National Occupational Standards for

Oil-fired Technical Services

Design and Installation Technician

Approved by UKCG December 2003

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

cogent

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

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

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UNIT 2

SPECIFY PROGRAMMES FOR WORKING ON OIL-FIRED SYSTEMS AND EQUIPMENT

Overview

This unit requires you to provide evidence of competence in the specification of programs for working on oil-fired installation systems.

The unit covers estimating workload and labour requirements, producing payment schedules and negotiating and agreeing contracts.

This Unit consists of two elements:

2.1 Produce and Monitor Work Programmes

You must be able to:

produce detailed resource requirements for system installations
produce work programmes which make best use of resources with contract conditions
produce schedules for inspections and payments
monitor progress of work, negotiate variations and revisions where necessary

2.2 Negotiate Job Contract Terms and Conditions

You must be able to :-

negotiate and agree contracts
specify and agree contract conditions
identify and negotiate changes to contract conditions where necessary

ELEMENT 2.1 PRODUCE AND MONITOR WORK PROGRAMMES

Performance Criteria - This is what you must do:

2.1.1 produce details of **resource requirements**(1) for system installations

2.1.2 produce **work programmes**(2) which make the best use of resources within the **contract conditions**(3)

2.1.3 schedule any **inspection or approval requirements**(4) by third party organisations within the work programme

2.1.4 produce a schedule of payments for the job based on the **contract conditions**(3)

2.1.4 monitor the progress of jobs against the work programme

2.1.4 negotiate revisions to work programmes where modifications and deviations prove necessary

RANGE:

Resource requirements	Equipment workloads timescales materials tools
(2) Work programmes	milestones deadlines constraints
(3) Contract conditions	Payment terms and schedules
(11) Inspection or approval requirements	arrange visits, approval requirements

Knowledge and Understanding - this is what you must know:

) How to determine the following for specific jobs –
  - material requirements
  - labour requirements
  - plant & equipment requirements

) how to produce basic work programmes in bar chart format to identify key stages in job progress

) how to develop work programmes which meet the requirements of customer and/or main contractor work programmes

) how to schedule inspection or approval site visits into work programmes

) how to specify job payment requirements which meet work progress, job contract and business requirements

) typical situations in which the work programme may have to be adjusted and how to obtain approval to adjust the work programme

ELEMENT 2.2 NEGOTIATE JOB CONTRACT TERMS AND CONDITIONS

Performance Criteria - This is what you must do:

2.2.1 negotiate and agree contract conditions between **relevant parties**(1)

2.2.2 specify **contract conditions**(2) in an agreed **contract format**(3)

2.2.3 confirm customer satisfaction with the **contract conditions**(2)

2.2.4 identify and negotiate with **relevant parties**(1) changes to the **contract conditions**(2) where deviations or modifications prove necessary

RANGE:

(1) Relevant parties	third parties, customers
Contract conditions	Payment terms and schedules
(3) Contract format	draft contract/formal contract

Knowledge and Understanding - this is what you must know:

( ) the basic forms of job agreement applicable to the size of contract –
- quotations and acceptance letters
- formal contract documents
- orders for material supply

( ) the circumstances in which deviations or variations to the contract may prove necessary

(c) the actions necessary to obtain agreement with customers or suppliers to deviations or variations to the contract conditions

UNIT 3

MAINTAIN ENVIRONMENTAL GOOD PRACTICE WHEN WORKING WITH OIL

Overview

This unit requires that you show you can maintain environmental good practice when working with oil.

The unit measures your ability to minimise environmental damage during work and to encourage others to adopt the same procedures.

You must be able to :-

- Recognise types of environmental damage and applicable legislation.
- Use appropriate tools, materials and methods to minimise environmental damage
- Report ***all*** environmental incidents to the environment agency for England, Wales and Northern Ireland or the Scottish Environment Protection Agency for Scotland.
- Promote environmental good practice.

This Unit is a single element Unit

Performance Criteria – this is what you must do:

1. perform work in a manner which minimises environmental damage
2. conduct work in accordance with relevant legislation, guidance and organisational procedures which relate to environmental impact
3. recognise any incidental damage and take action to minimise or rectify the damage promptly
4. dispose of waste materials safely and in accordance with relevant legislation
5. report and record all environmental incidents promptly and accurately to the appropriate agencies
6. identify opportunities to encourage relevant people to maintain environmental good practice
7. encourage relevant people to understand, and participate in, any changes to working practices
8. deliver communication clearly, accurately and in a manner which is likely to encourage involvement in environmental good practice

Range:

Environmental damage :	pollution, physical disturbance
Waste materials :	those to which COSHH regulations applies
Relevant people :	those within the organisation, those external to the organisation

Knowledge and Understanding – this is what you must know:

a) methods for minimising environmental damage during work
b) the most suitable choice of materials and equipment given the nature and the location of the work activity and its potential impact on the environment
c) types of environmental damage, the impact these can have on the environment and the corrective actions to be taken
d) organisational and legislative requirements in terms of minimising environmental damage
e) the ways in which tools and materials should be used in order to minimise environmental damage
f) safe methods of waste disposal which will minimise the risk to the environment
g) those to whom environmental incidents should be reported including the appropriate Environment bodies and the methods for so doing
h) how and why environmental good practice should be maintained
i) who to involve in improving environmental good practice
j) ways of communicating clearly to others and the importance of this in improving working practices
k) the range of information that needs to be passed to the customer to ensure the correct and economical use of energy dependant systems

UNIT 7

MAINTAIN THE SAFE WORKING ENVIRONMENT FOR OIL FIRED SYSTEMS AND RELATED WORK

Overview

This unit requires you show you can maintain the safe working environment for oil-fired systems and related work.

The unit measures your ability in the use of statutory and industrial procedures to maintain a safe working environment.

You must show you comply with health and safety legislation and take necessary precautions to reduce the risk of accidents, to yourselves, co-contractors, the public or any site visitor.

This is a single element Unit.

You must be able to:-

carry out a risk assessment
comply with existing risk assessments and warning notices
use tools and equipment in a manner that complies with health and safety requirements
maintain tools and equipment in-line with health and safety requirements
comply with COSHH requirements
safe guard customer's property

Performance Criteria - this is what you must do

comply with **health and safety legislation**(1) when working with **other persons**(2)

take **precautionary actions**(3) to minimise the potential safety risk to persons in the **work location**(4)

work to the procedures laid down in **risk assessments**(5) (or produce **written risk assessments**)(5)

take remedial action(s) where work methods which contravene health & safety requirements are identified

use **tools and equipment**(6) in a manner, which complies with health & safety requirements

maintain **tools and equipment**(6) to a standard which meets health & safety requirements

demonstrate production and installation processes which comply with health & safety requirements

handle **potentially hazardous materials**(7) in a manner which complies with health & safety requirements

take **precautionary actions**(3) during work activities to ensure the safety of **customer's property**(8)

comply with **hazard warning and prohibition notices**(9) in work locations

RANGE:

(0) Health & safety legislation	as appropriate to your status (employee), your work and your job role
(2) Other persons	Private client/customer, whether tenant or owner Main contractor's representative Representatives of inspectorates Co-contractor
Precautionary actions	warning notices wearing protective personal equipment permit to work
Work locations	the specific area where you work, immediate or remote locations

Risk Assessments	comply with or produce
(6) Tools and Equipment	maintain in line with health and safety requirements and good housekeeping
Potentially hazardous materials	identify/handle/disposal
(8) Customer's property	safeguard protect
(9) Hazard warning & prohibition notices	recognition compliance

