

1 ORGANISATIONAL OVERVIEW

1.1 Transport for London (TfL)

TfL is an executive body of the Greater London Authority, created in 2000 as the integrated body responsible for the Capital's transport system. Its primary role is to implement the Mayor of London's Transport Strategy and manage transport services across the Capital. TfL is made up of many predecessor organisations covering almost all transport modes in London, and therefore has the ingredients and accumulated experience to provide one of the largest integrated transport systems in the world.

TfL comprises of different modes. The modes are Surface Transport, Corporate, London Underground and Rail. TfL is a partner in Crossrail.

TfL manages London's transport network and is responsible for London's buses, the Underground, the Docklands Light Railway (DLR), London Overground, London River Services, Barclays Cycle Hire, electronic vehicles and policing. TfL also runs Victoria Coach Station and the London Transport Museum.

TfL is responsible for 360 miles (580km) of main roads, and all of London's 4,600 traffic lights. In addition, it manages the London Congestion Charging scheme and regulates the city's taxi and private hire trade. TfL also promotes a range of walking and cycling initiatives across the Capital.

1.2 Business Unit

Asset and Operational Support - Greenwich Generating Station

Greenwich Generating Station
Old Woolwich Road
LONDON
SE10 9NY

2 INTRODUCTION

2.1 Background

Greenwich Generating Station is a standby oil and gas fired power station on the River Thames at Greenwich in south-east London. It is a non National Grid source of electricity and provides a Central Emergency Power Supply (CEPS) to the LU network.

2.2 Objectives

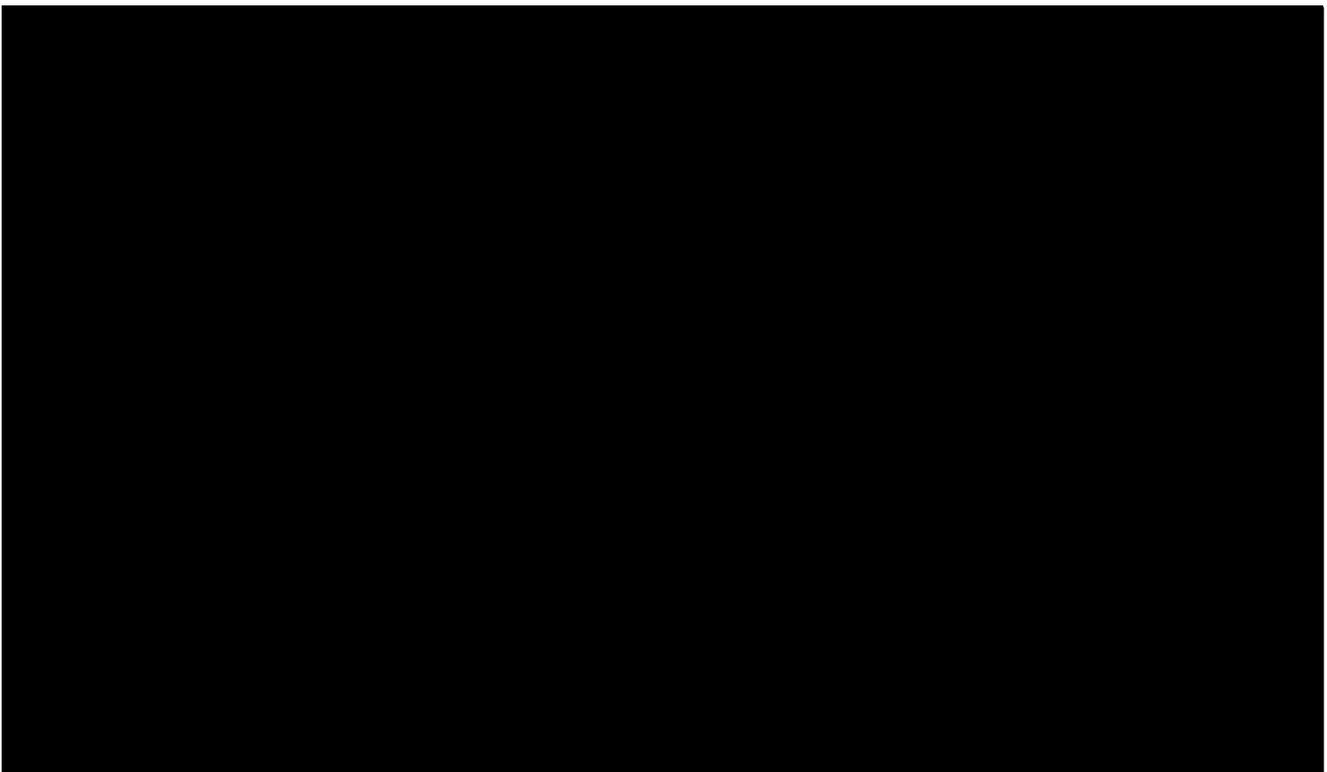
The objective is to appoint a single supplier to undertake, maintenance, inspection and testing of equipment installed in all areas of the power station, some of which are installed within areas classified as an explosive atmosphere, in compliance with Dangerous Substances & Explosive Atmosphere Regulations (DSEAR) 2002, ATEX Directive 94/9/EC (equipment and protective systems intended for use in potentially explosive atmospheres) and ATEX Directive 1999/92/EC (protection of workers potentially at risk from exposure to explosive atmospheres)

