QCF Unit and Assessment Specification

Unit title	Carry Out Engineering Activities Efficiently and Effectively
Ofqual Unit code	D/600/5784
SQA Unit code	FT2T 60
SSC Ref	Unit 79

History of changes

Publication date: March 2012

Version: completed by SQA

Version number	Date	Description	Authorised by

QCF Unit specification

Title	Carry Out Engineering Activities Efficiently and Effectively
Level	2
Credit value	4

Learning Outcomes **The learner will:**	**Assessment Criteria** **The learner can:**
1 Work efficiently and effectively in engineering.	1.1 Work safely at all times, complying with Health and Safety legislation, regulations and other relevant guidelines. 1.2 Ensure that they apply all of the following checks and practices at all times during the engineering activities: ♦ adhere to procedures or systems in place for risk assessment, COSHH, personal protective equipment and other relevant safety regulations ♦ wear the appropriate personal protective equipment for the work area and specific activity being carried out ♦ use all tools and equipment safely and correctly, and only for their intended purpose ♦ ensure that the work area is maintained and left in a safe and tidy condition. 1.3 Plan the engineering activities before they start them. 1.4 Prepare for the specific engineering activity, by producing a work plan which includes all of the following: ♦ documentation required (such as drawings, technical/reference documents - such as tapping drill sizes, imperial to metric conversion books, component specifications, quality documentation) ♦ materials required (such as stock material, components, part-machined components, cables/wire, welding consumables)

Learning Outcomes The learner will:	Assessment Criteria The learner can:
	♦ equipment required (such as machine tools to be used, lifting and handling equipment, bending and forming equipment, anti-static equipment, test equipment) ♦ workholding methods and equipment (such as machine or bench vice, clamps, special workholding arrangements), where appropriate ♦ tools required (such as hand tools, portable power tools, cutting tools, soldering irons) ♦ measuring equipment required (such as mechanical, electrical, pressure, flow, level, speed, sound) ♦ the operating sequence to be followed. ♦ timescale required to complete the engineering operations. 1.5 Prepare the work area for carrying out the engineering activity. 1.6 Prepare to carry out the engineering activity, ensuring all of the following, as applicable to the work to be undertaken: ♦ the work area is free from hazards and is suitably prepared for the activities to be undertaken ♦ any required safety procedures are implemented ♦ any necessary personal protection equipment is obtained, and is in a usable condition ♦ tools and equipment required are obtained and checked that they are in a safe and usable condition ♦ all necessary drawings, specifications and associated documents are obtained ♦ job instructions are obtained and understood ♦ the correct materials or components are obtained ♦ appropriate authorisation to carry out the work is obtained.

Learning Outcomes **The learner will:**	**Assessment Criteria** **The learner can:**
	1.7 Obtain all necessary tools and equipment and check that they are in a safe and usable condition. 1.8 Deal promptly and effectively with problems within their control, and seek help and guidance from the relevant people if they have problems that they cannot resolve. 1.9 Deal with problems affecting the engineering activity, to include two of the following: ♦ materials ♦ tools and equipment ♦ drawings ♦ job specification ♦ quality ♦ people ♦ timescales ♦ safety ♦ work activities or procedures.
2 Work more efficiently and effectively in engineering.	2.1 Maintain effective working relationships with colleagues and supervisors. 2.2 Create and maintain effective working relationships, to include carrying out all of the following: ♦ turning up at their place of work on time and suitably dressed for the work activities to be carried out ♦ following instructions given to them and checking out any uncertainties before they start work ♦ seeking information and assistance in a courteous and polite manner ♦ taking advice from others in a positive way ♦ dealing with disagreements in an amicable and constructive way ♦ communicating with others nearby to make sure that they know about actions they are taking which may affect their work

