

# Levels 2 & 3 NVQs in Electrical and Electronics Servicing

## National Occupational Standards and Assessment Requirements

1687



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# Foreword

This document provides details of the requirements specific to this N/SVQ qualification which includes:

- the requirements for occupational competence for all those involved in assessing performance
- specific assessment requirements and
- the National Occupational Standards.

It is designed to be used in conjunction with the following documents (also on the CD):

the *N/SVQ Candidate Guide and Logbook*  
and  
the *N/SVQ Centre Guide*.

The guide does not contain details of centre and scheme approval - these may be found in the document: 'Providing City and Guilds qualifications' (stock code EN-00-1111) available free of charge from the Sales Department or your regional/national City & Guilds office (see *Further information* section of this document).

Details of general regulations, registration and certification procedures, including fees, are included in the City & Guilds Directory of N/SVQ Awards. This information also appears on City & Guilds web site <http://www.city-and-guilds.co.uk>

The following documents also include information on policy and guidance on quality assurance within NVQs and assessors and verifiers should be aware of the contents.

- City & Guilds policy document '*Ensuring Quality*' – aimed at those involved in the assessment and verification of City & Guilds awards. Issued 3-4 times a year (available from Sales Department) NB Edition 12 – December 2001 summarises policy from all previous editions)
- *Joint Awarding Body Guidance on Internal Verification of NVQs*, issued November 2001, published by the DfES, also available on City & Guilds web site.

## General NVQ information

Centres should refer to the City & Guilds *Centre Guide for NVQs* available from the City & Guilds website for information on NVQs, the people involved, the assessment process and model recording forms.

# Levels 2 & 3 NVQs in Electrical & Electronic Servicing

## Scheme information

### Scope of the award

NVQs for the engineering sector are work-based qualifications designed to reflect the roles and responsibilities of personnel within the sector.

These awards are based on a mandatory and optional unit structure. The mandatory units cover those areas which have a common approach such as safety, engineering communications and team working. The optional units are combined in to 'pathways' which offer a choice to meet the needs of the main occupational patterns within typical aeronautical organisations.

### National Occupational Standards and Key Skills

The full National Occupational Standards and Key Skills mapping are enclosed within the CD. Centres may access whichever units are appropriate to their requirements.

### Restrictions on entry

There are no restrictions on entry to this award, however candidates should not register for this award if they hold or are registered with City & Guilds or another awarding body for a similar award at the same level.

### The Award

The Level 2 NVQ in **Electrical & Electronic Servicing** consists of 18 units. All candidates must take the **two** core units plus a specified number of optional units from one of the **three** occupational pathways to achieve the award. Additional units may be taken, for which the candidate will receive a Certificate of Unit Credit.

The Level 3 NVQ in **Electrical & Electronic Servicing** consists of 18 units. All candidates must take the **three** core units plus a specified number of optional units from one of the **three** occupational pathways to achieve the award. Additional units may be taken, for which the candidate will receive a Certificate of Unit Credit.

The certificates referred to in this guide are as follows

- Level 2 NVQ in **Electrical & electronic servicing (Signal Reception)**
- Level 2 NVQ in **Electrical & electronic servicing (Consumer/Commercial Electronics)**
- Level 2 NVQ in **Electrical & electronic servicing (Domestic Appliance Servicing)**
- Level 3 NVQ in **Electrical & electronic servicing (Signal Reception)**
- Level 3 NVQ in **Electrical & electronic servicing (Consumer/Commercial Electronics)**
- Level 3 NVQ in **Electrical & electronic servicing (Domestic Appliance Servicing)**

Some units from the Level 2 structure are used for the Level 3, and these are shown with their unit numbers in **bold**.

The Units have been contextualised by *SEMTA* from the National Engineering Competency Standards (ECS).

# Qualification Structure for Level 2 Electrical and Electronic Servicing

Mandatory Units (both units must be taken by all candidates)

- 201 Complying with Statutory Regulations and Organisational Safety Requirements
- 202 Contributing to Positive Working Relationships

## **Pathways:**

### **Signal Reception**

In addition to the mandatory units, all three of the following units must be taken:

- 204 Installing Signal Reception Equipment in Customers' Premises
- 205 Familiarising Customers with the Use of Products
- 206 Working Safely at Heights with Antennas

Plus, **either** the following pair of units:

- 207 Diagnosing Faults in Signal Reception Systems                      *and*
- 208 Replacing Modules in Signal Reception Systems

*or one other unit from the list below:*

- 203 Establishing Customer Requirements
- 209 Carrying Out Preventive Maintenance Procedures
- 210 Transporting and Protecting Products and Equipment
- 211 Collecting and Processing Payments
- 212 Promoting Your Organisation's Products and Services

### **Consumer/Commercial Electronics**

In addition to the mandatory units, **one** of the following **pairs** of units must be taken:

#### **Either:**

- 215 Diagnosing Faults in Consumer/Commercial Electronic Equipment                      *and*
- 217 Replacing Components in Consumer/Commercial Electronic Equipment

#### **Or:**

- 213 Installing Consumer/Commercial Electronic Equipment in Premises    *and*
- 205 Familiarising Customers with the Use of Products

Plus, **either** the un-chosen pair of units above, **or** one unit from the list below, must be taken as an option:

- 203 Establishing Customer Requirements
- 209 Carrying Out Preventive Maintenance Procedures
- 210 Transporting and Protecting Products and Equipment
- 211 Collecting and Processing Payments
- 212 Promoting Your Organisation's Products and Services

## Domestic Appliance Servicing

In addition to the mandatory units, **one** of the following **pairs** of units must be taken:

**Either:**

- 216 Diagnosing Faults in Domestic Appliances                      *and*
- 218 Replacing modules in Domestic Appliances

**Or:**

- 214 Installing Domestic Appliance Equipment in Customers' Premises    *and*
- 205 Familiarising Customers with the Use of Products

Plus, **either** the un-chosen pair of units above, **or** one unit from the list below, must be taken as an option:

- 203 Establishing Customer Requirements
- 209 Carrying Out Preventive Maintenance Procedures
- 210 Transporting and Protecting Products and Equipment
- 211 Collecting and Processing Payments
- 212 Promoting Your Organisation's Products and Services

### Notes:

At Level 2, candidates must complete all the mandatory units, plus any compulsory units for their chosen pathway, and a minimum of one optional unit (or unit pair).



# Qualification Structure for Level 3 Electrical and Electronic Servicing

Mandatory Units (all three units must be taken by all candidates)

- 201 Complying with Statutory Regulations and Organisational Safety Requirements
- 302 Developing and Maintaining Positive Working Relationships
- 303 Identifying and Costing Customer Requirements

## **Pathways:**

### **Signal Reception**

*In addition to the mandatory units, the following units must be taken:*

- 206 Working Safely at Heights with Antennas
- 304 Diagnosing and Analysing Faults in Signal Reception Networks
- 305 Rectifying Faults in Signal Reception Networks

*Plus **one** other unit from the list below:*

- 209 Carrying Out Preventive Maintenance Procedures
- 210 Transporting and Protecting Products and Equipment
- 211 Collecting and Processing Payments
- 306 Installing Distribution Networks in Premises
- 307 Familiarising Customers with the Use of Distribution Networks
- 308 Establishing Compliance with Distribution Network Specifications
- 309 Identifying and Recommending Improvements to Your Organisation's Products and Services
- 310 Contributing to the Development of Colleagues and Yourself

### **Consumer/Commercial Electronics**

*In addition to the mandatory units, the following units must be taken:*

- 311 Diagnosing and Analysing Faults in Consumer/Commercial Electronic Equipment
- 313 Rectifying Faults in Consumer/Commercial Electronic Equipment

*Plus **one** other unit from the list below:*

- 209 Carrying Out Preventive Maintenance Procedures
- 210 Transporting and Protecting Products and Equipment
- 211 Collecting and Processing Payments
- 309 Identifying and Recommending Improvements to Your Organisation's Products and Services
- 310 Contributing to the Development of Colleagues and Yourself

## Domestic Appliance Servicing

*In addition to the mandatory units, the following units must be taken:*

- 312 Diagnosing and Analysing Faults in Domestic Appliance Equipment
- 314 Rectifying Faults in Domestic Appliance Equipment

*Plus **one** other unit from the list below:*

- 209** Carrying Out Preventive Maintenance Procedures
- 210** Transporting and Protecting Products and Equipment
- 211** Collecting and Processing Payments
- 309 Identifying and Recommending Improvements to Your Organisation's Products and Services
- 310 Contributing to the Development of Colleagues and Yourself

### Notes:

At Level 3, candidates must complete all the mandatory units, plus any compulsory units for their chosen pathway, and a minimum of one optional unit.

Some units from the Level 2 structure are used for the Level 3, and these are shown with their unit numbers in **bold**. Candidates who have already achieved the Level 2 units do **not** need to do them again.

# Assessment Requirements for Awards within the Engineering Sector

## Introduction

The purpose of the assessment strategy is to

- assist assessors, internal verifiers and external verifiers
- encourage and promote consistent assessment of the qualification
- promote cost effective assessment strategies
- promote the use of external quality control of assessment methods

The assessment strategy also specifies

- the qualifications and experience required for assessors and verifiers
- the assessment environment and standard of equipment that should be used
- access to the qualification
- the evidence required to support competent performance against the standards
- carrying out assessments
- assessing knowledge and understanding

## Section A General Requirements

The assessment strategy for City and Guilds awards based on *SEMTA* units is detailed below. It applies throughout the standards and must be used as the basis for all individual assessments.

In the implementation of all *SEMTA* standards, reference should be made back to this strategy when specifying the assessment requirements for each unit or element of competence. The internal and external verifier will seek evidence that the requirements have been fulfilled by candidates and assessors at all times.

## Scope of the Award

Evidence of competence must be assessed against the requirements of the relevant National Occupational Standards. For this award, the relevant standards are contextualised versions of the Engineering Competence Standards (ECS).

## Qualification Structure

The qualification structure for this award requires candidates to complete common mandatory units, followed by a choice of pathways. Candidates may then be required to complete further mandatory units within their chosen pathway, followed by a number of optional units from a provided selection. The range of optional units allows for any variations in the occupation in different organisations and across the sector.

## Assessor Requirements

Assessment must be carried out by competent assessors who hold, or are working towards, the nationally recognised Assessor units (A1/A2) (formerly D32/D33).

Assessors must be able to demonstrate that they have sufficient technical competence to evaluate and judge evidence for this award. This will be demonstrated either by holding a relevant technical qualification or by proven suitable experience of the technical areas to be assessed. The assessor's competence must, at the very least, be at the same level as that required of the candidate(s) in the units being assessed.

Specific technical requirements for assessors of this qualification are outlined on page 14.

Assessors must also know:

- the content and meaning of the National Occupational Standards against which assessments are to be carried out
- the appropriate Regulatory Body's system of vocational qualifications
- the relevant Awarding Body's documentation and system of vocational qualifications within which the assessment is taking place.

## Verifier Requirements

Internal Verifiers must hold, or be working towards, the nationally recognised Internal Verifier unit (V1) (formerly D34), and would be expected to be familiar with, and preferably hold, the nationally recognised Assessor units.

External Verifiers must hold, or be working towards, the nationally recognised External Verifier unit (V2) (formerly D35), and would be expected to be familiar with, and preferably hold, the nationally recognised Assessor units, and possibly even the nationally recognised Internal Verifier unit.

Verifiers, both internal and external, will also be expected to be fully conversant with the standards against which the assessments and verification are to be carried out, the appropriate Regulatory Body's system of vocational qualifications, and the relevant Awarding Body's documentation and system of vocational qualifications within which the assessment and verification is taking place.

Additionally verifiers, both internal and external, should be technically familiar with the skill area being verified.

Specific technical requirements for verifiers of this qualification are outlined on page 15.

## Witness testimony

Where observation of process is used to obtain the performance evidence, this observation must be carried out against the standards. Best practice would require that such observation is carried out by a qualified assessor. If this is not practicable then alternative sources of evidence may be used.

For example, the observation may be carried out against the standards by someone else in close contact with the candidate. This could be a supervisor, colleague, mentor or manager, who may be regarded as a suitable witness to the candidate's competency. However, the witness must be technically competent in the process or skills that they are providing testimony for to at least the same level of expertise as that required of the candidate. It will be the responsibility of the assessor to make sure that any witness testimonies accepted as evidence of a candidate's competency are reliable and technically valid.

## Assessment Environment

Evidence for this award should be obtained from the working environment where the work activities or work outcomes to be assessed are clearly attributable to the candidate. However, in certain circumstances, replication of work activities may be acceptable.

Where replication is considered necessary, assessors must be confident that the environment replicates the workplace to such an extent that competencies gained will be fully transferable to the workplace. In this case assessors must clearly identify those aspects of the workplace that are critical to performance, and make sure that they have been replicated satisfactorily. Where replication is involved, assessors must obtain agreement with internal and external verifiers before assessing any candidates.

Examples of critical aspects could be:

- environmental conditions such as, noise levels, lighting conditions and the presence of hazards
- the use of industrial equipment and procedures
- pressure of work such as time constraints and repetitive activities
- carrying out work on actual work pieces and the consequences of making mistakes
- customer/supplier/departmental relationships

## Access to Assessment

There are no entry qualifications or age limits required for these qualifications unless this is a legal requirement of the process or the environment. Assessment is open to any candidate who has the potential to reach the standards laid down for this qualification. However centres should refer to the statement on access to assessment in the City & Guilds *Centre Guide for NVQs* on not entering for similar awards at the same level.

Aids or appliances which are designed to alleviate disability may be used during assessment providing they do not compromise the standard required.

## Carrying Out Assessments

*SEMTA* strongly recommends that the majority of assessment evidence for the mandatory units is gathered during the performance of the optional units. Evidence should be obtained as a whole, where practically possible, since competent performance in the optional units is often dependent on competence in the mandatory units. Although it is possible to achieve this qualification with the minimum number of optional units, organisations may wish their candidates to be assessed for more than this.

Where key skills are required, these may be included as additional units and assessed in conjunction with the mandatory and optional units, where this is appropriate.

The standards were developed to cover a range of activities. The evidence produced for this award will, therefore, depend on the candidate's choice of 'scope' items in the standard, which are intended to help the candidate to seek the appropriate information and to acquire the necessary skills, techniques and knowledge before being able to demonstrate competent performance.

Where the scope section gives a choice (for example 'any three from five'), assessors should note that candidates do not need to cover the other (in this example, two) items, particularly where these additional items may relate to other activities or methods which are not part of the candidate's normal workplace activity or area of expertise.

## Performance Evidence Requirements

Performance evidence must be the main form of evidence gathered.

In order to demonstrate consistent, competent performance for a unit, a minimum of **three** different evidence examples of performance evidence will be required, to show that the tasks reflected by the unit title have been carried out to the stated standards. The number of items required in each of the scope

statements specified for a unit (eg., four from a choice of six) must all be covered. It is possible that some of the scope items may be covered more than once. If, however, the three examples of performance evidence are not sufficient to cover all the specified scope items, then further examples of performance evidence will be required to ensure this coverage is achieved.

Assessors must make sure that the evidence provided reflects the candidate's competence and not just the achievement of the training programme.

Items of performance evidence often contain features that apply to more than one unit, and can be used as evidence in any unit where appropriate.

Performance evidence may be either:

- products of the candidate's work, such as items that have been produced or worked on,
  - documents produced as part of a work activity, records or photographs of the product
- or**
- evidence of the way the candidates carried out the activities such as witness testimonies,
  - assessor observations or authenticated candidate reports of the activity undertaken

Competent performance is more than just carrying out a series of individual set tasks. Many of the units contain statements that require the candidate to provide evidence that proves they are capable of combining the various features and techniques. Where this is the case, separate fragments of evidence would not provide this combination of features and techniques and will not, therefore, be acceptable as demonstrating competent performance.

If there is any doubt as to what constitutes suitable evidence, the external verifier should be consulted.

### **Assessing Knowledge and Understanding**

Knowledge and understanding are key components of competent performance, but it is unlikely that performance evidence alone will provide enough evidence in this area. Where the candidate's knowledge and understanding (and the handling of contingency situations) is not apparent from performance evidence, it must be assessed by other means and be supported by suitable evidence.

Knowledge and understanding can be demonstrated in a number of different ways, but it is suggested that the most appropriate methods for this qualification are oral questioning and practical demonstrations. Assessors should ask enough questions to be able to determine that the candidate has an appropriate level of knowledge and understanding as required by the unit.

Where oral questioning is used the assessor must retain a record of the questions asked, together with the candidate's answers.

## Section B Qualification-Specific Requirements for the Levels 2 & 3 NVOs in Electrical & Electronic Servicing

### Scope of the Award

This qualification is for people who are occupied in an Electrical & Electronic Servicing activity and who have a high level of technical skill and knowledge in that activity. They will be expected to demonstrate safe working practices and procedures at all times and work with minimum supervision, taking personal responsibility for the quality and accuracy of the work they carry out.

Candidates for this qualification will have gained a high level of skill ability and acquired sound knowledge and understanding of the relevant techniques, materials, tools and equipment used, in order to enable them to carry out the activities, solve related problems, correct any faults and ensure the work output meets the required specification standard.

### Specific Technical Requirements for Assessors

Assessors of this qualification should have a minimum of three years' relevant skills experience, and should have a thorough working knowledge of the processes, techniques and procedures that are used within the electrical/electronic engineering industry.

Competence in the specific areas covered by the unit being assessed is essential.

### Specific Technical Requirements for Verifiers

Verifiers should have some relevant skills experience, and should have held a position of engineering responsibility, preferably within the electrical/electronic sector. They should have sufficient technical knowledge to enable them to verify that assessments have been carried out to the technical and safety standards required, and to be able to ask relevant questions of assessors or candidates, if deemed necessary.

### Specific Evidence Requirements

Candidates must carry out at least THREE separate assessment tasks. The unit guidance and scope for each unit indicate in detail what evidence is required. There is a specific Unit Checklist provided for EACH unit in this guide.

### Completing the Unit checklists

The candidate must carry out **at least three separate assessment tasks**. The location of all items of evidence, that must cover ALL of the criteria given in the standards, should be entered on the checklist provided after each unit under the 'Performance Evidence' columns. These locations must be identified in a way that allows the verifiers (internal and external) to easily trace and audit the evidence eg. *Page 6*– could refer to the position in the portfolio of the inspection sheet covering a task. *Drawing 1* could provide the specification for the same task. Also *Job 1234* could refer to an actual product.

Note that it may not be possible to cover all of the required criteria by completing three tasks. In such cases supplementary work may be needed to cover this shortfall, this will be referenced in the fourth column.

In addition to the unit checklist, the required evidence must also contain

- Actual product evidence where practical – eg. taking into account its weight, size and or if it is an actual production item for customer use. Photographs or videos may be used in lieu provided they show the skill areas in sufficient detail for the verifiers (internal and external) to make a decision regarding the practical standards achieved
- A work sheet (company or centre devised) that clearly lays down the required product specification in terms of materials, tolerances and any time restrictions plus a drawing.

#### **Note**

- it is not necessary for the candidate to personally reproduce drawings, method descriptors etc. unless these items do not exist.
- in cases of industrial confidentiality or sensitivity then it may be permissible to exclude certain items from the evidence, but a description of the general nature of the work/activity must be provided. In cases of doubt the EV should be consulted about the validity of a proposed assessment before the candidate commences any such work.
- An inspection sheet or report that clearly identifies that the product has been reliably tested against the specification. If there are any discrepancies of a non-critical nature then the assessment may be deemed acceptable provided that there is a statement to this effect signed by a duly appointed and responsible person.
- A **brief** report, prepared by the candidate, that identifies any hazards or difficulties associated with the work and how these were dealt with. It should also highlight any specific requirements or special skill areas that were involved eg. non standard tools, tool and work holding methods (use of jigs and fixtures etc.) Note that where relevant some aspects of this could also form part of the required knowledge evidence.

#### **Knowledge evidence**

Where the required knowledge and understanding cannot be obviously and positively inferred from an assessor or expert witness observing the practical tasks, then the candidate must be formally questioned using either short written answer or oral types of questions.

The questions should only relate to the specific areas defined by the criteria for this unit. eg. if only AC equipment is used then the questions should not ask for setting details etc. of DC equipment. (Note that this knowledge may well form part of an all round **underpinning knowledge** programme but in such cases it would be assessed separately.

Assessors must carefully plan all types of questioning procedures beforehand. The actual questions (oral and written) must be kept under secure conditions and only made available to the candidates during the assessment process. The candidates will retain a copy of their results, including comments made by the assessor during oral questioning. (See the separate information section regarding the use of oral questioning techniques).

Assessors must make the questions available to verifiers so that the latter can compare them against the results sheets held by the candidates.

The knowledge evidence should be referenced in a similar fashion to that used for performance evidence.

