



NEBOSH Certificate NGC1/6 Principles of control

Suggested answers to revision questions

A1 The steps to a safe system of work:

- *assess the task*
- *identify the hazards*
- *define safe methods*
- *implement the system*
- *monitor the system*

A2 The basic procedure for job safety analysis:

Step 1 Identify the job to be examined

Step 2 Break the job down into its chronological step-by-step component parts

Step 3 Critically observe and examine each component part of the job to determine any hazard

Step 4 Determine whether there is a significant risk from the observed hazard, to people or plant

Step 5 Develop suitable control or protective measures to eliminate or reduce the risk of danger to people and plant

Step 6 Produce written safe systems of work and job safety instructions

Step 7 Provide the necessary training to operate the safe system of work

Step 8 Review safe systems of work at planned intervals to ensure that they continue to be relevant and used

A3 Situations where a permit to work will probably be required:

- *entry into confined spaces*
- *work at heights*
- *high voltage electrical work*
- *complicated maintenance work*
- *demolition work*
- *work in environments which present considerable health hazards:*
 - » *radiation work*
 - » *conditions of severe thermal stress - repair work in kilns, food freezer storage systems*
 - » *work involving toxic dusts (asbestos), gases and vapours (often in confined spaces)*
- *lone worker (remember that we discussed the various ways in which this term is used)*

You should be able to describe just how a permit to work system works, perhaps with the aid a simplified figure showing the layout of a permit to work form for a particular environment - confined space, hot work etc.





A4 As we pointed out, the causes of some of the very worst accidents have revolved around the problems of shift changes; another example could be the Herald of Free Enterprise disaster where nearly two hundred lives were sacrificed because of the combination of incompetent unqualified shore-based 'management' and so-called systems of work on board the ship which involved bizarre communications arrangements such as shoes left outside sleeping cabins as the sign that on-coming staff needed to be woken ready for the next shift.

A5 A brief essay on competence would encompass the often-used but clearly not entirely satisfactory circular argument that 'a person is considered as competent to undertake a certain function if his work experience and the training he has undertaken enable him to properly fulfil the duties involved in' and so on. Your answer should also encompass the fact that many people of long experience are very competent even though they may have received no formal training at all. Increasingly, legislation (Regulations) makes mention of the sort of qualifications that might be sufficient to indicate the competence necessary to undertake particular work responsibilities. Your answer should also encompass the growing importance of NVQs and similar qualifications.

A6 The three duties defined by The Confined Spaces Regulations are as follows:

- avoid entry into confined spaces*
- if entry is unavoidable, a safe system of work must be followed*
- adequate emergency procedures must be in place before work starts*

A7 Confined space accidents

- fire / explosion in confined space such as a ship's compartment or an underground water pumping system*
- accidents in structures such as grain silos - suffocation in the grain or collapse due to lack of oxygen*
- fumes from toxic chemicals in a sewage system*
- vapour from solvent or other cleaning agents causing toxic effects or fire in a confined space such as a storage tank*
- leakage of volatile chemicals such as a fuel oil into building excavations leading to explosion or toxic effects*

A8 Examples of confined spaces and their associated hazards

You should be able to name many examples: drains, ventilation systems, cold compartments for food storage and so on. You should also be able to relate these examples to their respective hazard(s), which may be classified as follows:

A Hazards presented by gases, fumes and vapours

- substances already present when work begins*
 - » remains of stored substances (ie in storage tanks)*
 - » sludge and decaying matter (drainage systems, sewers and so on)*
 - » carbon dioxide, the product of acid rainwater reacting with chalk*
- substances which are created by work activities*
 - » welding fumes, adhesives, solvents*
 - » heat from human and machine activity*
 - » oxygen enrichment from use of oxy/acetylene and similar equipment*
- substances which seep into the confined space as the work progresses*
 - » as a result of accidental damage to pipelines etc*





» a consequence of seepage of air currents bringing contaminants into the confined space, for example: exhaust fumes from nearby plant such as dumper trucks and compressors - petrol or diesel plant should never be operated in a confined space

B Oxygen deficiency may occur as a result of organic decay processes using up oxygen or as a result of an area being purged by the use of an inert gas such as nitrogen to flush out explosive gases such as methane; further purging with air may be required before the space is safe to enter.

C Fire, explosion and other hazards.

General precautions against the hazards presented by gases, fumes and vapours in confined spaces include:

- use of intrinsically safe electrical equipment
- continuous monitoring of the atmosphere
- provision of adequate ventilation

A9 In the case of confined space working, the permit to work provides:

- written authority for the space to be entered and for work to start and finish
- time limits and correct sequences
- procedures and responsibilities of all those involved
- checks and precautions pertaining to:
 - » atmospheric testing
 - » breathing apparatus
 - » rescue equipment and personnel

A10 In defining 'first aid', at the least you should remember that the 1981 Regulations provide a definition of 'first aid' - the examiners would give you credit for this. If you cannot remember the 'official' definition, you should be able to cobble together your own definition encompassing words such as:

... for the purpose of preserving life ... minimising the consequences of injury and illness until the help of a medical practitioner is obtained. The treatment of minor injuries which do not need further treatment by a medical practitioner.

If you ensure that you include these three aspects in your first-aid definition, you will not go far wrong.

A11 The main requirements of The Health and Safety (First-Aid) Regulations 1981 include:

- duty of employer to make provision for first aid:
 - » assessment of need
 - » first aid materials, equipment and facilities
 - » first aid personnel
- duty of employer to inform his employees of the arrangements made in connection with first aid including information for employees
- duty of self-employed person to provide first aid equipment

A12 The First-Aid Regulations are kept up-to-date via the flexibility of successive approved codes of practice.

A13 For the definition of appointed person etc we refer you to the study material. Also make sure that you have a clear idea of what constitutes, and examples of, low, medium and high risk work environments.

