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National Occupational Standards for Chemical, Pharmaceutical and Petro-chemical Operations

Controlling Process Operations

Approved by UKCG May 2005

The Sector Skills Council for Chemicals, Nuclear, Oil and Gas Petroleum and Polymers

AMENDMENTS				
AMENDMENT & DATE	**PAGES**	**CHANGES MADE BY:**	**CHECKED BY:**	**APPROVED BY:**

Any amendments made to this standard by Cogent will be recorded above.

Commentary for Unit 1.13:

Working effectively in a team

This unit addresses the competence required to work with others. This involves:

- those working in isolation, who need to communicate with others
- those working in groups
- accepting and clarifying responsibilities
- providing and receiving support and feedback
- working in ways which maintain your own and other's safety

There are three elements in this unit, each of which has performance standards and a knowledge base associated with it.

1.13.1 Determine and agree individual responsibilities in working with others
1.13.2 Complete work activities in conjunction with others
1.13.3 Provide and receive support and feedback

There is also a glossary of terms which appear within the unit and have a specific meaning.

Assessment Strategy Statement

In the context of N/SVQ assessment, the use of simulation is not acceptable in the assessment of this unit to cover the full scope as defined by the glossary of the unit. Workplace performance evidence is mandatory for this unit.

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Responsibility — That which is given by the appropriate authority

Authority — This gives the individual/s, permission to perform the activities

Personnel/work situation — This may include one, or a combination of:

- one to one
- group/team work
- where disagreement occurs
- on person to a group situation

Communicate — This may include all forms of communication including:

- spoken
- written
- electronic

Documentation — This may include all types of documentation that may be used in the organisation, in relation to the activity.

Corrective action — To be aware of potential hazards involved in the process, and take corrective action when necessary, including emergency shutdown.

Problems — These include those encountered with either plant/equipment/materials/and/or personnel.

Feedback/Support — Assistance given or received within the organisation. All forms of feedback and support should be constructive.

Health, Safety and Environmental legislation — To be aware of all relevant legislation.

ELEMENT 1.13.1 Determine and agree individual responsibilities in working with others

In carrying out this work you must:

1. Check that you have the required **authority** to complete the required activity
2. Check whether you need to inform others who may be affected by this activity
3. If required, **communicate** with others by the appropriate method
4. Check that all **personnel** have received the necessary information
5. Check that all **personnel** understand and agree to their responsibilities
6. Deal promptly with any **problems** that arise, that are your **responsibility**
7. For **problems** that you cannot solve and/or are not your **responsibility** inform the appropriate person/s
8. Follow safe working procedures at all times
9. Work within agreed time schedules
10. Complete any required **documentation** clearly and accurately

To do this you need to know

a) the definition of authority and responsibility within the organisation
b) how to check whether you have the required authority
c) your personal responsibility in the operation
d) how to check whether others need to be informed
e) methods of communication within the organisation
f) how to check that all parties understand what is required of them (if required)
g) your personal responsibilities with regard to health, safety and environment
h) what typical problems may arise and how to deal with them
i) who to inform if you cannot solve the problem and/or it is not your responsibility
j) the importance of keeping to agreed time schedules
k) what documentation to use and what information needs to be recorded

ELEMENT 1.13.2 Complete work activities in conjunction with others

In carrying out this work you must:

1. Check that you understand the work activity
2. Ensure that you know and understand your **responsibility** in the activity
3. Check, when required, that all other **personnel** understand their responsibililties
4. Ensure that the activity proceeds as planned
5. Keep other relevant **personnel** informed of the progress of the activity
6. Deal promptly with any **problems** in the activity that are your responsibility

7. Take appropriate **action** when disagreement occurs
8. Inform the appropriate person of any **problems** you cannot solve and/or are not your **responsibility**
9. Work safely at all times with regard to material, equipment and personal safety
10. Use appropriate methods of **communication**

To do this you need to know

a) the method of work activity planned

b) what your responsibilities are in the activity

c) why it is important that all personnel understand what is required of them

d) methods of monitoring the activity

e) how to keep all relevant personnel informed of the progress of the activity

f) how to deal with problems that are your responsibility

g) who to contact if you cannot deal with the problem and/or it is not your responsibility

h) what actions could be taken when disagreement occurs

i) your personal responsibilities with regard to health, safety and environment

j) what methods of communication to use and when to use them

ELEMENT 1.13.3 Provide and receive support and feedback

In carrying out this work you must

1. Ensure that all **personnel** know their responsibilities
2. Use appropriate methods of **communication** to keep all **personnel** informed
3. Identify when assistance is required
4. Give assistance when required if it is within the limit of your **authority**
5. Deal with any **problems** effectively, if they are your **responsibility**
6. Inform the appropriate person when you cannot solve a **problem** and/or it is not your **responsibility**
7. Give constructive **support** and **feedback** to appropriate **personnel**
8. Receive **support** and **feedback** from **personnel**
9. Follow safe working procedures at all times
10. Complete any **documentation** clearly and accurately

To do this you need to know

a) the meaning of responsibility and authority in the organisation

b) methods of communication within the organisation

c) how to identify when assistance may be required

d) how to give assistance within your limit of authority

e) why it is important to give constructive feedback and support in the operation

f) how to give constructive feedback and support within the organisation

g) why it is important to deal with problems effectively

h) who to inform if you cannot solve the problem and /or it is not your responsibility or within your limit of authority

i) what your personal responsibilities are with regard to health, safety and environment

j) what documentation needs to be completed

k) the importance of completing documentation/records accurately and clearly

Unit 3.10 : Emergency procedure

This unit addresses the competence required to comply with site/plant emergency procedures. This involves:

- raising the alarm once an emergency has been identified
- informing others
- minimising the effect of an emergency
- maintaining your own and other's safety while working

There are two elements in this unit, each of which has performance standards and a knowledge base associated with it.

3.10.1 Raise the alarm on discovering an emergency
3.10.2 Minimise the effect of an emergency

Element 3.10.1 Raise the alarm on discovering an emergency

Performance statements

In achieving this unit you must:

a. Activate the appropriate **alarm** on discovering the **emergency**
b. Take **action** appropriate to the **emergency**
c. Check the location and type of the **emergency**
d. Provide accurate details on nature and location of the **emergency** to emergency services
e. If necessary, alert other people to the **emergency**
f. Try to ensure that people do not panic
g. **Communicate** with relevant people
h. Follow safe working procedures at all times

Knowledge and Understanding

i. the methods of raising the alarm
ii. why it is important to take action which is appropriate to the emergency
iii. the consequence of taking no action
iv. what type of action to take
v. why it is important to check on the location of the emergency
vi. how to provide clear and accurate details on the nature and location of the emergency
vii. when and how to alert other personnel to the emergency
viii. methods to try to stop panic
ix. why it is important to communicate with relevant others
x. methods of communication to use
xi. why it is important to try to follow safe working procedures

Element 3.10.2 Minimise the effect of an emergency

Performance statements

In achieving this unit you must:

a. Take **action** appropriate to the **emergency**
b. Ensure any **action** is taken promptly
c. **Communicate** with others during the **emergency**
d. Try to ensure that panic is minimised
e. Assess the **risk** to yourself and others of trying to contain the **emergency**
f. If the **risk** is not increased take appropriate **action** by following the correct procedure
g. Minimise the effect on the **environment** by using appropriate techniques
h. Comfort and reassure any casualties in the **emergency**
i. Give a full and accurate report of the **emergency**
j. Work safely at all times

Knowledge and Understanding

i. the importance of taking the appropriate action
ii. the importance of taking immediate action
iii. the consequences of not taking immediate action
iv. methods of communicating during an emergency
v. ways to minimise panic
vi. why it is important to contain the emergency
vii. how to assess the risk of containing the emergency
viii. methods of containing emergencies
ix. why it is important to assess the risk to the environment
x. how to minimise environmental damage
xi. how to comfort and reassure casualties
xii. why it is important to give a full and accurate report of the incident
xiii. what your personal responsibilities are with regard to health, safety and environment

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Emergency

Emergencies could include:
- fire
- release/spillage of materials
- explosion
- discovery of suspect package
- discovery of injured person
- accident involving person/equipment
- major services failure

Raising the alarm

This could be done by :
- mechanical/electrical means
- notifying someone else
- shouting

Action

Other actions to be taken could include:
- emergency shut down of the plant

- evacuation of the plant
- notifying other people
- assessing risk
- emergency first aid
- shut down of the operation

Materials May include solids, liquids and gases.

Equipment/plant This may include any equipment/plant where there is some interaction between items and/or people

Problems These can relate to either personnel and/or equipment.

Documentation Including that relating to emergencies, including reports and any other relevant documentation.

Health, safety & environmental legislation To include relevant legislation and company policy.

Assess the hazard To assess the likelihood of harming yourself and/or others by taking some form of action.

Communication/ Communicate May include spoken, written and/or electronic

Assessment Strategy Statement

In the context of N/SVQ assessment, the use of simulation is acceptable in the assessment of this unit to cover the full scope of the unit as defined by the glossary.

Unit 3.11 : Solving process problems

This unit addresses the competence required to solve process problems. This involves:

- finding out the nature of process quality problems
- checking out the significance of process quality problems
- deciding what action needs to be taken when a problem arises
- making sure that the right actions are carried out, either by yourself or by calling on others
- assessing how effective the actions taken have been

There are three elements in this unit, each of which has performance standards and a knowledge base associated with it.

3.11.1 Determine the nature and significance of process problems
3.11.2 Diagnose faults/causes and select solutions to process problems
3.11.3 Implement and evaluate chosen solutions

Element 3.11.1 Determine the nature and significance of process problems

Performance statements

In achieving this unit you must:

a. Promptly identify when a **problem** has occurred
b. Gather enough information to be able to accurately identify the sort of **problem** that has occurred
c. Use the correct criteria to decide whether the **problem** needs immediate action or whether it can be allowed to continue until a more convenient time before dealing with it
d. Use the correct criteria and a logical approach to decide on the likely cause of the **problem**
e. Use the correct criteria to decide whether the assistance of others will be needed to deal with the **problem**
f. Wear **PPE** when appropriate
g. Work safely at all times

Knowledge and Understanding

i. what the main functions are of process equipment and systems, how the various parts of a system interact, and what types of services used by process equipment and systems
ii. what materials are used in different processes, what happens to them as they are processed, and why they have to be prepared
iii. what working practices and authorisations apply, the lines of communication and procedures that should be followed in a given situation and why it is important to work within the 'rules' of the organisation
iv. what should the readings be, what readings to expect and why, what process control involves, the sorts of problems that can arise with the process and what early warning signs there are, what interventions should be applied, when and by whom, what process control records are kept and why it is important that these are complete and accurate
v. what level of monitoring is required by different processes, what information to gather and when, how to compare data with expected values, the importance of following specified monitoring procedures, and when a process problem should be considered minor and when significant
vi. the sorts of records kept, how to complete them, where they are stored and who has access to them

vii. when and how to wear appropriate PPE
viii. what your personal responsibilities are with regard to health and safety

Element 3.11.2 Diagnose faults/causes and select solutions to process problems

Performance statements

In achieving this unit you must:

a. Use all relevant information to help identify possible **faults and causes**
b. Investigate **possible faults and causes** of production **problems**
c. Diagnose **possible faults and causes** and select appropriate action
d. Take decisions and set them in motion without any unnecessary delay
e. Choose a course of action which will safely limit unwanted effects on the system and process
f. Modify the actions taken if the **problem** changes or they do not work as intended
g. Provide those carrying out remedial actions with enough detail to ensure that the **problem** is dealt with fully and effectively
h. Maintain safety standards at all times
i. Keep accurate and complete **documentation** on the actions taken
j. Work safely at all times

