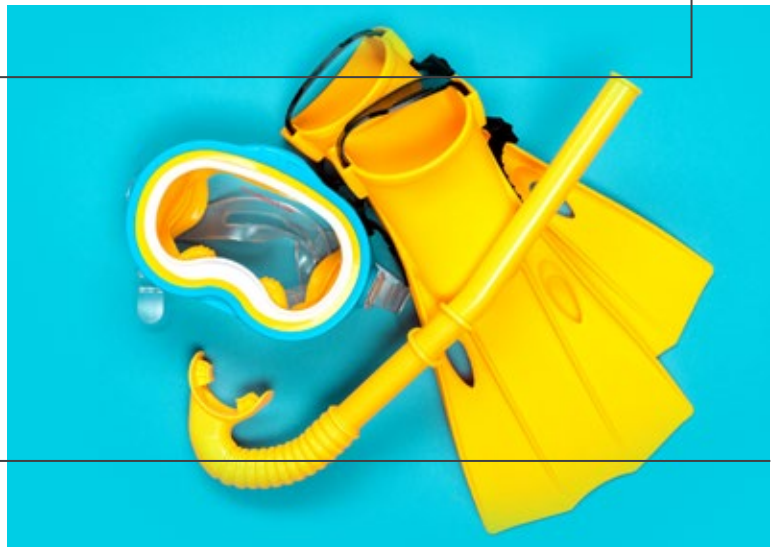


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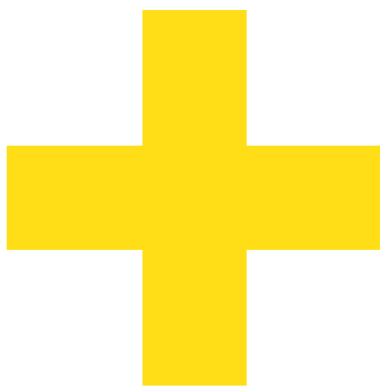


ACHIEVE
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INTRODUCTION

OPPORTUNITIES FOR A MARITIME NATION

With a 3,924km coastline and an Exclusive Economic Zone (EEZ) of 1,5523,00 km² South Africa has a significant opportunity to broaden its ocean economy by developing the maritime industry sectors required to govern, manage, exploit and sustain these territories.

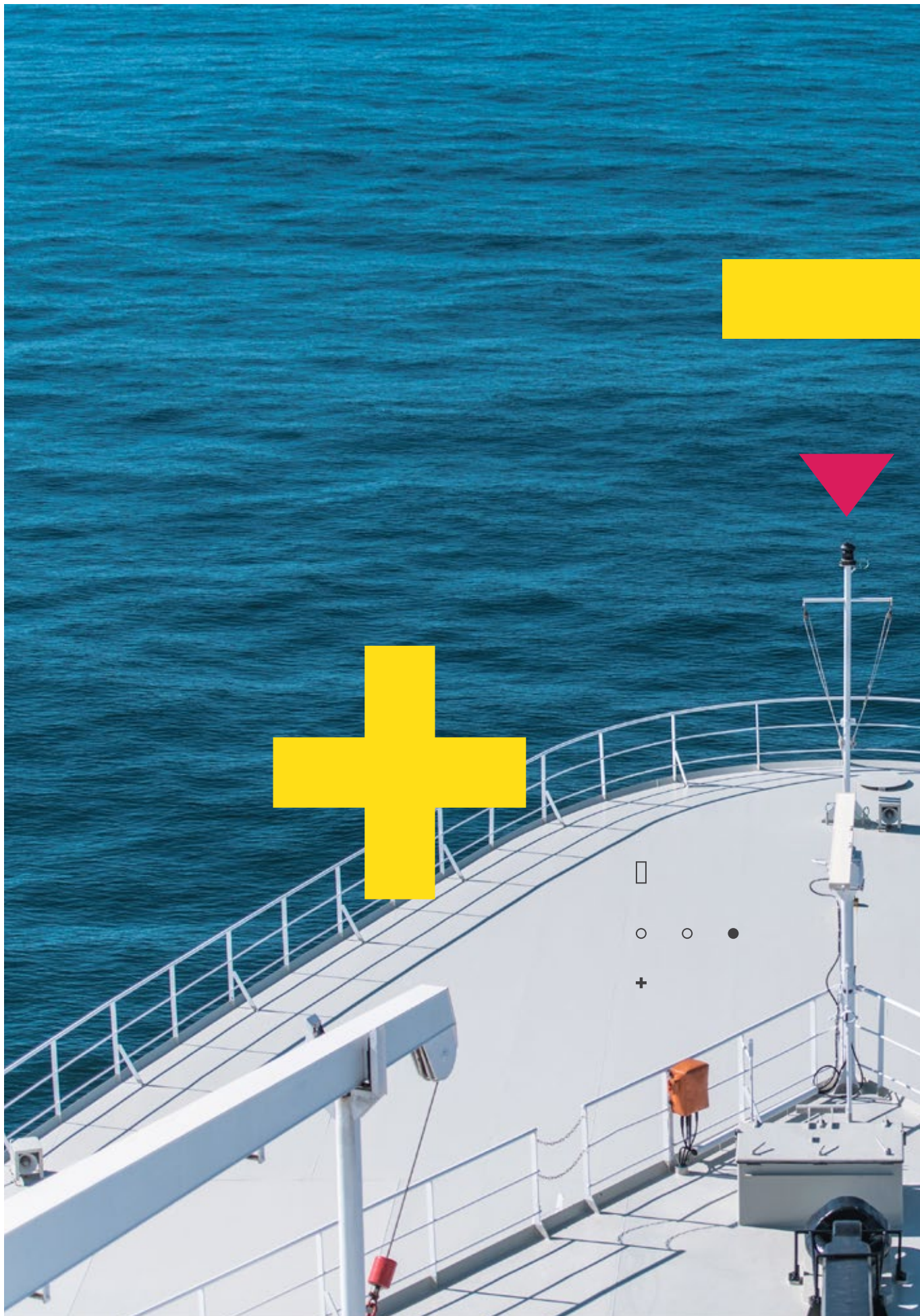
Our geographic position places the country on strategic trade routes between the East and the West and has resulted in the development of eight commercial ports that cater to the needs of both passing vessels as well as vessels calling to load and discharge cargo.

