पी डी आई एल
PDIL

COAL TO METHANOL PROJECT AT DANKUNI COAL COMPLEX, WEST BENGAL ON BUILD OWN OPERATE (BOO) BASIS

कोल इंडिया
Coal India

10.02.2021

संशोधन - VIII (तकनीकी) /

AMENDMENT – VIII (Technical)

To

Tender No. PNMM/PC-176/E-4001 dated 24.09.2020

Subject: Coal to Methanol (C2M) Project through Coal Gasification route on Build-Own-Operate (BOO) Basis at Dankuni Coal Complex, West Bengal, India.

यह सूचना उन सभी बोलीदाताओं की जानकारी के लिए है, जो उपरोक्त विषय निविदा में भाग लेने के इच्छुक हैं, कि संशोधन-VIII (तकनीकी) दिनांक 10.02.2021 को जारी किया जा रहा है और वर्तमान तिथि तक जारी किए गए निविदा एवं उसके बाद के संशोधन के संयोजन में पढ़ा जाएगा।

This is for information to all Bidders who are willing to participate in the subject Tender, that Amendment-VIII (Technical) dated 10.02.2021 is being issued and shall be read in conjunction to the Tender and subsequent Amendments issued till date.

कृते एवं वास्ते
कोल इंडिया लिमिटेड

For & on behalf of
Coal India Limited

पी आर साहु / **P.R. Sahu**
अपर महाप्रबंधक (सा.प्र.) / **Addl. General Manager (M.M)**
प्रोजेक्ट्स ऐंड डेवलपमेंट इंडिया लिमिटेड (भारत सरकार का एक उपक्रम) /
Projects & Development India Limited
फोन / **Tel No.: +91-120-2544063**
ई पी बी ए एक्स/ **EPABX:+91-120-2529842/43/47/51**

COAL TO METHANOL (C2M) PROJECT THROUGH COAL GASIFICATION ROUTE ON BUILD-OWNOPERATE (BOO) BASIS AT DANKUNI COAL COMPLEX WEST BENGAL, INDIA

Tender No. : PNPM/ PC-176/E- 4001 DATED 24.09.2020

Amendment-VIII: Technical-Process dated 10.02.2021

SL. NO.	REFERENCE OF BIDDING DOCUMENT				AMENDMENT TYPE M/D/A	MODIFICATION
	Part/Sec.	Page No.	Clause No.	NIT Description		
1.	Section-1.2	4 of 5	2.17	OTHER REQUIREMENTS	M	Any other work not specifically mentioned above but required to complete the work in all respects as per tender specifications, drawings and instruction of Engineer-in-Charge and also to result in an fully operable and maintainable plant. As spelt out elsewhere in this Tender, for all Civil Works, BOO OPERATOR's scope shall include removal of existing underground and / or rerouting above ground interferences as applicable. It is possible that underground cables, foundations, other services may be located during Construction Phase. The same shall be rerouted / protected by BOO OPERATOR using half cut pipes, and adequate care shall be taken of the same during Engineering &Construction phases. BOO OPERATOR shall provide Metal Analyzer at Site for In-Situ Metallurgical Analysis of Metal, during the Project Execution Stage. BOO OPERATOR shall comply with the requirements of Positive Materials Identification, enclosed elsewhere in this Tender. PMI shall be carried out by BOO OPERATOR for all pressure components of Mechanical (including Rotary, Static & Package equipment, Piping Items & Instruments). For Metal gaskets & welding PMI shall be carried out on Sample Basis. **The referred Clause is modified as below:** Any other work not specifically mentioned above but required to complete the work in all respects as per tender specifications, drawings and instruction of Engineer-in-Charge and also to result in an fully operable and maintainable plant. BOO OPERATOR shall provide Metal Analyzer at Site for In-Situ Metallurgical Analysis of Metal, during the Project Execution Stage. BOOOPERATOR shall comply with the requirements of Positive Materials Identification, enclosed elsewhere in this Tender. PMI shall be carried out by BOO OPERATOR for all pressure components of Mechanical (including Rotary, Static & Package equipment, Piping Items & Instruments). For Metal gaskets & welding PMI shall be carried out on Sample Basis.
2.	Section-1.4	4 of 13	2.3		M	**Sr. No.** / **Ash Content in Coal (%)** / **Guaranteed specific coal consumption per tonne of Methanol* (MT)** **1.** **18.0 ≤ Ash% < 20.0** **2.** **20.0 ≤ Ash% <**