Knowledge and Understanding

i. what the main functions are of process equipment and systems, how the various parts of a system interact, and what types of services used by process equipment and systems
ii. what materials are used in different processes, what happens to them as they are processed, and why they have to be prepared
iii. what working practices and authorisations apply, the lines of communication and procedures that should be followed in a given situation and why it is important to work within the 'rules' of the organisation
iv. what should the readings be, what readings to expect and why, what process control involves, the sorts of problems that can arise with the process and what early warning signs there are, what interventions should be applied, when and by whom, what process control records are kept and why it is important that these are complete and accurate
v. what level of monitoring is required by different processes, what information to gather and when, how to compare data with expected values, the importance of following specified monitoring procedures, and when a process problem should be considered minor and when significant
vi. the sorts of records kept, how to complete them, where they are stored and who has access to them
vii. what agreed health and safety procedures relate to controlling risks to health and safety and the process the environment
viii. what your personal responsibilities are with regard to health and safety

Element 3.11.3 Implement and evaluate chosen solutions

Performance statements

In achieving this unit you must:

a. Implement chosen **solution/s** within the limits of your **authority**
b. The implementation of the chosen **solution** should result in operating conditions being restored without unduly delaying the schedule, without compromising quality and safety and without wasting resources
c. Gather sufficient information to allow you to accurately monitor how effective a **solution** is in dealing with the problem
d. Carry out assessments within a sensible timescale according to how quickly the effects of the **solution** should be apparent
e. Continue with assessments until the **problem** has been fully resolved

f. Use the correct criteria in evaluating the **solution**
g. Keep accurate and complete **documentation** on the result
h. Identify and report any information arising during monitoring which may affect the diagnosis and response to similar **problems** in the future
i. Make **recommendations** to the appropriate people based on the information gained from the evaluation

Knowledge and Understanding

i. what the limits of your authority are
ii. why it is important that the solution results in operating conditions being restored
iii. what the main functions are of process equipment and systems, how the various parts of a system interact, and what types of services used by process equipment and systems
iv. what materials are used in different processes, what happens to them as they are processed, and why they have to be prepared
v. what working practices and authorisations apply, the lines of communication and procedures that should be followed in a given situation and why it is important to work within the 'rules' of the organisation
vi. what should the readings be, what readings to expect and why, what process control involves, the sorts of problems that can arise with the process and what early warning signs there are, what interventions should be applied, when and by whom, what process control records are kept and why it is important that these are complete and accurate
vii. what level of monitoring is required by different processes, what information to gather and when, how to compare data with expected values, the importance of following specified monitoring procedures, and when a process problem should be considered minor and when significant
viii. why it is logical to first investigate the most likely causes of a problem, before looking any further, and why it is important to gather sufficient information about a problem before drawing conclusions
ix. how to read and analyse relevant data in tables, print-outs and schematics, what conventions are used in the process and the units of measurement used and what they mean

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Problems
problems

Problems may arise from different causes. They can be

which you can deal with directly, which may require the assistance of others, or problems which must be notified to a superior or specialist colleague. Problems may include significant or minor deviations from process quality specifications, and/or significant of minor departure of process parameters from expected norms.

Possible faults and causes

The following may cause problems:

- faults or malfunctioning of the process equipment or system
- faults or malfunctioning of control system for the process
- faults in the materials supplied to the process

Solution/s
system

Solution/s that could be carried out could involve making

adjustments and changes yourself, seeking the assistance of

others

with particular expertise, reporting the problem to a superior

Materials

May include solids, liquids and gases.

Operating instructions/and/or specification

The set of instructions which detail the process and the quality/quantity/time outcomes for the operation**.** Including normal operating parameters.

Equipment/plant there is

This could be expected to include equipment/plant where some interaction between items and/or people. PPE to be specified, when necessary.

Problem materials

These can relate to either materials, equipment and/or and/or specifications. Typical production problems include:

- product contamination
- loss of yield
- equipment damage
- non-conformance
- non-achievement of specified quantity/time and/or quality requirements
- health/safety/environmental problems
- Not to include emergency shutdown.

Investigative methods

To find the solution some or all of the following may be used:

- inspecting
- interviewing
- testing of materials
- testing of equipment
- trying out solutions

Authority operation.

That which is given to the person responsible for the

Documentation any

Includes any relevant reports/records/recommendations and other documentation.

Communication/ Communicate

Methods to include individually or in groups, either:

- written
- spoken
- electronic

Recommendations

These may include some or all of the following:

- improving quality
- improving quantity
- reducing costs
- safety aspects
- environmental aspects
- improving time scales

Health, safety and environmental legislation

To include all relevant legislation

PPE

Personal Protective Equipment to be specified, when necessary

Assessment Strategy Statement

In the context of N/SVQ assessment, the use of simulation will only be considered relevant and acceptable in the rare or dangerous occurrences* (see below) in the assessment of this unit, to cover the full scope as defined by the glossary of the unit. Workplace performance evidence is mandatory for the rest of unit.

*• health, safety and environmental issues
- emergency scenarios
- rare occurrences at work

Commentary for Unit 1.12:

Handover

This unit addresses the competence required to handover operational responsibility, materials and/or information to others in the workplace. This involves:

- completion of handover information
- communication with incoming operator/s
- maintaining the operation of the equipment during handover
- accepting and confirming responsibility taken over
- maintaining your own and other's safety while working

There are two elements in this unit, each of which has performance standards and a knowledge base associated with it.

1.12.1 Follow handover procedure
1.12.2 Confirm responsibility accepted

There is also a glossary of terms which appear within the unit and have a specific meaning.

Assessment Strategy Statement

In the context of N/SVQ assessment, the use of simulation is not acceptable in the assessment of this unit to cover the full scope as defined by the glossary of the unit. Workplace performance evidence is mandatory for this unit.

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Materials — May include solids, liquids and gases.

Operating instructions — The set of instructions which describe the work to be carried out,

including details of the operating parameters.

Operating parameters — The conditions under which the processing should take place

Handover — The handing over of operational responsibility

Handover situation — May include some or all of the following:

- at the end of a shift
- during a shift at an appropriate point
- illness
- accident
- emergency situation
- exchange of responsibility during an operating procedure
- exchange of information during an operating procedure
- transfer of materials during an operating procedure

Handover method — May include some or all of the following methods:

- written handover
- verbal handover
- electronic handover

Equipment/plant — This may include equipment/plant where there is some interaction

between items and/or people. Also may include a number of parameters within the operator's control, and some control instrumentation.

Typical equipment within workplace area may include:

- chemical reactors
- addition tanks
- phase separators
- receiving vessels
- pipework and pumps
- film coaters
- solution make-up vessels
- filters and spray equipment

PPE — Personal protective equipment to be specified, when necessary.

PTW
continue with the

May include permit to work. Authority to start, and/or

operation or the equivalent.**Process type**
Batch and/or continuous processing. The following types may be included:

- batch operations, where there are a number of batch operations running simultaneously, and also a multi-staged batch operation. .
- continuous operations, such as reaction, recovery, separation and purification processes, mixing, granulating, drying and compressing.

Problems

These can relate to either personnel, materials, equipment , operating instructions and/or specifications. Where a problem requires another person, the person would be expected to report the problem to the person who has the necessary authority to deal with it.

Corrective actions

May include adjust, request assistance or shutdown.

Documentation

Including that relating to handover, and any other relevant documentation.

Conditions

Control of conditions may include:

temperature, flow, humidity, pressure, ph , density and level

Responsibility
confirm that

To be in charge of a certain operation, and accept and

responsibility

.
Confidentiality
have it.

Only providing information to those who are authorised to

Communicate

To include spoken, written and/or electronic.

Health, safety & environmental legislation
company policy.

To include all relevant legislation and

ELEMENT 1.12.1 Follow handover procedure

In carrying out this work you must:

1. Check that you know the required **handover method**
2. Check that if required, you have the necessary **PTW** or equivalent
3. Check that you are aware of the current **handover situation**
4. Check that the **handover** time is correct
5. Ensure that you complete any relevant handover **documentation** clearly and accurately
6. Check and confirm that the information contained in the **handover situation** is correct
7. Ensure that all relevant **handover** information is given to the incoming operator
8. **Handover** at the correct time and place
9. Maintain safe and effective operation of the **equipment** during **handover**
10. Wear appropriate **PPE**
11. **Communicate**, if required, with relevant personnel
12. Deal promptly with any **problems** that arise, reporting any which you cannot solve and/or are not your responsibility
13. Follow safe working procedures at all times

To do this you need to know

a) handover methods, and specifically the one to be used in the operation

b) what the current handover time and handover situation is

c) the importance of the correct handover time and method

d) why it is important to complete all documentation clearly and accurately

e) the consequences of not checking and confirming handover information

f) why it is important to give the incoming operator all relevant information

g) the importance of knowing the correct time and place for the handover

h) how to maintain safe and effective operation of equipment during handover

i) the importance of communication, keeping others informed during the operation

j) your personal responsibilities with regard to health, safety and environment

k) what personal protective equipment to use and why

l) the types of problems that can occur and how to recognise and deal with them

m) who to contact if there is an unsolvable problem and/ or it is not your responsibility

ELEMENT 1.12.2 Confirm responsibility accepted

In carrying out this work you must:

1. Check that you have the correct **handover** information
2. Check that you can interpret and understand the **handover** information
3. Clarify any concerns over the **handover** information with the appropriate person
4. Check that you have any relevant **documentation** that you may need to proceed
5. Complete any relevant **documentation** clearly and accurately
6. Check that any information is recorded correctly at time of **handover**
7. **Accept** and confirm **responsibility**, by appropriate method, after **handover** of information, responsibility and / or materials has taken place
8. **Communicate** if required with relevant personnel
9. Check that the **PTW** or equivalent, is complete (if necessary)
10. Wear appropriate **PPE**
11. Deal promptly with any **problems** in the procedure that are your responsibility
12. Inform the appropriate person of any **problems** you cannot solve and/or are not your responsibility
13. Work safely at all times
14. Ensure that security and **confidentiality** is observed where necessary

To do this you need to know

a) the importance of confirming that you have the correct handover information

b) how to interpret handover information

c) why it is important to clarify any points

d) what documentation may need to be obtained before proceeding

e) why it is important to complete any documentation clearly and accurately

f) methods of accepting and confirming responsibility

g) why it may be important that the permit to work is complete

h) why it is important to complete documentation clearly and accurately

i) methods of communication

j) what problems may occur in the operation and how to deal with them

k) who to report to with unsolvable problems and/or those which are not your responsibility

l) your personal responsibilities with regard to health, safety and environment

m) when and why PPE needs to be worn

n) when it may be important to observe security/confidentiality

Unit 3.1 : Control room operations

This unit addresses the competence required to start-up, control, maintain and shut-down the required process by remote control within the control room environment. This involves:

- control operations

- maintain process conditions by monitoring and adjusting
- restore required process conditions
- communicating with others
- maintaining your own and other's safety while working

There are two elements in this unit, each of which has performance standards and a knowledge base associated with it.

