
Examiners' Report

NEBOSH INTERNATIONAL TECHNICAL CERTIFICATE IN OIL AND GAS OPERATIONAL SAFETY



UNIT IOG1: MANAGEMENT OF INTERNATIONAL OIL AND GAS OPERATIONAL SAFETY

MARCH 2020

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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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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 IOG1 examination sat in March 2020.

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.

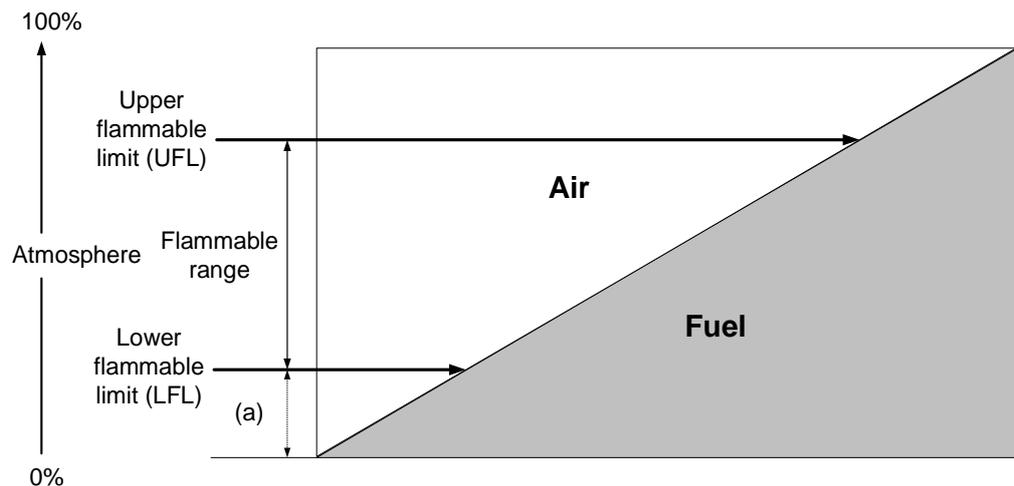
Learners and Learning Partners will also benefit from use of the 'Guide to the NEBOSH International Technical Certificate in Oil and Gas Operational Safety' which is available via the NEBOSH website. In particular, the guide sets out in detail the syllabus content for IOG1 and tutor reference documents 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 IOG1

Management of international oil and gas operational safety

- Question 1**
- (a) **Outline** the content of a typical permit-to-work. **(8)**
- (b) **Outline** how the content of a hot work permit differs from that of a typical permit-to-work. **(4)**
- (c) **Give** the meaning of the following terms:
- (i) lower flammable limit (LFL); **(2)**
- (ii) upper flammable limit (UFL). **(2)**
- (d) The flammability of a gas is a consideration with maintenance tasks and in particular, hot work permits. The diagram below highlights the flammable range of a gas.
- Explain** the significance of the range between 0% and the LFL, indicated as (a) on the diagram, in relation to gas monitoring as part of a hot work permit. **(4)**



This question assessed learners' knowledge and understanding of learning outcomes 2.5: Explain the importance of safe plant operation and maintenance of hydrocarbon containing equipment and processes; and 1.2: Explain the hazards inherent in oil and gas arising from the extraction, storage, and processing of raw materials and products.

In part (a) learners gained good marks outlining correct answers including permit title, emergency procedures and acceptance signature.

Part (b) proved to be more challenging for learners. Learners correctly outlined gas testing and fire watcher requirements. However, few mentioned simultaneous operations impacting hot work.

In part (c) learners were able to give good meanings of the terms required in sub-sections (i) and (ii).

Learners found part (d) challenging. Although some correctly acknowledged that the gas detector indicated a gas presence; the critical point (that is often misunderstood) is that gas is detected well before the gas concentration reaches the flammable range.

Question 2 **Outline** what should be considered when determining the adequacy of an escape route in an oil and gas installation. **(8)**

This question assessed learners' knowledge and understanding of learning outcome 4.2: Outline the principles, procedures and resources for effective emergency response.

Most learners outlined correct answers such as width and number of escape routes. However, some learners elaborated unnecessarily about evacuation and rescue methods, which did not result in any additional marks being awarded.

It is worthwhile reminding learners that the question needs to be read and re-read carefully, and appropriate examination technique applied in only responding to the question asked.

Question 3 Risk management techniques used in offshore installations can differ from the simple five-step approach prescribed by the United Kingdom Health and Safety Executive (HSE).

