



Unit Title:	Technical fault diagnosis
OCR unit number:	226
Level:	4
Credit value:	15
Guided learning hours:	90
Unit reference number:	L/500/7391

Candidates undertaking this unit must complete real work activities in a work environment. Simulation is only allowed in exceptional circumstances (please refer to the centre handbook for further details).

Unit aim and purpose

This unit is for learners who are involved in implementing and maintaining the diagnostic process and providing specialist support to others.

This is the ability to implement and maintain processes and techniques designed to diagnose the causes of faults within a technical context. This will include the review and improvement of approaches for routine and non-routine faults.

Learning Outcomes	Assessment Criteria	Knowledge, understanding and skills
<p>The Learner will:</p> <p>1 Understand the organisation's maintenance philosophy and the methods and information it requires</p>	<p>The Learner can:</p> <p>1.1 Describe the maintenance philosophy and processes used by the organisation</p> <p>1.2 Explain the types of diagnostic information that are commonly needed:</p> <ul style="list-style-type: none"> • problem description • problem history • problem location • technical information on a specified range of products including the system under investigation <p>1.3 Explain the following diagnostic methods and give examples of their appropriate use:</p> <ul style="list-style-type: none"> • substitution • replication • performance and functional testing • environment change <p>1.4 Explain how the following</p>	<p>Candidates must have a detailed understanding of:</p> <ul style="list-style-type: none"> • the maintenance philosophy to include: <ul style="list-style-type: none"> - how it fits into the strategic process - "The Maintenance Approach" - structure - cost effectiveness - resources - functionality versus improvement - technology utilised, support systems - performance aimed for • the information required in order to carry out effective fault diagnosis and why this information is required • the purpose of the following diagnostic methods and when they would be used: <ul style="list-style-type: none"> - substitution

Learning Outcomes	Assessment Criteria	Knowledge, understanding and skills
	<p>considerations can affect fault diagnosis.</p> <ul style="list-style-type: none"> • minimisation of service disruption during diagnostics • individual responsibility and authority • escalation procedure • service level agreements <p>1.5 Interpret specialist technical information on a range of products</p>	<ul style="list-style-type: none"> - replication - performance and functional testing - environmental change • factors that can effect fault diagnosis
<p>2 Maintain the diagnostic process and provide specialist support to others</p>	<p>2.1 Develop diagnostic tools</p> <p>2.2 Review and specify approved sources of diagnostic information</p> <p>2.3 Review and specify documentation and other recording systems to support diagnosis</p> <p>2.4 Analyse information across a wide range of faults to identify common issues</p> <p>2.5 Review and specify processes for identifying issues such as:</p> <ul style="list-style-type: none"> • poor product design. • poor manufacture • poor performance • poor implementation • high rates of failure <p>2.6 Provide specialist guidance to support diagnosis</p>	<p>Candidates must be able to:</p> <ul style="list-style-type: none"> • review and evaluate the diagnostic processes in place • source and develop relevant diagnostic tools • extensively analyse results for a wide range of faults • specify appropriate processes to identify a wide range of issues • provide specialist guidance to others to support the fault diagnosis process.
<p>3 Select and improve approaches to remedy for non-routine faults</p>	<p>3.1 Review and specify suitable remedies to rectify identified faults taking into account the following:</p> <ul style="list-style-type: none"> • business or service impact • resource and skill availability • ease of implementation • cost effectiveness • performance • compatibility • time 	<p>Candidates must be able to:</p> <ul style="list-style-type: none"> • carry out reviews of fault remedies in place and consider more effective alternatives. • identify trends in faults and consider preventative maintenance techniques to prevent reoccurrence.

Learning Outcomes	Assessment Criteria	Knowledge, understanding and skills
	<ul style="list-style-type: none"> • permanence 3.2 Identify possible ways to prevent reoccurrence of diagnosed faults	
4 Implement processes for diagnosis and remedy records	4.1 Implement approaches to documenting the diagnosis activities undertaken including: <ul style="list-style-type: none"> • fault description • supporting information • diagnostic tools etc used • cause of fault • remedy selected 	Candidates must: <ul style="list-style-type: none"> • understand the importance of documenting the diagnostic process and the information required. Candidate must be able to: <ul style="list-style-type: none"> • design and implement diagnostic systems and procedures to include the documentation of the diagnostic process.

Assessment

Candidates undertaking this unit must complete real work activities in order to produce evidence to demonstrate they are occupationally competent. Real work is where the candidate is engaged in activities that contribute to the aims of the organisation by whom they are employed, for example in paid employment or working in a voluntary capacity.

Simulation is only allowed for aspects of units when a candidate is required to complete a work activity that does not occur on a regular basis and therefore opportunities to complete a particular work activity do not easily arise. When simulation is used, assessors must be confident that the simulation replicates the workplace to such an extent that candidates will be able to fully transfer their occupational competence to the workplace and real situations.

