Occupation: Marine engineer Level 3

Profile: Marine engineers work on boats such as yachts, commercial craft and superyachts. They install, maintain, fault find and repair marine engines, ancillary systems and equipment. They design and produce solutions to meet boat layouts, restrictions and engineering requirements, or produce boat engineering systems from engineering and technical drawings to specifications. Marine engineers work to fine tolerances using a variety of measuring equipment, machines and tools. They manufacture, assemble, strip, repair and re-build components. They are expected to work individually and in teams. They comply with organisational and statutory health & safety, sustainability requirements and can work with minimum supervision. Marine engineers are good communicators and problem solvers, they commission and test boat systems, are responsible for the quality and accuracy of their work and often attend sea trials. Marine engineers typically work with associated trades such as Boatbuilders and Marine Electricians and have a strong marine industry understanding. They are highly skilled and capable of adapting to changing demands as boats become more complex.

Work Aspects	Skills	Knowledge and Understanding
Respond appropriately to customer needs (internal and external)	• Prepare for meetings and discussions • Communicate marine engineering principles, concepts and processes relevant to the customer using appropriate listening, questioning, non-verbal communication, recording and presentation techniques • Use appropriate marine and engineering terminology • Make recommendations to ensure optimal performance of boats	• National and international marine industry and the company's place, products and services within it • Types of customers and their typical engineering needs • How marine engineers interact with and support other marine trades • Role of formal and informal communication • Marine engineering terminology • Use of information technology in marine engineering • Costing, pricing and budgeting principles
Work methods and environment	• Comply with quality, health and safety and environmental regulations • Prepare the work area in order to conduct marine engineering activities • Select, use, maintain and store equipment and tools spanners, socket sets, screwdrivers, power tools • Follow and maintain work procedures, method statements and production records • Work efficiently and effectively • Consider sustainability and environmental impacts when making, safety, quality and cost decisions • Use mathematical techniques, formulae, and calculations in marine engineering processes	• Requirements and practices for working safely and ensuring the health and safety of themselves and others in the work environment • Safe efficient methods of, assembly/use/maintenance/ movement/protection and storage of materials, tools and equipment • How to produce and interpret scaled engineering drawings plus any certification requirements • Types and uses of work procedures, method statements, production records and manufacturer's manuals and specifications • Characteristics and reaction of materials to their environment: temperature, humidity, pressure • Mathematical techniques, formula, and calculations that underpin marine engineering • Requirements and principles for ensuring quality and continuous business improvement
Planning and set up	• Design layout of marine system or component • Interpret designer's plans and engineering data, drawings and documentation • Finalise time and cost of the work to be done • Select/ maintain/ store appropriate equipment and materials • Select/make/use appropriate engineering jigs, templates and tooling • Select and use calibrated and measuring engineering tools • Select, source and use a variety of precision data charts and reference tables • Practical and safe use of tools, materials and equipment • Safe uses of jigs, templates and tooling	• Company's process for design, planning and set up • How to obtain the required correct engineering data, specifications and documentation using selected procedures • Principles underpinning technical engineering documentation, the roles and safe and efficient use of fixed and rotating components • How to use tools, materials and equipment safely • Calibrated tools and measuring equipment and their uses • Vessel design and construction, and complex shapes • Sourcing of components, bill of materials methodology and reporting discrepancies and quality issues • Relationship between systems and efficient use of space • Feedback and/or change process (red line) drawings and specification errors or modifications required
Install and maintain marine engines and marine ancillary systems and components	• Measure and mark out to carry out precision machining and hand fitting processes • Use hand tools to cut, drill, shape and finish components to tolerances • Move components using appropriate safe methods and equipment • Assemble, remove, overhaul and refit marine engineering components, sub-assemblies and systems using appropriate machinery, equipment,	• Principles of 2 and 4 stroke petrol and diesel engines and their operation • Principles of boat ancillary systems - propulsion • How marine engineering systems relate to each other • Appropriate uses of measuring aids and equipment • Basic principles of contingency planning and problem solving • Options and constraints during installation/ maintenance of marine engineering systems and components • Working within confines of complex shapes and curves

	tools and materials • Check/inspect components for robustness, fit and tolerances • Shape, fabricate, manipulate and precision alignment of marine engineering components and materials to accepted tolerances • Conduct/undertake planned or routine maintenance to required specification • Check/test/diagnose marine engineering components to company and manufacturing standards • Complete required organisational and manufacturer's documentation	• Appropriate use of tools, equipment and machinery • Appropriate use of fixing techniques: mechanical fastenings, welding, adhesives • Storing marine engineering components safely • Methods of disassembling and repairing, refitting engineering components • Service and maintenance requirements: engine servicing and winterisation • How to inspect, diagnose, record and rectify defects • New and traditional engineering and electrical technologies • Importance of safe waste handling and disposal in line with statutory and company policies
Support commission, test and sea trials	• Apply safety and social responsibility practices when working at sea • Check installation meets required operational standards and is free from defects • Commission and test systems • Complete necessary documentation and company protocols • Undertake basic crew roles	• Manufacturers' specifications and requirements • Classification definition, types and regulations/ requirements, including Maritime and Coastguard Agency • Statutory and regulatory regulations for basin and sea trials • Principles of safe working practices for working on or near water • Different types of documentation: Trials checklist, engine sea trial report

Behaviours

- Appropriate safety behaviours individually and towards others.
- Commitment to quality, profitability and continuous improvement.
- Commercial and market awareness and business acumen.
- Focus on the requirements of the customer, internal and/or external.
- To work effectively individually and as part of a team and to communicate with all levels of the organisation.
- A strong work ethic including being motivated, committed, meticulous, reliable, proactive and adaptable.
- A recognition and appreciation of equality and diversity in the workplace.

Entry requirements - Individual employers will identify entry requirements. Typically candidates will have GCSEs (or equivalent) at A*-C in Maths, English, a Science, and Technology. An apprentice without level 2 English and maths on entry, must achieve this level before taking the end-point assessment.

Qualifications (in development) – After a period of foundation skills and technical knowledge all apprentices will be required to achieve a level 2 Diploma in Marine Engineering (Foundation) and level 3 Diploma in Marine Engineering (Advanced) before taking the end-point assessment.

Duration - Typically 48 months.

Link to professional registration and progression - On successful completion, the apprentice will be recognised by the Institute of Marine Engineering, Science and Technology (IMarEST) at Engineering Technician level.

Review date - The standard will be reviewed in 3 years.