(a) **Outline** why *advanced* risk assessment techniques may be needed in offshore installations. **(3)**

(b) **Identify** the two main types of risk assessment technique. **(2)**

(c) **Identify** the main stages of risk assessment for an offshore installation. **(3)**

This question assessed learners' knowledge and understanding of learning outcome 1.3: Outline the risk management techniques used in the oil and gas industries.

In part (a) learners correctly responded with the complex operations within the oil and gas industry.

For part (b) most learners were able to identify qualitative risk assessments. However, some learners incorrectly specified Bow-tie and Swiss cheese, but these are risk control barrier models.

In part (c) most learners were able to identify the main stages of risk assessment to gain the marks available.

Question 4 (a) **Give** the meaning of the term '*jet fire*'. **(2)**

(b) **Give** the meaning of the term '*pool fire*'. **(2)**

(c) **Outline** shared and individual consequences of jet fires and pool fires. **(4)**

This question assessed learners' knowledge and understanding of learning outcome 3.4: Outline the hazards, risks and controls available for safe containment of hydrocarbons offshore and offshore.

In part (a) some learners incorrectly stated a jet fire is a turbulent fire instead of a turbulent flame.

In part (b) some learners did not recognise that the fire is above the pool.

In part (c) some learners correctly outlined that the fire radiated heat and could cause severe injury.

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- Question 5** In the oil and gas industry, process safety management includes management of change controls.
- (a) **Identify** types of change that might require management of change controls. (6)
- (b) **Outline** why competence is important in the management of change. (2)
-

This question assessed learners' knowledge and understanding of learning outcome 2.2: Outline the tools, standards, measurement, competency requirements and controls applicable to Process Safety Management (PSM) in the oil and gas industries.

In part (a) most learners identified types of change, including organisational and laws.

For part (b) some learners correctly outlined competent persons needing to evaluate the significance of change. However, some learners incorrectly specified the meaning of competence which was not asked for in the question.

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- Question 6** **Identify** hazards that should be considered when planning diver operations beneath an oil and gas platform. (8)
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This question assessed learners' knowledge and understanding of learning outcome 5.1: Identify the main hazards of and suitable controls for marine transport in the oil and gas industries.

This question was answered well. However, some learners were a little too vague, giving insufficient, generic answers such as weather conditions, vehicle movements and temperature. The correct responses would have been tidal swells, remotely operated vehicles and water temperature excesses, respectively.

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- Question 7** Following preparation of a vessel for maintenance on an oil and gas installation, a low specific activity (LSA) radioactive sludge was encountered.
- Outline** control measures to help reduce the risk to workers exposed to the sludge. (8)
-

This question assessed learners' knowledge and understanding of learning outcome 1.2: Explain the hazards inherent in oil and gas arising from the extraction, storage, and processing of raw materials and products.

While learners correctly identified the requirement for personal protective equipment and barriers to restrict access, few mentioned the need to consider controls depending on radioactive material action limits and limited their marks.

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- Question 8** Pipelines are used in the oil and gas industry to transport hydrocarbons over long distances.
- (a) **Identify** typical causes of containment loss with these pipelines above and below ground. (3)
- (b) **Outline** control measures that protect these pipelines above and below ground. (5)
-

This question assessed learners' knowledge and understanding of learning outcome 3.4: Outline the hazards, risks and controls available for safe containment of hydrocarbons offshore and offshore.

In part (a) learners correctly identified causes of containment loss such as corrosion.

In part (b) most learners gave good answers, although few specified the possible need to inform or regularly contact landowners.

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- Question 9**
- (a) **Give** the meaning of the term '*inerting*'. (2)
- (b) **Outline** workplace processes in the oil and gas industry where inerting is required. (4)
- (c) **Outline** risks from inert atmospheres during maintenance. (2)
-

This question assessed learners' knowledge and understanding of learning outcome 2.5: Explain the importance of safe plant operation and maintenance of hydrocarbon containing equipment and processes.

In part (a) some learners were familiar with inerting, but generally learners found this topic challenging. Inerting relates to the partial or complete substitution of oxygen.

In part (b) some answers displayed good practical knowledge of inerting when filling storage tanks and during start-up operations.

In part (c) learners correctly identified risks such as asphyxiation.

In industry, inerting gases are readily used and have the capacity to prevent fire and explosion through substitution of oxygen. However, operational (and particularly maintenance) personnel need to be vigilant with this invisible menace.

