National Occupational Standards for Process Engineering Maintenance (Instrument and Control) Instrument and Control Technician Approved by UKCG

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.

Unit C3.1: Hand over process engineering plant and equipment

This unit is a tailored version of an electrical unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 7.03 & 7.02) which was originally designated MPS Elec 16

This unit has two elements and is about your competence in completing safe and effective hand over of plant and equipment. It includes the hand over to others and your acceptance and confirmation of responsibility for the control of the plant and equipment.

This unit is common to the Electrical, Mechanical and Instrument & Control disciplines.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Unit-wide Knowledge and Understanding

You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.
You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

You must have a working knowledge and understanding of the types of support through your **working relationships** that can be offered to those transferring control.

You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Unit-wide Scope

1. **The level and extent of responsibility** is limited to working within clearly defined specifications for hand over situations. In some cases, you may still be expected to refer to others for final authorisation, even though you remain responsible for identifying and implementing decisions.

2. **The type of products or assets** could include:

    - Systems & sub-systems
    - Process equipment
    - New installations

3. **The hand over procedures and environments** may be under operational or non-operational conditions.

A typical example of a hand over during operational conditions could be:

- Shift changes on continuous process plants

A typical example of hand over under non-operational conditions could be:

- Between maintenance and operational teams at the end of an overhaul
- Hand over of a large on-going maintenance project
- Hand over from in-house maintenance teams to outside specialists

- Shift to shift

4. **The parties to hand over to** could include:

   Clients
   Production operations
   Maintenance engineers
   Line supervisors

5. **The Complexity of hand-overs** could include:

   Written
   Oral
   Test documentation

Element C3.1.1: Hand over plant and equipment

Performance statements

In achieving this element you must:

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Confirm and define the condition of the engineering products or assets in accordance with specifications
c. Clearly define and obtain agreement on the moment of transfer of responsibility
d. Communicate hand over of control as specified
e. Produce and maintain records of the hand over in accordance with organisational procedures

Knowledge and Understanding

i. You must have a working knowledge and understanding of the **hand over procedures for products or assets.** This should include when the hand over should occur, how to confirm the precise moment of transfer, and why it is important to define the precise moment of transfer.

ii. You must have a working knowledge and understanding of the **record and documentation systems and procedures.** This should include the level of detail on the condition of engineering products/assets as required by different parties, how to confirm that information received at hand over is accurate and complete, and what the types of situation are where additional information and clarification might be required.

Element C3.1.2: Accept and confirm responsibility for the control of plant and equipment

Performance statements

In achieving this element you must:

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Check and confirm that the condition of the engineering products or assets is in an acceptable hand over condition
c. Make sure that the information received at hand over is accurate, up-to-date and complete
d. Seek additional information if there are any areas of doubt or lack of clarity
e. Provide proper support and co-ordination to those transferring control
f. Confirm and record acceptance of responsibility and control in line with agreed procedures

Knowledge and Understanding

i. You must have a working knowledge and understanding of the **hand over procedures for products or plant and equipment.** This should include when the hand over should occur, how to confirm the precise moment of transfer, and why it is important to confirm the precise moment of transfer.

ii. You must have a working knowledge and understanding of **record and documentation systems and procedures.** This should include the level of detail on the condition of engineering products/assets required by different parties.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit No C3.2: Reinstate the work area after completing the maintenance of process engineering plant and equipment

This unit is a tailored version of an Electrical unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 2.15) which was originally designated MPS Elec 15

This unit is about your competence in restoring the work area to a safe condition prior to returning to operations. You will be required to identify and separate waste materials for disposal and identify and separate out materials suitable for storage and further use. You will be following your organisations safe working practices at all times and working within the work permit procedures.

This unit is common to the Electrical, Mechanical and Instrument & Control disciplines

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving the unit you must:

a) Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b) Separate equipment, components, and materials for re-use from waste items and materials
c) Store reusable materials and equipment in an appropriate location
d) Dispose of waste materials in line with organisational and environmental safe procedures
e) Restore the work areas to a safe condition in accordance with agreed requirements and schedules
f) Deal promptly and effectively with problems within your control and report those that cannot be solved

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.
You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

ii. You must have a working knowledge and understanding of the **work area restoration requirements** and the relevant health and safety, and organisational safe working practices and procedures.

iii. You must have a working knowledge and understanding of the **material and equipment stores procedures**, and organisational procedures which you have to follow.

You must have a working knowledge and understanding of the appropriate **waste disposal methods and procedures** for different types of waste, in accordance with current health and safety regulations, relevant legislation and organisational practice.

You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of this standard

1. **The level and extent of responsibility** will involve you being responsible for ensuring the equipment and work site is safe for others or yourself to work in by following defined procedures. You will be accountable for the integrity of the work site and ensuring the work is recorded in a formal manner. Authorisation for proceeding with the work will be given by authorized signatories within the Permit to Work system.

2. **The work areas to be restored** should relate to chemicals manufacturing or onshore sites or offshore installations.

3. **The resources to be stored** are materials and equipment for use at sometime in the future and retained either in secure, enclosed containment or unenclosed within a work area or storage facility. Resources could be identified, sorted, protected and evaluated for further use. Appropriate storage facilities should be used where necessary. Typical resources could include:

   Consumables
   Assembly/alignment aids
   Storing/stacking equipment
   Lifting equipment
   Safety equipment
   Personal Protective Equipment/shielding equipment
   Excess materials
   Process and ancillary equipment
   Industrial gas cylinders
   Tools / equipment
   Protection sheeting
   Re-usable components assemblies

4. **The disposal of hazardous and non-hazardous materials** could include:

   Non hazardous:

   - Packaging/protecting materials
   - Swarf
   - Material off cuts
   - Replaced “lifed” consumables

   Hazardous:

   - Chemicals and fluids e.g. solvents and cleaning agents
   - Sharp objects/off cuts
   - Asbestos or asbestos based
   - Oils and greases

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit C3.3: Minimize risks to life, property and the environment

This unit is a contextualised version of a unit produced by the OSC Eng Engineering Competence Standards which was originally designated ECS 7.05

This unit is about your competence in minimizing the risks to life, property and the environment. You will be required to identify hazards, assess the risks involved, minimize the risks by implementing control measures and providing ongoing monitoring. All the relevant safety systems will require updating.

This unit is common to the Electrical, Mechanical and Instrument & Control disciplines.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

You must:

a. Work safely in accordance with the regulations for your work environment
b. Identify hazards and assess the level of risk involved
c. Minimize the risks and implement control measures in the minimum agreed timescales
d. Inform all those who are affected of the risk control measures in place and clarify any implications for them as required
e. Ensure that information provided for safety system records is clear, accurate and up-to-date
f. Monitor the effectiveness of the risk control measures and take prompt additional action where needed

Knowledge and understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.

   You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

ii. You must have a working knowledge and understanding of the **types of hazards involving processes, tools, equipment and materials** that are likely to be met whilst carrying out the maintenance of plant and equipment.

iii. You must have a working knowledge and understanding of the **safety assessment methods and techniques** to be used.

iv. You must have a working knowledge and understanding of the **actions to minimize risk from hazards.**

v. You must have a working knowledge and understanding of the **safety reporting procedures and documentation** for your working environment.

vi. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** for your working environment.

Scope of the standard

1. **The level and extent of responsibility** is limited to working within agreed specifications and following clearly defined procedures with regard to identifying and dealing with risks to life, property and the environment. You will be expected to take immediate action appropriate to the circumstances.

2. The **type of working environment** could be anywhere involving petroleum and chemicals manufacturing, controlled operational areas and offshore installations.