<table>
<tr><th rowspan="2">SL. NO.</th><th colspan="4">REFERENCE OF BIDDING DOCUMENT</th><th rowspan="2">AMENDMENT TYPE M/D/A</th><th rowspan="2">MODIFICATION</th></tr>
<tr><th>Part/Sec.</th><th>Page No.</th><th>Clause No.</th><th>NIT Description</th></tr>
<tr><td></td><td></td><td></td><td></td><td>Feed Stock</td><td></td><td>
<table>
<tr><td></td><td>22.0</td><td></td></tr>
<tr><td>3.</td><td>22.0 ≤ Ash% < 24.0</td><td></td></tr>
<tr><td>4.</td><td>24.0 ≤ Ash% < 26.0</td><td></td></tr>
<tr><td>5.</td><td>26.0 ≤ Ash% < 28.0</td><td></td></tr>
<tr><td>6.</td><td>28.0 ≤ Ash% < 30.0</td><td></td></tr>
<tr><td>7.</td><td>18.0 ≤ Ash% < 20.0</td><td></td></tr>
<tr><td colspan="3">*In case the ash content in the supplied coal is beyond the above range (i.e. beyond 18 < Ash% < 30), the guaranteed specific coal consumption on either side shall be derived mathematically through extrapolation at multiple of 2.0% intervals.</td></tr>
</table>
The referred table is modified as below:
<table>
<tr><th>Sr. No.</th><th>Ash Content in Coal (%)</th><th>Guaranteed specific coal consumption per tonne of Methanol* (MT)</th></tr>
<tr><td>1.</td><td>18.0 < Ash% < 20.0</td><td></td></tr>
<tr><td>2.</td><td>20.0 < Ash% < 22.0</td><td></td></tr>
<tr><td>3.</td><td>22.0 < Ash% < 24.0</td><td></td></tr>
<tr><td>4.</td><td>24.0 ≤ Ash% < 26.0</td><td></td></tr>
<tr><td>5.</td><td>26.0 ≤ Ash% < 28.0</td><td></td></tr>
<tr><td>6.</td><td>28.0 ≤ Ash% <</td><td></td></tr>
</table>
</td></tr>
</table>

SL. NO.	REFERENCE OF BIDDING DOCUMENT				AMENDMENT TYPE M/D/A	MODIFICATION
	Part/Sec.	Page No.	Clause No.	NIT Description		
						<table><tr><td></td><td>**30.0**</td><td></td></tr><tr><td colspan="3">*In case the ash content in the supplied coal is beyond the above range (i.e. beyond 18 < Ash% < 30), the guaranteed specific coal consumption on either side shall be derived mathematically through extrapolation at multiple of 2.0% intervals.</td></tr></table>
3.	Section-1.4	7 of 13	4.1	Plant On-stream factor	M	BOO OPERATOR may require from time to time to shut down the production facilities of the Production Plant for such period of time as may be necessary for BOO OPERATOR to make ordinary repairs and for maintenance consistent with proper operation. However, such planned shutdown (turn-around) shall be limited to about 35 (thirty-five) days at a stretch once in every year. In addition, the Coal Based Methanol plant will be planned for shutdown to meet the requirements of regulatory bodies (such as Indian Boiler Regulations) at intervals as specified by those respective regulatory bodies. BOO OPERATOR will be allowed to undertake such shutdown as per statutory requirements. BOO OPERATOR will make all endeavors to utilise these shutdowns on account of statutory requirements for other maintenance of plant as may be necessary from time to time as well as for replacement of catalyst. **The referred Clause is modified as below:** BOO OPERATOR may require from time to time to shut down the production facilities of the Production Plant for such period of time as may be necessary for BOO OPERATOR to make ordinary repairs and for maintenance consistent with proper operation. However, such planned shutdown (turn-around) shall be limited to about 35 (thirty-five) days at a stretch once in every year. BOO OPERATOR will design all the equipment/ steam generators etc. those requires mandatory statutory inspection for a minimum run length of 2 years. BOO operator is required to manage all the statutory inspection within this period.
4.	Section-1.4	7 of 13	4.3	Capacity Utilization	M	**Capacity Utilization:-** Name plate capacity of Methanol Complex is 2050 MTPD i.e. 100%. However, rated capacity of Methanol complex shall be 110%.

SL. NO.	REFERENCE OF BIDDING DOCUMENT				AMENDMENT TYPE M/D/A	MODIFICATION
	Part/Sec.	Page No.	Clause No.	NIT Description		
						The referred Clause is modified as below: **Capacity of Plant:-** Name plate capacity of Methanol Complex is 2050 MTPD i.e. 100%. However, Bidder shall consider sufficient design margin to meet the requirement of Name Plate Capacity i.e. 2050 MTPD.
5.	Section-1.4	7 of 13	4.4	Plant Availability	M	Plant availability factor for all the Coal Based Methanol Plant should be 98.5% (min) excluding the planned shutdowns. **The referred Clause is modified as below:** Plant availability factor for all the Coal Based Methanol Plant should be 100% excluding the planned shutdowns.
6.	Section-1.4	11 of 13	8.4 (Point no.4)	Environment	M	Carbon Mono-oxide emission limit shall be 650 PPMv (max) for Shift Conversion Section. **The referred Clause is modified as below:** Carbon Mono-oxide emission limit shall be 650 PPMv (max) for Rectisol Section.
7.	Section-1.4	12 of 13	10.0	CLIMATIC DATA	M	Bidder to collect the climatic data from concerned IMD office
8.	Section-1.5	2 of 8	1.0	Owner's Scope	M	Owner shall provide the followings Raw material and utilities on chargeable basis asmentioned in below clauses: - **The referred Clause is modified as below:** Owner shall provide the followings Raw material and utilities on chargeable basis till first delivery of Methanol (first start-up) and for all start-ups as mentioned in below clauses: -
9.	Section-1.5	4 of 8	2.4	Cooling Water	M	**2.4** | **Cooling Water (Added with suitable chemicals)** **Supply Header Pressure, kg/cm^{2}g** | **BOO Operator to decide**