Knowledge and Understanding - this is what you must know:

the general responsibilities of the employer and employee for ensuring safety in the work place
the requirements of safety legislation for the range of work operations
the potential hazards or risks associated with the range of work locations in which work on systems is undertaken, the measures to be taken to reduce risk
general measures to be taken to create safety awareness – company on site policies – applying and supervising site safety practices including measures to report potential safety hazards
accident reporting procedures and basic first aid procedures
how to produce general risk assessments and how to apply them in the workplace
safe practices when carrying out work on the range of systems and components
the range of tools and equipment for installation or maintenance work – their safe use – maintenance requirements – safety equipment.
the range of tools and equipment whose use is controlled by legislation.
methods of identifying and the range of potentially hazardous materials used for system installation or maintenance work including asbestos.
safety precautions including the use of personal protective equipment.
the legislation or recommendations governing the safe use or disposal of hazardous materials.
the methods of protecting customers property within the range of locations in which system installation or maintenance work is carried out.
how to liaise with the customer, pre-work inspection, reporting existing damage or identifying damage arising from work operations
the procedures for summoning the different emergency services. The information
required by the emergency services to permit them to respond promptly
the range of fire extinguishers used for different types of fire and how to extinguish small fires in a safe manner
typical evacuation procedures for work locations in which system installation or maintenance work may be carried out

UNIT 8

DEVELOP & MAINTAIN EFFECTIVE WORKING RELATIONSHIPS WITH OTHERS FOR OIL-FIRED RELATED WORK

Overview

This unit requires you show you can develop effective working relationships.

This unit covers working with others, communication of information & development and maintenance of effective working relationships with others in the workplace.

This Unit is a single element Unit.

You must be able to: -

- treat others in a courteous manner and ensure your appearance and behaviour matches your organisation's standards
- respond effectively to requests for job information from others in the workplace
- use a range of methods of communication to pass job information to others in the workplace
- develop effective working relations with relevant people in the workplace

Performance Criteria - this is what you must do:

treat **relevant people**(1) in a courteous and helpful manner, especially when working under pressure

maintain your personal appearance and behaviour consistently and in accordance with organisational standards

actively seek opportunities for improving working relationships with **relevant people**(1)

respond effectively to requests for **job information**(2) from others in the workplace

use a range of **methods of communication**(3) to pass **job information**(2) to others in the workplace

ensure your own behaviour consistently conveys a positive image of the organisation to current and potential **relevant people**(1)

RANGE:

relevant people	Private client/customer, whether tenant or owner Main contractor's representative Representatives of Inspectorates Co-contractor
Job information	Related to current job Related to company/organisation
Methods of communication	Oral, written, electronic as appropriate to suit purposes

Knowledge and Understanding - this is what you must know:

the range of other people encountered within the work environment with whom it may be necessary to establish working relationships.
the roles and responsibilities of those with whom you need to deal during the course of your work.
the types of job information that may be requested by others in the workplace – sources of information – methods of accessing information and possible restrictions on passing information to others.
the forms of communication used for the range of job or company information best suited to its purpose – using the key principles of good communication in work situations, including methods of confirming that the communication has been understood.
the actions that are necessary to begin, develop, and maintain good working relationships, or restore working relationships.
the principles of good working relationships and reasons why relationships may break down and the actions to take to restore working relationships where a breakdown occurs
your organisation's service standards and standards for appearance and behaviour
ways of creating opportunities to enhance working relationships with others and appropriate site behaviour

UNIT 9

CONTRIBUTE TO THE IMPROVEMENT OF OIL-RELATED PRODUCTS AND SERVICES

Overview

This unit requires you to show you can contribute to improvements of oil-related products and services. Activities include promoting a positive image of the business through personal characteristics and presentation of information.

You must recognise and act upon opportunities for promoting the services of the business. Identify potential improvements in customer care, and opportunities for improving business procedures. You must also apply and promote procedures that are environmentally friendly.

This is a two element Unit

9.1 Promote the image of the business to others

You must be able to:

- Present personal characteristics that provide a positive image of the business
- Promote the services of the business and identify opportunities for improving business procedures
- Take actions to rectify problems and address customer complaints

9.2 Identify and recommend opportunities for customer care

You must be able to:

- Identify potential improvements in customer care
- Take actions to deal with customer complaints

ELEMENT 9.1 PROMOTE THE IMAGE OF THE BUSINESS TO OTHERS

Performance Criteria – this is what you must do:

9.1.1 present personal characteristics that provide a positive image of the business

9.1.2 ensure that the **job information**(1) provided meets the needs of **relevant people**(2) in the workplace

9.1.3 present **job information**(1) in ways which encourage a positive image of the business

recognise and act on opportunities for promoting the services of the business

RANGE:

Job information	Related to the current job Related to the organisation Related to the industry Related to the company services
Relevant people	Private customer or representative Main contractor's representative Representatives of inspectorates Co-contractors

Knowledge and Understanding - This is what you must know:

the importance of correct personal presentation – clothing worn and manner

the range of actions designed to promote the employing business that are within the candidate's day to day routine

the types of actions that produce positive and negative responses

the range of promotional information appropriate to different work situations – ensuring that information provided is appropriate to its intended use

the methods of presenting information that are appropriate to the situation or the person requesting the information.

ELEMENT 9.2 IDENTIFY AND RECOMMEND OPPORTUNITIES FOR CUSTOMER CARE

Performance Criteria - This is what you must do:

9.2.1 identify potential improvements in customer care

9.2.2 take actions to rectify problems with customer care

9.2.3 take actions to address customer complaints on **system or components**(1) operation

9.2.4 report to job supervisor, line manager potential opportunities for improving **business procedures**(2)

RANGE:

(1) System or components	oil storage systems, oil supply systems, oil firing appliances, oil systems
(1) Business procedures	in relation to: Prompt response to requests Quality of workmanship Efficiency of operatives Cost factors Care of customer's property

Knowledge and understanding - This is what you must know:

the typical formal and informal approaches to ensuring a system of customer service

) the typical details contained in written statements of customer service policy

) the work actions necessary to support the businesses customer service policy

the checks to be carried out during work activities to ensure customer satisfaction with the service provided, and the measures to be taken where deficiencies in customer service are identified

the actions necessary to record and report any deficiencies in the performance of systems or components.

the methods of dealing with customer complaints arising from dissatisfaction with work standards or attitude of the workforce.

UNIT 10

DIAGNOSE AND RECTIFY FAULTS IN COMPLEX OIL STORAGE AND SUPPLY SYSTEMS AND ASSOCIATED EQUIPMENT

Overview

This unit requires you diagnose and rectify faults that occur outside of or in addition to servicing and commissioning of complex oil storage and supply systems.

You must be able to comply with statutory regulations, industry codes of practice, British standards, Building Regulations and Standards and manufacturers' instructions to ensure that diagnosis and rectification of faults is undertaken in a safe and efficient manner.

10.1 Establish nature of malfunction

You must be able to:-

- prepare the work area
- obtain information on the condition of and malfunctions in the present storage or supply system appliance through a variety of means
- obtain such information in a non disruptive manner, complying with statutory regulations, industry codes of practice, Building Regulations and Standards, British standards and manufacturers' instructions
- be aware of commonly occurring faults

10.2 Rectify faults in complex oil storage and supply systems and associated equipment

You must be able to:-

rectify faults and restore supply in accordance with relevant statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions

upon completion of repairs conduct tests to ensure that systems are fully operational.

