# **Guidance for producing centre devised tasks for 2463**



Qualification title: City & Guilds Certificate in Marine Construction System Engineering & Maintenance	Qualification number: 2463

### Guidance relating to all centre devised units for this qualification

The following guidance applies to all of the centre devised units listed. Where individual units require specific guidance, this is provided in the next section; Unit specific guidance.

## Generic guidance for units:

# Task Setting:

Each task will consist of

- planning and preparation
- carry out an appropriate risk assessment
- execution of the activity complying with current Health & Safety requirements and legislation
- inspection of the finished work
- recording and reporting on the completed task.

Specific guidance for each unit is given below.

In order to ensure all the knowledge requirements are covered, additional underpinning knowledge questions will need to be completed by the candidate.

City & Guilds has produced a set of questions for each unit. These should be treated as a separate assessment task and the standard forms used (ie fronted by GF2/3 if written of GF1 or alternative if oral).

## Forms of Evidence:

It is expected that the following forms of evidence will be produced for these units:

- Candidate report (fronted by GF2/3) and discussion with assessor (recorded on GF1).
- Inspection report form including marked up diagrams (centre devised form or GF1).
- Report, either on pre-prepared pro forma supplied by the assessor, or a written report and assessor checklist (fronted by GF2/3)
- Written report to include planning of the task, annotated illustrations of the process (e.g. drawings, photographs). (Any illustrations must clearly state what the candidate is doing/did) and completed job card and/or inspection report (fronted by GF2/3).
- Photographic evidence or actual work piece (fronted by GF2/3).



All candidate produced material should be fronted by GF2/3 and any evidence recorded by the assessor should be on GF1, or where appropriate a centre devised alternative, or media recording. Audio or video (media) recordings must be securely saved as evidence, clearly identified as relating to the candidate in question and accessible to the I&EV).

#### **Conditions:**

#### **Practical tasks**

The assignment should take place in the workshops and classrooms of a centre with full facilities for boat-building and/or marine engineering activities, with all the appropriate equipment, relevant tools and consumables for working with boat-building and/or marine engineering materials.

## **Underpinning knowledge questions**

The short answer underpinning knowledge questions must all be taken under supervised conditions as closed-book tests and must not be completed as homework.

This means that all the activities will be completed with the assessor, or other designated supervisor, present.

Strict exam regulations (e.g. JCQ ICE) do not apply; it is envisaged that most candidates will take the short answer questions in their normal learning environment with their own tutor present. Alternatively, assessors may ask the questions orally and record individual candidate's responses on the assignment evidence recording form. In the event of a candidate failing the knowledge task, the whole task does not need to be re-taken. The assessor will need to make a judgement on the specific areas of knowledge/understanding that the candidate is weak and devise suitable alternative questions or tasks. It is expected that some feedback or reflection, further teaching or practice will be required so immediate resit is not appropriate.

Please note that the mark scheme is given for guidance purposes, and is not prescriptive. Assessor's discretion as to the quality of answer is required, and alternative, recognised and acceptable answers can be considered if they fall within the scope of the question.

# Marking and grading criteria to be applied

Please refer to the Generic Grading Criteria (GM2) for the detailed descriptors for pass, merit and distinction.

The following will apply for the below units:

Performance of techniques/methods/skills (PT)

Practical application of knowledge and understanding (AKU)

Knowledge (K)

Understanding (U)



# Unit specific guidance

This guidance relates to the individual unit only and is in addition to any generic guidance specified for it above.

