Purpose of the inspection
The inspection will verify as far as is reasonably practicable that the electrical installation is in a safe condition and complies with the requirements of the current edition of the BS 7671 IEE Wiring Regulations and the Electricity at Work Regulations (1989)/Electricity at Work Regulations (Northern Ireland) 1991.

Preparation
Only Engineer Surveyors who are authorised to examine electrical installations will carry out this work. After following our standard procedures for entry to the site we will appraise the installation.

The Engineer Surveyor will:
- discuss and agree isolation issues (agreeing when systems will be isolated and in what order)
- establish whether working during unsociable hours will be necessary and agree any assistance
- discuss and agree access issues – equipment, assistance, keys, and feasibility
- consider risk assessment issues
- establish if there are installation certificates, diagrams, charts or tables, as required by BS 7671
- familiarise themselves with earthing arrangements and the layout of the installation.

Where practicable we will conduct the test procedures in the sequence recommended by the Institution of Electrical Engineers (IEE). We will conduct the visual inspection on an ongoing basis both during the test process and before/after the test process.

Visual inspection
The visual inspection will cover:
- accessories such as socket outlets, light switches and fixed spur etc and enclosures, including a 10% random internal inspection
- labelling/marking up of distribution boards and switchgear – inadequate/non existent marking will be noted as a defect. The Engineer Surveyor will not be able to undertake any such identification and labelling work.
Testing
Where possible we will carry out tests in the following order but may make changes for operational reasons.

Continuity testing

Continuity of protective conductors
We will test continuity from the distribution point to all exposed conductive parts. On circuits with more than one accessory, we will measure R2 at each accessory and note the highest value. Where this value is below 1 ohm and is acceptable, we will record the default value of <1.0 ohm in the schedule of test results. Where the value is either unacceptable or above 1 ohm, we will record the actual value.

Continuity of bonding conductors
If the full length of the conductor is not visible (and the system can be isolated), we will disconnect the bonding conductors for this test. If not, we will test them by continuity meter as connected.

Continuity of ring circuit conductors
With the distribution board isolated, we will carry out a basic test to check for continuity of the ring circuit.

Insulation resistance

Sub-main circuits
We will apply the test at 500v (twice rated) between phases and between phases and earth.

Distribution boards
We will apply the test will be applied at 500v (twice rated) to the whole board, to include all circuits as a group. We will then apply the test between all phase and neutral conductors connected together, and earth. If there is doubt about any electronic equipment remaining in circuit, we will reduce the test voltage to 250v and record this in the ‘Limitations’ section of the report.

Note: RCBO devices at distribution boards. Due to the physical problems of disconnecting the outgoing cables on some types of these devices, we may not test the insulation resistance of the outgoing circuit provided that we have satisfactorily tested the RCD function of the device.

Results
We will record results above 20 megohms in the schedule of test results as the default value of >20 Megohms. Where the results are below the default value we will record the actual results.

Polarity
We will conduct tests to ensure:

- the Polarity is correct at the consumer unit/distribution board
- Single pole control and protective devices are connected in the phase conductors only (10% random sample)
- conductors are correctly connected to all accessible socket outlets and a 10% random sample of other accessories/equipment.

Earth electrode resistance
Using an earth electrode resistance tester we will test each earth rod or group of rods separately, with the test links removed and with the installation isolated from the supply. If the electrode under test is being used in conjunction with an RCD, we may use an earth loop impedance tester as an alternative.

Earth fault loop impedance and prospective fault current (PSC)
We will carry out the following earth loop impedance and prospective fault current tests:

- At the consumer unit/distribution board we will record Zs and PSC.
- At accessible socket outlets we will record Zs.
- At the far end of radial and lighting circuits we will record Zs. Where this is not practicable we may use the Zs = Ze + (R1+R2) method. Access to lighting circuits will determine the feasibility of conducting these tests. We will exclude inaccessible fittings if there is a safety or practicality issue.

The earth fault loop impedance values obtained will relate to the protective device for that circuit, to ensure that this device will operate within the specified time.

We will compare the prospective fault current with the fault rating of the protective device to ensure that the fault rating exceeds the potential fault current at that point of distribution.

RCDs
We will carry out the following tests in addition to a test for the effectiveness of the test button, which we will check after the test sequence. We will take each of the test readings on both positive and negative half-cycles and record the longer operating time.

- Leakage current flowing equivalent to 50% of the rated tripping current.
- Leakage current flowing equivalent to 100% of the rated tripping current.
Additional requirement for supplementary protection
• Leakage current flowing equivalent to 500% of the rated tripping current.

Operation of devices for isolation and switching
We will verify the manual operation of circuit breakers, isolators and switching devices. Also a check will be made of loose parts of handles, indication (on/off, etc) and clearance of switch blades.

Reporting
We will produce the reports on our standard Thorough Electrical Installation Inspection and Test form.

Labelling
Upon completion of the inspection and testing we will fix a label at the origin of the installation stating the date of the inspection and the recommended date of the next inspection.

Limitations
Zurich Risk Services is not responsible for the design or installation of the electrical system covered by the periodic inspection and is therefore not responsible for any of those aspects of work over which it has no control.

We will not inspect cables concealed within trunking and conduits, or cables and conduits concealed under floors, in roof spaces and generally within the fabric of the building or underground.

The inspection and testing of installed machinery is limited to:
(a) an external visual inspection for electrical safety, excluding all control and operational functions
(b) earth continuity test to all exposed conductive parts.

Unless otherwise requested, the following specialist areas will be subject to separate contracts and will not therefore form part of the inspection and test.
(a) Emergency lighting systems.
(b) Lightning protection systems.
(c) Lift installations.
(d) Potentially explosive atmosphere installations which are subject to local licensing authority requirements.
(e) High level parts of the fixed installation and other parts of the installation not normally accessible without specialised equipment.
(f) Examination of machinery.
(g) H.V. Power Systems i.e. in excess of 1000 volts ac.
(h) Fire detection and alarm systems.
(i) Data/Telecommunication systems.