***Note that it is not necessary to assess the knowledge criteria on three separate occasions***



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# Levels 2 & 3 NVQs in Electrical & Electronic Servicing Knowledge evidence recording sheet

(this should be copied for each unit)

Knowledge reference	Method(s) used			Candidate's Evidence location	Assessor Reference	Result	Date assessed
	Written	Oral	Inferred				
1							
2							
3							
4							
5							
6							
7							
8							
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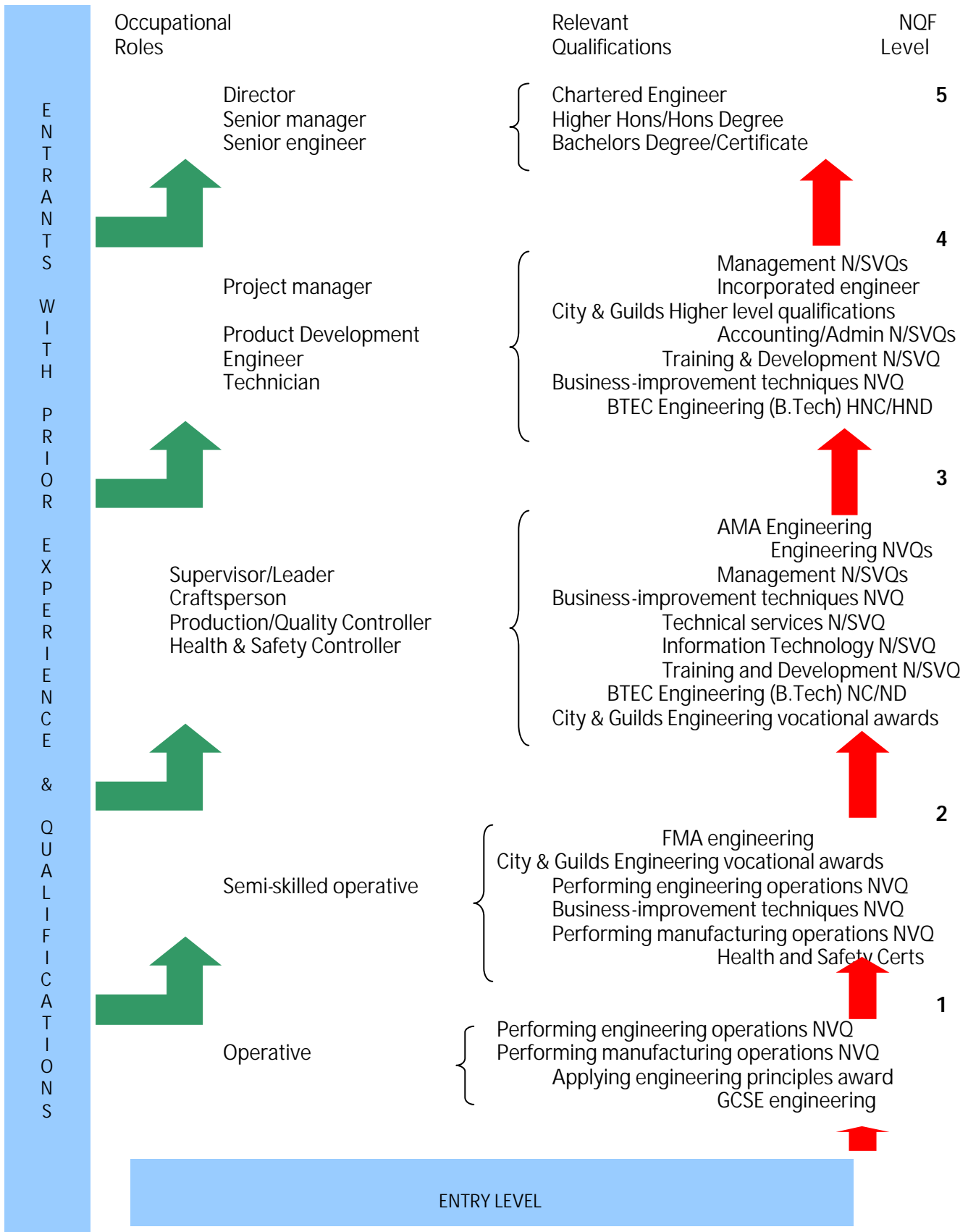
Name

Signature

Candidate:			Date:	
Assessor:			Date:	
Internal Verifier			Date:	
External Verifier			Date:	

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# Engineering Sector Progression Routes



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# **National Occupation Standards**– Levels 2 & 3 Electrical & Electronic Servicing

Standards supplied by *SEMTA*

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# Unit 201: Complying with Statutory Regulations and Organisational Safety Requirements

## Unit Summary

This unit identifies the competencies you need to deal with statutory regulations and organisational safety requirements, in accordance with approved procedures. You will be required to comply with all relevant regulations that apply to your area of work as well as your general responsibilities as defined in the Health and Safety at Work Act. You will also need to be able to identify the relevant qualified first aiders or appointed person, and must know the location of the first aid facilities. You will have an understanding of the procedures to be adopted in the case of accidents involving injury, and in situations where there are dangerous occurrences. You will also need to be fully conversant with the organisation's procedures for fire alerts and the evacuation of premises.

You will be required to identify the hazards and risks that are associated with your job. Typically these will focus on your working environment, the tools and equipment that you use, materials and substances that you use, working practices that do not follow laid-down procedures, and manual lifting and carrying techniques.

Your responsibilities will require you to comply with organisational policy and procedures for the statutory regulations and organisational safety activities undertaken, and to report any problems with the safety activities that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work with minimum supervision, taking personal responsibility for your own actions and for the way in which you carry out the required engineering activities.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying statutory regulations and organisational safety requirements and procedures. You will understand the safety requirements and their application, in adequate depth to provide a sound basis for carrying out the activities safely and correctly.



## Performance statements:

### **You must:**

- a Comply with your duties and obligations as defined in the Health and Safety at Work Act
- b Present yourself in the workplace suitably prepared for the activities to be undertaken
- c Follow organisational accident and emergency procedures
- d Recognise and control hazards in the workplace
- e Use correct manual lifting and carrying techniques
- f Apply safe working practices and procedures

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Demonstrate your understanding of your duties and obligations to health and safety by carrying out **all** of the following:
  - applying, in principle, your duties and responsibilities as an individual under the Health and Safety at Work Act and other relevant current legislation
  - identifying, within your organisation, appropriate sources of information and guidance on health and safety issues, to include:
    - Eye protection and personal protective equipment
    - COSHH regulations
    - Risk assessments
  - identifying the warning signs and labels of the main groups of hazardous or dangerous substances
  - complying with the appropriate statutory regulations at all times
2. Comply with **all** emergency requirements, to include:
  - identifying the appropriate qualified first aiders or appointed person and the location of first aid facilities
  - identifying the procedures to be followed in the event of injury to self or others
  - following organisational procedures in the event of fire and the evacuation of premises
  - identifying the procedures to be followed in the event of dangerous occurrences.
3. Identify the hazards and risks that are associated with **all** of the following:
  - ? your working environment
  - ? the tools and equipment that you use
  - ? the materials and substances that you use
  - using working practices that do not follow laid-down procedures
4. Demonstrate **two** of the following methods of manual lifting and carrying techniques:
  - lifting alone
  - with assistance of others
  - with mechanical assistance
5. Apply safe working practices when in a workshop environment, to include **all** of the following:
  - maintaining a tidy workplace with exits and gangways free from obstructions
  - using tools and equipment safely and only for the purpose intended
  - observing organisational safety rules, signs and hazard warnings
  - taking measures to protect others from harm resulting from any work you are carrying out

## Knowledge statements:

### You must have knowledge and understanding of:

1. The roles and responsibilities of yourself and others under the Health and Safety at Work Act 1974 and other current legislation (eg, The Management of Health and Safety at Work Regulations; Workplace Health and Safety and Welfare Regulations; Personal Protection at Work Regulations; Manual Handling Operations Regulations; Provision and Use of Work Equipment Regulations; Display Screen at Work Regulations)
2. The specific regulations and safe working practices and procedures that apply to your work activities
3. The warning signs for the seven main groups of hazardous substances defined by Classification, Packaging and Labelling of Dangerous Substances Regulations
4. How to locate relevant health and safety information for your tasks, and the sources of expert assistance when help is needed
5. What constitutes a hazard in the workplace (such as electricity, slippery and uneven surfaces, dust and fumes, handling and transporting, contaminants and irritants, fire, working at height, environment)
6. Your responsibilities for dealing with hazards and reducing risks in the workplace (such as hazard spotting and safety inspections; the use of hazard check lists, carrying out risk assessments, COSHH assessments and safe systems of working)
7. The risks associated with your working environment (the tools, materials and equipment that you use, not reporting accidental breakages of tools or equipment and not following laid-down working practices and procedures)
8. The first aid facilities that exist within your work area and within the organisation in general, and the procedures to be followed in the case of accidents involving injury
9. What constitutes dangerous occurrences and hazardous malfunctions, and why these must be reported even when no one was injured
10. The procedures for sounding the emergency alarms, evacuation procedures and escape routes to be used, and the need to report your presence at the appropriate assembly point
11. The organisational policy with regard to fire fighting procedures; the common causes of fire and what you can do to help prevent them
12. The protective clothing and equipment that is available for your areas of activity
13. How to lift and carry loads safely, and the manual and mechanical aids available
14. How to prepare and maintain safe working areas; standards and procedures to ensure good housekeeping
15. The importance of safe storage of tools, equipment, materials and products
16. The extent of your own authority and whom you should report to in the event of problems that you cannot resolve

# Unit 202: Contributing to Positive Working Relationships

## Unit Summary

This unit identifies the competences you need to contribute to the development and maintenance of positive working relationships with other people, in accordance with the requirements of your service organisation. You will be required to be positive and constructive in your dealings with others. You will be expected to keep others informed about work plans and activities that affect them, to seek and obtain assistance from others, when necessary, in a polite and courteous manner, and to respond in a timely and positive way when asked to provide help or information to others.

Your responsibilities will require you to comply with any policies of your service organisation in respect of contributing to the development and maintenance of positive working relationships with other people, particularly your customers. You will be expected to work within the general policies of your service organisation, and to know when to seek guidance and instructions from others, taking full responsibility for your own actions and for the quality and accuracy of your work.

Your underpinning knowledge will provide a good understanding of how you can contribute to the development and maintenance of positive working relationships with customers. It will also provide an understanding of the importance of your appearance and behaviour, the feelings and expectations of customers, and effective communications.

You will understand the safety precautions required when carrying out your duties, especially when working at heights or with heavy or powered equipment, and you will bear these things in mind when dealing with other people. You will also understand your responsibilities for health and safety in your place of work, and the importance of taking the necessary safeguards to protect yourself and others when you are working.

## Performance statements:

### **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 working activities
- e Respond in a timely and positive way when others ask for help or information

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Establish and maintain productive working relationships with **all** of the following:
  - customers
  - colleagues
  - supervisors
2. Respond to the individual needs of colleagues or customers, to include **two** of the following:
  - physical disabilities
  - learning difficulties
  - language differences (including dialects and accents)
  - technically aware
  - technically unaware
3. Use **all** of the following methods of communication when dealing with others:
  - face-to-face
  - telephone
  - documentary
4. Contribute to positive relationships by **all** of the following:
  - meeting your organisation's standards for appearance and behaviour
  - greeting your customers and colleagues in an appropriate way
  - communicating with your customers and colleagues in a way that makes them feel valued and respected
  - maintaining communication with your customers and colleagues to ensure that they are kept informed and reassured
  - seeking assistance from others in a polite and courteous way without causing undue disruption to normal work activities
5. Respond appropriately to the needs of customers and colleagues, by **all** of the following:
  - responding promptly and positively to questions and comments
  - keeping them informed about work plans or activities that affect them
  - treating your customers and colleagues courteously and helpfully, even when you are working under pressure

6. Avoid disagreements by carrying out **two** of the following:
- identifying and confirming the needs and expectations of your customers
  - checking with your customers that you have fully understood their needs and expectations
  - explaining clearly to your customers and colleagues any reasons why their needs or expectations cannot be met
  - seeking guidance and instruction from the appropriate person when necessary
7. Ensure you comply with company policy at all times, particularly in regard to **all** of the following
- maintaining correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem that you are unable to solve to the appropriate person
  - confidentiality

**Knowledge statements:**

***You must have knowledge and understanding of:***

1. Your customer's rights
2. Legislation regarding health and safety, data protection, equal opportunities and regulations that affect
3. the way that products and services you deal with are delivered to your customers
4. Industrial, organisational and professional codes of practice and ethical standards that apply
5. Any contractual agreements that your customers have with your organisation
6. The products or services of your organisation relevant to your customer service role
7. Any organisational targets relevant to your job; your role in meeting them, and the implications for your
8. organisation if those targets are not met
9. Methods of communication, and how to use the most appropriate one in different situations
10. How to communicate in a clear, polite, confident way, and why this is important
11. Your organisation's standards for appearance and behaviour
12. How to deal with problems that could have an adverse effect on relationships
13. The limits of your own authority, and when you need to seek agreement or permission from others

# Unit 203: Establishing Customer Requirements

## Unit Summary

This unit identifies the competencies you need to establish customer requirements, in accordance with approved procedures. You will be required to work with the customer to identify their needs, then to identify the products or services to meet those needs, and to reach agreement with the customer on the action to be taken to achieve the requirements.

Your responsibilities will require you to comply with organisational policy and procedures for dealing with customers and establishing their requirements. You will be expected to report any problems that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will know when to seek guidance and instructions from others, and will take full responsibility for your own actions and for the quality of your work.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to interpreting customer requirements, and applying customer care procedures. You will understand the products or services being offered to the customer, and their installation and maintenance requirements. You will know about the company procedures and resources, in adequate depth to provide a sound basis for carrying out the activities to the required standard.

You will understand the safety precautions required when carrying out your duties, especially when working at heights or with heavy or powered equipment, and you will bear these things in mind when establishing customer requirements. You will also understand your responsibilities for health and safety in your place of work, and the importance of taking the necessary safeguards to protect yourself and others when you are working.

## Performance statements:

### You must:

- a Obtain sufficient information to understand clearly the customer's objectives
- b Ensure that the technical requirements are understood and specified
- c Determine how your organisation can respond to the requirements in terms of workload and resources
- d Record and file relevant information in accordance with organisational requirements
- e Check and obtain agreement that the requirements are interpreted correctly
- f Maintain appropriate levels of confidentiality

### Scope of the unit:

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### You must:

1. Determine the customer requirements for **one** of the following:
  - for Consumer/Commercial Electronics**
  - television receiver (analogue or digital)
  - domestic audio equipment (eg, cassette/minidisc recorder/player, CD player, tuner, amplifier, etc)
  - video/DVD recorders/players
  - for Signal Reception**
  - satellite broadcast receiving system (including set top box and amplifiers if required)
  - terrestrial broadcast receiving system (including set top box and amplifiers if required)
  - for Domestic Appliances**
  - home laundry (eg, washing machine, tumble drier, etc)
  - refrigeration (eg, fridge, freezer, dehumidifier, etc)
  - cooking (eg, cooker, microwave oven, etc)
  - small domestic appliances (eg, hair drier, toaster, iron, etc)
2. Determine the type of service required by the customer, from **one** of the following:
  - installation.
  - equipment service
  - maintenance
  - product purchase
3. Determine the requirements of **one** of the following types of customer:
  - technically aware
  - technically unaware
  - having special physical or communication needs
4. Obtain all relevant information from the customer, and carry out **all** of the following:
  - relate to the product or service required
  - prioritise your activities
  - put activities into appropriate timescale
  - identify required actions or activities
  - identify appropriate company stocks and resources
5. Obtain customer agreement on **all** of the following:
  - the product or service required
  - the cost of the product or service
  - the actions to be taken (by you or the company)
  - the timescale for achieving the customer requirements
  - how the customer can contact the company (if required)

6. Ensure that the customer is aware of **all** of the following:

- quality of product expected
- quality of service or installation
- overall cost of service and/or product
- responsibility for payment

7. Ensure that company policy is kept with regard to **all** of the following:

- keeping correct records of all agreements and transactions
- ensuring that all products meet the relative health and safety standards
- obtaining authority to continue before working beyond agreed limits
- reporting any problem, that you are unable to solve, to the appropriate person
- maintaining appropriate levels of confidentiality

### **Knowledge statements:**

#### ***You must have knowledge and understanding of:***

1. The specific safety precautions to be taken when working with electrical or electronic equipment
2. The specification, application and cost of the product or service to be provided
3. Customer care requirements and techniques
4. The types of difficulty with customer relations, including domestic, that can occur, and how the situation should be dealt with
5. Relevant codes of practice
6. Company policy on the provision of services, customer care and confidentiality
7. Company reporting lines, procedures and documentation
8. The extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

#### **The following specific knowledge will also be required in relation to Signal Reception**

9. Alignment methods for both satellite and terrestrial antenna
10. The cause of signal loss in a system, (eg, cable type and length, diplexers, outlets, etc)

#### **The following specific knowledge will also be required in relation to Consumer/Commercial Electronics**

11. Basic operation of the products available
12. The signal requirements of the product

#### **The following specific knowledge will also be required in relation to Domestic Appliance Servicing**

13. Basic operation of the product
14. The service requirements of the product
15. Water by-laws (when appropriate)
16. The operation of test equipment (eg, earth loop impedance tester)



# Unit 204: Installing Signal Reception Equipment in Customers' Premises

## Unit Summary

This unit identifies the competencies you need to install signal reception equipment (terrestrial digital antennas, satellite dish antennas, outlets, cable, etc). You will be required to observe the manufacturer's installation instructions and use the appropriate test equipment.

Your responsibilities will require you to comply with, and work within, the policies and procedures of your organisation, and to report any problems to an appropriate person. You will know when to seek guidance and instructions from others, and will take full responsibility for your own actions and for the accuracy of your work.

Your underpinning knowledge will provide a good understanding of the products being installed, and their operation, and will include installation techniques and best practices, performance specifications for systems, modules and products, and the correct and safe use of tools and test equipment. You will also understand the requirements of the customer, and will have a good understanding of the health and safety guidelines and relevant codes of practice that apply. Your underpinning knowledge will be of adequate depth to provide a sound basis for carrying out installation procedures to the required standard.

You will understand the safety precautions required when carrying out the installation, especially when working at heights or with heavy or powered equipment. You will also understand your responsibilities for health and safety in your place of work, and the importance of taking the necessary safeguards to protect yourself and others when you are working.

## Performance statements:

### **You must:**

- a Work safely at all times, complying with health and safety and other relevant regulations and guidelines
- b Follow all relevant drawings and specifications for the installation being carried out
- c Use the correct tools and equipment for the installation operations and check that they are in a safe and usable condition
- d Install, position and secure the equipment and components in accordance with the specification
- e Ensure that all necessary connections to the equipment are complete
- f Deal promptly and effectively with problems within your control and report those that cannot be solved
- g Check that the installation is complete and that all components are free from damage

## Scope of the unit:

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** the following checks before installing the equipment:
  - confirm with the customer that the equipment is what they ordered and are expecting
  - ensure that the equipment is the correct type (if there are variants)
  - check that all the component parts are present and correct
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
  - ensure that the necessary services (eg, electrical supply) are available
  - make sure that the area is safe and ready for the installation
  - ensure that the installation is to be carried out at the correct address
  - ensure that a suitable signal is available
  - confirm the location of the receiving equipment with the customer
  - confirm the position of the antenna, the cable run and the positions of outlets with the customer
  - ensure that planning permission has been obtained (or confirm that it is not required)
  - ensure that the structure, or ground, is sound and suitable for the antenna mounting
2. Install **one** of the following:
  - satellite broadcast receiving system (including set top box and amplifiers if required)
  - terrestrial digital broadcast receiving system (including set top box and amplifiers if required)
3. Carry out **three** the following interconnections and commissioning using coaxial and SCART connectors:
  - television receiver
  - set top box
  - video recorder/player
  - DVD player
  - digital audio broadcast (DAB) receiver
  - analogue (AM/FM) radio
  - domestic audio equipment ('hi-fi')
  - other equipment (eg, interactive keyboard, etc)

4. Carry out the installation of the product or system, ensuring **all** of the following:
  - no damage occurs to the equipment or to the customer's property
  - the antenna is securely mounted and correctly aligned
  - all cabling is installed in accordance with the appropriate code of practice
  - all connections are correctly made and terminated
  - the correct signal levels are available at every outlet
  - the installation is carried out in accordance with the manufacturer's specification
  - the installation meets all health and safety requirements
  - the system is working to the manufacturer's specification and the customers satisfaction
  
5. Use **two** of the following items of equipment and aids in the installation:
  - multimeter
  - signal meter or spectrum analyser
  - installation manuals
  
6. Ensure that company policy is kept with regard to **all** the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem that you are unable to solve to the appropriate person
  - removing all packaging and waste material
  - leaving the work site in a clean and tidy state
  
7. Ensure that relevant health and safety legislation and regulations are complied with at all times with particular attention being given to **two** of the following:
  - correct lifting techniques
  - the handling and fitting of large brackets
  - the safe use of soldering equipment
  - safe working at heights
  - procedures for when cabling over roofs

## Knowledge statements:

### *You must have knowledge and understanding of:*

1. The specific safety precautions to be taken when working with signal reception equipment (including relevant codes of practice)
2. Customer care procedures and techniques
3. Installation site requirements (eg, structural)
4. Planning permission requirements
5. The techniques for drilling masonry, especially on high structures
6. The safe use of power tools, and the voltage requirements when working outdoors
7. How to select and use the appropriate mechanical fixing devices
8. The range of fittings that could be used in the installation, and how to secure them
9. How to terminate coaxial cables and other cable types (eg, aerial amplifier power cables)
10. The importance of correct location of equipment
11. The manufacturer's installation instructions and specifications for the product or system
12. The correct method of installing the product or system, and for making the necessary connections
13. Tests to be carried out to ensure that the equipment and system is fault free
14. Installation techniques and best practice
15. The causes of ghosting and multi-path reception, and how to minimise them
16. Waste disposal procedures
17. The basic operation of signal reception systems and the signal levels expected at each outlet
18. Alignment methods for both satellite and terrestrial antenna
19. The causes of signal loss in a system (eg, cable type and length, diplexers, outlets, etc)
20. The operation and care of test equipment (eg, spectrum analyser, signal level meter, etc) and tools
21. The extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

# Unit 205: Familiarising Customers with the Use of Products

## Unit Summary

This unit identifies the competencies you need to hand over, and to familiarise the customer with the use of, domestic appliances, signal reception or consumer electronic equipment.

