Annexure 1.3:

General Technical Requirements

Electrical

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1 GENERAL

1.1 Purpose of the Document

1.1.1 The purpose of this document is to provide the General Technical Requirements (“GTR”) which form part of the minimum Requirements of the Passenger Rail Agency of South Africa (“PRASA”) for the enablement of the PRASA Train Control System (“PTCS”) Phase 1 through the restoration, verification, testing, and commissioning of the existing original equipment manufacturer (“OEM”) Electronic Signalling Interlocking System in PRASA’s Western Cape (“WC”) service region (“the Project”) that the Bidder shall meet and deliver at the Bidder’s cost therefore within the Bid Price.

1.2 Executive Overview

1.2.1 Notwithstanding any other PRASA Requirements stated throughout the RFP, the Bidder shall uncompromisingly deliver the whole of the Works required to achieve successful delivery of the Project.

1.2.2 The Electrical Component of the Works, in this Phase 1 of the enabling of the PRASA PTCS, is at a minimum, summarised as follows:

a) Restore the Power Supply System to all the equipment rooms (SER’s and AR’s) where required.

b) Restore the change-over panel inside the equipment rooms as per PRASA Approved Drawings where required.

c) Restore the Main and Auxiliary Supplies, where required.

d) Any other Electrical Works, activities and resources required to achieve a fully integrated, functional and complete equipment room to meet any other requirements and specifications as requested throughout the RFP or as otherwise instructed in writing by PRASA.

2 MINIMUM SYSTEM REQUIREMENTS

2.1 General

2.1.1 The Bidder shall perform the following tasks, as a minimum, to restore full functionality of the main and alternative electrical supply infrastructure to support the RSS and PTCS:

a) Restore, test and commission the stepdown points and associated feeder cable from the PRASA 11kV/6.6kV transmission line for the equipment rooms, where required.

b) Restore, test and commission the alternative supply and associated feeder cable for the equipment rooms, where required.

c) Restore, test and commission the change-over panel as per the approved PRASA drawings, inside the equipment rooms where required.

d) Provide a suitably rated connection point together with a manual change-over switch, to accommodate an incoming supply from a 25kVA mobile generator, at Equipment rooms that have not been provided with permanent generators.

e) Install Electrical 11kV supply manual operated link switch where required.

f) The Bidder to comply with all PRASA Approved Electrical Drawings which will be issued.

g) The Bidder to comply with all PRASA Approved Electrical Specifications and Standards.

2.1.2 All Equipment supplied as part of the Works shall comply with the existing PRASA specifications, norms and standards. These requirements shall be taken to be generally applicable in accordance with good practice, and they shall not relieve the Bidder from ensuring that all Equipment incorporated in the Works is suitable for their intended purposes and environments.

2.1.3 The Bidder is responsible for all restoration changes on the existing Equipment and shall therefore perform any necessary work to re-establish the proper and safe functionality of the existing operation and Equipment including the updating of documentation.

2.1.4 The Bidder shall Restore the Electrical System in such a manner to minimize Maintenance requirements and ensure overall maintainability.

2.1.5 The Electrical System shall continue to function properly if maintained according to the current Maintenance strategy.

2.1.6 It shall be possible to mend Electrical breakdowns in a very short time and with a minimum impact on operations.

2.1.7 Any other Electrical Works, activities and resources required to restore and implement a fully integrated, functional, complete RSS as requested throughout the RFP or as

otherwise instructed in writing by PRASA.

2.2 Specific Tests

2.2.1 In addition to the routine Tests and any type Tests forming part of the Factory Acceptance Tests (“FAT”), special Tests may be required in the restoration Works to demonstrate the suitability of the Equipment in a railway-operating environment.

2.2.2 The Bidder shall, as part of the restoration, propose all special Tests considered necessary.

2.3 Applicable Rules and Regulations

2.3.1 Local Distribution Safety Rules, Railway Design Standards, Railway Safety Regulator Standards, SANS Standards and PRASA Standards shall be applicable during restorations.

2.4 Reliability and Availability

2.4.1 The reliability and availability of the power Supply Systems shall be as near to 100% as is reasonably practicable and they shall have a minimum life of 30 years.

2.5 Power System Data

2.5.1 The Bidder shall provide Equipment rated for the operating conditions.

2.6 Interfaces

2.6.1 The Bidder shall be fully responsible for the interface co-ordination with the Region and/or the local authority where required.

2.6.2 The Bidder shall be responsible for Testing and Commissioning of all restored Equipment provided under this contract including the necessary interfaces with the operating segment where applicable.

2.6.3 In certain cases, PRASA may instruct the Bidder to discuss and agree upon the interfaces between various disciplines, in which case the Bidder shall inform PRASA in writing of all discussions, agreements and conclusions.

2.7 Inspection Testing, Packing, Storage, Handling and Safety

2.7.1 It shall be the Bidder’s responsibility to guarantee that there is no damage to the Equipment while received in storage and when delivered to site and the Equipment on-site is well protected against damage from physical and environmental conditions.

