

September 2009

Examiners' Report

NEBOSH National Certificate in Environmental Management



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NEBOSH Certificate in Environmental Management

SEPTEMBER 2009 examinations



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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

Question 1 *Waste recycling is an established concept but further initiatives and efforts are required in order to meet EU quota requirements and preserve our resources.*

- (a) **Outline** the main benefits of recycling waste. (7)
 - (b) **Outline** the main barriers to recycling waste. (7)
 - (c) **Identify** how the barriers to recycling waste can be overcome. (6)
-

Candidates who answered this question well structured their answer. Recycled waste could be either materials that can be reused or products at the end of their useful life that can be refurbished or used elsewhere. The answers typically only included about half the potential benefits and barriers.

- (a) Legal compliance is one clear benefit. The environmental benefits of recycling waste are based on reducing the demand for raw materials, reducing emissions and water use and saving energy associated with new products. This results in reduced damage due to extraction of resources, less waste to landfill and fewer greenhouse gas emissions. These, in turn help conserve habitats and wildlife. A company benefits by reduced costs for materials and waste disposal. Recycling also creates jobs and improves public image.
- (b) There are physical barriers to recycling (such as limited space or unsuitable containers), lack of knowledge, and attitudes that affect behaviour. Recycling can take up time and requires some established processes and leadership to make it work. There could be some initial costs involved and there needs to be a market for recycled materials and goods. This market can be influenced by the perceived quality of recycled products or goods made from recycled materials.
- (c) Provision of the right equipment, provision of information and advice and keeping it simple will help improve recycling rates. Strong policy and leadership with demonstrable benefits will reinforce the message. Recycling can be included in contracts with suppliers and, working with organisations such as NISP or customers directly, markets for recycled materials or goods can be developed.

Question 2 *Under the Environmental Permitting (England and Wales) Regulations 2007:*

- (a) **Identify** the regulated facilities that would require an environmental permit; (3)
 - (b) **Identify** the circumstances in which a single permit can be granted for more than one regulated facility; (2)
 - (c) **Identify** the regulatory bodies for each type of activity. (3)
-

Answers to this question were generally weak.

- (a) Regulated facilities are an installation; mobile plant other than waste mobile plant; waste mobile plant; and a waste operation not carried on at an installation or by means of mobile plant. Relevant examples were accepted but only one example of each type would gain a mark.
- (b) Single permits can be granted if the regulator is the same for each facility; the operator is the same for each facility; or all facilities are on the same site.
- (c) Note that this part mentions activities rather than facilities. Part A(1) activities and waste operations are regulated by the Environment Agency/SEPA. Part A(2) and Part B activities are regulated by the Local Authority (SEPA in Scotland).

Question 3 *Outline the benefits to a business of good environmental management.* **(8)**

This question asked for the benefits to a business and some structure in answers helped with gaining good marks. Saving money must score highly with business so reducing the use of water, energy, raw materials and packaging, more efficient use of transport and the reduction of waste all contribute.

There are financial and PR benefits from improved legal compliance and improving environmental performance by reducing risk.

All of these can lead to improved relationships with stakeholders, including improving staff morale and recruitment. Insurers and investors will take a more positive view and there should be better opportunities for marketing and other business development.

Question 4 *Outline ways in which a company could communicate its environmental policy to all relevant parties.* **(8)**

This question was generally well answered. The question asked about communication so details about the content of environmental management systems did not gain marks.

Employees can be informed in a number of ways, including induction and training sessions, employee handbook, notice board and by letter or e-mail. The use of the internet is available to both internal and external parties. The latter can also be communicated with by direct mail, use of media such as newspapers, posters, the company annual reports and tender documents. Conferences, exhibitions and open days offer direct contact and can involve employees as well – thus reinforcing the messages to them.

Question 5 *A company is implementing a formal environmental management system.*

Identify:

(a) *the possible internal;* (4)

(b) *the possible external* (4)

sources of information which should be reviewed during the initial review.

There were some good answers to this question although some candidates digressed into other aspects of an environmental management system. Internal sources of relevant information for the initial review would start with those aspects of the business having an environmental impact: raw material and energy use, waste records and emission data. Further information could come from accident reports, complaints or previous environmental problems. The results from site audits or inspections would also be useful and talking to the staff could also bring out additional information.

For part (b), useful information can also be found in various standards (BSI, ISO) and from the regulatory bodies, government departments and the information services that they support. They publish codes of practice and guidance notes and similar information may be available from trade bodies, suppliers and manufacturers and professional associations. The relevant legislation and regulations that may apply to any business usually have supporting documents that are usually available on-line or commercially. Companies operating in similar areas of activity may also be able to help either through formal relationships or, informally, by networking.

Question 6 *Life cycle analysis (LCA) is growing in importance in environmental management.*

(a) **Outline** *the principles of LCA.* (4)

(b) **Outline TWO** *examples where an LCA study may be used in practice.* (4)

Answers to this question were not as good as expected. It appeared that many candidates did not understand the detail of carrying out a life cycle analysis (LCA).

Part (a) of this question had a mixed response. Most candidates referred to “cradle to grave” but did not clarify what this meant. Better answers mentioned the assessment of all inputs and outputs as well as the direct and indirect impacts from sourcing raw materials through manufacture, use and ultimate disposal. The environmental costs or burdens have to be added at all stages and an inventory produced. The costs and burdens have to be converted to equivalent units so that they can be compared and the interpretation applied depending on the comparisons to be made.