ELEMENT 10.1 ESTABLISH NATURE OF MALFUNCTION

Performance Criteria – this is what you must do:

1. prepare the work area to ensure safe working and cleanliness of site
1. establish the current condition of complex **oil storage and supply systems**
1. obtain information on servicing, previous operation and any changes made
1. carry out a visual inspection of the system to establish potential areas of malfunction
1. conduct a logical sequence of **tests and checks**
1. minimise disruption whilst carrying out safe practices in fault finding
1. perform all fault diagnosis activities safely and according to statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions

RANGE:

storage and supply system	oil storage tanks, supply systems and other associated equipment used in complex systems
Tests & checks	leakage/ pressure tests and other diagnostic tests and checks appropriate to oil storage and supply systems

Knowledge and Understanding – this is what you must know:

various common range of complex oil storage and supply systems available
risk assessment procedures appropriate to diagnosis and rectification for complex systems
analysis methods and techniques used in problem solving
standard testing procedures and how to use standards testing equipment
components and their characteristics
information required and their sources in relation to faults
commonly occurring faults and their symptoms in complex oil storage and supply systems in relation to:
- oil availability and supply faults
- sequential checks to conduct in order to identify and isolate faults

environmental, health and safety factors to take into account when diagnosing faults

ELEMENT 10.2 RECTIFY FAULTS IN COMPLEX OIL STORAGE AND SUPPLY SYSTEMS AND ASSOCIATED EQUIPMENT

Performance Criteria – this is what you must do:

4. identify and rectify faults following statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions
4. restore oil supply systems to normal operation following statutory regulations, industry codes of practice and manufacturers' instructions
4. locate and repair any oil leakage following statutory regulations, industry codes of practice, British Standards and manufacturers' instructions
4. record and report the disposal of contaminated ground or materials to licensed persons
4. conduct repair procedures in a manner which minimises disruption and inconvenience in the minimum time compatible with safety
4. carry out tests to ensure that appliances and systems can be returned to full working order
4. perform all fault rectification safely according to statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions
4. record results of tests in accordance with organisation's procedures
4. report and record all environmental incidents promptly and accurately to the appropriate Environment bodies

RANGE:

Complex storage and supply system	oil storage tanks, supply systems and other associated equipment used in complex systems

Knowledge and Understanding – this is what you must know:

your capabilities and the limit of your responsibilities with regard to the installation of complex oil storage and supply systems and associated equipment and to whom you should report problems
Repair techniques and procedures for different types of fault
Risk assessment procedures
Standard testing procedures for return to normal working order
Components and their characteristics
Commonly occurring faults and their symptoms in complex oil fired systems in relation to oil availability and supply faults
Environmental, health and safety factors to take into account when rectifying faults
Relevant statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions

UNIT 12

DESIGN OIL-FIRED SYSTEMS

Overview

This unit requires you show you can design oil-fired systems. It requires that you show you understand the basic principles of design for oil-fired systems and includes mechanical systems (wet systems).

This Unit is a two element Unit.

12.1 Review existing heating systems

You must be able to:

- assess customer requirements and requirements of the property including the potential maximum level of occupancy
- provide full information and options available to customers including issues such as cost and feasibility
- ensure design complies with industry standards
- obtain customer agreement on presented design proposals

12.2 Adapt existing heating systems for oil-firing

You must be able to:

- amend system design options to meet customer job requirements
- ensure that operating factors are considered
- ensure that recognised health and safety procedures and relevant legislation is considered
- consider the intended use of oil firing equipment and alternative methods of adaptation
- replace existing equipment where necessary

ELEMENT 12.1 REVIEW EXISTING HEATING SYSTEMS

Performance Criteria – this is what you must do:

identify and clarify the nature of the customer's requirements
review the existing system, site structures and features to evaluate the potential for adaptation
identify all relevant operating factors which will influence the adaptation
ensure that a risk assessment is made of any proposed adaptations to existing systems and that safety measures are incorporated in planning adaptations
review the feasibility of the proposed adaptation against technical, legal and cost criteria
present an appropriate range of design options to customers and fully discuss all technical and cost implications
agree and fully cost an adaptation plan
introduce all appropriate measures to ensure the safe removal of existing systems and comply with current legislation
obtain and record the customer's agreement to the design proposals

Range:

Customer requirements :	• preferred system • performance requirements • cost factors
Operating Conditions:	• to cope with summer/winter temperatures • different types of user controls • programming • to cope with different types of ventilation loss

Knowledge and Understanding – this is what you must know:

e) All relevant health, safety and environmental factors including the importance of risk assessments
e) All relevant industry codes of practice
e) Types of oil firing equipment and their capacities and capabilities
e) Manufacturers' instructions and recommendations relating to oil-fired systems
e) Appropriate methods of identifying customer requirements
e) The principles and features of alternative systems
e) The capacity and operating conditions of different systems
e) All technical criteria for evaluating potential adaptations
e) The ways of costing alternative system adaptations
e) The importance of getting the customer's agreement to the design proposals

ELEMENT 12.2 ADAPT EXISTING HEATING SYSTEMS FOR OIL FIRING

Performance Criteria – this is what you must do:

0. check components of the existing heating system for wear and damage
0. replace incorrectly sized and worn out equipment
0. clean pipe systems internally using an approved flushing and cleanser chemicals
0. add a corrosion inhibitor to the completed system after final flushing
0. renew the control systems in accordance relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions

Range of Applications

Adaptation of existing systems	• conversion of non-oil systems to oil-firing systems • improving performance and efficiency including control • refurbishment • conversions of systems

Knowledge and Understanding – this is what you must know:

) The advantages and disadvantages of gravity primary systems including: excessively high water storage temperature, lack of electrical connections to prevent short cycling and internal corrosion due to incorrect positioning of feed cistern
) The commonly occurring problems with older heating systems including: poor insulation, high operating costs, poor control systems, inefficient or oversized appliances, internal and external corrosion, leaks from radiators and pipework joints, unsightly exposed pipework, insufficient hot water storage, excessive hot water temperatures
) The health, safety and environmental factors during adaptation including safety vents and by-pass pipes
) How to use cleansing and corrosion inhibitor products and their correct application
) Relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions relating to design principles and conversion of existing systems to new

UNIT 13

SERVICE AND COMMISSION OIL-FIRED SYSTEMS AND EQUIPMENT

Overview

This unit requires that you service and commission oil-fired systems and equipment.

This unit measures your ability to establish and maintain the effective operation of oil-firing systems. It covers those activities involved in fulfilling their responsibilities in inspecting and checking that the installation of the tank and oil lines meet with relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards, manufacturers' instructions and the Environment Agency for England and Wales and the Scottish Environment Protection Agency.

It also covers checking ventilation provision meets required standards and carrying out appliance testing.

