March 2009

Examiners' Report

NEBOSH National General Certificate in Occupational Health and Safety (NGC2)

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NEBOSH LEVEL 3 CERTIFICATE IN OCCUPATIONAL HEALTH AND SAFETY

PAPER NGC2: CONTROLLING WORKPLACE HAZARDS

MARCH 2009

CONTENTS

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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 to be 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

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 Department for Education and Skills (D*f* ES), 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 the question 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 any degree of understanding. Candidates should prepare themselves for this vocational examination by ensuring their understanding, not rote-learning pre-prepared answers.

Recurrent Problems

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.

Paper NGC2
Controlling workplace hazards

Question 1 *There has been an increase in the number of cases of occupational stress reported in a large organisation.*

(a) ***Identify FOUR*** *behavioural symptoms of occupational stress.* ***(4)***

(b) ***Outline*** *factors that could lead to occupational stress.* ***(8)***

(c) ***Outline*** *the control measures that could be taken to minimise the risk of occupational stress.* ***(8)***

In answering part (a) of the question, candidates could have identified behavioural symptoms of occupational stress such as an increased dependency on tobacco and /or alcohol; lack of concentration; relationship problems with displays of aggression or irritability; mood swings; obsessive behaviour; issues of confidence and evasive behaviour. This part of the question was generally well answered though some candidates did have a misconception about what constituted a behavioural symptom.

For part (b), factors that could lead to occupational stress could usefully have been divided into those relating to work or task organisation and those relating to workplace interactions. Job factors might include work load, work patterns such as shift work, unsocial hours or excessive overtime and the work environment; repetitive or monotonous work; lack of adequate breaks; lack of control over the job with work loads too high or too low and the task not matched to the skills of the individual; and a lack of support from management with limited resources in the way of equipment or systems available, no information or training given to employees and requests for help and support ignored. Additionally, organisational change could result in insecurity and the fear of redundancy. Interactions involve such issues as harassment, bullying, discrimination, fear of violence, poor communication and general relationships with supervisors and work colleagues. There are also a range of personal and social factors such as illness, financial worries and family commitments and problems that could increase an employee's level of stress at work, even if some may not be work related.

Options that are available to an organisation to reduce stress levels amongst its employees include those related to work/life balance such as the organisation of shift patterns, discouraging the working of excessively long hours and introducing flexible working arrangements; introducing job rotation and increasing work variety; drawing up clear job descriptions and taking steps to match individuals to the descriptions; seeking the views of employees for example in team meetings or in staff appraisals and involving them in decisions; improving the working environment and systems of work; introducing and implementing policies to cover harassment, discrimination, violence and the investigation of complaints and ensuring adequate levels of supervision with supervisors trained to recognise the symptoms of stress so that ameliorative action can be taken or, in extreme cases, so that those affected might be offered counselling.

Answers to parts (b) and (c) of the question varied in quality with many candidates producing lists rather than outlines and finding difficulty in identifying a broad range of factors and control measures. There were few candidates who demonstrated a good understanding of HSE's stress management standards.

Question 2

(a) ***State*** *the significance of the 'fire triangle'.* ***(4)***

(b) ***Identify TWO*** *methods of heat transfer* ***AND state*** *how* ***EACH*** *can cause the spread of fire in work premises.* ***(4)***

Most candidates were able to state often with the aid of a clearly labelled diagram, that each side of the fire triangle represents one of the three elements – namely, fuel, oxygen and a source of ignition, heat or energy – that must be present for combustion to occur.

For part (b), candidates could have chosen two methods of heat transfer from the following: conduction where, for example, heat can travel through conductive solids such as metal beams between separate compartments and cause ignition; radiation where heat is radiated through the air causing heating of material at a distance; convection involving the upward transfer of heat by currents of hot air and contact or direct burning where a heat source comes into direct contact with combustible material causing ignition. While candidates were able to identify methods of heat transfer there were occasions when they found difficulty in showing how they might cause a fire to spread in the workplace.

Question 3

Identify *the precautions that could be taken to reduce the risk of injury when using stepladders.* ***(8)***

In answers to this question, Examiners were looking to candidates to identify precautions such as: the need to ensure that the stepladder is inspected for defects before use; that it is correctly erected on level ground with its chain or rope fully extended; that it is suitable for the task to be performed and does not involve carrying out work from the top step; that it is footed by a second person when necessary; that it is correctly positioned to avoid over-reaching; that it is not overloaded and that side loading is avoided since it could have an effect on lateral stability.

Many candidates did not read the question with sufficient care and identified the precautions to be taken in the use of a ladder rather than a stepladder. They were, however, able to gain some marks since some of the required precautions are common to both types of ladder.