3.1.1 Take control of operations
3.1.2 Monitor and maintain the process

Element 3.1.1 Take control of operations

Performance statements

In achieving this unit you must:

a. Check that you have the required **operating instructions** and that they are clear and complete
b. Ensure that the **operating parameters** are set according to the **operating instructions**
c. Ensure that controls are set correctly as contained in the **operating instructions**
d. Check that all of the control **equipment/system** is in a safe and functional state
e. Follow any 'handover' procedure before accepting responsibility
f. Follow the correct **operating procedure** when carrying out control actions
g. Follow the correct sequence of actions when carrying out control actions
h. Wear appropriate **PPE**
i. **Communicate** with relevant personnel
j. Deal promptly with any **problems** that arise, reporting any which you cannot solve and/or are not your responsibility
k. Follow safe working procedures at all times
l. Complete any required **documentation** accurately and clearly

Knowledge and Understanding

- the importance of accepting responsibility
- the meaning of terms used in operating instructions
- the importance of operating parameters in the process
- how to set operating parameters in the control room operation
- how to check that the equipment and materials are ready for processing
- how to set the controls correctly as specified in the operating instructions
- why it is important to check that all controls are set correctly
- how to follow the correct operating procedure and sequence of actions when in control
- the consequences of not following correct procedures
- the importance of communication, and of keeping others informed during the operation
- your personal responsibilities with regard to health, safety and environment
- what personal protective equipment to use and why
- the types of problems that may occur and how to recognise and deal with them
- who to contact if there is an unsolvable problem and/ or it is not your responsibility
- what documentation needs to be used and how to complete it
- the importance of keeping accurate records for this activity

Element 3.1.2 Monitor and maintain the process

Performance Statements

In achieving this unit you must:

a. Ensure that the **process operation** runs within acceptable limits as specified in the **operating instructions**
b. Monitor and check the **process operation** at the required intervals
c. Obtain process data and log accurately
d. Interpret the results and take **corrective action** where necessary
e. **Communicate** systems information to other personnel when required
f. Maintain the quality, quantity and time schedule of the process
g. Inform the appropriate person of any **problems** you cannot solve and/or are not your responsibility
h. Record and information accurately using correct **documentation**
i. Wear appropriate **PPE**
j. Work safely at all times
k. Observe security and confidentiality when required

Knowledge and Understanding

i. how to, and the importance of monitoring the process
ii. methods of obtaining process data
iii. how to log process data accurately
iv. how to interpret the data
v. what corrective action could be taken when appropriate
vi. the importance of communicating systems information to others
vii. methods of communication
viii. how to record and document information accurately
ix. the consequences of not recording accurately
x. who to report to with unsolvable problems and/or those which are not your responsibility
xi. your personal responsibilities with regard to health, safety and environment
xii. when and why PPE needs to be worn
xiii. when and why it may be important to observe security and confidentiality

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Materials — May include solids, liquids and gases.

Operating instructions — The set of instructions which describe the work to be carried out, including details of the operating parameters.

Operating parameters — The conditions under which the processing should take place.

Operating conditions — Control of conditions may include: temperature, flow, humidity, pressure, density, ph and level

System — The collection of plant, equipment, materials, components and personnel which functions dynamically, and contributes to the process.

Equipment/plant interaction — This may include equipment/plant where there is some between items and/or people. Includes parameters within the operator's control, and control instrumentation**.**

Typical equipment may include:

- chemical reactors
- addition tanks
- phase separators
- receiving vessels
- pipework and pumps
- film coaters
- solution make-up vessels
- filters and spray equipment

PPE — Personal protective equipment to be specified, when necessary.

PTW — May include permit to work. Authority to start, and/or continue with the operation or the equivalent.

Process type/operations — Batch and/or continuous processing. The following types may be included:

- batch operations, where there may be a number of batch operations running simultaneously, or may be multi-staged batch operation.

	• continuous operations, such as reaction, recovery, separation and purification processes, mixing, granulating, drying and compressing, distillation. Relevant personnel **May include process, utilities, materials handling, laboratory and any other relevant personnel.**
Problems	These may relate to either materials, equipment, personnel, operating instructions and/or specifications.
Communication/Communicate	Methods of communication to include spoken, written and electronic.
Deviations	Significant deviations from quality specifications, non-conformance departures of process parameters from expected norms. Problems to include those that are predictable, within plant's history, within other operational areas, indoors and outdoors.
Corrective actions	May include adjust, request assistance, replace defective materials or shutdown.
Documentation	May include that relating to controlling processing, and any other relevant documentation.
Health, safety and Environmental legislation	May include all relevant legislation and company policy.

Assessment Strategy Statement

In the context of N/SVQ assessment, the use of simulation will only be considered relevant and acceptable in the rare or dangerous occurrences* (see below) in the assessment of this unit, to cover the full scope as defined by the glossary of the unit. Workplace performance evidence is mandatory for the rest of unit.

*• health, safety and environmental issues
• emergency scenarios
• rare occurrences at work

Unit 3.3 : Prepare for complex processing operation

This unit addresses the competence required to prepare area and equipment for complex processing. This involves:

- preparation of area ,equipment and materials
- confirmation of status of equipment
- completing necessary documentation
- maintaining your own and other's safety while working

There are two elements in this unit, each of which has performance standards and a knowledge base associated with it.

3.3.1 Prepare area, equipment and materials for complex processing
3.3.2 Complete necessary documentation

Element 3.3.1 Prepare area, equipment and materials for complex processing

Performance statements

In achieving this unit you must:

a. Check that you have the required **operating instructions** and that they are clear and complete
b. Check that if required, you have the necessary **PTW** or equivalent
c. Ensure that the **operating parameters** are established
d. Check that the area and **equipment/plant** to be used is in a safe and functional condition
e. Confirm the status of the **equipment/plant** before processing begins
f. Check that the **materials** to be used are of the correct identity, quality and amount so that processing can begin
g. Wear appropriate **PPE**
h. Begin operation and operate **equipment/plant** safely
i. Deal with deviations from the specified parameters promptly, minimising loss and damage
j. **Communicate**, if required, with relevant personnel
k. Deal promptly with any **problems** that arise, reporting any which you cannot solve and/or are not your responsibility
l. Follow safe working procedures when using **equipment** and dealing with hazardous materials
m. Complete any required **documentation** accurately and clearly

Knowledge and Understanding

i. the meaning of terms used in operating instructions
ii. the importance of the permit to work (or equivalent)
iii. how to interpret and check operating parameters
iv. the functions and uses of the different types of equipment used in the operation
v. the importance of confirming status of plant/equipment
vi. why it is important to check the materials against specification
vii. how to deal with deviations from the norm
viii. why it is important to minimise loss and damage
ix. the importance of communication, keeping others informed during the operation
x. how to handle equipment safely in ways that protect yourself and others from risk
xi. your personal responsibilities with regard to health, safety and environment
xii. what personal protective equipment to use and why
xiii. the types of problems that can occur and how to recognise and deal with them
xiv. who to contact if there is an unsolvable problem and/ or it is not your responsibility

xv. what documentation needs to be used and how to complete it
xvi. the importance of keeping accurate records for this activity

Element 3.3.2 Complete necessary documentation

Performance statements

In achieving this unit you must:

a. Check that you have the specified **materials** for the process operation
b. Confirm and record that the **materials** are as specified
c. Check that you have all of the relevant **documentation** to proceed
d. Check that the **PTW** or equivalent, is completed if required
e. Ensure that the relevant **documentation** is completed accurately and clearly
f. Record any data accurately
g. Wear appropriate **PPE**
h. Deal promptly with any **problems** in the procedure that are your responsibility
i. Record the outcome/solution of the **problem** accurately
j. Inform the appropriate person of any **problems** you cannot solve and/or are not your responsibility
k. Work safely at all times with regard to **materials, equipment** and personal safety
l. Ensure that security and confidentiality are observed where necessary

Knowledge and Understanding

i. the importance of confirming materials to be used in the process
ii. what documentation needs to be obtained before proceeding
iii. why it is important that the permit to work is complete
iv. why it is important to complete documentation clearly and accurately
v. what problems may occur in the operation and how to deal with them
vi. the importance of recording outcomes/solutions to problems
vii. who to report to with unsolvable problems and/or those which are not your responsibility
viii. your personal responsibilities with regard to health, safety and environment
ix. when and why PPE needs to be worn
x. when it may be important to observe security/confidentiality

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Materials — May include solids, liquids and gases. Some may be hazardous.

Operating instructions — The set of instructions which describe the work to be carried out, including details of the operating parameters. To include reaction, recovery, separation and purification processes.

Operating parameters — The conditions under which the processing should take place

Optimisation programme — The programme which aims to optimise performance.

Equipment/plant — This may include equipment/plant where there is some interaction between items and/or people. Also may include a number of parameters within the operator's control, and some control instrumentation.

Typical equipment may include:

- chemical reactors
- addition tanks
- phase separators
- receiving vessels
- pipework and pumps
- film coaters
- solution make-up vessels
- filters and spray equipment

PPE — Personal protective equipment to be specified, where necessary.

PTW — May include permit to work, authority to start, and/or continue with the operation, or the equivalent .

Process type — Batch and/or continuous processing. The following types may be included:

- batch operations, where there may be a number of batch operations running simultaneously, and also a multi-staged batch operation. .
- continuous operations, such as reaction, recovery, separation and purification processes, mixing, granulating, drying and compressing.

Problems — These may relate to either materials, equipment , materials, operating instructions and/or specifications.

Corrective actions — May include adjust, request assistance or shutdown

Documentation May include that relating to preparations, and any other relevant documentation.

Health, safety & environmental legislation To include all relevant legislation and company policy.

Conditions Control of conditions may include:

- temperature, flow, humidity, pressure, density, ph and level

Communication/Communicate May include spoken, written and electronic.

Relevant personnel May include process, utilities, materials handling, laboratory and any other relevant personnel.

Services May include steam, water, air, electricity, fuel, gas and/or nitrogen.

Assessment Strategy Statement

In the context of N/SVQ assessment, the use of simulation is not acceptable in the assessment of this unit to cover the full scope as defined by the glossary of the unit. Workplace performance evidence is mandatory for this unit.

Unit 3.4 : Control, maintain and restore complex processing operation

This unit addresses the competence required to maintain the required process conditions by monitoring and adjusting, fault diagnosis and restoration of conditions in the event of problems. This involves:

- maintaining process conditions by monitoring and adjusting
- restoring required process conditions in the event of significant problems
- completing necessary documentation
- maintaining your own and other's safety while working

There are three elements in this unit, each of which has performance standards and a knowledge base associated with it.