Learning Outcomes The learner will:	Assessment Criteria The learner can:
	♦ showing respect for the views, rights and property of others. 2.3 Review personal training and development, as appropriate to the job role. 2.4 Contribute to developing their own engineering competence, to include all of the following: ♦ describing the levels of skill, Knowledge and Understanding needed for competence in the areas of work expected of them ♦ describing their development objectives/program, and how these were identified ♦ providing information on their expectations and progress towards their identified objectives ♦ using feedback and advice to improve their personal performance. 2.5 Tidy up the work area on completion of the engineering activity. 2.6 Complete the work activities, to include all of the following: ♦ returning tools and equipment to the designated location ♦ returning drawings and work instructions ♦ disposing of waste materials, in line with organisational and environmental requirements ♦ completing all necessary documentation accurately and legibly ♦ identifying, where appropriate, any damaged or unusable tools or equipment. 2.7 Contribute to, and communicate opportunities for, improvement to working practices and procedures.

Learning Outcomes **The learner will:**	**Assessment Criteria** **The learner can:**
	2.8 Contribute to organisational procedures for identifying opportunities for improvement to one of the following: ♦ working practices ♦ working methods ♦ quality ♦ tools and equipment ♦ internal communication ♦ teamwork ♦ training and development ♦ safety ♦ other.
3 Know how to work efficiently and effectively in engineering.	3.1 Describe the safe working practices and procedures to be followed whilst preparing and tidying up their work area. 3.2 Explain how to present themselves in the workplace suitably dressed for the activities to be undertaken (such as being neat, clean and dressed in clothes appropriate to the area of activity; ensuring that, if they have long hair, it is tied back or netted; and removing any jewellery or other items that can become entangled in the machinery). 3.3 Describe the personal protective equipment to be worn for the engineering activities undertaken (such as correctly fitting overalls, safety shoes, eye protection, ear protection). 3.4 Describe the correct use of any equipment used to protect the health and safety of themselves and their colleagues.

Learning Outcomes The learner will:	Assessment Criteria The learner can:
	3.5 Explain how to plan and prepare to carry out the engineering activity (such as obtaining the appropriate drawings/documentation to be used, determining the materials required, determining the tools and equipment required, determining a suitable sequence of operations, determining the quality checks to be made and equipment to be used). 3.6 Describe the procedure for ensuring that all documentation relating to the work being carried out is available, prior to starting the activity. 3.7 Describe the procedure for ensuring that all tools and equipment are available prior to undertaking the activity. 3.8 Describe the checks to be carried out to ensure that tools and equipment are in full working order, prior to undertaking the activity. 3.9 Describe the checks to be carried out to ensure that all materials required are correct and complete, prior to undertaking the activity. 3.10 Describe the action that should be taken if documentation, tools and equipment or materials are incomplete or do not meet the requirements of the activity. 3.11 Describe their role in helping to develop their own skills and knowledge (such as checking with their supervisor about the work they are expected to carry out and the standard they need to achieve; the safety points to be aware of and the skills and knowledge they will need to develop).

Learning Outcomes **The learner will:**	**Assessment Criteria** **The learner can:**
	3.12 Describe the benefits of continuous personal development, and the training opportunities that are available in the workplace. 3.13 Describe the importance of reviewing their training and development with trainers and supervisors, of comparing the skills, Knowledge and Understanding that they have at any given point with the competences they need to develop, and of setting objectives to overcome any shortfall or address any development needs. 3.14 Describe their responsibilities for providing evidence of their performance and progress (such as submitting work for assessment or the completion of assignments or tests).
4 Know how to work efficiently and effectively in engineering (continued).	4.1 Describe the importance of maintaining effective working relationships within the workplace (such as listening attentively to instructions told to them by their supervisor, making sure they ask for help and advice in a polite and courteous manner, responding positively to requests for help from others). 4.2 Describe the reason for informing others of their activities which may have impact on their work (such as the need to temporarily disconnect a shared resource like electricity or compressed air supply; making undue noise or creating sparks, fumes or arc flashes from welding). 4.3 Explain how to deal with disagreements with others in ways which will help to resolve difficulties and maintain long term relationships.

