

July 2014

Examiners' Report

NEBOSH National
Diploma in
Occupational Health
and Safety - Unit C



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NEBOSH NATIONAL DIPLOMA IN OCCUPATIONAL HEALTH AND SAFETY


UNIT C: WORKPLACE AND WORK EQUIPMENT

JULY 2014



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NEBOSH (The National Examination Board in Occupational Safety and Health) was formed in 1979 as an independent examining board and awarding body with charitable status. We offer a comprehensive range of globally-recognised, vocationally-related qualifications designed to meet the health, safety, environmental and risk management needs of all places of work in both the private and public sectors.

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NEBOSH is an awarding body that applies best practice setting, assessment and marking and applies to Scottish Qualifications Authority (SQA) regulatory requirements.


This report provides guidance for candidates which it is hoped will be useful to candidates and tutors in preparation for future examinations. It is intended to be constructive and informative and to promote better understanding of the syllabus content and the application of assessment criteria.

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Many candidates are well prepared for this unit assessment and provide comprehensive and relevant answers in response to the demands of the question paper. This includes the ability to demonstrate understanding of knowledge by applying it to workplace situations.

There are other candidates, however, who appear to be unprepared for the unit assessment and who show both a lack of knowledge of the syllabus content and a lack of understanding of how key concepts should be applied to workplace situations, which is an essential requirement at Diploma level.

This report has been prepared to provide feedback on the standard date examination sitting in July 2014.

Feedback is presented in these key areas; examination technique, command words and learning outcomes and is designed to assist candidates and course providers prepare for future assessments in this unit.

Candidates and course providers will also benefit from use of the 'Guide to the NEBOSH National Diploma in Occupational Health and Safety' which is available via the NEBOSH website. In particular, the guide sets out in detail the syllabus content for Unit C and tutor reference documents for each Element.

Additional guidance on command words is provided in 'Guidance on command words used in learning outcomes and question papers' which is also available via the NEBOSH website.

Candidates and course providers should also make reference to the Unit C 'Example question paper and Examiners' feedback on expected answers' which provides example questions and details Examiners' expectations and typical areas of underperformance.

Unit C

Workplace and work equipment

Candidate performance

This report covers the examination sitting in July 2014 which produced an overall pass rate of 42%.

Examination technique

The following examination technique issues were identified as the main areas of improvement for candidates:

Misread or misinterpreted the question

Generally questions were answered in the set order and different parts clearly identified. However, in numerous cases candidates misread or misunderstood the requirements of different parts of the question resulting in key points required by one part of the question being included in the answer to another part of the question. Alternatively, probably due to noting a certain trigger word or phrase, candidates would answer on the correct syllabus area but miss the actual question requirement. This error appears closely linked with rote learning, the candidate has an answer prepared for a certain question and will employ it even if inappropriate to the actual question requirements.

When preparing candidates for examination, or offering advice on examination technique, accredited course providers should stress that understanding the question requirements and the sub-structure of the response to the question is the fundamental step to providing a correct answer. Rather than learning the 'ideal answer' to certain questions effort would be better spent in guided analysis on what a question requires. The rote learning of answers appears to close the candidates' minds to the wider (and usually correct) possibilities.

Did not respond effectively to the command word

This is specifically addressed in the following section dealing with command words, most commonly failure to provide sufficient content to constitute an 'outline' was noted. Failure to respond to the relevant command word in context was also a frequent problem hence information inappropriate to the question was often given.

Course exercises should guide candidates to assessing the relevant points in any given scenario such that they are able to apply the relevant syllabus elements within the command word remit.

Repeated the same point but in different ways

This issue can be caused by two distinct problems; failure to structure the question such that repetition occurs or insufficient knowledge leading candidates to attempting to put a previously noted point in different words. This problem was compounded where candidates spent half a page covering just one point of information or phrased their answer in the form of a question – never an appropriate style for an examination response.

Accredited course providers should provide examination technique pointers and practice as an integral part of the course exercises. Technique as much as knowledge uptake should be developed, particularly as many candidates may not have taken formal examinations for some years.

Command words

The following command words are listed in the order identified as being the most challenging for candidates:

Explain

Most candidates were unable to explain their answers in sufficient detail or appeared to become confused about what they wanted to say as they wrote their answer. For example in question 1 many candidates explained the difference between the types of sign, explaining colours and shapes of signs without explaining how they could be used in the depot.

Outline

Generally good responses were noted; but where marks were missed, in most instances this was due to insufficient detail being given. Some candidates insist on writing a detailed explanation and explaining the point a number of times in different ways and while obtaining credit are penalising themselves both in terms of time and creating a mistaken personal impression that they have provided an answer of sufficient breadth.

Describe

Few candidates gave adequate descriptions when required. Most gave vague outlines with little detail, sometimes using only two or three words which, whilst pertinent, were insufficient to warrant any marks. Many candidates seemed not to appreciate the meaning of describe tending to give outlines, where what was needed were statements of how something is the way it is, or what it does and how it does it.