Your responsibilities will require you to comply with, and work within, the policies and procedures of your organisation, and to report any problems to an appropriate person. You will know when to seek guidance and instructions from others, and will take full responsibility for your own actions and for the accuracy of your work.

Your underpinning knowledge will provide a good understanding of the product and its operation. This will be of adequate depth to provide a sound basis for carrying out the handover and familiarisation procedures to the required standard. You will understand the needs of the customer, both for the installed product and for suitable explanation and/or demonstration of its use. You will be able to assess the understanding level of the customer, and to communicate the operating procedures in the appropriate manner.

You will understand your responsibilities for health and safety in your place of work, and the importance of taking the necessary safeguards to protect yourself and others when you are working. You will be expected to explain any health and safety aspects that the customer needs to know about, both for their own protection and for the safe operation of the equipment. You will also familiarise the customer with how to isolate the equipment in the case of failure or emergency, and will ensure that the customer has appropriate contact details should he/she need further advice or help.

## Performance statements:

### **You must:**

- a Work safely at all times, complying with health and safety and other relevant regulations and guidelines
- b Confirm that everyone involved accepts that the product or asset is in a satisfactory condition for handover to take place
- c Clearly identify any unusual features of the condition of the product or asset
- d Make the handover and obtain agreement between everyone involved on the precise moment of transfer of responsibility
- e Make sure that clear, accurate and complete records of the handover are made

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Hand over, and familiarise the customer with the use of, **one** of the following:

#### **for Consumer/Commercial Electronics**

- television receiver (analogue or digital)
- domestic audio equipment (eg, cassette/minidisc recorder/player, CD player, tuner, amplifier, etc)
- video/DVD recorders/players

#### **for Signal Reception**

- satellite broadcast receiving system (including set top box and amplifiers if required)
- terrestrial digital broadcast receiving system (including set top box and amplifiers if required)

#### **for Domestic Appliances**

- home laundry (eg, washing machine, tumble drier, etc)
- refrigeration (eg, fridge, freezer, dehumidifier, etc)
- cooking (eg, cooker, microwave oven, etc)
- small domestic appliances (eg, hair drier, toaster, iron, etc)

2. Confirm **all** of the following about the product or system:

- it is the correct one or that it is suitable for the purpose
- it is working to its given specifications
- it meets the customer's expectations
- it meets all required safety standards

3. Explain and demonstrate the operation of the product to the customer, including **two** of the following:

- general operation
- set top box (if fitted)
- use and effect of controls
- any specific features
- any warning systems

4. Encourage the customer to operate the product and to ask questions, ensuring **all** of the following:

- the customer is able to operate the product
- the customer is aware of any safety requirements
- questions are answered clearly and accurately
- the customer knows who to contact in the event of product failure

5. Ensure that company policy is kept with regard to **all** of the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem that you are unable to solve to the appropriate person
  
6. When leaving the customer's premises, ensure **all** of the following:
  - the customer has all the instruction books and appropriate paperwork
  - all packaging and waste material are removed
  - the work site is left in a clean and tidy state

## **Knowledge statements:**

### ***You must have knowledge and understanding of:***

1. The specific safety precautions to be taken when working with electrical domestic appliances, consumer electronic equipment or signal reception equipment
2. The safety issues relating to working on live equipment at the customer's premises
3. Customer relations methods and procedures
4. Company policy regarding the handover and demonstration of a product
5. Company recording and documentation procedures
6. Installation site requirements (eg, structural, services and ventilation)
7. The manufacturer's installation instructions and specifications for the product
8. Product operation, controls, settings and adjustments
9. Waste disposal procedures
10. The extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

### **The following specific knowledge will also be required in relation to Signal Reception**

11. Signal reception systems, and the signal levels expected at each outlet
12. Alignment methods for both satellite and terrestrial antenna
13. The causes of signal loss in a system (eg, cable type and length, diplexers, outlets, etc)

### **The following specific knowledge will also be required in relation to Consumer/Commercial Electronics**

14. Basic operation of the product
15. The signal requirements of the product

### **The following specific knowledge will also be required in relation to Domestic Appliances**

16. Basic operation of the product
17. The need to ensure a good, properly bonded earth for the appliance
18. The settings that can be adjusted, and their effect on performance
19. The operation and care of test equipment (eg, earth loop impedance tester)
20. Water by-laws (when appropriate)



# Unit 206: Working Safely at Heights with Antennas

## Unit Summary

This unit identifies the competencies you need to work safely at heights, when installing or servicing antennas, etc, in accordance with approved procedures. You will be required to assess the risks - by identifying the hazards, estimating the likelihood of risk, assessing who would be at risk - and the appropriate safety precautions to minimise the risk. You will be familiar with the use of fall protection equipment, and the safety procedures for using ladders as a work platform or as a means of access.

Your responsibilities will require you to comply with organisational policy and procedures for the antenna installation or servicing activities undertaken, and to report any problems to the relevant authority. You will know when to seek guidance and instructions from others, and will take full responsibility for your own actions and for the accuracy of your work.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying the safety procedures for working at heights. You will understand the legal requirements as well as the regulations that apply. You will know about the codes of safety practice, in adequate depth to provide a sound basis for carrying out the activities to the required quality and safety standards.

You will understand the safety precautions required when carrying out the installation or servicing at heights. You will also understand your responsibilities for health and safety in your place of work, and the importance of taking the necessary safeguards to protect yourself and others when you are working.

## Performance statements:

### **You must:**

- a Work safely at all times, complying with health and safety and other relevant regulations and guidelines
- b Carry out a risk assessment before starting work.
- c Follow the codes of practice for ladder safety and working at heights
- d Use personal protection equipment, and ensure that it is in a useable and safe condition
- e Use fall protection equipment in the correct manner, and check that it is in a serviceable condition
- f Follow the approved safety procedures for working on pitched and flat roofs
- g Follow the approved safety procedures for when working in lofts and when handling large assemblies or components

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Install or service **one** of the following:
  - a satellite signal receiving system
  - a terrestrial signal receiving system
2. Carry out a risk assessment, before starting work, to identify what action should be taken for **all** of the following:
  - falling - and the precautions to be taken (eg, fall protection equipment)
  - debris or tools falling - and the precautions to be taken (eg, personal protective equipment, clear zone areas)
  - ladder stability - and the precautions to be taken (eg ladder stability aids, eyebolt fastening, stand-off devices)
  - the people who would be at risk (eg, installers, observers, customers), and how to protect them
  - working on a pitched roof if appropriate (eg, unusual shaped roof, roof windows, unstable chimney stacks, loose ridge tiles, weather conditions)
  - overhead power cables, their proximity to the installation and to transported ladders
3. Wear a full body harness at all times when working at height (unless working on a single ladder for a short period of time e.g. 5 minutes or less), and ensure **all** of the following:
  - the straps are not twisted
  - the harness is fitted and removed in the approved way
  - a rope grab and two twist-lock karabiners are used on sections 2 and 3 of the ladder, roof ladder and for flat roof access
  - diastatic kernmantle rope with aluminium karabiners are used on sections 2 and 3 of ladder, roof ladder and for flat roof access
  - a cow tail and twist-lock karabiner are used on a single section of ladder and for roof access
  - the equipment is in good condition, functional and not suffering from wear and tear (corrosion, abrasions, cuts, holes, burns, etc)

4. Ensure that **all** the following personal protective equipment (PPE) is used (in the appropriate circumstances):

- a helmet and chinstrap must be used during all outside work
- clean safety footwear must be worn at all times
- eye protection must be worn when drilling or clipping cable
- hearing protection should be worn when drilling
- a high visibility vest must be worn when working by public highways
- a face mask must be worn when drilling, working in lofts or in dusty environments
- safety gloves must be worn when there is a risk of trapping or cutting hands

5. Ensure **all** of the following when working with ladders:

- the ladder is kept in a safe and useable condition
- the ladder is secured by an eyebolt and strap, approximately one metre above the ground unless the work is of short duration (5 minutes maximum) on a single ladder (e.g. to secure a horizontal cable run)
- the ladder is secured with an additional eyelet and strap near the top when using sections 2 and 3
- a ladder stability aid is used at the top and bottom when using sections 2 and 3 of a ladder
- a ladder stand-off device is used as a stability aid on the single section of ladder.
- the ladder stability aid is not used to carry out an unsafe activity (eg, over-reaching, straddling from a ladder to a nearby foothold)
- if fall restraint equipment is required, a safety line must be attached to the ladder before it is secured
- the ground provides a firm footing and a ladder spike is used on soft ground
- an adjustable ladder foot is used, within its design specifications, when the ground slopes to the left or right of the ladder
- when removing the eyebolt, the hole must be plugged, and filled with silicone sealant
- the ladder is securely placed to prevent slippage
- the ladder is set at the correct (1-to-4) angle
- the ladder is positioned away from outward opening doors and windows (unless these are fastened shut)
- the 'three points of contact' rule is always observed
- over-reaching is avoided
- tools, equipment and materials are carried in the approved manner

6. Ensure **all** of the following when working on a pitched roof:

- safety harnesses are worn and secured in the recommended fashion
- roof ladders are placed over the ridge tiles
- roof ladders are secured to the access ladder
- roof ladders are accessed by a minimum of 1.2 metres of access ladder above the gutter line
- a stand-off ladder device is used with a ladder stability aid for sections 2 and 3 of the access ladder
- the roof ladder is not left without alternative harness security
- ascending onto, and descending from the roof is done in the recommended manner

7. Ensure **all** of the following when working on a flat roof:
- avoid working within two metres of the edge, unless wearing fall arrest equipment
  - fall arrest equipment is used, unless there is sufficient edge protection and the roof integrity has been established
  - assess the roof for visible damage (eg, soft or fragile surfaces, water ingress on underside, etc) and possible dangerous features (eg, skylights, overhanging gable ends, etc), before standing on it
  - crawling boards are used
  - single section ladders must not be used in place of crawling boards
  - ascending onto, and descending from the roof is done in the recommended manner
8. When fitting an antenna to a chimney stack, ensure **all** of the following:
- planning permission has been obtained (or is not required)
  - the structure and pointing on the chimney stack are sound
  - you inform customer of any doubt regarding the strength of the chimney or loose ridge tiles, and obtain the consent of both the customer and your company before continuing
9. When installing or servicing large brackets, ensure **all** of the following:
- gloves are always worn
  - only one bracket at a time is taken up the ladder
  - you do not work more than one metre above the top eyelet fixing
  - your feet are not be above the ladder stand-off device
10. Before working in a loft, wear the appropriate PPE, and ensure that the loft has **all** of the following:
- a safe fixed access
  - suitable boarding
  - adequate working lights
  - good ventilation
11. When cabling over roofs, ensure **all** of the following:
- the cable is taken from the front to the rear of the property
  - a sentry is establish and maintain a clear zone in the drop area
  - a controlled method is used to guide the cable across the roof
  - care is taken not to dislodge tiles or damage the antenna
12. Ensure all height access and personal protective equipment is looked after in **all** the following ways:
- maintained according to the manufacturer's schedule
  - cleaned and oiled in the recommended way
  - stored in the recommended way

## Knowledge statements:

### *You must have knowledge and understanding of:*

1. The specific safety precautions to be taken when working at heights, especially when carrying, handling or fixing antennas and brackets
2. The personal protective equipment (PPE) to be worn, and how to ensure that it is in good condition
3. How to assess risks before, and during, the installation or servicing activity
4. Codes of practice relating to ladder use and safety
5. The procedure to be followed when it is not possible to secure a ladder with an eyebolt
6. Types of fall protection equipment, and the correct way to use it
7. The procedures for accessing pitched and flat roofs
8. The procedures to be used when working on pitched and flat roofs
9. The procedures to be used when working in lofts
10. The procedures to be followed when there is no safe access to a loft
11. Health and safety legislation, regulations and safe working practices and procedures applicable to working at heights
12. How to ensure planning permission is obtained (or how to confirm that permission is not required)
13. How to run cables over roofs
14. How to check and ensure that the structure and pointing of chimney stacks is sound
15. How to secure brackets and antennas to chimney stacks
16. Company safety procedures, and the importance of adhering to them
17. Company documentation required for safety procedures
18. The extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

# Unit 207: Diagnosing Faults in Signal Reception Systems

## Unit Summary

This unit identifies the competencies you need to diagnose faults in signal reception equipment or systems, in accordance with approved procedures. You will be required to use logical service techniques, and to select and use the appropriate test equipment.

Your responsibilities will require you to comply with, and work within, the policies and procedures of your service organisation, and to report any problems to an appropriate person. You will know when to seek guidance and instructions from others, and will take full responsibility for your own actions and for the accuracy of your work.

Your underpinning knowledge will provide a good understanding of the system being serviced, together with its operation, installation requirements and relevant codes of practice, in adequate depth to provide a sound basis for carrying out the servicing activities to the required standard.

You will understand the safety precautions required when carrying out the fault diagnosis activities, especially those for working at heights. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **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

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** of the following during the fault diagnostic activity:
  - obtain all the available information about the fault
  - adhere to the relevant safety standards
  - carry out the fault diagnostic activities using approved procedures
  - identify the fault to module level and determine appropriate corrective action
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
2. Carry out fault diagnosis on **one** of the following systems:
  - satellite broadcast receiving system (including set top box and amplifiers if required)
  - terrestrial digital broadcast receiving system (including set top box and amplifiers if required)
3. Use a range of fault diagnostic techniques, to include **all** of the following:
  - input/output technique
  - function testing
  - visual inspection
4. Use a variety of diagnostic aids and sources of information, to include **three** of the following:
  - previous fault history
  - manufacturer's technical support
  - the reported symptoms
  - customer comments
5. Use **two** of the following types of test equipment to aid fault diagnosis:
  - multimeter/ammeter/voltmeter
  - signal meter or spectrum analyser
  - other specific test equipment
6. Find faults that have resulted in **one** of the following breakdown categories:
  - intermittent action or circuit failure
  - partial failure or reduced performance
  - complete breakdown

7. Carry out the fault diagnosis in compliance with the health and safety legislation, regulations and requirements, including **one** of the following:

- the safe use of soldering equipment
- safe working at heights

8. Ensure that company policy is kept with regard to **all** of the following:

- keeping correct records
- obtaining authority to continue before working beyond agreed limits
- reporting any problem that you are unable to solve to the appropriate person



## Knowledge statements:

### You must have knowledge and understanding of:

1. The specific safety precautions to be taken when working with signal reception equipment
2. The safety issues relating to working on live equipment at the customer's premises
3. The codes of practice that apply to the type of equipment or system being diagnosed
4. Customer care procedures and techniques
5. The correct soldering techniques for the work in hand
6. The risk of faults reoccurring, and how to minimise this
7. The use of workshop manuals and other appropriate sources of information
8. Hazards associated with carrying out fault diagnosis on electrical equipment, and how they can be minimised
9. How to use the various aids, reports and sources of information available for fault diagnosis
10. How to use various items of fault diagnostic equipment to investigate the problem
11. The proper use and care of tools and equipment
12. The various fault finding techniques that can be used, and how they are applied (eg, input-to-output, function testing, visual inspection)
13. How to obtain and interpret drawings, circuit diagrams, manufacturers' manuals, and other documents needed for the fault diagnosis process
14. The company documentation for recording the outcomes of servicing activities
15. Alignment methods for both satellite and terrestrial antenna
16. The characteristics of antennas and dishes
17. The causes of ghosting and multi-path reception, and how to minimise them
18. The causes of signal loss in a system (eg, cable type and length, diplexers, outlets, etc)
19. The operation and care of test equipment (eg, spectrum analyser, signal level meter, etc)
20. The extent of your own authority and whom you should report to if you have problems that you cannot resolve

# Unit 208: Replacing Modules in Signal Reception Systems

## Unit Summary

This unit identifies the competencies you need to rectify faults in signal reception systems by replacing (ie, removing and replacing) faulty modules, and/or by making adjustments to modules to bring the system back to full working order, in accordance with approved procedures. You will be required to ensure that any replacement parts are correct for their intended purpose, that they meet any safety requirements, and are fitted without damage.

Your responsibilities will require you to comply with organisational policy and procedures for the replacement of identified modules and the associated work to be undertaken, and to report any problems with the modules to the relevant authority. You will be expected to know when to seek guidance and instruction from others, taking full responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of the system, together with its operation, installation procedures and relevant codes of practice, in adequate depth to provide a sound basis for carrying out servicing activities to the required standard.

You will understand the safety precautions required when carrying out the replacement activities, especially those for isolating the equipment. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **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

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** the following during the module replacement activity:
  - carry out the replacement activities to cause minimum disruption to the customer
  - adhere to all relevant safety standards
  - provide safe access and working arrangements for the service area
  - carry out the replacement activities using appropriate techniques and procedures
  - record the details of the replacement activity, using appropriate methods or documentation
  - rectify faults to module level
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
2. Rectify faults in **one** of the following products:
  - satellite broadcast receiving system (including set top box and amplifiers if required)
  - terrestrial broadcast receiving system (including set top box and amplifiers if required)
3. Carry out **all** of the following before beginning the module replacement:
  - identify the removal procedures to be followed
  - select and obtain the correct tools for the removal procedures
  - ensure it is safe to begin removal procedures
  - carry out a visual inspection to confirm the modules for removal
4. Replace the components or modules using **two** of the following methods:
  - single connection soldering techniques
  - removal/replacement of fasteners (crimps, screws, bolts, cable ties)
  - disconnecting/reconnecting (plugs/sockets)

5. Ensure **all** of the following when replacing modules:
  - any module replaced is fit for its intended purpose
  - the replacement module is not damaged during the fitting process
  - no other components, modules or wiring (etc) are damaged during the replacement activities
6. Set up the system and return it to the customer, ensuring **all** of the following:
  - any adjustments made are within the normal operating specification of the system
  - the system's performance meets the customer's expectations
  - any questions that the customer asks are answered in a clear and accurate way
  - the system meets all health and safety requirements
7. Ensure that company policy is kept with regard to **all** the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem that you are unable to solve to the appropriate person
8. When leaving the customer's property, ensure **all** of the following:
  - replaced modules are clearly identified with customer
  - the customer is given the opportunity to retain replaced modules that are chargeable
  - care has been taken not to damage the customer's property or flooring
  - all packaging and waste material are removed
  - the customer's premises are left in a clean and tidy state
9. Ensure that relevant health and safety legislation and regulations are complied with at all times with particular attention being given to **two** of the following:
  - correct lifting techniques
  - the safe use of soldering equipment
  - safe working at heights

## **Knowledge statements:**

### ***You must have knowledge and understanding of:***

1. The specific safety precautions to be taken when working with signal reception equipment or systems
2. The safety issues relating to working on live equipment at the customer's premises
3. Customer care procedures and techniques
4. How to use workshop manuals and interpret circuit diagrams, mechanical and component drawings
5. Component or module replacement techniques and safety precautions (eg, de-soldering, mechanical fastenings and electrical connectors)
6. The correct soldering techniques for the work in hand Appropriate component handling and disposal precautions (eg, for static sensitive components)
7. Component or module operating conditions, and any associated hazards (eg, stored electrical or mechanical energy)
8. How to select and use the correct tools and equipment for the work in hand
9. Tool and equipment care and control procedures
10. Product or system specifications, and the tests needed to confirm that they are being met
11. The company documentation required for service procedures
12. Waste disposal procedures including ownership and advice to customers
13. Alignment methods for both satellite and terrestrial antenna
14. The causes of signal loss in a system (eg, cable type and length, diplexers, outlets, etc)
15. The operation and care of test equipment (eg, spectrum analyser, signal level meter, etc)
16. The extent of your own responsibility, and whom you should report to if you have problems that you cannot resolve

# Unit 209: Carrying Out Preventive Maintenance Procedures

## Unit Summary

This unit identifies the competencies you need to carry out preventive maintenance on domestic appliances, consumer electronic equipment or signal reception equipment or systems. You will be required to implement the preventive maintenance procedures in compliance with the manufacturer's instructions, to use the appropriate test equipment, and to restore the appliance to normal operation at the end of the work.