3.4.1 Maintain and control required process conditions
3.4.2 Restore required process conditions
3.4.3 Confirm quality and complete documentation

Element 3.4.1 Maintain and control required process conditions

Performance statements

In achieving this unit you must

a. Check that you have the required **operating instructions** and that they are clear and complete
b. Check that if required, you have the necessary **PTW** or equivalent
c. Ensure that the **operating parameters** are set.
d. Ensure that **equipment/plant** and **materials** are ready for the processing operation.
e. Ensure that controls are set correctly as contained in the **operating instructions**
f. Obtain **operation** data, and analyse by appropriate method
g. Adjust controls when necessary to produce specified quality
h. Wear appropriate **PPE**
i. **Communicate**, if required, with relevant personnel
j. Deal promptly with any **problems** that arise, reporting any which you cannot solve and/or are not your responsibility
k. Follow safe working procedures when using **equipment/plant** and dealing with hazardous materials
l. Complete any required **documentation** accurately and clearly

Knowledge and Understanding

i. the meaning of terms used in operating instructions
ii. the importance of the permit to work (or equivalent)
iii. how to interpret and check operating parameters
iv. how to check that the equipment and materials are ready for processing
v. the importance of checking materials are as specified
vi. the importance of checking that controls are as specified in the operating instructions
vii. methods of obtaining process data, and how to analyse and interpret the data
viii. how to adjust the process to meet the specified quality
ix. the importance of communication, and of keeping others informed during the operation
x. how to handle equipment safely in ways that protect yourself and others from risk
xi. your personal responsibilities with regard to health, safety and environment
xii. what personal protective equipment to use and why

xiii. the types of problems that may occur and how to recognise and deal with them
xiv. who to contact if there is an unsolvable problem and/ or it is not your responsibility
xv. what documentation needs to be used and how to complete it
xvi. the importance of keeping accurate records for this activity

Element 3.4.2 Restore required process conditions

In achieving this unit you must:

a. Ensure you have the necessary **specification** and **operating parameters**
b. Recognise **deviations** from the **specification**
c. Identify possible faults and causes of **deviations** from the **specification**
d. Investigate all of the possible faults and causes of the **problem**
e. Identify the faults and causes of the **problem**
f. Take corrective action to restore **Process type**
g. Inform the appropriate person of any **problems** you cannot solve and/or are not your responsibility
h. Record and information accurately using appropriate **documentation**
i. Wear appropriate **PPE**
j. **Communicate** with others when necessary
k. Work safely at all times with regard to **materials**, **equipment** and personal safety

Knowledge and Understanding

i. the importance of the work specification and operating parameters
ii. what deviations may occur from the norm, and how to recognise them
iii. what consequences can occur with deviations from the norm
iv. the importance of remedial action
v. how to identify possible faults and causes of the problem
vi. methods of investigating faults and causes
vii. how to analyse information and identify the faults and causes of the problem
viii. what corrective action to take to restore processing in normal operating conditions
ix. why it is important to complete documentation clearly and accurately
x. why it is important to keep others informed
xi. who to report to with unsolvable problems and/or those which are not your responsibility
xii. your personal responsibilities with regard to health, safety and environment
xiii. when and why PPE needs to be worn

Element 3.4.3 Confirm quality and complete documentation

In achieving this unit you must:

a. Check that the process is operating according to **specification** and within operating **parameters**
b. Check that you have all of the relevant **documentation** to proceed
c. When required organise the taking of **samples** at the specified time from the specified place
d. Ensure that the **sample** is representative
e. Ensure that the correct procedure for processing samples is followed
f. Interpret **sample** results correctly, and take any necessary action
g. Ensure that the **process type** quality is controlled, and waste is minimised
h. Ensure that the relevant **documentation** is completed accurately and clearly
i. Wear appropriate **PPE**
j. Deal promptly with any **problems** in the procedure that are your responsibility

k. Inform the appropriate person of any **problems** you cannot solve and/or are not your responsibility

l. Work safely at all times with regard to **materials, equipment** and personal safety

Knowledge and Understanding

i. the importance of checking that the process is operating within normal parameters
ii. what documentation needs to be obtained before proceeding
iii. how to obtain representative samples and why it is important
iv. how to label samples correctly and why it is important
v. the correct method/procedure for processing samples
vi. how to interpret sample results
vii. what corrective action to take, if any is needed
viii. how to control the process quality
ix. the importance of minimising waste in the process
x. why it is important to complete documentation clearly and accurately
xi. what problems may occur in the operation and how to deal with them
xii. who to report to with unsolvable problems and/or those which are not your responsibility
xiii. your personal responsibilities with regard to health, safety and environment
xiv. when and why PPE needs to be worn

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Materials — May include solids, liquids and gases.

Operating instructions/ Specification — The set of instructions which describe the work to be carried out including details of the operating parameters. Also to include Standard Operating Procedure when necessary.

Operating parameters — The conditions under which the processing should take place

Operating conditions — Control of conditions may include:

- temperature, flow, humidity, pressure, ph, density and level

Samples — Method of obtaining, analysing , labelling and interpreting samples

to depend on process.

Equipment/plant — May include equipment/plant where there is some interaction between items and/or people. Also includes a number of parameters within the operator's control, and may include some control instrumentation.
Typical equipment may include:

- chemical reactors
- addition tanks
- phase separators
- receiving vessels
- pipework and pumps
- film coaters
- solution make-up vessels

- filters and spray equipment

PPE	Personal protective equipment to be specified, when necessary.
PTW	May include permit to work. Authority to start, and/or continue with the operation or the equivalent.
Process type/operations	Batch and/or continuous processing. The following types may be included: • batch operations, where there may be a number of batch operations running simultaneously, or may be multi-staged batch operation. . • continuous operations, such as reaction, recovery, separation and purification processes, mixing, granulating, drying and compressing. Relevant personnel **To include process, utilities, materials handling ,laboratory and any other relevant personnel.**
Problems	These can relate to either materials, equipment , materials, operating instructions and/or specifications. Where a problem requires a maintenance engineer, the person would be expected to report the problem to a more senior person.
Communication/ Communicate	Methods of communication to include spoken, written and electronic.
Deviations	Significant deviations from quality specifications, departures of process parameters from expected norms. Problems to include those that are predictable, within plant's history, within other operational areas, indoors and outdoors.
Corrective actions	May include adjust, request assistance, replace defective materials or shutdown.
Documentation	Including that relating to controlling processing, and any other relevant documentation.
Health, safety and Environment Legislation	To include all relevant legislation and company policy.

Assessment Strategy Statement

In the context of N/SVQ assessment, the use of simulation is not acceptable in the assessment of this unit to cover the full scope as defined by the glossary of the unit. Workplace performance evidence is mandatory for this unit.

Unit 3.5 : Complete complex processing operation

This unit addresses the competence required to complete a complex processing operation. This involves:

- prepare to shut down services
- shut down of services that are no longer required
- confirmation of status of plant and equipment
- control of waste and residual materials
- completing necessary documentation
- informing the relevant people in the organisation
- maintaining your own and other's safety while working

There are two elements in this unit, each of which has performance standards and a knowledge base associated with it.

3.5.1 Complete complex processing operation
3.5.2 Complete necessary documentation

Element 3.5.1 Complete complex processing operation

In achieving this unit you must:

a. Check that you have the required shut down **operation instructions** and that they are clear and complete
b. Check that the **plant /equipment** is in an appropriate condition for shut down to commence
c. Ensure that all services not required are shut down according to **SOP**
d. Confirm that **services** are isolated
e. **Communicate** with all relevant personnel that shut down is imminent
f. Inform all relevant personnel when shut down is completed
g. Minimise any loss or damage through the operation
h. Control **residual** and / or **waste materials**
i. Place product, **residual** and / or **waste materials** in suitably labelled containers ready for removal
j. Clean **equipment/plant** if necessary ready for next operation
k. Complete any required **documentation** accurately and clearly
l. Wear appropriate **PPE**
m. Deal promptly with any **problems** that arise, reporting any which you cannot solve and/or are not your responsibility
n. Follow safe working procedure at all times

Knowledge and Understanding

i. the meaning of terms used in shut down operation instructions
ii. how to check that the equipment is ready for shut down to commence
iii. methods of shut down for the operation
iv. the importance of shutting down services not required by SOP
v. the importance of keeping relevant personnel informed
vi. why it is important to minimise any loss/damage during shut down
vii. what containers to place product, residual and waste materials in
viii. why it is important to complete documentation accurately and clearly
ix. how to handle equipment safely in ways that protect yourself and others from risk
x. your personal responsibilities with regard to health, safety and environment
xi. what personal protective equipment to use and why
xii. the types of problems that can occur and how to recognise and deal with them
xiii. who to contact if there is an unsolvable problem and/ or it is not your responsibility

Element 3.5.2 Complete necessary documentation

In achieving this unit you must:

a. Check that you have the correct **documentation** for the operation
b. When necessary reconcile **residual materials**
c. Record all results accurately
d. Report all deviations from specified limits to the appropriate person
e. Ensure that the relevant **documentation** is completed accurately and clearly
f. Wear appropriate **PPE**
g. Deal promptly with any **problems** in the procedure that are your responsibility
h. Record the outcome/solution of the **problem** accurately
i. Inform the appropriate person of any **problems** you cannot solve and/or are not your responsibility
j. Work safely at all times with regard to **materials**, **equipment/plant** and personal safety
k. Ensure that security and confidentiality is observed when necessary

Knowledge and Understanding

i. the importance of checking that you have the correct documentation
ii. what documentation needs to be obtained
iii. when it is important to reconcile materials
iv. methods of material reconciliation
v. why it is important to complete documentation clearly and accurately
vi. who to report deviations to
vii. what problems may occur in the operation and how to deal with them
viii. who to report to with unsolvable problems and/or those which are not your responsibility
ix. your personal responsibilities with regard to health, safety and environment
x. when and why PPE needs to be worn
xi. when it may be important to observe security/confidentiality

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Materials	May include solids, liquids and gases. Some may be hazardous.
Operating instructions/ Specification	The set of instructions which describe the work to be carried out, including details of the operating parameters.
Operating parameters	The conditions under which the processing should take place
Optimisation programme	The programme which aims to optimise performance.
Equipment/plant	This may include equipment/plant where there is some interaction between items and/or people. Also may include a number of parameters within the operator's control, and some control instrumentation. Typical equipment may include: • chemical reactors

- addition tanks
- phase separators
- receiving vessels
- pipework and pumps
- film coaters
- solution make-up vessels
- filters and spray equipment

PPE Personal protective equipment to be specified, when necessary.

PTW May include permit to work. Authority to start, and/or continue with the operation or the equivalent.

Process type Batch and/or continuous processing. The following types may be included:

- batch operations, where there may be a number of batch operations running simultaneously, and also a multi-staged batch operation.
- continuous operations, such as reaction, recovery, separation and purification processes, mixing, granulating, drying and compressing.

Problems These may be can relate to either materials, equipment , materials, operating instructions and/or specifications.

Corrective actions May include adjust, request assistance or shutdown

Documentation May include that relating to preparations, and any other relevant documentation.

Conditions Control of conditions may include:

- temperature, flow, humidity, pressure, density , ph and level

Health, safety & environmental legislation To include all relevant legislation and company policy.

Communication/ Communicate May include spoken, written and/or electronic .

SOP Standard operating procedure. The method of performing a task that is recognised as best practice.

Services May include steam, water, air, electricity, fuel, gas, and/or nitrogen.

Waste/residual materials May include off specification product, waste materials and/or excess product.

Assessment Strategy Statement

In the context of N/SVQ assessment, the use of simulation will only be considered relevant and acceptable in the rare or dangerous occurrences* (see below) in the assessment of this unit, to cover the full scope as defined by the glossary of the unit. Workplace performance evidence is mandatory for the rest of unit.

*• health, safety and environmental issues
- emergency scenarios
- rare occurrences at work

Unit 3.6 : Contribute to the maintenance of product quality

NB This unit is a tailored version of a Combined Working Practices unit produced by PINTOG, which was originally designated Unit 3.

This unit addresses the competence required to contribute to the maintenance of product quality. This involves:

- identifying problems using guidance materials
- selecting and carrying out defined procedures to deal with a problem

There are two elements in this unit, each of which has performance standards and a knowledge base associated with it.