Title: Yacht & boatbuilding assembly & sub-assembly	Graded: pass/merit/distinction	Sample assessment:
Task Setting:		
The equipment to be worked on during the assignment should in	clude the following:	
<ul> <li>An actual or simulated yacht &amp; boatbuilding assembly an</li> </ul>	•	
<ul> <li>Suitable material of sufficient size and quality to demonst boatbuilding assembly &amp; sub assembly components.</li> </ul>	rate marine industry standards and specifica	ations required to produce yacht and
<ul> <li>Suitable tools and equipment of sufficient quality to demo boatbuilding assembly and sub assembly components.</li> </ul>	onstrate marine industry standards and spec	ifications required to produce yacht &
Appropriate tasks will include		
<ul> <li>Interpret drawings, data and specifications.</li> </ul>		
<ul> <li>Utilise information from the specifications to create a prod</li> </ul>	duction schedule.	
<ul> <li>Carry out an appropriate risk assessment.</li> </ul>		
<ul> <li>Produce moulds and templates and/or a cutting list to ne</li> </ul>	cessary for the production of assembly and	sub-assembly components.
<ul> <li>Select and use a range of marine materials/ fasteners/ad</li> </ul>	hesives/bedding compounds as specified in	the unit's assessment criteria range.
<ul> <li>Produce assembly and sub-assembly boat components to</li> </ul>	using appropriate hand/power & machine too	ols.
<ul> <li>Install assembly and sub-assembly components using approximately</li> </ul>	propriate bracing/securing techniques.	
<ul> <li>Finish assembly and sub-assembly boat components to one</li> </ul>	comply with the specification.	
<ul> <li>Check the assembly and sub-assembly meet the assess</li> </ul>	ment criteria.	
<ul> <li>Reinstate the work area.</li> </ul>		



Unit	Unit details		
205	Title: Production of external boat components	Graded: pass/merit/distinction	Sample assessment: yes
	Task Setting:	,	,
	The equipment to be worked on during the assignment must	include one item from each of the following:	
	<ul> <li>An actual or simulated boat exterior.</li> </ul>		
	<ul> <li>Representative marine industry material of sufficient drawings/data/specifications and from those produce</li> </ul>		terpret marine industry
	Appropriate tasks will include:  Interpret drawings, data and specifications to produce  Utilise information from the specifications, joiner's rod  Carry out an appropriate risk assessment.  Select and use a range of marine materials/fasteners  Produce external boat components using appropriate  Install external components using appropriate bracing  Finish external boat components to comply with the selections.	d, moulds and templates and/or a cutting list to only adhesives/bedding compounds as specified in hand/power/machine tools.  g/securing techniques.	reate a production schedule.



Unit	Unit details			
206	Title: Interior installation and fitting out of boats	Graded: pass/merit/distinction	Sample assessment:	
	Task Setting:			
	The equipment to be worked on during the assignment shoul	d include the following:		
	<ul> <li>Actual or simulated interior of a boat.</li> </ul>			
	<ul> <li>Representative marine industry material of sufficient s drawings, data and specifications as required for the I</li> </ul>	• •	utilised to interpret marine industry	
	<ul> <li>Appropriate hand tools power tools and woodworking</li> </ul>	machinery for the interior installation and fitting	g out of boats.	
	Appropriate tasks will include:			
	<ul> <li>Interpret drawings, data and specifications.</li> </ul>			
	Utilise information from the specifications to create a production schedule.			
	<ul> <li>Carry out an appropriate risk assessment.</li> </ul>			
	<ul> <li>Produce moulds and templates and/or a cutting list to</li> </ul>	necessary for the production of internal boat of	omponents.	
	<ul> <li>Select and use a range of marine materials/fasteners/</li> </ul>	adhesives/bedding compounds as specified in	the unit's assessment criteria range.	
	<ul> <li>Produce components for the installation and fitting ou</li> </ul>	t of a boat using appropriate hand/power or ma	achine tools.	
		with the enecification		
	<ul> <li>Install and finish interior boat components to comply v</li> </ul>	with the specification.		
	<ul> <li>Install and finish interior boat components to comply v</li> <li>Check the installation of interior boat components me</li> </ul>	·		