You must be able to:-

ensure that the system is correctly installed
check incoming services have been utilised as intended
carry out pre-commissioning checks
inspect tank, oil supply, combustion and ventilation air supply
check pipework and all other components
confirm commissioning requirements from manufacturers and industry procedures

This Unit has four elements:

2. prepare for the servicing of oil firing systems
2. carry out inspection and servicing of tanks and oil
2. carry out inspection and servicing of flueing and air supply systems
2. service and test appliances and burners

ELEMENT 13.1 PREPARE FOR THE SERVICING OF OIL FIRING SYSTEMS

Performance Criteria - this is what you must do:

0. prepare working areas and protect them from dust, grease and oil
0. conduct a risk assessment at site prior to servicing and adopt appropriate environmental, health and safety measures in accordance with statutory regulations, industry codes of practice, British Safety Standards and manufacturers' instructions
0. establish current operating condition of system and service history
0. structure the recommended service schedule procedure in accordance with manufacturers' recommendations
0. prepare and check the required equipment and materials are fit for purpose

Range:

(1) Equipment and materials:	testing equipment, cleaning materials, jointing materials
(2) Components of oil firing systems to be checked and serviced:	supply systems, flueing, combustion systems

Knowledge and Understanding – this is what you must know:

k) planning methods and techniques
k) safety assessment methods and techniques
k) normal operating capacities and efficiencies of various types of burner
k) relevant operating information required in order to plan servicing
k) service schedule requirements as specified by relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions governing oil firing systems testing methods and procedures
k) waste disposal methods and procedures issued by the Environmental Bodies for England and Wales, for Scotland and for Northern Ireland
k) repair and replacement procedures
k) component construction, removal and re-assembly methods and techniques
k) performance monitoring procedures
k) handling equipment methods and techniques
k) information and documentation systems
k) servicing schedules and consumable replacement recommendations
k) ways of detecting wear and damage
k) commonly occurring servicing problems and how to overcome them
k) sealing materials and their characteristics

ELEMENT 13.2 CARRY OUT INSPECTION AND SERVICING OF TANKS AND OIL

Performance Criteria – this is what you must do:

0. visually inspect the oil storage tank, associated valves, fill lines, pipework and oil supply lines to ensure there is no leakage or corrosion

0. repair leaks and make good any damage if possible and inform the responsible person of action taken

0. confirm that the tank is clearly marked with :
   - product type
   - tank capacity information
   - environmental care stickers

0. check the condition of
   - tank supports
   - tank containment
   - oil level gauges

   meets manufacturers' requirements and whether replacements are necessary

0. paste dip the tank to identify whether
   - water or sludge is present
   - reporting for its safe disposal is required

0. ensure all fill points are capped and isolated

0. carry out all appropriate cleaning and replacements as required

0. perform servicing operations safely and following relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions

Range:

(1) Types of tank:	types used in domestic, light, commercial, industrial settings
(2) Tank fittings:	valves, pipes, gauges and other associated components
(3) Types of oil gauges:	mechanical, electronic, hydrostatic
(4) Oil supply systems:	single, two pipes

Knowledge and Understanding – this is what you must know:

relevant statutory regulations, building regulations and standards, industry codes of practice, British standards and manufacturers' instructions applying to tank installation including external, internal and underground locations and tank performance
types of foundations and supports required
approved methods of support and foundation construction
moisture prevention, anti-corrosion procedures and access and maintenance requirements for tanks
environmental, health and safety requirements for tank servicing including fire protection standards and containment requirements in relation to tank capacity
materials used for pipework and their properties
appropriate forms of fitting, jointing materials including petroleum-resisting compounds and insulating materials
industry code of practice for a product identification system for petroleum products
cut off valve and fire protection safety systems
the guidelines on disposing of waste from the appropriate environment bodies

Element 13.3 CARRY OUT INSPECTION AND SERVICING OF FLUEING AND AIR SUPPLY SYSTEMS

Performance Criteria – this is what you must do:

0. inspect balanced flue seals, air inlets, flue outlets and chimneys to ensure effective operation
0. conduct flue draught tests as required and adjust stabilisers as appropriate to the manufacturers' instructions.
0. check that combustion ,ventilation and make up air supply are performing to manufacturers' instructions
0. record and report the results of the inspection and inform the customer any cleaning requirements
0. examine and rectify joints in flue pipes for leakages as necessary
0. clean primary flues adjacent to the appliance
0. inspect and ensure that flue terminations are free from obstruction and appropriate guards are in place
0. perform servicing operations safely and following relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions
0. record and report abnormal occurrences and potential malfunctions to appropriate persons

Range:

(1) Types of flueing and air supply systems:	conventional, open low-level, fan assisted flues,
(2) Types of connection:	room sealed flues, to a lined chimney, to a flue only
(3) Flue terminating positions:	steel types, plastic

Knowledge and Understanding – this is what you must know:

-) appliance and flue classification categories
-) calculation of free area of air supply systems
-) characteristics of materials required for flues and chimneys
-) appliance manufacturers' instructions
-) insulation requirements for existing chimneys
-) ways of jointing materials together
-) lifespan of flueing and chimney materials
-) different types and uses of terminals
-) durability of chimney terminals
-) regulations governing flue terminating positions and clearances for oil fired appliances
-) flue gas temperatures and their impact on materials
-) behaviour of combustion gases and combustion air allowance
-) flue draught requirements and types of stabilisers
-) relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions
-) fuel constituents and their properties
-) combustion air and reaction requirements
-) incomplete combustion and its consequences
-) common causes of poor combustion and how to overcome them

ELEMENT 13.4 SERVICE AND TEST APPLIANCES AND BURNERS

Performance Criteria – this is what you must do:

0. prepare the work area to ensure safe working and cleanliness of site
0. establish the operating condition in accordance with industry practice and manufacturers' instructions for the appliance
0. ensure the appliance is isolated from oil in accordance with safe working practices
0. ensure an appropriately qualified person has isolated the appliance from the electrical supply
0. adjust or remove parts, inspect for wear and replace following relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions
0. re-assemble and fire the appliance and ensure the effective function of control and safety devices
0. carry out a range of combustion efficiency tests in the correct sequence and ensure adjustments comply with manufacturers' recommendations and prevailing site conditions
0. record the results of the test in accordance with organisation's requirements.
0. ensure that all replaced parts and waste are dealt with in accordance with the guidelines issued by the appropriate environmental body
0. restore the appliance and site to a clean condition
0. update and store service records in accordance with industry practice and report any appliance or installation defects found during servicing
0. report and record all environmental incidents promptly and accurately to the appropriate environmental body

Range:

(1) Control devices:	thermostats, valves, programmer
(2) Safety devices:	pressure switches, thermostats, valves

Knowledge and Understanding – this is what you must know:

d) relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions applicable to the appliance
d) calorific values of different types of fuels
d) combustion air and reaction requirements, efficiency factors and testing procedures
d) common causes of poor combustion and how to overcome them
d) commonly occurring faults within appliances and boilers and how they can be rectified
d) component parts and operation of burners
d) effects of draught on appliance efficiency
d) fuel constituents and their properties
d) how to measure appliance efficiency, burner outputs, fuel consumption
d) normal servicing intervals and procedures
d) how pipe supply systems function
d) principles behind operation of burners and appliances
d) how to isolate the appliance from the oil supply
d) procedures for isolating the appliance from the electrical supply by an appropriately qualified person
d) different types of burners and their suitability for
d) risk assessment procedures

d) safety procedures for combustion testing including environmental protection for the safe disposal of fluids and waste
d) ways of optimising fuel-air mixing and excess air requirements
d) how to record and report findings

UNIT 14

DIAGNOSE AND RECTIFY FAULTS IN OIL-FIRED APPLIANCES, SYSTEMS AND EQUIPMENT

Overview

This unit requires you diagnose and rectify faults that occur outside of or in addition to servicing and commissioning of oil fired appliances and systems.

You must be able to comply with statutory regulations, industry codes of practice, British standards, Building Regulations and Standards and manufacturers' instructions to ensure that diagnosis and rectification of faults is undertaken in a safe and efficient manner.