Question 4

(a) *In relation to machine safety,* ***outline*** *the principles of operation of:*

(i) *interlocked guards;* ***(2)***

(ii) *trip devices.* ***(2)***

(b) *Other than contact with dangerous parts,* ***identify FOUR*** *types of hazard against which fixed guards on machines may provide protection.* ***(4)***

For part (a), candidates should have referred to an interlocked guard as one that is linked to the machine controls by mechanical, electrical, hydraulic or pneumatic means so that the machine will not operate until the guard is closed, and when the machine is in a dangerous condition, the guard is either prevented from opening or, if it is opened, the dangerous parts of the machine are made safe. A trip device, on the other hand, detects the presence of a person or body part and operates when the person approaches a danger area. Typical examples are trip bars or probes, pressure mats or

photoelectric systems ('light curtains'). Once the device is triggered, it 'trips' the machine which either stops or otherwise becomes safe.

For part (b), Examiners expected candidates to identify how a fixed guard might help to protect employees by reducing noise emissions, by containing hazardous substances such as oil mist or dust, by providing shielding against heat or electricity, and by preventing the ejection of material (for example, particles or broken mechanical parts) from the machine.

Answers to this question were generally not to the required standard and many candidates showed a lack of understanding of the principles of machinery guarding often relating trip devices to residual current devices which would trip when activated. In answers to part (b), despite the wording of the question, reference was often made to contact with dangerous parts of the machine.

Question 5 *An industrial washing machine has been installed on a concrete floor of a factory in order to clean employees' work clothes. When the machine is in use, employees are exposed to excessive noise levels that are emitted from the machine.*

(a) ***Identify FOUR*** *possible effects on the health of the employees from long-term exposure to the noise.* ***(4)***

(b) ***Outline*** *the practical measures that could be taken to reduce the levels of noise to which the employees are exposed.* ***(4)***

In answering part (a) of the question, candidates should have identified possible effects such as permanent threshold shift, noise induced hearing loss, chronic tinnitus, occupational deafness and secondary effects such as stress, headaches and loss of concentration.

For part (b), practical measures that could have been outlined included moving the washing machine to a separate sound proofed room; placing it on rubber matting; erecting an insulating barrier in front of the machine; ensuring regular maintenance was carried out on the machine such as lubricating the bearings and adjusting the belts; stiffening or damping the metal case; using the machine outside of working hours; outsourcing the laundering; providing hearing protection such as ear plugs or muffs and even buying a quieter machine.

Answers to this question were generally to a good standard though in the second part some candidates referred to maintenance and the provision of hearing protection in general terms without giving specific examples of what these would entail.

Question 6 *A storeman is required to place boxes of metal components by hand onto shelved racking.*

(a) ***Identify FOUR*** *types of injury to which the storeman may be at risk while carrying out this operation.* ***(4)***

(b) ***Identify*** *the factors in relation to the* ***task*** *that will affect the risk of injury.* ***(4)***

In answering part (a), candidates could have chosen from potential injuries including spinal disc compression or prolapsed disc, strains to tendons or muscles, hernia, dislocation or fracture of bones, cuts and abrasions and crushing or impact injuries.

Some referred only to non specific injuries such as back pain and work related upper limb disorders (WRULDs) for which no marks could be awarded.

Answers to part (b) required candidates to identify factors relating to the task which could have contributed to the risk of injury such as the manipulation of the load at a distance from the trunk, the work rate and insufficient periods allowed for rest and recovery, excessive carrying distances, excessive lifting or lowering distances, and the need to adopt unsatisfactory body positions because of space restrictions. Despite the word "task" being highlighted in the question, there were some candidates who identified factors related to the individual, the load and the environment but not the task.

Question 7 *An engineering company has noticed a recent increase in work-related ill-health amongst the shop floor workers who use a degreasing solvent for which a workplace exposure limit (WEL) has been assigned.*

(a) ***Explain*** *the meaning of the term 'workplace exposure limit'.* ***(2)***

(b) ***Give*** *possible reasons for the increase in work-related ill-health amongst the shop floor workers.* ***(6)***

The "workplace exposure limit" is concerned with concentrations of hazardous substances in the air that people breathe averaged over a specified period of time and referred to as a time weighted average. Two time periods are used: long term (8 hours) intended to control effects by restricting the total intake by inhalation over one or more work shifts and short term (usually 15 minutes) to control effects that may be seen after a brief exposure. WEL is an important basic concept and candidates should be aware of it but few showed that they were.

In part (b), an important reason for the increase in work related ill-health might have been the inadequacy of the original risk assessment carried out for the operation or a subsequent increase in the frequency and duration of the exposure of employees. Additionally, the original degreasing solvent might have been replaced by a new solvent for which no risk assessment had been carried out. Other reasons would include a failure to carry out health screening of new employees or to give them adequate training on the precautions to be observed; an increase in the quantity or concentration of the solvent; an inadequate or poorly maintained local exhaust ventilation system; a failure to provide personal protective equipment or to wear it if issued and a failure to carry out regular monitoring to ensure the work exposure limit was not being exceeded. Answers to this part of the question were to a better standard though candidates tended to refer to ventilation in general terms rather than to the more specific local exhaust ventilation.

