
Examiners' Report

UNIT ED1: MANAGING ENVIRONMENTAL RISK

JULY 2019



For: **NEBOSH National Diploma in Environmental Management**
NEBOSH International Diploma 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 around 50,000 learners annually and are offered by over 600 Learning Partners, with examinations taken in over 120 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 that applies best practice setting, assessment and marking and applies to Scottish Qualifications Authority (SQA) Accreditation regulatory requirements.

This report provides guidance for learners and Learning Partners for use 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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Any enquiries about this report publication should be addressed to:

NEBOSH
Dominus Way
Meridian Business Park
Leicester
LE19 1QW

tel: 0116 263 4700
fax: 0116 282 4000
email: info@nebosh.org.uk

General comments

Many learners 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 learners, 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.

This report has been prepared to provide feedback on the standard date examination sitting in July 2019.

Feedback is presented in these key areas: responses to questions, examination technique and command words and is designed to assist learners and Learning Partners prepare for future assessments in this unit.

Learners and Learning Partners will also benefit from use of the 'Guide to the NEBOSH National Diploma in Environmental Management' / the 'Guide to the NEBOSH International Diploma in Environmental Management' which are available via the NEBOSH website. In particular, the guide sets out in detail the syllabus content for ED1 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.

Unit ED1

Management of environmental risk

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- Question 1**
- (a) **Outline** the waste hierarchy. (4)
 - (b) **Outline** the concept of a circular economy. (8)
 - (c) **Explain** how decisions at the design stage of a product can reduce waste. (8)
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This question assessed learners' knowledge and understanding of learning outcome 7.1: Explain the need for responsible waste management.

The waste hierarchy sets prevention as the preferred option and moves down through less desirable options to landfill disposal as the final resort. Those learners who chose to answer this question generally performed well in part (a) with many gaining full marks.

The circular economy is an alternative to the linear economy and aims to keep resources in use for as long as possible. Answers to part (b) were generally limited and many learners gave only narrow responses. Some answers largely re-stated the stages of the waste hierarchy from part (a) and so gained only limited marks. Better answers outlined the need to consider options to reuse, repair or recycle materials at every stage, from sourcing through production and distribution to use and eventual end-of-life, in order to extract maximum value for resources.

Many learners had difficulty with part (c) and limited their answers to consideration of the manufacturing stage, eg opportunities or recycle production waste. Learners who also included consideration of wider issues, such as maximising design life, material selection and end-of-life, gained more marks.

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- Question 2** A manufacturing process generates large amounts of dust.
- (a) **Outline** what should be considered in the selection of suitable dust control options for this process. (8)
 - (b) **Give FOUR** examples of dust control devices that could be used **AND describe** how **EACH** removes particulates from air. (12)
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This question assessed learners' knowledge and understanding of learning outcome 8.3: Describe appropriate control strategies and measures for releases to atmosphere.

In selecting suitable dust control options, there are a wide range of things to consider, such as the properties of the dust to be captured, or the costs and removal efficiencies of control devices. Many learners who chose this question gave answers to part (a) that covered the main issues that would be considered. However, some learners gave only limited answers and gained fewer marks.

In part (b) many learners identified four examples of appropriate dust control devices and described how they remove particulates from air, demonstrating familiarity with this topic.

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- Question 3** Two of the principles of the Rio Declaration on Environment and Development (1992) were the 'Precautionary Approach' and 'Polluter Pays'.
- (a) **Outline** the 'Precautionary Approach' principle. (5)
- (b) **Outline** the 'Polluter Pays' principle. (5)
- (c) **Outline** the costs of operating a chemical manufacturing facility, that could be influenced by the '*Polluter Pays*' principle. (10)
-

This question assessed learners' knowledge and understanding of learning outcomes 1.3: Outline the purpose of the Principles 15 and 16 made under the Rio Declaration on Environment and Development (1992); and 2.1: Explain the reasons for improving environmental and social performance.