3. The **type of hazards involved** could be those that may affect the safety and / or integrity of:

People	Operational equipment
Environment	

4. The **risk control measures to be implemented** will include those approved by the company.

5. The **type of action to be taken** will be limited to your responsibility but should include:

Removal of the hazard	Shutting down the process
Raising the alarm	Stopping the work

6. The **methods of communicating or reporting actions** will be in accordance with the requirements of the company.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit is suitable for a combination of assessment in the workplace and simulation.

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Unit C3.4: Work safely, minimize risk and comply with emergency procedures

This unit is an tailored version of a core unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 7.06) which was originally designated CO2

This unit is about your competence in working safely, dealing with risks by taking action to minimize the risks and where necessary complying with the emergency procedures.

You will be following your organisation's safe working practices at all times.

This unit is common to the Electrical, Mechanical and Instrument & Control disciplines

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must:

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Call for expert help in the event of contingencies occurring, using warning systems as appropriate
c. Take prompt and appropriate action to minimize risk of personal and third party injury as a first priority and then damage to property and equipment
d. Follow shutdown and evacuation procedures promptly and correctly
e. Deal safely with dangers that can be contained using appropriate equipment and materials, in accordance with organisational policy and procedures

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.
You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

ii. You must have a working knowledge and understanding of **First Aid procedures.** This should include the sources of competent assistance including the location of local first-aid facilities and first-aiders and systems for alerting relevant professional authorities.

iii. You must have a working knowledge and understanding of the **evacuation procedures.** This should include what the procedures for shutdown and evacuation are, and where information on shutdown and evacuation procedures can be obtained.

iv. You must have a working knowledge and understanding of **contingency reporting documentation and systems** relevant to the procedures at the workplace. This could be expected to include local or company reporting procedures for near misses or accidents.

v. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of this standard

1. **The level and extent of responsibility** is limited to working within an overall risk control strategy which has been developed by safety specialists and which includes detailed criteria for identifying risks together with clearly defined procedures for action which must be followed. In some cases, you may be expected to refer to others for final authorisations, even though you remain responsible for identifying and implementing decisions.

2. **The types of contingencies,** i.e. accidents and incidents by their very nature are unexpected but the company risk control strategy sets out the responses that you should follow in order to limit risks arising.

3. **The actions to be taken** could include:

Isolation of hazard/containment	Restriction of others exposure to hazard
Stopping activities	Implementation of alarm and evacuation
Reporting to appropriate person	procedures to assembly point.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit is suitable for a combination of assessment in the workplace and simulation.

Unit C3.5: Contribute to effective working relationships

This unit is an tailored version of a core unit produced by the ECITB from the OSC Eng Engineering Competence Standards (8.02) which was originally designated CO1

This unit is about your competence in developing and maintaining effective working relationships with others. This may include colleagues, supervisors and visitors and may be frequent or infrequent. Both oral and written methods will be used.

This unit is common to the Electrical, Mechanical and Instrument & Control disciplines.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving the unit you must:

a. Establish and maintain productive working relationships
b. Deal with disagreements in an amicable and constructive way so that good relationships are maintained
c. Keep others informed about work plans or activities which affect them
d. Seek assistance from others in a polite and courteous way without causing undue disruption to normal work activities
e. Respond in a timely and positive way when others ask for help or information

Knowledge and Understanding

I. You must have a working knowledge and understanding of how to **create and maintain working relationships**, and why it is important to do so.

II. You must have a working knowledge and understanding of what the types of **problems** are that can **affect relationships**, and what actions can be taken to deal with specific difficulties.

III. You must have a working knowledge and understanding of what your own and others responsibilities are with regards to **lines of communication and responsibilities.**

Scope of this standard

1. **The groups of people with which relationships should be maintained.** Working relationships need to be fostered with other people with whom you come into contact as part of your work role either on a frequent or regular basis, or occasionally only. Typical relationships could be with:

Those for whom you have responsibility	Those to whom you are responsible
Clients	Colleagues
Other disciplines	Suppliers
Security/safety personnel	

2. Effective working relations require **communication** with others. This could include:

Formal/informal Written Oral

Examples could include:

Tool box talks
Safety feedback
Complaints
Appraisals/performance reviews.
Inductions
Production loop
Liaison between training and workplace contacts

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit is suitable for a combination of assessment in the workplace and simulation.

Unit I3.1 : Carry out planned maintenance procedures on instrument and control systems

This unit has been tailored from an instrument and control unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 5.01) which was originally designated MPS Inst 3

This unit is about your competence in maintaining instrument and control equipment in line with the manufacturers and organisational practices and procedures. You will be required to complete the maintenance procedures in a timely manner, follow procedures and finally complete the appropriate documentation. You will be following your organisations safe working practices at all times and working within the work permit procedures.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must:

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Follow the relevant maintenance schedules to carry out the required work
c. Carry out the maintenance activities within the limits of your personal authority
d. Carry out the maintenance activities in the specified sequence and in an agreed time scale
e. Report any instances where the maintenance activities cannot be fully met or where there are identified defects outside the planned schedule
f. Complete relevant maintenance records accurately and pass them on to the appropriate person
g. Dispose of waste materials in accordance with safe working practices and approved procedures

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.

ii. You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

iii. You must have a working knowledge and understanding of the **maintenance schedules and related specifications** to which you are expected to work. This could be expected to include:

Authorisation procedures	Safe working practices
Product worksheets	Methods statement
Tests	Records
Internal maintenance schedules	Timescales

IV. You must have a working knowledge and understanding of which **maintenance methods and procedures** are standard during maintenance and how they can be modified to optimise the work.

V. You must have a working knowledge and understanding of **maintenance records and documentation procedures**.

VI. You must have a working knowledge and understanding of your responsibilities for the **care and control of equipment** that you use.

VII. You must have a working knowledge and understanding of **maintenance authorisation procedures** and limits of responsibility and authority in line with company and manufacturers procedures.

VIII. You must have a working knowledge and understanding of the appropriate methods and **waste disposal procedures** in relation to legislation, regulation and procedures for waste segregation.

IX. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of this standard

1. **The level and extent of responsibility** will involve you being responsible for ensuring the maintenance procedures are carried out safely by following company defined procedures. You will be accountable for the integrity of the work and ensuring the work is recorded in a formal manner. Authorisation for proceeding with the work will be given by authorized signatories within the PTW system

2. The **plant or equipment to be maintained** could include:

   Measurement Systems
   Analysers, protection and detection devices
   Control Systems

3. The **maintenance procedures and activities** to be followed are fully defined within the company maintenance procedures. Typical procedures could include:

   Tightening of connections
   Checking outputs
   Replacement of regularly changed “lifed” components (lamps, bulbs, indicators etc.)
   Checking and adjusting movements/components
   Inspection for damage/ wear/ corrosion/ movement
   Replacement of worn/damaged/corroded components
   Cleaning.

