

2395-302 Level 3 Principles, Practices and Legislation for the Periodic Inspection, Testing and Condition Reporting of Electrical Installations.

Chief Examiner's report – **June 2014**



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1 Introduction

The purpose of this document is to provide centres with feedback on the performance of candidates in the **June 2014** examination for 2395-302 Level 3 Principles, Practices and Legislation for the Periodic Inspection, Testing and Condition Reporting of Electrical Installations.

The Chief Examiners' Report has been reintroduced as a result of feedback from centres, to give them guidance in preparing candidates for the written examination.

2 Feedback on candidate performance

General feedback

The following comments are intended to help students prepare for the examination by having a better understanding of what is expected of them. The feedback within this report would also be valuable to tutors in understanding candidates' difficulties in answering questions and the areas where more guidance is required.

The June 2014 series question paper was found to be in accordance with the scheme requirements.

Candidates appeared to have no issues with the paper format. They need to be aware that the space left for their answer is intended to be generous and, in almost all cases, is more than enough to record their answer.

Candidates should keep their responses within the allotted area and any additional sheets should be stapled to the back of the answer book. Any additional sheets should be completed on plain lined paper and not in a second answer book. The blank pages at the back of the answer book should not be used for candidate responses as these are not allocated areas for the marking and so are not included in the scanned marking allocation.

Where it becomes necessary for centres to copy/print additional answer books these should be produced double sided to facilitate correct scanning into the marking software.

Candidates and centres should be mindful that this qualification relates to the periodic inspection of electrical installations. It was evident from answers provided by some candidates that they had little experience or understanding of the requirements for periodic inspection. It was further apparent from some of the supplementary information given in the candidates' responses that many were referencing initial verification requirements.

The requirements of periodic inspection and the actions to be taken by the inspector in given situations and the information which is recorded on the report presented problems for a large number of candidates. These areas of the periodic inspection process require a better understanding than is currently being demonstrated. Centres may wish to review the extent to which this is covered in their course presentation.

From the information provided by candidates it appears that, whilst they may be aware of the need for inspection, they had little understanding of what needs to be inspected and why the inspection is required. A large number of candidates when answering questions related to inspection gave responses related to testing and test results and not to inspection items or requirements. A large number of candidates failed to address the specific items identified in the question when describing inspection items. Many responses indicated that the candidate was not aware of the requirements of periodic inspection in relation to the fixed wiring.

Candidates should be aware that the Schedule of Inspections for the periodic inspection of electrical installations given in Guidance Note 3 provides detailed information on the items of inspection for these installations. Further guidance is given in Appendix 6 of BS 7671 for installations with a supply exceeding 100A. Candidates becoming familiar with the items they are to consider, inspect and record the outcome will greatly improve both their understanding of the inspection process and their success in any related questions.

It was also apparent that candidates were not reading the question carefully and so not producing appropriate answers. Some candidates gave responses which did not relate to the question asked or provided generic answers some of which were not appropriate.

These types of responses indicate that the candidates were either not in possession of suitable knowledge or have failed to consider and understand the requirements of the questions.

Candidates should also be aware that where questions carry high marks these require a more detailed response, for example a three word statement is not going to achieve 10 marks.

The candidates should be aware of the requirement to show calculations and descriptions to demonstrate their conclusions when answering questions. It is also important that candidates include the correct units for the answers produced from their calculations e.g. Ω , $m\Omega$, A & kA ms etc.

Candidates need to read the questions carefully as failure to do so produces incorrect responses, this includes some simple errors such as stating 'five times test' for an RCD when the question asks for the applied test current and determining voltage drop as a % when the value is asked for in volts.

Knowledge of BS 7671 and Guidance Note 3

When determining whether a sampled periodic inspection could be carried out for a given scenario many candidates failed to correctly identify the reasons why. Many related their answers to the age of the installation and competent supervision requirements neither of which were appropriate for the given scenario. The information provided clearly identified the presence of previous certificates, reports, schedules of test results etc which allow sampling to be considered. It is a common recurring misunderstanding from candidates that a sampled inspection relates to the age of the installation failing to appreciate the need for previous records against which to reference for change or deterioration.

A large number of candidates were unable to correctly identify the purpose of the information that is recorded on the Electrical Installation Condition Report in particular the observations, recommendations and classification codes. Whilst the completion of this information is a requirement, understanding the reason why they are recorded and what information they provide is an essential part of the periodic inspection and test process.

When given specific scenarios the common error in this regard was the code definitions which were required eg. C1 Danger present, being incorrectly given as immediate danger.

When asked for the purpose of the codes recorded against the observations made on the report very few candidates were able to explain their purpose. Many answers related to the information contained in the observation not the purpose of the code. This could be summarised as either to identify the severity of the observation or identify the urgency of the action to be taken by the client.

It was apparent that a large number of candidates were unaware of the need to consult with the client and recommend the isolation when a dangerous situation is identified. Many candidates simply isolated before any discussion with the client, which is not acceptable, and/or simply recorded on the EICR.