3.6.1 Carry out quality checks
3.6.2 Deal with quality problems according to procedures

Element 3.6.1 Carry out quality checks

Performance statements

In achieving this unit you must:

a. Accurately identify quality requirements from **operating/sampling instructions**
b. Make the quality checks required in accordance with **operating/sampling instructions**
c. Promptly and correctly identify quality **problems**
d. Accurately record the details of the **problem** in the correct records
e. Seek the advice of others when you cannot be certain about the nature of the **problem** and what to do about it
f. **Communicate** effectively at all times
g. Wear **PPE** when appropriate
h. Work safely at all times

Knowledge and Understanding

i. what materials are used in different processes, what happens to them as they are processed, and why they have to be prepared
ii. what working practices and authorisations apply, the lines of communication and procedures that should be followed in a given situation and why it is important to work within the 'rules' of the organisation
iii. why it is logical to first investigate the most likely causes of a problem, before looking any further, and why it is important to gather sufficient information about a problem before drawing conclusions
iv. what quality control measurements are taken with regard to product quality, at what stages are product quality checked, and what quality control systems are in your workplace
v. what typical problems may occur and how to deal with them in the procedure
vi. when and how to wear PPE
vii. what your personal responsibilities are with regard to health and safety

Element 3.6.2 Deal with quality problems according to procedures

Performance statement

In achieving this unit you must:

a. Segregate non complying items according to the **operating/sampling instruction**
b. Label and record appropriately
c. Work safely, following all **safety, health and environment** (SHE) requirements relevant to the process
d. Deal effectively with **problems**
e. Report any **problems** that you cannot solve and or and not your responsibility
f. Wear PPE when appropriate
g. **Document** all information accurately
h. Work safely at all times

Knowledge and Understanding

i. what materials are used in different processes, what happens to them as they are processed, and why they have to be prepared
ii. what working practices and authorisations apply, the lines of communication and procedures that should be followed in a given situation and why it is important to work within the 'rules' of the organisation
iii. the sorts of records kept, how to complete them, where they are stored and who has access to them
iv. what your personal responsibilities are with regard to health and safety
v. how to deal with typical problems
vi. who to report unsolvable problems to
vii. What quality control measurements are taken with regard to product quality, at what stages are product quality checked, and what quality control systems are in your workplace
viii. When and how to wear PPE

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Materials	May include solids, liquids and gases.
Specification / operating Instructions	The set of instructions which describe the work to be carried out. Including customer requirements, both qualitative and quantitative, and the time within which it must be completed .
Sample request / sampling instructions	Could include the following: • quality assurance testing during production • later moisture content testing • on-site sample
Sampling plan	Contains all relevant information. Could include • conditions • sampling method

- access
- location
- timing
- frequency
- duration
- recording methods

Testing request

Could include the following:

- conducting density/moisture tests
- establishing liquid and plastic limits
- performing viscosity tests
- cell identification/in-numeration

Testing plan

Contains all relevant information to be used. Could include

- calibration of equipment
- testing method
- cleanliness
- environment
- time
- acceptable variations
- recording methods

Sampling equipment

Sampling equipment to include (to be completed)

Equipment

PPE to be specified, when necessary.

Problems
materials

These can relate to either materials, equipment and/or

and/or delivery specifications. The person carrying out this work would be expected to resolve any equipment problem for which maintenance engineers are not required. Where a problem does require a maintenance engineer, the person would be expected to report the problem to a more senior person. Other problems include, contamination, disruption and disturbance.

Documentation
relevant

Includes specifications, reports, schedules and any other

documentation.

Conditions

Control of conditions includes:

- temperature
- pressure
- flow
- level
- humidity
- density
- ph

Risk assessment

To include hazardous materials and contamination.

Health, safety and Environmental legislation

To include all relevant legislation and company policy.

Quality checks	Quality checks can be carried out on both materials and products.
PPE	Personal Protective Equipment to be worn when specified.
Communication/ Communicate	May include spoken, written and/or electronic

Assessment Strategy Statement

In the context of N/SVQ assessment, the use of simulation will only be considered relevant and acceptable in the rare or dangerous occurrences* (see below) in the assessment of this unit, to cover the full scope as defined by the glossary of the unit. Workplace performance evidence is mandatory for the rest of unit.

*• health, safety and environmental issues
- emergency scenarios
- rare occurrences at work

Commentary for Unit 3.2:

Control emergencies and critical situations in chemical, pharmaceutical and petro-chemical manufacture

NB This unit is a contextualised version of a unit produced by OPITO, which was originally designated Unit C5.

This unit is about controlling emergencies and critical solutions. This involves:

- maintaining a state of readiness
- controlling critical situations
- co-ordinating the response to emergencies

There are three elements in this unit, each of which has performance standards and a knowledge base associated with it.

3.2.1 Maintain a state of readiness
3.2.2 Control critical situations
3.2.3 Co-ordinate the response to emergencies

There is also a glossary of terms which appear within the unit and have a specific meaning.

Assessment Strategy Statement

In the context of N/SVQ assessment, the use of simulation will only be considered relevant and acceptable in the rare or dangerous occurrences* (see below) in the assessment of this unit, to cover the full scope as defined by the glossary of the unit. Workplace performance evidence is mandatory for the rest of unit.

*• health, safety and environmental issues
• emergency scenarios
• rare occurrences at work

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Emergency

Emergencies could include:

- fire
- release/spillage of materials
- release/spillage of materials
- explosion
- discovery of suspect package
- discovery of injured person
- accident involving person/equipment
- major services failure

Raising the alarm

This could be done by :

- mechanical/electrical means
- notifying someone else
- shouting

Action/operational requirements

Other actions to be taken could include:

- emergency shut down of the plant
- evacuation of the plant
- notifying other people
- assessing risk
- emergency first aid
- shut down of the operation

Communication/Communicate

To include spoken, written and/or electronic.

PPE

Personal Protective Equipment

ELEMENT 3.2.1 Maintain a state of readiness

In carrying out this work you must:

1. Effectively access current **emergency** procedures and report all anomalies
2. Identify all conditions which may affect the **emergency** response
3. Effectively hand over all safety critical information
4. Correctly take part in drills and exercises
5. Work safely in accordance with **operational requirements**

To do this you need to know

a) how to select, use and care for PPE (to include sight/hearing protection, gloves, footwear, hard hats, respirators)

b) the implications of statutory (e.g. HASAWA and COSHH) and organisational requirements

c) how to interpret operational requirements (e.g. policies, procedures, instructions, codes of practice, standards, schedules)

d) emergency procedures for the installation

e) plant layout and its integration with other processes and systems

f) the internals of equipment and their function and operation

g) methods and consequences of isolation and depressurisation

h) functioning of remote process control (to include instrumentation and logic)

i) normal operating parameters and their tolerances

j) how to access and interpret drawings and manuals regarding the plant

k) the composition and properties of produced fluids and gases (to include toxicity, flammability, specific gravity (SG), temperature)

l) the reactions taking place and the effect of changes to the physical and chemical properties

m) the effects of changes in ambient conditions on plant operation

n) the principles and effect of Hydrocarbon hydrate formation, prevention and dispersion

o) the operation of and potential implications of the ESD control systems

p) the operation of and potential implications of the Fire and Gas control systems

q) the effect and potential implications of loss of any system and its reinstatement

r) consequences of emissions to the environment

s) how to access and interpret the status of the appropriate equipment and systems, to include detection; protection; communications; evacuation

t) how to access and interpret the status of operations and simultaneous operations

u) how to access and interpret information on weather conditions

how to access and interpret information on the availability of key emergency response personnel

ELEMENT 3.2.2 Control critical situations

In carrying out this work you must:

1. Identify developing and existing critical solutions
2. Activate all relevant **alarms** and take appropriate **action** to the situation
3. Effectively monitor the situation and minimise risks to personnel, process, plant and equipment
4. Report the critical situation correctly
5. Work safely in accordance with **operational requirements**

To do this you need to know

a) how to select, use and care for PPE (to include sight/hearing protection, gloves, footwear, hard hats, respirators)

b) the implications of statutory (e.g. HASAWA and COSHH) and organisational requirements

c) how to interpret operational requirements (e.g. policies, procedures, instructions, codes of practice, standards, schedules)

d) emergency procedures for the installation

e) plant layout and its integration with other processes and systems

f) the internals of equipment and their function and operation

g) methods and consequences of isolation and depressurisation

h) functioning of remote process control (to include instrumentation and logic)

i) normal operating parameters and their tolerances

j) how to access and interpret drawings and manuals regarding the plant

k) the composition and properties of produced fluids and gases (to include toxicity, flammability, specific gravity (SG), temperature)

l) the reactions taking place and the effect of changes to the physical and chemical properties

m) the effects of changes in ambient conditions on plant operation

n) the operation of and potential implications of the ESD control systems

o) the operation of and potential implications of the Fire and Gas control systems

p) the effect and potential implications of loss of any system and its reinstatement

q) consequences of emissions to the environment

r) the operations of and potential implications of the Emergency Shutdown control systems

s) the operation of and potential implications of the Fire and Gas control systems

ELEMENT 3.2.3 Co-ordinate the response to emergencies

In carrying out this work you must

1. Accurately identify and immediately take the **actions** required to make the situation safe
2. Activate all relevant **alarms**
3. Effectively **communicate** all relevant information and instructions
4. Clarify and act upon information received
5. Record critical information
6. Work safely in accordance with **operational requirements**

To do this you need to know

a) how to select, use and care for PPE (to include sight/hearing protection, gloves, footwear, hard hats, respirators)

b) the implications of statutory (e.g. HASAWA and COSHH) and organisational requirements

c) how to interpret operational requirements (e.g. policies, procedures, instructions, codes of practice, standards, schedules)

d) emergency procedures for the installation

e) plant layout and its integration with other processes and systems

f) the internals of equipment and their function and operation

g) methods and consequences of isolation and depressurisation

h) functioning of remote process control (to include instrumentation and logic)

i) normal operating parameters and their tolerances

j) how to access and interpret drawings and manuals regarding the plant

k) the composition and properties of produced fluids and gases (to include toxicity, flammability, specific gravity (SG), temperature)

l) the reactions taking place and the effect of changes to the physical and chemical properties

m) the effects of changes in ambient conditions on plant operation

n) the operation of and potential implications of the ESD control systems

o) the operation of and potential implications of the Fire and Gas control systems

p) the effect and potential implications of loss of any system and its reinstatement

q) consequences of emissions to the environment

r) how to react appropriately (to include make safe; isolate; shutdown; evacuate the work area; informing connecting installations and others; do nothing; activate internal emergency response teams; inform duty personnel; inform adjacent facilities; activate ESD; account for people)

s) those who must be contacted and how to contact them

Unit 3.7 : Plan to maintain product integrity

NB This unit is a tailored version of a Level 3 LATA unit produced by the ST & M Council and was originally designated Unit 2.

This unit is for those with responsibility for the detailed planning of sampling and testing procedures which have to be produced as a result of the initial technical plan. This overall technical plan may have been produced by a different person. It describes competences involved in implementing the technical components of the plan. It is designed for technical experts inside the organisation who devise specifications and procedures to be followed when conducting sampling and testing.

Sampling and testing procedures may be developed, adapted from existing procedures and standards or existing procedures assessed for their suitability and adopted unchanged.

Customers for the plans can be either external to the organisation or internal, e.g. other departments within the organisation.

The unit states the competences required in:
- defining what constitutes a representative sample
- establishing the conditions for sampling
- developing a sampling procedure
- identifying the properties to be tested for
- developing a testing procedure.

