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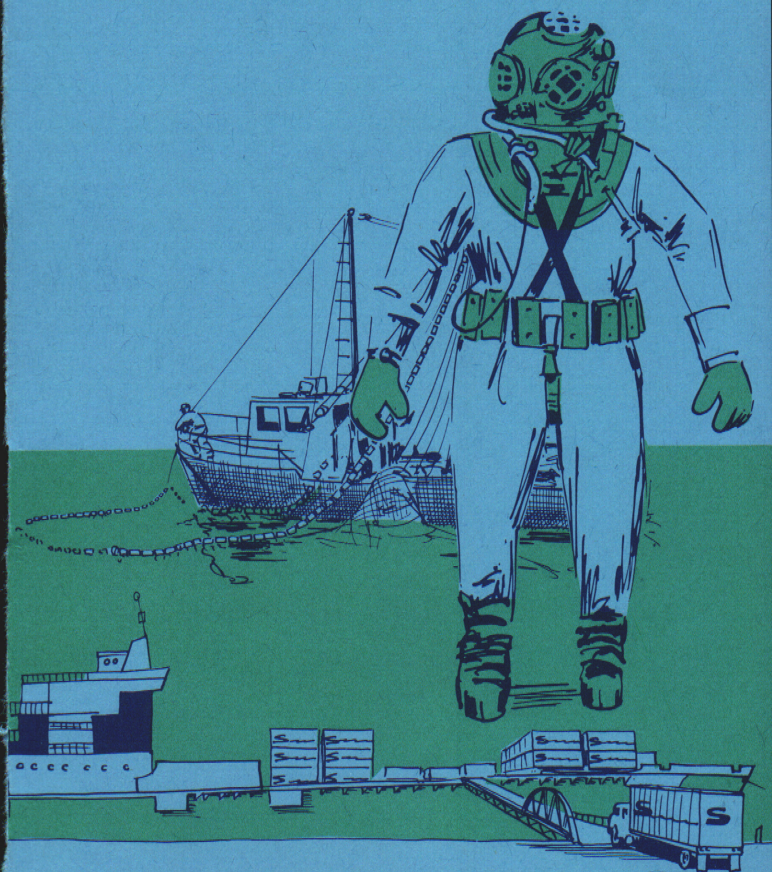
Technical Marine Careers  
Michigan State University  
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# Technical Marine Careers

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Cooperative Extension Service  
Michigan State University





## Marine Careers

*This is designed to help students gain a better understanding of the many marine-type careers. This is not a comprehensive listing, but includes examples of job descriptions from scientific, professional, and technical fields.*

*It should also assist college-oriented students in choosing high school and college courses that will prepare them for these positions. A number of colleges and universities offer undergraduate courses in marine-oriented subjects.*

*No effort has been made to specify undergraduate courses that would lead to graduate school placement in the various disciplines. Individual graduate schools' requirements should be obtained from the respective schools.*

*Some of the job opportunities do not require college degrees but may instead require special training. Students should request further information on this training from their guidance office or career resource center.*

*Michigan, along with certain other states, is instituting marine vocational/technical programs at the high school level. Contact the Michigan Department of Education for a list of these schools.*

*Training for certain jobs may be obtained by "on-the-job" experience without the need for post-secondary school studies. The availability of these jobs depends upon the condition of the general job market.*

*Wherever mentioned, the word "marine" is used in its broadest context, referring to both salt and fresh water systems.*



# Technical Careers

## **Education/Training**

Since this is the most broadly based category of marine careers, the education or training required for technical positions is quite varied, depending upon the particular job. Typically, technical personnel transform the ideas and plans of scientists and professionals into goods and services. Training needed ranges from on-the-job experience, to two-year vocational training, to a full undergraduate program.

## **Job Availability**

Job opportunities are best among technical positions because of the great diversity within this category. With ever-increasing interest in these positions, however, competition is increasing somewhat and the better-trained or experienced applicants are filling the most desirable positions.

## **Ship/Boat Building and Repair Positions**

*Boatmen* operate small utility watercraft around the shipyard. These boats transport men, equipment, and materials from shore to worksite and between shipyard and subplant.