Your responsibilities will require you to comply with any policies and procedures of your service organisation in respect of maintenance procedures, and to report any problems to an appropriate person. You must ensure that all necessary company documentation is completed accurately and legibly. You will be expected to work within the general policies of your service organisation, and to know when to seek guidance and instructions from others, taking full responsibility for your own actions and for the quality and accuracy of your own work.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying preventive maintenance procedures. You will understand the operating principles of the product, systems or equipment, the installation procedures, codes of practice and preventive maintenance procedures, in adequate depth to provide a sound basis for carrying out the activities to the required standard. In addition, you will be expected to report where the outcome identifies the need for further investigation or maintenance work.

You will understand the safety precautions required when carrying out the maintenance activities, especially those for isolating the equipment. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### 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

### Scope of the unit:

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### You must:

1. Carry out **all** of the following during the preventive maintenance activities:
  - use the correct issue of company and/or manufacturers' drawings and maintenance documentation
  - adhere to the relevant safety standards
  - provide safe access and working arrangements for the maintenance area
  - carry out the preventive maintenance activity using appropriate techniques and procedures
  - return the equipment or system to service on completion of the maintenance activities
  - functionally test and adjust the equipment or system to meet the specification
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
2. Carry out preventive maintenance on **one** of the following products or systems:
  - for Consumer/Commercial Electronics**
    - television receiver (analogue or digital)
    - domestic audio equipment (eg, cassette/minidisc recorder/player, CD player, tuner, amplifier, etc)
    - video/DVD recorders/players
  - for Signal Reception**
    - satellite broadcast receiving system (including set top box and amplifiers if required)
    - terrestrial broadcast receiving system (including set top box and amplifiers if required)
  - for Domestic Appliances**
    - home laundry (eg, washing machine, tumble drier, etc)
    - refrigeration (eg, fridge, freezer, dehumidifier, etc)
    - cooking (eg, cooker, microwave oven, etc)
    - small domestic appliances (eg, hair drier, toaster, iron, etc)
3. Ensure **all** of the following when replacing components or modules:
  - any safety component or module replaced is a direct replacement
  - any component or module replacement is fit for the purpose
  - the replacement component or module is not damaged during the fitting process
  - no other component, module or wiring (etc) is damaged during the replacement process

4. Carry out **two** of the following assembly activities:
  - single connection soldering
  - multi-connection soldering
  - controlled temperature soldering
  - electrical assembly
  - mechanical assembly
  
5. Carry out **all** of the following checks on completion of the maintenance activity:
  - all components or modules are fit for purpose
  - all connections are electrically and mechanically safe and sound
  - the product or system functions to specification
  - all potential or remaining defects are identified and reported for future action
  - the relevant people are informed, and authority to continue is obtained, before working beyond the company agreed maintenance limits
  - the product or system meets all health and safety requirements
  
6. Ensure that all health and safety legislation and regulations are complied with at all times, with particular attention being given to **all** of the following, as appropriate:
  - the safe use of soldering equipment.
  - the isolation of live television chassis.
  - water by-laws.
  - safe working at heights
  
7. Ensure that company policy is kept with regard to **all** of the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem, that you are unable to solve, to the appropriate person
  - identifying any replaced modules or components for return to the customer
  - giving the customer the opportunity to retain replaced modules or components that are chargeable
  - removing all packaging and waste material
  - leaving the work site in a clean and tidy state



## **Knowledge statements:**

### ***You must have knowledge and understanding of:***

1. The specific safety precautions to be taken when preventing faults through preventive maintenance procedures
2. The use of workshop manuals and maintenance procedures
3. Customer care procedures and techniques
4. Component or module replacement methods and techniques
5. The requirements for handling specific components or modules (eg, static-sensitive components)
6. The correct tools and equipment required for the work in hand
7. The company documentation required for service procedures
8. Waste disposal procedures (including ownership and advice to customers)
9. Disassembly and reassembly procedures for the product or system
10. The product or system specification
11. Faults that can be prevented by maintenance and those that can not
12. The extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

### **The following specific knowledge will also be required in relation to Signal Reception**

13. Alignment methods for both satellite and terrestrial antenna
14. The cause of signal loss in a system (eg, cable type and length, diplexers, outlets, etc)
15. The operation and care of test equipment (eg, spectrum analyser, signal level meter, etc)

### **The following specific knowledge will also be required in relation to Consumer/Commercial Electronics**

16. Basic operation of the product stage by stage
17. The need to isolate a live (TV) chassis before working on it
18. The signal requirements of the product
19. The operation and care of test equipment (eg, multimeter, oscilloscope, function generator, etc)

### **The following specific knowledge will also be required in relation to Domestic Appliance Servicing**

20. The basic operational principles of the modules contained in the appliance (motors, pumps, water valves, heaters, processors, etc)
21. The sequence in which the appliance operates
22. The need to ensure a good, properly bonded earth for the appliance
23. The service requirements of the product
24. Appliance settings that can be adjusted
25. The operation and care of test equipment (eg, multimeter, earth loop impedance tester, insulation resistance tester, etc)
26. Water by-laws (when appropriate)

# Unit 210: Transporting and Protecting Products and Equipment

## Unit Summary

This unit identifies the competences you need to transport and protect products and equipment to meet the requirements of your company. You will be required to protect products and equipment prior to transportation, to take all reasonable security measures to protect them prior to delivery, and to ensure that their delivery is made safely and effectively.

Your responsibilities will require you to comply with any policies of your company in respect of protection and transportation, and to report any problems to an appropriate person. You will be expected to work within the general policies of your company and know when to seek guidance and instructions from others, taking full responsibility for your own actions and for the quality and accuracy of your work.

You will require underpinning knowledge of handling, transportation and protection, customer relations, the products and services provided by your company, and the tools and equipment it uses for servicing.

You will understand the safety precautions required when carrying out the transporting activities, especially where these involve heavy equipment. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **You must:**

- a Work safely at all times, complying with health and safety and other relevant regulations and guidelines
- b Ensure that the product and/or equipment is suitable for use
- c Ensure that all products and/or equipment are loaded and protected correctly
- d Use the correct handling and lifting procedures
- e Complete and pass all the relevant documentation to the appropriate people
- f Inform the relevant people of any delay
- g Transport the product and/or equipment safely to its destination
- h Take all reasonable security measures to protect products and equipment in line with company policy and procedures
- i Correctly remove and dispose of waste material

## Scope of the Unit

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Ensure that the product and/or equipment to be transported meets **three** of the following criteria:
  - it is to the correct specification
  - it is correctly stowed
  - it is stowed in the correct order for delivery
  - it is in good condition
  - it is tied down (if necessary)
  - it is protected with the appropriate packing
2. Ensure **all** of the following when moving or lifting the product and/or equipment:
  - the correct lifting techniques are used
  - the correct use is made of trolleys and other moving equipment
  - that trolleys and other moving equipment are in good condition and suitable for the load/work required
3. Inform the relevant people of any delays, including **one** of the following:
  - customers
  - line management
  - transport controllers
4. Transport the product and/or equipment to the correct destination, ensuring **all** of the following:
  - the vehicle is driven in a safe and considerate manner
  - the most effective route is chosen, subject to customer requests
  - all reasonable security measures to protect products and equipment are taken during transportation
  - health and safety legislation, and transport regulations, are complied with at all times

5. Ensure that company policy is kept with regard to **all** of the following:
- maintaining correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem that you are unable to solve to the appropriate person
  - leaving the delivery site in a clean and tidy state
  - removing all packaging and waste material from site

## **Knowledge statements:**

### ***You must have knowledge and understanding of:***

1. The specific health and safety precautions to be taken when transporting products and equipment
2. Customer relations methods and procedures
3. Company policy regarding the transportation of products and equipment
4. Types of packaging needed for specific products
5. Methods of ensuring restriction of movement within a product (eg, washing machine drum)
6. The type of damage that can occur with products packed close together without protection
7. The company record and documentation procedures
8. Lifting techniques and handling aids
9. The company products, services and procedures
10. Protection and stowage techniques
11. Specific security measures required to protect products when in transit
12. Waste disposal procedures
13. The extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

# Unit 211: Collecting and Processing Payments

## Unit Summary

This unit identifies the competences you need to collect and process payments for servicing or installation services. You will be required to establish the price and to obtain the correct payment from the customer.

Your responsibilities will require you to comply with any policies and procedures of your organisation in respect of collecting and processing payments, and to report any problems to an appropriate person. You will be expected to work within the general policies of your organisation, and to know when to seek guidance and instructions from others, taking full responsibility for your own actions and for the quality and accuracy of your work.

Your underpinning knowledge will include cash and credit control systems, customer relations, information systems, and costs of the activities, as well as the products and services that your organisation provides.

Safe working practices are as important in the collection and processing of payments as they are in other servicing activities, and you will understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **You must:**

- a Work safely at all times, complying with relevant regulations and guidelines
- b Identify the service required by the customer
- c Correctly calculate the price of the service
- d Agree the price of the service with the customer
- e Obtain the correct payment
- f Record the payment in the appropriate documentation
- g Provide the customer with a correct record of the payment
- h Secure the payments in the correct manner and pass responsibility for their security to the appropriate people
- i Inform the appropriate people in case of difficulty

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Ensure that regulations and guidelines are followed including **all** of the following:
  - health and safety
  - financial
  - company policy
  - VAT regulations if applicable
  - credit card regulations if applicable
2. Identify the type of service required by the customer, from **one** of the following:
  - repair
  - maintenance
  - installation
  - repair estimate
3. Calculate the correct price for the service, including **two** of the following:
  - labour
  - parts
  - discounts
  - supplements
  - VAT
  - delivery
4. Agree the price of the service or product with the customer, ensuring that the customer is aware of **two** of the following:
  - quality of product expected
  - quality of service or installation
  - overall cost of service and/or product
  - responsibility for payment

5. Obtain the correct payment by **one** of the following methods, ensuring beforehand that the person making the payment is entitled to pay by the chosen method:

- cash
- credit card
- debit card
- company account
- account
- cheque

6. Record the payment in the correct manner, including **one** of the following:

- receipt book
- card docket
- company documentation

7. Provide the customer with the relevant proof of payment, including **one** of the following:

- receipt
- card docket
- company document

8. Transport the payments in a safe manner by **both** of the following:

- not drawing attention to them
- carrying them in a secure manner

9. Ensure that payments, and the responsibility for their security, are passed on to **one** the following:

- company accounts department
- manager/supervisor/appointed person
- bank



## **Knowledge statements:**

### ***You must have knowledge and understanding of:***

1. Company products and services, together with their cost
2. VAT and other legal requirements
3. Supplements or discounts that may be included in the cost
4. Company financial policy, documentation and office procedures
5. Procedures for presenting the total cost to customer
6. Common types of disagreement that may occur over costs
7. Customer relations, and methods of dealing with disagreements
8. Methods of payment
9. Security methods for different types of payment
10. Security measures to be taken when transporting cash
11. The extent of your own authority, and whom you should report to if you have problems that you cannot resolve

# Unit 212: Promoting Your Organisation's Products and Services

## Unit Summary

This unit identifies the competencies you need to promote the products and services of your organisation. You will be required to identify the customer's requirements, and to inform the customer about what the organisation can provide. You will then be expected to initiate and complete the sales of products and services to the customer.

Your responsibilities will require you to comply with any policies and procedures of your service organisation in respect of promoting and selling its products and services, and to report any problems to an appropriate person. You will be expected to work within the general policies of your service organisation, and know when to seek guidance and instructions from others, taking full responsibility for your own actions and for the quality and accuracy of your own work.

Your underpinning knowledge will include sales techniques and procedures, the products and services provided by your service organisation, and the principles of customer service.

You will understand your responsibilities for health and safety, and for explaining to the customer any health and safety requirements or implications of the products or services being supplied.

## Performance statements:

### **You must:**

- a Work safely at all times, complying with relevant regulations and guidelines
- b Identify the product or service required by the customer
- c Accurately convey the advantages of the product or service to the customer
- d Ensure the availability of the product or service
- e Correctly calculate the price of the product or service
- f Agree the product or service and the price with the customer
- g Agree the delivery date with the customer
- h Obtain the correct payment or agreement, record it in the appropriate documentation, and provide the customer with a receipt
- i Inform the appropriate people in case of difficulty

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Ensure that all relevant regulations and guidelines are followed, including **all** the following:
  - health and safety
  - financial
  - company policy
  - VAT regulations if applicable
  - credit card regulations if applicable
2. Promote your organisation's products and services to **two** of the following:
  - a technical customer
  - a non-technical customer
  - a company
3. Promote your organisation's products and services, to include **two** of the following:
  - an installation
  - a product
  - a service repair
  - routine maintenance
4. Produce a file containing information on the products and services that you are promoting, to include **all** of the following:
  - availability of the product or service (or the source of information on availability)
  - cost of the product or service (or the source of information on cost)
  - literature/brochures on products or services currently available
  - technical information on the products or services

5. Identify the product or service required by the customer, and carry out **all** of the following:
  - describe the advantages of the product or service to the customer
  - ensure that the product or service meets all the customer's needs
  - inform the customer of the availability of the product or service
  - confirm with the customer that the product or service meets their requirements and expectations
  - answer any of the customer's questions with clear, accurate and relevant information
6. Agree the price of the product or service with the customer, confirming **two** of the following:
  - the quality of product expected
  - the quality of service or installation
  - the overall cost of the service and/or product
  - responsibility for payment
7. Confirm the availability of the product or service, and agree with the customer **all** of the following:
  - when the product or service would be available
  - when the customer would like the product or service
  - when the product or service would be delivered to the customer
8. Explain **one** of the following payment procedures to the customer:
  - cash
  - account
  - credit card
  - debit card
  - company account
  - cheque
9. Explain to the customer how they will be provided with proof of payment by **one** of the following methods:
  - receipt book
  - card docket
  - company documentation
10. Ensure that company policy is kept with regard to **all** of the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem, that you are unable to solve, to the appropriate person

## **Knowledge statements:**

### ***You must have specific knowledge and understanding of:***

1. Health and safety legislation and regulations
2. Sales techniques and procedures
3. Company products and services, together with their costs
4. VAT and other legal requirements
5. Supplements or discounts that may be included in the cost
6. Company financial policy, documentation and office procedures
7. Procedures for presenting the total cost to the customer
8. Common types of disagreement over cost
9. Customer relations, and methods of dealing with disagreements
10. The various methods of payment
11. The security precautions to be taken for different payment methods
12. Specific security measures to be taken when transporting cash
13. The extent of your own authority, and whom you should report to if you have problems that you cannot resolve

# Unit 213: Installing Consumer/Commercial Electronic Equipment in Premises

## Unit Summary

This unit identifies the competencies you need to install consumer/commercial electronic equipment in customers' premises. You will be required to observe the manufacturer's installation instructions and use the appropriate test equipment.

Your responsibilities will require you to comply with, and work within, the policies and procedures of your organisation, and to report any problems to an appropriate person. You will know when to seek guidance and instructions from others, and will take full responsibility for your own actions and for the accuracy of your work.

Your underpinning knowledge will provide a good understanding of the products being installed and their operation. It will include installation techniques and best practices, performance specifications for the product, and the correct and safe use of tools and test equipment. You will also understand the requirements of the customer, and will have a good understanding of the health and safety guidelines and relevant codes of practice that apply. Your underpinning knowledge will be of adequate depth to provide a sound basis for carrying out installation procedures to the required standard.

You will understand the safety precautions required when carrying out the installation. You will also understand your responsibilities for health and safety in your place of work, and the importance of taking the necessary safeguards to protect yourself and others when you are working.

## Performance statements:

### **You must:**

- a Work safely at all times, complying with health and safety and other relevant regulations and guidelines
- b Follow all relevant drawings and specifications for the installation being carried out
- c Use the correct tools and equipment for the installation operations and check that they are in a safe and usable condition
- d Install, position and secure the equipment and components in accordance with the specification
- e Ensure that all necessary connections to the equipment are complete
- f Deal promptly and effectively with problems within your control and report those that cannot be solved
- g Check that the installation is complete and that all components are free from damage

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** the following checks before installing the product:
  - confirm with the customer that the product is what they ordered and are expecting
  - ensure that the product is the correct model (if there are variants)
  - check that all the component parts are present and correct
  - ensure that the necessary services (eg, antenna feeds, electrical supply) are available
  - make sure that the area is safe and ready for the installation
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
2. Install **one** of the following products:
  - television receiver (analogue or digital)
  - domestic audio equipment (eg, cassette/minidisc recorder/player, CD player, tuner, amplifier, etc)
  - video/DVD recorder/player
3. Carry out **three** of the following interconnections and commissioning using coaxial and SCART connectors:
  - television receiver
  - set top box
  - video recorder/player
  - DVD player/recorder
  - digital audio broadcast (DAB) receiver
  - analogue (AM/FM) radio
  - domestic audio equipment ('hi-fi')
  - other equipment (eg, interactive keyboard, etc)
4. Before moving or installing the equipment into the customer's premises, make **all** the following checks:
  - ensure that the product is being installed at the correct address
  - confirm the location of the product with the customer
  - ensure that there is adequate space for the product to be installed
  - ensure that there is a free path to the installation
5. Carry out the installation of the product or system, ensuring **all** of the following:
  - the correct lifting techniques are used when moving the product (using transport aids if required)

- there is no damage to the product or to the customer's property when moving the product
- the product is stable
- all connections are correctly made
- the manufacturer's installation instructions are followed
- the installation is carried out in accordance with the manufacturer's specification
- the installation meets all health and safety requirements
- the product is working to the manufacturer's specification, and to the customer's satisfaction

6. Ensure that company policy is kept with regard to **all** the following:

- ? maintaining correct records
- ? obtaining authority to continue before working beyond agreed limits
- ? reporting any problem that you are unable to solve to the appropriate person
- ? removing all packaging and waste material
- ? leaving the work site in a clean and tidy state

7. Ensure that relevant health and safety legislation and regulations are complied with at all times with particular attention being given to **two** of the following:

- correct lifting techniques
- the safe use of soldering equipment
- the isolation of live television chassis



## **Knowledge statements:**

### ***You must have knowledge and understanding of:***

1. The specific safety precautions to be taken when working with consumer/commercial electronic equipment (including relevant codes of practice)
2. Customer care procedures and techniques
3. Installation site requirements (eg, structural, services and ventilation)
4. The importance of correct location of equipment
5. The manufacturers' installation instructions and specifications for the product or system
6. The correct method of installing the product or system, and for making the necessary connections
7. Tests to be carried out to ensure that the product is fault free
8. Installation techniques and best practice
9. Waste disposal procedures
10. The basic operation of the product and its controls
11. The need to isolate a live (TV) chassis before working on it
12. The signal requirements of the product
13. The operation and care of tools and test equipment (eg, multimeter, oscilloscope, test signal generator, etc)
14. The extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

# Unit 214: Installing Domestic Appliance Equipment in Customers' Premises

## Unit Summary

This unit identifies the competencies you need to install domestic appliances in customers' premises. You will be required to observe the manufacturer's installation instructions and use the appropriate test equipment.

Your responsibilities will require you to comply with, and work within, the policies and procedures of your organisation, and to report any problems to an appropriate person. You will know when to seek guidance and instructions from others, and will take full responsibility for your own actions and for the accuracy of your work.

Your underpinning knowledge will provide a good understanding of the products being installed, and their operation, and will include installation techniques and best practices, performance specifications and the correct and safe use of tools and test equipment. You will also understand the requirements of the customer, and will have a good understanding of the health and safety guidelines and relevant codes of practice that apply. Your underpinning knowledge will be of adequate depth to provide a sound basis for carrying out installation procedures to the required standard.

You will understand the safety precautions required when carrying out the installation, especially when working with heavy equipment. You will also understand your responsibilities for health and safety in your place of work, and the importance of taking the necessary safeguards to protect yourself and others when you are working.