The many different maritime sectors offer good career opportunities that are interesting, challenging, rewarding and provide good scope for advancement and personal development. From the exciting salvage environment where seafarers and maritime experts are called upon to respond to incidents at sea and the merchant mariner's responsibilities of moving valuable cargo around the world to port management, maritime law, logistics and naval architects – there is a career suited for everyone in the maritime sectors.

The maritime industry includes a number of sectors and sub-sectors. Each of these offer many career options with their own required skill sets. While there is an overlap of skills between the sectors and many ways to group sectors and sub-sectors. The diagram below provides a basic understanding of how these interact.



Currently seen as an industry with growth potential, the South African government as well as many international governments are investing in infrastructure and training to develop the potential impact of the various maritime sectors. This will provide more job opportunities for people interested in the maritime world. Operation Phakisa was launched in 2014 to drive the development of the ocean economy with the objective of creating significant new employment opportunities for South Africans in the maritime sectors by 2030.



SEAFARERS

SECTOR

01

INTRODUCTION

The most obvious maritime-related career path involves becoming a crewmember on board a ship. There are a number of maritime sectors that rely on the skills of seafarers to safely navigate and operate a variety of different types of vessels. All of these sectors offer a rewarding career opportunity for individuals who are self-disciplined, adventurous and hard-working.

While the basic training requirements are similar for each sector, some sectors may require additional training and education for operation of vessels that go further out to sea or across oceans that require ice navigation. In many cases, however, the training and education received by seafarers can form the foundation of a number of other careers across the maritime value chain.

MARINE TRANSPORT SECTOR: Also known as the merchant navy, the marine transport sector operates on a global scale moving different types of cargo around the world on established trade routes between trading partners. Approximately 80 to 90 per cent of all trade is carried on ships that are specifically designed to accommodate different types of cargo. Container ships carry a wide variety of different cargo that is packed into individual containers and stacked on a vessel, while bulk vessels are designed to accommodate either liquid or dry bulk in tanks or holds on board. Seafarers that work on board merchant ships are often away from home for months at a time.

CRUISE INDUSTRY: As one of the fastest growing maritime industries, the cruise sector operates mega cruise ships along established cruise routes at suitable times of the year. These hotels at sea are mini cities that employ the usual hospitality-type careers, but also need a full complement of seafarers to ensure that the ship runs smoothly and safely. Seafarers who work in the cruise industry may be away from home for months at a time, but may enjoy regular stops in interesting ports.

SUPERYACHT SECTOR: The superyacht sector offers opportunities for seafarers who are looking for a more exclusive working environment. Superyachts are essentially small cruiseliners that are owned by individuals and cater to small groups of passengers. Seafarers working in this environment need to be particularly mindful of privacy issues, but still need to ensure that the vessel operates safely and smoothly. Contract periods vary for seafarers in this sector.

