

September 2010

Examiners' Report NEBOSH National Certificate in Environmental Management



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Introduction

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. Courses leading to NEBOSH qualifications attract over 25,000 candidates annually and are offered by over 400 course providers in 65 countries around the world. Our qualifications are recognised by the relevant professional membership bodies including the Institution of Occupational Safety and Health (IOSH) and the International Institute of Risk and Safety Management (IIRSM).

NEBOSH is an awarding body recognised and regulated by the UK regulatory authorities:

- The Office of the Qualifications and Examinations Regulator (Ofqual) in England
- The Department for Children, Education, Lifelong Learning and Skills (DCELLS) in Wales
- The Council for the Curriculum, Examinations and Assessment (CCEA) in Northern Ireland
- The Scottish Qualifications Authority (SQA) in Scotland

NEBOSH follows the “GCSE, GCE, VCE, GNVQ and AEA Code of Practice 2007/8” published by the regulatory authorities in relation to examination setting and marking (available at the Ofqual website www.ofqual.gov.uk). While not obliged to adhere to this code, NEBOSH regards it as best practice to do so.

Candidates’ scripts are marked by a team of Examiners appointed by NEBOSH on the basis of their qualifications and experience. The standard of the qualification is determined by NEBOSH, which is overseen by the NEBOSH Council comprising nominees from, amongst others, the Health and Safety Executive (HSE), the Confederation of British Industry (CBI), the Trades Union Congress (TUC) and the Institution of Occupational Safety and Health (IOSH). Representatives of course providers, from both the public and private sectors, are elected to the NEBOSH Council.

This report on the Examination provides information on the performance of 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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General comments

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 always some 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.

In order to meet the pass standard for this assessment, acquisition of knowledge and understanding across the syllabus are prerequisites. However, candidates need to demonstrate their knowledge and understanding in answering the questions set. Referral of candidates in this unit is invariably because they are unable to write a full, well-informed answer to one or more of the questions asked.

Some candidates find it difficult to relate their learning to the questions and as a result offer responses reliant on recalled knowledge and conjecture and fail to demonstrate a sufficient degree of understanding. Candidates should prepare themselves for this vocational examination by ensuring their understanding, not rote-learning pre-prepared answers.

Common pitfalls

It is recognised that many candidates are well prepared for their assessments. However, recurrent issues, as outlined below, continue to prevent some candidates reaching their full potential in the assessment.

- Many candidates fail to apply the basic principles of examination technique and for some candidates this means the difference between a pass and a referral.
- In some instances, candidates are failing because they do not attempt all the required questions or are failing to provide complete answers. Candidates are advised to always attempt an answer to a compulsory question, even when the mind goes blank. Applying basic health and safety management principles can generate credit worthy points.
- Some candidates fail to answer the question set and instead provide information that may be relevant to the topic but is irrelevant to the question and cannot therefore be awarded marks.
- Many candidates fail to apply the command words (also known as action verbs, eg describe, outline, etc). Command words are the instructions that guide the candidate on the depth of answer required. If, for instance, a question asks the candidate to 'describe' something, then few marks will be awarded to an answer that is an outline.
- Some candidates fail to separate their answers into the different sub-sections of the questions. These candidates could gain marks for the different sections if they clearly indicated which part of the question they were answering (by using the numbering from the question in their answer, for example). Structuring their answers to address the different parts of the question can also help in logically drawing out the points to be made in response.
- Candidates need to plan their time effectively. Some candidates fail to make good use of their time and give excessive detail in some answers leaving insufficient time to address all of the questions.
- Candidates should also be aware that Examiners cannot award marks if handwriting is illegible.

UNIT NEC1 – Management and control of environmental hazards

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- Question 1**
- (a) **Give** the meaning of the term 'aspects' in the context of introducing an Environmental Management System (EMS). (2)
 - (b) **Identify** the types of environmental aspects that a company would review when implementing an EMS. (10)
 - (c) **Outline** the circumstances which would require a company to review any previous assessments of its aspects. (8)
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In part (a) Examiners were looking for candidates to demonstrate knowledge that an aspect is an element of an organisation's activities, products and services that can interact with the environment. An answer to part (b) would draw on this to identify such elements as raw materials used and their source, by-products from processes, waste produced, energy and water used, emissions to air and water, life span of products and end of life disposal, packaging and transport issues, hazards from materials, etc. Most candidates produced acceptable answers to parts (a) and (b) but few gained full marks.

For part (c), assessments would need to be reviewed if there were significant changes to some of the elements in part (b) such as changes in raw material source or change of product. However, changes in plant or location, the availability of new processes and technologies or recycling opportunities could also be reasons. In addition, new legislation or market and public pressures, evidence of environmental damage or accidents could also prompt a review. Reviews of assessments may also arise as a result of audits or from annual reviews as part of an EMS or striving for continuous improvement. Candidates again mentioned some of these reasons although few got a comprehensive list.