SL. NO.	REFERENCE OF BIDDING DOCUMENT				AMENDMENT TYPE M/D/A	MODIFICATION			
	Part/Sec.	Page No.	Clause No.	NIT Description					
								Return Header Pressure, kg/cm^{2}g (Min/ Nor/ Max)	BOO Operator to decide
								Mechanical Design Pressure, kg/cm^{2}g	8.0
								Supply Header Temperature, ^oC	33
								Return Header Temperature, ^oC	By BOO Operator
								Mechanical Design Temperature, ^oC	70
								Design wet Bulb temperature , ^oC	29.0
								ΔT	10 °C max.
								Relative Humidity at Dankuni	100% (max.)
								COC	5
								Drift losses and evaporation loss (% of circn.)	By BOO Operator
								Analysis of Cooling Water	By BOO Operator
								pH	
								Conductivity, µ mho/cm	
								Turbidity, NTU	
								Total Alkanity as $CaCO_3$, ppm	
								P. Alkanity as $CaCO_3$, ppm	
								Total Hardness as $CaCO_3$, ppm	
								Ca Hardness as $CaCO_3$, ppm	
								Mg Hardness as $CaCO_3$, ppm	

<table>
<tr><th rowspan="2">SL. NO.</th><th colspan="4">REFERENCE OF BIDDING DOCUMENT</th><th rowspan="2">AMENDMENT TYPE M/D/A</th><th rowspan="2">MODIFICATION</th></tr>
<tr><th>Part/Sec.</th><th>Page No.</th><th>Clause No.</th><th>NIT Description</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>Chloride as Cl, ppm</td><td></td></tr>
<tr><td></td><td>TDS, ppm</td><td></td></tr>
<tr><td></td><td>Total iron as Fe, ppm</td><td></td></tr>
<tr><td></td><td>Corrosion Rate, ppm</td><td></td></tr>
<tr><td></td><td>Silica as SiO_2, ppm</td><td></td></tr>
<tr><td></td><td>Nitrate as NO_3, ppm</td><td></td></tr>
<tr><td></td><td>Sulphate as SO_4, ppm</td><td></td></tr>
<tr><td></td><td>SRB count</td><td></td></tr>
<tr><td></td><td>Total Suspended solids (TSS)</td><td></td></tr>
<tr><td></td><td>Manganese as Mn</td><td></td></tr>
<tr><td></td><td>Free Chlorine, ppm</td><td></td></tr>
<tr><td></td><td>Phosphate as PO_4 (Orth), ppm</td><td></td></tr>
<tr><td></td><td>Total Phosphate, ppm</td><td></td></tr>
</table>
The referred Table is modified as below:
<table>
<tr><td>2.4</td><td colspan="2">Cooling Water (Added with suitable chemicals)</td></tr>
<tr><td></td><td>Supply Header Pressure, kg/cm^2g (</td><td>By BOO Operator</td></tr>
<tr><td></td><td>Return Header Pressure, kg/cm^2g (Min/ Nor/ Max)</td><td>By BOO Operator</td></tr>
<tr><td></td><td>Mechanical Design Pressure, kg/cm^2g</td><td>By BOO Operator</td></tr>
<tr><td></td><td>Supply Header Temperature, ^oC</td><td>By BOO Operator</td></tr>
<tr><td></td><td>Return Header Temperature, ^oC</td><td>By BOO Operator</td></tr>
<tr><td></td><td>Mechanical Design</td><td>By BOO Operator</td></tr>
</table>
</td></tr>
</table>

<table>
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<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>Temperature, ^{o}C</td><td></td></tr>
<tr><td></td><td>Design wet Bulb temperature , ^{o}C</td><td>By BOO Operator</td></tr>
<tr><td></td><td>ΔT</td><td>By BOO Operator</td></tr>
<tr><td></td><td>Relative Humidity at Dankuni</td><td>By BOO Operator</td></tr>
<tr><td></td><td>COC</td><td>By BOO Operator</td></tr>
<tr><td></td><td>Drift losses and evaporation loss (% of circn.)</td><td>By BOO Operator</td></tr>
<tr><td></td><td>Analysis of Cooling Water</td><td>By BOO Operator</td></tr>
</table>
</td></tr>
<tr><td>10.</td><td>Section-1.5</td><td>4 of 8</td><td>2.5</td><td>Nitrogen Gas (Utility)</td><td>M</td><td>
<table>
<tr><td colspan="2">Nitrogen Gas (Utility)</td></tr>
<tr><td>Pressure, kg/cm^{2}g (Min/Nor/Design)</td><td>6.0/8.0/9.0</td></tr>
<tr><td>Temperature</td><td>Ambient</td></tr>
<tr><td>N_2, Vol %, min</td><td>99.99%</td></tr>
<tr><td>O_2, Vol ppm</td><td>< 10</td></tr>
</table>
The referred table is modified as below:
<table>
<tr><td colspan="2">Nitrogen Gas (Utility)</td></tr>
<tr><td>Pressure, kg/cm^{2}g (Min/Nor/Design)</td><td>By BOO Operator</td></tr>
<tr><td>Temperature</td><td>By BOO Operator</td></tr>
<tr><td>N_2, Vol %, min</td><td>99.99%</td></tr>
<tr><td>O_2, Vol ppm</td><td>< 10</td></tr>
</table>
</td></tr>
<tr><td>11.</td><td>Section-1.5</td><td>4 of 8</td><td>2.7</td><td></td><td>M</td><td>
<table>
<tr><td>Instrument Air</td><td>Min.</td><td>Nor.</td><td>Max.</td></tr>
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</table>