## Performance statements:

### **You must:**

- a Work safely at all times, complying with health and safety and other relevant regulations and guidelines
- b Follow all relevant drawings and specifications for the installation being carried out
- c Use the correct tools and equipment for the installation operations and check that they are in a safe and usable condition
- d Install, position and secure the equipment and components in accordance with the specification
- e Ensure that all necessary connections to the equipment are complete
- f Deal promptly and effectively with problems within your control and report those that cannot be solved
- g Check that the installation is complete and that all components are free from damage

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** the following checks before installing the appliance:
  - ensure that the appliance is being installed at the correct address
  - confirm the location of the appliance with the customer
  - ensure that there is adequate space for the appliance to be installed
  - confirm with the customer that the appliance is what they ordered and are expecting
  - ensure that the appliance is the correct model (if there are variants)
  - check that all the component parts are present and correct
  - ensure that the necessary services (water, gas, electrical supply) are available
  - make sure that the area is safe, ready for the installation, and that there is a free path to the installation
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
2. Install **two** of the following appliances:
  - home laundry (eg, washing machine, tumble drier, etc)
  - refrigeration (eg, fridge, freezer, dehumidifier, etc)
  - cooking (eg, cooker, microwave oven, etc)
  - small domestic appliances (eg, hair drier, toaster, iron, etc)

3. Carry out the installation of the appliance, ensuring **all** of the following:
  - the correct lifting techniques are used when moving the appliance (using transport aids if required)
  - there is no damage to the product or to the customer's property when moving the appliance
  - the appliance is level and stable
  - all connections are correctly made and leak free (eg, water, electricity)
  - the installation is carried out in accordance with the manufacturer's specification
  - any settings which cannot be achieved are identified, and suitable alternatives are suggested to the customer
  - the installation meets all health and safety requirements
  - the appliance is working to the manufacturer's specification, and to the customer's satisfaction
  
4. Use **both** of the following in the installation:
  - installation manuals
  - earth loop impedance tester
  
5. Ensure that company policy is kept with regard to **all** the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem that you are unable to solve to the appropriate person
  - removing all packaging and waste material
  - leaving the work site in a clean and tidy state
  
6. Ensure that relevant health and safety legislation and regulations are complied with at all times with particular attention being given to **one** of the following:
  - correct lifting techniques
  - water by-laws
  - retained heat

## **Knowledge statements:**

### ***You must have knowledge and understanding of:***

1. The specific safety precautions to be taken when working with domestic appliances (including relevant codes of practice)
2. Customer care procedures and techniques
3. Installation site requirements (eg, structural, services and ventilation)
4. The importance of correct location of equipment
5. The manufacturers' installation instructions and specifications for the appliance
6. The correct method of installing the appliance, and for making the necessary connections
7. Tests to be carried out to ensure that the appliance is fault free, and connections are leak free
8. Installation techniques and best practice
9. Waste disposal procedures
10. The basic operation of the appliance
11. The need to ensure a good, properly bonded earth for the appliance
12. The settings that can be adjusted, and their effect on performance
13. The operation and care of tools and test equipment (eg, multimeter, earth loop impedance tester, insulation resistance tester, etc)
14. Water by-laws (when appropriate)
15. The extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

# Unit 215: Diagnosing Faults in Consumer/Commercial Electronic Equipment

## Unit Summary

This unit identifies the competencies you need to diagnose faults in consumer electronic equipment, in accordance with approved procedures. You will be required to use logical service techniques, and to select and use the appropriate test equipment.

Your responsibilities will require you to comply with, and work within, the policies and procedures of your service organisation, and to report any problems to an appropriate person. You will know when to seek guidance and instructions from others, and will take full responsibility for your own actions and for the accuracy of your work.

Your underpinning knowledge will provide a good understanding of the equipment being serviced, together with its operation, installation requirements and relevant codes of practice, in adequate depth to provide a sound basis for carrying out the servicing activities to the required standard.

You will understand the safety precautions required when carrying out the fault diagnosis activities, especially those for isolating a live TV chassis. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **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

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** of the following during the fault diagnostic activity:
  - obtain all the available information about the fault
  - adhere to the relevant safety standards
  - carry out the fault diagnostic activities using approved procedures
  - collect fault diagnostic evidence from 'live' and isolated circuits
  - disconnect or isolate components or parts of circuits, when appropriate, to confirm the diagnosis
  - identify the fault and determine appropriate corrective action
  - diagnose a fault to component level (with faults that are known to occur regularly in a product)
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
2. Carry out fault diagnosis on **one** of the following types of equipment:
  - television receiver (analogue or digital)
  - domestic audio equipment (eg, cassette/minidisc recorder/player, CD player, tuner, amplifier, etc)
  - video/DVD recorders/players
3. Use a range of fault diagnostic techniques, to include **three** of the following:
  - input/output technique
  - half-split technique
  - function testing
  - visual inspection
  - voltage, current and resistance measurement
  - waveform observation
  - signal analysis

4. Use a variety of diagnostic aids and sources of information, to include **three** of the following:
  - manufacturers' manuals
  - previous fault history
  - manufacturer's technical support
  - workshop manuals
  - equipment self diagnostics
  - the reported symptoms
  - customer comments
  
5. Use **two** of the following types of test equipment to aid fault diagnosis:
  - multimeter/ammeter/voltmeter
  - signal/function/pattern generator
  - oscilloscope
  - isolation transformer
  - other specific test equipment
  
6. Find faults that have resulted in **one** of the following breakdown categories:
  - intermittent action or circuit failure
  - partial failure or reduced performance
  - complete breakdown
  
7. Carry out the fault diagnosis in compliance with the health and safety legislation, regulations and requirements, including **one** of the following:
  - ? the safe use of soldering equipment
  - ? the isolation of live television chassis
  
8. Ensure that company policy is kept with regard to **all** of the following:
  - ? keeping correct records
  - ? obtaining authority to continue before working beyond agreed limits
  - ? reporting any problem that you are unable to solve to the appropriate person.



## Knowledge statements:

### *You must have knowledge and understanding of:*

1. The specific safety precautions to be taken when working with consumer electronic equipment
2. The safety issues relating to working on live equipment at the customer's premises
3. The codes of practice that apply to the type of equipment or system being diagnosed
4. Customer care procedures and techniques
5. The correct soldering techniques for the work in hand
6. The risk of faults reoccurring, and how to minimise this
7. The use of workshop manuals and other appropriate sources of information
8. Hazards associated with carrying out fault diagnosis on electrical equipment (live electrical components or chassis, stored energy, misuse of tools), and how they can be minimised
9. How to use the various aids, reports and sources of information available for fault diagnosis
10. How to use various items of fault diagnostic equipment to investigate the problem
11. The various fault finding techniques that can be used, and how they are applied (such as half-split, input-to-output, function testing, injection and sampling techniques and equipment self-diagnostics)
12. How to obtain and interpret drawings, circuit diagrams, manufacturers' manuals, and other documents needed for the fault diagnosis process
13. The company documentation for recording the outcomes of servicing activities
14. Basic operation of the product, stage by stage
15. The need to isolate a live (TV) chassis before working on it
16. The signal requirements of the product
17. The operation and care of tools and test equipment (eg, multimeter, oscilloscope, function generator, etc)
18. The extent of your own authority and whom you should report to if you have problems that you cannot resolve

# Unit 216: Diagnosing Faults in Domestic Appliances

## Unit Summary

This unit identifies the competencies you need to diagnose faults in domestic appliances, in accordance with approved procedures. You will be required to use logical service techniques, and to select and use the appropriate test equipment.

Your responsibilities will require you to comply with, and work within, the policies and procedures of your service organisation, and to report any problems to an appropriate person. You will know when to seek guidance and instructions from others, and will take full responsibility for your own actions and for the accuracy of your work.

Your underpinning knowledge will provide a good understanding of the appliance being serviced, together with its operation, installation requirements and relevant codes of practice, in adequate depth to provide a sound basis for carrying out the servicing activities to the required standard.

You will understand the safety precautions required when carrying out the fault diagnosis activities, especially those for correct earthing requirements. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **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

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** of the following during the fault diagnostic activity:
  - obtain all the available information about the fault
  - adhere to the relevant safety standards
  - carry out the fault diagnostic activities using approved procedures
  - disconnect or isolate components or parts of circuits, when appropriate, to confirm the diagnosis
  - identify the fault and determine appropriate corrective action
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
2. Carry out fault diagnosis on **one** of the following appliances to module level:
  - home laundry (eg, washing machine, tumble drier, etc)
  - refrigeration (eg, fridge, freezer, dehumidifier etc)
  - cooking (eg, cooker, microwave oven, etc)
  - small domestic appliances (eg, hair drier, toaster, iron, etc)
3. Use a range of fault diagnostic techniques, to include **three** of the following:
  - input/output techniques
  - function testing
  - visual inspection
  - voltage, current and resistance measurement

4. Use a variety of diagnostic aids and sources of information, to include **three** of the following:
  - manufacturers' manuals
  - previous fault history
  - manufacturer's technical support
  - workshop manuals
  - equipment self diagnostics (if available)
  - the reported symptoms
  - ? customer comments
  
5. Use **two** of the following types of test equipment to aid fault diagnosis:
  - multimeter/ammeter/voltmeter
  - insulation resistance tester
  - earth-loop impedance tester
  - portable appliance tester
  - other specific test equipment
  
6. Find faults that have resulted in **one** of the following breakdown categories:
  - ? intermittent action
  - ? partial failure or reduced performance
  - ? complete breakdown
  
7. Carry out the fault diagnosis in compliance with the health and safety legislation, regulations and requirements, including **one** of the following:
  - ? water by-laws
  - ? retained heat
  
8. Ensure that company policy is kept with regard to **all** of the following:
  - ? keeping correct records
  - ? obtaining authority to continue before working beyond agreed limits
  - ? reporting any problem that you are unable to solve to the appropriate person.

## Knowledge statements:

### You must have knowledge and understanding of:

1. The specific safety precautions to be taken when working with domestic appliance
2. The safety issues relating to working on live equipment at the customer's premises
3. The codes of practice that apply to the type of equipment or system being diagnosed
4. Customer care procedures and techniques
5. The risk of faults reoccurring, and how to minimise this
6. The use of workshop manuals and other appropriate sources of information
7. Hazards associated with carrying out fault diagnosis on electrical equipment, and how they can be minimised
8. How to use the various aids, reports and sources of information available for fault diagnosis
9. How to use various items of fault diagnostic equipment to investigate the problem
10. The various fault finding techniques that can be used, and how they are applied (input-to-output, function testing, visual inspection and voltage, current and resistance measurement)
11. How to obtain and interpret drawings, circuit diagrams, manufacturers' manuals, and other documents needed for the fault diagnosis process
12. The company documentation for recording the outcomes of servicing activities
13. The operational principles of the modules contained in the appliance (motors, pumps, water valves, heaters, processors etc.)
14. The sequence in which the appliance operates
15. The need to ensure a good, properly bonded earth for the appliance
16. The service requirements of the product
17. The operation and care of tools and test equipment (eg, multimeter, earth loop impedance tester, insulation resistance tester, etc)
18. Water by-laws (when appropriate)
19. The extent of your own authority and whom you should report to if you have problems that you cannot resolve

# Unit 217: Replacing Components in Consumer/Commercial Electronic Equipment

## Unit Summary

This unit identifies the competencies you need to rectify faults in consumer electronic equipment, by replacing (ie, removing and replacing) faulty components and/or by making adjustments to components to bring the product back to full working order, in accordance with approved procedures. You will be required to ensure that any replacement parts are correct for their intended purpose, that they meet any safety requirements, and are fitted without damage.

Your responsibilities will require you to comply with organisational policy and procedures for the replacement of identified components and the associated work to be undertaken, and to report any problems with the components or assemblies to the relevant authority. You will be expected to know when to seek guidance and instruction from others, taking full responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of the product, together with its operation, installation procedures and relevant codes of practice, in adequate depth to provide a sound basis for carrying out servicing activities to the required standard.

You will understand the safety precautions required when carrying out the component replacement activities, especially those for isolating the equipment. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **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

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** the following during the component replacement activity:
  - carry out the replacement activities, to component level, to cause minimum disruption to the customer
  - adhere to all relevant safety standards
  - provide safe access and working arrangements for the service area
  - carry out the replacement activities, to component level, using appropriate techniques and procedures
  - record the details of the replacement activity, using appropriate methods or documentation
  - ensure that you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
2. Rectify faults in **one** of the following products:
  - television receiver (analogue or digital)
  - domestic audio equipment (eg, cassette/minidisc recorder/player, CD player, tuner, amplifier, etc)
  - video/DVD recorders/players
3. Carry out **all** of the following before beginning the component replacement:
  - identify the removal procedures to be followed
  - select and obtain the correct tools for the removal procedures
  - ensure it is safe to begin removal procedures
  - carry out a visual inspection to confirm the components for removal
4. Replace the components using **one** of the following methods:
  - single connection soldering techniques
  - multi-connection soldering techniques
  - controlled temperature soldering techniques

5. Ensure **all** of the following when replacing components:
  - any safety component replaced is a direct replacement, and functions properly
  - any component replaced is fit for its intended purpose
  - the replacement component is not damaged during the fitting process
  - no other components, modules or wiring (etc) are damaged during the replacement activities
  
6. Set up the product and return it to the customer, ensuring **all** of the following:
  - any adjustments made are within the normal operating specification of the equipment
  - the product's performance meets the customer's expectations
  - any questions that the customer asks are answered in a clear and accurate way
  - the product meets all health and safety requirements
  
7. Ensure that company policy is kept with regard to **all** the following:
  - ? keeping correct records
  - ? obtaining authority to continue before working beyond agreed limits
  - ? reporting to the appropriate person any problem that you are unable to solve
  
8. When leaving the customer's property, ensure **all** of the following:
  - ? replaced components are clearly identified with customer
  - ? the customer is given the opportunity to retain replaced components that are chargeable
  - ? care has been taken not to damage the customer's property or flooring
  - ? all packaging and waste material are removed
  - ? the customer's premises are left in a clean and tidy state
  
9. Ensure that relevant health and safety legislation and regulations are complied with at all times with particular attention being given to **two** of the following:
  - correct lifting techniques
  - the safe use of soldering equipment
  - the isolation of live television chassis



## Knowledge statements:

### *You must have knowledge and understanding of:*

1. The specific safety precautions to be taken when working consumer electronic equipment
2. The safety issues relating to working on live equipment at the customer's premises
3. Customer care procedures and techniques
4. How to use workshop manuals and interpret circuit diagrams, mechanical and component drawings
5. Component replacement techniques and safety precautions (eg, de-soldering, soldering)
6. The correct soldering techniques for the work in hand
7. Appropriate component handling and disposal precautions (eg, for static sensitive components)
8. Component operating conditions and any associated hazards (eg, stored electrical or mechanical energy)
9. How to select and use the correct tools and equipment for the work in hand
10. Product specifications, and the tests needed to confirm that they are being met
11. The company documentation required for service procedures
12. Waste disposal procedures including ownership and advice to customers
13. Basic operation of the product, stage by stage
14. The need to isolate a live (TV) chassis before working on it
15. The signal requirements of the product
16. The operation and care of tools and test equipment (eg, multimeter, oscilloscope, signal generator, etc)
17. The extent of your own responsibility, and whom you should report to if you have problems that you cannot resolve

# Unit 218: Replacing Modules in Domestic Appliances

## Unit Summary

This unit identifies the competencies you need to rectify faults in domestic appliances, by replacing (ie, removing and replacing) faulty modules to bring the product or system back to full working order, in accordance with approved procedures. You will be required to ensure that any replacement parts are correct for their intended purpose, that they meet any safety requirements, and are fitted without damage.

Your responsibilities will require you to comply with organisational policy and procedures for the replacement of identified modules and the associated work to be undertaken, and to report any problems with the modules to the relevant authority. You will be expected to know when to seek guidance and instruction from others, taking full responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of the appliance together with its operation, installation procedures and relevant codes of practice, in adequate depth to provide a sound basis for carrying out servicing activities to the required standard.

You will understand the safety precautions required when carrying out the module replacement activities, especially those for isolating the equipment. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **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

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** the following during the module replacement activity:
  - carry out the replacement activities, to module level, to cause minimum disruption to the customer
  - adhere to all relevant safety standards
  - provide safe access and working arrangements for the service area
  - carry out the replacement activities using appropriate techniques and procedures
  - record the details of the replacement activity, using appropriate methods or documentation
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
2. Rectify faults in **one** of the following products:
  - home laundry (eg, washing machine, tumble drier, etc)
  - refrigeration (eg, fridge, freezer, dehumidifier, etc)
  - cooking (eg, cooker, microwave oven, etc)
  - small domestic appliances (eg, hair drier, toaster, iron, etc)
3. Carry out **all** of the following before beginning the module replacement:
  - identify the removal procedures to be followed
  - select and obtain the correct tools for the removal procedures
  - ensure it is safe to begin removal procedures
  - carry out a visual inspection to confirm the modules for removal
4. Replace the modules using **one** of the following methods:
  - removal/replacement of fasteners (crimps, screws, bolts, cable ties)
  - disconnecting/reconnecting (plugs/sockets)

5. Ensure **all** of the following when replacing modules:
  - any replacement module is in good condition and fit for its intended purpose
  - the replacement module is not damaged during the fitting process
  - no other components, modules or wiring (etc) are damaged during the replacement activities
  
6. Set up the appliance and return it to the customer, ensuring **all** of the following:
  - any adjustments made are within the normal operating specification of the appliance
  - the appliance performance meets the customer's expectations
  - any questions that the customer asks are answered in a clear and accurate way
  - the appliance meets all health and safety requirements
  
7. Ensure that company policy is kept with regard to **all** the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting to the appropriate person any problem that you are unable to solve
  
8. When leaving the customer's property, ensure **all** of the following:
  - ? replaced modules are clearly identified with customer
  - ? the customer is given the opportunity to retain replaced modules that are chargeable
  - ? care has been taken not to damage the customer's property or flooring
  - ? all packaging and waste material are removed
  - ? the customer's premises are left in a clean and tidy state
  
9. Ensure that relevant health and safety legislation and regulations are complied with at all times with particular attention being given to **one** of the following:
  - correct lifting techniques
  - water by-laws

## Knowledge statements:

### You must have knowledge and understanding of:

1. The specific safety precautions to be taken when working with domestic appliance
2. The safety issues relating to working on live equipment at the customer's premises
3. Customer care procedures and techniques
4. How to use workshop manuals and interpret circuit diagrams, mechanical and component drawings
5. Module replacement techniques and safety precautions (eg, mechanical fastenings and electrical connectors)
6. Module operating conditions and any associated hazards (eg, stored electrical or mechanical energy)
7. How to select and use the correct tools and equipment for the work in hand
8. Appliance specifications, and the tests needed to confirm that they are being met
9. The company documentation required for service procedures
10. Waste disposal procedures including ownership and advice to customers
11. The operational principles of the modules contained in the appliance (motors, pumps, water valves, heaters, processors, etc)
12. The sequence in which the appliance operates
13. The need to ensure a good, properly bonded earth for the appliance
14. The service requirements of the appliance
15. Appliance settings that can be adjusted
16. The operation and care of tools and test equipment (eg, multimeter, earth loop impedance tester, insulation resistance tester, etc)
17. Water by-laws (when appropriate)
18. The extent of your own responsibility, and whom you should report to if you have problems that you cannot resolve

# Unit 302: Developing and Maintaining Positive Working Relationships

## Unit Summary

This unit identifies the competences you need to develop and maintain positive working relationships with other people, in accordance with the requirements of your service organisation. You will be required to be positive and constructive in your dealings with others, especially when dealing with disagreements. You will be expected to keep others informed about work plans and activities which affect them, and to seek and obtain assistance from others when necessary, in a polite and courteous manner. You will respond in a timely and positive way when asked to provide help or information to others.

Your responsibilities will require you to comply with any policies of your service organisation in respect of developing and maintaining positive working relationships with other people, particularly your customers. You will be expected to work within the general policies of your service organisation, and to know when to seek guidance and instructions from others. You will be expected to work with a minimum of supervision, taking full responsibility for your own actions and for the quality and accuracy of your work.

In particular, your underpinning knowledge will provide a good understanding of developing and maintaining positive working relationships with customers, and will provide an informed approach to your appearance and behaviour, the feelings and expectations of customers and effective communications.

You will understand the safety precautions required when carrying out your duties, especially when working at heights or with heavy or powered equipment, and you will bear these things in mind when dealing with other people. You will also understand your responsibilities for health and safety in your place of work, and the importance of taking the necessary safeguards to protect yourself and others when you are working.