Identify

A number of candidates were challenged to provide sufficient breadth in their answers. Some put a bit too much information down and wasted time having already gained the mark.

For adequate response to the command words a structured approach to developing examination technique would repay the time spent. However, it is interesting to note that those candidates who have demonstrated a comprehensive knowledge of the unit are most able to respond appropriately to the command words.

Give

Reasonable responses were noted.

The attention of both candidates and accredited course providers is drawn to NEBOSH's recently published '*Guidance on command words*' document, which is available on our website and should assist: www.nebosh.org.uk/students/default.asp?cref=1345&ct=2.

Learning outcomes

Question 1 assessed learning outcome:

1.2 Explain how safety signs are used in the workplace

This question firstly required candidates to identify situations from the given scenario where given classes of safety sign would contribute to reduction of risk. The second part of the question then required a summary of the means by which an employer could ensure that the signs they erect remain fit for purpose.

The majority of candidates gained less than half marks, failing to address the requirement of part (a) and in part (b), not understanding the practical effects of the legal duty contained in the Safety Signs etc. Regulations, to ensure that safety signs that are erected should remain fit for purpose.

In part (a) many candidates went into descriptions of the appearance of signs as opposed to identifying specific examples of sign usage in context to the scenario and explaining how they reduced risk. For part (b) candidates, who were unfamiliar with the practicalities of safety sign use, adopted a scattergun approach instead of adopting a structured approach of materials specification / reputable supplier, inspection, maintenance, reporting, etc.

Question 2 assessed learning outcome:

2.3 Outline the main principles and practices of fire and explosion prevention and protection

Candidates had to provide a generally accepted explanation of what inerting is and then provide information of the reasons it might be required in a given scenario.

Many different interpretations of inerting were provided, a majority of which were not appropriate. It would appear that candidates had never been taught the technique as a means of controlling hazardous atmospheres and were therefore unable to relate to the practicalities of the technique.

The majority of candidates performing poorly on this question often tried to 'recycle' the words in the question, which led to incoherent statements in answer. Those who performed well gave logical, appropriate and coherent responses to the command words in each part. However, there was also inclusion of irrelevant hazards and controls.

Question 3 assessed learning outcome:

9.2 Explain the scope and application of the Construction (Design and Management) Regulations 2007

This question firstly required a summary of the duties of the *designer* under CDM 2007. Secondly, the candidate had to offer information on the way in which design could contribute to safety and health in construction activities.

Many candidates confused their answers to parts (a) and (b), with generally few marks being awarded. Mostly, the referred candidates simply did not know the CDM Regulations. They also tended to produce overly generalised responses in answering part (b). Statements made in answer to both parts were often vague, imprecise or duplicated and there was noticeable confusion between 'risks' and 'hazards'. Overall, some candidates could not distinguish between the specific statutory duties of designers for part (a) and explanations of how designers could practically fulfil those duties. Some candidates referred their answer to equipment design.

The widespread failure to address the requirements of CDM leads the Examiners to question the depth to which this subject area is being taught.

Question 4 assessed learning outcome:

5.3 Explain safe working procedures for the maintenance, inspection and testing of work equipment according to the risks posed

Three maintenance strategies are contained in the syllabus learning requirements of part 5.3. Candidates are required to know what these are and to be able to provide an explanation of each.

Few answers identified all three maintenance strategies and candidates were sometimes confused regarding the details involved in each strategy as well as when they should/could be used and why.

Those providing incorrect answers mostly answered out of context by either discussing maintenance in general, or giving unrelated examples to support outline or describe type answers - the command word explain being regularly overlooked. There was some widespread confusion over the terms (given in the syllabus) for the three different types of maintenance.

Of the three strategies, very few candidates mentioned condition based maintenance.

Question 5 assessed learning outcome:

8.2 Outline the dangers of electricity

Candidates were required to demonstrate an understanding of the effects of electricity on the body and what might limit these effects (ie prevent the maximum harm occurring) in practice.

This was a high performing question and most candidates were able to identify the effects of current flow through the human body. Fewer found reasons for the limitation of effect, some going through preventative measures, which was not asked for.

There was some confusion between cardiac arrest and fibrillation of the cardiac muscle.

Question 6 assessed learning outcome:

10.1 Explain the hazards, risks and control measures for safe workplace transport operations

Candidates were asked to address design features of internal transport routes. Some responses did stray into other areas outside of design (procedural, etc) but generally this question was well answered.

Question 7 assessed learning outcomes:

3.2 Explain the processes involved in the identification of hazards and the assessment of risk from fire

3.3 Describe common fire detection and alarm systems and procedures

3.4 Outline the factors to be considered when selecting fixed and portable fire-fighting equipment for the various types of fire

3.5 Outline the factors to be considered in the provision and maintenance of means of escape

This question assessed the component aspects of fire risk assessment, consideration of which result in a comprehensive approach to dealing with changes to established situations.

The major problems apparent in answers to this question were firstly a lack of understanding of the terms 'prevention', 'mitigation' and escape. Secondly, candidates wanted to alter the scenario under discussion by removing heaters and diesel vehicles.

