



**PROJECT SPECIFICATION AND BILL OF QUANTITY**

**FOR**

**Appointment of a contractor for an Upgrade of existing ETAP Power  
system simulation tool for traction network.**

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## **1. Introduction**

The department needs to upgrade the current ETAP software to conduct evaluations related to power quality, energy management, and network capacity. This upgrade is essential for ensuring the infrastructure is prepared for the latest introduction of new trains in the Western Cape region. Currently, the new trains are operating within the system, and the assessment tools will aid in determining the energy usage of these new trains, as well as the available and necessary capacity. Additionally, these tools will support energy management efforts within the network, ultimately reducing energy consumption costs.

## **2. Simulation Tool [ETAP/ETRAX] to be able to simulate.**

- Power system studies
- Substation power supply
- Load flow studies
- Power quality studies
- Energy management studies
- Power factor analysis and correction
- Network reliability
- Overall network behavior
- Train/load modelling
- Train/load behavior
- Effect of wave filters
- Regenerative braking simulations
- Train/load movement shown on the route (Google map)
- Substation power consumption while trains are moving.
- Effect of new trains vs old
- AC and DC traction system combine.
- AC distribution system and DC Traction combined.
- Predictions of future behavior
- SCADA system for the entire network

- Harmonics
- Harmonics, Unbalanced Network

### **3. Simulation Capability**

- 500 Bus Simulation Capability

### **4. Training**

- The contractor shall provide a training for one Engineering Technician and Engineer of PRASA.

Simulation package will be able to do online system monitoring. The package has a proven record of simulation studies in the railway industry, provides online support and technical tutorials. The simulation package will provide a complete simulation system setup at Control center and Depot for substation simulation studies. System to be provided with free software updates.