Internal quality assurance personnel must agree the use of simulated activities before they take place and must sample all evidence produced through simulated activities.

It is the assessor's role to satisfy themselves that evidence is available for all performance, knowledge and evidence requirements before they can decide that a candidate has finished a unit. Where performance and knowledge requirements allow evidence to be generated by other methods, for example by questioning the candidate, assessors must be satisfied that the candidate will be competent under these conditions or in these types of situations in the workplace in the future. Evidence of questions must include a written account of the question and the candidate's response. Observations and/or witness testimonies must be detailed and put the evidence into context ie the purpose of the work etc.

All of the assessment criteria in the unit must be achieved and clearly evidenced in the submitted work, which is externally assessed by OCR.

Evidence for the knowledge must be explicitly presented and not implied through other forms of evidence.

Evidence requirements

All aspects of the assessment criteria must be covered and evidence must be available that shows where and how the assessment criteria have been achieved.

Assessment criterion 1

The candidate could provide evidence in the form of a report, personal statement or presentation supported by relevant documentation. This could be supported by a detailed witness testimony, a detailed assessor observation or professional discussion.

Candidates must describe the maintenance philosophy and processes used by their organisation. This should include the following:

- how it fits into the strategic process
- “The Maintenance Approach”
- structure
- cost effectiveness
- resources
- functionality versus improvement
- technology utilised, Support systems
- performance aimed for

Candidates must explain the types of diagnostic information to be recorded to include:

- problem description
- problem history
- problem location
- technical information on a specified range of products including the system under investigation

Candidates must explain the following diagnostic methods and give examples of when they would be used:

- substitution
- replication
- performance and functional testing
- environment change

Candidates must explain the following factors that can affect diagnostics and where possible provide examples:

- minimisation of service disruption during diagnostics
- individual responsibility and authority
- escalation procedure
- service level agreements

Candidates must provide evidence of interpreting specialist technical information on a range of products. Evidence could be presented by learners annotating screen prints or printouts from diagnostic tools used.

Assessment criterion 2

Candidates must provide evidence of maintaining the diagnostic process and provide specialist support to others. The evidence could be presented via a report or a personal statement supported by documentation from diagnostics carried out eg annotated results etc. The candidates should provide evidence for the identification of a wide range of acceptable diagnostic tools to

support both common and non-common faults. Evidence from provide specialist support to others could include detailed witness testimonies explaining the context of the support and how effective the learner was in their support.

Assessment criterion 3

Candidates could provide evidence from carry out an in depth review an analysis of faults that have occurred paying particular attention to reoccurring faults. They should provide evidence of analysing the most effective methods for rectifying the faults to include the following:

- business or service impact
- resource and skill availability
- ease of implementation
- cost effectiveness
- performance
- compatibility
- time
- permanence

Candidates should also provide evidence of analysing the factors that cause reoccurring faults and consider ways that these can be addressed eg preventative maintenance, substitution, renewal etc.

Assessment criterion 4

Candidates must provide evidence of creating, implementing and using documentation which will support the recording of the fault diagnosis and subsequent remedy. Candidates may present evidence using a personal statement, report or presentation. The evidence must however, include documentary evidence used.

Guidance on assessment and evidence requirements

Evidence can reflect how the candidate carried out the process or it can be the product of a learner's work or a product relating to the candidate's competence.

For example: The process that the learner carries out could be recorded in a detailed personal statement or witness testimony. It is the assessor's responsibility to make sure that the evidence a candidate submits for assessment meets the requirements of the unit

Questioning the candidate is normally an on-going part of the assessment process, and is necessary to:

- test a candidate's knowledge of facts and procedures
- check if a candidate understands principles and theories *and*
- collect information on the type and purpose of the processes a candidate has gone through
- candidate responses must be recorded

It is difficult to give a detailed answer to how much evidence is required as it depends on the type of evidence collected and the judgement of assessors. The main principles, however, are as follows: for a candidate to be judged competent in a unit, the evidence presented must satisfy:

- all the items listed, in the section 'Learning Outcomes'
- all the areas in the section 'Assessment Criteria'

The quality and breadth of evidence provided should determine whether an assessor is confident that a candidate is competent or not. Assessors must be convinced that learners working on their own can work independently to the required standard.

You should refer to the '*Admin Guide: Vocational Qualifications (A850)*' for *Notes on Preventing Computer-Assisted Malpractice*.

Resources

The candidate should conduct effective research to evaluate the wide range of IT diagnostic tools available. This should include the cost, functionality and compatibility. They should also undertake wider reading from a variety of maintenance and fault repair books that are available eg PC + Hardware Maintenance and Repair (Professional Series) by Michael Graves; A+ Computer Maintenance.

Additional information

For further information regarding administration for this qualification, please refer to the OCR document '*Admin Guide: Vocational Qualifications*' (A850) on the OCR website www.ocr.org.uk.