

SCHEDULE A: INTRODUCTION & PREAMBLE TO THE PRICE & TECHNICAL SCHEDULES

[Actual Burden shall be finalized at execution time based on sizing calculation. Accuracy & VA shall have to be defined for all ratio]

- 1D2.5 Six (6) nos. of 30kV rated voltage, 10kA nominal discharge current, 50Hz, Heavy duty station class, single phase surge arresters.
- 1D2.6 One (1) lot of LV side connection between 36kV terminal of 132/33 kV transformer to 36 kV switchyard including necessary fittings, structures and conductors. Gantry Structure of 36 kV shall be considered for 8 (eight) nos. feeder including incomer and each bay width shall be 6(six) meter. Whole bus and Bus sectionalizer DS of rating 3000A shall be considered.
- 1D2.7 Six (6) nos. of 36kV, 31.5 kA/1 sec, 50Hz, 170kVp BIL, post type current transformer.
2400-1600-800/1A, Class 5P20, 30VA for Main 1 Protection
2400-1600-800/1A, Class 5P20, 30VA for Main 2 Protection,
2400-1600-800/1A, Class 0.2S, 15VA for Metering 1
2400-1600-800/1A, Class 0.2S, 15VA for Metering 2, BCU
[Actual Burden shall be finalized at execution time based on sizing calculation. Accuracy & VA shall have to be defined for all ratio]
- 1D2.8 One (1) lot of flexible conductors for bus and jumper, insulators, fittings including all necessary clamps and connectors required for completing 36kV busbar and switchgear connection as specified in the technical specifications and bid drawings.
- 1D2.9 One (1) lot of steel structures for gantry and equipment supports required for completing 36kV busbar and switchgear as specified in the technical specifications and bid drawings.

1E Power Transformers & Earthing/Auxiliary Transformers

- 1E1 Two (2) sets of 132/33 kV, 50/75 MVA (ONAN/ONAF), three phase outdoor type power transformers.
- 1E2 Two (2) sets 33/0.415 kV, 300kVA three phase outdoor type auxiliary transformers associated with Bushing CTs and steel support structures including all necessary connections.

1F Control, Protection, Monitoring, Substation Automation & Metering

The equipment to be supplied, installed and commissioned is shown in bid drawings are comprising of:-

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- 2D2.4 Twelve (12) nos. of single-phase, 2-core, $33/\sqrt{3} / 110/\sqrt{3} / 110/\sqrt{3}$ kV/V/V, 3P/0.2, 20-50/10-20VA 36kV, 31.5kA/1 sec, 50Hz, 170kVp BIL, inductive type voltage transformers.
[Actual Burden shall be finalized at execution time based on sizing calculation. Accuracy & VA shall have to be defined for all ratio]
- 2D2.5 Six (6) nos. of 30kV rated voltage, 10kA nominal discharge current, 50Hz, Heavy duty station class, single phase surge arresters.
- 2D2.6 One (1) lot of LV side connection between 36kV terminal of 132/33 kV transformer to 36 kV switchyard including necessary fittings, structures and conductors. Gantry Structure of 36 kV shall be considered for 8 (eight) nos. feeder including incomer and each bay width shall be 6(six) meter. Whole bus and Bus sectionalizer DS of rating 3000A shall be considered.
- 2D2.7 Six (6) nos. of 36kV, 31.5 kA/1 sec, 50Hz, 170kVp BIL, post type current transformer.
2400-1600-800/1A, Class 5P20, 30VA for Main 1 Protection
2400-1600-800/1A, Class 5P20, 30VA for Main 2 Protection,
2400-1600-800/1A, Class 0.2S, 15VA for Metering 1
2400-1600-800/1A, Class 0.2S, 15VA for Metering 2, BCU
[Actual Burden shall be finalized at execution time based on sizing calculation. Accuracy & VA shall have to be defined for all ratio]
- 2D2.8 One (1) lot of flexible conductors for bus and jumper, insulators, fittings including all necessary clamps and connectors required for completing 36kV busbar and switchgear connection as specified in the technical specifications and bid drawings.
- 2D2.9 One (1) lot of steel structures for gantry and equipment supports required for completing 36kV busbar and switchgear as specified in the technical specifications and bid drawings.

