Works Information

AS AND WHEN REQUIRED SCOPE OF WORK FOR SUBSTATION BATTERY ROOM (HAZARDOUS LOCATIONS) INSTALLATIONS ASSESSMENTS, INSPECTIONS AND TESTING

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28 August 2023

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1. DESCRIPTION OF THE *WORKS*

The *works* includes 'as and when' inspections, testing and issuing of certificates of compliance of the electrical installations in the Transmission substation battery rooms.

2. SCOPE OF WORK TO BE PERFORMED BY THE *CONTRACTOR* FOR THE *WORKS*

The *contractor* is required to perform the following scope of work per substation battery room but not limited to:

2.1 Battery room installations assessments, inspection and testing

A competent Master Installation Electrician (MIE) is required to perform the inspections, testing and issuing of the Certificate of Compliance (CoC) in accordance with applicable South African National Standards (SANS) in the Transmission Substation Battery rooms. The services will be provided in various areas as identified by the Employer (Eskom). The professional service provider shall be registered member with the Department of Labour (DoL) with a valid registration number and proof of rendering such services in the past five years.

The service provider shall provide the hazardous location (Hazloc) classification report where such report does not exist. The classification report shall as a minimum indicate the calculation indicating how the classification was determined by considering the following:-

- The Geometry of the source of release
- Release velocity
- Concentration
- Ventilation calculations
- Grade of release
- Determine the extent of zone
- Temperature class
- The explosive level (Lower Explosive Limit and the Upper Explosive Limit)
- Risk Assessment
- The type of Explosive Protection Equipment required in that particular room
- The Gas Group

The Classification report shall as a minimum include the following:-

- Indicate the information that will be displayed on the Hazloc signage for the area.
- Hazloc Drawing
- The type of inspections and the frequency of the inspection to be conducted.
- The demarcation indicating the hazardous area

The MIE shall as part of an internal HAZLOC (Hazardous Locations) assessment team carry out the following tasks:

- Assess battery room electrical installations, test and issue certificates of compliance (COC) for specialised (hazardous locations) and normal electrical installations after reparations, modifications or new installations.

- Assess and analyse any other HAZLOC areas and recommend appropriate classifications on existing, modified and new plant and equipment as and when required for the duration of the contract period.

- Do inspections and issue valid CoC's as per SANS requirements:

- Select and approve electrical components for designated HAZLOC areas, in accordance with the relevant OHSACT, GMR, SANS and other relevant codes of practice requirements.

- Verify and advise end users of the correct rating of protective devices, through appropriate calculations in accordance with the applicable approved design standards and specifications.

- Verify and advise end users of the correct conductor rating and current carrying capacity for the protective devices and connected load, through calculation in accordance with the applicable design standards.

- Assess and perform appropriate tests on connections of conductors, earthing and bonding. Ensure the circuit is mechanically sound and electrically continuous.

- Ensure that circuits, fuses, switching devices, terminals, earth leakage units, circuit breakers and distribution boards are correct and permanently identified, marked and labelled.

- Calculate and verify the voltage rating, voltage drop, current carrying capacity and short circuit capacity in accordance with appropriate SANS requirements.

- Verify and advise end users of appropriate ventilation in applicable HAZLOC zones / areas through appropriate calculation in accordance with the relevant SANS standards.

- Verify and advise end users that the appropriate signs and demarcation is in place.

- Provide all relevant documentation and inspection test reports for each site.

- Predict remaining life of components and advise of what spares and materials to keep for future repairs.

- Use appropriate test equipment and perform periodic tests

- Ensure that all required tests are executed for the CoC of a specific HAZLOC zone.

- Record test results, measurements, calculate ratios and compare with specifications. Identify compliance / non-compliance and provide all the necessary reports for all the tests done.

- Complete all related test documentation. Compare test results/ratios with specifications and report any identified non-compliance.

- Ensure that applicable tools and test equipment are in proper working condition and calibrated timeously and provide valid calibration certificates.

- Check all relevant documentation, such as drawings for correctness and equipment validity.

- In terms of new installations, Handover documents must be checked for correctness.

- Before commissioning of the equipment, an initial detailed inspection schedule shall be completed for the different protection types, for all equipment installed in hazardous locations in accordance with SANS 60079-14 and SANS 60079-17.

- Issue and sign off CoC's, for HAZLOC and Non-HAZLOC related plant and equipment as and when required.

- Ensure that the end users are advised of the required HAZLOC signage is to be displayed at all hazardous locations.

Review Hazloc zones and reassess classification:

- Conduct required inspections and tests to reconfirm area classification zones as per the SANS. Analyse results by calculating exposure zone in accordance with the relevant SANS standards and applicable procedural requirements. Reassess HAZLOC zones and propose revised classification where appropriate.

- Compile inspection / test reports for proof of compliance, highlighting problem areas, risks involved and corrective action are taken.

- Implement and coordinate HAZLOC area upgrade projects as and when required by the Transmission Grids.

- Ensure that all relevant documentation, CoC's are handed over to the end users at the end of each project.

- Provide technical advice and guidance end users for the purchasing of SANS approved material / spares applicable to plant and equipment in HAZLOC areas.

- Advise on any Maintenance procedures if so required by end users.

3. QUALITY ASSURANCE AND CONTROL

3.1 QUALITY ASSURANCE

Proof of certification, theoretical & practical training required from the tenderer:

- Unit Standard No. 13821 - Test and inspect an electrical installation in a hazardous location. (SAQA)
- SANS 10108 with ARP 0108 (South Africa only)
- SANS IEC 60079-10; SANS IEC 60079-14; SANS IEC 60079-17
- SANS 10086 (South Africa only);
- SANS 10089 (South Africa only);
- IP 15 3rd Edition (UK)
- API 505 (USA) for the construction, installation, maintenance and Inspection of Ex equipment.

Portfolio of evidence over and above the certification requirements:

- Curriculum vitae (CV);
- Certified copies of all qualifications, certificates and identity document;
- Statement from a Registered Person;
- The CoCs and all the related information on the installations that the applicant tested; and
- The statement of results of the CoC course attended.
- Proof of registration with the department of labour as a master installation electrician.
- Valid Hazloc Training Certificate

Prior project experience clearly demonstrating the following competencies:

The project experience submitted should demonstrate that the MIE has completed projects during the following competencies have been attained.

- They have participated in the classification of hazardous locations.
- They have performed calculations and selected equipment suitable for different types of hazardous locations.
- They have installed such Ex equipment in hazardous locations.

3.2 QUALITY CONTROL

All COCs, inspection and testing reports should be signed by the accredited person who takes full responsibility.

4. ACCOMODATION AND TRAVEL

All travel and accommodation of the *Contractor's* staff whether permanent, non-permanent, part-time, sub-contracted is the *Contractor's* responsibility. It must be included in their quotation.

5. LABOUR

All staff whether permanent, non-permanent, part-time, sub-contracted, and labour only supply, is the *Contractor's* responsibility in terms of supervision and control.

The *Contractor's* supervisor shall be on site at all times seeing to it that all the workers under his supervision work properly and safely.

The *Contractor* shall indicate the man-hours required to execute each activity and this shall be used to gauge the efficiency of the bidder.

6. LETTER OF AUTHORIZATION

The Contractor must have an accreditation certificate indicating that they have been trained and certified to perform inspections and testing in hazardous locations. They should also have a valid registration with the department of labour.