<table>
<tr><th rowspan="2">SL. NO.</th><th colspan="4">REFERENCE OF BIDDING DOCUMENT</th><th rowspan="2">AMENDMENT TYPE M/D/A</th><th rowspan="2">MODIFICATION</th></tr>
<tr><th>Part/Sec.</th><th>Page No.</th><th>Clause No.</th><th>NIT Description</th></tr>
<tr><td></td><td></td><td></td><td></td><td>Instrument Air</td><td></td><td>
<table>
<tr><td>Pressure, kg/cm^2 g</td><td>6.0</td><td>8.0</td><td>10.0</td></tr>
<tr><td>Supply Temperature, °C</td><td>Ambient</td><td>Ambient</td><td>50</td></tr>
<tr><td>Mech. Design Pressure, kg/cm^{2}g</td><td colspan="3">10.5</td></tr>
<tr><td>Mech. Design Temperature, °C</td><td colspan="3">65</td></tr>
<tr><td>Dew point</td><td colspan="3">-40 ^{o}C at atm. pressure</td></tr>
<tr><td>Quality</td><td colspan="3">Free of dust, water drops & oil</td></tr>
<tr><td>Storage Capacity (10 to 6 Kg/Cm^{2}g depressurization) at each unit</td><td colspan="3">15 minute</td></tr>
<tr><td>Storage Capacity (40 to desired pressure Kg/cm^{2}g depressurization) at Instrument Air Plant</td><td colspan="3">15 minute</td></tr>
</table>
The referred table is modified as below:
<table>
<tr><th>Instrument Air</th><th>Min.</th><th>Nor.</th><th>Max.</th></tr>
<tr><td>Pressure, kg/cm^2 g</td><td>By BOO Operator</td><td>By BOO Operator</td><td>By BOO Operator</td></tr>
<tr><td>Supply Temperature, °C</td><td>By BOO Operator</td><td>By BOO Operator</td><td>By BOO Operator</td></tr>
<tr><td>Mech. Design Pressure, kg/cm^{2}g</td><td colspan="3">By BOO Operator</td></tr>
<tr><td>Mech. Design Temperature, °C</td><td colspan="3">By BOO Operator</td></tr>
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<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>depressurization) at each unit</td><td></td></tr>
<tr><td>Storage Capacity (40 to desired pressure Kg/cm^{2}g depressurization) at Instrument Air Plant</td><td>15 minute</td></tr>
</table>
</td></tr>
<tr><td>12.</td><td>Section-1.5</td><td>4 of 8</td><td>2.8</td><td>Demineralised Water</td><td>M</td><td>
<table>
<tr><td colspan="2">Demineralised Water</td></tr>
<tr><td>Pressure @ B/L, kg/cm^{2}g (Min/ Nor/ Max)</td><td>4.0/ 5.5/ 6.0</td></tr>
<tr><td>Temperature, °C (Normal)</td><td>Ambient/ 40 (max)</td></tr>
<tr><td>Mech. Design Pressure, kg/cm^{2}g</td><td>10</td></tr>
<tr><td>Mech. Design Temperature, °C</td><td>70</td></tr>
<tr><td>pH</td><td>6.5-8.5</td></tr>
<tr><td>Total Hardness, ppm wt.</td><td>Zero</td></tr>
<tr><td>Total Dissolved Solids, ppm wt (max.)</td><td>0.1</td></tr>
<tr><td>Conductivity at 20 deg C, micro mho/cm (max.)</td><td><0.2</td></tr>
<tr><td>M Alkanity as $CaCO_3$, ppm wt.</td><td>Nil</td></tr>
<tr><td>Chlorides, ppm wt.</td><td>Nil</td></tr>
<tr><td>Iron as Fe, ppm wt. (max.)</td><td>0.01</td></tr>
<tr><td>Copper , mg/l</td><td><0.003</td></tr>
<tr><td>Silica as SiO_2, ppm wt. (max.)</td><td>0.02</td></tr>
<tr><td>Oil, ppm wt.</td><td>Nil</td></tr>
<tr><td>Sodium as Na, ppm wt. (max.)</td><td>< 0.1</td></tr>
</table>
The referred table is modified as below:
<table>
<tr><td colspan="2">Demineralised Water</td></tr>
<tr><td>Pressure @ B/L, kg/cm^{2}g (Min/ Nor/ Max)</td><td>By BOO Operator</td></tr>
<tr><td>Temperature, °C (Normal)</td><td>By BOO Operator</td></tr>
<tr><td>Mech. Design Pressure, kg/cm^{2}g</td><td>By BOO Operator</td></tr>
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<tr><th rowspan="2">SL. NO.</th><th colspan="4">REFERENCE OF BIDDING DOCUMENT</th><th>AMENDMENT TYPE M/D/A</th><th>MODIFICATION</th></tr>
<tr><th>Part/Sec.</th><th>Page No.</th><th>Clause No.</th><th>NIT Description</th><th></th><th></th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>Mech. Design Temperature, °C</td><td>By BOO Operator</td></tr>
<tr><td>pH</td><td>6.5-8.5</td></tr>
<tr><td>Total Hardness, ppm wt.</td><td>Zero</td></tr>
<tr><td>Total Dissolved Solids, ppm wt (max.)</td><td>0.1</td></tr>
<tr><td>Conductivity at 20 deg C, micro mho/cm (max.)</td><td><0.2</td></tr>
<tr><td>M Alkanity as $CaCO_3$, ppm wt.</td><td>Nil</td></tr>
<tr><td>Chlorides, ppm wt.</td><td>Nil</td></tr>
<tr><td>Iron as Fe, ppm wt. (max.)</td><td>0.01</td></tr>
<tr><td>Copper , mg/l</td><td><0.003</td></tr>
<tr><td>Silica as SiO_2, ppm wt. (max.)</td><td>0.02</td></tr>
<tr><td>Oil, ppm wt.</td><td>Nil</td></tr>
<tr><td>Sodium as Na, ppm wt. (max.)</td><td>< 0.1</td></tr>
</table>
</td></tr>
<tr><td>13.</td><td>Section-1.5</td><td>4 of 8</td><td>2.11</td><td>Service water</td><td>M</td><td>
<table>
<tr><td colspan="2">Service Water</td></tr>
<tr><td>Colour</td><td>< 5.0</td></tr>
<tr><td>Smell</td><td>Agreeable</td></tr>
<tr><td>pH</td><td>7.0-8.5</td></tr>
<tr><td>Taste & Odour</td><td>Unobjectionable</td></tr>
<tr><td>TDS, mg/l</td><td>< 150</td></tr>
<tr><td>Turbidity, NTU</td><td>< 1.0</td></tr>
<tr><td>Total Hardness, mg/l</td><td>< 85</td></tr>
<tr><td>Chloride (as Cl), mg/l</td><td>< 15</td></tr>
<tr><td>Sulphate (as SO_4), mg/l</td><td>< 60</td></tr>
<tr><td>Total Iron (Fe), mg/l</td><td>< 0.01</td></tr>
<tr><td>Dissolved Silica, mg/l</td><td>< 4</td></tr>
<tr><td>Supply Pressure, kg/cm^2g (Min/ Nor/ Max)</td><td>4.0/6.0/8.0</td></tr>
<tr><td>Supply Temperature, deg C</td><td>Ambient</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th rowspan="2">SL. NO.</th><th colspan="4">REFERENCE OF BIDDING DOCUMENT</th><th rowspan="2">AMENDMENT TYPE M/D/A</th><th rowspan="2">MODIFICATION</th></tr>
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<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>Mechanical Design Pressure, kg/cm^{2}g</td><td>10.5</td></tr>
<tr><td>Mechanical Design Temperature, deg C</td><td>65</td></tr>
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The referred table is modified as below:
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<tr><td>Service Water</td><td>As per BOO Operator requirement</td></tr>
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<tr><td>14.</td><td>Section-1.5</td><td>4 of 8</td><td>2.12</td><td>Process Water (after treatment) , BOO Operator to Fill</td><td>M</td><td>
<table>
<tr><td colspan="2">Process Water (after treatment) , BOO Operator to Fill</td></tr>
<tr><td>pH</td><td></td></tr>
<tr><td>Chlorides, mg/l</td><td></td></tr>
<tr><td>Sulphates, mg/l</td><td></td></tr>
<tr><td>Silica, mg/l</td><td></td></tr>
<tr><td>Iron, mg/l</td><td></td></tr>
<tr><td>Manganese, mg/l</td><td></td></tr>
<tr><td>Total Suspended Solids, mg/l</td><td></td></tr>
<tr><td>Total Dissolved Solids, mg/l</td><td></td></tr>
<tr><td>Oil & Grease, mg/l</td><td></td></tr>
<tr><td>Ammonia, mg/l</td><td></td></tr>
<tr><td>Alkanity, mg/l as $CaCO_3$</td><td></td></tr>
<tr><td>Calcium Hardness, mg/l as $CaCO_3$</td><td></td></tr>
<tr><td>Total Hardness, mg/l as $CaCO_3$</td><td></td></tr>
<tr><td>Supply Pressure, kg/cm^{2}g (Min/ Nor/ Max)</td><td></td></tr>
<tr><td>Supply Temperature, deg C</td><td></td></tr>
<tr><td>Mechanical Design Pressure, kg/cm^{2}g</td><td></td></tr>
<tr><td>Mechanical Design Temperature, deg C</td><td></td></tr>
</table>
The referred table is modified as below:
<table>
<tr><td>Process Water (after treatment)</td><td>As per BOO Operator</td></tr>
</table>
</td></tr>
</table>

