

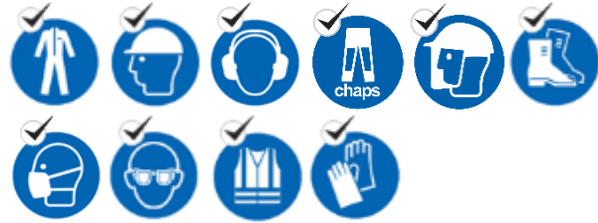
Planned maintenance procedures for electrical inspection and maintenance of pump stations.

Health & Safety and Operational Information

Hazard Indicators



Personal Protection



Health and Safety Information

- Health and Safety documentation.
- Generic Traffic Management Plans or site-specific Traffic Management plan.
- Hazardous Waste
- Confined Space Entry

Operation's & Maintenance Documentation

- Corridor Access Requests (CAR) and WIP Permits (site specific or generic/global)
- Service plans (B4uDig)
- Design drawings
- Site plans
- Notification Calling Cards

Customer Information (Confidential)

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Priority Customer Categories

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Emergency Procedure / Escalation

Emergency

- Make "Site Safe" and isolate risks to people or property with resources at hand

Escalate if extra resources required or problems occur!

- Escalate to Team Leader and inform of the issues faced and/or expected resources required if necessary.

Additional Documentation

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Required Skills, Competencies (Qualifications and/or Certifications)

Registered Electrician.
Industrial Electrician

Standard Operating Procedure

Required Equipment

Equipment and Information	Details
Fully Equipped Vehicle	Ensure vehicle, plant, equipment and materials appropriate to the day's work schedule is available.
Specialist Equipment	Ensure specialist equipment required is available for utilisation.
Specialist Materials & Parts	Ensure you have loaded up all the required parts and materials required to undertake the maintenance work to be completed.
Vulnerable & Priority List	<As required – remove row if not required>
Specialist Equipment	<As required – remove row if not required>

Prepare to do the work

Action	Action Details
Pre Start Process	<p>Complete the Daily Pre Start - Planning Reactive Maintenance</p> <ul style="list-style-type: none"> - Include Hazard ID - Include Pre-Start Tailgate Meeting <p>Undertake all tasks required in the Generic Planned Maintenance SOP.</p>
Compliance	Traffic Management Plan - Where required, TMP to be in place prior to work starting. TMP to be accessible on site.

Perform the work @ 26 weeks

Actions are colour coded for the frequency, perform all actions up to the end of the current frequency (i.e perform 4 weeks actions in addition to Annual actions during annual works)

4 weeks; 26 weeks; 52 weeks;

Action	Trade	Action Details
Inspect	Industrial Electrician	Check bus bars and Switch gear Report any corrosion or signs of arcing on bars and main breakers.
Inspect	Industrial Electrician	Check generator changeover switch is functioning freely and has no loose connections. Operate generator switch and verify it is operational and in good condition
Inspect	Industrial Electrician	Inspect circuit protection devices and electrical control devices. Check for functionality and integrity concerning operation and protection.
Inspect	Industrial Electrician	Check control drawings verify that the control As built drawings are on site
Inspect	Industrial Electrician	Check operation of all indicator lights and labels Check all indicator lights and replace if failed. Visually check all identification labels and report on any missing.
Inspect	Industrial Electrician	Check operation of all indicator lights and labels Visually check all identification labels and report on any missing. Check and replace all burnt out indicator and illumination lights. Check all external identification labels.
Maintenance	Industrial Electrician	Thermal check of control Panel Load the switchboard as heavily as possible and take a thermographic image of the switchboard. Identify hot spots and remedy cause (loose connection, fault contact etc). On completion of task reset plant to "Auto" status.
Maintenance	Industrial Electrician	The switchboard condition and connections. Inspect all electrical switchboards for signs of loose connections frayed wires etc. Check all main power terminals for tightness
Maintenance	Industrial Electrician	Earthing Conduct ground resistance test on site earthing rod/system. Record resistance and Verify all exposed metal is bonded to the main earth. Also Visually check main earth connection at earth stake.
Maintenance	Industrial Electrician	Control Panel Gently clean out Control Panels and switchboards removing dirt and dust. Repair or replace any damage to the panel structure. Also clean all transparent surfaces
Record	Industrial Electrician	Mains supply Record Impedance, PSC and voltage on incoming mains supply
Maintenance	Industrial Electrician	RCD outlets Test all RCD socket outlets using an RCD tester and record results

Action	Trade	Action Details
Inspect	Industrial Electrician	CB identification Panel drawings on site and all circuit breaker purpose identified
Inspect	Industrial Electrician	External equipment Visually check all cables, external push buttons, junction boxes and sockets for damage or leakage
Record	Industrial Electrician	Power meter Record ICP number on the electricity meter and check condition
Maintenance	Industrial Electrician	Transducer maintenance Clean all transducers and verify accuracy. Verify Pressure gauge reading are the same as the transducer reading if applicable.
Record	Industrial Electrician	Pump insulation resistance and continuity Disconnect pump cables from panel terminations and test pumps with a 500v tester and record the insulation resistance values between earth and phase. Then record the resistance values between phases using a multimeter. Report status if below current standards or have concern.
Maintenance	Industrial Electrician	SCADA graphic page Review scada graphic to confirm reading and status are correct with the actual status of the pump station
Maintenance	Industrial Electrician	Flow meter Verify flow meter is operational and working as designed, earthing in good condition
Maintenance	Industrial Electrician	Scada monitoring Test all control and status circuitry that is connected to the RTU to verify its correct operation
Maintenance	Industrial Electrician	On site Appliances test all electrical appliances and recertification where required.
Maintenance	Industrial Electrician	VSD's and soft starters Check VSD and soft starter protection parameters. Check condition of electrical components and replace fans if required
Maintenance	Industrial Electrician	Site attended alarm Check Door/hatch switch condition and it alarms out to operators when door/ hatch is opened.
Maintenance	Industrial Electrician	Lighting All station lighting and emergency lights are operational repair or replace when required.
Maintenance	Industrial Electrician	Site Antenna Verify that the antenna is in good condition and is secure
Record	Industrial Electrician	Batteries test batteries and record Battery age
Record	Industrial Electrician	Pressure Gauges Verify pressure gauges and switches are set accurately and operational by using an external reference. Clean surface of transducers.
Record	Industrial Electrician	Wet well floats/ probes test and reset at correct levels for high level and overflow set points. Verify that the SMS alarms for these floats have been sent.
Record	Industrial Electrician	Cable routes Inspect the condition of cable support systems and cables for damage
Record	Industrial Electrician	Shunt trip Test the operation of the shunt trip. Also verify that the mains fail alarm SMS has been sent with all sites
Record	Industrial Electrician	Main supply cabinet Inspect the condition of the cabinet confirm that it is secure. Remove dirt and debris and exam switch gear and report status
Record	Industrial Electrician	Back up controls system were applicable disable the watch dog so controls revert to the backup level controller verify operation
Maintenance	Industrial Electrician	Sump pump Check operation of sump pump including the flood alarm float and verify that the SMS alarm has been sent.
Maintenance	Industrial Electrician	Hurt alarm Check that the hurt alarm operates and SMS is received
Maintenance	Industrial Electrician	Penstock actuators checks condition of Actuator and verify correct operation and statuses are correct on scada
Maintenance	Industrial Electrician	Run Pumps to verify correct operation identify any failures with electrical systems with the pumps running
Inspect	Industrial Electrician	Inspect and test AC breakers & Isolators. Test air breaker with manufactures recommendation maintenance plan.