## Performance statements:

### **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 working activities
- e Respond in a timely and positive way when others ask for help or information

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Establish and maintain productive working relationships with **all** of the following:
  - customers
  - colleagues
  - supervisors
  - other companies
2. Respond to the individual needs of colleagues or customers, to include **three** of the following:
  - physical disabilities
  - learning difficulties
  - language differences (including dialects and accents)
  - technically aware
  - technically unaware
3. Use **all** of the following methods of communication when dealing with others:
  - face-to-face
  - telephone
  - internal company documents
  - letters
  - external company documents
4. Establish effective relationships by **all** of the following:
  - meeting your organisation's standards for appearance and behaviour
  - greeting your customers and colleagues in an appropriate way
  - communicating with your customers and colleagues in a way that makes them feel valued and respected
  - maintaining communication with your customers and colleagues to ensure that they are kept informed and reassured
  - seeking assistance from others in a polite and courteous way without causing undue disruption to normal work activities

5. Respond appropriately to customers and colleagues, under **all** of the following circumstances:
  - when they indicate that they need or want your attention
  - responding promptly and positively to questions and comments
  - keeping them informed about work plans or activities that affect them
  - treating your customers and colleagues courteously and helpfully, even when you are working under pressure
  
6. Avoid or resolve disagreements by an appropriate amicable and constructive method, including **three** of the following:
  - identifying and confirming the needs and expectations of your customers
  - checking with your customers that you have fully understood their needs and expectations
  - explaining clearly to your customers and colleagues any reasons why their needs or expectations cannot be met
  - seeking guidance and instruction from the appropriate person when necessary.
  
7. Ensure you comply with company policy at all times, particularly in regard to **all** of the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem that you are unable to solve to the appropriate person
  - confidentiality
  
8. Carry out regular checking and gauging of the feelings of customers and colleagues, through **all** of the following, and adapt your behaviour accordingly:
  - observation of behaviour
  - observation of tone
  - sensitive questioning



## **Knowledge statements:**

### ***You must have knowledge and understanding of:***

1. Your customer's rights
2. Legislation regarding health and safety, data protection, equal opportunities and regulations that affect the way that the products and services you deal with are delivered to your customers
3. Industrial, organisational and professional codes of practice and ethical standards that apply
4. Any contractual agreements that your customers have with your organisation
5. The products or services of your organisation relevant to your customer service role
6. Any organisational targets relevant to your job; your role in meeting them, and the implications for your organisation if those targets are not met
7. Formal and informal methods of communication, and how to use the most appropriate one in different situations
8. How to communicate in a clear, polite, confident way, and why this is important
9. The need for confidentiality
10. Your organisation's standards for appearance and behaviour
11. Questioning techniques relating to needs and feelings
12. Ways in which feelings are expressed
13. Techniques for responding to the needs and feelings of others
14. How to deal with problems that could have an adverse effect on relationships
15. The limits of your own authority, and when you need to seek agreement or permission from others

# Unit 303: Identifying and Costing Customer Requirements

## Unit Summary

This unit identifies the competencies you need to identify customer requirements, in accordance with approved procedures. You will be required to work with the customer to identify their needs, then to identify the products or services to meet those needs, to analyse the requirements in terms of resources, time and cost, and to reach agreement with the customer on the action to be taken to achieve the requirements.

Your responsibilities will require you to comply with organisational policy and procedures for dealing with customers and establishing their requirements. You will be expected to report any problems that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work with a minimum of supervision, and will take full responsibility for your own actions and for the quality of your work.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to interpreting customer requirements, and applying customer care procedures. You will understand the products or services being offered to the customer, and their installation and maintenance requirements. You will know about the company procedures and resources, in adequate depth to provide a sound basis for carrying out the activities to the required standard.

You will understand the safety precautions required when carrying out your duties, especially when working at heights or with heavy or powered equipment, and you will bear these things in mind when establishing customer requirements. You will also understand your responsibilities for health and safety in your place of work, and the importance of taking the necessary safeguards to protect yourself and others when you are working.

## Performance statements:

### **You must:**

- a Obtain sufficient information to understand clearly the customer's objectives
- b Ensure that the technical requirements are understood and specified
- c Determine how your organisation can respond to the requirements in terms of workload and resources
- d Record and file relevant information in accordance with organisational requirements
- e Check and obtain agreement that the requirements are interpreted correctly
- f Maintain appropriate levels of confidentiality

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Determine the customer requirements for **one** of the following:
  - for Consumer/Commercial Electronics**
    - television receiver (analogue or digital)
    - domestic audio equipment (eg, cassette/minidisc recorder/player, CD player, tuner, amplifier, etc)
    - video/DVD recorders/players
  - for Signal Reception**
    - satellite broadcast receiving system (including set top box and amplifiers if required)
    - terrestrial digital broadcast receiving system (including set top box and amplifiers if required)
    - television and radio signal distributions in commercial premises
    - television and radio signal distribution systems in multiple dwelling units
  - for Domestic Appliances**
    - home laundry (eg, washing machine, tumble drier, etc)
    - refrigeration (eg, fridge, freezer, dehumidifier, etc)
    - cooking (eg, cooker, microwave oven, etc)
    - small domestic appliances (eg, hair drier, toaster, iron, etc)
2. Determine the type of service required by the customer, from **two** of the following:
  - installation.
  - equipment service
  - maintenance
  - product purchase
3. Determine the requirements of **two** of the following types of customer (could be an individual or a company):
  - technically aware
  - technically unaware
  - having special physical or communication needs
4. Obtain all relevant information from the customer, and carry out **all** of the following:
  - relate to the product or service required
  - prioritise your activities
  - put activities into appropriate time scale
  - identify required actions or activities
  - identify the associated costs
  - identify appropriate company stocks and resources

5. Obtain customer agreement on **all** of the following:

- the product or service required
- the cost of the product or service
- the actions to be taken (by you or the company)
- the timescale for achieving the customer requirements
- how the customer can contact the company (if required)

6. Resolve any disagreements according to company policy and ensure that the customer is aware of **all** of the following:

- quality of product expected
- quality of service or installation
- overall cost of service and/or product
- responsibility for payment

7. Ensure that company policy is kept with regard to **all** of the following:

- keeping correct records of all agreements and transactions
- ensuring that all products meet the relative health and safety standards
- obtaining authority to continue before working beyond agreed limits
- reporting any problem, that you are unable to solve, to the appropriate person
- maintaining appropriate levels of confidentiality

## **Knowledge statements:**

### ***You must have knowledge and understanding of:***

1. The specific safety precautions to be taken when working with electrical or electronic equipment
2. The safety issues relating to working on live equipment at the customer's premises
3. The specification, application and cost of the product or service to be provided
4. Customer care requirements and techniques
5. The types of difficulty that can occur with customer relations, and how such situations should be dealt with
6. Relevant codes of practice
7. Company policy on the provision of services, customer care and confidentiality
8. Company reporting lines, procedures and documentation
9. The extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

### **The following specific knowledge will also be required in relation to Signal Reception**

10. The design of signal reception systems and the signal levels expected at each outlet
11. Alignment methods for both satellite and terrestrial antenna
12. The cause of signal loss in a system, (eg, cable type and length, diplexers, outlets, etc)

### **The following specific knowledge will also be required in relation to Consumer/Commercial Electronics**

13. The theory relating to the operation of the product
14. The signal requirements of the product

### **The following specific knowledge will also be required in relation to Domestic Appliance Servicing**

15. The theory relating to the operation of the product
16. The need to ensure a good, properly bonded earth for the appliance
17. The service requirements of the product
18. Water by-laws (when appropriate)

# Unit 304: Diagnosing and Analysing Faults in Signal Reception Networks

## Unit Summary

This unit identifies the competencies you need to carry out efficient and effective fault diagnosis on signal reception networks, in accordance with approved procedures. You will be required to diagnose faults on these networks using a variety of fault diagnosis methods and techniques, and to utilise a number of diagnostic aids and test equipment. From the evidence gained, you will be expected to identify the fault and to determine its probable cause. You will also be expected to identify the most appropriate action to remedy the problem.

Your responsibilities will require you to comply with organisational policy and procedures for the fault diagnostic activities undertaken, and to report any problems with these activities (or the tools and equipment used) that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying fault diagnosis procedures on signal reception networks. You will understand the various fault diagnosis methods and techniques used, and their application. You will also know how to interpret and apply information obtained from the diagnostic aids and test equipment, in adequate depth to provide a sound basis for identifying faults or conditions that are outside the required specification.

You will understand the safety precautions required when carrying out the fault diagnosis activities, especially those for working at heights. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **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 on the appropriate company document

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** of the following during the fault diagnostic activity:
  - plan the fault diagnosis, based on the available information about the fault
  - provide safe access and working arrangements for the fault finding area
  - carry out the fault diagnostic activities, to component or module level, using approved procedures
  - collect equipment fault diagnostic evidence from 'live' and isolated circuits
  - disconnect or isolate components or parts of network, when appropriate, to confirm the diagnosis
  - identify the fault and determine appropriate corrective action
  - ensure that there was not an additional reason for the fault occurring
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
2. Carry out fault diagnosis on **one** of the following types of signal reception networks:
  - non-domestic premises (eg, hotels)
  - multiple dwelling units (eg, blocks of apartments)
3. Use a range of fault diagnostic techniques, to include **two** of the following:
  - input/output technique
  - visual inspection
  - voltage, current and resistance measurement
  - half-split technique
  - function testing
  - signal analysis

4. Use a variety of diagnostic aids and sources of information, to include **four** of the following:

- manufacturers' manuals
- previous fault history
- manufacturers' technical support
- workshop manuals
- previous experience
- the reported symptoms
- customer comments
- equipment self diagnostic

5. Use the following types of test equipment to aid fault diagnosis:

- spectrum analyser

**plus one** of the following:

- multimeter/ammeter/voltmeter
- signal meter
- other specific test equipment

6. Find faults that have resulted in **two** of the following breakdown categories:

- intermittent action or network failure
- partial failure or reduced performance
- complete breakdown

7. Carry out the fault diagnosis in compliance with the health and safety legislation, regulations and requirements, including **one** of the following:

- the safe use of soldering equipment
- safe working at heights

8. Ensure that company policy is kept with regard to **all** the following:

- keeping correct records
- obtaining authority to continue before working beyond agreed limits
- reporting any problem that you are unable to solve to the appropriate person



## Knowledge statements:

### *You must have knowledge and understanding of:*

1. The specific safety precautions to be taken when working with signal reception equipment and networks
2. The safety issues relating to working on live equipment at the customer's premises
3. The codes of practice that apply to the type of equipment or system being diagnosed
4. Customer care procedures and techniques
5. The correct soldering techniques for the work in hand
6. The risk of faults reoccurring, and how to minimise this
7. The use of workshop manuals and other appropriate sources of information
8. Hazards associated with carrying out fault diagnosis on electrical equipment (live electrical components, stored energy, misuse of tools), and how they can be minimised
9. The procedure to be adopted to establish the background of the fault
10. How to evaluate the various types of information available for fault diagnosis
11. How to use the various aids, reports and sources of information available for fault diagnosis
12. How to use various items of fault diagnostic equipment to investigate the problem
13. The various fault finding techniques that can be used, and how they are applied (such as input-to-output, visual inspection, voltage, current and resistance measurement, half split, function testing and signal analysis)
14. How to analyse evidence and evaluate possible characteristics and causes of specific faults/problems
15. How to relate previous reports/records of similar fault conditions
16. How to calibrate electrical test instruments and check that they are free from damage and defects
17. How to obtain and interpret drawings, circuit and physical layouts, charts, specifications, manufacturers' manuals, history/maintenance reports and other documents needed in the service process
18. The basic principles of how the network functions, the purpose of individual units/components and how they interact
19. How to prepare a report or take follow-up action which satisfies the company policy on concluding fault diagnosis
20. The design of signal reception systems and the signal levels expected at each outlet
21. Alignment methods for both satellite and terrestrial antenna
22. The causes of signal loss in a system (eg, cable type and length, diplexers, outlets, etc)
23. The operation and care of test equipment (eg, spectrum analyser, signal level meter, etc)
24. The extent of your own authority and whom you should report to if you have problems that you cannot resolve

# Unit 305: Rectifying Faults in Signal Reception Networks

## Unit Summary

This unit identifies the competencies you need to carry out efficient and effective rectification of faults on signal reception networks, in accordance with approved procedures. You will be expected to replace (ie, remove and replace) faulty components or modules, and/or to make adjustments to bring the network back to full working order. You will be required to ensure that any replacement parts are correct for their intended purpose, that they meet any safety standards, and are fitted without damage.

Your responsibilities will require you to comply with organisational policy and procedures for the replacement of identified components or modules and the associated work to be undertaken, and to report any problems with the components or modules to the relevant authority. You will be expected to work with a minimum of supervision, taking full responsibility for your own actions and for the quality and accuracy of the work that you produce.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying component or module replacement procedures. You will understand the function and operating principles of the components or modules being replaced and the techniques and procedures for replacing and/or adjusting them in sufficient depth to provide a sound basis for carrying out the replacement activities to the required standard.

You will understand the safety precautions required when carrying out the component replacement activities. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **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 equipment, appliance or system to ensure it 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

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** of the following during the replacement activity:
  - plan the replacement activities to cause minimum disruption to the customer
  - provide safe access and working arrangements for the work area
  - carry out the replacement activities, to component or module level, using appropriate techniques and procedures
  - record the details of the work according to company policy
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
2. Rectify faults in **one** of the following networks:
  - non-domestic premises (eg, hotels)
  - multiple dwelling units (eg, blocks of apartments)
3. Carry out **all** of the following before beginning the component or module replacement:
  - identify the removal procedures to be followed
  - select and obtain the correct tools for the removal procedures
  - ensure it is safe to begin removal procedures
  - carry out a visual inspection to confirm the components or modules for removal
4. Replace **three** of the following types of component to the network:
  - electrical (eg, power connections, earth bonding, signal feeds or connections etc)
  - electronic (eg, receiver, amplifier, multiswitch, tap, splitter etc)
  - mechanical (eg, dish antenna assembly, support brackets etc)
  - safety (eg, fuse, earth bonding connections, isolated outlets etc)

5. Replace the components or modules using **two** of the following methods:
  - single connection soldering techniques
  - mechanical assembly
  - removal/replacement of fasteners (crimps, screws, bolts, cable ties)
  - disconnecting/reconnecting (plugs/sockets)
6. Ensure **all** of the following when replacing components or modules:
  - any safety component or module replaced is an direct replacement and functions correctly
  - any component or module replaced is fit for its intended purpose
  - the replacement component or module is not damaged during the fitting process
  - no other components, modules or wiring (etc) are damaged during the replacement activities
7. Set up the product or system and return it to the customer, ensuring that **all** of the following:
  - any adjustments made are within the normal operating specification of the network
  - the network's performance meets the customer's expectations
  - any questions that the customer asks are answered in a clear and accurate way
  - the customer is made familiar with the operation of the network
  - the network meets all health and safety requirements
8. Ensure that company policy is kept with regard to **all** the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem that you are unable to solve to the appropriate person
  - removing all packaging and waste material
  - leaving the customer's premises in a clean and tidy state
  - clearly identifying replaced components with the customer
  - giving the customer the opportunity to retain replaced components that are chargeable
9. Ensure that relevant health and safety legislation and regulations are complied with at all times, with particular attention being given to **one** of the following:
  - correct lifting techniques
  - the safe use of soldering equipment
  - safe working at heights

## Knowledge statements:

### *You must have knowledge and understanding of:*

1. The specific safety precautions to be taken when working with signal reception networks
2. The specific safety precautions when working with components and substances (eg, solder, heatsink paste)
3. How to identify and use the appropriate codes of practice
4. Customer care procedures and techniques
5. How to interpret equipment circuit diagrams, mechanical and component drawings
6. Component or module replacement techniques and safety precautions (eg, desoldering, mechanical fastenings and electrical connectors)
7. The correct soldering techniques for the work in hand
8. Appropriate component handling and disposal precautions (eg, static sensitive components)
9. Identification of component defects (eg, visible changes/damage)
10. Component or assembly operating conditions, and any associated hazards (eg, stored electrical or mechanical energy)
11. How to select and use the correct tools and equipment for the work in hand
12. Tool and equipment care and control procedures (company-specific, HASAWA regulations)
13. Product or system specifications, and the tests needed to confirm that they are being met
14. Company documentation required for service procedures
15. Waste disposal procedures, including ownership and advice to customers
16. The design of signal reception networks, and the signal levels expected at each outlet
17. Alignment methods for both satellite and terrestrial antenna
18. The causes of signal loss in a system (eg, cable type and length, diplexers, outlets, etc)
19. The operation and care of test equipment (eg, spectrum analyser, signal level meter, etc)
20. The extent of your own responsibility, and whom you should report to if you have problems that you cannot resolve

# Unit 306: Installing Distribution Networks in Premises

## Unit Summary

This unit identifies the competencies you need to install signal reception and distribution equipment (terrestrial antenna, satellite dish antenna, splitters, outlets, cabling, etc). You will be required to observe the manufacturer's installation instructions and use the appropriate test equipment.

Your responsibilities will require you to comply with, and work within, the policies and procedures of your organisation, and to report any problems to an appropriate person. You will know when to seek guidance and instructions from others, although you will be expected to work with a minimum of supervision, taking full responsibility for your own actions and for the accuracy of your work.

Your underpinning knowledge will provide a good understanding of the products being installed, and their operation. It will include installation techniques and best practices, performance specifications for systems and their component parts and the correct and safe use of tools and test equipment. You will also understand the requirements of the customer, and will have a good understanding of the health and safety guidelines and relevant codes of practice that apply. Your underpinning knowledge will be of adequate depth to provide a sound basis for carrying out installation procedures to the required standard.

You will understand the safety precautions required when carrying out the installation, especially when working at heights or with heavy or powered equipment. You will also understand your responsibilities for health and safety in your place of work, and the importance of taking the necessary safeguards to protect yourself and others when you are working.

## Performance statements:

### **You must:**

- a Work safely at all times, complying with health and safety and other relevant regulations and guidelines
- b Follow all relevant drawings and specifications for the installation being carried out
- c Use the correct tools and equipment for the installation operations and check that they are in a safe and usable condition
- d Install, position and secure the equipment and components in accordance with the specification
- e Ensure that all necessary connections to the equipment are complete
- f Deal promptly and effectively with problems within your control and report those that cannot be solved
- g Check that the installation is complete, correctly adjusted and that all component parts are free from damage

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** the following checks before installing the distribution network:
  - confirm with the customer that the system is what they ordered and are expecting
  - check that all the component parts are present and correct
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition and are used only for their intended purpose
  - ensure that the necessary electrical services are available
  - make sure that the area is safe and ready for the installation
  - ensure that the installation is to be carried out at the correct address
  - ensure that a suitable signal is available
  - confirm the location of the receiving equipment with the customer
  - confirm the positions of the antenna, the cable run and the outlets with the customer
  - ensure that planning permission has been obtained (or is not required)
  - ensure that the structure, or ground, is sound and suitable for the antenna mounting
2. Install (either individually or as leader of a team) television and/or radio signal distribution network in **one** of the following locations:
  - non-domestic premises (eg, hotels)
  - multiple dwelling units (eg, blocks of apartments)
3. Incorporate **two** the following signal sources:
  - satellite broadcasts
  - terrestrial digital broadcasts
  - cable sources
  - telephone lines
  - customer's own sources (eg, tape, graphics, etc)

4. Carry out the installation of the distribution network, ensuring **all** of the following:
  - no damage occurs to the equipment or to the customer's property.
  - the antenna (if one is being installed) is securely mounted and correctly aligned
  - all connections are correctly made and terminated
  - the correct signal levels are available at every stage and every outlet
  - the installation is carried out in accordance with the manufacturer's specification and the relevant code of practice
  - the installation meets all health and safety requirements
  - the system is working to the manufacturer's specification and the customer's satisfaction
  
5. Use **all** the following equipment and aids, as appropriate, in the installation and commissioning:
  - multimeter.
  - signal meter
  - spectrum analyser
  - installation manuals
  - design specifications
  
6. Ensure that company policy is kept with regard to **all** the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem that you are unable to solve to the appropriate person
  - removing all packaging and waste material
  - leaving the work site in a clean and tidy state
  
7. Ensure that relevant health and safety legislation and regulations are complied with at all times, with particular attention being given to **two** of the following:
  - correct lifting techniques
  - the safe use of soldering equipment
  - safe working at heights
  - the handling and fitting of large brackets
  - procedures when cabling over roofs



## **Knowledge statements:**

### ***You must have knowledge and understanding of:***

1. The specific safety precautions to be taken when working with signal reception equipment (including relevant codes of practice)
2. Customer care requirements
3. Installation site requirements (eg, structural, services and ventilation)
4. The importance of correct location of distribution equipment
5. The correct operation and use of the spectrum analyser
6. The design of a distribution network to give the correct signal levels relevant to each stage of the network
7. The design, operation and calibration of frequency conversion equipment
8. The causes of signal loss in a network distribution system (eg, cable type and length, splitters, outlets, etc)
9. Installation and alignment methods for both satellite and terrestrial antenna
10. The manufacturers' installation instructions and specifications for the equipment or system
11. The operation and use of network distribution components (eg, amplifiers, splitters, outlets, etc)
12. The correct method of installing the equipment or system, and for making the necessary connections
13. Tests to be carried out to ensure that the distribution network is working correctly
14. The operation and care of test equipment and tools (eg, spectrum analyser, signal level meter, etc)
15. Installation techniques and best practice
16. Waste disposal procedures
17. The extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

# Unit 307: Familiarising Customers with the Use of Distribution Networks

## Unit Summary

This unit identifies the competencies you need to hand over, and to familiarise the customer, or an appropriate member of the customer's staff, with the use and operation of a signal distribution network or system.

