

NATIONAL CERTIFICATE IN BOATBUILDING MARINE SYSTEMS ENGINEERING (Level 4)

287 CREDITS Version 5

An apprentice completing this NZQA registered qualification will gain the knowledge and skills required to be Marine Industry recognized and qualified as a competent **Marine Systems Engineer**.

This qualification is for apprentices in the Marine Industry who specialise in marine systems engineering, rather than the construction of boats.

In this qualification, apprentices are given a basic overview of the boatbuilding sector of the Marine Industry and gain an understanding of boat engineering, electronic drawings and related information. They also learn how to properly install electric and electronic components and how to handle electrical and electronic equipment in safety. Apprentices also gain a good understanding of modern computer technology

Marine systems engineers work with the power plants, the 'life blood' of motor driven vessels. They are essential members of any project team, being responsible for the manufacture, installation and maintenance of engineering components and systems.

The sector is diverse, and you could be working around boilers in a traditional engine room or installing state of the art engineering equipment and machinery in the latest superyacht. This is a specialist area of the industry and good marine systems engineers are in high demand.

This qualification takes, on average 3 to 4.5 years to complete.

Pablo Vega



Pablo Vega completed a one year, pre-apprenticeship course at the Unitec Institute of Technology in Auckland. Having decided that boatbuilding was for him, Pablo signed up to an apprenticeship in composite boatbuilding which he completed in only 2.5 years (he received credit for his UNITEC course).

While installing running gear on boats, Pablo became interested in marine engineering and enrolled in a second qualification, the National Certificate in Boatbuilding (Marine Systems Engineering) level 4 which he completed in 2008.

In future, Pablo hopes to develop his experience of marine engineering and gain more responsibility with a leading hand's position so that he can pass on his knowledge and skills to current apprentices.

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Unit Standard Content

Unit Number	Unit Title	Level	Credit Value
414	Demonstrate knowledge of the distribution environment	2	4
2399	Dismantle, inspect, assemble and test components under supervision	3	10
2406	Dismantle, inspect assemble and test components	4	6
2430	Draw and interpret engineering sketches under supervision	2	4
2431	Draw and interpret engineering drawings under supervision	2	8
2672	Weld steel in the downhand positions to a general purpose industry standard using the gas metal arc welding process	3	6
2682	Weld steel in the downhand positions to a general purpose industry standard using the manual metal arc welding process	3	6
2683	Cut metals using manual thermal processes	3	4
5433	Demonstrate knowledge of electrical and electronic applications for marine use	4	8
9913	Demonstrate knowledge of the New Zealand marine industry	2	3
9917	Demonstrate knowledge of boatbuilding methods	2	4
9922	Produce templates and patterns used in boatbuilding	3	4
9923	Install internal and external boat hardware fittings	4	4
9937	Install interior and exterior boat systems	4	10
9938	Install pipework in boats	3	15
11661	Produce components by performing basic engineering drilling operations	2	8
11662	Produce components by performing basic engineering turning operations	2	12
11663	Produce components by performing basic engineering milling operations	2	12
11778	Install and test custom power plants and power trains	4	20
18158	Select, use and care for hand tools used in boatbuilding	2	5
18159	Select, use and care for portable power tools used in boatbuilding	2	5
18160	Operate mechanical plant used in boatbuilding	2	12
18161	Perform measurements and calculations used in boatbuilding	2	5
18162	Calculate quantities and costs for boatbuilding projects	3	4
18163	Demonstrate knowledge of boatbuilding construction drawings and produce related freehand sketches	3	2
18164	Demonstrate knowledge of insulation and install insulation in boats	3	2
18165	Demonstrate knowledge of computer technology used in the boating industry	3	6
18166	Participate in a project team in the boating industry	2	4
18170	Contribute to a project team in the boating industry	3	3
21677	Demonstrate knowledge of a diesel fuel system	2	2
21692	Perform minor servicing tasks on a diesel fuel system	2	2
21907	Demonstrate and apply knowledge of safe welding procedures under supervision	2	3
23035	Describe and install boat tankage systems	3	6
23243	Identify and explain the causes and prevention of material deterioration in the marine environment	4	8
23244	Identify and apply health and safety procedures for the boatbuilding industry	3	4
24179	Demonstrate knowledge of a forced air intake system on an engine	3	4
24180	Inspect and test diesel engine intake and exhaust systems	3	4
25115	Describe, install and test plumbing systems in boats	3	6
25116	Lift, support and move boats and components	3	8
25343	Identify boat fittings and fastenings	2	4
25344	Demonstrate knowledge of marine trades and expectations of employees	2	3
25345	Demonstrate knowledge of terminology used in the marine industry	2	6
26542	Demonstrate basic knowledge of the operation of recreational craft by day	2	6

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NATIONAL CERTIFICATE IN BOATBUILDING (MARINE SYSTEMS ENGINEERING) Level 4 (Version 5)**Elective Unit Standard Content** Plus at least **25** credits from the following list:

Unit Number	Unit Title	Level	Credit Value
2434	Manually produce detailed engineering drawings under supervision	3	15
2675	Weld aluminium in the downhand positions using the gas metal arc welding process	3	6
2676	Weld stainless steel sheet using the gas tungsten arc welding process	3	6
2677	Weld aluminium in the downhand positions using the gas tungsten arc welding process	3	6
2686	Weld aluminium in all positions using the gas metal arc welding process	4	10
2687	Weld stainless steel sheet and plate in all positions using the gas metal arc or flux cored arc welding process	4	10
2688	Weld stainless steel tube using the gas tungsten arc welding process	4	12
2689	Weld aluminium in all positions using the gas tungsten arc welding process	4	10
2714	Produce components by performing engineering turning operations	3	15
2715	Produce components by performing engineering milling operations	3	15
5231	Use constructions and make drawings for geometrical situations	1	2
11777	Install production inboard engine packages in boats	3	6
11781	Preserve and evaluate previously-submerged power plants	4	3
11782	Maintain and repair marine engine systems under supervision	3	20
15403	Test and diagnose diesel fuel injection systems, and repair fuel delivery systems	3	4
18171	Demonstrate knowledge of spars and rigging	3	5
25152	Apply 2D CAD/CAM in boatbuilding	4	5