A very large number of candidates were unable to demonstrate an understanding of voltage drop and its determination during a periodic inspection and test. This is a common and recurring situation across the 2395-302 series of examinations.

A large number of candidates appeared to be aware of the determination of voltage drop during the design of an electrical installation and then attempt to apply that to a periodic inspection.

The main incorrect responses included:

- Being unable to explain why voltage drop cannot be determined by direct measurements at the origin and furthest point of the circuit.
- Stating voltage drop can only be determined using the design calculation $mV/A/m \times I_b \times L \div 1000$ even when this information is not available for an existing installation.
- No correction for conductor operating temperature where resistance is measured at 20 °C

Where the method of measurement of conductors was correctly identified a number of candidates lost marks by incorrectly stating measuring $R_1 + R_2$ and not $R_1 + R_n$ as required for voltage drop.

A large number of candidates incorrectly stated that an RCD would operate when a fault between live conductors occurred on the circuit it was protecting. This indicates a lack of understanding of the purpose and operation of an RCD.

Candidates were asked what check should be undertaken on the earthing and main protective bonding conductors before carrying out a Z_s test. A large number of candidates appeared to misunderstand the 'check' and stated a test of continuity to be carried out. This implies a sequence for tests which is not a requirement at periodic inspection and is not required prior to Z_s testing. In this instance the check should make sure that they are connected. Having incorrectly identified a test requirement a number of candidates then incorrectly identified the instrument required for the continuity test and not the one required for the Z_s test as required in the question.

Test Equipment

Candidates were asked questions relating to an earth fault loop impedance test, a test of an RCD and the safe isolation at the origin of a three phase installation. A number of candidates were unable to correctly identify the instruments used for one or more of these activities.

Inspection

The requirements for inspection continue to be a major problem for candidates taking this examination.

Whilst the majority of candidates appeared to be familiar with the basic testing requirements it was the specific requirements of periodic inspection and testing which caused them problems.

Common errors relate to inspection items which require dismantling or cannot be assessed, for example the cables within trunking, cable condition, space factor etc. It is a standard limitation of the model forms in BS 7671 that cables contained within the building structure and within containment systems are excluded from the inspection.

The requirements specifically related to the inspection of an electrical installation were a further area of considerable misunderstanding. It appears that the requirements of the inspection (the inspection items and what they are inspected for) is an area which requires more attention during the related course delivery. This area is important to ensure that candidates have the knowledge required to both carry out an inspection and maximise their chances of success in the examination. Centres may wish to review the extent to which the inspection is covered during their course presentation.

Candidates were asked to identify items to be checked during the inspection of the DNO's equipment at the origin of the installation. Many candidates identified supply characteristics and this appears to indicate that they either did not read the question carefully or they are not familiar with the requirements for inspection of the DNO's equipment.

The recording of suitable observations and appropriate classification codes, together with the reasons why a particular code is considered appropriate presented difficulty for many candidates.

This is an area in which candidates continue to underperform and a better understanding of the observation and coding process is required.

Testing

The requirements for testing during periodic inspection and test are different to those required at initial verification.

When carrying out tests which involve the isolation of an installation or circuit the inspector needs permission to isolate as the client needs to be aware that this is a situation that will occur during the test. Simply seeking permission to carry out the test does not indicate that the client is aware and agrees to the loss of supply.

Candidates were also asked to describe the process for carrying out an earth fault loop impedance test on a given circuit. A number of candidates incorrectly indicated that the earthing and main protective bonding conductors would be disconnected for this test.

The candidates were asked to state the electrical tests to be carried out on a 30 mA RCD installed to provide additional protection including the applied test current and the maximum operating time for each test. A surprising number of candidates were unable to correctly identify the appropriate test current in mA and/or the appropriate maximum disconnection time for each test. The use of m/s (metres per second) instead of ms (milliseconds) when stating the operating time was a common error. A number of candidates failed to carry out the test on both half cycles of the supply (0° and 180°).

3 National pass rate

The national pass rate for the 2395-302 June 2014 examination is as follows:

Exam series	Pass rate (%)	Fail rate (%)
June 2014	63	37

Past examination series

Exam series	Pass rate (%)	Fail rate (%)
April 2014	49	51
February 2014	55	45
December 2013	47	53
October 2013	51	49
August 2013	32	68

Forthcoming Exam Dates are:

Wed	13 August 2014	18:30 – 20:30
Wed	22 October 2014	18:30 – 20:30
Wed	3 December 2014	18:30 – 20:30
Wed	11 February 2015	18:30 – 20:30
Wed	22 April 2015	18:30 – 20:30
Wed	10 June 2015	18:30 – 20:30

Please note from August 2014 series onwards we have swapped exam dates so that 2394 is on Tuesday and 2395 on Wednesday to suit the order of course delivery. From August, the exam duration will increase to two hours. There will be no change to the exam format and number of questions.

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