

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

Chief Examiner's report – August 2017



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1 Introduction

The purpose of this document is to provide centres with feedback on the performance of candidates in the **August 2017** 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 August 2017 series question paper was found to be in accordance with the scheme requirements.

The number of scripts received for this series was **approximately 90**.

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 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 information given in the candidates' responses that many were referencing the requirements for initial verification.

It was apparent that some 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 which were not appropriate to the scenario given. 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.

The requirements of periodic inspection, the actions to be taken by the inspector in given situations and the information which is recorded on the report presented problems for a 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 require a better understanding of what needs to be inspected and why the inspection is required. 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 fixed wiring and terminations.

The requirements specifically related to the inspection of an electrical installation continue to be an area of considerable misunderstanding. It appears that the requirements of inspection (that is 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 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 100 A. 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.

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.

Knowledge of BS 7671 and Guidance Note 3

Candidates were asked to identify two supply characteristics which are to be recorded and can only be determined by enquiry. Many candidates gave either information related to the DNO equipment or recordable quantities such as Z_e and I_{pf} . The items required were nominal voltage and nominal frequency.

A large number of candidates were unable to explain why there is no set sequence for the tests carried out at a periodic inspection and test. Many incorrectly stated that the extent and limitations and/or client requirements affected the test sequence.

Candidates were asked to identify the appropriate classification code, the code description and reason for their choice for given scenarios. Many candidates were unable to provide correct answers for these questions. A number of candidates were unable to identify the correct code for each scenario and it was apparent that there was a lack of understanding of the application of the classification codes.

Many candidates were unable to correctly state the code description and very few were able to explain why their reason for the using the code they had recorded.

It would appear that there is much confusion over the use of the classification codes and centres may wish to consider how this is covered in their course delivery to ensure a better understanding.

Candidates were given a scenario with regards to the periodic inspection and test which included a specified third party. Many candidates failed to include the specified third party when stating who would be consulted to determine the extent and limitations of the periodic inspection and test.

A large number of candidates were unable to state two reasons why fault finding and remedial work do not form part of the periodic inspection and test process. It was evident from the candidate responses that they were unaware of the reasons and centres may wish to consider how this is covered in their course delivery to ensure a better understanding.

When asked to confirm the compliance of a given earth fault loop impedance value for a given scenario many candidates did not correctly justify their findings. There were a number of candidates who produced incorrect random formulas to determine compliance and experienced difficulty in describing how to confirm compliance. This is a worrying situation as it is a fundamental requirement for periodic inspection and testing and is required for the 2395 practical assessment.

It was apparent that the requirement for determining voltage drop compliance presents difficulties for a considerable number of candidates. Many still believe voltage drop can be confirmed by measuring the voltage at the origin and at the load. This is not an acceptable method of determining voltage drop. Of those candidates who identified the conductor resistance

measurement a number incorrectly used $R_1 + R_2$ in place of $R_1 + R_n$. When calculating the actual voltage drop for a given scenario there were a number of candidates who were unable to correctly determine the value as they tried to use a design calculation or random incorrect formulas. Of those who were able to apply the correct process, a common error was the omission of the temperature correction factor. (Conductor resistance was given at 20 °C so conductors were not at their operating temperature.)

When determining the maximum voltage drop for the given power circuit a number of candidates used incorrect percentages of the nominal voltage with 3%, 4% and 6% being the common incorrect values. Those candidates using 3% may have failed to read the question correctly as it referred to a power circuit and not a lighting circuit.

The scenario related to a single-phase circuit supplied from a three-phase distribution board. A number of candidates incorrectly used the three-phase voltage when determining maximum voltage drop for the circuit.

Test Equipment

Candidates were asked questions relating to carrying out various tests. A number of candidates were unable to correctly identify the instruments used for these activities.

Candidates should be aware that the instruments to be identified are those specific to the test in question as identified in GN3.

Inspection

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

There were two questions which related to items to be inspected and recorded during a periodic inspection. Many candidates had difficulty in providing correct answers for both questions. The first related to the items to be inspected in relation to the earthing and bonding arrangements for a given installation. Many candidates incorrectly gave information such as type of earthing system, Z_e , etc. whilst others simply provided a list of conductors. It appears that many of the candidates are not aware of the items recorded on the inspection schedule for the periodic inspection.

The second question referred to the inspection of the DNO's equipment at the origin of a given installation. It would appear that many of the candidates did not read the question correctly or failed to understand the requirements. The most common errors involved quoting characteristics of the supply such as voltage, Z_e , I_{pf} , type of system, number of live conductors, type and rating of protective device and the like. Those candidates who did include the inspection items (as detailed on the schedule of inspections for the DNO equipment) often failed to state what they were inspecting to find out. It would be acceptable to identify that it is the condition of the equipment (responses including good, or not damaged etc are also acceptable).

Testing

Candidates were asked to describe the procedure for carrying out an insulation resistance test on a single-phase power distribution board with all the final circuits connected. A number of candidates carried out the test on each individual circuit. It was also evident that the question was not fully understood when dimmer switches and lamps were considered for disconnection. A number of

candidates carried out the test on the whole distribution board with the circuit breakers switched off.

Candidates were asked questions relating to the testing of the earth fault loop impedance of a cooker circuit in a given scenario. The information provided clearly identified that the cooker outlet connection was inaccessible as it was behind a built in oven.

Many candidates stated they would disconnect the cooker from the outlet or carry out the test at the cooker outlet which appears to indicate that they did not read the question carefully and that they appear to not understand the periodic inspection and test process.

A number of candidates stated they carried out the test at the distribution board, which appears to indicate that they do not understand the process for testing Z_s as this would test Z_{db} and not the circuit Z_s . Some candidates incorrectly stated they would remove the earthing and/or bonding to carry out the test which is incorrect.

Some candidates elected to carry out an $R1 + R2$ test and calculate the Z_s which was not what was required in the question. Candidates were expected to test Z_s at the cooker control unit. The testing of Z_s is a fundamental requirement for the periodic inspection and testing of installations and it is recommended that candidates have a better understanding of this subject to ensure they can explain how this is carried out in a common scenario.

3 National pass rate

The national pass rate for the 2395-302 **August 2017** examination is as follows:

Exam series	Pass rate (%)	Fail rate (%)
August 2017	55	45

Past examination series

Exam series	Pass rate (%)	Fail rate (%)
June 2017	70	30
April 2017	69	31
February 2017	77	23

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