<table>
<tr><th rowspan="2">SL. NO.</th><th colspan="4">REFERENCE OF BIDDING DOCUMENT</th><th rowspan="2">AMENDMENT TYPE M/D/A</th><th rowspan="2">MODIFICATION</th></tr>
<tr><th>Part/Sec.</th><th>Page No.</th><th>Clause No.</th><th>NIT Description</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td><table><tr><td></td><td>requirement</td></tr></table></td></tr>
<tr><td>15.</td><td>Section-1.5</td><td>4 of 8</td><td>2.12</td><td>Drinking water</td><td>M</td><td><table>
<tr><td colspan="2">Drinking Water</td></tr>
<tr><td>Colour</td><td>< 5.0</td></tr>
<tr><td>Smell</td><td>Agreeable</td></tr>
<tr><td>pH</td><td>7.0-7.5</td></tr>
<tr><td>Taste & Odour</td><td>Unobjectionable</td></tr>
<tr><td>TDS, mg/l</td><td>< 150</td></tr>
<tr><td>Turbidity, NTU</td><td>< 1.0</td></tr>
<tr><td>Total Hardness, mg/l</td><td>< 85</td></tr>
<tr><td>Chloride (as Cl), mg/l</td><td>< 15</td></tr>
<tr><td>Sulphate (as SO_4), mg/l</td><td>< 60</td></tr>
<tr><td>Total Iron (Fe), mg/l</td><td>< 0.01</td></tr>
<tr><td>Dissolved Silica, mg/l</td><td>< 4</td></tr>
<tr><td>Supply Pressure, kg/cm^{2}g (Min/ Nor/ Max)</td><td>4/ 5.5/ 6.0</td></tr>
<tr><td>Supply Temperature, deg C</td><td>Ambient</td></tr>
<tr><td>Mechanical Design Pressure, kg/cm^{2}g</td><td>10.0</td></tr>
<tr><td>Mechanical Design Temperature, deg C</td><td>65</td></tr>
<tr><td colspan="2">Note: Drinking water of quality conforming to IS: 10500-1991 shall be provided by the Owner to Boo Operator at the Battery Limit.</td></tr>
</table>
The referred table is modified as below:
<table>
<tr><td>Drinking Water</td></tr>
<tr><td>Drinking water quality shall be as per latest IS: 10500</td></tr>
</table></td></tr>
<tr><td>16.</td><td>Section-1.5</td><td>4 of 8</td><td>2.14</td><td>Plant Air</td><td>M</td><td><table>
<tr><td colspan="2">Plant air</td></tr>
<tr><td>Moisture</td><td>Saturated</td></tr>
</table></td></tr>
</table>