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- Question 10** Gases, vapours, mists and dusts can all form explosive atmospheres with air. Hazardous area classification identifies *zoning* where special precautions over ignition sources are needed to prevent fires and explosions.
- (a) **Identify THREE** zone classifications for a mixture of air and a hydrocarbon gas **AND outline** the related conditions for **EACH** zone. (6)
- (b) **Identify** zone classifications for a cloud of combustible dust in air. (2)
-

This question assessed learners' knowledge and understanding of learning outcome 3.5: Outline the fire hazards, risks and controls relating to hydrocarbons.

In part (a) learners frequently gained all of the marks available for identifying the zone classifications. However, fewer gained the marks available for accurate outlines of the related conditions that were required by the question.

In part (b) learners were able to identify the respective combustible dust classifications.

- Question 11** A maintenance worker was severely burned while disconnecting/disjointing a pipe that previously contained a corrosive chemical.
- Outline** possible root causes of this accident. (8)
-

This question assessed learners' knowledge and understanding of learning outcome 1.1: Explain the purpose of and procedures for investigating incidents and how the lessons learnt can be used to improve health and safety in the oil and gas industries.

While most learners answered this question well, some confused immediate causes with root causes.

Correct responses included an inadequate Lock Out, Tag Out (LOTO) procedure, whereas an incorrect response (of an immediate cause) would have been a behavioural one, such as the operator ignoring the LOTO procedure.

Examination technique

The following issues are consistently identified as the main areas in need of improvement for learners taking Certificate level qualifications:

Learners misread/misinterpreted the question

Learners misreading or misinterpreting the question is by far the most common cause of learners not gaining the maximum marks available.

NEBOSH questions are systematically and carefully prepared and are subject to a number of checks and balances prior to being authorised for use in question papers. These checks include ensuring that questions set for the Certificate level qualifications relate directly to the learning outcomes contained within the associated syllabus guides. The learning outcomes require learners to be sufficiently prepared to provide the relevant depth of answer across a broad range of subject areas. For example, a learner could be asked about the causes of stress, or could be asked about the effects of stress. A question could require a response relating to the principles of fire initiation, or a question could require a response relating to the spread of fire. Therefore, a learner should focus not only on the general topic area (eg stress, fire) but also the specific aspect of that subject to which the question relates.

Learners must also pay attention to the command word. For example, a question could ask learners to '**identify** the hazards associated with demolition work', or a question from the same element could ask learners to '**outline** the control measures required during demolition work'. Learners appear to focus solely on the object of the question (demolition) and do not pay sufficient attention to the subject (hazards or control measures in the examples given) or the command word ('identify' or 'outline' in the examples given). There is often some confusion between hazard and risk. If a question requires an outline of hazards for a given situation, learners must be careful not to provide risks, or even in some circumstances precautions, as they will not be able to attract marks.

Examiners suggest that while many learners do begin their answer satisfactorily and perhaps gain one or two marks, they then lose sight of the question and include irrelevant information. Although further points included in an answer can relate to the general subject area, these points are not focused on the specific learning outcome and marks cannot be awarded. However, some learners appear to misread or misinterpret several questions. This situation is more likely due to learners preparing for the examination with a number of memorised answers obtained through rote-learning, that again can provide answers that are loosely associated with the subject matter but do not provide answers specific to the question. Such an approach is clearly evident to an Examiner and demonstrates little understanding of the subject matter and marks are not awarded.

Learners are advised to allow sufficient time to read and re-read the question in order to determine the key requirements prior to committing their answer to paper. Preparing a time plan before the examination will indicate how many minutes are available for each question and then part of this time allocation can be given to reading the question. Underlining or highlighting key words can assist in keeping focused on the salient points and simple mind maps or answer plans can also be useful. Maps and plans should be kept simple so as not to use up too much examination time.

Learners did not respond effectively to the command word

A key indicator a question will be the command word, which is always given in **bold** typeface. The command word will indicate the depth of answer that is expected by the learner and relates to the amount of detail that should be included in each point of the answer.

The learning outcomes in each element of all syllabus guides include the relevant command word that dictates the level of detail that should be covered in a course of study and the depth of answer that a learner would be expected to provide in an answer to an examination question.

