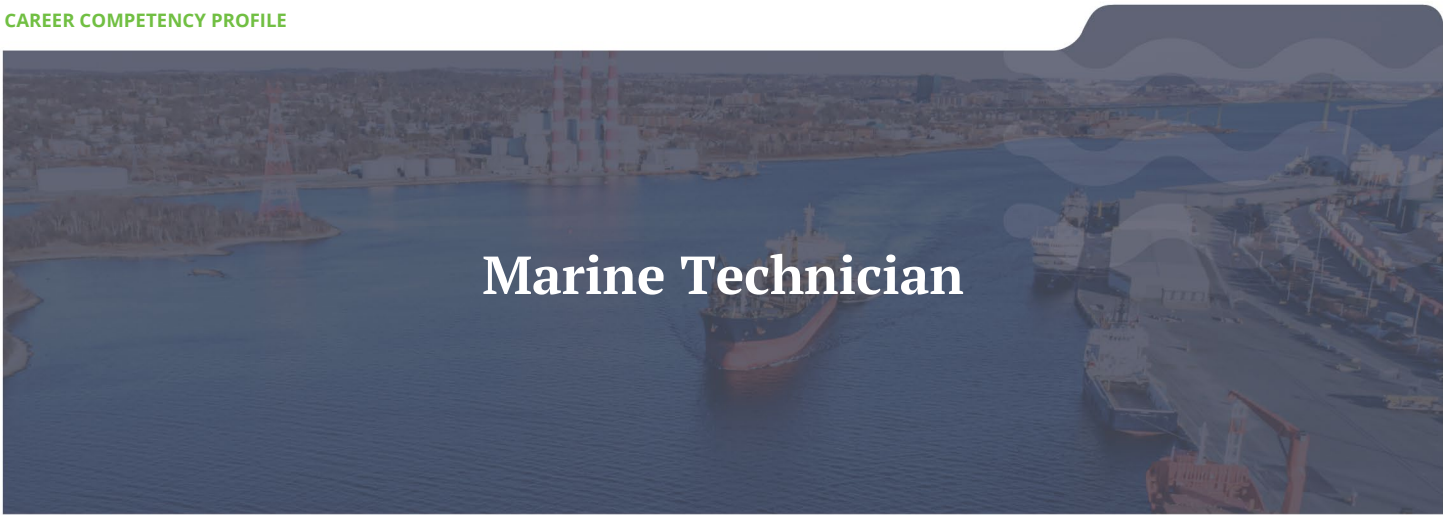

Marine Technician

ROLE OVERVIEW

Marine technicians carry out technical functions to help marine engineers with the design, development, manufacturing and testing processes, installation, and maintenance of all types of boats from pleasure crafts to naval vessels, including submarines.

They also conduct experiments, deploy, maintain, and operate oceanographic equipment, and collect and analyse data to report their findings.

Graduates of technology programs are prepared to analyze and design systems using computer aided design (CAD) software, specify project methods and materials, perform cost estimates, perform project management roles, and manage technical activities in support of collecting oceanographic data, procuring equipment, building, construction, and repair projects within the marine environment.

STRATA LEVEL: 2 – Technician

Also Known as:

- Marine Engineering Technician
- Vessel Technologist
- Marine Technologist
- Marine Engineering Technologist

Education and Experience:

- Two-year diploma in engineering, ocean technologies, or applied science technology.
- Certification in engineering technology by a provincial association may be considered an asset.
- In Quebec, membership in a regulatory body is required to use the title of 'technologist.'

Associated NOC(s):

- **2232** – Mechanical Engineering Technologists and Technicians

TECHNICAL

Engineering Review and Analysis

Reviews and analyzes relevant information pertaining to technical designs and complex systems to develop appropriate solutions.

- Reviews technical engineering drawings to make recommendations or design processes to improve efficiency, quality, or performance.
- Analyze engineering and manufacturing processes to improve process to reduce production loses and overall costs.
- Uses mathematical models and computer simulations to analyze the stress imposed on an object by temperature, load, motion, vibration, or other variables to determine its failure points.
- Interprets a variety of engineering design drawings to determine the engineering requirements to create solutions.