Unit	Unit details		
207	Title: Composite manufacture for marine construction	Graded: pass/merit/distinction	Sample assessment:
	Task Setting:	,	
	The equipment to be worked on during the assignment should in	clude the following:	
	<ul> <li>Moulds and formers necessary for the manufacture of ma</li> </ul>	rine related composite components.	
	<ul> <li>Representative resins, reinforcements and ancillary mate marine industry drawings/data and specifications as requ</li> </ul>		
	<ul> <li>Appropriate hand tools power tools and equipment for the</li> </ul>	e working and production of marine related of	composites.
	Appropriate tasks will include:		
	<ul> <li>Interpret drawings, data and specifications.</li> </ul>		
	<ul> <li>Utilise information from the specifications to create a proc</li> </ul>	duction schedule.	
	<ul> <li>Carry out an appropriate risk assessment.</li> </ul>		
	<ul> <li>Produce moulds and templates necessary for marine con</li> </ul>	nposite manufacture.	
	<ul> <li>Select and use a range of resins, reinforcements, marine assessment criteria range.</li> </ul>	materials/fasteners/adhesives/bedding com	pounds as specified in the unit's
	<ul> <li>Select and use a range of tools and equipment necessary</li> </ul>	for the application and consolidation of res	ins & reinforcements.
	<ul> <li>Produce boat components using composite manufacturin</li> </ul>	g techniques.	
	<ul> <li>Apply releasing techniques to remove component from m</li> </ul>	ould.	
	<ul> <li>Test and check the component meet the assessment crite</li> </ul>	eria.	
	Reinstate the work area.		



Unit	Unit details		
208	Title: Servicing and maintenance of marine engines	Graded: pass/merit/distinction	Sample assessment:
	Task Setting:		
	The equipment/facilities to be available during the assignment sho	uld include the following:	
	<ul> <li>Appropriate tools and testing equipment.</li> </ul>		
	<ul> <li>Suitable working examples of a range of marine engines.</li> </ul>		
	<ul> <li>A range of appropriate manufacturers specifications and da</li> </ul>	ata.	
	<ul> <li>A selection of appropriate consumable products (oils, oil/ail</li> </ul>	r filters, coolants).	
	<ul> <li>Appropriate tasks will include:</li> <li>Interpret drawings, data and specifications.</li> <li>Utilise information from the specifications to create a service.</li> <li>Carry out an appropriate risk assessment.</li> <li>Select and use a range of tools and testing equipment necessary out servicing and maintenance tasks as appropriate.</li> <li>Check tasks completed meet required specifications.</li> <li>Identify and record results of task carried out.</li> <li>Reinstate the work area.</li> </ul>		arine engines.



Unit	Unit details			
209	Title: Servicing and maintenance of marine propulsion systems	Graded: pass/merit/distinction	Sample assessment:	
	Task Setting:			
	The equipment/facilities to be available during the assignment sh	nould include the following:		
	<ul> <li>Appropriate tools and testing equipment.</li> </ul>			
	<ul> <li>Suitable working examples of a range of marine propulsion</li> </ul>	on systems.		
	<ul> <li>A range of appropriate manufacturers specifications and</li> </ul>	data.		
	A selection of appropriate consumable products.			
	Appropriate tasks will include:			
	<ul> <li>Interpret drawings, data and specifications.</li> </ul>			
	Utilise information from the specifications to create a servicing/maintenance schedule.			
	<ul> <li>Carry out an appropriate risk assessment.</li> </ul>			
	<ul> <li>Select and use a range of tools and testing equipment ne</li> </ul>	cessary for servicing and maintenance of m	narine propulsion systems.	
	<ul> <li>Carry out servicing and maintenance tasks as appropriate</li> </ul>	э.		
	<ul> <li>Check tasks completed meet required specifications.</li> </ul>			
	Identify and record results of task carried out.			
	Reinstate the work area.			