   The **quality standards and accuracy to be achieved** are as set down in QA and QC specifications.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit I3.2 : Deal with variations and defects in instrument and control systems

This unit is a contextualised version of a unit produced by the OSC Eng Engineering Competence Standards which was originally designated ECS 5.07

This unit is about your competence in identifying, assessing and dealing with variations and defects in instrument and control products or assets. The reporting of recommendations to the appropriate people will be required. You will be following your organisation's safe working practices at all times and working within the work permit procedures.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must:

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Identify defects with regard to the product or asset specification
c. Assess the defects and determine action required to return the products and assets to specified condition
d. Report recommendations for action to the appropriate people promptly and in accordance with organisational procedures
e. Record details of defects in accordance with quality assurance and control systems and procedures

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.
You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

ii You must have a working knowledge and understanding of **engineering drawings and their related specifications**. This should include the specifications to which you will be expected to work, including technical drawings (component, assembly, general arrangements, isometrics, 1st and 3rd angle projections), method statements and product worksheets, tolerances.

iii You must have a working knowledge and understanding of the **identification of defects in products and assets.** This could include:

Observation and using all senses	Maintenance logs
Fault reports	Operations logs

iv. You must have a working knowledge and understanding of the **methods of dealing with defects** as defined by your company procedures.

iv. You must have a working knowledge and understanding of the **methods of dealing with defects and variations** and what factors determine the actions to be taken, and why it is important to maintain records of the checks made and the assessments that result from those checks, what information should be entered on those records and where they should be kept.

v. You must have a working knowledge and understanding of the **Quality control systems and documentation procedures** that are specified by your company.

vi. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of the standard

1. The **level and extent of responsibility** will involve you being responsible for ensuring the maintenance procedures are carried out safely by following company defined procedures. You will be accountable for the integrity of the work and ensuring the work is recorded in a formal manner. Authorisation for proceeding with the work will be given by authorized signatories within the PTW system

2. The **assets or equipment to be maintained** could include:

Measurement systems
Analysers, protection and detection devices
Control systems

3. The **type and complexity of defects** will vary from severe damage with the potential for immediate failure to minor damage.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit I3.3 : Diagnose and determine the causes of faults in instrument and control systems

This unit is a contextualised version of a unit produced by the OSC Eng Engineering Competence Standards which was originally designated ECS 6.08

This unit is about your competence in diagnosing and finding faults within instrument and control systems. You will be required to select the most appropriate fault finding technique and tools to locate the fault and on completion notify the appropriate people. To record the results you will follow company procedures and your organisations safe working practices at all times and working within the work permit procedures

During this work you must take account of the relevant installation procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Review and use all relevant information on the symptoms and problems associated with the products or assets
c. Investigate and establish the most likely causes of the faults
d. Select, use and apply diagnostic techniques, tools and aids to locate faults
e. Complete the fault diagnosis within the agreed time and inform the appropriate people when this cannot be achieved
f. Determine the implications of the fault for other work and for safety considerations
g. Use the evidence gained to draw valid conclusions about the nature and probable cause of the fault
h. Record details on the extent and location of the faults in an appropriate format

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.

ii. You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

iii. You must have a working knowledge and understanding of **fault diagnostic aids**. This could be expected to include electrical test equipment, historical data and schematic drawings.

iv. You must have a working knowledge and understanding of **fault finding methods and techniques** this should include how to investigate problems, how to identify the extent and location of problems and what to do when causes are difficult to find, and which actions can be taken to deal with the fault.

v. You must have a working knowledge and understanding of **analysis method and techniques**. This could be expected to include historical data, comparison, and circuit measurements.

vi. You must have a working knowledge and understanding of company procedures and manufacturers guidelines for the **operating and care of test equipment and control procedures.**

vii. You must have a working knowledge and understanding of **assessing the likely risks arising from faults** such as fire, electric shock and damage to plant.

viii. You must have a working knowledge and understanding of **maintenance reporting documentation and control procedures** and how descriptions should be presented, why it is important to record results of the diagnosis, and why it is important to relay conclusions on to others in a timespan appropriate to the nature of the problem.

ix. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of this standard

1. **The level and extent of responsibility** extends to determination and follow up of the information needed to support a clear and accurate definition of the problem and the selection and analysis of diagnostic procedures appropriate to the problem as identified. In some cases, you may still be expected to refer to others for final authorisations, even though you remain responsible for identifying and implementing decisions.

2. **The type of systems investigated** may be single or multiple technology.

   Typical systems could be:

   - Measurement systems
   - Control systems
   - Analysers, protection and detection devices

3. **The type of fault finding techniques or procedures, diagnostic aids and equipment** could include:

   Function testing
   Comparison diagnosis
   Substitution
   Examination of failed components
   Operational performance testing
   Timed monitoring
   Sectional isolation.

4. **The type and range of problems and faults** may arise from environmental factors such as exposure to sudden temperature changes and/or from human error and/or from materials that have been used in or by the systems and/or from inherent features of the systems such as design aspects, age, and/or natural wear and tear.

5. **The level and complexity of diagnosis** can be achieved by applying procedures which are formally specified or which are devised by the candidate in response to the symptoms of the fault.

6. **The record keeping systems and procedures** to include:

   Test results
   Data sheets
   Company procedures.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit C3.6: Prepare work areas for the maintenance of process engineering plant and equipment

This unit is a tailored version of an electrical unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 2.11) which was originally designated MPS Elect 12

This unit is about your competence in preparing the work area in order to carry out the maintenance of plant and equipment. You will be involved in activities such as clearing materials and equipment from the worksite, providing service supplies and completing isolations. You will be following your organisations safe working practices at all times and working within the work permit procedures.

This unit is common to the Electrical, Mechanical and Instrument & Control disciplines.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must:

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Ensure that the work environment is suitable for the work activities to be undertaken
c. Ensure that all necessary service supplies are connected and ready for use
d. Prepare the work areas so that they are ready for the engineering activities to be carried out
e. Make sure that required safety arrangements are in place to protect other workers from activities likely to disrupt normal working
f. Report completion of preparations in line with organisational procedures
g. Deal promptly and effectively with problems within your control and report those that cannot be resolved

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.
You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

ii. You must have a working knowledge and understanding of what the **work area preparation requirements and methods** are. This could be expected to include the location and whether the conditions of work environments are appropriate in terms of:

Layout Accessibility Isolations	Safety Security

iii. You must have a working knowledge and understanding of the potential problems and **consequences of not preparing work areas correctly** in relation to hazards which may occur.

iv. You must have a working knowledge and understanding of the connection and operation of the applicable **supply services and connection procedures** related to the equipment relevant to the industry, including pneumatic, electrical and hydraulic tools.

v. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of this standard

1. **The level and extent of responsibility** will involve you being responsible for ensuring the preparations are carried out safely by following company defined procedures. You will be accountable for the integrity of the work and ensuring the work is recorded in a formal manner. Authorisation for proceeding with the work will be given by authorized signatories within the PTW system

2. **The type of work area to be prepared** would include:

Chemicals manufacturing and petroleum sites	Controlled operational areas	Offshore installations

3. The **type of work area preparations** could involve ensuring that the location and condition of work environments are appropriate in terms of:

Layout Security	Safety Isolations (where relevant)	Accessibility

4. The **type of work area protection and safety requirements** will take into account any hazards due to the particular working conditions that could also include:

Working on access structures (scaffold) At height	Inside systems and plant Adverse weather conditions	Confined spaces In shafts

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit I3.4 : Prepare equipment required for maintaining instrument and control systems

This unit has been tailored from an instrument and control unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 2.13) which was originally designated Inst 13

This unit is about your competence in preparing instrument and control equipment in order to carryout the maintenance of systems. You will be required to obtain and prepare the Instrument and control equipment including making sure the safety arrangements are in place and report to the appropriate authority when completed. You will be following your organisations safe working practices and working within the work permit procedures.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must:

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Obtain all the required equipment and ensure that it is in safe and usable condition
c. Carry out the necessary preparations to equipment in line with work requirements
d. Make sure that required safety arrangements are in place to protect other workers from activities likely to disrupt normal working
e. Report completion of preparations in line with organisational procedures
f. Deal promptly and effectively with problems within your control and report those that cannot be solved

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.

ii. You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

iii. You must have a working knowledge and understanding of **equipment preparation methods and procedures**. This could be expected to include checking the working condition and operation of standard equipment, including safety checks and inspections.

iv. You must have a working knowledge and understanding of the **types of equipment** which may be used. This could be expected to include fixed (machine) and or portable (hand or machine).

v. You must have a working knowledge and understanding of what your responsibilities are for ensuring the **security of tools and equipment** that you use. This could be expected to include ingress protection ratings, explosion protection rating equipment, corrosion, portable appliance testing, heating and ventilation and permit systems.

vi. You must have a working knowledge and understanding of your responsibilities with regard to the reporting **lines and procedures** in your working environment.