Advanced Manufacturing Technology (AMT)

Program, assemble, install, and use advanced manufacturing technologies, devices, components, or systems according to engineering specifications to improve organization performance and competitiveness.

- Use computer-aided design (CAD) systems to assist in the creation, modification, analysis, or optimization of a drawing or design.
- Use computer-aided manufacturing (CAM) programmes to control machinery and machine tools in the creation, modification, analysis, or optimization of equipment and components.
- Uses computer-aided engineering (CAE) analysis tasks such as Finite Element Analysis and computational Fluid Dynamics to improve product designs or resolve engineering problems.

Electrical Systems

Contribute to the design, assembly, and commissioning of electrical circuits, equipment, and systems to fulfill the project requirements and ensue operational functionality.

- Analyze properties of shipboard electrical systems and design of electrical systems for ships.
- Analyze principles of operation and the function of different components in ships' electrical systems.
- Identify ship electrical loads and requirements based on systems needs and equipment.
- Interpret engine electrical systems drawings, specifications, standards, and technical literature to contribute to the design of ship electrical systems to adhere to relevant legislation and guidelines.
- Applies knowledge of oceanographic sampling techniques to observe and record ocean acoustics.

Mechanical Systems

Contribute to the design, assembly, and commissioning of mechanical assemblies, equipment, and systems to fulfill the project requirements and ensue operational functionality.

- Research and specify appropriate materials, components, and practices to develop appropriate mechanical system solutions.
- Applies appropriate knowledge of mechanics, fluid mechanics, thermodynamics, hydraulics and pneumatics to the analysis and development of mechanical systems.
- Services, repairs, adjusts, and tests machines, devices, moving parts, and equipment that operate primarily based on mechanical principles to ensure functionality.
- Prepares preliminary technical drawings with sufficient details and specifications to ensure the effective and safe construction of structures, systems, and facilities.
- Interpret engine auxiliary systems drawings, specifications, standards, and technical literature to contribute to the design of ship auxiliary systems to adhere to relevant legislation and guidelines.

Troubleshooting

Identifies operating problems and inefficiencies in current equipment, process, or systems and report problems to determine effective solutions.

- Completes service records and repair documentation to facilitate the follow up of preventive maintenance and equipment replacement.
- Responds to troubleshooting requests, providing initial diagnosis, and determining the priority and suitable solution weighing in the effects on crew safety and possibility of further equipment damage.
- Identifies and reports major equipment maintenance needs, prior to failure, to maintenance personnel to ensure safe and efficient operations.
- Recommends potential updates and short-and long-term infrastructure and equipment requirements.

Auxiliary Systems

Contribute to the design, assembly, and commissioning of auxiliary systems, equipment, and components to fulfill the project requirements and ensue operational functionality.

- Analyze applications of ship's propulsion systems and required power systems to implement calculations in accordance with design criteria.
- Performs corrective and preventative maintenance on a ships auxiliary equipment according to established protocols to ensure equipment and systems function efficiently.
- Disassemble internal combustion engines, generators, pumps, and other auxiliary systems to make repairs and improve performance.
- Apply appropriate techniques and processes to overhaul and re-assemble ship auxiliary power systems and engines to ensure optimal power generation and output.

Equipment Operation

Operates equipment using established processes to ensure outcomes are within allowable variances and maximizes safety and efficiency.

- Operates equipment in compliance with organizational standards to maintain efficient and safe workplace operations.
- Follows appropriate procedures to calibrate and recalibrate instruments and equipment to ensure accurate measurements and quality control.
- Uses welding equipment including personal and protective equipment to melt and join pieces of metal or steel together to repair or construct components or parts of a vessel.
- Uses battery testing equipment to detect flaws affecting the battery's performance, measure accumulating charge, or test voltage output.
- Uses two- and three-dimensional measuring equipment to measure the size of components to ensure precision and check fit.
- Deploy, retrieve, maintain, calibrate, and test oceanographic devices in the marine environment to study the physical marine environment.
- Integrates and sets up sampling technologies and/or equipment required on board to support scientific research activities.