Unit	Unit details			
210	Title: Maintaining electrical marine engineering equipment and systems	Graded: pass/merit/distinction	Sample assessment:	
	Task Setting:			
	The equipment/facilities to be available during the assignment should	l include the following:		
	<ul> <li>Appropriate tools and testing equipment required for maintain</li> </ul>	ing electrical marine engineering equipment a	and systems.	
	<ul> <li>Suitable working examples of a range of electrical marine eng</li> </ul>	ineering equipment and systems.		
	A range of appropriate manufacturers specifications and data.			
	<ul> <li>A selection of appropriate replacement/ maintenance compon</li> </ul>	ents (for example pumps, lighting, fuses, batt	eries, switches).	
	<ul> <li>Appropriate tasks will include:</li> <li>Interpret drawings, data and specifications.</li> <li>Utilise information from the specifications to create a marine expected.</li> <li>Carry out an appropriate risk assessment.</li> <li>Select and use a range of tools and testing equipment necess and systems.</li> <li>Carry out maintenance tasks as appropriate.</li> <li>Check tasks completed meet required specifications.</li> <li>Identify and record results of task carried out.</li> <li>Reinstate the work area.</li> </ul>		al marine engineering equipment	
	Reinstate the work area.			



Unit	Unit details				
211	Title: Principles of marine electrical systems	Graded: pass/merit/distinction	Sample assessment:		
	Task Setting:		<u> </u>		
	The equipment/facilities to be available during the assignment	t should include the following:			
	<ul> <li>Appropriate tools and testing equipment required to de</li> </ul>	emonstrate the function of basic electrical circu	its and resistors.		
	<ul> <li>Suitable working examples of a range of electrical man</li> </ul>				
	A range of appropriate manufacturers specifications at	nd data.			
	<ul> <li>A selection of appropriate components (for example breakers, fuses, resistors, capacitors, batteries, pcb's).</li> </ul>				
	Appropriate tasks will include:  Interpret drawings, data and specifications.  Utilise information from the specifications to create a marine electrical circuit.  Carry out an appropriate risk assessment.  Select and use a range of tools and testing equipment necessary for demonstrating the function of basic electrical circuits and resistors.  Carry out relevant tasks associated with the principles of marine electrical systems.  Check tasks completed meet required specifications.  Identify and record results of task carried out.  Reinstate the work area.				



Unit	it Unit details				
212	Title: Prepare surfaces and marine coatings	Graded: pass/merit/distinction	Sample assessment:		
	Task Setting:				
	The equipment to be worked on during the assignment shou	ıld include the following:			
	<ul> <li>Actual or simulated surfaces. Painted and unpainted cement).</li> </ul>	of (wood, metals of ferrous and non ferrous con	nposition, composite/FRP, ferro-		
	<ul> <li>Representative data and specifications used in the m</li> </ul>	narine industry as required for the preparation of	surfaces and marine coatings.		
	<ul> <li>Representative degreasing solvents, chemicals and a and marine coatings.</li> </ul>	ancillary materials used in the marine industry as	required for the preparation of surfaces		
	<ul> <li>Appropriate hand tools power tools and equipment for the working on and preparation of marine surfaces.</li> </ul>				
	<ul> <li>Appropriate tasks will include:</li> <li>Interpret instructions, data and specifications.</li> <li>Utilise information from the instructions, data and specifications.</li> <li>Carry out an appropriate risk assessment.</li> <li>Select and use a range of preparation materials as specified and use a range of tools and equipment necessing.</li> <li>Select, mix and prepare marine coatings as specified.</li> <li>Test and check that the surface preparation of substrates.</li> </ul>	pecified in the unit's assessment criteria range. ssary for the preparation of surfaces to take mari d in the assessment criteria range.	-		
	Reinstate the work area.				