*Boilermakers* fabricate and assemble new boilers, tanks, and pressure vessels. They also repair defective tank-type equipment.

*Burners* use an acetylene cutting torch to cut and shape metal. They possess skills similar to those of a welder, i.e., the ability to read blueprints and layouts and to regulate gauges. The burner should have a working knowledge of metallic characteristics.

*Derrick Barge Operators* maneuver a boom mounted on a boat or barge to lift and transfer heavy objects from one location to another.

*Drydock Head Linemen* direct the placing of wooden supports on the drydock, the lowering and raising of the drydock, and the accurate positioning of the ship over the drydock before it is raised to an above-water position.

*Electricians*, working from blueprints and wiring diagrams, fabricate instrument panels, and repair and install all electrical and electronic wiring aboard ship



and in the shipyard. In addition, they install various electrical devices such as voltage regulators and switch panels.

*Fiberglass Repairmen* have knowledge of both the fiberglass process and the design of hulls. The demand for repairers who know both boats and fiberglass, and are skilled craftsmen, is growing fast.

*Inboard Mechanics* fix, install, test, and troubleshoot engines that are built into the boat's body.

*Machinists (Inside)* work from engineering drawings, sketches, prototypes, or part descriptions and use such machine tools as lathes, shapers, and milling machines. They manufacture, repair, and assemble tools, mechanisms, and machines that are used aboard ship or on shore.

*Machinists (Outside)* install and repair machinery aboard ship such as propelling and steering equipment, refrigeration, and cargo-handling machinery.

*Marine Draftsmen* specialize in preparing structural, machine, or electrical drawings for marine vessels or shore installations. These drawings are prepared from designs and notes supplied by the marine architect or marine engineer.

*Outboard Mechanics* have a thorough knowledge of outboard engines, and must be able to diagnose difficulties. Most major marine manufacturers have training schools to prepare the outboard mechanic.

*Pipe Fitters*, following a set of specifications and blueprints, repair and install hydraulic, air, and oil lines in a ship.

*Riggers* set the mast, tune the rigging, and know how to install all the items of sail hardware. In some firms, the rigger also installs steering, lighting, and control systems.

*Riveters* join the structural components and plates used in fabricating a ship's hull and superstructure.

*Ship Carpenters*, using pencil, chalk, tapes, straightedges, blueprints, etc., lay out woods used in fabricating structures, cabinets, and appointments aboard ship. They may finish hardware and erect scaffolding to be used by craftsmen and laborers working above deck or ground level.

*Shipfitters*, following blueprints and using templates and handtools, lay out structural components for ship hulls and superstructures. In addition, the shipfitter installs and aligns the completed members.



*Templatemen* form wood or metal templates to the shape of the ship being repaired, reworked, or replaced.

*Welders*, skilled workers, perform welding aboard ship or in the yard. The welder, working with electric welding equipment, fuses metal parts together to fabricate, repair, or enlarge objects or equipment.

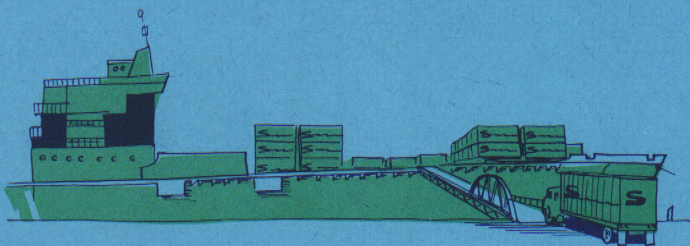
## Merchant Marine Positions (Crewmen)

*Boatswains* work directly under the first officer. As foreman of the deck crew, they work closely with the first mate to direct the activities of deck crew members, supervise the deck crew in repairing deck equipment, and in docking and mooring the ship.

*Able (Bodied) Seamen* are experienced in handling deck equipment, manning the wheel on the bridge, and all other duties except navigating and piloting. After serving three years aboard ship, the ordinary seaman can be certified by the Coast Guard as an Able Bodied Seaman.

*Ordinary Seamen* act as laborers aboard ship. The ordinary seaman scrubs decks, splices ropes, chips and paints.