<table>
<tr><th rowspan="2">SL. NO.</th><th colspan="4">REFERENCE OF BIDDING DOCUMENT</th><th rowspan="2">AMENDMENT TYPE M/D/A</th><th rowspan="2">MODIFICATION</th></tr>
<tr><th>Part/Sec.</th><th>Page No.</th><th>Clause No.</th><th>NIT Description</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>Oil Content</td><td>Nil</td></tr>
<tr><td>Supply Pressure, kg/cm^{2}g (Min/ Nor/ Max)</td><td>4.0/7.0/8.0</td></tr>
<tr><td>Supply Temperature, deg C (Min/ Nor/ Max)</td><td>40/40/50</td></tr>
<tr><td>Mechanical Design Pressure, kg/cm^{2}g</td><td>10.5</td></tr>
<tr><td>Mechanical Design Temperature, deg C</td><td>65</td></tr>
</table>
The referred table is modified as below:
<table>
<tr><td colspan="2">Plant air</td></tr>
<tr><td>Moisture</td><td>Saturated</td></tr>
<tr><td>Oil Content</td><td>Nil</td></tr>
<tr><td>Supply Pressure, kg/cm^{2}g (Min/ Nor/ Max)</td><td>By BOO Operator</td></tr>
<tr><td>Supply Temperature, deg C (Min/ Nor/ Max)</td><td>By BOO Operator</td></tr>
<tr><td>Mechanical Design Pressure, kg/cm^{2}g</td><td>By BOO Operator</td></tr>
<tr><td>Mechanical Design Temperature, deg C</td><td>By BOO Operator</td></tr>
</table>
</td></tr>
<tr><td>17.</td><td>Section-1.6</td><td>4 of 14</td><td>3.1 a)</td><td>Corrosion allowance</td><td>M</td><td>
<table>
<tr><td>SS</td><td>Min. 0.75 mm</td></tr>
<tr><td>CS/LAS</td><td>Min. 3.0 mm</td></tr>
<tr><td>Cladding thickness</td><td>Min. 3.0 mm</td></tr>
</table>
The referred table is modified as below:
<table>
<tr><td>CS/ LAS</td><td>Min. 3.0 mm</td></tr>
<tr><td>Cladding thickness</td><td>Min. 3.0 mm</td></tr>
</table>
</td></tr>
<tr><td>18.</td><td>Section-1.6</td><td>8 of 14</td><td>3.3.1</td><td></td><td>M</td><td>Air-cooling shall be maximized for which the cut-off temperature of process streams shall be 55 deg C. However, when furthertrim-cooling by water is necessary, the cut-off temperature of process stream shall be 65</td></tr>
</table>

<table>
<tr><th rowspan="2">SL. NO.</th><th colspan="4">REFERENCE OF BIDDING DOCUMENT</th><th rowspan="2">AMENDMENT TYPE M/D/A</th><th rowspan="2">MODIFICATION</th></tr>
<tr><th>Part/Sec.</th><th>Page No.</th><th>Clause No.</th><th>NIT Description</th></tr>
<tr><td></td><td></td><td></td><td></td><td>Heat exchangers/ Air Cooler/ Condensers/ Re-boilers</td><td></td><td>deg C. Dry bulb temperatures 35 deg C to be considered for Cooler sizing. However, to avoid small trim cooler or air cooler these guide lines can be relaxed.