Unit	Unit details		
213	Title: Apply marine coatings	Graded: pass/merit/distinction	Sample assessment:
	Task Setting:		
	The equipment to be worked on during the assignment should include	e the following:	
	<ul> <li>Actual or simulated surfaces. Painted and unpainted of (wood cement).</li> </ul>	d, metals of ferrous and non ferrous com	position, composite/FRP, ferro-
	<ul> <li>Representative data and specifications used in the marine ind</li> </ul>	lustry as required for the application of n	narine coatings.
<ul> <li>Representative range of marine coatings and ancillary materials used in the marine industry as required for the coatings.</li> </ul>			ed for the application of marine
	<ul> <li>Appropriate application equipment for marine coatings.</li> </ul>		
	<ul> <li>Appropriate tasks will include:</li> <li>Interpret instructions, data and specifications.</li> <li>Utilise information from the instructions, data and specification</li> <li>Carry out an appropriate risk assessment.</li> <li>Select, mix and prepare marine coatings as specified in the assessment are all the select and use a range of application tools and equipment received.</li> <li>Apply marine coatings as specified in the unit's assessment or the select and check the marine coatings meet the assessment critical points.</li> </ul>	ssessment criteria range. quired for marine coating operations. riteria range.	
	Reinstate the work area.		



Unit	nit Unit details		
304	Title: Construction and repair of hulls and boat structures	Graded: pass/merit/distinction	Sample assessment: yes
	Task Setting:	1	
	The equipment to be worked on during the assignment must include	one item from each of the following:	
	<ul> <li>An actual or simulated hull/boat structure.</li> </ul>		
	<ul> <li>Representative marine industry material of sufficient size to d drawings/data/specifications and from those produce structure</li> </ul>	·	et marine industry
	Appropriate tasks will include:  Interpret drawings, data and specifications to determine mate  Utilise information from the drawings, data, specifications and  Carry out an appropriate risk assessment.  Transfer interpreted data onto materials to produce moulds, to  Produce structural hull/boat components using appropriate had  Select and use a range of marine fasteners/adhesives/bedding  Install structural hull/boat components using appropriate brace  Finish structural hull/boat components to comply with the drawn  Reinstate the work area.	/or a cutting list to create a production schedemplates or jigs as required.  and/power/machine tools. g compounds as specified in the unit's assesting/securing techniques.	



Unit	Unit details				
305	Title: Producing and fitting structural boat components	Graded: pass/merit/distinction	Sample assessment:		
	Task Setting:				
	The equipment to be worked on during the assignment should in	clude the following:			
	An actual or simulated structural boat component.				
	<ul> <li>Representative marine industry material of sufficient size to demonstrate the techniques utilised to interpret marine industry drawings/data/specifications required for the production and fitting of structural boat components.</li> </ul>				
	Appropriate tasks will include:  • Interpret drawings, data and specifications to produce joiner's rod and/or a cutting list.				
	<ul> <li>Utilise information from the specifications, joiner's rod and/or a cutting list to create a production schedule.</li> </ul>				
	Carry out an appropriate risk assessment.				
	<ul> <li>Produce structural sub-assembly and/or fit-out boat components using appropriate hand/power/machine tools.</li> </ul>				
	<ul> <li>Select and use a range of marine materials/fasteners/adhesives/bedding compounds as specified in the unit's assessment criteria range.</li> </ul>				
	<ul> <li>Install structural sub-assembly and/or fit-out boat components using appropriate bracing/securing techniques.</li> </ul>				
	<ul> <li>Finish structural sub-assembly and/or fit-out boat components to comply with the specification.</li> </ul>				
	Reinstate the work area.				



Unit	Unit details				
306	Title: Establishing reinstatement requirements when servicing, repairing and maintaining boats	Graded: pass/merit/distinction	Sample assessment:		
	Task Setting:				
	<ul> <li>The equipment to be worked on during the assignment should include one item from each of the following:</li> <li>An actual or simulated vessel.</li> <li>Representative marine industry materials required to establish reinstatement requirements when servicing, repairing and maintaining boats.</li> </ul>				
	<ul> <li>Appropriate tasks will include:</li> <li>Utilise appropriate sources of information, inspections and tests to establish the reinstatement options available.</li> <li>Produce a reinstatement schedule taking into account the variables of time, materials, equipment costs and human resources.</li> <li>Carry out an appropriate risk assessment.</li> <li>Carry out reinstatement procedures while ensuring that minimal damage is caused to the surrounding area and the structural integrity of the hull is not compromised.</li> <li>Disposal of any waste products taking into account current applicable legislation.</li> <li>Carry out any pre/post reinstatement recording procedures to comply with the requirements laid down by manufacturers, regulating authorities or government bodies.</li> </ul>				