14.1 Establish nature of malfunction

You must be able to:-

prepare the work area
obtain information on the condition of and malfunctions in the present system or appliance through a variety of means
obtain such information in a non disruptive manner, complying with statutory regulations, industry codes of practice, Building Regulations and Standards, British standards and manufacturers' instructions
be aware of commonly occurring faults

14.2 Rectify faults in oil fired systems and equipment

You must be able to:-

- rectify faults and restore supply in accordance with relevant statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions
- upon completion of repairs conduct tests to ensure that appliances and systems are fully operational.

ELEMENT 14.1 ESTABLISH NATURE OF MALFUNCTION

Performance Criteria – this is what you must do:

prepare the work area to ensure safe working and cleanliness of site
establish the current condition of oil fired appliances or systems
obtain information on servicing, previous operation and any changes to appliances
carry out a visual inspection of the system to establish potential areas of malfunction
conduct a logical sequence of tests
minimise disruption whilst carrying out safe practices in fault finding
perform all fault diagnosis activities safely and according to statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions

Range:

(1) Types of faults:	relating to different components, or component failure or misuse of the system
(2) Types of appliance:	those relating to the oil-fired system
(3) Components of system:	pumps, valves, control, safety features/devices, expansion equipment, flues and ventilation

Knowledge and Understanding – this is what you must know:

the various oil fired appliances and connected systems
risk assessment procedures
analysis methods and techniques used in problem solving
standard testing procedures and how to use standards testing equipment
components and their characteristics
information required and their sources in relation to faults
commonly occurring faults and their symptoms in oil fired systems in relation to:

- electrical faults
- system faults
- oil availability and supply faults
- combustion faults
- flue and ventilation
- sequential checks to conduct in order to identify and isolate faults
- probable causes of faults in relation to different types of burner

environmental, health and safety factors to take into account when diagnosing faults

ELEMENT 14.2 RECTIFY FAULTS IN OIL FIRED SYSTEMS AND EQUIPMENT

Performance Criteria – this is what you must do:

4. identify and rectify faults following statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions
4. restore oil supply systems to normal operation following statutory regulations, industry codes of practice and manufacturers' instructions
4. locate and repair any oil leakage following statutory regulations, industry codes of practice, British Standards and manufacturers' instructions
4. record and report the disposal of contaminated ground or materials to licensed persons
4. conduct repair procedures in a manner which minimises disruption and inconvenience in the minimum time compatible with safety
4. carry out tests to ensure that appliances and systems can be returned to full working order
4. perform all fault rectification safely according to statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions
4. record results of tests in accordance with organisation's procedures
4. report and record all environmental incidents promptly and accurately to the appropriate Environment bodies

Range:

(1) Rectification:	relating to combustion, oil supply, oil appliances, flue and ventilation

Knowledge and Understanding – this is what you must know:

Repair techniques and procedures for different types of fault
Risk assessment procedures
Standard testing procedures for return to normal working order
Components and their characteristics
Commonly occurring faults and their symptoms in complex oil fired systems in relation to:
- electrical faults
- system faults
- oil availability and supply faults
- combustion faults
- flue and ventilation

Environmental, health and safety factors to take into account when rectifying faults
Relevant statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions

UNIT 15

INSTALL COMPLEX OIL STORAGE AND SUPPLY SYSTEMS

Overview

This unit requires you show you can install and connect complex oil pipework supply systems and install complex oil storage systems.

This Unit measures your ability to prepare and undertake the installation of oil storage and pipework supply systems whilst complying with relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions.

15.1 Prepare for installation

For this unit you must be able to:-

ensure that materials and fittings selected are appropriate
quantities of materials required are correctly estimated
ensure that the recognised statutory regulations, industry codes of practice, British standards, Building Regulations and Standards and manufacturers' instructions are complied with throughout the operation
survey work area for installation

15.2 Install oil filling and pipework supply system

- identify the suitability of the location for tank installation

check the provision of the tank and ancillary components
install tank storage system and components that meet the criteria to be laid out above

15.3 Install and connect tanks

connect services to installed system and components
work in a safe methodical manner

This Unit does not involve constructing the support and foundations for the tank, that is the subject of a separate trade.

ELEMENT 15.1 PREPARE FOR INSTALLATION

Performance Criteria – this is what you must do:

install and select fittings of the appropriate dimension and nature for the tank and appliance
identify the best location for pipework, valves and related materials
select and use materials which
- meet operating conditions
- are compatible with appliance category and fuel type
- are in accordance with manufacturers' instructions

establish the requirements for jointing and select materials accordingly
accurately estimate all required quantities of materials and their availability
complete a risk assessment prior to preparatory work for the tank installation
identify :
- a location for the tank that is safe and meets statutory regulations, industry codes of practice, British Standards, Building regulations and Standards and manufacturers' instructions
- a tank of the appropriate design and capacity

assess the requirements and feasibility for remote filling
select appropriate containments and associated components of the right dimensions
carry out appropriate moisture prevention procedures as necessary
ensure that external surfaces of tanks are clean, free from rust, oil or grease and protected with appropriate surface coatings

ELEMENT 15.2 INSTALL OIL FILLING AND PIPEWORK SUPPLY SYSTEMS

Performance Criteria – this is what you must do:

0. carry out checks to ensure the proper location of the outlet pipe
0. identify, position and fit system components
0. provide appropriate insulation of tanks, pipework and filters to ensure protection and adequate fuel flow
0. ensure that the fuel supply system gives adequate flow rate and pressure as specified by the appliance manufacturer.
0. provide appropriate insulation of tanks, pipework and filters to maintain adequate fuel temperatures to ensure protection and adequate fuel flow rate.
0. report and record all environmental incidents promptly and accurately to the appropriate environmental body

ELEMENT 15.3 INSTALL AND CONNECT TANKS

Performance Criteria – this is what you must do:

carry out an on site visual inspection of the tank to ascertain it is of the correct type, design, capacity and condition

where necessary, carry out damp proof procedures prior to lowering of tank and ensure that the tank is positioned on the supports in accordance with manufacturers' requirements

position and fix extended vent pipework to enable the safe installation of the tank

install and connect the tank in accordance with statutory regulations, industry codes of practice, British Standards, Building Regulations and Standards and manufacturers' instructions

carry out appropriate identification procedures with product identification labels and tags

conduct necessary tests to check that the tank and associated fuel pipework

- is installed in accordance with relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions
- is able to be filled safely
- meets the standard for pressure

pipework and ancillary components are filled and tested in accordance with relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions

report and record all environmental incidents promptly and accurately to the appropriate environmental body

Range:

(1) Tank fittings, Oil supply systems, Types of piping materials, Types of tank, Location of tank, Pressure testing	in relation to those required of a complex oil storage and supply system

Knowledge and Understanding – this is what you must know:

your capabilities and the limit of your responsibilities with regard to the installation of complex oil-fired systems and equipment and to whom you should report problems
the different type of materials used for oil pipework
appropriate forms of fitting and jointing materials including petroleum-resisting compounds and insulating materials
relevant British standards for a product identification system for petroleum products
appropriate fill and vent pipe diameters, couplings, location and fitting procedures for different size tanks including extended fill and vent pipes
what is acceptable tank support
the normal access and maintenance requirements for specific types of tanks
relevant statutory regulations, building regulations and standards, industry codes of practice, British standards and manufacturers' instructions applying to tank construction, installation and applying to internal, external and underground tank location
the different storage capacities of tanks in relation to system requirements and appliance ratings
appropriate fill and vent pipe diameters, couplings, location and fitting procedures for different size tanks including extended fill and vent pipes
what is acceptable tank support
the normal access and maintenance requirements for specific types of tanks
the uses of associated components such as electronic and manual gauges, alarms/warnings devices, fill pipes, couplings, and whether those selected meet industry requirements for the design of tank selected
when tank inclination is important and industry recommendations
different types of foundation and tank support required
how to ensure moisture prevention and anti-corrosion procedures for steel tanks
the importance of getting the location right in terms of access, maintenance and meeting industry standards
appropriate environmental, health and safety requirements for tank installation including fire protection standards, containment requirements in relation to tank capacity, control of pollution regulations including from environmental agencies and fire protection

UNIT 16

DESIGN OIL STORAGE AND SUPPLY SYSTEMS

Overview

This unit requires you show you can design oil storage and supply systems.

