

REQUEST FOR QUOTATIONS FOR THE REMOVAL OF ELECTRICAL CABLES, INSTRUMENTS AND GRATING PLATFORM IN PREPARATION FOR THE REMOVAL OF PUMP-SETS 4-7 AT LETHABO INTAKE PUMPING STATION.

C3.2 SCOPE OF WORK

Rand Water is in the process of refurbishing the pumps at Lethabo Intake Pumping Station. This document covers the scope of the work required to be executed to enable safe removal of the pumps. The existing arrangement is such that each motor and pump are protected by instruments with digital and analogue signals being interfaced with the pumpset PLC. The required work under this document entails the removal of instruments and instrumentation cables, electrical cables, and Grating Platform in preparation for the removal of four Pump-sets (4-7) at Lethabo Intake Pumping Station.

The instruments include temperature transmitters, pressure transmitters, vibrations sensors, flow meters, and flow switches. In addition, signals (both analogue and digital) are also received from the Cooling Water Pump Sump and the Flood Alarms panels to the PLC. The PLC receives feedback signals of the status of all the equipment in the field. These signals are also fed to the HMI/Scada. All operations of the pump are performed from the HMI.

The electrical cabling involves Medium Voltage (MV) cabling fed from 6.6kV switchgear and the Low Voltage System (LV) includes the 400V fed from the MCC with mains supply, standby generator supply, and the Uninterruptible Power Supply (UPS) system. The motors for each Pump-set (i.e. 6 to 7) are connected and controlled by two Rockwell Powerflex 7000 VSD. The configuration is such that any motor can be controlled by any of the VSDs. The DOL is implemented if there will be no speed regulation required.

The scope of work for each pump-set rated at 450 M/d includes the following:

1. Using the existing drawings, confirm the current installation and do markups for generation of new instrumentation drawings.
2. Decommissioning and disconnection of pump sets 4 – 7 MV and LV cables including coiling the cables away from the pump set.
3. Audit and test all the existing instruments and record the current condition of the instruments. Take date and time-stamped photographic evidence for record purposes as a before.
4. Decommissioning, disconnection, and removal of pump sets 4 – 7 instruments cabling including coiling the cables away from the pumpset.

5. Decommissioning, disconnection, and removal of instruments (temperature transmitters, pressure transmitters, vibrations sensors, flow meters/flow switches) from pump sets 4 – 7.
6. Removal of the pumpset cooling water system pipework
7. Cutting and removal of the MV, LV, and instrumentation cables support systems around pumpsets 4 – 7.
8. Audit and test the existing instrumentation panels and record the current condition of the panels. Take date and time-stamped photographic evidence for record purposes as a before.
9. Removal of electrical and instrumentation panels that impede removal of pump sets 4 – 7 motor and pump).
10. Removal of steel grating and supports to enable rigging of pump sets 4 – 7.
11. Decouple motors and pumps and rig out the motors for pumpsets 4 -7.
12. After the refurbishment and installation of the pumps, rig in the motors for pump sets 4 -7.
13. Reinstatement of steel grating and supports after the installation of the pumpsets 4 – 7.
14. Reinstatement of the cooling water system pipework.
15. Reinstatement of the MV, LV, and instrumentation cables support systems for pump sets 4 – 7.
16. Replace any instruments and cabling that is now non-functional due to poor workmanship. Compare against the before record.
17. Audit and test the reinstalled instrumentation and cables; record the after condition of the instruments. Take date and time-stamped photographic evidence for record purposes as an after.
18. Re-installation of the electrical and instrumentation panels for pumpsets 4 – 7.
19. Replace any panels that are non-functional or damaged due to poor workmanship. Compare against the before record.

20. Audit and test the reinstalled instrumentation panels and record the after condition of the panels. Take date and time-stamped photographic evidence for record purposes as an after.
21. Re-instatement of MV, LV, and instrumentation cabling including terminations for pumpsets 4 -7.
22. Production of Quality Assurance (QA) / Quality Control (QC) pack.
23. Provision of as-built drawings
24. Testing, commissioning, and putting back into operation of pumpsets 4 – 7. Testing and commissioning to include working on the existing PLC programs to test and confirm the reconnected pumpsets instrumentation signals.

Note:

The work will be undertaken under shutdown condition i.e. water supply will be interrupted. For this reason, the execution must be started and completed in one attempt. The work will also not be performed in sequential order nor run parallel; it will be done prior when each pump-set is taken for overhaul. The overhaul is estimated to take four months before another pump-set can be taken.