

| <b>BOQ for SPARES AND SPECIAL TOOLS TO BE SUPPLIED WITH 1 No. 220kV / xx kV<br/>± 125MVAR, STATCOM Bay at 220kV SAGAPARA substation</b> |   |             |                        |                          |
|---|---|-------------|------------------------|--------------------------|
| <b>Sr.<br/>No.</b>  | <b>Particulars of Item</b>  | <b>Unit</b> | <b>Supply<br/>Qty.</b> | <b>Erection<br/>Qty.</b> |
| <b>A</b>  | <b>STATCOM Power Modules</b>  |             |                        |                          |
| 1   | IGBT Valve sub modules(5%)  | Set         | LS                     |                          |
| 2   | Gate control unit each type and rating  | Set         | 2                      |                          |
| 3   | Optical fibre signal cable each type and length for Power module  | Set         | 1                      |                          |
| 4   | Capacitor each type and rating  | Set         | 1                      |                          |
| 5   | Gasket of each type and rating  | Set         | 1                      |                          |
| 6   | Nut & Bolts each type and rating  | Set         | 1                      |                          |
| 7   | Communication components (if applicable)  | Set         | 1                      |                          |
| 8   | Liquid cooling components (if applicable)   | Set         | 1                      |                          |
| <b>B</b>  | <b>STATCOM Equipments</b>   |             |                        |                          |
| 1   | Arrestors across valve  | Nos         | 3                      |                          |
| 2   | Insulators of each type and rating  | Set         | 1                      |                          |
| 3   | Charging resistor   | Nos         | 1                      |                          |
| 4   | Bye pass switch for charging resistor   | Nos         | 1                      |                          |
| 5   | Grounding switch contact kit  | Nos         | 1                      |                          |
| 6   | Wall bushing each type and rating (if applicable)   | Set         | 1                      |                          |
| 7   | Hall current sensor (If applicable)   | Nos         | 1                      |                          |
| 8   | Cooling pipe repairing kit  | Set         | 1                      |                          |
| 9   | Air core series reactor   | Nos         | 1                      |                          |
| 10  | Any other material / equipment/ items / consumables necessary for satisfactory operation of designed service life of IGBT Valve | Set         | LS                     |                          |
| <b>C</b>  | <b>STATCOM Valve Control &amp; Protection System</b>  |             |                        |                          |
| 1   | Cards each type and rating  | Set         | 1                      |                          |

| <b>Sr.<br/>No.</b> | <b>Particulars of Item</b>                                     | <b>Unit</b> | <b>Supply<br/>Qty.</b> | <b>Erection<br/>Qty.</b> |
|--------------------|--|-------------|------------------------|--------------------------|
| 2                  | Power supply module each type and rating                       | Set         | 2                      |                          |
| 3                  | Auxiliary relays of each type and rating                       | Set         | 2                      |                          |
| 4                  | Pluggable miniature relay each type and rating (if applicable) | Set         | 2                      |                          |

| Sr. No.  | Particulars of Item   | Unit | Supply Qty. | Erection Qty. |
|----------|---|------|-------------|---------------|
| 5        | Ethernet switch   | Nos  | 1           |               |
| 6        | Protocol converters each type (If applicable)   | Set  | 1           |               |
| 7        | Any other material / equipment/ items / consumables necessary for satisfactory operation of designed service life of IGBT Valve | Set  | LS          |               |
| <b>D</b> | <b>Cooling system</b>   |      |             |               |
| 1        | Fine water pump with motor  | Set  | 1           |               |
| 2        | Resin   | Set  | 1           |               |
| 3        | Pump with motor each type and rating except covered in Point No.1   | Set  | 1           |               |
| 4        | Flex pipes for complete replacement   | Set  | 1           |               |
| 5        | Fan unit of water to air heat exchanger   | Nos  | 1           |               |
| 6        | Pressure gauge of each type   | Set  | 1           |               |
| 7        | Valves of each type including safety valves   | Set  | 1           |               |
| 8        | Conductivity, Pressure and Temperature Sensors of each type   | Set  | 1           |               |
| 9        | Conductivity, Pressure and Temperature Transmitters of each type  | Set  | 1           |               |
| 10       | Flow gauge  | No   | 1           |               |
| 11       | Level switch  | No   | 1           |               |
| 12       | Sealing kit for pump  | Nos  | 1           |               |
| 13       | Gasket set with O ring  | Set  | 1           |               |
| 14       | Service kit for pump  | No   | 1           |               |
| 10       | Any other material / equipment/ items / consumables necessary for satisfactory operation of designed service life of IGBT Valve | Set  | LS          |               |
| <b>K</b> | <b>Tools / Tackles / Kits</b>   |      |             |               |
| 1        | STATCOM Valve module testing Kit  | Nos  | 2           |               |

| <b>Sr. No.</b> | <b>Particulars of Item</b>   | <b>Unit</b> | <b>Supply Qty.</b> | <b>Erection Qty.</b> |
|----------------|--|-------------|--------------------|----------------------|
| 2              | STATCOM Valve module handling Kit (if applicable)                                      | Nos         | 1                  |                      |
| 3              | Capacitance meter  | Nos         | 1                  |                      |
| 4              | Hydraulic Pump   | Nos         | 1                  |                      |
| 5              | Air relief Pump  | Nos         | 1                  |                      |
| 6              | Make up water Pump   | Nos         | 1                  |                      |
| 7              | Hydraulic Jack   | Nos         | 1                  |                      |
| 8              | Trolley for movement of STATCOM Valve modules  | Nos         | 1                  |                      |
| 9              | Test kit / tool for STATCOM Controller and Valve monitoring controller (if applicable) | Nos         | 1                  |                      |