You must show you can comply with statutory regulations, Building regulations and standards, industry codes of practice, British Standards, manufacturers instructions and in accordance with customers/users needs, environmental regulations.

This unit consists of a two element Unit.

16.1 Review intended requirements of the oil storage and supply system

You must be able to:-

- assess requirements based on the requirements of the property including level of output required
- provide full information and options available to colleagues including issues such as cost and feasibility

16.2 Select design options for oil storage and supply system

You must be able to:-

- ensure design complies with relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions.
- obtain agreement from relevant people on presented design proposals
- amend system design options to meet job requirements
- ensure that operating factors are considered
- replace existing equipment where necessary

ELEMENT 16.1 REVIEW INTENDED REQUIREMENTS OF THE OIL STORAGE AND SUPPLY SYSTEM

Performance Criteria – this is what you must do:

3. identify and clarify the nature of the requirements of the systems

3. where there is an existing system, site structures and features evaluate the potential for adaptation

3. review the feasibility of the proposed adaptation against technical, legal and cost criteria

3. where the system is new, identify all relevant operating factors which will influence the new storage and supply systems

3. ensure that a risk assessment is carried out for incorporation in planning and associated documentation

1. review **key factors**(1) for siting oil storage and supply systems and the impact this will have on the final design

1. ensure your plans have due regard to access, maintenance requirements and relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions

2. identify different design options for evaluation and which meet **industry requirements**(2)

3. discuss the options with **relevant people**(3) to establish if they are technically feasible and cost-effective

Range:

(1) Key factors for siting oil storage and supply systems	general access and for maintenance, usage and size of tanks and components required user's requirements
(0) Industry requirements	Statutory regulations, Building regulations and Standards, British Standards, manufacturers instructions, industry codes of practice
(0) Relevant people	Private customer or representative Main contractor's representative Representatives of inspectorates Co-contractors

Knowledge and Understanding – this is what you must know:

All relevant health, safety and environmental factors including how to carry out a risk assessment
All relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions.
Types of oil storage and supply systems, their capacities and capabilities
Manufacturers' instructions and recommendations for usage

Appropriate methods of identifying requirements
The principles and features of alternative systems
The capacity and operating conditions of different systems
All technical criteria for evaluating potential adaptations
The ways of costing alternative system adaptations
All appropriate alternative ways of meeting the system requirements
The importance of getting the relevant person's agreement to the design proposals

ELEMENT 16.2 SELECT DESIGN OPTIONS FOR OIL STORAGE AND SUPPLY SYSTEMS

Performance Criteria – this is what you must do:

0. agree and fully cost a plan of action including the removal of any old components

0. ensure your design meets key operating requirements and include calculations to determine the required capacity of the tank storage system

0. where existing systems require removal, introduce all appropriate measures for their safe removal which comply with current legislation

0. agree with relevant people the final design which complies with relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions

0. obtain and record the relevant person's agreement on the design proposals

Range:

Key design requirements:	agreed standards for installations of oil storage and supply systems covering regulations and statutory requirements
Tank types	those appropriate to complex oil storage and supply systems

Knowledge and Understanding – this is what you must know:

relevant statutory regulations, building regulations and standards, industry codes of practice, British standards and manufacturers' instructions applying to tank construction, installation and applying to internal, external and underground tank location
how to carry out site surveys
how to calculate the requirements of system components – size and specification
methods of presenting design information to users/customers – including
drawings
specifications
the range of job information that is required to carry out design work across –
new buildings
existing properties
positioning requirements for complex oil storage and pipework supply components within systems and standard system layouts
the normal access and maintenance requirements for specific types of tanks
the different storage capacities of tanks in relation to system requirements and appliance ratings

UNIT 17

INSTALL COMPLEX OIL-FIRED SYSTEMS AND EQUIPMENT

Overview

This unit requires that you install complex oil systems and equipment.

This unit measures your ability on the use of statutory and industrial procedures to install a complex range of oil-fired systems and equipment.

You must comply with statutory regulations, Building regulations and standards, industry codes of practice, British Standards and manufacturers instructions in order to ensure that oil pipework, systems and equipment are installed to meet the customers/users needs and operate in a safe and efficient manner.

This is a single element Unit

You must be able to :-

Install complex oil-fired systems and equipment to meet customers, manufacturers and industry requirements.
Connect services to installed system and components
Test services connected to systems and components
Work in a safe methodical manner
Take precautionary actions to prevent use of unsafe installations.

Pipework, systems and equipment must be in relation to **complex** oil-fired systems

Performance Criteria - This is what you must do:

ensure that safety provisions within the immediate work location conform to the requirements of health and safety legislation and allows for the safe movement of the workforce, members of the public and materials

ensure that the **relevant person's**(1) property and building fabric is fully protected against possible damage being caused during the installation process

ensure that the **input services**(2) to the system components have been checked as being suitable for their intended purpose

confirm that the customer has job information on all key aspects of the installation process

confirm that the **materials, tools and equipment**(3) required for the installation processes are fit for their intended purpose

fabricate **system components**(4) using work methods that conform to **industry requirements**(6)

position and fix pipework, **systems and equipment**(9) to conform to the **system design requirement**(5) and **industry requirements**(6)

connect pipework, systems and equipment to systems and input services using methods that meet **industry requirements**(6)

when installing components and equipment they conform to the system design requirement as agreed with the relevant person(1)

where there are problems report to the **relevant person**(1) immediately making clear what the problems are with suggestions for possible solutions to the problem

confirm the integrity of the installed system using **soundness testing procedures**(7)

take **precautionary actions**(6) to prevent the unauthorised use of un-commissioned systems and components

RANGE:

(1) Relevant person	Private client/customer, whether tenant or owner Main contractor's representative Representatives of Inspectorates Co-contractor
(2) Input services	oil, water, electricity, ventilation
(3) Materials, tools and equipment	materials, tools and equipment required for the complex installation work which meet industry requirements, and are fit for purpose
(0) System components	fixings, fittings and other items relevant to installation
(0) System design requirements	agreed standards for installations covering regulations and statutory requirements
(0) Industry requirements	Statutory regulations, Building regulations and Standards, British Standards, manufacturers instructions, industry codes of practice
(0) Soundness testing procedures	pressure checks and tests,
(0) Precautionary actions	notices, warning labels, wearing personal protective equipment

Knowledge and understanding - this is what you must know:

your capabilities and the limit of your responsibilities with regard to the installation of complex oil-fired systems and equipment and to whom you should report problems
how to measure and record installation and site details for prefabrication purposes
industry codes of practice and work standards for installing complex oil-fired systems and for fabricating and installing system components
the positioning and fixing requirements for system components which conform to the system design and intended functions
the procedures required for checking suitability and connecting to input services or connecting pipework into existing systems
how to install oil-fired systems which require multiple appliances and control zones with particular reference to large sites
methods of working to protect building décor, property and existing systems or equipment
job management structures and methods of reporting and recording job progress or problems delaying progress
the care and maintenance requirements of tools and equipment, and checks for safe condition.
the range of tests used to confirm the soundness of systems and components and how to use the range of soundness test equipment.

