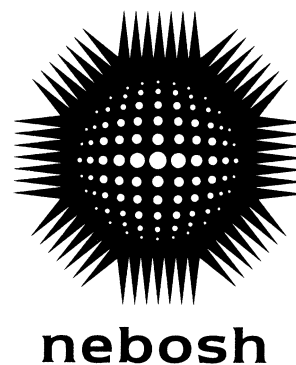


# NEBOSH International Technical Certificate in Oil and Gas Operational Safety



## UNIT IOG1 - Management of international oil and gas operational safety

### Duration of examination: 2 hours

Answer **ALL** questions.

The maximum marks for each question, or part of a question, are shown in brackets.

Start each answer on a new page.

Answers may be illustrated by sketches, where appropriate.

This question paper must be returned to the invigilator after the examination.

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You are advised to spend about **half an hour** on **Question 1**.

You are advised to spend a total of about **one and a half hours** on **Questions 2-11**.

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- 1 (a) **Outline** reasons why incidents should be investigated by employers. (4)
- (b) Incident investigations commonly include the following sequence of stages:
1. gathering information;
  2. analysing information;
  3. identifying suitable risk control measures;
  4. producing an action plan.
- Identify** which stage **EACH** of the following tasks aligns with:
- (i) drawing conclusions about immediate causes of the incident; (1)
  - (ii) collecting a permit-to-work document from permit display boards; (1)
  - (iii) suggesting that inexperienced workers are supervised more closely; (1)
  - (iv) documenting a management system failure as a root cause; (1)
  - (v) reducing likelihood by requesting updated standard operating procedures; (1)
  - (vi) prioritising risk control measures for implementation; (1)
  - (vii) taking measurements at the scene of the incident; (1)
  - (viii) nominating timescales given for short and long term recommendations. (1)
- (c) As the health and safety adviser on an incident investigation team, **explain** how you can help ensure that recommendations are effective. (8)

- 2 Oil and gas production installations use flare systems and blowdown to protect safety-critical equipment.
- (a) Flare systems are used as part of the pressure relief system where steam is used at the flare stack.
    - (i) **Outline** the purpose of a flare. (2)
    - (ii) **Outline** the purpose of using steam in flare systems. (1)
    - (iii) **Identify** additional types of flare system used in oil and gas production installations. (3)
  - (b) **Give** the meaning of the term '*blowdown*' in the context of the oil and gas industry. (2)
- 3 **Identify** suitable controls for traffic management on a large refinery site. (8)
- 4 **Outline** topics for discussion between a permit issuer and contract worker before the commencement of work under a hot work permit. (8)
- 5 **Outline** what should be considered when determining the adequacy of an escape route in an oil and gas installation. (8)
- 6 Following an annual shutdown of a process plant, **outline** operational control measures that could help reduce the risk of an incident *before* filling equipment in preparation for start-up. (8)
- 7 (a) Concept and commissioning are process plant project phases where risk management applies.
- Identify FOUR** additional project phases where risk management applies. (4)
- (b) **Outline** the concept of '*as low as reasonably practicable*' (ALARP) within risk management. (2)
  - (c) **Outline** how a quantitative risk assessment mainly differs from a qualitative risk assessment. (2)
- 8 (a) **Give** the meaning of the term '*standard operating procedure*'. (3)
- (b) **Outline** benefits of a standard operating procedure. (5)

9 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)

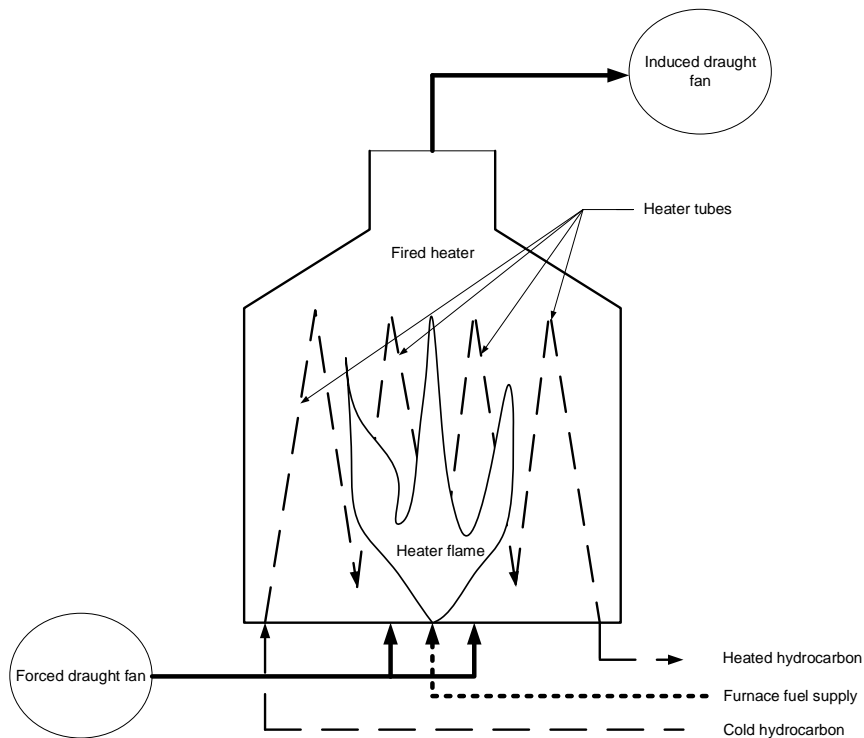
10 Decommissioning of plant involves decontamination.

(a) **Outline** the objectives of decontamination. (3)

(b) **Identify** physical forms that the plant contaminants can take. (2)

(c) **Outline** ways of decontaminating plant. (3)

11 A fired heater is used to heat a hydrocarbon fluid. A forced draught fan supplies the air that is required for combustion and the induced draught fan extracts the combustion gases. The cold hydrocarbon flows through tubes within the heater and is heated indirectly by the ignited fuel.



With reference to the description and diagram above:

(a) **identify** possible causes of low hydrocarbon flow through the heater tubes; (2)

(b) **outline** controls that prevent heater tube failure. (6)



**Do not turn this question paper until you are instructed to do so by the invigilator.**

Please check your student number and name printed on this document are correct. If they are not correct you **MUST** inform the invigilator immediately.

Student Number:

Name:

Examination date:

Please also check that this paper is for the correct Unit and Qualification:

Unit: **IOG1 – Management of international oil and gas operational safety**

Qualification: **NEBOSH International Technical Certificate in Oil and Gas Operational Safety**

At the end of the examination you must return this question paper to the invigilator.