Although the two main sources of ignition risk were the space heaters and the electrics, few mentioned the hazard from heaters and hardly anyone mentioned electrics and maintenance. Having been told that the warehouse uses propane space heaters, quite a few candidates gained no marks by suggesting swapping these for electric heaters as opposed to addressing appropriate controls for this hazard.

Answers drifted into building construction techniques. Some candidates put their answers against the wrong section of the question, which indicated a reading or comprehension error.

Candidates must understand that most scenarios in question stems describe a largely unalterable situation; it's their job to answer on the basis of the prevailing conditions.

Question 8 assessed learning outcome:

6.7 Explain the analysis, assessment and improvement of system failures and system reliability with the use of calculations

This question assessed the candidates understanding of the engineering safety principles tested by numerical analysis. The key concepts of *component reliability*, *system reliability* and '*common mode failure*' formed the syllabus knowledge requirements for this question.

There was some understanding of component reliability and a little understanding of system reliability. Few convincing answers were given by the candidates who attempted this question. The majority of answers gave no reasonable meaning of "common mode failure" and very few equipment design features were outlined. In the area concerning 'equipment design features' a lack of outline was often evident – some candidates tended to list.

Some answers were often incoherent and there were particularly confusing answers relating to the 'component' with those dealing with the 'system'. Most candidates had too little breadth in their answers.

Question 9 assessed learning outcomes:

6.2 Describe, with examples, the principal generic mechanical and non-mechanical hazards of general workplace machinery

7.1 Describe the main hazards and control measures associated with commonly encountered mobile work equipment

Candidates were required to present an understanding of general workplace machinery in a contemporary scenario and apply this knowledge to a situation where automated mobile work equipment is to be introduced.

Many responses were limited. Common problems were lack of breadth in the answer, misunderstanding what an AGV was (many wrote about robotic arms) and identifying problems that were not health and safety related. Most candidates did not appreciate that use of AGVs meant that there would be few or no employees in the warehouse except for maintenance activities. Understanding how an automated warehouse works seems beyond the knowledge of most candidates, many answers trying to compensate for this by tending to the 'generic'.

Another common mistake was the use of vague, unsupported statements such as 'problems with programming or software etc'.

Accredited course providers and candidates need to look at a wide range of common work scenarios including chemical plants, logistics companies, construction sites, production lines and so on.

Question 10 assessed learning outcome:

4.4 Explain the need for emergency planning, the typical organisational arrangements needed for emergencies and relevant regulatory requirements

Candidates' understanding of the broad range of 'emergency' response on sites, for all credible adverse events was assessed. Candidates were also assessed on the detail of arrangements to be included in a major incident response.

Many did not understand what a procedure or arrangement was and when asked for what type of procedure went straight into detailed arrangements. For the arrangements there was still too much detail on a narrow band of aspects and not enough breadth of answer.

Many candidates did not address the 'detail of arrangements' question adequately. Very few candidates included business continuity for example, phones/radios pagers or a documented emergency plan.

Question 11 assessed learning outcomes:

- 2.1 Outline the properties of flammable and explosive materials and the mechanisms by which they ignite**
- 2.3 Outline the main principles and practices of fire and explosion prevention and protection**
- 4.2 Outline the main principles of the safe storage, handling and transport of dangerous substances**
- 4.3 Outline the main principles of the design and use of electrical systems and equipment in adverse or hazardous environments**
- 11.1 Outline the principles of operation of liquefied gas storage; refrigeration systems; and heating systems**

This question assessed the candidates' knowledge of closed circuit refrigeration plants (CCRP).

The NEBOSH Diploma is not a core qualification for refrigeration engineers, so the inclusion of CCRP in the syllabus is meant to address the key hazards associated with such plant – commonly used in food processing, they pressurise a toxic / explosive gas which can (and does) escape with adverse consequences.

The question is also assessing the candidate's ability to draw in knowledge from different elements in order to synthesise a response.

So knowing that an explosive gas escaping into the atmosphere creates the first required response, how you prevent (including the initial escape) or mitigate (including protected electrics) an explosion is the next. Finally as an explosive, toxic cloud may be released an emergency response will be required.

Some understanding of causes of ammonia leaks was demonstrated eg corrosion, no maintenance, mechanical damage. However, little understanding of possible controls, eg collision protection and preventive maintenance and inspection and/or testing regimes was presented.

Generally candidates showed very little understanding/knowledge of the necessary design features of building, possibly because they are conditioned to deal with explosion-proofing under differently presented scenarios.

Generally little understanding was shown of the principle contents required in an off-site emergency plan; a number of candidates confused the content of an 'off-site' plan with that of an 'on-site' one.

Conclusion

The feedback from Examiners highlighted that candidates taking the Unit C examination in July 2014 needed most improvement in the areas of assimilating syllabus knowledge – to be able to provide adequate depth and breadth of knowledge for the question demands. All syllabus areas are of equal importance.

With regards to examination technique, candidates sitting this examination should spend significant time in developing examination technique particularly reading and comprehending the question.



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