The referred Clause is modified as below:

Air-cooling shall be maximized for which the cut-off temperature of process streams shall be 55 deg C. However, when further trim-cooling by water is necessary, the cut-off temperature of process stream shall be 65 deg C. Dry bulb temperatures as per IMD Data to be considered for Cooler sizing. However, to avoid small trim cooler or air cooler these guide lines can be relaxed.</td></tr>
<tr><td>19.</td><td>Section-1.15</td><td>5 of 6</td><td>2.1</td><td>As-Built Drawings</td><td>M</td><td>The Referred table is modified as below:
<table>
<tr><th rowspan="2">Sl. No.</th><th rowspan="2">Description</th><th rowspan="2">With Bid</th><th colspan="3">After Job Award</th><th>Remarks</th></tr>
<tr><th>For Review</th><th>For Information</th><th>For Record</th><th></th></tr>
<tr><td>1.</td><td>Process Flow diagram with heat & material balance, identifying all equipment</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td></tr>
<tr><td>2.</td><td>Design Basis</td><td>√</td><td>√</td><td>√</td><td>√</td><td></td></tr>
<tr><td>3.</td><td>P & ID with interlock and logic diagram and write-up</td><td></td><td>√</td><td></td><td>√</td><td></td></tr>
<tr><td>4.</td><td>Equipment Specification</td><td>√</td><td></td><td>√</td><td>√</td><td>*Indicating Type, Broad dimensions, capacity</td></tr>
</table></td></tr>
</table>

SL. NO.	REFERENCE OF BIDDING DOCUMENT				AMENDMENT TYPE M/D/A	MODIFICATION
	Part/Sec.	Page No.	Clause No.	NIT Description		

							, duty, MOC etc
5.	A write-up explaining the configured plant and how various demands will be met by BOO OPERATOR	√	√		√		
6.	Data sheet for equipments		√		√		
7.	Flare Load summary	√	√		√		
8.	Confirmed utility & Effluent (both normal and peak consumption figures)	√	√		√		
9.	Interface Engineering Data		√		√		
10.	Report on HAZOP study		√		√		
11.	Instrument data sheets		√		√		
12.	Control Philosophy		√		√		
13.	Line Schedule		√		√		
14.	Tie-In List	√	√		√		
15.	Electrical Load-List	√	√		√		
16.	Process Description	√		√	√		

LEGEND:M: MODIFICATION, A: ADDITION, D: DELETION,

Tentative List of Component to be analysed online

1. NOx
2. SOx
3. CO
4. CO_2
5. H_2S
6. H2
7. N2
8. O2
9. Ar
10. Hydrocarbon/ VOC
11. SPM (PM10 & PM2.5)
12. Methane
13. Product Syn. Gas Analyzer
14. pH
15. Conductivity
16. Silica
17. O2 (in BFW)
18. Any other required for safe & trouble free operation.

COAL TO METHANOL (C2M) PROJECT THROUGH COAL GASIFICATION ROUTE ON BUILD-OWNOPERATE (BOO) BASIS AT DANKUNI COAL COMPLEX WEST BENGAL, INDIA
Tender No. : PNPM/ PC-176/E-4001 DATED 24.09.2020

Amendment-VIII: Technical-Static dated 10.02.2021

SL. NO.	REFERENCE OF BIDDING DOCUMENT				AMENDMENT TYPE M/D/A	MODIFICATION
	Part/Sec.	Page No.	Clause No.	NIT Description		
1.	PC176/E/4001/PII/ SEC-1.7	255 of 726	3.2	Formed heads cold formed or hot formed below normalizing temperature shall be subsequently normalized and weld seams if any shall be fully radio graphed after forming	M	Formed heads cold formed or hot formed below normalizing temperature shall be subsequently normalized and weld seams if any shall be fully radio graphed after forming. **<u>The referred Clause is modified as below:</u>** Heat treatment of formed parts shall be carried out as Heat treatment of formed parts shall be carried out as per following: For Carbon Steel: a. Cold formed dished ends or knuckles upto 16 mm nominal thickness shall be stress relieved. b. Cold formed dished ends or knuckles above 16 mm nominal thickness shall be normalized. For Low alloy Steel: - a. Cold Formed Dish ends or Knuckles shall be stress relieved. b. Hot formed dished ends or similar parts, which have not been uniformly heated in the normalizing range in the final stages of manufacture shall be normalized. c. When the completed vessel involves post weld heat treatment, heat treatment recommended in (a) above shall not be applicable.

SL. NO.	REFERENCE OF BIDDING DOCUMENT				AMENDMENT TYPE M/D/A	MODIFICATION
	Part/Sec.	Page No.	Clause No.	NIT Description		
						d. Vessels in caustic service, Amine or Sour gas service shall be stress relieved. e. all internal and external attachments, clips, insulation studs, name plate bracket, and the like shall be welded to the vessel before post weld heat treatment.
2.	PC176/E/4001/ PII/ SEC-1.7	255 of 726	3.5	Unless otherwise stated gaskets used during testing shall be same as specified for operating conditions. After testing, gaskets used during testing shall be replaced by new gaskets.	M	Unless otherwise stated gaskets used during testing shall be same as specified for operating conditions. After testing, gaskets used during testing shall be replaced by new gaskets. **The referred Clause is modified as below:** a) Gaskets used for hydro test shall be same as service Gaskets specified for Operating conditions. b) Gaskets shall be replaced only where flanges need to be opened after hydro test. Balance places where flanges are not opened, Gasket need not to be replaced. c) Welded, lip seal type, double conical gaskets, RTJ and Lens gasket will not be replaced after hydro test as the same are reusable. These gaskets to be replaced, if they are found damaged during or post hydro test.
3.	PC176/E/4001/ PII/ SEC-1.7	260 of 726	Annexure-II	Hydrogen Service & Cyclic Service	D/M	**The referred Annexure-II applicability is modified as below:** Applicability of Hydrogen service and cyclic service Shall be as per Licensor & code requirement. Minimum Service requirement shall