Unit	Unit details					
307	Title: Fibre reinforced plastics technology for marine construction	Graded: pass/merit/distinction	Sample assessment:			
	Task Setting:		1			
	The equipment to be worked on during this assignment should in	nclude the following:				
	<ul> <li>Plugs, moulds and formers necessary for the production</li> </ul>	of fibre reinforced plastic marine componen	ts.			
	<ul> <li>Representative drawings specifications and data used in</li> </ul>	the marine industry for the production marin	ne related fibre reinforced components.			
	<ul> <li>Representative resins, catalysts, pigments, reinforcement marine related fibre reinforced components.</li> </ul>	Representative resins, catalysts, pigments, reinforcements, fillers and ancillary materials used in the marine industry for the production				
	Appropriate hand tools power tools and equipment for th	Appropriate hand tools power tools and equipment for the working and production of fibre reinforced plastic marine components.				
	Appropriate tasks will include:  Interpret drawings, data and specifications.  Utilise information from the specifications to create a production schedule.  Carry out an appropriate risk assessment.  Produce plugs, moulds and templates necessary for the production of marine fibre reinforced plastic components.  Select, measure weigh, mix and use a range of resins, catalysts, pigments fillers and reinforcements.  Select and use a range of tools and equipment necessary for the application, consolidation forming and trimming of resins & reinforcements.  Produce boat components using fibre reinforced plastics techniques.  Apply releasing techniques to remove FRP components from moulds.  Test and check that the components meet the assessment criteria.  Reinstate the work area.					



Unit	Unit details				
308	Title: Installation and repair of vessel services	Graded: pass/merit/distinction	Sample assessment:		
	Task Setting:				
	The equipment/facilities to be available during the assignment should	l include the following:			
	Appropriate tools and testing equipment.				
	A range of appropriate manufacturers specifications and data.				
	<ul> <li>Suitable working examples of service equipment (black water</li> </ul>	system, grey water system, air conditioning)	).		
	A selection of appropriate service/consumable components.				
	Appropriate tasks will include:  Interpret drawings, data and specifications.  Utilise information from the specifications to create an installation/repair schedule.  Carry out an appropriate risk assessment.  Select and use a range of tools and testing equipment necessary for the installation and repair of vessel services.  Carry out installation and repair of vessel services in accordance with manufacturer's specifications.  Check tasks completed meet required specifications.  Identify and record results of task carried out.				



Unit	Unit details				
309	Title: Installation and repair of marine engines	Graded: pass/merit/distinction	Sample assessment:		
	Task Setting:				
	The equipment/facilities to be available during the assignment should	I include the following:			
	<ul> <li>Appropriate tools and testing equipment.</li> </ul>				
	Suitable working examples of a range of marine engines.				
	A range of appropriate manufacturers specifications and data.				
	A selection of appropriate installation and repair components.				
	Appropriate tasks will include:  Interpret drawings, data and specifications.  Utilise information from the specifications to create a servicing/maintenance schedule.  Carry out an appropriate risk assessment.  Select and use a range of tools and testing equipment necessary for installation and repair of marine engines.  Carry out installation and repair tasks as appropriate.  Check tasks completed meet required specifications.  Identify and record results of task carried out.				



Unit	Unit details		
310	Title: Installation and repair of marine propulsion systems	Graded: pass/merit/distinction	Sample assessment:
	Task Setting:		,
	The equipment/facilities to be available during the assignment shou	ıld include the following:	
	<ul> <li>Appropriate tools and testing equipment.</li> </ul>		
	Suitable working examples of a range of marine propulsion	•	
	<ul> <li>A range of appropriate manufacturers specifications and da</li> </ul>	ta.	
	A selection of appropriate consumable products.		
	<ul> <li>Appropriate tasks will include:</li> <li>Interpret drawings, data and specifications.</li> <li>Utilise information from the specifications to create a schede</li> <li>Carry out an appropriate risk assessment.</li> <li>Select and use a range of tools and testing equipment nece</li> <li>Carry out installation and repair tasks as appropriate.</li> <li>Check tasks completed meet required specifications.</li> <li>Identify and record results of the tasks carried out.</li> </ul>	·	