3 SCOPE

3.1 Specification for the maintenance, inspection and testing of equipment installed in the areas of the Greenwich site which are not classified as an explosive atmosphere

- Maintenance, calibration and testing of instrumentation, including temperature and pressure gauges, switches and transducers – numerous types/manufacturers. To comply with all relevant BS/EN standards for calibration. All works including any remedial works to be undertaken by suitably qualified/competent personnel.
- Maintenance and testing of valve actuators – types: Rotork, Limit-Torque, Worcester, James Nelsbury and Asahi-America. All works including any remedial works to be undertaken by suitably qualified/competent personnel.
- Maintenance, inspection and testing of lightning protection system – annual periodic inspection/testing as to BS6651:1999 of the condition of all lightning conductors/tapes, test points, links and clips etc. Inspection report to detail the condition and include a test certificate for the continuity resistance measurements of the various earth terminations. Report is to include any recommendations for repairs or upgrades where necessary to restore it to a compliant condition. Inspections to be carried out by suitably qualified/competent personnel accredited by the Association of Technical Lightning and Access Specialists (ATLAS).

Site layout drawing of lightning conductor points:

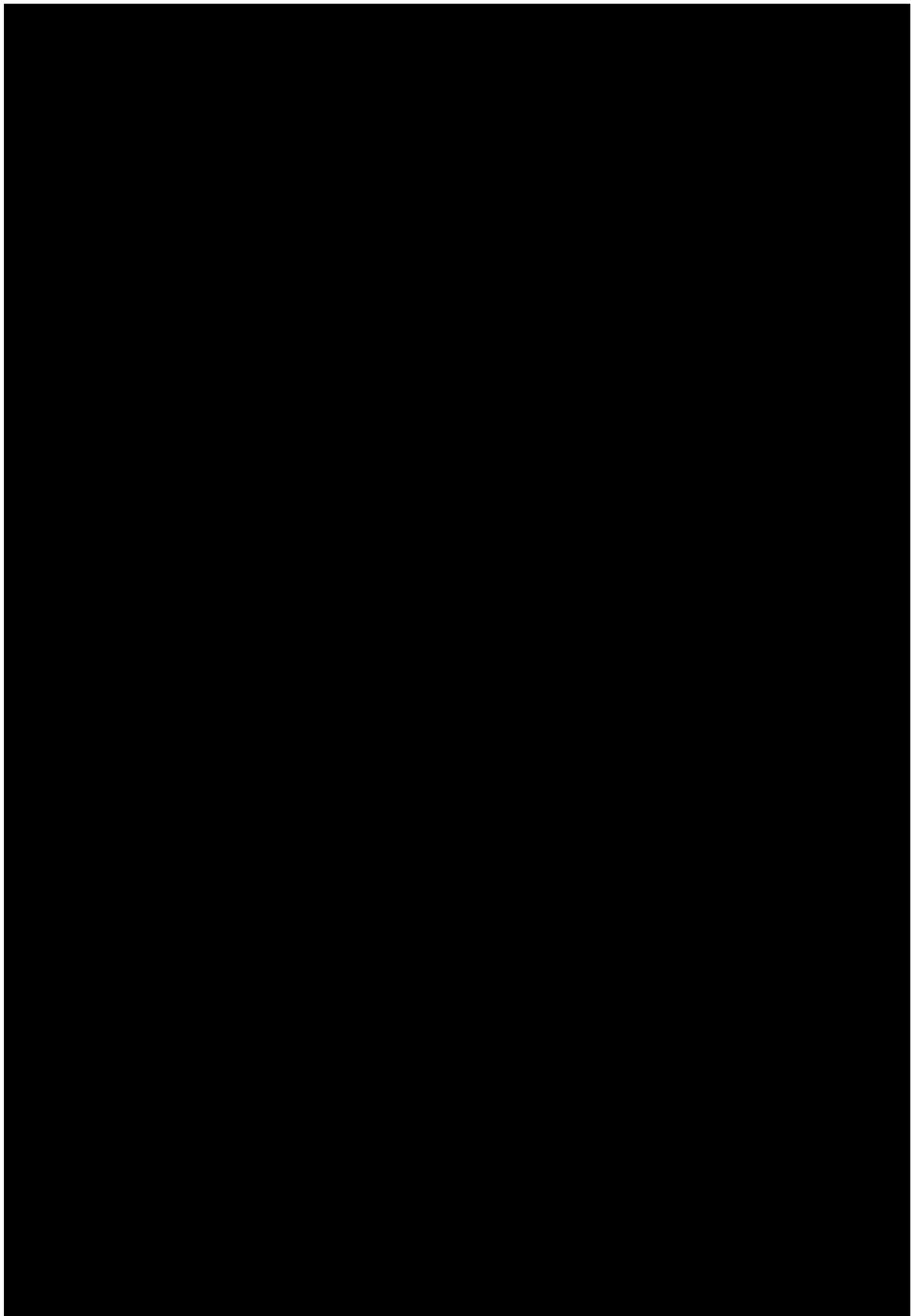


- Maintenance, inspection and testing of site earthing protection system – annual periodic inspection/testing as to BS7430 of the condition of all earth conductors/tapes, rods, test points, links and clips etc. Inspection report to detail the condition and include a test certificate for the continuity resistance measurements of the various earth terminations. Report is to include any recommendations for repairs or upgrades where necessary to restore it to a compliant condition. All works including any remedial works to be undertaken by suitably qualified/competent personnel.