Scope of this standard

1. **The level and extent of responsibility** extends to determining and then implementing the preparations necessary where specifications of requirements may be absent or incomplete in some way. In some cases, you may still be expected to refer to others for final authorisation, even though you remain responsible for identifying and implementing decisions.

2. **The equipment safety checks** and inspections will be carried out to ensure that there are no obvious faults present, in accordance with company procedures.

3. The **types of equipment to be prepared** could include:

    - Protective clothing/equipment
    - Lifting & handling equipment
    - Access structures (typically ladders, steps, trestles, youngman boards, temporary staging, access hoists… "cherry-pickers")
    - Process equipment
    - Tools
    - Safety equipment/harnesses
    - Temporary electrical supplies.

4. **Types of equipment preparation**

    Equipment preparation could involve selection, inspection, changing settings or the calibrating as well as routine checks on its condition, operation, suitability and safety, in compliance with company procedures.

    Typical preparation could include:

    - Identification
    - Addition of extra lifting points
    - Storage
    - Confirming alignment
    - Development
    - Cleaning
    - Protecting/preserving
    - Security
    - Precision measuring
    - Weight confirming/assessment
    - Checking quality and quantity
    - Asset/product orientation
    - Setting out

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting

information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit I3.5 : Prepare materials required for maintaining instrument and control systems

This unit has been tailored from an instrument and control unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 2.12) which was originally designated MPS Inst 12

This unit is about your competence in preparing the materials in order to carry out the maintenance of instrument and control systems. You will be required to check the quality and quantity of the materials, determine how the materials should be prepared and report on completion. You will be following your organisations safe working practices and working within the work permit procedures.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must**:**

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Obtain the required materials and check them for quantity and quality
c. Determine how the materials need to be prepared
d. Carry out the preparations using suitable equipment
e. Report completion of preparations in line with organisational procedures
f. Deal promptly and effectively with problems within your control and report those that cannot be solved

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.

ii. You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

iii. You must have a working knowledge and understanding of how to **identify the materials** you are to use **and recognise defects** in the quality of them.

iv. You must have a working knowledge and understanding of the **types of handling and preparation methods** and techniques needed for different materials.

v. You must have a working knowledge and understanding of what your responsibilities are for ensuring the security of the **tools and equipment and their control procedures** that you use. This could be expected to include:

Ingress protection ratings	Explosion protection rating equipment	Corrosion
Portable appliance testing		Permit systems
Heating and ventilation		

vi. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of this standard

1. **The level and extent of responsibility** will involve you being responsible for ensuring the preparations are carried out safely by following company defined procedures. You will be accountable for the integrity of the work and ensuring the work is recorded in a formal manner. Authorisation for proceeding with the work will be given by authorized signatories within the PTW system

2. **The type and complexity of material preparations** involve standard treatments and/or require taking instrument readings for analysis. Typical preparation could include:

Identification	Cleaning	Precision measuring
Storage	Protecting/preserving	Checking quality and quantity
Confirming alignment	Security	Asset/product orientation
Setting out		

3. **The types of materials** could include materials and/or components used in the engineering activity, including:

Proprietary items (repair by replacement)	Spare parts

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit No I3.6 : Adjust instrument and control systems to meet operational requirements

This unit has been tailored from an instrument and control unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 5.02) which was originally designated MPS Inst 4

This unit is about your competence in adjusting instrument and control equipment in line with the manufacturers and organisations parameters. You will be required to identify the equipment to be adjusted, carryout the adjustment and complete the appropriate documentation. You will be following your organisations safe working practices and working within the work permit procedures.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must:

Work safely at all times, complying with health and safety and other relevant regulations and guidelines
Follow the appropriate operating specifications for the equipment being maintained
Carry out adjustments within the limits of your personal authority
Make the required adjustments in the specified sequence and in an agreed time scale
Confirm that the adjusted equipment meets the required operating specification
Report any instances where the equipment fails to meet the required performance after adjustments or where there are identified defects outside the required adjustments
Maintain documentation in accordance with organisational requirements

Knowledge and Understanding

1. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.

2. You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

3. You must have a working knowledge and understanding of the **maintenance schedules and related specifications.** This should include where to access operating requirements, and what the specified operating requirements are of specific assets, including internal maintenance schedules.

4. You must have a working knowledge and understanding of the **maintenance methods and procedures.** This should include how different types of adjustment should be made, how much time is allowed for different types of adjustment, which tools, materials, and methods should be used for maintenance, and how to minimize disruption to other activities.

5. You must have a working knowledge and understanding of **maintenance records and documentation procedures** in line with company and manufacturers' procedures.

6. You must have a working knowledge and understanding of **equipment operating and care and control procedures** of the equipment that you use.

7. You must have a working knowledge and understanding of **maintenance authorisation procedures and limits of your responsibility and authority** in line with company and manufacturer's procedures.

8. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your environment.

Scope of this standard

1. **The level and extent of responsibility** extends to the interpretation of a specification, selecting and verifying methods, procedures and materials at his/her discretion to achieve the best possible result in the conditions applying. In some cases, you may still be expected to refer to others for final authorisation, even though you remain responsible for identifying and implementing decisions.

2. **The type of equipment to be worked on** could include

    - Measurement systems
    - Analysers, protection and detection devices
    - Control systems

3. **The type and complexity of adjustments to be made** could include

- Replenishment of consumable
- Safety checks
- Checking outputs
- Recording data
- Replacement of worn/damaged/corroded components
- Cleaning
- Tightening of connections
- Checking and adjusting movements/components
- Inspection for damage/wear/corrosion/movement
- Replacement of regularly changed 'life' components

The **quality standards and accuracy to be achieved** are in accordance with manufacturers' guidelines and procedures and relevant international standards.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.ed.

Unit I3.7 : Remove components from instrument and control systems

This unit has been tailored from an instrument and control unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 5.03) which was originally designated MPS Inst 5

This unit is about your competence in removing components from instrument and control equipment using manufacturer's procedures. You will be required to ensure suitable precautions are taken to prevent the escape of liquids or gases. Following removal, the components should be labelled and stored according to organisational procedures. You will be following your organisations safe working practices and working within the work permit procedures.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving the unit you must:

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Establish, and where appropriate, mark component orientation for re-assembly
c. Ensure that any stored energy or substances are released safely and correctly
d. Remove the required components using approved tools and techniques
e. Take suitable precautions to prevent damage to components, tools and equipment during removal
f. Check the condition of the removed components and record those that will require replacing
g. Label and store the removed components in an appropriate location
h. Store or discard the removed components in accordance with approved procedures
i. Maintain documentation in accordance with organisational requirements

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.

ii. You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

iii. You must have a working knowledge and understanding of the **engineering drawings and related specifications** to which you will be expected to work, including technical drawings (component, assembly, general arrangements, isometrics, 1st and 3rd angle projections), method statements and product worksheets, tolerances.