Learning Outcomes The learner will:	Assessment Criteria The learner can:
	4.4 Describe the organisational procedures to deal with and report any problems that can affect working relationships. 4.5 Describe the difficulties that can occur in working relationships, and how to resolve them. 4.6 Describe the sorts of attitudes and requests that are likely to create conflict or negative responses. 4.7 Describe the regulations that affect how they should be treated at work (such as Equal Opportunities and Equal Pay, Race Relations and Sex Discrimination, Working Time Directive, Disabled Persons Acts). 4.8 Describe the importance of making a contribution to improving working practices and procedures, and the procedure and format for making suggestions for improvements. 4.9 Describe the benefits to them and to the organisation if improvements can be identified and implemented. 4.10 Describe the need to dispose of waste materials and consumables (such as oils and chemicals) in a safe and environmentally friendly way. 4.11 Explain where tools and equipment should be stored and located, and the importance of returning all tools and documentation to their designated area on completion of their work activities. 4.12 Explain when to act on their own initiative and when to seek help and advice from others.

Learning Outcomes The learner will:	Assessment Criteria The learner can:
	4.13 Describe the importance of leaving the work area in a safe condition on completion of their activities (such as equipment correctly isolated, cleaning the work area and removing and disposing of waste).

Additional information about the Unit

Unit purpose and aim(s)

To provide the learner with the practical engineering skills and procedures required to undertake duties as an Electro-technical Officer on board a merchant vessel.

Unit expiry date

31 December 2014

Details of the relationship between the Unit and relevant national occupational standards (if appropriate)

Details of the relationship between the Unit and other standards or curricula (if appropriate)

CO1 — Monitor and operate engine room machinery, C11 — Prepare and operate vessel propulsion machinery and ancillary systems C12 — Operate vessel auxiliaries and service machinery.

International Maritime Organisation (IMO) standards for training and certification for watchkeeping (stcw) requirements for an Electro-technical Officer at Operational Level.

Assessment requirements specified by a sector or regulatory body (if appropriate)

This Unit must be assessed in a work environment and must be assessed in accordance with the 'Common Requirements for National Vocational Qualifications (NVQ) in the QCF' which can be downloaded from Semta's website:

http://www.semta.org.uk/training_providers__awarding/national_occupational_standard/qca_assessment_requirements.aspx

Additional assessment requirements have been published by Semta. These additional assessment requirements are set down in Semta's Performing Engineering Operations Level 2 Unit assessment strategy which can be downloaded from Semta's website:

http://www.semta.org.uk/training_providers__awarding/national_occupational_standard/qca_assessment_requirements.aspx

Additional information about the Unit (cont)
Endorsement of the Unit by a sector or other appropriate body (if required)
Maritime and Coastguard Agency (MCA)
Location of the Unit within the subject/sector classification system
4.1 Engineering
Name of the organisation submitting the Unit
EAL
Availability for use
Shared
Availability for delivery
September 2011
Guided Learning Hours
29

QCF Assessment specification

Assessment (evidence) Requirements
The following evidence is required to demonstrate that learners have the appropriate level of knowledge to carry out engineering activities efficiently and effectively. .All Learning Outcomes and Assessment Criteria must be achieved. Written and/or recorded oral evidence is required for the following: ♦ Learning Outcome 2 — Assessment Criterion 4 ♦ Learning Outcomes 3 and 4 Performance evidence in the workplace or in an appropriate simulated environment is required for the following: ♦ Learning Outcome 1 ♦ Learning Outcome 2 — Assessment Criteria 1, 2, 3, 5, 6, 7 and 8 This could be achieved through the observation of learners undertaking practical exercises. An approved Maritime Skills Alliance (MSA) approved Training Record Book (TRB) should be used to record evidence of achievement.
Guidance on Instruments of Assessment
Performance evidence can be generated using an approved Maritime Skills Alliance (MSA) approved Training Record Book (TRB) and/or practical exercises. Short answer written questions and/or oral interview could be used for the other Outcomes and Assessment Criteria.