Electrical System Maintenance

Applies appropriate processes and procedures to maintain electrical systems and components to ensure systems meet quality assurance and operating specifications.

- Perform a site-specific risk assessment prior to starting work to identify hazards and implement necessary control measures.
- Makes appropriate checks and adjustments to electrical equipment to ensure components are correctly replaced, positioned, or aligned.
- Applies appropriate methods and techniques to dismantle, remedy, and reassemble electrical systems or components.
- Lockout and tags components or electrical systems prior to starting maintenance work to ensure stored energy is not released unsuspectedly.
- Apply appropriate disassembly and reassembly methods to dismantle, remove, and replace faulty electrical power generation and distribution assemblies and sub-assemblies.

PERSONAL AND PROFESSIONAL

Communication

Positively directs outcomes by delivering communication that results in a better understanding of goals and objectives and that capture interest, and gain support for immediate action.

- Verbally conveys complex technical information accurately, clearly, and effectively to communicate technical operations.
- Recognizes and builds on the good ideas of others and willingly seeks feedback so that operational efficiency may improve.
- Informs team members and supervisors of developments affecting consistencies and functionalities to ensure safe and efficient systems.
- Asks questions when assigned unfamiliar tasks to ensure understanding and accuracy.
- Actively listens to team members and managers to understand different perspectives and incorporate feedback into workplace tasks.
- Provides leadership with workplace reports to convey processes and procedures to tasks to remedy inaccuracies and redundancies.

Teamwork

Actively participates in working with and helps others to accomplish a common objective.

- Collaborate with other technical staff to ensure common understanding and devise solutions to product design.
- Ensures tasks are completed in the most efficient manner to optimize workplace output.
- Listens to constructive feedback and incorporates suggestions to achieve a collective objective.
- Recommends improvements or solutions to supervisors for the purposes of improving operational efficiency

Problem Solving

Identifies problems and uses logic, judgement, and evidence to evaluate alternative scenarios and recommend solutions to achieve a desired goal.

- Applies mathematical models and techniques to perform analysis and create solutions to specific problems.
- Analyzes operational data to evaluate operations, understand trends, and potential areas of concern to take appropriate action where required.
- Simplifies complex ideas and technical concepts into accessible information to communicate with stakeholders, senior management, and team members.
- Takes an unbiased stance to interpreting new information to solve a problem in an object manner.

LEGAL, REGULATORY, AND POLICY

Regulatory Compliance

Adheres to specific regulations, codes, and legislation within a defined jurisdiction to ensure the health and safety of others.

- Identify inspection requirements for vessels to schedule site visits for regulatory bodies.
- Identify and evaluate all system requirements to meet applicable codes, standards, and regulations.
- Inspect vessel and vessel components to ensure compliance with industry standards and regulatory specifications.
- Applies engineering codes and statues, of a defined jurisdiction, in the design process to ensure a safe workplace.

Health and Safety Procedure

Abides by and advocates specific workplace safe operating procedures and occupational health and safety requirements within a defined jurisdiction to ensure the health and safety of others.

- Participates in all safety and environmental drills, inspections, toolbox talks, and other recommended training to ensure safe workplace conditions and zero near misses.
- Identifies potentially hazardous working conditions and safety problems to be corrected in workplace safe operating procedures and employee reviews.
- Leads by example in following establish health and safety protocols to encourage all staff to do the same.
- Applies appropriate health and safety procedures in all aspects of work to ensure zero-incidents.

ENVIRONMENTAL

Naval Architecture

Applies appropriate engineering theory and methods to the planning, design, and evaluation of naval architecture construction.

- Reviews naval architecture drawings and client specifications to determine the machinery requirements for piping applications and piping systems.
- Interpret engineering and naval architectural drawings to specifications to ensure vessel is compliant with regulatory guidelines.
- Analyzes the ships electrical operational requirements to design appropriate systems to handle electrical loads.
- Prepares the integration and coordination of clearances, locations, and interferences between structural, mechanical, environmental, and electrical systems to ensure complete functionality.
- Coordinates with naval architect and other technical specialists to resolve specialized problems related to ship architecture.
- Research speciality components for vessel systems to source materials to ensure completion of ship construction.

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