Part (b) was intended to outline the sorts of comparisons that LCA is used for. These could be for supporting claims for a product, comparing products or production routes, analysing design and manufacturing to minimise overall environmental impact or supporting the aspects assessment for ISO 14001. Some candidates answered with examples of LCA in use, eg in comparing reusable and disposable nappies or glass and plastic bottles. In order to get full marks in these cases there needed to be inclusion of how the LCA was applied and the reason for carrying it out.

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- Question 7** (a) **Identify FOUR common air pollutants.** (4)
- (b) **Identify ONE typical source for EACH of the air pollutants identified above.** (4)
-

Answers to this question were generally good although some candidates listed dust, smoke and grit as three separate pollutants in part (a). Carbon dioxide, oxides of sulphur and nitrogen, particulate matter such as dust or PMs are identifiable groups. There is also a range of volatile organic compounds such as methane, CFCs, and solvents. Water vapour does not fall into the category of a pollutant.

To answer part (b) correctly, the right sources need to be matched to the pollutants identified in answers to part (a). Carbon dioxide arises mainly from the combustion of fossil fuels. Sulphur dioxide is produced from burning fuels (principally coal or diesel) containing sulphur compounds and from some metal processing industries. Nitrogen oxides also come from burning fuels, for example in vehicle exhausts.

Particulate matter can arise at quarries or construction sites but fine particles are also produced in combustion.

Sources of organic compounds as pollutants depend on the gas under consideration. Methane is usually associated with land fill or other anaerobic process although there are natural sources. Other compounds are associated with refrigeration, paint manufacture and use and combustion.

-
- Question 8** **Outline the main sources of water pollution from industrial sites.** (8)
-

Candidates answered this question fairly well however high marks were generally not attained. The question asked for sources of water pollution from industrial sites so answers that contained types of polluting industry or non-industrial sources were not relevant.

The main regular sources are usually process water and sewage although cooling water can also be a problem if too hot.

Leaks from operational or disused equipment and water spread onto hard standing from washing operations can find its way into streams via surface water drains. In emergencies, accidental spills or fire water can similarly cause pollution unless contained. Cross connections of contaminated drains to surface water drains are also a common problem. Badly managed waste facilities and wash off of solids can result in pollution of water courses or loss of visual amenity. Polluting materials spread on to unmade ground can seep into ground water as well.

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- Question 9** **Outline EIGHT significant ways to reduce energy costs within an organisation.** (8)
-

There were some excellent answers to this question. The question asked for ways to reduce costs so answers could contain examples that did not necessarily reduce environmental impact.

Initial design and choice of equipment either for fuel type or plant efficiency with replacement of inefficient equipment is a good starting point. Once installed, maintenance is essential to keep performance tuned.

Heating costs can be reduced by insulation of pipes and spaces, good control systems and avoiding heating empty accommodation. Heat recovery from hot process water may be beneficial if large volumes are involved. Electrical costs can be reduced by light switches that are motion sensitive, low energy light bulbs, use of highly rated equipment such as fridges and switching equipment off completely when not in use. The use of alternative sources of energy such as solar heating or power generation may be worth a look but the adoption of combined heat and power or peak load management may be more practical.

Transport is an important cost with fuel type, driver training and route planning all able to provide savings.

All of these potential cost savings need management drive to introduce them and maintain the momentum. Staff training should reinforce the process. Finally, there are companies that offer advice services and will take over energy management on larger sites with their remuneration based on savings achieved.

Question 10 *A large dust extraction fan and collector unit is to be installed against an outside wall of a factory building.*

- (a) **Identify TWO possible sources of noise from this equipment.** (2)
- (b) **Outline the issues to be considered in order that the equipment does not cause a noise nuisance when in operation.** (6)

For the example given, there are three potential sources of noise: the motor and fan, vibration of the equipment – including the ducting and grills – and from the discharge point. Candidates often only recognised vibration.

It was possible to answer part (b) without getting part (a) right by focussing on the issues that would be common to any source of noise. The design of the complete system and choice of equipment can make a difference. Once installed, maintenance will be needed.

The likelihood of complaints will depend on the location, type and number of neighbours. They will be influenced by the noise levels actually emitted, the frequency and duration of the noise and whether it is at an unacceptable time of day. Monitoring by the factory management will be necessary to interpret any complaints. There are many ways of attenuating noise problems by sound insulation, vibration-absorbing mountings and screening by enclosures, trees, fences and earth banks.

Question 11 *Outline the information that should be contained within an environmental emergency response plan.* (8)

Most candidates produced good answers to this question. Nearly everyone identified the need for a location plan and a site plan showing the location of the site, access routes and the nearest neighbours. The location of watercourses and other sensitive areas along with a drainage plan are also essential.

This needs to be supplemented with lists of operations and the types of materials on site along with their locations. Locations of emergency equipment and means of dealing with fire water should also be there. The warning systems along with means of communicating with local residents and businesses and dealing with the media may also be required. In most cases the identification of a control centre and the procedures to react will be included.

All of this needs to be supplemented with contact numbers for internal staff such as those taking decisions or implementing the plan and external organisations such as the emergency services and regulatory bodies. As much of this information is subject to change, there should be information on the person responsible for updating it along with the review dates and records of staff training or briefing.



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