Unit	Unit details					
311	Title: Installing electrical wiring support systems on boats	Graded: pass/merit/distinction	Sample assessment:			
	Task Setting:	•				
	The equipment/facilities to be available during the assignment should	•				
	Appropriate tools and testing equipment required for installing					
	Suitable working examples of a range of electrical wiring sup	•				
	A range of appropriate manufacturers specifications and data					
	<ul> <li>A selection of appropriate components for the installation of e connectors, earthing devices, cable connectors).</li> </ul>	<ul> <li>A selection of appropriate components for the installation of electrical wiring and support systems (for example terminal blocks, crimp connectors, earthing devices, cable connectors)</li> </ul>				
	Appropriate tasks will include:					
	Interpret drawings, data and specifications.					
	Utilise information from the specifications to create a schedule for the installation of electrical wiring support systems.					
	Carry out an appropriate risk assessment.					
	Select and use a range of tools and testing equipment necessary for the installation of electrical wiring support systems.  Correctly the installation of electrical wiring support systems as expressions.					
	Carry out the installation of electrical wiring support systems as appropriate.  Check that installation tooks completed most required enceitigations.					
	<ul> <li>Check that installation tasks completed meet required specifications.</li> <li>Identify and record results of tasks carried out.</li> </ul>					
	Reinstate the work area.					
	1 Remotate the work area.					



Unit	Unit details				
312	Title: Principles of marine electrical engineering	Graded: pass/merit/distinction	Sample assessment:		
	Task Setting:		1		
	The equipment/facilities to be available during the assignment s	should include the following:			
	<ul> <li>Appropriate tools and testing equipment required to dem</li> </ul>	nonstrate the principles of marine electrical e	ngineering.		
	<ul> <li>Suitable working examples of a range of electrical distribution</li> </ul>	oution, supply and storage systems.			
	A range of appropriate manufacturers specifications and data.				
	<ul> <li>A selection of appropriate components (for example shore cables, consumer units, engine driven alternators, split charge relays, battery demand operated plant, high energy LED luminaries).</li> </ul>				
	<ul> <li>Appropriate tasks will include:</li> <li>Interpret drawings, data and specifications.</li> <li>Utilise information from the specifications to demonstrate</li> <li>Carry out an appropriate risk assessment.</li> <li>Select and use a range of tools and testing equipment new</li> <li>Carry out relevant tasks associated with the principles of the check tasks completed meet required specifications.</li> <li>Identify and record results of task carried out.</li> <li>Reinstate the work area.</li> </ul>	ecessary for demonstrating the principles of			



Unit	Unit details				
313	Title: Principles of integrated marine electronic navigation systems	Graded: pass/merit/distinction	Sample assessment:		
	Task Setting:		•		
	The equipment/facilities to be available during the assignment shou	lld include the following:			
	<ul> <li>Appropriate tools and testing equipment required to demons</li> </ul>	strate the principles of integrated marine e	electronic navigation systems.		
	<ul> <li>Suitable working examples of integrated marine electronic n</li> </ul>	avigation systems.			
	<ul> <li>A range of appropriate manufacturers specifications and date</li> </ul>	a.			
	<ul> <li>A selection of appropriate integrated marine electronic navigation system components (for example bulkhead mounted instruments, chart plotters, depth instruments and fish finders, position finding systems, autopilots, satellite communications).</li> </ul>				
	<ul> <li>Appropriate tasks will include:</li> <li>Interpret drawings, data and specifications.</li> <li>Utilise information from the specifications to demonstrate the principles of integrated marine electronic navigation systems.</li> <li>Carry out an appropriate risk assessment.</li> <li>Select and use a range of tools and testing equipment necessary for demonstrating the principles of integrated marine electronic navigation systems.</li> <li>Carry out relevant tasks associated with the principles of integrated marine electronic navigation systems.</li> <li>Check tasks completed meet required specifications.</li> <li>Identify and record results of task carried out.</li> </ul>				