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- Question 2**
- (a) **Explain** why energy efficiency is important. (4)
 - (b) **Give FOUR** examples of how energy efficiency in an office can be improved without large capital expenditure. (4)
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Most candidates answering part (a) explained that the need to use energy efficiently is driven by requirements to reduce emissions of gases such as carbon dioxide or sulphur dioxide that cause global warming or acid rain respectively. Reduced energy use also conserves non-renewable fossil fuels extending the life of reserves. There are additional benefits from reduced fuel usage such as fewer incidents of pollution arising from extraction, refining and distribution of products such as oil. Legal requirements such as carbon trading and the need to reduce costs are playing an increasing role.

Most candidates were able to give four relevant examples for part (b) from the range of opportunities likely to be available. These would include: improving the efficiency of lighting with low energy bulbs, motion sensors and maximising natural light; improving the efficiency of heating with insulation, better controls and efficient boilers; the use of "A-rated" appliances and switching off equipment not in use; the use of natural ventilation rather than air conditioning; transport arrangements; regular maintenance of energy using equipment and training staff and using campaigns to change behaviour.

Question 3 ***Outline** the measures that should be taken by a producer of waste to reduce the risk during storage prior to its collection for disposal elsewhere.* **(8)**

Most candidates gave reasonable responses to this question. Segregation of waste and containment to prevent escape especially choosing suitable containers are key measures. Liquid wastes need some bunding arrangements and all wastes may need secure sites and protection from the weather, pests and scavengers. Incompatibility risks of different materials and location of sites away from buildings, watercourses or other potential sites where damage may be caused could also be important. Proper labelling and site management including record keeping and supervision and site inspections help but in the event of some unplanned incident it is also necessary to have emergency plans in place.

Question 4 ***Outline** the control hierarchy for air pollution emissions **AND** give **TWO** suitable examples for **EACH**.* **(8)**

The first measure of the control hierarchy is to eliminate or prevent pollution by ceasing or changing the process or the materials used (eg aqueous paint instead of solvent-based or renewable energy instead of fossil fuel derived).

The second measure is to minimise/reduce emissions by the use of control devices or process management (eg boiler controls, regular maintenance or the use of filtration).

The third measure is to render any remaining emissions harmless by reducing the polluting content or by dilution (eg use of scrubbers, catalytic converters or tall chimneys).

Most candidates did well on this question successfully outlining the hierarchy and producing suitable examples.

Question 5 (a) ***Outline** how the common law ‘Tort’ of negligence may apply to environmental pollution.* **(6)**

 (b) ***Identify TWO** possible remedies that the courts could impose when tort of negligence is proven.* **(2)**

Answers to this question were quite variable. There were some very good answers to part (a), with better answers including the key points that for negligence to apply it would need to be shown that a duty of care was owed, this duty was breached, and as a result of the breach harm or loss occurred, the harm being foreseeable and not too remote from the breach. Credit was also given for recognising that the duty of care is owed to ‘neighbours’ and others who might be expected to suffer a loss as a result of the negligence, and that negligence can include acts or emissions.

Some candidates failed to gain marks in part (a) by simply describing specific examples of circumstances which might lead to the tort of negligence being applied, rather than the tort itself. Other candidates described the circumstances such as loss of enjoyment of property which might lead to the tort of nuisance which could not gain credit.

Part (b) was generally well answered, with many candidates identifying possible remedies such as damages/compensation, an injunction to stop or restrict the activity, and notices to restore or remediate the circumstances back to what they were before the incident.

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- Question 6**
- (a) **Give the meaning of the term 'safe drinking water'.** (2)
- (b) **Give the meaning of the following water quality indicators:**
- (i) *the chemical oxygen demand (COD);* (2)
- (ii) *the biochemical oxygen demand (BOD);* (2)
- (iii) *the total oxygen demand (TOD).* (2)
-

A few candidates gained marks for part (a) by providing a reasonable meaning of the term 'safe drinking water'. This needs to refer to meeting international or national standards for drinking water and that it can be used without the risk of immediate or long term harm.

Part (b) was not well answered despite these terms being fundamental to understanding and describing water quality.

COD is the result of a chemical test which measures the amount of oxygen consumed by material in the water that is oxidised under prescribed conditions (typically heating for 2 hours in acid solution of a dichromate salt). The oxygen is generally consumed by organic substances (some but not all of the biodegradable and non-biodegradable compounds) but can include inorganic ones. The test is widely used for liquid effluents for monitoring and charging purposes.

BOD is the result of a biochemical test which measures the amount of oxygen used to oxidise material under different prescribed conditions (presence of oxygen in solution and suitable bacteria and generally over 5 days at 20°). This is mainly due to organic substances which are biodegradable under these conditions but would include ammonia. The amount of oxygen used is influenced by the number of microorganisms present and their metabolic rate. This test more closely represents natural conditions but because of the time needed is mainly used for environmental samples.