Your responsibilities will require you to comply with, and work within, the policies and procedures of your organisation, and to report any problems to an appropriate person. You will know when to seek guidance and instructions from others, although you will be expected to work with a minimum of supervision, taking full responsibility for your own actions and for the accuracy of your work.

Your underpinning knowledge will provide a good understanding of the distribution system and its operation. This will be of adequate depth to provide a sound basis for carrying out the handover and familiarisation procedures to the required standard. You will understand the needs of the customer, both for the system installed and for suitable guidance in its use. You will be able to assess the understanding level of the customer, and to communicate the necessary information in the appropriate manner.

You will understand your responsibilities for health and safety in your place of work, and the importance of taking the necessary safeguards to protect yourself and others when you are working. You will be expected to emphasise any health and safety aspects that the customer needs to know about, both for their own protection and for the safe operation of the equipment. You will also be expected to demonstrate to the customer how to isolate the equipment in the case of failure or emergency, and to ensure that the customer has appropriate contact details should they need further advice or help.

## Performance statements:

### **You must:**

- a Work safely at all times, complying with health and safety and other relevant regulations and guidelines
- b Confirm that everyone involved accepts the product or asset is in a satisfactory condition for handover to take place
- c Clearly identify any unusual features of the condition of the product or asset
- d Make the handover and obtain agreement between everyone involved on the precise moment of transfer of responsibility
- e Make sure that clear, accurate and complete records of the handover are made

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Hand over, and familiarise the customer with the use of, television and/or radio signal distribution network **one** of the following locations:
  - non-domestic premises (eg, hotels)
  - multiple dwelling units (eg, blocks of apartments)
2. Confirm with the customer **all** of the following about the distribution network:
  - it is the correct one or that it is suitable for the purpose
  - it is working to its given specifications
  - it meets the customer's expectations
  - it meets all required safety standards
3. Explain and demonstrate the operation of the product to the customer, including **all** of the following:
  - general operation
  - use and effect of controls panels
  - any specific features
  - any warning systems
4. Encourage the customer to operate the system and to ask questions, ensuring **all** of the following:
  - the customer is able to operate the system
  - the customer is aware of any safety requirements
  - questions are answered clearly and accurately
  - the customer knows who to contact in the event of network failure
5. Ensure that company policy is kept with regard to **all** of the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem that you are unable to solve to the appropriate person
6. When leaving the customer's premises, ensure **all** of the following:
  - the customer has all the appropriate documentation for the network
  - all packaging and waste material are removed
  - the work site is left in a clean and tidy state

## **Knowledge statements:**

### ***You must have knowledge and understanding of:***

1. Any specific safety precautions to be taken when using the distribution network, and how to ensure that the customer understands these
2. Customer relations methods and procedures
3. How to gauge the level of technical understanding of the customer
4. How to present the information to the customer so as to maximise his/her understanding of the network
5. Company policy regarding the handover and demonstration of a distribution network
6. Company recording and documentation procedures
7. The outline specifications for the network (ie, what it will, and will not, do)
8. The system's operation, controls, settings and adjustments
9. How the system interfaces to existing customer equipment (eg, video recorder)
10. How to encourage and guide the customer to operate the system for themselves
11. Who the customer can contact regarding any subsequent queries or problems
12. The warranty period(s) and conditions that apply to the overall network or its component parts
13. The extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

# Unit 308: Establishing Compliance with Distribution Network Specifications

## Unit Summary

This unit identifies the competencies you need to test the compliance of a signal distribution system against its specification, in accordance with approved procedures. You will be required to ensure that the correct signal, at the correct level, is present at the points given in the system specification.

Your responsibilities will require you to comply with organisational policy and procedures for these activities, and to report any problems to the relevant authority. You will be expected to work with a minimum of supervision, taking full responsibility for your own actions and for the quality and accuracy of your work.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying the test procedures. You will understand the distribution system, and its application, and will know about the equipment that is used, in adequate depth to provide a sound basis for carrying out the activities to the required standard.

You will understand the safety precautions required when carrying out the compliance testing activities, especially where these involve working at heights, or with heavy or live equipment. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **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 useable 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

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** the following activities during the compliance testing activity:
  - plan the testing activities to minimise disruption to the customer
  - adhere to all relevant safety standards
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
  - carry out the test activities using appropriate techniques and procedures
  - record the details of the compliance testing activity, using appropriate company documentation
  - dispose of waste items in a safe and environmentally acceptable manner, and leave the work area in a safe condition
2. Carry out compliance testing, against the specification, for **one** of the following networks:
  - television and radio signal distributions in commercial/non-domestic premises (eg, hotels)
  - television and radio signal distribution systems in multiple-dwelling units (eg, blocks of apartments)
3. Cover **two** of the following signal sources when carrying out compliance testing on distribution networks:
  - satellite broadcasts
  - terrestrial broadcasts
  - cable sources
  - telephone lines
  - customer's own material (eg, tape, graphics, etc)
4. Use the appropriate equipment or aids when testing the network, to include:
  - a spectrum analyser
  - **plus** two of the following:
    - multimeter
    - signal strength meter
    - system specification
    - installation manual(s)

5. Check signals and levels at all specified signal points and outlets, for compliance against the specification of **all** of the following, and report any variations to the appropriate person:
  - the range of signals present
  - the level of each signal
  - *the correct supply voltage (if required)*
6. Check the network for compliance with the appropriate code of practice, for **all** of the following:
  - safety
  - installation practice
  - component parts used
7. Ensure that company policy is kept with regard to **all** of the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem, that you are unable to solve, to the appropriate person
8. Return the network to the customer, ensuring **all** of the following:
  - the network's performance meets the specification
  - the network's performance meets the customer's expectations
  - the network meets all health and safety requirements

## **Knowledge statements:**

### ***You must have knowledge and understanding of:***

1. The specific safety precautions to be taken when working with signal reception and distribution equipment
2. The relevant codes of practice and guidelines for distribution networks
3. How to interpret and make best use of workshop and other manuals
4. The company specifications for installed signal distribution networks
5. The relevant compliance checking methods and techniques
6. The adjustments that can be made to the network to ensure compliance with the specifications
7. The acceptable limits of tolerance or deviation from the specification
8. How to bring the network into compliance, and what to do if this cannot be achieved
9. The company compliance reporting and quality control methods and documentation
10. The design of distribution networks and the signal levels expected at each outlet
11. Alignment methods for both satellite and terrestrial antenna
12. The causes of signal loss in a system (eg, cable type and length, diplexers, outlets, etc)
13. The operation and care of test equipment (eg, spectrum analyser, signal level meter, etc)
14. The extent of your own responsibility and whom you should report to if you have problems that you cannot resolve



# Unit 309: Identifying and Recommending Improvements to Your Organisation's Products and Services

## Unit Summary

This unit identifies the competencies you need to identify and recommend improvements to your organisation's products and services, in accordance with approved procedures. You will be required to monitor and assess customer requirements and complaints, to compare your organisation's activities with those of its competitors, to identify areas of possible improvement within your organisation, and to make realistic recommendations for the implementation of those improvements.

Your responsibilities will require you to comply with organisational policy and procedures for the monitoring and assessment of organisational activities, and to report any problems with the monitoring or assessment to the relevant person. You will be expected to work with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying monitoring and assessment procedures. You will understand the importance of customer care, and will know about your organisation's products, services and activities, in adequate depth to provide a sound basis for carrying out the duties.

You will be aware of any safety precautions required when carrying out the monitoring and assessment activities, and will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **You must:**

- a. Monitor the impact and effectiveness of the organisation's activities
- b. Ensure that regular contact with customers is maintained, and that their requirements are assessed for use in improving the organisation's activities
- c. Review information on the products and services provided by other companies or competitors
- d. Identify and assess activities within the organisation that could be improved
- e. Make realistic recommendations for improvements to the organisation's activities to the appropriate people

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** the following during the monitoring and assessment activity:
  - plan the monitoring activities to minimise disruption to normal working
  - adhere to any relevant safety standards
  - carry out the monitoring and assessment activities using appropriate techniques and procedures
  - record the results of your assessment, and your recommendations for improvement, using appropriate methods or documentation
  - make your recommendations for improvement to the appropriate people
2. Monitor the impact and effectiveness of the organisation's activities on **all** of the following:
  - cost effectiveness
  - response time
  - growth
  - complaints
  - staff turnover
  - profits
3. Maintain regular contact with customers, and identify their needs, from **three** of the following:
  - verbal comments
  - job card comments
  - questionnaires
  - complaints
  - follow-up telephone calls
4. Review information on products and services provided by other companies, from **two** from the following:
  - advertisement
  - verbal comments
  - customer comments
  - 'mystery' shoppers
  - local newspapers

5. Identify potential improvements in **two** of the following areas of your organisation:

- purchasing from suppliers
- servicing activities
- sales activities and techniques
- financial policy and control
- human resources/personnel
- advertising and marketing
- customer care
- staff development
- product or service developments

6. Ensure your recommendations for improvements are **all** of the following, before passing them on to the appropriate people:

- realistic
- applicable to the organisation's activities
- sufficiently detailed to assist in the decision making process
- in a suitable format

7. Ensure that company policy is kept with regard to **all** the following

- health and safety regulations
- keeping correct records
- obtaining authority to continue before working beyond agreed limits
- reporting any problems to the appropriate person

## **Knowledge statements:**

### ***You must have knowledge and understanding of:***

1. The specific safety precautions to be taken when working with electrical and electronic equipment
2. The organisation's products, their specifications and operation
3. The organisation's services and activities
4. Information sources, and how to access them
5. The use of performance indicators
6. Monitoring and assessment methods
7. How to interpret specifications for products and systems
8. How to identify and evaluate potential improvements
9. Customer care procedures and techniques
10. Lines of communication within the organisation and outside the organisation
11. Who needs to be made aware of your recommendations
12. How to write reports and make presentations
13. The extent of your own responsibility and whom you should report to if you have problems that you cannot resolve

### **The following specific knowledge will also be required in relation to Signal Reception**

14. The design of signal reception systems
15. The causes of signal loss in a system (eg, cable type and length, diplexers, outlets, etc)
16. Product specifications and applications

### **The following specific knowledge will also be required in relation to Consumer/Commercial Electronics**

17. The theory relating to the operation of the various products
18. The signal requirements of the various products

### **The following specific knowledge will also be required in relation to Domestic Appliance Servicing**

19. The theory relating to the operation of the various products
20. The service requirements of the various products
21. Water by-laws, etc (which may have a bearing on any recommended improvements)

# Unit 310: Contributing to the Development of Colleagues and Yourself

## Unit Summary

This unit identifies the competencies you need to contribute to the development of colleagues and yourself, in accordance with approved procedures. You will be required to carry out assessments, identify training needs, produce development plans with personal objectives, arrange suitable training, review training outcomes, provide positive feedback to colleagues, and encourage feedback from others.

Your responsibilities will require you to comply with organisational policy and procedures for these activities, and to report any problems to the relevant authority. You will be expected to work with a minimum of supervision, taking full responsibility for your own actions and for the quality and accuracy of your work.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying appraisal and training. You will understand the mentoring process, and its application, and will know about the company's products and services, in adequate depth to provide a sound basis for carrying out your activities to the required standard.

You will understand your responsibilities for safety, and the importance of applying safe working practices and taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

*You must:*

- a Assess your current competence and areas for development using relevant techniques and processes
- b Identify development objectives that are realistic and achievable
- c Review your performance and progress regularly and use the outcome to plan future development activities
- d Seek constructive feedback and advice from others and use it to help you maintain and improve your performance
- e Agree with line management about the time and other resources needed to help achieve the development objectives

## Scope of the unit:

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

**You must:**

1. Assess current competencies for **both** of the following:
  - yourself
  - colleagues
2. Assess strengths and weaknesses of yourself and colleagues against the job specification, using **three** of the following:
  - normal work activities
  - simulation
  - work records
  - customer comments
  - appraisal
3. Produce a development plan that is realistic and achievable, to include **all** of the following:
  - personal objectives
  - proposed training
  - relative experience required
  - special assignments
  - agreement with the appropriate people
4. Seek advice on available training from **two** of the following:
  - management
  - colleagues
  - colleges
  - training providers
  - manufacturers

5. Obtain training provision to meet objective needs (including health and safety requirements), from **three** of the following sources:

- mentoring
- internal courses
- external courses
- distance learning
- demonstrations
- coaching
- development activities

6. Identify the resources needed to carry out the development plan, and gain approval for their use, to include three of the following:

- the cost of external training.
- replacement staff costs and availability during the provision of training
- mentoring costs
- travelling costs to external courses
- material and equipment costs for internal courses
- tutor costs for internal courses

7. Carry out regular reviews, and ensure that you do **all** of the following:

- consider the achievements to date
- assess the advantages of any training received
- reassess current strengths and weaknesses
- consider any changes to the personal objectives
- consider any changes to the training programme
- reach agreement on future progress

8. Obtain constructive feedback and advice from **two** of the following:

- colleagues
- superiors
- tutors
- mentors

9. Ensure that company policy is kept with regard to **all** of the following:

- keeping correct records
- obtaining authority to continue before working beyond agreed limits
- reporting any problem that you are unable to solve to the appropriate person
- confidentiality

## **Knowledge statements:**

### ***You must have knowledge and understanding of:***

1. The specific safety precautions that apply to the company products and services
2. Customer care procedures and techniques
3. How to identify and take advantage of training and development opportunities
4. Self assessment models and techniques
5. How to provide positive feedback, and how to obtain feedback from others
6. Demonstration and presentation techniques
7. The need for confidentiality
8. How to identify appropriate sources of information and how to obtain relevant information from them
9. The company procedures for obtaining resources
10. Development objective setting
11. Working relationships, and how to maintain them
12. The company reporting lines and procedures
13. The company products and services
14. The company installation methods and procedures
15. Company service/maintenance methods and procedures
16. The extent of your own responsibility and whom you should report to if you have problems that you cannot resolve



# Unit 311: Diagnosing and Analysing Faults in Consumer/Commercial Electronic Equipment

## Unit Summary

This unit identifies the competencies you need to carry out efficient and effective fault diagnosis on consumer electronic equipment, in accordance with approved procedures. You will be required to diagnose faults on equipment using a variety of fault diagnosis methods and techniques, and to utilise a number of diagnostic aids and test equipment. From the evidence gained, you will be expected to identify the fault and to determine its probable cause. You will also be expected to identify the most appropriate action to remedy the problem.

Your responsibilities will require you to comply with organisational policy and procedures for the fault diagnostic activities undertaken, and to report any problems with these activities (or the tools and equipment used) that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying fault diagnosis procedures on electronic equipment. You will understand the various fault diagnosis methods and techniques used, and their application. You will also know how to interpret and apply information obtained from the diagnostic aids and test equipment, in adequate depth to provide a sound basis for identifying faults or conditions that are outside the required specification.

You will understand the safety precautions required when carrying out the fault diagnosis activities, especially those for isolating a live TV chassis. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **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

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** of the following during the fault diagnostic activity:
  - plan the fault diagnosis, based on the available information about the fault
  - provide safe access and working arrangements for the fault finding area
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
  - carry out the fault diagnostic activities, to component level, using approved procedures
  - collect equipment fault diagnostic evidence from 'live' and isolated circuits
  - disconnect or isolate components or parts of circuits, when appropriate, to confirm the diagnosis
  - identify the fault and determine appropriate corrective action
  - ensure that there was not an additional reason for the fault occurring
2. Carry out fault diagnosis on **one** of the following types of equipment or systems:
  - television receiver (analogue or digital)
  - domestic audio equipment (eg, cassette/minidisc recorder/player, CD player, tuner, amplifier, etc)
  - video/DVD recorders/players
3. Use a range of fault diagnostic techniques, to include **three** of the following:
  - input/output technique
  - visual inspection
  - voltage, current and resistance measurement
  - half-split technique
  - function testing
  - waveform observation

4. Use a variety of diagnostic aids and sources of information, to include **four** of the following:
  - manufacturers' manuals
  - previous fault history
  - manufacturers' technical support
  - workshop manuals
  - previous experience
  - the reported symptoms
  - customer comments
  
5. Use **three** of the following types of test equipment to aid fault diagnosis:
  - multimeter/ammeter/voltmeter
  - signal/function/pattern generator
  - oscilloscope
  - isolation transformer
  - other specific test equipment
  
6. Find faults that have resulted in **two** of the following breakdown categories:
  - intermittent action or circuit failure
  - partial failure or reduced performance
  - complete breakdown
  
7. Carry out the fault diagnosis in compliance with the health and safety legislation, regulations and requirements, including **one** of the following:
  - the safe use of soldering equipment
  - the isolation of live television chassis
  
8. Ensure that company policy is kept with regard to **all** the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem that you are unable to solve to the appropriate person

## Knowledge statements:

### *You must have knowledge and understanding of:*

1. The specific safety precautions to be taken when working with electronic equipment
2. The safety issues relating to working on live equipment at the customer's premises
3. The codes of practice that apply to the type of equipment or system being diagnosed
4. Customer care procedures and techniques
5. The correct soldering techniques for the work in hand
6. The risk of faults reoccurring, and how to minimise this
7. The use of workshop manuals and other appropriate sources of information
8. Hazards associated with carrying out fault diagnosis on electrical equipment (live electrical components, stored energy, misuse of tools), and how they can be minimised
9. The procedure to be adopted to establish the background of the fault
10. How to evaluate the various types of information available for fault diagnosis
11. How to use the various aids, reports and sources of information available for fault diagnosis
12. How to use various items of fault diagnostic equipment to investigate the problem
13. The various fault finding techniques that can be used, and how they are applied (such as input-to-output, visual inspection, voltage, current and resistance measurement, half split technique, function testing and wave form observation)
14. How to analyse evidence and evaluate possible characteristics and causes of specific faults/problems
15. How to relate previous reports/records of similar fault conditions
16. How to calibrate electrical test instruments and check that they are free from damage and defects
17. How to obtain and interpret drawings, circuit and physical layouts, charts, specifications, manufacturers' manuals, history/maintenance reports and other documents needed in the service process
18. The basic principles of how the circuit functions, the operating sequence, the purpose of individual units/components and how they interact
19. How to prepare a report or take follow-up action which satisfies the company policy on concluding fault diagnosis
20. The theory relating to the operation of the product, stage by stage
21. The need to isolate a live (TV) chassis before working on it
22. The signal requirements of the product
23. The operation and care of test equipment (eg, multimeter, oscilloscope, function generator, etc)
24. The extent of your own authority and whom you should report to if you have problems that you cannot resolve

# Unit 312: Diagnosing and Analysing Faults in Domestic Appliance Equipment

## Unit Summary

This unit identifies the competencies you need to carry out efficient and effective fault diagnosis on domestic appliances in accordance with approved procedures. You will be required to diagnose faults on appliances using a variety of fault diagnosis methods and techniques, and to utilise a number of diagnostic aids and test equipment. From the evidence gained, you will be expected to identify the fault and to determine its probable cause. You will also be expected to identify the most appropriate action to remedy the problem.

Your responsibilities will require you to comply with organisational policy and procedures for the fault diagnostic activities undertaken, and to report any problems with these activities (or the tools and equipment used) that you cannot personally resolve, or are outside your permitted authority, to the relevant people. You will be expected to work with a minimum of supervision, taking personal responsibility for your own actions and for the quality and accuracy of the work that you carry out.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying fault diagnosis procedures on electrical/electronic equipment. You will understand the various fault diagnosis methods and techniques used, and their application. You will also know how to interpret and apply information obtained from the diagnostic aids and test equipment, in adequate depth to provide a sound basis for identifying faults or conditions that are outside the required specification.