Site layout drawing of site earthing protection system: see separate appendix 1

- Inspection and testing of electrical fixed wired installations (lighting and small power distribution boards) must be carried out periodically every 3 years in accordance with BS7671 Electrical Wiring Regulations. On completion of the inspection and testing an NICEIC certificate is to be issued along with a report detailing the work carried out and any remedial works or recommendations included. The fixed installations to be inspected and tested are all the Lighting and Small Power Distribution Boards within the Greenwich site. All other Switchboards on site are excluded from this specification as they are inspected and tested during periodically planned routine maintenance programs by qualified London Underground Greenwich Generating Station personnel.

An asset list and Instrument Inventory List are provided at appendix 2



All equipment/plant to be installed within an area classified as an explosive atmosphere must be of the correct ATEX certified type and rating for the area zoning classification (Greenwich has Zones 1 and 2 only, there are no Zone 0 areas) and comply with the numerous related IEC standards. In addition any new control system installations need to consider the Safety Integrity Level (SIL) **in compliance with the standards IEC 62061 and IEC 61508.**

Equipment/plant must be suitably rated based on the hazardous elements within the areas, which specifically at Greenwich include natural gas, fuel oil (ULS gas oil), lubrication oil, insulating oil, hydraulic oil, hydrogen (from the charging of lead/acid batteries). There are numerous sources of ignition within these areas from sources such as extreme surface temperatures with the gas turbine enclosures (570°) and various electrical power sources.