COD and BOD tests give different results although COD can be used as a surrogate for BOD in samples that have a relatively consistent composition. Neither oxidises all of the potentially oxidisable material in a sample. TOD is measured with an instrument that oxidises everything possible. The instrument vaporises the sample and uses pure oxygen (usually in the presence of a catalyst) at high temperature. This test gives the highest measure of oxygen consumed but the result does **not** equal the sum of BOD and COD.

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- Question 7** ***Outline the powers available to inspectors under the Environmental Protection Act (EPA) 1995 other than serving notices.*** (8)
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This question was generally well answered, with most candidates outlining a reasonable range of the powers available to inspectors. Inspectors can enter premises at any reasonable time or at any time if they have reason to believe that there is immediate risk of serious pollution to the environment. They may be accompanied by other authorised persons or a police constable and take with them any equipment or materials required to exercise their powers.

Once there they can make any examinations or inspections necessary and take samples, photographs, measurements and copies of documents. They may cause premises or parts of premises to be left undisturbed and ask for articles to be dismantled, tested or rendered harmless. Articles and substances may be taken and examined or ensured that they are secure from tampering and available as evidence. Persons involved are required to offer assistance or facilities as necessary and may be required to answer questions and sign a declaration that their statements are true. There is a catch-all giving them any duty required to discharge their function. The end result may be the initiation of legal proceedings.

A few candidates failed to gain maximum marks by giving answers which were lists rather than outlines.

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| Question 8 | <p>(a) Identify reasons for carrying out environmental impact assessments. (3)</p> <p>(b) Identify FIVE types of environmental impacts which should be considered when doing an environmental impact assessment. (5)</p> |
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Environmental impact assessments are a legal requirement in some planning applications (described in schedules to the Act) or as part of an IPPC application. They are also an essential part of implementing an Environmental Management System (EMS) where they can help identify the impacts from associated aspects. Their use identifies the control measures that may be required to minimise environmental risk or to provide a risk rating for the purpose of prioritisation. Most candidates identified one or two reasons in answer to part (a).

Candidates generally did better in part (b) although a few identified aspects rather than impacts. Atmospheric, aquatic and land aspects were readily identified. Impacts on ecosystems and local communities, loss of amenity, archaeological or historic features and the impact of transport were also mentioned.

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| Question 9 | <p><i>A manufacturing company operates at a site near to a stream.</i></p> <p>Explain why the preparation of an environmental emergency response plan would be advisable in this situation. (8)</p> |
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This question was not well answered, with most candidates unable to provide more than one or two reasons why an emergency response plan would be advisable in the circumstances described. Many candidates spent a lot of their answer describing the content of typical plans, rather than providing a justification for why the plan would be advisable. Plans are required as part of an EMS under ISO14001 and are a legal requirement under COMAH and some IPPC or EP permits. There are good moral or ethical reasons as well but there are more practical reasons that deliver business benefits. A plan helps meet the need for prompt action to protect people and the environment in the event of an incident and should reduce the risk of prosecution and clean up costs if appropriate action is not initiated. Similarly, the presence of a good plan should help prevent reputational damage and loss of business and include contingencies to prevent water pollution due to fire or other catastrophe.

Question 10 *A construction project is being undertaken on a large construction site adjacent to residential houses.*

(a) **Outline** the typical effects of noise during the construction work. (4)

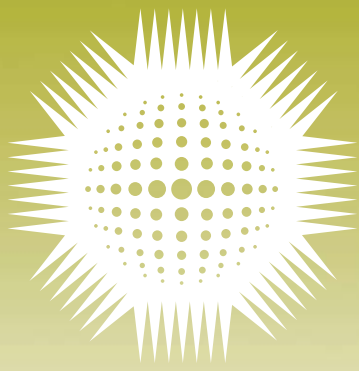
(b) **Identify** the factors which determine whether noise from the construction site is likely to constitute a nuisance. (4)

Part (a) required effects not sources in the answer. Most candidates identified some from: disruption of sleep, stress and disruption to wildlife. Fewer identified nuisance or interfering with enjoyment of land.

For part (b) the factors sought included: frequency, loudness, is it within audible range, time of day and duration. Other factors could be the character of the neighbourhood, proximity to habitation, background noise levels and whether there is impact noise involved. Most candidates answered this part well.

Question 11 *Outline the factors which should be taken into account when evaluating the significance of environmental impacts.* (8)

Few candidates answered this question really well although most got some marks. The factors sought were those that were important in evaluating the significance of environmental impacts. This includes size or magnitude of the impact (local vs global), nature (toxicity for example), frequency of occurrence, likelihood and duration of impact, severity of consequences and sensitivity of the receiving environment as factors which were relevant to the receptor. The pathway between source and receptor may be significant as may be the extent to which the impact is reversible. There may be legal requirements or contractual obligations which may be relevant as can the importance of interested parties and the costs involved.



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