iv. You must have a working knowledge and understanding of **component removal methods and techniques including** what the types of isolations and connections are that have to be made, and which tools, equipment and methods can be used to remove specific components from specific systems.

v. You must have a working knowledge and understanding of the **identification of component defects** that have been removed.

vi. You must have a working knowledge and understanding of the **labelling and storage of components for re-use** and what the available marking systems are for specific components and connections.

vii. You must have a working knowledge and understanding of the **disposal of unwanted components and substances,** this should include what substances could be released during the removal of components, which risks are associated with the release of substances, and where to access information on the environmental standards, including an appreciation on COSHH, SEPA and company procedures.

viii. You must have a working knowledge and understanding of the **tool and equipment care and control procedures** including what your responsibilities are for ensuring the security of tools and equipment that you use.

ix. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of this standard

1. **The level and extent of responsibility** will involve you being responsible for ensuring the equipment and work site is safe for others or yourself to work in by following defined procedures. You will be accountable for the integrity of the work site and ensuring the work is recorded in a formal manner. Authorisation for proceeding with the work will be given by authorized signatories within the PTW system

2. **The equipment to be worked on** includes**:**

   Rotating equipment and tools
   Protection methods
   Electrical distribution systems

3. **The type of components to be removed** may be robust or fragile. Robust components are those that are resistant to most forms of damage or disruption during their working lives. Fragile components are those that are easily disrupted or damaged. Damage or disruption could be due to physical, chemical or other forces (e.g. Electro-magnetic).

   Typical robust components could be:

   - Metering devices
   - Control panels
   - Mechanical linkages
   - Components of back-up systems
   - Motors
   - Control valves/governors
   - Components of process control systems

   Typical fragile components could be:

- Components of gauges
- Components of metering devices
- Components of motors
- Components of analysing devices
- Actuators
- Seatings
- Components of circuit/environmental protectors
- Safety limit protection devices
- Seals
- Components of control panels
- Springs
- Diaphragms
- Components of impulse systems
- Electronic components

4. **The removal techniques or procedures to be followed** should involve components to be removed that may require a sequential series of steps to complete the removal. The component may be difficult to access and may be surrounded by other fragile/valued components and may need specialised tooling requirements. Removal may involve more than 1 differing technologies and/or involve a significant number of fragile components.

5. The specifications to which a candidate would be expected to work to could include:

    - Product worksheets
    - Technical drawings (components, assembly, general arrangement, isometrics).
    - Method statements
    - Maintenance schedules.

6. The **removal operations** for the component may be may be difficult to access and may be surrounded by other fragile/valued components and may need specialised tooling requirements. Removal may involve more than one different technologies and/or involve a significant number of fragile components

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit I3.8 : Replace components in instrument and control systems

This unit has been tailored from an instrument and control unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 5.04) which was originally designated MPS Inst 6

This unit is about your competence in replacing components in Instrument and control systems. You will be required to ensure the replaced components meet the required specifications, protect them from damage, replace using the appropriate tools and techniques and making any final adjustments. You will be following your organisations safe working practices and working within the work permit procedures.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving the unit you must:

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Obtain all the required components and ensure that they are in a suitable condition for replacement and fit for purpose
c. Ensure that any replacement components used meet the required specification
d. Take adequate precautions to prevent damage to components, tools and equipment during replacement
e. Replace the components in the correct sequence using appropriate tools and techniques
f. Make any necessary settings or adjustments to the components to ensure they will function correctly
g. Deal promptly and effectively with problems within your control and report those that cannot be solved
h. Maintain documentation in accordance with organisational requirements

Knowledge and Understanding

I. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.
II. You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

III. You must have a working knowledge and understanding of the **engineering drawings and related specifications** to which you will be expected to work, including technical drawings (component, assembly, general arrangements, isometrics, 1st and 3rd angle projections), method statements and product worksheets, tolerances.

IV. You must have a working knowledge and understanding of the **component replacement methods and techniques** including the types of reconnection that have to be made, and which tools, equipment and methods can be used to replace specific components in specific systems.

V. You must have a working knowledge and understanding of **Handling equipment, methods and techniques**. This could be expected to include manual handling

pressure and thermal methods and techniques.

VI. You must have a working knowledge and understanding of what your responsibilities are for the **tool and equipment care and control procedures** thereby ensuring the security of tools and equipment that you use. This could be expected to include ingress protection ratings, explosion protection rating, corrosion, portable appliance testing, heating and ventilation and permit systems.

VII. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of this standard

1. **The level and extent of responsibility** will involve you being responsible for ensuring the equipment and work site is safe for others or yourself to work in by following defined procedures. You will be accountable for the integrity of the work site and ensuring the work is recorded in a formal manner. Authorisation for proceeding with the work will be given by authorized signatories within the PTW system

2. **Equipment to be worked on could include:**

   Rotating equipment and tools
   Protection methods
   Electrical distribution systems

3. **The type of components to be replaced** may be robust or fragile. Robust components are those that are resistant to most forms of damage or disruption during their working lives. Fragile components are those that are easily disrupted or damaged. Damage or disruption could be due to physical, chemical or other forces (*e.g. Electro-magnetic*). Typical robust components could be:

   - Metering devices
   - Control panels
   - Mechanical linkages
   - Components of back-up systems
   - Motors
   - Control valves/governors
   - Components of process control systems

   Typical fragile components could be:

   - Components of gauges
   - Components of metering devices
   - Components of motors
   - Components of analysing devices
   - Actuators
   - Seatings
   - Components of circuit/environmental protectors
   - Safety limit protection devices
   - Seals
   - Components of control panels
   - Springs
   - Diaphragms
   - Components of impulse systems
   - Electronic components

4. There are particular problems associated with **the assembly methods and techniques**. This could relate to orientation, fragility and locating requirements. The methods and techniques used take account of this could include:
   - Using thread fasteners
   - Clamping
   - Connecting male/female connectors
   - Installing springs
   - Soldering
   - Sealing
   - Terminating cables/impulse lines

5. **The Complexity of assembly operations** may be simple or complex. Simple replacement of components refers to situations where the component is quickly and easily removed from its position. Typical examples could include lifting out of plug-in components and undoing threaded fasteners to release the component. Complex replacements refers to situations where the components can only be replaced by disrupting the surrounding areas e.g. by cutting or de-soldering and/or where replacement of one component necessitates replacements of other interacting components.

   The **quality standards and accuracy to be achieved** are as set down in the work specifications.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit I3.9: Determine the feasibility of repair of components from instrument and control systems

This unit has been tailored from an instrument and control unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 5.05) which was originally designated MPS Inst 16

This unit is about your competence in establishing and deviation from the required tolerances and what action has to be taken to bring the component back into service.
You will be following your organisations safe working practices and working within the work permit procedures.
During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving the unit you must:

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Follow the relevant specifications for the component to be repaired
c. Assess the amount and level of wear or damage to the component and determine what work is required to bring the component back to the specified condition
d. Report on findings and conclusions on the feasibility and cost-effectiveness of repairs

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.

ii. You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

iii. You must have a working knowledge and understanding of the **engineering specifications** to which you will be expected to work. This could be expected to include product worksheets, method statements, manufacturers' data sheets, maintenance schedules, and technical drawings (components, assembly, general arrangement, isometrics).

iv. You must have a working knowledge and understanding of **assessing the conditions of components for re-use**. This could be expected to include electrical integrity.

v. You must have a working knowledge and understanding of **determining the feasibility and viability of repairs**. This could be expected to include Instrument and control integrity.

vi. You must have a working knowledge and understanding of **component replacement methods and techniques.** This could be expected to include manufacturers' data, and sources of information.

vii. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of this standard

1. **The level and extent of responsibility** will involve you being responsible for ensuring the equipment and work site is safe for others or yourself to work on by following defined procedures. You will be accountable for the integrity of the work site and ensuring the work is recorded in a formal manner. Authorisation for proceeding with the work will be given by authorized signatories within the PTW system

2. **The type of components to be repaired** may be robust or fragile. Robust components are those which are resistant to most forms of damage or disruption during their working lives. Fragile components are those which are easily disrupted or damaged. Damage or disruption could be due to physical, chemical or other forces (e.g. Electro-magnetic).