*Ship's Carpenters* are responsible for repairing and maintaining the ship's anchor and winch. In addition, they help to shore or brace cargo, and act as general maintenance man of the ship.





*Electricians* maintain and service such electrical equipment as winches, generators, motors and motor controls, lights, fuses, etc. aboard ship.

*Chief stewards* oversee the operation and upkeep of crews', officers', and passengers' quarters aboard cargo and passenger ships. They requisition all food products and supervise the activities of employees affiliated with the steward's department.

*Chief Cooks* oversee the preparation of food for the crew and officers. They also inspect the galley and its equipment, and direct galley personnel in sanitation practices. The chief cook works with the chief steward to prepare the ship's menu.

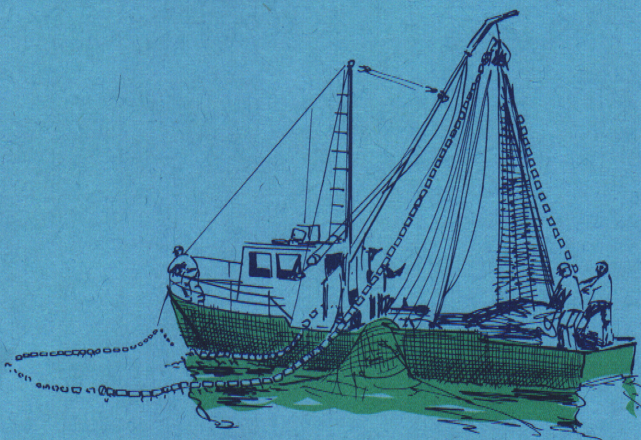
*Utilitymen* serve in a position requiring minimal skill. They gather food supplies from the ship's storerooms and iceboxes, wash and prepare vegetables, wash eating and cooking utensils, and clean the galley.

## Commercial Fishing Positions

*Captains* manage the operation of the vessel. Their work involves administrative and technical responsibilities for the operation, maintenance, and safety of the vessel; planning and supervision of operations and maintenance on the deck and engine of the vessel; administration of business affairs such as purchasing, disbursing, and insuring compliance with customs and immigration regulations; and piloting vessels through rivers, straits, and harbors.

*Rigmen* do much of the deck work aboard the vessel. They operate the trawls and booms, clean the net, and help in sorting, icing, and unloading the catch.

*Production Supervisors* ensure that all aspects of production operate smoothly. In addition, the





production supervisor also sees that proper personnel adjustments due to absenteeism are made.

*Line Foremen* work in a processing area of the industry. They supervise those duties performed by a particular line or section.

*Salespeople* are responsible for seeing that seafood products are marketed properly.

## **Offshore Mining and Petroleum Operation Positions**

*Rotary Drillers* specialize in drilling underwater wells from barge-mounted derricks or from platforms. To drill wells, they operate gasoline, diesel, or electric draw works. Using handtools, powered wrenches, and tongs, they connect sections of drill pipe and select and change drill bits according to the strata. Drillers record footage drilled, location and nature of strata penetrated, and materials used.

*Derrickmen* rig derrick equipment and operate pumps to circulate "mud" through drill holes. They may clean and oil pulleys, blocks, and cables in addition to repairing pumps.

*Tool Pushers (Drilling Foremen)* supervise and coordinate activities of workers drilling oil and gas wells. They direct rig builders to erect, dismantle, and move drilling rigs. They also instruct drilling crews in setting up and operating power units, draw works, and other drilling equipment.

*Roustabouts* assemble and repair oilfield equipment. They connect tanks and flow lines, do maintenance work such as painting, sandblasting, and chipping, and help in loading and unloading boats.

*Lease Operators* operate power pumps and auxiliary equipment to produce a natural or artificial flow of oil or gas from wells. They shut off wells according to the production schedule and switch the oil flow into unfilled storage tanks. The lease operator may supervise workers pumping oil from wells, and may also repair gas and oil meters and gauges.

*Crude-Oil Treaters* operate chemical, electrical, and centrifugal oil-treatment units to remove sediment and water from crude oil before it is transported by pipeline to refineries.