Possible contexts in which these competences could be used include:
- establishing a procedure for sampling effluent levels
- developing procedures for where and how materials will be tested for strength
- selecting test procedures to apply to new materials being prepared for an external customer.

There are two elements in this unit, each of which has performance standards and a knowledge base associated with it.

- Plan sampling requirements
- Plan testing requirements

The unit will be assessed by applying the Evidence Requirements stated in the introduction to these standards and the specific assessment guidance attached to each Element.

The following unit-wide knowledge will be assessed via a generic knowledge bank and assessor supplementary questioning:
- Principles of planning.
- Safety, health and environmental requirements and procedures for sampling and testing.
- Calibration requirements for equipment.
- Principles of sampling and testing systems and techniques.
- Requirements regarding handling, storage and disposal of materials.

Element 3.7.1 Plan sampling requirements

Performance statements

In achieving this unit you must:

a. Accurately define the characteristics of a representative sample
b. Define the **conditions** under which the sample is to be obtained
c. Accurately assess the appropriateness and accessibility of the sampling site
d. Decide the sampling points and frequency of sample taking in order to provide a
e. Representative sample
f. Identify appropriate equipment
g. Identify appropriate sampling **procedures** and incorporate into **testing plan**
h. Incorporate into the plan the procedures for maintaining the integrity of the sample
i. Identify hazards and accurately assess risks
j. Define with **testing plan** the system for correct disposal of sample in accordance with safe
k. operating procedures
l. Make plans to deal with contingencies during sample taking
m. Ensure **testing plan** contains all relevant information in a form usable by others
n. Ensure sampling methodology meets customer requirements

Knowledge and Understanding

i. the characteristics of a representative sample in terms of correlation of sample to source; variability; properties; size; location
ii. impact, of sampling method chosen upon source and sample
iii. extent of required statistical significance
iv. sources and methods of accessing relevant sampling standards
v. factors influencing integrity of the sample
vi. correct disposal; safety, health and environmental standard procedures
vii. contingencies and how to deal with them including: equipment failure; delays; limitations to access; changes in variables affecting sample condition; safety and environmental changes.

Element 3.7.2 Plan testing requirements

Performance statements

In achieving this unit you must:

a. Define properties to be tested for
b. Specify appropriate **equipment**
c. Identify appropriate procedures and incorporated into **testing plan**
d. Accurately quantify resource requirements for testing
e. Accurately quantify conditions for testing
f. Ensure sample conforms with test requirements
g. Identify hazards and accurately assess risks
h. Define a system for correct disposal of **waste materials**
i. Ensure **testing plan** includes procedures to deal with contingencies during testing
j. Ensure **testing plan** contains all relevant information in a form usable by others
k. Ensure testing methodology meets customer requirements

Knowledge and Understanding

i. relevant testing methods appropriate to achieve objectives
ii. relevant test resources and their suitability
iii. potential impact of test upon health, safety and the environment
iv. correct disposal: environmental, health and safety procedures
v. contingencies arising during testing and how to deal with them including: equipment failure; delays changes in variables affecting testing conditions; safety and environmental changes

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Materials — May include solids, liquids and gases.

Specification — The set of instructions which describe the work to be carried out.

Including customer requirements, both qualitative and quantitative, and the time within which it must be completed.

Sample request — Could include the following:

- quality assurance testing during production
- later moisture content testing
- on-site sample

Sampling plan — Contains all relevant information. Could include:

- conditions
- sampling method
- access
- location
- timing
- frequency
- duration
- recording methods

Testing request — Could include the following:

- conducting density/moisture tests
- establishing liquid and plastic limits
- performing viscosity tests
- cell identification/in-numeration

Testing plan — Contains all relevant information to be used. Could include:

- calibration of equipment
- testing method
- cleanliness
- environment
- time
- acceptable variations
- recording methods

Equipment as	PPE to be specified, when necessary. Sampling equipment specified with in the specification.
Problems materials	These can relate to either materials, equipment and/or and/or delivery specifications. The person carrying out this work would be expected to resolve any equipment problem for which maintenance engineers are not required. Where a problem does require a maintenance engineer, the person would be expected to report the problem to a more senior person. Other problems include, contamination, disruption and disturbance.
Documentation relevant	Includes specifications, reports, schedules and any other documentation.
Conditions	Control of conditions may include: • temperature • pressure • flow • level • humidity • density • ph
Risk assessment	To include hazardous materials and contamination.
Waste materials	To include off specification product and waste materials.
Health, safety and Environmental legislation	To include all relevant legislation and company policy.

Assessment Strategy Statement

In the context of N/SVQ assessment, the use of simulation is not acceptable in the assessment of this unit to cover the full scope as defined by the glossary of the unit. Workplace performance evidence is mandatory for this unit.

Unit 3.9 : Allocate personnel to maintain processing

This unit addresses the competence required to allocate personnel to ensure the processing operation achieves its objectives. This involves:

- planning the work of teams and individuals
- providing feedback when necessary for teams and individuals
- ensuring planned process objectives are achieved
- maintaining your own and other's safety while working

There are two elements in this unit, each of which has performance standards and a knowledge base associated with it.

3.9.1 Plan the work
3.9.2 Achieve the objectives

Element 3.9.1 Plan the work

Performance statements

In achieving this unit you must:

a. Check that you have the required **work schedule** and that it is clear and complete
b. Check that you have the required **objectives** and that they are clear and complete
c. **Allocate work** taking into account **team members** and/or individuals abilities
d. Ensure the **plans** and **schedules** cover all relevant personnel
e. Ensure plans and schedules are realistic and achievable within **organisational constraints**
f. Check that all **team members** and/or individuals agree with the **plans** and **schedules**
g. Confirm team members and/or individuals agree with, and understand the **plans** and **schedules**
h. When appropriate wear **PPE**
i. **Communicate**, when required, with relevant personnel
j. Deal promptly with any **problems** that occur in the planning stage of the operation
k. Follow safe working procedures at all times
l. Complete any required **documentation** accurately and clearly

Knowledge and Understanding

i. the meaning of terms used in work schedules
ii. the objectives which need to be achieved
iii. the importance of meeting objectives
iv. how to allocate work taking into account individual's/ team member's abilities
v. the importance of ensuring plans and schedules cover all personnel
vi. what organisational constraints there are and how they may affect the plans and schedules
vii. the importance of gaining agreement
viii. the importance of confirming that individuals and team members agree and understand the plans and schedules
ix. the importance of communication, keeping others informed during the operation
x. the problems that may occur in the planning stage
xi. your personal responsibilities with regard to health, safety and environment
xii. what personal protective equipment to use and why
xiii. the types of problems that can occur and how to recognise and deal with them
xiv. who to contact if there is an unsolvable problem and/ or it is not your responsibility
xv. what documentation needs to be used and how to complete it

Element 3.9.2 Achieve the objectives

Performance statements

In achieving this unit you must:

a. Check that you have the required work **schedule/objectives** and that they are clear and complete
b. **Monitor** actual **performance**
c. Assess the **performance** against agreed **plans** and **schedules**
d. Provide **feedback** to individuals and/or team members when appropriate
e. Take **corrective action** when necessary to ensure **objectives** are met
f. Deal promptly with any **problems** that arise which may affect the achievement of **objectives**
g. Inform the appropriate person of any **problems** which you cannot solve and/or which are not your responsibility
h. Ensure that the relevant **documentation** is completed accurately and clearly
i. When appropriate wear **PPE**
j. Work safely at all times
k. Ensure that security and **confidentiality** is observed when necessary

Knowledge and Understanding

i. the required objectives and the importance of meeting objectives
ii. methods of monitoring individuals and teams members performance
iii. how to assess performance
iv. the importance of comparing actual performance against planned performance
v. methods of providing feedback
vi. the importance of providing constructive feedback
vii. what corrective action to take to meet objectives
viii. typical problems that may occur
ix. how to deal with problems that may affect the meeting of objectives
x. why it is important to complete documentation clearly and accurately
xi. who to report to with unsolvable problems and/or those which are not your responsibility
xii. your personal responsibilities with regard to health, safety and the environment
xiii. when and why PPE needs to be worn
xiv. when it may be important to observe security/confidentiality at times

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Allocate work	Giving teams and individuals responsibility for tasks which should achieve agreed work objectives.
Confidentiality	Only providing information to those who are authorised to have it.
Feedback on performance	Information to give to others on how well they are performing against the objectives which have been agreed.
Objectives	Clearly defined results which you need to achieve which are specific, measurable, agreed with others , realistic and within time constraints.

Organisational constraints	Organisational policies, objectives, level of resources which limit your actions and decisions.
Plans	Documents or spoken agreements which describe the work to be carried out, when, by whom, to what standard and with what resources, in the order that requirements and objectives can be met.
Schedules	Documents showing the work to be done, when and sometimes by whom.
Team members	People who work with you as part of a functional or project team; team members may report to you either as their line/shift manger/foreman, or as the manger / foreman in charge of a specific process/ activity /project on which they are working.
Performance	How individuals and /or team members perform in relation to achievement of objectives.
Monitor	Method used to compare actual with planned performance.
Work schedule	The set of instructions which describe the work to be carried out, and the objectives that need to be achieved.
PPE	Personal protective equipment to be specified, when necessary.
Problems	These can relate to either personnel, materials , equipment , operating instructions and/or specifications. Where a problem requires a maintenance engineer, the person would be expected to report the problem to a more senior person.
Corrective actions	May include adjust, request extra personnel, other assistance or shutdown
Documentation	Including that relating to allocation of personnel, and any other relevant documentation.
Communication/ Communicate	To include either written, spoken and/or electronic

Health, safety and environmental legislation To include all relevant legislation and company policy.

Assessment Strategy Statement

In the context of N/SVQ assessment, the use of simulation is not acceptable in the assessment of this unit to cover the full scope as defined by the glossary of the unit. Workplace performance evidence is mandatory for this unit.

Unit 3.11 : Solving process problems

This unit addresses the competence required to solve process problems. This involves:

- finding out the nature of process quality problems
- checking out the significance of process quality problems
- deciding what action needs to be taken when a problem arises
- making sure that the right actions are carried out, either by yourself or by calling on others
- assessing how effective the actions taken have been

There are three elements in this unit, each of which has performance standards and a knowledge base associated with it.