Parts (a) and (b) required learners to outline the 'Precautionary Approach' and the 'Polluter Pays' Principles respectively. The 'Precautionary Approach' is stated as Principle 15 of the Rio Declaration. Some learners gave answers that closely reflected the extent of Principle 15 and gained marks. However, many learners found it challenging to express this principle in their answers and gained only limited marks.

For part (b) the 'Polluter Pays' principle is stated in Principle 16 of the Rio Declaration and learners gave slightly better outlines than for part (a). For example, some answers gave examples of the types of economic instruments that may be used by States, such as environmental taxation.

Many learners found part (c) challenging. Most did gain marks for outlining the potential for fines and clean-up costs for pollution events and for increased energy costs. However, few learners considered a broad range of direct or indirect costs that could arise, such as from permitting charges, investment to achieve emission limits, effect on raw material costs, etc. Learners should ensure that they consider the full range of costs in operating a facility and ask themselves whether these costs could be affected.

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- Question 4** An organisation has set a target for reducing their energy usage.
- Describe** a strategy to reduce energy consumption without the need for high initial spending. (20)
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This question assessed learners' knowledge and understanding of learning outcomes 12.2: Explain the need for energy efficiency; and 12.3: Describe an energy monitoring strategy and the benefits and limitations of carrying out monitoring.

Many learners appeared to have a good knowledge of the subject matter. Better answers were structured clearly into sections covering planning, implementation and monitoring/review. Many learners gained marks for reference to monitoring energy usage to understand patterns of use, setting targets for savings and raising awareness through campaigns, etc. Marks were also given for practical measures that could be taken, including controlling use of plant and equipment, reducing the number of energy consuming appliances/equipment and ensuring that plant and equipment are maintained to give maximum efficiency and investigating and resolving areas where energy is being lost, etc.

Question 5 Desalination can be used to produce drinking water, or water for agricultural use.

- (a) **Outline** the following desalination methods:
- (i) multi-stage flash distillation; (4)
 - (ii) vapour compression; (4)
 - (iii) reverse osmosis. (4)
- (b) (i) **Outline** the advantages of desalination. (4)
- (ii) **Outline** the disadvantages of desalination. (4)
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This question assessed learners' knowledge and understanding of learning outcome 9.3: Outline different potable water and wastewater treatment methods and the situation/s in which each method would be used.

Many learners demonstrated they had familiarity with desalination and gave answers that outlined each of the three methods identified in part (a) covering how each of the three selected methods works to produce clean water.

Part (b) was generally answered to a reasonable standard and most answers outlined a range of advantages and disadvantages of desalination, including producing clean water in areas where water is a limited resource as an advantage, or the high maintenance requirements as a disadvantage.

Question 6 Houses are being built near to an existing factory site. The factory owners are concerned that residents may complain about the noise from the factory.

- (a) **Describe** how the potential for environmental noise complaints should be assessed. (12)
- (b) **Outline** control measures that could be used to minimise noise nuisance arising from process machinery. (8)
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This question assessed learners' knowledge and understanding of learning outcomes 10.1: Explain the characteristics of noise and advise on the measurement and assessment of environmental noise levels; and 10.2: Outline control strategies and methods for the control of environmental noise.

In part (a) some learners identified the model for such assessments set out in BS 4142:2014 as providing an appropriate framework for their responses. Answers then set out the key stages from determining 'background' noise levels and 'specific' noise levels to making appropriate adjustments and then comparing the difference between the rating level and the background. Better answers also included a description of the factors to be considered in carrying out noise measurement. Some learners appeared to misread the question and focused on assessing occupational noise exposure. The question was specific to 'environmental' noise and so little marks could be gained.

In outlining control measures for nuisance arising from process machinery in part (b), many learners provided good answers that covered a broad range of options, such as maintenance regimes, silencing or location of noise sources away from receptors.