2.8 Bidder’s Responsibility

2.8.1 Approvals granted by PRASA shall not relieve the Bidder of any of his responsibilities under the Contract.

2.8.2 The Bidder shall demonstrate that all Equipment offered for this Contract is suitable for the Works and in compliance with the most recent applicable specifications and standards

3 CONSTRUCTION

3.1 General

3.1.1 Electrical Restoration work shall comply with all relevant Standards, Specifications, Regulations and Procedures as specified throughout the RFP.

3.1.2 The Bidder shall submit method statements for all Electrical Restoration work to be performed to PRASA for review and approval before commencement of the work.

3.1.3 All Construction work on or near the railway line shall be performed under Occupation-between-trains (“OBT”) or Total Occupation conditions.

3.1.4 The Bidder to perform all the Restoration work, except if expressly stated otherwise in the GTRs or PTRs.

4 TESTING AND COMMISSIONING

4.1 General

4.1.1 All restored assets shall be Tested and Commissioned to comply with all relevant Standards, Specifications, Regulations and Procedures as specified throughout the RFP.

4.1.2 The Bidder shall submit a Method Statement to PRASA for acceptance before any Testing and Commissioning commences. The Method Statement shall clearly indicate:

a) All Systems, sub-Systems and Equipment that shall be included in the Testing and Commissioning process.

b) Specification, from PRASA, against which the Testing and Commissioning shall be conducted.

4.2 Factory Acceptance Testing (“FAT”)

4.2.1 All relevant Electrical Systems, sub-Systems and Equipment shall undergo and pass FAT before shipping to site.

4.2.2 The Bidder shall be responsible for all FAT.

4.2.3 The Bidder shall invite PRASA to all FAT taking place at least 21 working days prior to commencing of the FAT. Should PRASA not be able to attend, PRASA shall give the Bidder permission to continue or request the dates for the FAT to be changed. If PRASA cannot attend these revised dates, then the bidder must perform the FAT without further delay. PRASA shall not be held liable for any delays caused by this unavailability.

4.2.4 The Bidder shall submit all duly signed FAT Test certificates and associated Test sheet to PRASA for information purposes, prior to Commissioning.

4.2.5 PRASA accepts no accountability nor liability for any FAT conducted, despite any checks done or inputs given by any of PRASA's agents.

4.3 Final Testing and Commissioning

4.3.1 Final Testing and Commissioning shall be done by a PRASA approved Test and Commissioning Engineer provided by the Bidder.

4.3.2 Once the Bidder is convinced the Bidder is ready for Final Testing and Commissioning, he shall agree with PRASA on a suitable date for the activity, at least 21 working days prior to the proposed date.

4.3.3 The Bidder shall submit a comprehensive Final Testing and Commissioning Method Statement to PRASA for approval before any Commissioning commences.

4.3.4 The Bidder shall be responsible for providing a complete Testing and Commissioning team as per the Method Statement, as well as all Tools and Equipment required for introducing, Testing and Commissioning of the System.

4.3.5 The members of the Bidder’s Testing team shall have not been involved in any Design, manufacturing, assembling, FAT or SAT activities relating to the System, sub-System or Equipment for which that member is responsible during the final Testing and Commissioning.

4.3.6 The Bidder shall submit all duly signed Test certificates and associated Test sheets to PRASA for record purposes.

5 DECOMMISSIONING, DISMANTLING AND REMOVAL

5.1 General

5.1.1 The Bidder shall, at a minimum, ensure that:

a) The Decommissioning, dismantling and removal of redundant equipment shall comply with all relevant Standards, Specifications, Regulations and Procedures as specified throughout the RFP.

b) The Bidder shall be responsible for the Decommissioning, dismantling and removal of all redundant Electrical Equipment.

c) The Bidder shall remove all redundant visible cables.

d) All buried redundant cables may be abandoned.

e) The Bidder shall submit a Method Statement for the Decommissioning, dismantling and removal of all redundant Equipment to the PRASA approval before commencing any work.

f) The Bidder shall dispose of the redundant Equipment according to the process describedthe RFP.

g) The Bidder shall complete the Decommissioning and removal of visible cable within 14 calendar days after the Commissioning of any Section.

h) The Bidder shall complete the Decommissioning, dismantling and removal of redundant Equipment no later than 40 calendar days after the Commissioning of any Section.

6 WARRANTIES

6.1 General

6.1.1 The Bidder shall take full Warranty responsibility and liability for all new Equipment and Works tested, commissioned, and handed over to PRASA from the date of handover for 365 calendar days.

a) Warranties for all Electrical related Works, shall at a minimum, be valid and cover:

- Replacement of all faulty Plant and Materials, Components and labour.
- Tracking and tracing and correcting faults.

b) Failures caused by environmental and infrastructure conditions asspecified throughout the RFP including, but not limited to:

- Any Plant and Materials or Components damaged due to exposure to extreme direct sunlight and elevated temperatures
- Any Plant and Materials or Components damaged due to continuous exposure to high humidity
- Any Plant and Materials or Components failure due to corrosion