UNIT 18

PRE-COMMISSION AND DECOMMISSION COMPLEX OIL-FIRED SYSTEMS AND EQUIPMENT

Overview

This unit requires that you show you can pre-commission and decommission a range of complex oil fired systems and equipment.

This Unit measures your ability in the use of statutory and industrial requirements to carry out a range of pre-commissioning checks and tests, and decommission complex oil fired systems, pipe work systems, tanks, and other associated equipment.

You must show you can comply with relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions in order to ensure that appliances and systems are pre-commissioned and decommissioned safely by removal or dismantling.

This Unit consists of two elements :

18.1 Carry out pre-commissioning checks and tests on complex oil-fired systems and equipment:

You must be able to:-

- ensure the whole system is installed to industry standards
- check incoming services have been utilised as intended
- carry out pre-commissioning checks and tests to include:
    - checking ventilation, flues, and that the system is purged

18.2 De-commission complex oil-fired systems and equipment

You must be able to:-

- Communicate the decommissioning requirements to co-contractors of the customer
- Check the operation of system controls
- Set system controls in-line with manufacturers and users requirements.
- Explain the operation of the decommissioning procedure to others
- Set the isolation valves to the necessary positions to enable safe decommissioning
- Test supplies to ensure that the decommissioning process is complete.
- Take precautionary action to ensure that decommissioned systems do not pose a safety hazard
- Demonstrate that you understand the requirements of carrying out pre-commissioning checks and tests on complex oil-fired systems and equipment and decommissioning complex oil-fired systems and equipment.

ELEMENT 18.1 CARRY OUT PRE-COMMISSIONING CHECKS AND TESTS ON COMPLEX OIL-FIRED SYSTEMS AND EQUIPMENT

Performance Criteria - this is what you must do:

18.1.1 confirm that the **system and equipment**(1) installation complies with **industry requirements**(2)

18.1.2 check that **input services**(3) to the **system components**(1) are suited to their intended purpose.

18.1.3 check **systems or components**(1) for soundness using procedures that comply with **industry requirements**(2)

18.1.4 carry out **pre-commissioning tests and checks**(4) in accordance with **industry requirements**(2)

18.1.5 check that the system cleanliness, additives and charging comply with **industry requirements**(2)

RANGE:

System and equipment	complex oil fired systems, pipe work systems, tanks, other associated equipment
Industry requirements	relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions
Input services	oil, water, electricity, ventilation,
Tests & checks	soundness tests pre-commissioning checks and tests

Knowledge and Understanding - this is what you must know:

the procedures, equipment and legislative requirements for applying soundness tests to systems
the methods of establishing that input services adequately supply all components within the system and that they have sufficient capacity to support the system
the methods of connecting components to systems
the actions to take where pre-commissioning checks or tests reveal system or component defects
how to complete pre-commissioning documentation confirming the safe commissioning of systems and components
pre-commissioning techniques appropriate to commercial/industrial uses or sites
which safety checks to make and who must be involved before starting pre-commissioning activities on a complex oil-fired system

ELEMENT 18.2 DECOMMISSION COMPLEX OIL-FIRED SYSTEMS AND EQUIPMENT

Performance Criteria - this is what you must do:

18.2.1 check the agreement on which section(s) of the oil-fired system is to be decommissioned and confirm the sequence for de-commissioning that is safe and complies with industry requirements

18.2.2 liaise with **other persons**(1) at appropriate points within the de-commissioning process to minimise disturbance to work routines

18.2.3 check that conditions within the system will permit safe de-commissioning

18.2.4 decommission complex **systems and components**(2) using tests and procedures, which comply with **industry requirements**(3)

18.2.5 take **precautionary actions**(4) to ensure that de-commissioned **systems and components**(2) do not prove a safety hazard

18.2.6 ensure that arrangements have been made for the safe removal of system contents and old equipment in line with the activity undertaken

RANGE:

(0) Other persons	Private client/customer, whether tenant or owner Main contractor's representative Representatives of inspectorates Co-contractor
(0) System components	oil fired systems, pipe work systems, storage tanks and associated components
(0) Industry requirements	relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions
(0) Precautionary actions	adequate combustion and ventilation air supply and routes, British standards, Building regulations and Standards requirements for non closable openings,

Knowledge and Understanding - this is what you must know:

your capabilities and the extent of your responsibilities with regard to the pre-commissioning and decommissioning of complex oil-fired systems and equipment and to whom you should report problems

the importance of confirming the system design, specification, functions and outcomes of suspending the operation of the system

the need to check the sequence of decommissioning that is safe and complies with industry and safety regulations

the need to liaise with others whose procedures or routines may be affected by the suspension of the system operation

the potential hazards that could arise from complex de-commissioning activities and the safety checks to be carried out before de-commissioning takes place

de-commissioning procedures for temporary and permanent de-commissioning of systems

the precautions to ensure that de-commissioned systems do not prove a safety hazard – measures to prevent systems being brought into operation – safety and warning notices

the procedures and requirements for the safe collection and disposal of system contents and equipment that may be hazardous to health or the environment.

how to complete system de-commissioning records and documentation appropriate to the complex systems and equipment

UNIT 19

DIAGNOSE AND RECTIFY FAULTS IN COMPLEX OIL-FIRED SYSTEMS AND EQUIPMENT

Overview

This unit requires you diagnose and rectify faults in complex oil-fired systems and equipment that occur outside of or in addition to servicing and commissioning of oil-fired systems and equipment.

You must show that you can comply with statutory regulations, industry codes of practice, British standards, Building Regulations and Standards and manufacturers' instructions to ensure that the diagnosis and rectification of faults on complex systems is undertaken in a safe and efficient manner.

19.1 Establish nature of malfunction

You must be able to:-

prepare the work area
obtain information on the condition of and malfunctions in the present system and equipment through a variety of means
obtain such information whilst complying with statutory regulations, industry codes of practice, Building Regulations and Standards, British standards and manufacturers' instructions
demonstrate you can handle faults occurring in complex oil-fired systems and equipment

19.2 Rectify faults in complex oil fired systems and equipment

You must be able to:-

- rectify faults and restore supply in accordance with relevant statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions
- upon completion of repairs conduct tests to ensure that all sections of the system and equipment are fully operational.