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- Question 7**
- (a) **Describe** how releases of environmentally hazardous substances to air may affect the health of people outside the workplace. (13)
- (b) **Outline** what should be considered when assessing health risks associated with environmentally hazardous substances that are released. (7)
-

This question assessed learners' knowledge and understanding of learning outcomes 8.1: Outline the types of emissions to atmosphere and the harm to the environment from specific pollutants; and 4.1: Explain the principles of environmental aspect identification.

Many learners gained good marks on part (a), but had difficulty with part (b).

For part (a) many answers considered the range of exposure pathways, such as inhalation or ingestion following deposition, and then referenced the types of adverse health effect that can arise for each route. Better answers also described the health consequences arising from other exposures, such as stress caused by nuisance or skin cancer arising from increased ultraviolet radiation associated with ozone depletion. The command word was 'describe' and some answers were only simple lists or outlines, limiting marks.

Part (b) addressed what should be considered when making assessments of health risks. Some learners correctly outlined such factors as potential for bioaccumulation, environmental persistence or likely exposure levels. However, many learners appeared to find this part challenging and provided limited answers, suggesting a lack of knowledge of the subject area.

- Question 8** An organisation has an environmental management system, certified to ISO 14001, and a separate health and safety management system in place. Senior management wants to introduce a formal quality management system and is considering integrating the three systems.
- (a) **Explain** potential benefits of integration. (10)
- (b) **Explain** potential limitations of integration. (10)
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This question assessed learners' knowledge and understanding of learning outcome 3.1: Explain the purpose, benefits, limitations and structure of an environmental management system.

Most learners gained marks in part (a) for explaining the benefits from combined documentation, reduced costs administering a combined system and reduced costs for auditing combined systems. However, answers were generally limited in breadth and few considered other benefits, such as reducing risk of conflict between systems, or potential for adding additional management systems in the future.

Learners appeared to find part (b) more challenging than part (a). Most explained that integrated systems require broader competency for audit and the process of integration can be challenging to manage. However, in general answers to part (b) were limited in breadth and gained few marks.

Examination technique

The following examination techniques were identified as the main areas of improvement for learners:

Learners did not respond effectively to the command word

A number of learners do not appear to understand the differences in depth and breadth associated with different command words. In particular 'outline' and 'describe' appear to be poorly understood. Some learners do not give enough detail when answering this type of question. For example an 'outline' answer should give a brief overview and should not be limited to a simple list.

Conversely questions based on 'identify' or 'outline' can illicit lengthy answers covering several sentences, when in fact short answers would have sufficed. This means that learners waste time and effort for no additional credit.

Learning Partners should ensure that learners understand the importance of command words in determining the depth and breadth of information required in answers.

Learners misread/misinterpreted question

Examiners reported that a significant number of learners either misread or misinterpret some of the questions. It appears that those learners who have difficulty are 'question-spotting', seeing a key word or phrase and answering the question based on that, rather than thoroughly reading the question and answering what was set. Consequently, some learners produce answers that contain information that is either irrelevant and/or out of context, such as addressing waste and water use minimisation in a question on energy use.

On several questions, learners extended their answers to cover points outside of the question. This could indicate that they had not thoroughly read the question before attempting it, or that they misinterpreted the question as something similar they had previously seen.

Rather than rushing into an answer, some learners might improve their performance by producing a short answer plan and then pausing for a few seconds, to confirm in their minds that this is what the question is really asking.

Learning Partners should ensure that learners are taught how to read and analyse questions so that they are clear exactly what information is likely to gain marks.

Learners repeated the same point but in different ways

Learners occasionally produce several paragraphs that all address the same point but in different ways. This tends to indicate that they have not planned their answers carefully. Examiners can only give marks once. No additional marks will be available for re-stating a point several times.

For example, outlining 'recycling' as a way of reducing disposal costs for waste, but then repeating this several times for different waste types, such as introducing paper recycling in offices or recycling manufacturing waste as different points. Such practice might expand the answer where breadth of knowledge is limited but gains no extra marks. Repetition also wastes precious examination time.