Unit	Unit details				
314	Title: Prepare surfaces and marine coatings	Graded: pass/merit/distinction	Sample assessment:		
	Task Setting:				
	The equipment to be worked on during this assignment sho	· ·			
	<ul> <li>Actual or simulated surfaces. Painted and unpainte</li> </ul>	ed of (wood, metals ferrous and non ferrous, comp	oosite/FRP, ferro-cement).		
	Representative data and specifications used in the limitation.	marine industry as required for the preparation of	surfaces and marine coatings.		
	<ul> <li>Representative degreasing solvent, chemicals and ancillary materials used in the marine industry as required for the preparation of surfaces and marine coatings.</li> </ul>				
	<ul> <li>Appropriate hand tools power tools and equipment for the working on and preparation of marine surfaces.</li> </ul>				
	Appropriate tasks will include:  Interpret instructions, data and specifications.  Utilise information from the instructions, data and specifications to create a working schedule.  Carry out an appropriate risk assessment.  Select and use a range of materials as specified in the unit's assessment criteria range.  Select and use a range of tools and equipment necessary for the preparation of surfaces to take marine coatings.  Select, mix and prepare marine coatings as specified in the assessment criteria range.  Test and check the surface preparation of surfaces and the mixing of marine coatings meet the assessment criteria.  Reinstate the work area.				



Unit details					
Title: Apply marine coatings	Graded: pass/merit/distinction	Sample assessment: yes			
Task Setting:					
The equipment to be worked on during this assignment should include	le the following:				
<ul> <li>Actual or simulated surfaces. Painted and unpainted of (woo</li> </ul>	d, metals ferrous and non ferrous, comp	posite/FRP, ferro-cement).			
·		•			
<ul> <li>Representative range of marine coatings and ancillary materi coatings.</li> </ul>	<ul> <li>Representative range of marine coatings and ancillary materials used in the marine industry as required for the application of marine coatings.</li> </ul>				
<ul> <li>Appropriate hand or spray application equipment for marine of</li> </ul>	coatings.				
<ul> <li>Carry out an appropriate risk assessment.</li> <li>Select mix and prepare marine coatings as specified in the as</li> <li>Select and use a range of tools and application equipment fo</li> <li>Apply marine coatings as specified in the unit's assessment of</li> </ul>	ssessment criteria range. r marine coatings. criteria range.				
	Title: Apply marine coatings  Task Setting: The equipment to be worked on during this assignment should include  Actual or simulated surfaces. Painted and unpainted of (woole Representative data and specifications used in the marine include Representative range of marine coatings and ancillary materic coatings.  Appropriate hand or spray application equipment for marine of the Interpret instructions, data and specifications.  Utilise information from the instructions, data and specification.  Carry out an appropriate risk assessment.  Select mix and prepare marine coatings as specified in the assessment of the Interpret in the Interpret in the Interpret Inte	Title: Apply marine coatings  Task Setting:  The equipment to be worked on during this assignment should include the following:  • Actual or simulated surfaces. Painted and unpainted of (wood, metals ferrous and non ferrous, composite to the application of the supersentative data and specifications used in the marine industry as required for the application of the supersentative range of marine coatings and ancillary materials used in the marine industry as required coatings.  • Appropriate hand or spray application equipment for marine coatings.  Appropriate tasks will include:  • Interpret instructions, data and specifications.  • Utilise information from the instructions, data and specifications to create a working schedule.  • Carry out an appropriate risk assessment.  • Select mix and prepare marine coatings as specified in the assessment criteria range.  • Select and use a range of tools and application equipment for marine coatings.  • Apply marine coatings as specified in the unit's assessment criteria range.  • Test and check the marine coatings meet the assessment criteria.			