Question 8 *(a)* ***Identify*** *the possible effects of electricity on the body.* ***(4)***

(b) ***State*** *the emergency action to take if a person suffers a severe electric shock.* ***(4)***

For part (a), most candidates were able to provide a reasonable description of the effects of electricity on the body. This included reference to the cardio-respiratory effects, in particular the risk of fatal injury due to disruption to heart rhythm; muscular contraction following contact with AC current resulting in an involuntary grip on the live conductor, thus prolonging current flow through the body; tissue burns with the main sites of damage being the entry and exit points with the possibility of damage to internal organs and fractures or dislocations caused by a resulting fall.

The second part of the question, which required candidates to state the emergency actions necessary after someone receives an electric shock, was also well answered. Depending on the circumstances, these may include isolation of the victim from the supply (either by switching off or pushing him/her clear with a non-conductive implement), summoning help, administering first aid such as cardio-pulmonary resuscitation, treatment of burns and other injuries, placing the victim in the recovery position and remaining with him/her until professional medical help arrives. Some candidates then went on to refer to the need to report the accident and commence an investigation into the occurrence, detail that was not particularly relevant to the question.

Question 9 *A mechanical hoist is to be used to remove an engine from a vehicle in a motor repair shop.*

(a) ***State*** *the requirements for the statutory examination and inspection of the hoist.* ***(4)***

(b) ***Outline*** *the precautions to be taken to reduce the risk of injury to employees and others during the lifting operation.* ***(4)***

Those candidates familiar with LOLER would have had little difficulty with the first part of this question. The Regulations require the hoist to be thoroughly examined by a competent person prior to its first use and then at least once in every period of twelve months in accordance with an examination scheme and additionally after repair from identified faults and after any exceptional circumstances liable to jeopardise the safety of the equipment. Few candidates able to state the statutory requirements and some referred to PUWER rather than to LOLER.

Answers to part (b) were also limited and many showed a minimal understanding of lifting operations. There may well have been candidates who were unfamiliar with the type of mechanical hoist that was to be used but who, by working from first principles, could have arrived at least at some of the precautions necessary for its safe use. Precautions to be taken include a pre-use inspection; siting the hoist on firm level ground, with wheels locked during the lifting operation; securing the load firmly to the hook of the hoist with appropriate lifting accessories; ensuring that the weight of the engine is within the safe working load of the equipment; prohibiting work under the suspended load; carrying out the lift at a steady rate; transporting the engine over a short distance before lowering it on to a trolley or bench and using competent employees under supervision to carry out the operation.

Question 10 *(a)* ***Identify FOUR*** *hazards associated with the use of photocopiers.* ***(4)***

(b) ***Outline*** *the precautions that should be taken to reduce the risks to health and safety of photocopier users.* ***(4)***

There is a range of both mechanical and non-mechanical hazards associated with photocopiers from which candidates were required, for part (a), to select four. Hazards can arise from contact with solvents and toners, exposure to ozone, electricity, hot surfaces, sharp edges, non-ionising radiation and entanglement or trapping in moving parts when clearing jams.

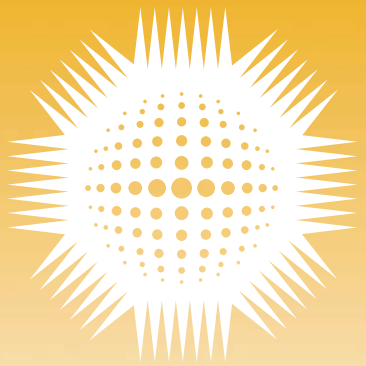
In answering part (b), candidates were expected to refer to precautions such as the need to site and use the machine in a well ventilated area; wearing gloves as a protection against toner and solvent; isolating the electricity supply before opening the machine doors; ensuring the cover is closed when the machine is in use to shield from radiation; fitting warning signs to the machine to warn of hot surfaces and training of personnel in the safe use of the machine.

This question in general did not seem to provide much difficulty for the majority of candidates.

Question 11 ***Identify EIGHT*** *components of an independent tied scaffold that has been erected by a competent person.* ***(8)***

Most candidates gained some success in answering this question by referring to components such as standards, transoms, base plates, sole boards, ledgers, bracing, ties, working platforms, toe boards and guard rails, safe means of access such as ladders internal to the structure, brick guards and chutes to dispose of waste.

A few candidates, however, were unable to give the correct name to the component and others appeared not to know the difference between an independent tied scaffold and a scaffold tower.



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