In addition all installation works (inclusive of cabling/glands) shall be carried out by a CompEX certified competent person and will comply with BS7671 Electrical Wiring Regulations and be provided with an NICEIC Inspection/Test Certificate. Cables should be as to the relevant British Standard selected for the duty/rating required and shall be XLPE, LSZH, SWA (outer sheath colour light blue).

The ATEX rated equipment/plant installed at Greenwich consist of pressure/temperature switches, transducers, motors, valves/actuators, lighting and control systems.

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Specific routine maintenance, inspection and testing requirements in compliance IEC 60079-17 (refer to specific standard for scope of checks required):

- Visual Inspection – annual
- Close Inspection – bi-annual
- Detailed Inspection – 3 yearly

3.3 Inspection details:

- Connection of conductors.
- Identification of conductors.
- Routing of cables in safe zones or protection against mechanical damage.
- Selection of conductors for current-carrying capacity and voltage drop.
- Connection of single-pole devices for protection or switching in phase conductors only.

- Correct connection of accessories and equipment.
- Presence of fire barriers, suitable seals and protection against thermal effects.

Protection against both direct and indirect contact, i.e. SELV, limitation of discharge of energy.

Protection against direct contact, i.e. insulation of live parts, barrier or an enclosure, (IP rating), obstacles, placing out of reach, PELV.

Protection against indirect contact, i.e. earthed equipotential bonding and automatic disconnection of supply, earthing conductor, protective conductors, main equipotential bonding conductors, supplementary equipotential bonding conductors, earthing arrangements for combined protective and functional purposes, Class II equipment or equivalent insulation, non-conducting location, absence of protective conductors, earth-free local equipotential bonding, earth-free equipotential bonding conductors, electrical separation.

- Prevention of mutual detrimental influence.
- Presence of appropriate devices for isolation and switching correctly located.
- Presence of undervoltage protection devices.
- Choice and setting of protective and monitoring devices.
- Labelling of protective devices, switches and terminals.
- Selection of equipment and protective measures appropriate to external influences.
- Adequacy of access to switchgear and equipment.
- Presence of danger notices and other warning signs.
- Presence of diagrams, instructions and similar information.
- Erection methods.
- General service report on condition of kit, any defects and remedial works must be provided.

3.4 Testing details

- Continuity of protective conductors including main and supplementary equipotential bonding.
- Continuity of ring final circuit conductors.
- Insulation resistance.
- Polarity.
- Earth loop impedance.
- Operation of devices for isolation and switching.
- Operation of residual current devices.
- Prospective fault current.
- Continuity of ring circuit conductors.
- Manual operation of overcurrent protective devices other than fuses
- General electrical works including – new installations, fault finding on electrical control systems, replacement of light fittings and lamps. All works including any remedial works to be undertaken by suitably qualified/competent personnel in accordance with BS7671 Electrical Wiring Regulations and NICEIC certification.

4 TIMESCALES

- Technical on site support required within 24 hours.



5 SITE SPECIFIC TRAINING/CERTIFICATION REQUIRED FOR WORKS AT GREENWICH:

- Site Induction – see schedule 11 of contract
- Site Person in Charge (SPC) – LUL standard
- Acceptor (M) training/authorisation to enable acceptance of safety documentation (Permit to Work etc) as part of site specific safety rules – site specific
- Police National Computer (PNC) security clearance (Basic Disclosure Scotland security check) mandatory requirement for working on all ex-Powerlink sites – site specific
- CompEx certified to work on equipment installed in areas classified as an explosive atmosphere.
- BS7671 certified for work on electrical installations
- City and Guilds 2391 certified for inspection/testing of electrical installation (NICEIC registered).
- Fire Watchman (only if works require hot work to be carried out) – standard industry based
- First Aider – standard industry based
- Confined Space Training (if required to work in an area on site designated as a confined space – standard industry based
- International Powered Access Federation (IPAF) required for operating Mobile Elevated Work Platforms (MEWPS), cherry pickers etc – standard industry based
- Prefabricated Access Suppliers and Manufacturers Association (PASMA) required for erecting mobile access/scaffold towers/platforms – standard industry based
- Specialist training certification will be required for work requiring certain types of welding (coded welder etc) – standard industry based
- Specialist training certification will be required for working on pressure systems (gas compressor and air compressor equipment/systems) – standard industry based