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

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Chief Examiners' report – December 2012



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1 Introduction

The purpose of this document is to provide centres with feedback on the performance of candidates in the December 2012 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 December 2012 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 be included in the scanned marking allocation.

From the information given by candidates it appears that whilst they may be aware of the need for inspection, they demonstrated little understanding of what needs to be inspected and why the inspection is required. The responses from the candidates for this series indicate that there is little understanding of the inspection process and what is to be inspected and recorded as part of the report. The majority of candidates were unable to distinguish between inspection and testing and therefore many of the answers to questions related to inspection were poorly answered.

Candidates should be aware that the Schedule of Inspections for the periodic inspection of installations given in BS 7671 and GN 3 provide detailed information on the items of inspection for these installations. 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. A Schedule of Inspections needs to be completed for every periodic inspection and forms part of the Electrical Installation Condition Report. Candidates therefore need to be familiar with the content and what is required during the inspection. It is also a requirement for the practical assessment for this qualification.

This qualification relates to periodic inspection of electrical installations and so encompasses the preparation, client discussion and the inspection, testing and verification process. This includes the identification of non-compliances and the awarding of appropriate classification codes together with the safety and practical aspects of periodic inspection.

Candidates should be aware that generally the installations being inspected and tested are energised, unless they are given information to the contrary. As a result the need to isolate in order to carry out certain tests must be included in the test process. The description would generally need to include: the need to obtain permission, to safely isolate and lock off and to retain the key. A description of the actual safe isolation process would only need to be provided where expressly asked for in the question.

It was also apparent that candidates were not reading the question carefully and so not producing appropriate answers. Many candidates gave responses which did not relate to the

question asked. This indicates that the candidates were either not in possession of suitable knowledge or 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 units for the answers produced from their calculations e.g. Ω, mΩ, A & kA etc.

Knowledge of BS 7671 and Guidance Note 3

From given information in the scenario, candidates were asked to identify the reasons why a periodic inspection may be carried out on a sample basis rather than on the whole installation. This caused problems for many candidates. A large number appear to believe that the premises being vacant or because it was a commercial property made this acceptable whilst others stated that the property being only seven years old was the reason.

Some candidates stated that when carrying out a test to confirm continuity of main protective conductors the hazard was electric shock as the conductor is disconnected. As the installation must be isolated for this test there is then no shock risk.

Test Equipment

Candidates were not using the correct titles for test instruments when describing the test procedures. Some candidates failed to include basic requirements such as the use of GS38 compliant leads and probes for appropriate tests.

Inspection

A large number of candidates were unable to demonstrate knowledge of the requirements for inspection including the items to be inspected and recorded and the actions to be taken by the inspector in given circumstances. The requirement to complete a Schedule of Inspections for a periodic inspection is identified in BS 7671 and a requirement of the practical assessment for this qualification. The apparent lack of knowledge of both the content of the schedule and the application of the inspection process is of particular concern.

Candidates were asked to state the action to be taken by the inspector when there are no previous documents, details or circuit charts available before any inspection and testing can be undertaken. A large number of the candidates responded that 100% inspection and test is required and/or to confirm the extent and limitations with the client. Very few identified the need for investigation or survey to establish the details of the installation.

Candidates were asked to identify specific items which would be inspected and the result recorded during the inspection process for i) insulated consumer control unit before the covers were removed, ii) the earthing and bonding arrangements and iii) the DNO's equipment. The responses to these three items appear to indicate that the majority of candidates were not aware of the requirements of the inspection, the items to be inspected and recorded on the Schedule of Inspections. Many responses referred to information on the Schedule of Test Results, actual tests to be carried out, and the characteristics and values such as Z_e. Very few candidates were able to score well in these questions.

Many candidates were unable to identify the reasons why sampling could be applied to a periodic inspection and test when given details of the information available and the condition of the installation in the source document. Candidates appear to be unaware of the conditions and information required to enable sampling at a periodic inspection and, as a result, are unable to identify the requirements.

The majority of candidates incorrectly stated that a ring final circuit continuity test could be omitted from a periodic inspection and test 'because the circuit is protected by a 30 m RCD'. This is a very worrying interpretation of the requirements for periodic inspection and testing.

Testing

Very few candidates could describe the procedure for carrying out a test to determine the resistance of an earth electrode for a standby generator at a data storage facility. Candidates were unable to identify the correct test process with many either failing to isolate the generator and disconnect the earthing conductor or isolating the installation which would cause the generator to start. The test instruments suggested for the test included an earth fault loop impedance tester or a low resistance ohmmeter. Where test electrodes were included their positioning, the number of tests required and the relevant distances were seldom correct. Few candidates scored well in this question and it would appear that the requirements of this test and the procedure, which may also be used for an installation earth electrode, is not understood by the majority of candidates.

When describing the procedure for safe isolation many candidates failed to identify the need for equipment to be confirmed as complying with GS 38. A number of candidates stated the isolate and lock off process and then simply stated 'test for dead' with no further details of how and where this should be carried out.

Another common incorrect answer given by candidates was that the continuity of main protective bonding conductors could be carried out using either the $R_1 + R_2$ method or, worryingly, an earth fault loop impedance tester.

Description of a test for insulation resistance on a given circuit presented problems for a large number of candidates. Common errors included failure to identify the need to safely isolate, lock of and retain the key (the installation was energised) indicating an unsafe procedure. Failure to identify the test voltage used to carry out the test. Many candidates disconnected all circuit conductors and tested to cpc or simply stated test to cpc when BS 7671 clearly indicates that insulation resistance testing is to be carried out with the cpc and all earthing and bonding conductors connected. Some candidates failed to disconnect loads or link live conductors when carrying out the test.

Evaluation of Test Results

Candidates were asked to determine whether a stated value for the measured resistance of a given main protective bonding conductor was acceptable. Candidates were therefore expected to use given information to determine the expected value of resistance and compare this with the stated measured value. Some candidates carried out the correct calculation but failed to identify the units applicable to their answer and so losing marks.

A large number of candidates incorrectly stated that the maximum value for the resistance of a main protective bonding conductor was 0.05 Ω. This value is applicable where access to the bonding connection is not possible and a test is made between two extraneous conductive parts (GN3 Page 35). This value is not the maximum permitted resistance of the main protective bonding conductor.

3 National pass rate

The national pass rate for the 2395-302 December 2012 examination is as follows:

Exam series	Pass rate (%)	Fail rate (%)
December	**24**	**76**

Past examination series

Exam series	Pass rate (%)	Fail rate (%)
October	**43**	**57**
August	**27**	**73**
June	**24**	**76**
April	**49**	**51**

Forthcoming Exam Dates are:

12 February 2013
16 April 2013
25 June 2013
20 August 2013

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