ELEMENT 19.1 ESTABLISH NATURE OF MALFUNCTION

Performance Criteria – this is what you must do:

4. prepare the work area to ensure safe working and cleanliness of site
4. establish the current condition of the **type of oil-fired system and equipment**
4. obtain detailed information on servicing, previous operation and any changes to appliances from a variety of means
4. carry out a visual inspection of the system to establish potential areas of malfunction
4. conduct a logical sequence of tests to establish the **type of fault**
4. whilst reviewing the functionality of the different **components of the system** minimise disruption
4. perform all fault diagnosis activities safely and according to statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions

Range:

(1) Types of faults:	relating to different components, or component failure or misuse of the system
(2) Types of oil-fired system and equipment :	those relating to a complex oil-fired system and including the connected mechanical system (wet system)
(3) Components of system:	pumps, valves, control, safety features/devices, expansion equipment, flues and ventilation

Knowledge and Understanding – this is what you must know:

a) the various oil fired systems and equipment
a) risk assessment procedures for diagnosis
a) analysis methods and techniques used in problem solving
a) standard testing procedures and how to use standard testing equipment
a) different components and their characteristics with relation to fault-finding
a) information required to assist with fault finding and their sources
a) faults and their symptoms in complex oil-fired systems and equipment in relation to:
   - electrical faults
   - system faults
   - oil availability and supply faults
   - combustion faults
   - flue and ventilation
a) sequential checks to conduct in order to identify and isolate faults
a) probable causes of faults in relation to different types of burner
a) environmental, health and safety factors to take into account when diagnosing faults

ELEMENT 19.2 RECTIFY FAULTS IN OIL FIRED SYSTEMS AND EQUIPMENT

Performance Criteria – this is what you must do:

11. **rectify faults** following statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions
11. restore oil supply systems to normal operation following statutory regulations, industry codes of practice and manufacturers' instructions
11. locate and repair any oil leakage following statutory regulations, industry codes of practice, British Standards and manufacturers' instructions
11. record and report the disposal of contaminated ground or materials to licensed persons
11. conduct repair procedures in a manner which minimises disruption and inconvenience in the minimum time, compatible with safety
11. carry out tests to ensure that appliances and systems can be returned to full working order
11. perform all fault rectification safely according to statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions
11. record results of tests in accordance with organisation's procedures
11. report and record all environmental incidents promptly and accurately to the appropriate Environment bodies

Range:

(1) Rectification of faults :	relating to mechanical systems,

Knowledge and Understanding – this is what you must know:

f) your capabilities and the extent of your responsibilities with regard to the rectification of complex oil-fired systems and equipment and to whom you should report problems
f) repair techniques and procedures for different types of fault
f) risk assessment procedures in relation to carrying our rectification and repair procedures
f) standard testing procedures for returning systems and equipment to normal working order
f) relevant statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions relating to diagnosis and repair of complex oil-fired systems and equipment
f) environmental, health and safety factors to take into account when rectifying faults
f) relevant statutory regulations, industry codes of practice, British standards, Building regulations and standards and manufacturers' instructions

UNIT 20

PRE-COMMISSION AND DECOMMISSION COMPLEX OIL STORAGE AND SUPPLY SYSTEMS AND ASSOCIATED EQUIPMENT

Overview

This unit requires that you show you can pre-commission and decommission a range of complex oil storage and supply systems.

This Unit measures your ability in the use of statutory and industrial requirements to carry out the necessary range of pre-commissioning checks and tests, and decommission complex oil storage and supply systems and associated equipment.

You must comply with relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions in order to ensure that tanks, supply systems and associated equipment are pre-commissioned and decommissioned safely by removal or dismantling.

This Unit consists of two elements :

20.1 Carry out pre-commissioning checks and tests on complex oil storage and supply systems and associated equipment

You must be able to :

- ensure the oil storage and supply systems and associated equipment are installed to industry requirements
- carry out pre-commissioning checks and tests to confirm:
    - that the tank and associated fuel pipework is installed in accordance with relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions
    - is able to be filled safely
    - meets the standard for pressure

20.2 De-commission complex oil storage and supply systems and associated equipment

You must be able to:-

- communicate the decommissioning requirements to others
- explain the operation of the decommissioning procedure to others
- set the isolation valves to the necessary positions to enable safe decommissioning
- test supplies to ensure that the decommissioning process is complete.
- take precautionary action to ensure that decommissioned systems do not pose a safety hazard

- demonstrate that you understand the requirements of carrying out pre-commissioning checks, tests and the decommissioning of complex oil storage and supply systems and associated equipment.

ELEMENT 20.1 CARRY OUT PRE-COMMISSIONING CHECKS AND TESTS ON COMPLEX OIL STORAGE AND SUPPLY SYSTEMS

Performance Criteria - this is what you must do:

20.1.1 confirm that the complex **storage system** (1) installation complies with **industry requirements**(2)

20.1.2 check that the fittings, supply systems and associated equipment suit their intended purpose and the installation complies with industry requirements

20.1.3 check the complex **storage system** (1) meet the pressure tests using procedures that comply with **industry requirements**(2)

20.1.4 carry out other **pre-commissioning tests and checks**(3) in accordance with **industry requirements**(2)

20.1.5 check that the storage system capacity, labelling and supply system comply with **industry requirements**(2)

RANGE:

(1) Storage and supply system	oil storage tanks, supply systems and other associated equipment appropriate to complex systems
(2) Industry requirements	relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions
(3) Tests & checks	leakage/ pressure tests and other pre-commissioning checks and tests

Knowledge and Understanding - this is what you must know:

a) the procedures, equipment and legislative requirements for applying tests to storage systems
b) the actions to take where pre-commissioning checks or tests reveal system or component defects
c) how to complete pre-commissioning documentation confirming the safe commissioning of storage and supply systems
d) pre-commissioning techniques appropriate to complex systems
e) which safety checks to make and who must be involved before starting pre-commissioning activities on a complex oil storage and supply system

ELEMENT 20.2 DECOMMISSION COMPLEX OIL STORAGE AND SUPPLY SYSTEMS

Performance Criteria - this is what you must do:

20.2.1 check the agreement on which section(s) of the oil-fired system is to be decommissioned and confirm the sequence for de-commissioning that is safe and complies with industry requirements

20.2.2 liaise with **other persons**(1) at appropriate points within the de-commissioning process to minimise disturbance to work routines

20.2.3 check that conditions within the system will permit safe de-commissioning

20.2.4 decommission **complex storage and supply systems** (2) using tests and procedures, which comply with **industry requirements**(3)

20.2.5 take **precautionary actions**(4) to ensure that de-commissioned **complex storage and supply systems**(2) do not prove a safety hazard

20.2.6 ensure that arrangements have been made for the safe removal of system contents and old equipment in line with the activity undertaken

RANGE:

(1) Other persons	Private client/customer, whether tenant or owner Main contractor's representative Representatives of inspectorates Co-contractor
(2) Storage and supply system	oil storage tanks, supply systems and other associated equipment appropriate to complex systems
(3) Industry requirements	relevant statutory regulations, Building regulations and Standards, industry codes of practice, British standards and manufacturers' instructions
(4) Precautionary actions	adequate combustion and ventilation air supply and routes, British standards, Building regulations and Standards requirements for non closable openings,

Knowledge and Understanding - this is what you must know:

a) your capabilities and the extent of your responsibilities with regard to pre-commissioning and de-commissioning complex oil storage and supply systems and associated equipment and to whom you should report problems
b) the importance of confirming the system design, specification, functions and outcomes of suspending the operation of the system
c) the need to check the sequence of decommissioning that is safe and complies with industry and safety regulations

d) the need to liaise with others whose procedures or routines may be affected by the suspension of the system operation
a) the potential hazards that could arise from complex de-commissioning activities and the safety checks to be carried out before de-commissioning takes place
a) de-commissioning procedures for temporary and permanent de-commissioning of storage and supply systems
a) the precautions to ensure that de-commissioned systems do not prove a safety hazard – measures to prevent systems being brought into operation – safety and warning notices
a) the procedures and requirements for the safe collection and disposal of storage system contents and equipment that may be hazardous to health or the environment.
a) how to complete system de-commissioning records and documentation appropriate to the usage or site