*Oil Well Cementers* control cement mixing and pumping equipment to caulk openings in permeable rock formations and in walls or casings of gas or oil wells.



*Well Pullers* control power hoisting equipment that extracts tubing from wells for repair, and lowers repaired equipment, testing devices, and servicing tools into the well.

## **Port Activity and Maintenance Positions**

*Surveying Technicians* survey harbors and shorelines to determine water depths and establish or maintain reference points. This information is recorded and submitted to the engineering and drafting staff, who prepare hydrographic and topographic maps.

*Construction Inspectors* oversee construction activities to ensure that materials, methods, and procedures comply with plans and specifications. They keep a job progress log, maintain quantity records for pay purposes, and report this information to the field office regularly.

*Survey Boat Operators* maneuver the boat carrying sound equipment and personnel around the harbor. The operator is able to read navigation charts and to determine the exact location where soundings should be made.

*Foremen (Construction and Maintenance)* supervise and coordinate the work done by mechanics, laborers, pile drivers, blacksmiths, electricians, truck drivers, and other occupations in repairing and maintaining the shipyard. A foreman has a working knowledge of these crafts and can supervise and coordinate these activities among employees.

*Container-Crane Operators* maneuver large cranes positioned on tracks that transfer semitruck container cargo units to/from the truck bed from/to the ship's hold during loading.

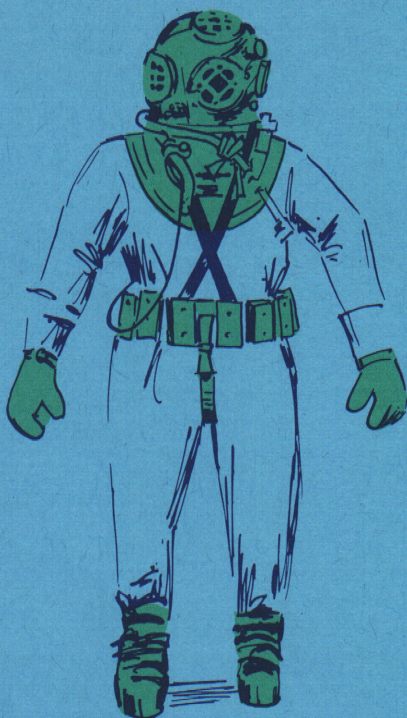
*Longshoremen* operate such material-handling equipment as the power winch, grain trimmer, crane, and lift truck to transfer cargo from the dock to the ship's hold or vice versa.

*Clerks* compile and type the ship's manifest for use at custom houses or terminals. They also verify the accuracy of the manifest. This work is normally performed in the steamship agent's office.

*Dredge Barge Superintendents* oversee all activities of crewmen aboard the barge. They are responsible for overall barge performance and are in charge of any shore operation.

*Divers*, working below the surface of the water, employ SCUBA or a diving suit with an airline





extension to the surface in order to inspect, repair, remove, and install equipment and structures.

*Diver Tenders* help divers into their diving suits, inspect diving equipment, and maintain communications with the submerged divers by lifeline or telephone. They hand equipment to the divers and help them into the water, and attend the lifeline and telephone to receive signals from the divers.

## **Marina and Marine Dealer Positions**

*Managers* have the responsibility for management decisions associated with the business. These responsibilities include personnel management, facilities management, public relations, financial management, marketing, and legal management. These responsibilities may fall entirely upon the manager, or he/she may delegate certain duties to others, depending on the size and resources of the business.

*Salespeople* assist the manager a great deal both in terms of public relations and marketing. They must have a thorough knowledge of their product lines, which include both sail and power boats, boating accessories and hardware, marine engines, electronic equipment, and fishing equipment.



*Yardworkers* are responsible for dock and slip maintenance and repair, boat hauling and storage, pump-out facility operation, gas dock operation, and other general yard duties.

*Boat Service Personnel* have the responsibility for servicing customers' boats. Such personnel may be trained as fiberglass repairmen, inboard repairmen, outboard repairmen, riggers, ship carpenters, and/or welders (see Ship/Boat Building and Repair Positions).

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