   Typical robust components could be:

   - Metering devices
   - Control valves/governors
   - Components of back-up systems
   - Motors
   - Control panels
   - Mechanical linkages
   - Components of circuit/environment protectors
   - Components of process control systems

   Typical fragile components could be:

   - Components of gauges
   - Components of metering devices
   - Components of motors
   - Components of analysing devices
   - Components of impulse systems
   - Actuators
   - Safety limits protection devices
   - Seatings
   - Components of control panels
   - Seals
   - Springs
   - Diaphragms

3. The **type of repair** to be made requires one or more **techniques** to be applied depending upon its complexity. The techniques are standard within the sector but may require some modification to achieve the required result. The techniques may relate to one or more technologies depending upon the complexity of the repair.

   Typical repair techniques could include:

   - Re-aligning
   - Bonding
   - Re-soldering
   - Re-sealing
   - Re-shaping by material removal

4. **The nature of repairs to be carried out** may be simple or complex. Simple repairs are those which can be easily achieved using tools and techniques generally available and/or for which clearly defined procedures exist and/or where the repair site is easily accessed. Complex repairs are those which can only be achieved using tools and techniques which have been specially modified in some way to achieve the repair and/or where no pre-defined procedures exist for effecting repair and/or where the repair site is difficult to access.

5. The **quality standards and accuracy to be achieved** are as set down in the work specifications.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit No I3.10 : Interpret detailed instrument and control information from technical sources

This unit is a contextualised version of a unit produced by the OSC Eng Engineering Competence Standards which was originally designated ECS 1.12

This unit is about your competence in interpreting information from drawings, diagrams and technical manuals. You will be required to ensure the information is accurate, up to date and contains all the data. You will also be required to identify and deal with any problems that may arise.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must:

a. Use up-to-date, accurate and relevant information on technical requirements
b. Ensure that the information contains all essential data
c. Identify and interpret the required details
d. Identify and deal promptly and effectively with any problems occurring with the requirements and their interpretation

Knowledge statements

i. You must have a working knowledge and understanding of the **information and document systems** that relate to the maintenance of Instrument and control systems.

ii. You must have a working knowledge and understanding of the **document care and control procedures** in line with the company and manufactures procedures.

iii. You must have a working knowledge and understanding of the **specification structure and content**

iv. You must have a working knowledge and understanding of the **conventions, symbols and abbreviations** as used within the oil and gas, chemicals manufacturing and petroleum industries. This could include:

- British standards
- Codes of Practice
- International standards
- Company specific
- Manufacture specific

v. You must have a working knowledge and understanding of the **standards and regulations** that relate to the maintenance of Instrument and control systems.

vi. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your environment.

Scope of the standard

This should cover:

1. The **level and extent of responsibility** will involve you being responsible for ensuring that the source information is obtained from the latest version. In some cases you may be expected to refer to others when checking the data even though you remain responsible for the final product.

2. The **complexity of technical detail** could include:

   - Pneumatic schematics
   - Instrument and control schematics and single line diagrams
   - Hydraulic schematics

3. The **technical problems and issues** will vary from solving simple single line diagrams to more complex drawings and specifications provided by the manufacture.

4. The **use and interpretation of information**

5. The **type and complexity of technical sources**

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit No I3.11 : Read and extract information from instrument and control engineering drawings and specifications

This unit is a contextualised version of a unit produced by the OSC Eng Engineering Competence Standards which was originally designated ECS 1.13

This unit is about your competence in extracting information from technical drawings and publications prior to starting instrument and control maintenance work.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must:

a. Use the approved source to obtain the required drawings and specifications
b. Correctly interpret the drawings and specifications
c. Identify, extract and interpret the required information
d. Use the information obtained to ensure that work output meets the specification
e. Deal promptly and effectively with any problems within your control and report those which cannot be solved
f. Report any inaccuracies or discrepancies in drawings and specification

Knowledge statements

i. You must have a working knowledge and understanding of the **information and documentation systems** that relate to the maintenance of systems.

ii. You must have a working knowledge and understanding of the currently used **types of engineering drawing and specifications.** This could include:

schematic diagrams
As-built drawings
Manufactures specifications
Processing and instrumentation diagrams (P&ID's)

iii. You must have a working knowledge and understanding of the **conventions, symbols and abbreviations used** within your company. This could include:

British Standard
Codes of Practice
International standards
Company specific

iv. You must have a working knowledge and understanding of the **sources of information** available to you.

v. You must have a working knowledge and understanding of the **identification and selection of data,** this should ensure that the data is current and relevant to the location.

vi. You must have a working knowledge and understanding of the **document care and control** procedures that are specified by the company.

vii. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of this Standard

The **level and extent of responsibility you have** for ensuring the information is sourced from the latest version of the **drawings and specifications**.

2. The **type and complexity of drawings and specifications** could be:

- Pneumatic schematics
- Instrument and control schematics and single line diagrams
- Hydraulic schematics

3. The **information to be extracted** will relate to the maintenance and repair of systems normally used within the oil and gas, chemicals manufacturing and petroleum industries.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit No I3.12 : Identify and suggest improvements to working practices and procedures whilst maintaining instrument and control systems

This unit is a contextualised version of a unit produced by the OSC Eng Engineering Competence Standards which was originally designated ECS 1.23

This unit is about your competence in identifying and suggesting improvements. You will be required to collect and assess information on current practices and suggest opportunities for improvement by following agreed company procedures.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must:

a. Take into consideration health and safety and other relevant regulations and guidelines
b. Collect information and feedback on current working practices and procedures
c. Assess current working practices and procedures against agreed standards
d. Identify opportunities for improving working practices and procedures
e. Make suggestions for improvements that are realistic and which indicate the benefits that might be achieved
f. Ensure that suggested improvements meet organisational requirements
g. Present suggestions for improvements in accordance with organisational procedures
h. Contribute to discussions about work practices and quality

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.

You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

ii. You must have a working knowledge and understanding of the **sources of information** that are available from the:

Company records
Company procedures
Clients
Personal experience
Tool box talks

iii. You must have a working knowledge and understanding of **work improvement methods and techniques** that are set by your company.

iv. You must have a working knowledge and understanding of **organisational structure, improvement systems and procedures** that are set by your company

v. You must have a working knowledge and understanding of **presentation of information** as described by the company procedures.

vi. You must have a working knowledge and understanding of the **working relationships** taking account of the organisation structure, the individuals and any external influences.

vii. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of the standard

1. The **engineering activities** will be within your own area expertise and contained within the oil and gas, chemicals manufacture and petroleum industries.

2. The **complexity of activities** will be those processes and systems on which the maintenance activities are being conducted.

3. The **type and range of improvements to be identified** will involve the changes to existing procedures and processes covering safety, quality, time and cost.

4. The **methods for identifying improvements** may include use of senses, discussions at tool box talks and own work practices.