Examiners report that learners continue to incorrectly observe the command words and therefore compromise their ability to gain the marks available. The majority of cases where command words are not observed relate to insufficient detail being given by a learner in their examination answer. A significant number of learners, irrespective of the command word given in the question, provide all answers in the form of a brief list of one or two words. This would normally not be sufficient to gain marks where the command word given was 'outline', 'explain' or 'describe', all of which require answers of more than one or two words.

Some learners do provide too much information, which would not be required where a command word limits the expected answer to 'give' or 'identify'. Learners would not be penalised for providing excessive detail but this would not be an efficient use of the time allocated.

Learning Partners should ensure that learning materials complement the command words in the syllabus guide and the NEBOSH guidance on command words and that sufficient time is given to advising learners on suitable examination technique during a course of study.

Learners unnecessarily wrote the question down

Developing a time plan is a key element in preparing for an examination. Advice included on Certificate question papers suggests that 30 minutes should be allocated for the answer to the long 20-mark question, and 90 minutes should be allocated to the answers for the remaining ten, 8-mark short questions. Therefore there are around 9 minutes available to answer an 8-mark question. This time will be required for reading the question properly at least twice, developing an answer plan, and then committing the answer to paper while regularly referring back to the question in order to maintain focus. Therefore any inefficient use of this time should be avoided.

The efficient use of this time is essential in order to ensure that all questions can be answered within the 2 hours available. Many learners feel it necessary to write out the question, in full, prior to providing their answer and although this practice will not lose marks it will lose valuable time. A significant number of learners do not answer all of the questions in the time permitted and do not complete the question paper, some of whom obviously run out of time.

Learners provided rote-learned responses that did not fit the question

It is clear that there are a significant number of learners who seem to recite answers in the examination that have been rote-learned in advance and do not answer the question.

While knowledge of material forms a part of the study for a Certificate-level qualification, a key aspect being assessed is a learner's **understanding** of the subject and reciting a pre-prepared and memorised answer will not show a learner's understanding. In fact, if a learner gives a memorised answer to a question that may look similar, but actually is asking for a different aspect of a topic in the syllabus, it shows a lack of understanding of the subject and will inevitably result in low marks being awarded for that answer.

Learners repeated the same points but in different ways / Learners provided the same answer to different questions

There are instances where learners repeat very similar points in their answers, sometimes a number of times. This is easily done in the stressful environment of the examination. However, once a point has been successfully made and a mark awarded for it, that mark cannot be awarded again for similar points made later in the answer.

Learners are advised to practise examination technique in their preparations to avoid this kind of pitfall. Writing an answer plan where points can be ticked off when made, or structuring an answer so that each point made is clearly shown, for example by underlining key points, can be of great use. This technique aids learners and makes it much clearer in the stress of the examination for learners to see which points have been made and reduce the chances of the same point being made several times.

Learners did not answer all of the questions

It has been noted that a number of learners do not attempt all of the questions and of course where a learner does not provide an answer to a question, no marks can be awarded. This seriously affects the potential marks available and the possibility of achieving a pass. Learning Partners must emphasise the importance of attempting all questions in order to maximise the opportunity to attract marks.

There can be several reasons for this issue: running out of the allocated time for the examination, not knowing the answer to the question, or forgetting to answer a question.

Questions can be answered in any order and answers can be written in any order in the answer book provided. Learners are advised to clearly keep track of questions they have attempted, such as marking them on the question paper that would minimise the risk of inadvertently missing a question to answer.

If the subject of the question is unfamiliar or the answer is not known, then it will be challenging to provide an answer. This can result from rote-learning and preparing for an examination with a number of memorised answers, or simply not being adequately prepared for the examination across the breadth of the syllabus. There is always the risk of a learner 'going blank' in an examination situation, in which case learners should be prepared with some techniques to help. Rather than trying to remember what was taught or what has been read, ask yourself 'what would I do, in this situation?'. Reference to personal application or experience is sometimes enough to stimulate an answer that otherwise may have been missed. Alternatively, learners can go back to first principles and break a question down into elements such as 'people', 'equipment', 'materials' and the 'working environment'. Approaching a question in small sections can minimise the risk of being overwhelmed by it as a whole.

Running out of time can be avoided by having an examination time plan and working to it. The question paper advises that you should spend 30 minutes on the long answer (question 1) and 90 minutes on the remaining ten short answer questions. This will provide around 9 minutes per short answer, follow the clock and when the time per question has expired, move on. Answering a question partly is better than not answering at all.