2E Power Transformers & Earthing/Auxiliary Transformers

- 2E1 Two (2) sets of 132/33 kV, 50/75 MVA (ONAN/ONAF), three phase outdoor type power transformers.
- 2E2 Two (2) sets 33/0.415 kV, 300kVA three phase outdoor type auxiliary transformers associated with Bushing CTs and steel support structures including all necessary connections.

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- 3E2 Two (2) sets 33/0.415 kV, 300kVA three phase outdoor type auxiliary transformers associated with Bushing CTs and steel support structures including all necessary connections.

3F Control, Protection, Monitoring, Substation Automation & Metering

The equipment to be supplied, installed and commissioned is shown in bid drawings are comprising of:-

145 kV Circuits

The equipment to be supplied, installed and commissioned is shown in bid drawings are comprising of :-

- 3F1 Control, Protection & Monitoring including BCU for two (2) sets of overhead line circuits bays.
- 3F2 Control, Protection & Monitoring including BCU for two (2) sets of 132/33 kV power transformer circuits.
- 3F3 Complete Control, Protection & Monitoring including BCU for bus coupler circuit.
- 3F4 Complete Busbar protection for 132kV system
- 3F5 Complete Independent standalone Digital Fault and Disturbance recorder (DFDR) with PMU functionality to monitor 132kV bays and 33kV incomer bays. Engineering workstation shall be supplied. DFDR should be integrated with central client station. The Engineering workstation PCs shall have minimum configuration of core i7 (latest generation), 16GB RAM, 1TB SSD with RAID1, and 27" display.
- 3F6 Complete Tariff metering panel to accommodate programmable & recordable digital 3-phase, 4-wire import and export MWh and MVarh meters (accuracy class 0.2) for each 132 kV line and transformer feeder. For each feeder one meter shall be supplied including one set software and communication cord. Substation Automation System shall include the metering for all the bays. Tariff Metering is to be supplied from Europe, Canada, USA or Japan make. Printed catalogue, operation and service manual are to be provided.
- 3F7 Two (2) sets of SAS System including Operator Workstations and related software with all licenses (shall be perpetual and sufficient for all future bays), Necessary Ethernet switches and GPS for the SAS system, 55 inch LED

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4E Power Transformers & Earthing/Auxiliary Transformers

4E1 Two (2) sets of 132/33 kV, 80/120 MVA (ONAN/ONAF), three phase outdoor type power transformers.

4E2 Two (2) sets 33/0.415 kV, 300kVA three phase outdoor type auxiliary transformers associated with Bushing CTs and steel support structures including all necessary connections.

4F Control, Protection, Monitoring, Substation Automation & Metering

The equipment to be supplied, installed and commissioned is shown in bid drawings are comprising of:-

145 kV Circuits

The equipment to be supplied, installed and commissioned is shown in bid drawings are comprising of :-

4F1 Control, Protection & Monitoring including BCU for four (4) sets of overhead line circuits bays.

4F2 Control, Protection & Monitoring including BCU for two (2) sets of 132/33 kV power transformer circuits.

4F3 Complete Control, Protection & Monitoring including BCU for bus coupler circuit.

4F4 Complete Busbar protection for 132kV system

4F5 Complete Independent standalone Digital Fault and Disturbance recorder (DFDR) with PMU functionality to monitor 132kV bays and 33kV incomer bays. Engineering workstation shall be supplied. DFDR should be integrated with central client station. The Engineering workstation PCs shall have minimum configuration of core i7 (latest generation), 16GB RAM, 1TB SSD with RAID1, and 27" display.

4F6 Complete Tariff metering panel to accommodate programmable & recordable digital 3-phase, 4-wire import and export MWh and MVarh meters (accuracy class 0.2) for each 132 kV line and transformer feeder. For each feeder one meter shall be supplied including one set software and communication cord.

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