3.11.1 Determine the nature and significance of process problems
3.11.2 Diagnose faults/causes and select solutions to process problems
3.11.3 Implement and evaluate chosen solutions

Element 3.11.1 Determine the nature and significance of process problems

Performance statements

In achieving this unit you must:

h. Promptly identify when a **problem** has occurred
i. Gather enough information to be able to accurately identify the sort of **problem** that has occurred
j. Use the correct criteria to decide whether the **problem** needs immediate action or whether it can be allowed to continue until a more convenient time before dealing with it
k. Use the correct criteria and a logical approach to decide on the likely cause of the **problem**
l. Use the correct criteria to decide whether the assistance of others will be needed to deal with the **problem**
m. Wear **PPE** when appropriate
n. Work safely at all times

Knowledge and Understanding

ix. what the main functions are of process equipment and systems, how the various parts of a system interact, and what types of services used by process equipment and systems
x. what materials are used in different processes, what happens to them as they are processed, and why they have to be prepared
xi. what working practices and authorisations apply, the lines of communication and procedures that should be followed in a given situation and why it is important to work within the 'rules' of the organisation
xii. what should the readings be, what readings to expect and why, what process control involves, the sorts of problems that can arise with the process and what early warning signs there are, what interventions should be applied, when and by whom, what process control records are kept and why it is important that these are complete and accurate
xiii. what level of monitoring is required by different processes, what information to gather and when, how to compare data with expected values, the importance of following specified monitoring procedures, and when a process problem should be considered minor and when significant
xiv. the sorts of records kept, how to complete them, where they are stored and who has access to them

xv. when and how to wear appropriate PPE
xvi. what your personal responsibilities are with regard to health and safety

Element 3.11.2 Diagnose faults/causes and select solutions to process problems

Performance statements

In achieving this unit you must:

k. Use all relevant information to help identify possible **faults and causes**
l. Investigate **possible faults and causes** of production **problems**
m. Diagnose **possible faults and causes** and select appropriate action
n. Take decisions and set them in motion without any unnecessary delay
o. Choose a course of action which will safely limit unwanted effects on the system and process
p. Modify the actions taken if the **problem** changes or they do not work as intended
q. Provide those carrying out remedial actions with enough detail to ensure that the **problem** is dealt with fully and effectively
r. Maintain safety standards at all times
s. Keep accurate and complete **documentation** on the actions taken
t. Work safely at all times

Knowledge and Understanding

ix. what the main functions are of process equipment and systems, how the various parts of a system interact, and what types of services used by process equipment and systems
x. what materials are used in different processes, what happens to them as they are processed, and why they have to be prepared
xi. what working practices and authorisations apply, the lines of communication and procedures that should be followed in a given situation and why it is important to work within the 'rules' of the organisation
xii. what should the readings be, what readings to expect and why, what process control involves, the sorts of problems that can arise with the process and what early warning signs there are, what interventions should be applied, when and by whom, what process control records are kept and why it is important that these are complete and accurate
xiii. what level of monitoring is required by different processes, what information to gather and when, how to compare data with expected values, the importance of following specified monitoring procedures, and when a process problem should be considered minor and when significant
xiv. the sorts of records kept, how to complete them, where they are stored and who has access to them
xv. what agreed health and safety procedures relate to controlling risks to health and safety and the process the environment
xvi. what your personal responsibilities are with regard to health and safety

Element 3.11.3 Implement and evaluate chosen solutions

Performance statements

In achieving this unit you must:

j. Implement chosen **solution/s** within the limits of your **authority**
k. The implementation of the chosen **solution** should result in operating conditions being restored without unduly delaying the schedule, without compromising quality and safety and without wasting resources
l. Gather sufficient information to allow you to accurately monitor how effective a **solution** is in dealing with the problem
m. Carry out assessments within a sensible timescale according to how quickly the effects of the **solution** should be apparent
n. Continue with assessments until the **problem** has been fully resolved

o. Use the correct criteria in evaluating the **solution**
p. Keep accurate and complete **documentation** on the result
q. Identify and report any information arising during monitoring which may affect the diagnosis and response to similar **problems** in the future
r. Make **recommendations** to the appropriate people based on the information gained from the evaluation

Knowledge and Understanding

x. what the limits of your authority are
xi. why it is important that the solution results in operating conditions being restored
xii. what the main functions are of process equipment and systems, how the various parts of a system interact, and what types of services used by process equipment and systems
xiii. what materials are used in different processes, what happens to them as they are processed, and why they have to be prepared
xiv. what working practices and authorisations apply, the lines of communication and procedures that should be followed in a given situation and why it is important to work within the 'rules' of the organisation
xv. what should the readings be, what readings to expect and why, what process control involves, the sorts of problems that can arise with the process and what early warning signs there are, what interventions should be applied, when and by whom, what process control records are kept and why it is important that these are complete and accurate
xvi. what level of monitoring is required by different processes, what information to gather and when, how to compare data with expected values, the importance of following specified monitoring procedures, and when a process problem should be considered minor and when significant
xvii. why it is logical to first investigate the most likely causes of a problem, before looking any further, and why it is important to gather sufficient information about a problem before drawing conclusions
xviii. how to read and analyse relevant data in tables, print-outs and schematics, what conventions are used in the process and the units of measurement used and what they mean

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Problems
problems

Problems may arise from different causes. They can be

which you can deal with directly, which may require the assistance of others, or problems which must be notified to a superior or specialist colleague. Problems may include significant or minor deviations from process quality specifications, and/or significant of minor departure of process parameters from expected norms.

Possible faults and causes

The following may cause problems:

- faults or malfunctioning of the process equipment or system
- faults or malfunctioning of control system for the process
- faults in the materials supplied to the process

Solution/s
system

Solution/s that could be carried out could involve making

adjustments and changes yourself, seeking the assistance of

others

with particular expertise, reporting the problem to a superior

Materials

May include solids, liquids and gases.

Operating instructions/and/or specification

The set of instructions which detail the process and the quality/quantity/time outcomes for the operation**.** Including normal operating parameters.

Equipment/plant there is

This could be expected to include equipment/plant where some interaction between items and/or people. PPE to be specified, when necessary.

Problem materials

These can relate to either materials, equipment and/or and/or specifications. Typical production problems include:

- product contamination
- loss of yield
- equipment damage
- non-conformance
- non-achievement of specified quantity/time and/or quality requirements
- health/safety/environmental problems
- Not to include emergency shutdown.

Investigative methods

To find the solution some or all of the following may be used:

- inspecting
- interviewing
- testing of materials
- testing of equipment
- trying out solutions

Authority operation.

That which is given to the person responsible for the

Documentation any

Includes any relevant reports/records/recommendations and other documentation.

Communication/ Communicate

Methods to include individually or in groups, either:

- written
- spoken
- electronic

Recommendations

These may include some or all of the following:

- improving quality
- improving quantity
- reducing costs
- safety aspects
- environmental aspects
- improving time scales

Health, safety and environmental legislation

To include all relevant legislation

PPE

Personal Protective Equipment to be specified, when necessary

Assessment Strategy Statement

In the context of N/SVQ assessment, the use of simulation will only be considered relevant and acceptable in the rare or dangerous occurrences* (see below) in the assessment of this unit, to cover the full scope as defined by the glossary of the unit. Workplace performance evidence is mandatory for the rest of unit.

*• health, safety and environmental issues
- emergency scenarios
- rare occurrences at work

Commentary for Unit 3.12:

Enable individual learning through coaching

NB This unit is a tailored version of a Health and Safety unit produced by EMPNTO, which was originally designated Unit L12

This unit addresses the competence required to coach individual learners and/or assist individual learners to apply their learning. This involves:

- identifying individual needs and learning styles
- choosing the manner and speed of coaching
- checking on the progress of learners
- giving feedback to learners
- reviewing the potential for e-learning support for learners
- helping learners to apply their learning
- giving ongoing support to learners

There are two elements in this unit, each of which has performance standards and a knowledge base associated with it.

3.12.1 Coach individual learners
3.12.2 Helping individual learners to apply their learning

There is also a glossary of terms which appear within the unit and have a specific meaning.

Assessment Strategy Statement

In the context of N/SVQ assessment, evidence must be derived from workplace performance, with the exception of element 2, criterion b) where candidate presentation of Information Learning Technology (ILT) alternatives is considered, in order to cover the full scope of the unit as defined in the glossary.

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Learning needs/objectives	An individual's and/or organisations needs and learning objectives.
Learning outcome/s	That which an individual gains from the process, (coaching)
Assessment methods	To include appropriate methods for checking learner's progress.
Coaching	The method where the primary source of teaching is by demonstration. To include how to match coaching opportunities with individual learning needs. How to sequence and pace the information for individual learners.
Feedback	The information that is given to learners to assess their progress.
Documentation	Including that relating to learning, and any other relevant documentation
Responsibility	To be in charge of a certain operation, and accept and confirm that responsibility
Confidentiality	Only providing information to those who are authorised to have it.
Communication	May include spoken, written and/or electronic.
Health, safety & environment	To include all relevant legislation and company policy.
Materials	May include solids, liquids and gases.
Equipment/plant	This may include equipment/plant where there is some interaction between items and/or people. Also may include a number of parameters within the operator's control, and some control instrumentation. Typical equipment may include:

- chemical reactors
- addition tanks
- phase separators
- receiving vessels
- pipework and pumps
- film coaters
- solution make-up vessels
- filters and spray equipment

PPE necessary.	Personal protective equipment to be specified, when
PTW operation	Permit to work. Authority to start, and/or continue with the or the equivalent.
Process type may be	Batch and/or continuous processing. The following types included: • batch operations, where there are a number of batch operations running simultaneously, and also a multi-staged batch operation. • continuous operations, such as reaction, recovery, separation and purification processes, mixing, granulating, drying and compressing.
Problems	These can relate to either personnel, materials, equipment , operating instructions, specifications, learning needs and/or assessment methods. Where a problem requires another person, the person would be expected to report the problem to the person who has the necessary authority to deal with it.
Corrective actions	May include adjust, request assistance or shutdown.

ELEMENT 3.12.1 Coach individual learners

In carrying out this work you must:

a) Identify individual needs and learning styles

b) Choose a style of **coaching** which meets the **learning objectives** of the organisation

c) Coach in a manner and at a speed which is appropriate to learners

d) Analyse the skills needed and the order they need to be learned in

e) Regularly check that learners are making progress towards learning outcomes

f) Give learners positive **feedback** on the learning process

g) Alter **coaching** in the light of learners' progress and **feedback**

h) Identify anything that prevents learning and review this with learners

To do this you need to know

The nature and role of coaching

1 how to match coaching opportunities to individual learning needs and objectives
2 how to put information in order and decide whether the language you will be using is appropriate for individual learners
3 the separate areas of coaching which encourage learning
4 which types of learning are best achieved and supported through coaching
5 how to identify the opportunities available for learners to apply their learning

Principles and concepts

6 how to put learners at their ease
7 how to identify individual learning needs
8 what the different learning styles are and how they affect learning
9 how to identify and use different learning opportunities
10 how to structure learning activities
11 how to choose and prepare appropriate materials, including technology-based materials
12 how to encourage learners to recognise their own achievements
13 how to recognise the things that are likely to prevent learning and how to overcome them
14 how to check learners' understanding and progress

External factors influencing human resource development

15 how to make sure that everyone acts in line with health, safety and environmental protection legislation and best practice
16 how to analyse and use developments in learning and new ways of delivery, including technology-based learning

ELEMENT 3.12.2 Helping individual learners to apply their learning

In carrying out this work you must:

a) Give learners the opportunities to practise skills, apply their knowledge and get experience in a structured way.

b) Consider using technology-based support for learners, including e-support.

c) Identify opportunities for learners to achieve agreed **learning objectives** and give them positive **feedback** on their progress.

d) Identify opportunities to use different learning opportunities and agree action with learners.

e) Give learners clear and accurate information on the resources available to help them apply their learning.

f) Give learners positive **feedback** on the learning experience and the outcomes achieved.

g) Identify anything that prevents learning and review this with learners.

h) Explain to learners the ongoing support that is available to them.

