SF6 GAS HANDLING PLANT

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Engineering Department

WEST BENGAL STATE ELECTRICITY TRANSMISSION COMPANY LIMITED

পশ্চিমবঙ্গ রাজ্য বিদ্যুৎ সংবহন কোম্পানি লিমিটেড

(পশ্চিমবঙ্গ সরকারের একটি উদ্যোগ)

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1. Scope

This specification covers the design, manufacture, testing, supply, and training for SF6 Gas Handling Plant for use in WBSETCL substations. The plant shall be capable of performing evacuation, recovery, dry, filtration, and filling of SF6 gas into circuit breakers and other gas insulated equipment. Also, it should be able to evacuation SF6 gas from gas filled chamber to cylinder. The plant shall be portable and suitable for operation in outdoor substations under hot and humid tropical conditions.

2. Standards

The SF6 Gas Handling Plant shall conform to the latest editions of the following standards, unless otherwise specified:

- IEC 60376 / IEC 60376A / IEC 60376B – SF6 Gas for use in electrical equipment
- IS 12032 – Equipment for handling and storage of gases
- Relevant IS/IEC standards for electrical and mechanical components

3. Functional Requirements

The equipment shall be able to:

- Evacuate, filter and fill SF6 gas in circuit breakers and GIS components
- Ensure SF6 recovery efficiency of ≥99.5%
- Filter and dry SF6 gas during the filling and evacuation process
- Be mounted on a portable cart with ≥12” pneumatic wheels for manoeuvrability on metal-gravel switchyard surfaces

4. Major Components

The equipment shall consist of the following components, integrated into a single compact housing and operable on 240V, 50Hz power supply:

a) Vacuum Pump: ≥40 m^3/h capacity; capable of creating vacuum <1 mbar

b) High Pressure Oil-less Compressor: ≥5.5 m^3/h capacity; maximum pressure up to 50 bar

c) Vacuum Compressor: ≥4.5 m^3/h capacity; vacuum creation <5 mbar

d) Gauges: Vacuum and Pressure gauges with min resolution of 0.1 mbar and max 50 bar

e) Gas Flow Mimic Diagram

f) Filters: Particle filter, Dry filter

g) Valves: Three-way valves, anti-suck back valve

h) SF6 Bottle Balance and onboard storage cylinder (Min. 300 L/280 kg capacity) with integrated weighing system

i) Working hour counter, hose assembly (Min. 15m with couplings), dew point meter, and tool set

5. Filtration System

The plant shall provide filtration up to 1 micron or finer during gas recovery and filling operation.

6. Dew Point Measurement

The system shall include a dew point measuring instrument with:

- Sensor Range: +30°C to -60°C
- Operating Temp.: 0°C to 50°C
- Panel Mounted Display Unit/Indicators

7. Power Supply Requirements

The unit shall be operable from:

- Single phase 240V, 50Hz or three phase 415V, 50Hz AC

It shall be equipped with a phase sequence relay to ensure correct compressor/vacuum pump rotation.

8. Performance Parameters

- Maximum SF6 filling pressure: ≥50 bar
- Operating Voltage: 230V ±10%, 50 Hz
- Minimum recovery efficiency: 99.5%

9. Commissioning & Training

The supplier shall be responsible for successful commissioning of the plant. Training on safe operation and maintenance of the unit shall be provided to WBSETCL engineers. Instruction manuals shall be supplied with the plant.

10. Packaging and Transport

The plant and accessories shall be packed in rugged, weatherproof containers to ensure safe transportation to various substations without loss of accuracy or performance.

11. Maintenance Tool Kit

A complete set of tools required for operation and maintenance shall be supplied.

12. After Sales Service

Bidder must furnish evidence of established service centers and organization chart indicating availability of service personnel.