Learners did not allocate enough time to the question / Time management

In a number of cases question 1 is left until last or later in the question paper and does not appear to be answered completely. Other learners appear to rush the last one or two questions by providing very brief or bullet point answers, even when these questions require an outline. This indicates a lack of time management. It is advised that Learning Partners and learners spend time developing the skill of writing answers to questions bearing in mind the number of marks and time available. A 20-mark question requires significantly more detail than an 8-mark question.

Learners might benefit from writing abbreviations to save time and to recognise that there is no need to write out the question at the beginning of their answer. Standard abbreviations such as HSE, RIDDOR, COSHH, PPE and DSE are acceptable.

Learners' handwriting was illegible

Sometimes Examiners have difficulty in reading the handwriting of some learners. Although allowances are made for learners under the pressure of an examination, Learning Partners must remind learners that their writing needs to be legible or valuable marks may not be picked up during marking.

There is a minimum literacy requirement for learners on NEBOSH qualifications. As stated in the syllabus guides the standard of English required by learners studying for Certificate level must be such that they can both understand and articulate the concepts contained in the syllabus.

NEBOSH recommends to Learning Partners that learners taking this qualification should reach a minimum standard of English equivalent to an International English Language Testing System score of 6.0 or higher in IELTS tests in order to be accepted onto a Certificate level programme.

For further information please see the latest version of the IELTS Handbook or consult the IELTS website: <https://www.ielts.org/about-the-test/test-format>

Learners wishing to assess their own language expertise may consult the IELTS website for information on taking the test: <https://www.ielts.org>

Learning Partners are reminded that they must ensure that these standards are satisfied or additional tuition provided to ensure accessible and inclusive lifelong learning.

Command words

Please note that the examples used here are for the purpose of explanation only.

Outline

The command word 'outline' is by far the most challenging for learners. Referring to the NEBOSH guidance on command words available on the NEBOSH website, 'outline' means *"To indicate the principal features or different parts of"*.

Many learners do not give sufficient detail in order to warrant an 'outline' answer. The NEBOSH guidance on command word states that *"an exhaustive description is not required. What is sought is a brief summary of the major aspects of whatever is stated in the question"*.

If the use of the command word in everyday language or conversation is considered it may help the learner understand what is required. If asked to '**outline** the risks to an operator when manually closing a valve' an answer such as 'cuts, bruises, burns and strains' would be insufficient as this represents a listed answer. However, 'cuts from contact with sharp edges of the hand wheel, bruises from impact with adjacent plant items, burns from contact with adjacent uninsulated pipe work and strains from using excessive force' would be sufficient.

Explain

The command word 'explain' requires the learner to provide an understanding of the subject of the question and will usually be used in conjunction with 'why' or 'how'. Such as '**explain** how an interlocked guard operates' or '**explain** why a forklift truck may overturn'.

Some learners approach an 'explain' question the same as an 'outline' and provide a number of individual points rather than providing an explanation as to how something operates or why something occurs. While some learners do answer such questions sufficiently and satisfactorily, other learners have difficulty in explaining in a logical sequence and many repeat the same point.

Identify

'Identify' questions require the name or title of an item, such as, '**identify** the effects of electricity on the human body', or '**identify** the features of a vehicle route'. In most cases one or two words will be sufficient and further detail will not be required to gain the marks.

For example, if asked to '**identify** types of equipment found in an office' appropriate answers could be personal computer, printer, telephone, photocopier, etc. There would be no need to embellish those points with a description of the equipment or its function.

However, in contrast to 'outline' answers being too brief, many learners feel obliged to expand 'identify' answers into too much detail, with the possible perception that more words equals more marks. This is not the case and Learning Partners should use the NEBOSH guidance on command words within their examination preparation sessions in order to prepare learners for the command words that may arise.

Describe

The command word 'describe' clearly requires a description of something. The NEBOSH guidance on command words says that 'describe' requires a detailed written account of the distinctive features of a topic such that another person would be able to visualise what was being described.

If asked to describe the clock in the examination room, a person would have little difficulty in doing so and would most probably refer to its shape, its size, the colour of the clock and the style of numerals. Answers to such a question would almost certainly not result in general unconnected information about clocks, the history of clocks, or an explanation of why the clock is present in the room. Learners should consider the general use of the command word when providing examination answers.

Give

'Give' questions require a statement that is relevant to the subject asked for in the question but additional explanation is not required. Often, 'give' questions ask for the meaning of a particular term. While detailed explanation of the application of the term would not be required, a correct knowledge of the term itself is needed in order for the Examiner to award marks.

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.