5. The **presentation techniques** will be in line with company procedures.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit I3.13 : Establish that an engineering maintenance process has been completed to specification

This unit has been tailored from an instrument and control unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 6.01) which was originally designated MPS Inst 19

This unit is about your competence in ensuring that the work has been completed to company and or manufacturers standards.

During this work you must take account of the relevant worksite operational requirements, procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving the unit you must:

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Follow and make appropriate use of the specifications for the product or asset being checked
c. Use all the correct tools and inspection equipment and check that they are in usable condition
d. Carry out the checks in an appropriate sequence using approved methods and procedures
e. Identify and assess any defects or variations from the specification and take appropriate action
f. Report completion of compliance activities in line with organisational procedures

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.

ii. You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

iii. You must have a working knowledge and understanding of the **Engineering drawings and related specifications** to which you will be expected to work, including technical drawings (component, assembly, general arrangements, isometrics, 1st and 3rd angle projections), method statements and product worksheets, tolerances.

iv. You must have a working knowledge and understanding of how to make an adequate **check of compliance against criteria**. This could be expected to include ex equipment and data sheets, commissioning procedures, manufacturers data and local procedures.

v. You must have a working knowledge and understanding of **Identification of defects in systems.** This should include what the typical defects and variations are that arise and how to identify them.

vi. You must have a working knowledge and understanding of **quality control systems and documentation procedures.** This should include how defects and variations should be dealt with and what factors determine the actions to be taken, and why it is important to maintain records of the checks made and the assessments that result from

those checks, what information should be entered on those records and where they should be kept.

vii. You must have a working knowledge and understanding of **the case of inspection equipment and control procedures.** This should include what your responsibilities are for ensuring the security of tools and equipment that you use. This could be expected to include ingress protection ratings, explosion protection equipment, corrosion, portable appliance testing, heating and ventilation and permit systems.

viii. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of this standard

1. **The level and extent of responsibility** extends to dismantling the asset to a specified degree but you may alter and/or vary the sequence of actions and techniques followed at your discretion to achieve the best possible result in the conditions applying. In some cases, you may still be expected to refer to others for final authorisations, even though you remain responsible for identifying and implementing decisions.

2. The **type of products or assets to be checked** are Instrument and control systems related to engineering work. This would include:

    - Engines
    - Transmissions systems
    - Power transmissions systems
    - Turbines
    - Mechanical/hydraulic systems/actuators
    - Fluid/gas transmission systems

3. The **inspection, test and record-keeping procedures to be followed** are as set out in internal QA and QC procedures.

4. **The aspects, characteristics and complexity of checks to be made** are as set down in manufacturers guidelines and procedures and will include ensuring compliance with relevant international standards, equipment manufacturer specifications, HSE, company procedures, the Electricity at Work regulations and BS 7671. The type of checks made will depend on the engineering process carried out which may include:

    - Dismantling
    - Assembly
    - Positioning and installation
    - Repair of components
    - Removal and replacement of components
    - Adjustment
    - Planned maintenance activities testing

5. The **quality standards and accuracy** are as set down in work specifications.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace..

Unit No I3.14 : Test the performance and condition of instrument and control systems

This unit has been tailored from an instrument and control unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 6.02) which was originally designated MPS Inst 17

This unit is about your competence in testing instrument and control systems. You will be expected to refer to manufacturers manuals and follow your company procedures.

During this work you must take account of the relevant installation procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must:

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Follow the appropriate procedures for use of tools and equipment to carry out the required tests
c. Set up and carry out the tests using the correct procedures and within agreed timescales
d. Record the results of the tests in the appropriate format
e. Review the results and carry out further tests if necessary

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.

ii. You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

iii. You must have a working knowledge and understanding of engineering test specifications. This could be expected to include the latest manufacturers data sheets and test specifications for specific equipment.

iv. You must have a working knowledge and understanding of different types of test equipment and their applications.

v. You must have a working knowledge and understanding of the calibration of equipment and authorisation procedures. This should include how to ensure that test equipment is set up and calibrated correctly.

vi. You must have a working knowledge and understanding of testing methods and procedures. This could be expected to include which tests relate to different aspects of performance and conditions specifications, which procedures are followed in different testing contexts, and what the normal timescales are for conducting tests, including individual company procedures.

vii. You must have a working knowledge and understanding of analysis methods and techniques. This could be expected to include what data is provided from tests and

which methods can verify data, why it is important to be sure about the reliability, validity and completeness of data before analysis begins, and which analysis methods and procedures can be applied to test results.

viii. You must have a working knowledge and understanding of environmental controls relating to testing, including company HSE policy.

ix. You must have a working knowledge and understanding of the test reporting documentation and procedures. This should include what the formats are for recording the test procedures and results in line with individual company procedures.

x. You must have a working knowledge and understanding of your responsibilities with regard to the reporting lines and procedures in your working environment.

Scope of this standard

1. The **level and extent of responsibility** is limited to working within a detailed specification and following clearly defined procedures. In some cases, you may still be expected to refer to others for final authorisation, even though you remain responsible for identifying and implementing decisions.

2. The **typical Systems which are likely to be tested** could include:

- Measurement systems
- Control systems
- Analysers, protection and detection devices

The **type of tools and test equipment to be used**

- Electrical test equipment
- Hand tools - fixed/portable
- Machine tools fixed/portable

4. **The type and complexity of tests to be carried out** are clearly defined and are appropriate for the engineering product. Detailed procedures and specifications define the set up and conduct of the tests and the interpretation of test results. The testing and analytical techniques/procedures to be followed are clearly defined and, although they may involve more than one stage, full details on when and how to proceed through the stages are available.

5. The **quality standards and accuracy to be achieved** are as set down in the work specifications.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting

information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit I3.15 : Monitor the performance and condition of instrument and control systems

This unit has been tailored from an instrument and control unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 6.04) which was originally designated MPS Elec 7

This unit is about your competence in completing performance condition monitoring on operational and static instrument and control systems. You will be required to set-up, monitor and record the results in accordance with company procedures. You will be following your organisations safe working practices at all times and working within the work permit procedures

During this work you must take account of the relevant installation procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Correctly set up and check/calibrate the equipment required for the monitoring being carried out
c. Carry out the monitoring activities effectively with minimum disruption to normal activities
d. Record and review the outcomes and take appropriate actions

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.

ii. You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

iii. You must have a working knowledge and understanding of the **performance requirements of systems.** This could be expected to include manufacturers' and company specifications on performance requirements.

iv. You must have a working knowledge and understanding of the **monitoring methods and procedures for systems** and which data is required to make decisions.

v. You must have a working knowledge and understanding of the **importance of the need for equipment calibration and authorisation procedures** including ensuring that the monitoring equipment is set up and calibrated correctly.

vi. You must have a working knowledge and understanding of **monitoring equipment setting, operating and care and control procedures**. The types of disruption which can occur during monitoring, and how to minimize different types of disruption.

vii. You must have a working knowledge and understanding of the formats for **recording and monitoring results** in line with company procedures.

viii. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of this standard

The level and extent of responsibility extends to selecting and modifying methods at your discretion to optimise the effectiveness of the monitoring and assessment undertaken in the conditions applying. In some cases, you may still be expected to refer to others for final authorisations, even though you remain responsible for identifying and implementing decisions.

The type of assets to be monitored involve multiple technology or are of a single technology interacting with other assets in a dynamic manner.

Typical systems could be:

- Measurement systems
- Control systems
- Analysers, protection and detection devices

The monitoring methods and equipment to be used may need to be customised to suit the conditions applying.