You will understand the safety precautions required when carrying out the fault diagnosis activities, especially those for correct earthing requirements. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **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

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** of the following during the fault diagnostic activity:
  - plan the fault diagnosis, based on the available information about the fault
  - provide safe access and working arrangements for the fault finding area
  - carry out the fault diagnostic activities, to component level, using approved procedures
  - collect equipment fault diagnostic evidence from 'live' and isolated circuits
  - disconnect or isolate components or parts of circuits, when appropriate, to confirm the diagnosis
  - identify the fault and determine appropriate corrective action
  - ensure that there was not an additional reason for the fault occurring
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
2. Carry out fault diagnosis on **two** of the following types of appliance:
  - home laundry (eg, washing machine, tumble drier, etc)
  - refrigeration (eg, fridge, freezer, dehumidifier, etc)
  - cooking (eg, cooker, microwave oven, etc)
  - small domestic appliances (eg, hair drier, toaster, iron, etc)
3. Use a range of fault diagnostic techniques, to include **all** of the following:
  - visual inspection
  - voltage, current and resistance measurement
  - function testing

4. Use a variety of diagnostic aids and sources of information, to include **four** of the following:
  - manufacturers' manuals
  - previous fault history
  - manufacturers' technical support
  - workshop manuals
  - previous experience
  - the reported symptoms
  - customer comments
  - equipment self diagnostic
  
5. Use **three** of the following types of test equipment to aid fault diagnosis:
  - multimeter/ammeter/voltmeter
  - insulation resistance tester
  - earth-loop impedance tester
  - portable appliance tester
  - other specific test equipment
  
6. Find faults that have resulted in **two** of the following breakdown categories:
  - intermittent action or appliance failure
  - partial failure or reduced performance
  - complete breakdown
  
7. Carry out the fault diagnosis in compliance with the health and safety legislation, regulations and requirements, including **one** of the following:
  - the safe use of soldering equipment when working on controller/timers
  - water by-laws
  - correct lifting techniques
  - avoidance of residual heat
  
8. Ensure that company policy is kept with regard to **all** the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem that you are unable to solve to the appropriate person

## Knowledge statements:

### *You must have knowledge and understanding of:*

1. The specific safety precautions to be taken when working with electrical equipment
2. The safety issues relating to working on live equipment at the customer's premises
3. The codes of practice that apply to the type of equipment or system being diagnosed
4. Customer care procedures and techniques
5. The correct soldering techniques for the work in hand
6. The risk of faults reoccurring, and how to minimise this
7. The use of workshop manuals and other appropriate sources of information
8. Hazards associated with carrying out fault diagnosis on domestic equipment (live electrical components, stored energy, misuse of tools, water leaks, rotating parts, etc), and how they can be minimised
9. The procedure to be adopted to establish the background of the fault
10. How to evaluate the various types of information available for fault diagnosis
11. How to use the various aids, reports and sources of information available for fault diagnosis
12. How to use various items of fault diagnostic equipment to investigate the problem
13. The various fault finding techniques that can be used, and how they are applied (visual inspection, voltage, current and resistance measurement, function testing)
14. How to analyse evidence and evaluate possible characteristics and causes of specific faults/problems
15. How to relate previous reports/records of similar fault conditions
16. How to calibrate electrical test instruments and check that they are free from damage and defects
17. How to obtain and interpret drawings, circuit and physical layouts, charts, specifications, manufacturers' manuals, history/maintenance reports, graphical electrical symbols, IEE wiring regulations, and other documents needed in the service process
18. The basic principles of how the appliance functions, the operating sequence, the purpose of individual units/components and how they interact
19. How to prepare a report or take follow-up action which satisfies the company policy on concluding fault diagnosis
20. The need to ensure a good, properly bonded earth for the appliance
21. The service requirements of the product
22. The operation and care of test equipment (eg, multimeter, earth loop impedance tester, insulation resistance tester, etc)
23. Water by-laws (when appropriate)
24. The extent of your own authority and whom you should report to if you have problems that you cannot resolve



# Unit 313: Rectifying Faults in Consumer/Commercial Electronic Equipment

## Unit Summary

This unit identifies the competencies you need to carry out efficient and effective rectification of faults on consumer electronic equipment, by replacing (ie, removing and replacing) faulty components and/or by making adjustments to bring the product back to full working order, in accordance with approved procedures. You will be required to ensure that any replacement parts are correct for their intended purpose, that they meet any safety standards, and are fitted without damage.

Your responsibilities will require you to comply with organisational policy and procedures for the replacement of identified components and the associated work to be undertaken, and to report any problems with the components to the relevant authority. You will be expected to work with a minimum of supervision, taking full responsibility for your own actions and for the quality and accuracy of the work that you produce.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying component replacement procedures. You will understand the function and operating principles of the components being replaced and the techniques and procedures for replacing and/or adjusting them in sufficient depth to provide a sound basis for carrying out the replacement activities to the required standard.

You will understand the safety precautions required when carrying out the component replacement activities. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **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 equipment, appliance or system to ensure it 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

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** of the following during the replacement activity:
  - plan the component replacement activities to cause minimum disruption to the customer
  - provide safe access and working arrangements for the work area
  - carry out the component replacement activities using appropriate techniques and procedures
  - record the details of the work according to company policy
  - ensure that no damage takes place to the customers property or flooring.
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
2. Rectify faults in **one** of the following products:
  - television receiver (analogue or digital)
  - domestic audio equipment (eg, cassette/minidisc recorder/player, CD player, tuner, amplifier, etc)
  - video/DVD recorders/players
3. Carry out **all** of the following before beginning the component or module replacement:
  - identify the removal procedures to be followed
  - select and obtain the correct tools for the removal procedures
  - ensure it is safe to begin removal procedures
  - carry out a visual inspection to confirm the components or modules for removal
4. Replace **three** of the following types of component:
  - electrical (eg, transformer, etc)
  - electronic (eg, resistor, capacitor, transistor, integrated circuit, etc)
  - mechanical (eg, cosmetic parts, etc)
  - safety (eg, thermal fuse, safety resistor, cut-out, integrated circuit protector, etc)

5. Replace the components or modules using **two** of the following methods:
  - single connection soldering techniques
  - multi-connection soldering techniques
  - controlled temperature soldering techniques
  
6. Ensure **all** of the following when replacing components or modules:
  - any safety component replaced is an direct replacement and functions correctly
  - any component replaced is fit for its intended purpose
  - the replacement component is not damaged during the fitting process
  - no other components, modules or wiring (etc) are damaged during the replacement activities
  
7. Set up the product or system and return it to the customer, ensuring **all** of the following:
  - any adjustments made are within the normal operating specification of the equipment
  - the equipment's performance meets the customer's expectations
  - any questions that the customer asks are answered in a clear and accurate way
  - the customer is made familiar with the operation of the equipment
  - the equipment or meets all health and safety requirements
  
8. Ensure that company policy is kept with regard to **all** the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem that you are unable to solve to the appropriate person
  - removing all packaging and waste material
  - leaving the customer's premises in a clean and tidy state
  - clearly identifying replaced components with the customer
  - giving the customer the opportunity to retain replaced components that are chargeable
  
9. Ensure that relevant health and safety legislation and regulations are complied with at all times, with particular attention being given to **one** of the following:
  - correct lifting techniques
  - the safe use of soldering equipment
  - the isolation of live television chassis

## Knowledge statements:

### *You must have knowledge and understanding of:*

1. The specific safety precautions to be taken when working with consumer electronic equipment
2. The specific safety precautions when working with components and substances (eg, solder, heatsink paste)
3. How to identify and use the appropriate codes of practice
4. Customer care procedures and techniques, including ownership and advice to customers
5. How to interpret equipment circuit diagrams and component drawings
6. Component replacement techniques and safety precautions (eg, desoldering)
7. The correct soldering techniques for the work in hand
8. Appropriate component handling and disposal precautions (eg, static sensitive components)
9. Identification of component defects (eg, visible changes/damage)
10. Component or assembly operating conditions, and any associated hazards (eg, stored electrical or mechanical energy)
11. How to select and use the correct tools and equipment for the work in hand
12. Tool and equipment care and control procedures (company-specific, HASAWA regulations)
13. Product or system specifications, and the tests needed to confirm that they are being met
14. Company documentation required for service procedures
15. Waste disposal procedures
16. The theory relating to the operation of the product, stage by stage
17. The need to isolate a live (TV) chassis before working on it
18. The signal requirements of the product
19. The operation and care of test equipment (eg, multimeter, oscilloscope, function generator, etc)
20. The extent of your own responsibility, and whom you should report to if you have problems that you cannot resolve

# Unit 314: Rectifying Faults in Domestic Appliance Equipment

## Unit Summary

This unit identifies the competencies you need to carry out efficient and effective rectification of faults on domestic appliances, by replacing (ie, removing and replacing) faulty components and/or by making adjustments to bring the appliance back to full working order, in accordance with approved procedures. You will be required to ensure that any replacement parts are correct for their intended purpose, that they meet any safety standards, and are fitted without damage.

Your responsibilities will require you to comply with organisational policy and procedures for the replacement of identified components and the associated work to be undertaken, and to report any problems with the components to the relevant authority. You will be expected to work with a minimum of supervision, taking full responsibility for your own actions and for the quality and accuracy of the work that you produce.

Your underpinning knowledge will provide a good understanding of your work, and will provide an informed approach to applying component replacement procedures. You will understand the function and operating principles of the components being replaced and the techniques and procedures for replacing and/or adjusting them in sufficient depth to provide a sound basis for carrying out the replacement activities to the required standard.

You will understand the safety precautions required when carrying out the component replacement activities. You will also understand your responsibilities for safety and the importance of taking the necessary safeguards to protect yourself and others in the workplace.

## Performance statements:

### **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

### **Scope of the unit:**

*The numbers of scope items specified (below) indicate the minimum requirements for this Occupational Standard.*

### **You must:**

1. Carry out **all** of the following during the replacement activity:
  - plan the component replacement activities to cause minimum disruption to the customer
  - provide safe access and working arrangements for the work area
  - carry out the component replacement activities using appropriate techniques and procedures
  - record the details of the work according to company policy
  - ensure that all waste material is removed from the customers premises on completion.
  - ensure that no damage takes place to the customers property or flooring.
  - make sure you have all the necessary tools and equipment, that they are in a safe and serviceable condition, and are used only for their intended purpose
2. Rectify faults in **two** of the following products:
  - home laundry (eg, washing machine, tumble drier, etc)
  - refrigeration (eg, fridge, freezer, dehumidifier etc)
  - cooking (eg, cooker, microwave oven, etc)
  - small domestic appliances (eg, hair drier, toaster, iron, etc)
3. Carry out **all** of the following before beginning the component replacement:
  - identify the removal procedures to be followed
  - select and obtain the correct tools for the removal procedures
  - ensure it is safe to begin removal procedures
  - carry out a visual inspection to confirm the components for removal
4. Replace **three** of the following types of component:
  - electrical (eg, motor, solenoid etc)
  - electronic (eg, resistor, capacitor, transistor, integrated circuit, etc)
  - mechanical (eg, drive belt, cosmetic parts, etc)
  - safety (eg, thermal fuse, safety resistor, cut-out etc)

5. Replace the components or modules using **two** of the following methods:
  - single connection soldering techniques
  - mechanical assembly
  - removal/replacement of fasteners (crimps, screws, bolts, cable ties)
  - disconnecting/reconnecting (plugs/sockets)
6. Ensure **all** of the following when replacing components or modules:
  - any safety component replaced is a direct replacement and functions correctly
  - any component replaced is fit for its intended purpose
  - the replacement component is not damaged during the fitting process
  - no other components, modules or wiring (etc) are damaged during the replacement activities
7. Set up the product or system and return it to the customer, ensuring that **all** of the following:
  - any adjustments made are within the normal operating specification of the appliance
  - the appliance's performance meets the customer's expectations
  - any questions that the customer asks are answered in a clear and accurate way
  - the customer is made familiar with the operation of the appliance
  - the appliance meets all health and safety requirements
8. Ensure that company policy is kept with regard to **all** the following:
  - keeping correct records
  - obtaining authority to continue before working beyond agreed limits
  - reporting any problem that you are unable to solve to the appropriate person
  - removing all packaging and waste material
  - leaving the customer's premises in a clean and tidy state
  - clearly identifying replaced components with the customer
  - giving the customer the opportunity to retain replaced components that are chargeable
9. Ensure that relevant health and safety legislation and regulations are complied with at all times, with particular attention being given to **one** of the following:
  - correct lifting techniques
  - the safe use of soldering equipment
  - water by-laws

## Knowledge statements:

### *You must have knowledge and understanding of:*

1. The specific safety precautions to be taken when working with domestic appliances
2. The specific safety precautions when working with components and substances (eg, solder, heatsink paste, bearing grease, sealants, etc)
3. How to identify and use the appropriate codes of practice
4. Customer care procedures and techniques including ownership and advice to customers
5. How to interpret equipment circuit diagrams, mechanical and component drawings
6. Component or module replacement techniques and safety precautions (eg, desoldering, mechanical fastenings and electrical connectors)
7. The correct soldering techniques for the work in hand
8. Appropriate component handling and disposal precautions (eg, for static sensitive components)
9. Identification of component defects (eg, visible changes/damage)
10. Component or assembly operating conditions, and any associated hazards (eg, stored electrical or mechanical energy, rotating parts, live components, water leaks, etc)
11. How to select and use the correct tools and equipment for the work in hand
12. Tool and equipment care and control procedures (company-specific, HASAWA regulations)
13. Product or system specifications, and the tests needed to confirm that they are being met
14. Company documentation required for service procedures
15. Waste disposal procedures
16. The theory relating to the operation of the product, and its operating sequence
17. The need to ensure a good, properly bonded earth for the appliance
18. The service requirements of the product
19. Appliance settings that can be adjusted
20. The operation and care of test equipment (eg, multimeter, earth loop impedance tester, insulation resistance tester, etc)
21. Water by-laws (when appropriate)
22. The extent of your own responsibility, and whom you should report to if you have problems that you cannot resolve



**Evidence record sheet unit 201**

evidence record sheet	performance evidence 1	performance evidence 2	performance evidence 3	additional performance evidence (if required)
evidence type				
date				
<b>health &amp; safety (understanding all application of duties and equipment)</b>				
H & S at Work Act				
PPE				
COSHH				
risk assessments				
hazardous substances				
statutory regulations				
<b>emergency requirements (all)</b>				
first aider/facilities				
injury procedures				
fire procedures				
danger/hazard procedures				
<b>environmental hazards/risks (all)</b>				
working environment				
tools & equipment				
materials and substances				
bad working practices				
<b>manual lifting &amp; carrying techniques (two)</b>				
lifting alone				
with assistance of others				
with mechanical assistance				
<b>safe working practices (all)</b>				
tidy workplace				
tools & equipment				
safety/hazard warnings				
protect others				

Knowledge and understanding reference:

Candidate: ..... Date: .....

Assessor: ..... Date: .....

**Evidence record sheet unit 202**

evidence record sheet	performance evidence 1	performance evidence 2	performance evidence 3	additional performance evidence (if required)
evidence type				
date				
<b>Establish and maintain productive working relationships (all)</b>				
customers				
colleagues				
supervisors				
<b>Respond to the individual needs of colleagues or customers (two) o</b>				
physical disabilities				
learning difficulties				
language differences (including dialects and accents)				
technically aware				
technically unaware				
<b>Use all of the following methods of communication</b>				
face-to-face				
telephone				
documentary				
<b>Contribute to positive relationships (all)</b>				
meeting your organisation's standards for appearance and behaviour				
greeting customers and colleagues in an appropriate way				
communicating with customers and colleagues in a way that makes them feel valued and respected				
maintaining communication with customers and colleagues to ensure that they are kept informed and reassured				
seeking assistance from others in a polite and courteous way without causing undue disruption to normal work activities				

**Evidence record sheet unit 202 (continued)**

Respond appropriately to the needs of customers and colleagues <b>(all)</b>				
responding promptly and positively to questions and comments				
keeping them informed about work plans or activities that affect them				
treating customers and colleagues courteously and helpfully, even when working under pressure				
Avoid disagreements by carrying out <b>two</b>				
identifying and confirming the needs and expectations of customers				
checking with customers you have fully understood their needs/expectations				
explaining to customers/colleagues any reasons why needs/expectations cannot be met				
seeking guidance and instruction from the appropriate person when necessary				
Ensure you comply with company policy at all times <b>(all)</b>				
maintaining correct records				
obtaining authority to before working beyond agreed limits				
reporting any problem that you are unable to solve to appropriate person				
confidentiality				

Knowledge and understanding reference:

Candidate: ..... Date: .....

Assessor: ..... Date: .....



## Levels 2 & 3 NVQs in Electrical & Electronic Servicing

### Opportunities for generation of Key Skills evidence:

The award in Electrical & Electronic Servicing has been contextualised by *SEMTA* from the National Engineering Competency Standards (ECS). The following table lists the opportunities for generation of Key Skills evidence for each unit and also gives reference to the ECS unit it has been derived from.

Unit	ECS Unit	Key Skills Reference		
		Communication	Application of Number	Problem Solving
<b>Level 2 Units</b>				
201 Complying With Statutory Regulations And Organisational Safety Requirements	N/A			
202 Contributing to Positive Working Relationships	8.02	2.1a		1.1 1.2 1.3
203 Establishing Customer Requirements	1.01	2.2 2.3		2.1
204 Installing Signal Reception Equipment in Customers' Premises	4.02	2.1a 2.2 2.3		2.1 2.2 2.3
205 Familiarising Customers with the Use of Products	7.01	2.1a 2.3		
206 Working Safely at Heights with Antennas	N/A			
207 Diagnosing Faults in Signal Reception Systems	6.08	1.1 1.2 1.3		1.1 1.2
208 Replacing Modules in Signal Reception Systems	5.04	1.1 1.3 2.2	2.1	2.1 2.2 2.3
209 Carrying Out Preventive Maintenance Procedures	5.01	2.1a 2.2 2.3		
210 Transporting and Protecting Products and Equipment	N/A			
211 Collecting and Processing Payments	N/A			
212 Promoting Your Organisation's Products and Services	N/A			
213 Installing Consumer/Commercial Electronic Equipment in Premises	4.02	2.1a 2.2 2.3		2.1 2.2 2.3
214 Installing Domestic Appliance Equipment in Customers' Premises	4.02	2.1a 2.2 2.3		2.1 2.2 2.3

Unit	ECS Unit	Key Skills Reference		
		Communication	Application of Number	Problem Solving
215 Diagnosing Faults in Consumer/Commercial Electronic Equipment	6.08	1.1 1.2 1.3		1.1 1.2
216 Diagnosing Faults in Domestic Appliances	6.08	1.1 1.2 1.3		1.1 1.2
217 Replacing Components in Consumer/Commercial Electronic Equipment	5.04	1.1 1.3 2.2	2.1	2.1 2.2 2.3
218 Replacing modules in Domestic Appliances	5.04	1.1 1.3 2.2	2.1	2.1 2.2 2.3
<b>Level 3 units</b>				
302 Developing and Maintaining Positive Working Relationships	8.02	2.1a		1.1 1.2 1.3
303 Identifying and Costing Customer Requirements	1.01	2.2 2.3		2.1
304 Diagnosing and Analysing Faults in Signal Reception Networks	6.08	1.1 1.2 1.3		1.1 1.2
305 Rectifying Faults in Signal Reception Networks	5.04	1.1 1.3 2.2	2.1	2.1 2.2 2.3
306 Installing Distribution Networks in Premises	4.02	2.1a 2.2 2.3		2.1 2.2 2.3
307 Familiarising Customers with the Use of Distribution Networks	7.01	2.1a 2.3		
308 Establishing Compliance with Distribution Network Specifications	6.01	1.1 1.3 2.2	2.1	1.1 1.2 1.3
309 Identifying and Recommending Improvements to Your Organisation's Products and Services	N/A			
310 Contributing to the Development of Colleagues and Yourself	8.01	2.1a 2.3		2.1 2.2 2.3
311 Diagnosing and Analysing Faults in Consumer/Commercial Electronic Equipment	6.08	1.1 1.2 1.3		1.1 1.2
312 Diagnosing and Analysing Faults in Domestic Appliance Equipment	6.08	1.1 1.2 1.3		1.1 1.2

Unit	ECS Unit	Key Skills Reference		
		Communication	Application of Number	Problem Solving
313 Rectifying Faults in Consumer/Commercial Electronic Equipment	5.04	1.1 1.3 2.2	2.1	2.1 2.2 2.3
314 Rectifying Faults in Domestic Appliance Equipment	5.04	1.1 1.3 2.2	2.1	2.1 2.2 2.3





## Further information

Further information regarding centre/scheme approval or any aspect of assessment of our qualifications should be referred to the relevant City & Guilds regional/national office:

Region	Telephone	Facsimile
City & Guilds Scotland	0131 226 1556	0131 226 1558
City & Guilds North East	0191 402 5100	0191 402 5101
City & Guilds North West	01925 897900	01925 897925
City & Guilds Yorkshire	0113 380 8500	0113 380 8525
City & Guilds Wales	02920 748600	02920 748625
City & Guilds West Midlands	0121 359 6667	0121 359 7734
City & Guilds East Midlands	01773 842900	01773 833030
City & Guilds South West	01823 722200	01823 444231
City & Guilds London and South East	020 7294 2820	020 7294 2419
City & Guilds Southern	020 7294 2724	020 7294 2412
City & Guilds East	01480 308300	01480 308325
City & Guilds Northern Ireland/ Ireland	028 9032 5689	028 9031 2917
City & Guilds Customer Relations Unit	020 7294 2800	020 7294 2400

Website [www.city-and-guilds.co.uk](http://www.city-and-guilds.co.uk)

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