Learning Partners should encourage learners to plan their answers in advance of writing to avoid repetition. Learners should be encouraged to practice examination technique, and in particular structuring answers using a simple plan, so as to ensure that their answers follow a logical structure and avoid covering a topic more than once.

Learners produced an incoherent answer

Learners sometimes stray into areas outside the question and waste time and effort in producing confusing answers addressing matters not relevant to the question, such as detailing statutory nuisance on a civil law question.

Learners should be taught to limit their answers to only the topic detailed in the question.

Learners did not follow specific instructions

Where a question instructs that a learner produces an answer in a specified form, such as a brief, marks cannot be awarded if answers are not in the specified form.

Learners should be taught how to present and structure their answers in common formats, such as a memorandum or a brief.

Command words

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

Describe

Describe: To give a detailed written account of the distinctive features of a topic. The account should be factual without any attempt to explain.

Many learners outline without giving adequate content for a 'describe' question. A typical description should cover more than the outline of the point being made. The command word 'describe' requires that learners provide distinctive features of the particular syllabus learning outcome being assessed but do not need to provide extensive information on that topic. Learners occasionally respond to 'describe' by completing a full page of text without actually responding with the distinctive features associated with the question topic. Learners need to distinguish between 'outline' and 'describe' and not respond with a series of unconnected points generally related to the topic in the question. If a learner was asked to describe a control strategy aimed at the prevention of environmental pollution, the inclusion of monitoring of airborne concentrations and emissions that include estimates of losses by mass balances would satisfy the command word.

Explain

Explain: To provide an understanding. To make an idea or relationship clear.

When a question specifies 'explain' the learner is required to provide an understanding or make clear an idea or relationship. For example '**explain** the cradle to grave concept'; if a learner responded with 'takes into account inputs and outputs, considers environmental costs and uses equivalences; then this constitutes an outline but **not** an explanation. This would be insufficient to merit full marks as this does not provide a deep enough understanding or relationship from the specified command word or the context in which the question is asked. However, if a learner responded in greater depth, for example 'a life cycle analysis study taking into account an inventory of all inputs and outputs; supply, manufacturing and waste impacts would be taken into account; environmental costs or obstacles would be added in at all stages along the way with interpretation through evaluation of these identified stages and alignment with the scope of the study'; then this would merit the awarding of further marks.

Outline

Outline: To indicate the principal features or different parts of.

An 'outline' requires a brief summary on each point. Examiners report that the command word 'outline' challenges many learners. Insufficient detail is provided in response to the principal features or parts of the topic matter requested when 'outline' is specified in the question. Exhaustive descriptions are not required for 'outline' but limited answers like single words or listed answers do not satisfy the command word requirements.

If asked to '**outline** the information that should be included in an environmental report following an environmental assessment', significant effects on the environment, including short, medium and long-term effects would be an example of an adequate 'outline' response.

Breadth is important in an outline question. Some learners give far too much detail for a relatively small number of points. Learners should be aware that for an outline question, the number of marks available for each distinct point is limited, and no additional marks can be given for lengthy detailed responses.

Identify

Identify: To give a reference to an item, which could be its name or title.

When providing a response to 'identify' the selection and naming of an answer that relates to the question should be sufficient. In most cases one or two words would be sufficient to be awarded corresponding marks. Any further detail would not be required and impacts negatively on the time limit for completing the examination. If the use of the command word in everyday language or conversation was considered it may help the learner understand what was required. For example, if the question was '**identify** types of kitchen appliances', 'toaster, kettle and microwave' would be suitable responses for the 'identify' command word.

For additional guidance, please see NEBOSH's '*Guidance on command words used in learning outcomes and question papers*' document, which is available on our website: <https://www.nebosh.org.uk/i-am/a-learner/> - from this page the document can be found by clicking on the relevant Qualification link, then on the 'Resources' tab.