Typical monitoring methods could include:

- Analysing trends
- Investigating abnormal characteristics
- Researching historical data
- Analysing/reviewing outputs
- Comparison against norms

4. **The monitoring conditions or operating environment** may be normal operating environments which are complex by virtue of access problems and/or the likelihood of disruption to the monitoring process. Conditions may also be abnormal as a result of unusual hazards being present or non-standard demands placed on the operation of the assets.

5. **The complexity of monitoring to be carried out** would include motor tests as advised by company procedures, including:

Temperature monitoring
Vibration monitoring
Current readings
Run down and up time.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit I3.16 : Assess the performance and condition of instrument and control systems

This unit has been tailored from an instrument and control unit produced by the ECITB from the OSC Eng Engineering Competence Standards (ECS 6.05) which was originally designated MPS Inst 8

This unit is about your competence in assessing the performance and condition of instrument and control systems using all available sources of information. You will be required to check that your have all the necessary data, complete the assessment and analyse the results by comparing with norms and previous records. To record the results you will follow company procedures and your organisations safe working practices at all times and working within the work permit procedures

During this work you must take account of the relevant installation procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Ensure that you have the necessary test data on which to conduct the assessment
c. Carry out the assessment using all relevant data and valid methods
d. Check that the assessment provides clear and accurate information
e. Compare current performances and condition data with that from previous assessments
f. Identify and report the implications arising from the assessments
g. Record the results of the assessments in the appropriate format

Knowledge and Understanding

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.

ii. You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

iii. You must have a working knowledge and understanding of **equipment operating and test specifications** including manufacturers' and company specifications.

iv. You must have a working knowledge and understanding of the **equipment monitoring methods and procedures** including the types of data provided from monitoring, which methods can verify data and why it is important to do so.

v. You must have a working knowledge and understanding of the **assessment methods and techniques** for specific data and systems, and the factors that have to be taken into account when assessing performance of specific systems.

vi. You must have a working knowledge and understanding of the **reporting documentation and control procedures** including how to present results of the assessment, and who should receive the results and implications of assessments.

vii. You must have a working knowledge and understanding of your responsibilities with regard to the **reporting lines and procedures** in your working environment.

Scope of this standard

The level and extent of responsibility extends to selecting and modifying methods at your discretion to optimise the effectiveness of the monitoring and assessment undertaken in the conditions applying. In some cases, you may still be expected to refer to others for final authorisations, even though you remain responsible for identifying and implementing decisions.

The type of assets to be assessed involve multiple technology or are of a single technology interacting with other assets in a dynamic manner.

Typical systems could be:

Measurement systems
Control systems
Analysers, protection and detection devices

The type of data to be analysed covers:

Vibration
Temperature
Current
Voltage

The analysis methods to be used covers:

Comparison to manufacturers' specification
Historical
Maintenance records
Trend analysis

The complexity of monitoring information to be used could include motor, plant or equipment tests as advised by company procedures. The information gained will vary in complexity and depend on the assessment being carried out. The information gathered will be used in various ways as dictated by the test or company procedures.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy and associated addendum.

In the context of N/SVQ assessment it has been agreed that this unit can only be assessed in the workplace.

Unit No I3.17 : Inspect instrument and control systems

This unit is a contextualised version of a unit produced by the OSC Eng Engineering Competence Standards which was originally designated ECS 6.06

This unit is about your competence in completing checks on Instrument and control systems. You will be required to complete the checks following your company procedures. The checks may be routine or non routine in nature. To record the results you will follow company procedures and your organisations safe working practices at all times and working within the work permit procedures

During this work you must take account of the relevant installation procedures and safe working practices AS THEY APPLY TO YOU.

Performance statements

In achieving this unit you must

a. Work safely at all times, complying with health and safety and other relevant regulations and guidelines
b. Follow the correct specification for the product or equipment being inspected
c. Use the correct equipment to carry out the inspection
d. Identify and confirm the inspection checks to be made and acceptance criteria to be used
e. Carry out all required inspections as specified
f. Identify any defects or variations from the specification
g. Record the results of the inspection in the appropriate format
h. Deal promptly and effectively with problems within your control and report those that cannot be solved

Knowledge statements

You must have knowledge and understanding of:

i. You must have a working knowledge and understanding of what your responsibilities are in respect of **Health, Safety** and **Environment**. This should include the limits of your personal responsibility, your legal responsibility for your own heath and safety and the health and safety of others.
You must have a working knowledge of the **relevant regulations** and the safe working **practices and procedures** required within your work area.

ii. You must have a working knowledge and understanding of the **engineering drawings and related specifications** to which you will be expected to work. This will include technical drawings (component, assembly, general arrangements, isometrics 1st and 3rd angle projections) method statements and product worksheets, tolerances.

iii. You must have a working knowledge and understanding of the **inspection methods and techniques** that are approved by the company.

iv. You must have a working knowledge and understanding of **calibration of equipment and authorisation procedures** that are approved by the company. This should include the procedure for recertification and how to interpret the calibration certificate.

v. You must have a working knowledge and understanding of the **inspection equipment care and control procedures** that are approved by the company. This should include storage, both in situ and transit, and the checking of calibration certificates.

vi. You must have a working knowledge and understanding for the **identification of defects in products, equipment or systems.** This should include what the typical defects are that arise and how to identify them, typical examples are:

Weathering
Corrosion
Wear and tear

vii. You must have a working knowledge and understanding of the **quality control systems and documentation procedures** This should include how defects and variations should be dealt with and what factors determine the actions to be taken, and why it is important to maintain records of the checks made and the assessments that result from those checks, what information should be entered on those records and where they should be kept.

viii. You must have a working knowledge and understanding of the **reporting lines and procedures** in your working environment**.**

Scope of the standard

This should cover:

1. **The level and extent of responsibility** extends to selecting and modifying methods at your discretion to optimise the effectiveness of the monitoring and assessment undertaken in the conditions applying. In some cases, you may still be expected to refer to others for final authorisations, even though you remain responsible for identifying and implementing decisions

2. The **type of products to be inspected** involve multiple technology or are of a single technology interacting with other assets in a dynamic manner.

   Typical systems could be:

   Measurement systems
   Control systems
   Analysers, protection and detection devices

3. The **aspects, characteristics and complexity of checks** are as set down in manufacturer's guidelines and procedures and will include ensuring compliance with relevant international standards, equipment manufacturer specifications and company procedures. The type of checks made will depend on the engineering process carried out which may include:

   - Dismantling
   - Assembly
   - Positioning and installation
   - Repair of components
   - Removal and replacement of components
   - Adjustment
   - Planned maintenance activities testing

The **inspection methods and techniques and type of equipment to be used** are as set out in internal QA and QC procedures.

The **quality standards and accuracy to be achieved** are as set down in work specifications.

Glossary of Terms

The Knowledge and Understanding level expressed above indicates the minimum level of knowledge and understanding sufficient to perform your role in a manner that would normally be associated with the minimum acceptable performance of a competent person undertaking your role.

The expression **"working knowledge and understanding"** indicates you are able to:

- identify and apply relevant information, procedures and practices to your usual role in your expected working environments needing only occasional recourse to reference materials;
- describe, in your own words, the principles underlying your working methods. This does not mean the ability to quote "chapter and verse". Rather you must know what supporting information is available, how and where to find it and from whom to seek further guidance and information to confirm any additional required detail; and
- interpret and apply the information obtained to your role, your working practice and in your expected working environment.

Assessment Strategy Statement

This statement should be read in conjunction with the full Cogent assessment strategy.

In the context of N/SVQ assessment it has been agreed that this unit is suitable for complete assessment in the work place. If there are any events which occur very infrequently in the work place and this delays the achievement of the award then simulation may be considered.