To do this you need to know

The nature and role of coaching

1 how to match coaching opportunities to individual learning needs and objectives
2 how to put information in order and decide whether the language you will be using is appropriate for individual learners
3 the separate areas of coaching which encourage learning
4 which types of learning are best achieved and supported through coaching
5 how to identify the opportunities available for learners to apply their learning

Principles and concepts

6 how to put learners at their ease
7 how to identify individual learning needs
8 what the different learning styles are and how they affect learning
9 how to identify and use different learning opportunities
10 how to structure learning activities
11 how to choose and prepare appropriate materials, including technology-based materials
12 how to encourage learners to recognise their own achievements
13 how to recognise the things that are likely to prevent learning and how to overcome them

14 how to check learners' understanding and progress

External factors influencing human resource development

15 how to make sure that everyone acts in line with health, safety and environmental protection legislation and best practice
16 how to analyse and use developments in learning and new ways of delivery, including technology-based learning

Unit 3.13 : Conduct an assessment of risks in the workplace

NB This unit is a tailored version of a Health and Safety unit produced by the Employment NTO, which was originally designated Unit G. This means that the wording of the unit differs slightly from the rest of the COGENT suite.

This unit addresses the competence needed to identify hazards in the workplace, assess the level of risk resulting from those hazards, make recommendations to control the risk and review the results.

There are three elements in this unit, each of which has performance standards and a knowledge base associated with it.

3.13.1 Identify hazards in the Workplace
3.13.2 Assess the level of risk and recommend action
3.13.3 Review your workplace assessment of risks

Fundamental to this Unit is an understanding of the process of carrying out a risk assessment. A person competent in this unit should be able to carry out risk assessments according to regulatory requirements.

This unit is for: a person required to, or who has been asked to, carry out a risk assessment in the workplace. This could be an employer, line manager, supervisor, safety representative or employee.

This unit is about the competences needed to identify hazards in the workplace, assess the level of risk resulting from those hazards, make recommendations to control the risk and review the results.

This is what you need to show:

In element G.1: that you understand the process of identifying hazards in the workplace. You should be prepared for the hazard identification process, and investigate both those areas where risks are most likely to occur and those who might be harmed. You should be able to identify when to make use of expert advice and guidance on identifying hazards.

In element G.2: that you understand the criteria for assessing the level of risk. You should show you know the criteria for acceptable risks and understand when risks are acceptable. You should show you can prepare and present a report on the results of the risk assessment to include those significant findings of your risks assessment.

In element G.3: that you understand the importance of reviewing your assessment from time to time. This will include understanding when changed circumstances might affect your current assessment

Element 3.13.1 Identify hazards in the workplace

Performance statements

In achieving his unit you must:

a. Define clearly, why and where the **risk** assessment will be carried out
b. Confirm that all the information available to you on statutory health and safety regulations is up-to-date and from recognised and reliable information sources
c. Recognise your own limitations and seek expert advice and guidance on risk assessment when appropriate
d. Select a method of identifying **hazards** appropriate to the workplace being assessed
e. Ensure your investigation fully identifies those areas in the workplace where hazards with a potential for serious harm to health and safety are most likely to occur
f. Identify **hazards** which could result in serious harm to **others**
g. Record those **hazards** in a way which meets legal, good practice and **workplace** requirements
h. Report the results of the process to the **responsible persons** in an agreed format and timescale
i. Work safely at all times

Knowledge and Understanding

i. your legal duties for health and safety in the workplace as required by the Health and Safety at Work Act 1974
ii. your duties for health and safety as defined by any specific legislation covering your job role
iii. methods of identifying hazards including direct observation, examining records, or interview
iv. hazards that are most likely to cause harm to health and safety
v. the particular health and safety risks which may be present in your own job role and the precautions to be taken
vi. the work areas and people for whom you are carrying out the assessment
vii. work activities of the people in the workplace where you are carrying out the risk assessment
viii. resources required for a risk assessment to take place
ix. information sources for risk assessments (e.g. HSE publication)
x. the importance of dealing with or promptly reporting risks
xi. where to find expert advice and guidance

Element 3.13.2 Assess the level of risk and recommend action

Performance statements

In achieving this unit you must:

a. Review all legal requirements that are appropriate to your **workplace** and **working practices** to ensure effective control measures are in place
b. Confirm that industry standards and all other reasonable precautions are in place
c. Identify **hazards** that could be eliminated
d. Start your **risk** assessment for **hazards** that cannot be eliminated, with those **hazards** that are most likely to cause serious harm to **others**
e. Assess the level of **risk/s** and consider how the **risk/s** can be controlled to minimise harm
f. List unacceptable **risk/s** in priority order including all breaches of relevant health and safety legislation and workplace procedures
g. Prepare a risk/s assessment report containing recommendations for minimising **risk/s**

h. Present the results of the risk/s assessment to **responsible persons** in the agreed format and timescale

Knowledge and Understanding

i. the responsibilities for risk assessments as required by the Management of Health and Safety at work Regulations 1992 and other related regulations
ii. your legal duties for health and safety in the workplace as required by the Health and Safety at Work Act 1974
iii. your duties for health and safety as defined by any specific legislation covering your job role
iv. your own limitations, job responsibilities and capabilities
v. the work areas and people for whom you are carrying out the assessment
vi. effective procedures for carrying out a risk assessment
vii. the purpose, legal implications and importance of carrying out a risk assessment
viii. work activities of the people in the workplace where you are carrying out the risk assessment
ix. resources required for a risk assessment to take place
x. what to do with the results of the risk assessment
xi. effective communication methods

Element 3.13.3 Review your workplace assessment of risks

Performance statements

In achieving this unit you must:

a. Compare the latest **risk/s** assessment to current **workplace** and **working practices**
b. Identify, accurately, any significant differences between previous and new **working practices**
c. Investigate the action taken as a result of your recommendations specified in the latest **risk** assessment
d. Identify, accurately, new **hazards** arising from changes in the **workplace** or **working practices**
e. Make changes to your **risk/s** assessment in line with the review
f. Inform, promptly, everyone affected by the changes

Knowledge and Understanding

i. your legal duties for health and safety in the workplace as required by the Health and Safety at Work Act 1974
ii. your duties for health and safety as defined by any specific legislation covering your job role
iii. methods of identifying hazards
iv. your own limitations, job responsibilities and capabilities
v. the work areas and people for whom you are carrying out the assessment
vi. work activities of the people in the workplace where your are carrying out the risk assessment
vii. how to communicate effectively

Glossary of terms

The following terms have a specific meaning in this unit and are highlighted where they appear in the performance standards. In the context of NVQ/SVQ assessment, awarding bodies are required to make sure that a candidate's evidence of performance from the workplace demonstrates that their work is consistent with these terms as defined here.

Procedures Specifications of how to carry out work activities in a manner that will

ensure the required outcomes if the procedure is followed accurately.

All workplace policies, practice and procedures should be specified.

Resources

A range of resources which are used in any activity. These could include:

- Information, documentation and specifications
- manufacturer/supplier data for equipment and materials
- materials
- tools
- equipment

Hazard/risk

The Health and Safety Executive (HSE) have defined two important concepts as follows: a hazard is something with the potential to cause harm: a risk is the likelihood of a hazard's potential being realised. The hazards covered by this unit are relating to:

- the use of plant and equipment
- the use of substances hazardous to health
- the workplace layout
- the working practices
- the job role
- people with special needs

Each organisation will have its own risk control strategy, the candidate will be required to work within this.

Risk

Almost anything may be a hazard, but may or may not become a risk. For example

- a trailing electrical cable from a piece of equipment is a hazard. If it is trailing across a passageway there is a high risk of someone tripping over it, but if it lies along a wall out of the way, the risk is much less
- toxic or flammable chemicals stored in a building are a hazard, and by their nature may present a high risk. However, if they are kept in a properly designed secure store, and handled by properly trained and equipped people, the risk is much less than if they are left about in a busy workshop for anyone to use - or misuse.
- a failed light bulb is a hazard. If it is just one bulb out of many in a room it presents very little risk, but if it is the only light on a stairwell, it is a very high risk. Changing the bulb may be a high risk, if it is high up, or if the power has been left on, or low risk if it is in a table lamp which has been unplugged.
- a box of heavy material is a hazard. It presents a higher risk to someone who lifts it manually than if a mechanical handling device is properly used.

Relevant people

People who have expertise in and/or responsibility for the areas of work affected by the procedure. This is likely to include colleagues with production, safety, health, environment and quality specialisms.

Problems

Problems with others, and/or working practices.

- working policies which do not conform to laid down policies
- unsafe behaviour
- accidental breakages
- accidental spillages
- environmental factors

Work place

This is the single or multiple areas in which you carry out your work.

Changes in the workplace covered by this unit are in relation to:

- layout of workplace
- new facilities and services

Working practices

These are any activities, procedures , use of materials or equipment and working techniques used in carrying out your job. In this unit it also covers any omissions in good working practice which may pose a threat to health and safety. Previous and new working practices covered by this unit are relating to:

- plant, machinery and equipment
- substances or materials
- people

Workplace policies

The Workplace Policies covered by this unit are documentation prepared by the employer on the procedures to be followed regarding health and safety matters. It could be the employer's safety procedures covering aspects of the workplace that should be drawn to the employees' (and "other persons") attention.

Other persons

This refers to everyone covered by the Health and Safety at Work Act including: visitors, members of the public, colleagues, contractors, clients, customers, patients, students, pupils.

Personal presentation

The includes: personal hygiene; use of personal protection equipment; clothing and accessories suitable to the particular workplace.

Responsible persons

The persons or persons at work to whom you should report any health and safety issues or hazards. This could be a supervisor, line manager or your employer. Responsible persons covered by this unit are:

- management associated with the examined activities
- employees associated with the examined activities
- decision makers
- union representatives
- staff representatives

Information sources

Information sources covered by this unit are:

- internal Health and Safety experts
- HSE offices
- relevant industry publications
- external organisations

Key points regarding Health and Safety legislation and regulations

"Health and Safety at Work Act 1974"

The Health and Safety at Work Act 1974 is the main piece of legislation under which nearly all other regulations are made . It is for this reason that only this piece of legislation is specifically referred to in this Unit.

Employers have a legal duty under this Act to ensure, so far as is reasonably practicable, the health, safety and welfare at work of the people for whom they are responsible and the people who may be affected by the work they do.

Under this Act it is also important to be aware that all people at work, not just employers, have a duty to take reasonable care to avoid harming themselves or others through the work they do.

Risks should be reduced "so far as is reasonably practicable". This term means the duty-holder (in most instances the employer) can balance the cost against the degree of risk although obviously any Health and Safety Inspectors would expect that relevant good practice is followed.

According to the Act:

Employers must safeguard so far as is reasonably practicable, the health, safety and welfare at works of all the people who work for them and "other persons". This applies in particular to the provision and maintenance of safe plant and systems of work, and covers all machinery, equipment and substances used.

People at work also have a duty under the Act to take reasonable care to avoid harm to themselves or to others by their working practices, and to co-operate with employers and others in meeting statutory requirements. The Act also requires employees not to interfere with or misuse anything provided to protect their health, safety or welfare in compliance with the Act.

Other Legislation

There is an array of health and safety regulations and codes of practice which affect people at work. There are regulations for those who, for example, work with electricity, or work on construction projects, as well as regulations covering noise at work, manual handling, working with VDUs, or dealing with substances hazardous to health, etc. The specific requirements for all or any of these can be obtained from HSE local offices.

As many of the regulations are only relevant to certain workplaces or working practices no specific reference has been made in the Knowledge Requirements to any of these regulations. The phrase "your responsibilities for health and safety as required by any specific legislation covering your job role" is intended to relate to those specific pieces of legislation important to your workplace and/or working practices which you should be able to find out about

Assessment Strategy Statement

In the context of N/SVQ assessment, the use of simulation is not acceptable in the assessment of this unit to cover the full scope as defined by the glossary of the unit. Workplace performance evidence is mandatory for this unit.

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