
2.4	Duty	continuous
2.5	Agitator location	Outdoor
2.6	Operation	Whenever Recirculation Pumps are not running.
2.7	MOC of Agitator	Agitator Shaft (which is continuously in contact with slurry) and blades shall be made with Alloy 926 or better material
2.8	Minimum liquid level in the tank	4.2
2.9	Normal liquid level in the tank	5.0
2.10	Maximum liquid level in the tank	6
2.11	Quantity of Agitators per Tank	2 No's + 1 warehouse spare
2.12	Total Quantity	3 nos x 2 units = 6 nos
<b>3</b>	<b>Slurry Analysis</b>	
3.1	Maximum solid particle size	200 mesh (74 μ)
3.2	Normal solid particle size, d50	325 mesh (44 μ)
3.3	Solid to be handled	gypsum along with Limestone & other impurities
3.4	Chloride concentration	max 30000 ppm
3.5	Hardness of particle	5-7 mohs scale
3.6	Slurry concentration, wt%	30%
3.7	Sp. Gravity of slurry	1.212
3.8	Sp. Gravity of Lime Stone & Gypsum	2.32(avg)
3.9	Viscosity of Slurry	10 cP
3.10	pH	4 to 8
3.11	SiO <sub>2</sub> Content	4 to 6 g/l
3.12	Temperature	Normal 62 deg C; Design 70 deg C.
<b>3</b>	<b>Power loading for auxiliary power consumption</b>	not applicable
<b>4</b>	<b>Power loading per KW in USD</b>	refer tender spec
<b>5</b>	<b>Mandatory spares</b>	Please refer to marketing mandatory spares list

**Project: NTPC 2x210 + 2x210 MW KAHALGAON - FGD**

Cont No: G213-G216,		Rev 00		Rev 01		Rev 02		Rev 03	
		Sign	Date	Sign	Date	Sign	Date	Sign	Date
Engineer	VV								
Reviewer	PNR								
Approver	ACR								

**ANNEXURE-TI-4**

**TECHNICAL INFORMATION FOR SIZING OF ABSORBER AGITATORS  
PROJECT: NTPC 3X500 MW AT KAHALGAON - FGD SYSTEM PACKAGE**

<b>1</b>	<b>Absorber Details</b>								
1.1	Tank shape	Rectangular							
1.2	Dimension of tank (m)	22.4 W X 9.9 D X 5.0H							
1.3	Capacity of tank (in m3)	1109 m <sup>3</sup>							
1.4	No. of absorber tank	1 no.							
1.5	Total no. of tanks for Three units	3 nos.							
<b>2</b>	<b>Agitator selection data</b>								
2.1	Type	Marine Propeller – Horizontal Type (Side Entry)							
2.2	Medium to be handled	Gypsum slurry							
2.3	Seal Type	Mechanical seal (emergency flush start ) required in case of side entry							
2.4	Duty	continuous							
2.5	Agitator location	Outdoor							
2.6	Operation	Whenever Recirculation Pumps are not running.							
2.7	MOC of Agitator	Agitator Shaft (which is continuously in contact with slurry) and blades shall be made with Alloy 926 or better material							
2.8	Minimum liquid level in the tank	4.2							
2.9	Normal liquid level in the tank	5.0							
2.10	Maximum liquid level in the tank	6							
2.11	Quantity of Agitators per Tank	2 No's + 1 warehouse spare							
2.12	Total Quantity	3 nos x 3 units = 9 nos							
<b>3</b>	<b>Slurry Analysis</b>								
3.1	Maximum solid particle size	200 mesh (74 μ)							
3.2	Normal solid particle size, d50	325 mesh (44 μ)							
3.3	Solid to be handled	gypsum along with Limestone & other impurities							
3.4	Chloride concentration	max 30000 ppm							
3.5	Hardness of particle	5-7 mohs scale							
3.6	Slurry concentration, wt%	30%							
3.7	Sp. Gravity of slurry	1.214							
3.8	Sp. Gravity of Lime Stone & Gypsum	2.32(avg)							
3.9	Viscosity of Slurry	10 cP							
3.10	pH	4 to 8							
3.11	SiO <sub>2</sub> Content	4 to 6 g/l							
3.12	Temperature	Normal 62 deg C; Design 70 deg C.							
<b>3</b>	<b>Power loading for auxiliary power consumption</b>	not applicable							
<b>4</b>	<b>Power loading per KW in USD</b>	refer tender spec							
<b>5</b>	<b>Mandatory spares</b>	Please refer to marketing mandatory spares list							
<b>Project: NTPC 3X500 MW KAHALGAON - FGD</b>									
Cont No: G512-G514		Rev 00	Rev 01	Rev 02	Rev 03				
		Sign	Date	Sign	Date	Sign	Date	Sign	Date
Engineer	VV								
Reviewer	PNR								
Approver	ACR								