SL. NO.	REFERENCE OF BIDDING DOCUMENT				AMENDMENT TYPE M/D/A	MODIFICATION
	Part/Sec.	Page No.	Clause No.	NIT Description		
						be as per licensor's and code specification.
4.	PC176/E/4001/ PII/ SEC-1.7	254 of 726	2.9.3(e)	FEM Analysis for all shell to head junction Y shaped skirt.	M	FEM Analysis shall be done for all shell to head junction Y shaped skirt, welded/ weld overlayed support rings and any other stressed point. **<u>The referred Clause is modified as below:</u>** For high temperature service ,FEM Analysis shall be done for shell to head and skirt junction, if forged Y shaped ring shall be used.
5.	PC176/E/4001/ PII/SEC-1.7	245 of 726	2.7	Pipe Davit	M	**<u>The referred Clause is modified as below:</u>** cl. 27. (i) shall be same as per NIT. However Lifting arrangement (lifting lug) to be provided for removable component as per bidder specification for exchangers.
6.	PC176/E/4001/ PII/ SEC-1.7	257 of 726	Annexure-I	Material Selection	M	**<u>Referred Annexure-I applicability is modified as below:</u>** Material Selection shall be done as per licensor requirement, wherever specified. if not specified by Process licensor, material grade shall be selected as per Annexure-I & bidder to ensure compatibility of material with service Fluid. In case of Any special material requirement as per service, same shall be as per recommendation of bidder subjected to owner approval.

LEGEND:M: MODIFICATION, A: ADDITION, D: DELETION,

COAL GASIFICATION BASED METHANOL PLANT ON BUILT-OWN-OPERATE (BOO) BASIS
COAL INDIA LIMITED
Tender No. : PNPM/ PC-176/E- 4001 DATED 24.09.2020

Amendment-VIII: Technical-Electrical dated 10.02.2021

SL. NO.	REFERENCE OF BIDDING DOCUMENT			AMENDMENT TYPE M/D/A	MODIFICATION
	Part/Sec.	Page No.	Clause No.		
1.	Sec-1.10 Engineering Specification – Electrical	23 of 47	6.7.7	M	Process units having different types of gas groups like IIA / IIB/ IIC or different area classification like Zone-1 or Zone-2 or safe shall have electrical equipment to meet all gas groups / area classification to facilitate installation and minimum spare inventory and uniformity. ***To be read as…….*** Process units having different types of gas groups like IIA / IIB/ IIC or different area classification like Zone-1 or Zone-2 or safe shall have electrical equipment to meet that gas groups / area classification. Hazardous Area Classification shall be as per Process Licensor .
2.	Sec-1.10 Engineering Specification – Electrical	32 of 47	7.13.12	M	Lighting control scheme shall also be designed to trip the entire lighting system in case of air raid warning. Tripping signal for the lighting system shall be wired from the nearest existing substation. ***To be read as…….*** Lighting control scheme shall also be designed to trip the entire lighting system in case of air raid warning. Tripping signal for the lighting system shall be wired from the BOO Operator's substations.

LEGEND:
M: MODIFICATION, A: ADDITION, D: DELETION

COAL TO METHANOL (C2M) PROJECT THROUGH COAL GASIFICATION ROUTE ON BUILD-OWNOPERATE (BOO) BASIS AT DANKUNI COAL COMPLEX WEST BENGAL, INDIA

Tender No. : PNPM/ PC-176/E- 4001 DATED 24.09.2020
Amendment-VIII: Technical-Civil-dated 10.02.2021

SL. NO.	REFERENCE OF BIDDING DOCUMENT				AMENDMENT TYPE	MODIFICATION
	Part/Sec.	Page No.	Clause No.	Description as per NIT	M/D/A	
1		5 of 18	1.1.1	Soil Investigation Report 1) The Geo- Technical Investigation for Dankuni Complex is attached with the NIT and may be viewed by the bidders, for guidance purpose only.	M	1) The Geo- Technical Investigation for Dankuni Complex is attached with the NIT and may be viewed by the bidders, for guidance purpose only. The interpretation of the results should be re-assessed by the bidder on the basis of bore logs and soil data. If bidder feels then he may conduct preliminary soil investigation for bidding purpose. However, the successful bidder shall carryout detailed soil investigation for the proposed plant afresh at the time of detail engineering.
2		6 of 18	1.2	Required Topographical / Contour survey shall be done by BOO OPERATOR for micro grading & layout purpose. The plant battery limit co-ordinates shall be as per enclosed plot plan (plant). Survey drawing of the Refinery area is attached with the NIT & can be viewed by the bidder, if desired.	M	Topographical / Contour survey report has been attached with the NIT for reference to the bidders. The plant battery limit co-ordinates shall be as per enclosed plot plan (plant).
3		7 of 18	1.4	**Grading** The land shall be handed to the BOO contractor on 'As is where As' basis. BOO operator to develop the site as per requirement.	M	Graded and compacted land shall be provided to the bidder. However, micro grading as required shall be the done by the bidder.

LEGEND:M: MODIFICATION, A: ADDITION, D: DELETION,