FISHING INDUSTRY: Fishing vessels also offer a number of opportunities for seafarers. While the fishers are engaged in catching and hauling fish onto a fishing vessel, the seafaring staff need to ensure that the vessel navigates safely to and from the fishing fields. Depending on the size and capacity of the fishing vessel, seafarers are not likely to be away from home for extended periods of time, unless working on board a factory vessel that can undertake long trips and keep its haul fresh. (See the chapter of fishing for more information about other careers in the sector.)

SALVAGE SECTOR: The salvage industry requires particularly experienced and skilled seafarers who are able to work under pressure, often in emergency situations. They can be tasked with towing stricken vessels, rescuing crew or removing wrecks from sensitive areas. Depending on the contract being undertaken, seafarers on board a salvage vessel may be away from home for protracted periods.

PORTS/HARBOURS: Seafarers are required to operate harbour tugs that guide visiting ships into harbours around the world. In most cases a visiting ship will not be permitted into a harbour without the assistance of a harbour tug as well as a harbour pilot who is shuttled to the ship to join the bridge crew. Tug crew need to know their port very well and understand the challenges associated with the safe mooring and berthing of visiting vessels. They will generally work shifts and return home on a daily basis. Off-port-limits (OPL) vessels also work from ports and harbours to deliver supplies to vessels that do not want to come into harbours. These are usually operated by private companies and they employ seafarers to undertake

THE WORKING ENVIRONMENT

Working on the merchant fleet in the marine transport sector can be varied. Some shipowners offer better working environments than others with better crew connectivity as well as contract periods, but generally container and bulk vessels offer comfortable crew facilities and amenities. The higher the rank of the seafarer, the better the accommodation is. Lower ranked officers will share a cabin and bathroom, while more senior officers will have their own cabins, offices and bathrooms on board.

The Maritime Labour Convention of 2006 sets out the requirements for decent working conditions in the maritime sector by stipulating the minimum requirements for seafarers to work on ships. These include conditions of employment; hours of work and rest; accommodation, recreational facilities; food and catering; health protection; medical care; welfare and social security protection.

While the deck officers spend their working hours on the bridge in relatively comfortable conditions, the engineering officers are generally confined to the engine room and other areas housing the machinery associated with the sailing of the vessel. This can include the engine and propulsion system, the generators, the fresh water generators and any loading/discharge machinery.



Before embarking on a career at sea, it is advisable to investigate whether the working environment and conditions associated with long periods away from home, encountering rough seas and working in a multicultural setting are attractive to you. Crews that work and live on board a vessel are often sourced from many nationalities and must overcome cultural differences to ensure that the ship remains safe and maintains its course. As such a good command of English is vital to integrate into the multi-cultural environment found on board.

But the adventure of the high seas does appeal to many and the opportunities for career advancement as well as travel provide a very satisfying work life for those who seek to apply themselves. In addition, a career at sea provides an excellent base from which to pursue a land-based maritime career path.

As a truly international industry, global safety and training standards are required to ensure that the multinational crews work seamlessly while on board.



POSITIONS ON BOARD A MERCHANT SHIP

The ship's crew is divided into the deck department which consists of crew that are responsible for the navigation and safe routing of the vessel, and the engineering department which oversees the equipment on board as well as the steward department that oversees the wellbeing of everyone onboard.

On shore however, the crew is overseen by the Crewing Manager at the ship owning company or ship management company's offices.



Crewing Manager

The Crewing Manager is a shore-based member of a ship management team and is responsible for the planning of the crews on board the company's vessels in conformity with the defined crewing and vessel policies. In addition, the Crewing Manager must undertake timely reporting and analysing of crew-related costs for the respective vessels.

Key tasks:

- Implement recruitment procedures, working with recruitment agencies.
- Provide accurate and timely information and registration relating to planning and planning issues to the Operations Department, applicable business partners and crew members.
- Manage administrative matters including flights, accommodation and visa arrangements. Ensure certification and experience of crew meets legal requirements.
- Create and maintain personal records and update all certificates.

Entry requirements/training:

Crewing Managers are generally required to hold a Bachelor's Degree in Maritime Operations/ Ship Management, Business Administration, Business Economics or Human Resource Management. Being an ex-seafarer would be an advantage and knowledge of the STCW Convention as well as the Marine Labour Convention would be essential.

Career advancement:

Experienced Crewing Managers may find opportunities for advancement within ship owning or ship management companies.

Ranks and positions on board ships:

DECK DEPARTMENT: Responsible for navigation and safe passage of the ship.	ENGINE DEPARTMENT: Responsible for keeping the ship and machinery running.	STEWARD DEPARTMENT: Responsible for general housekeeping and catering on board.
Master/Captain	Chief Engineer	Chief Steward
Chief Officer/Mate	Second Engineer	Chief Cook
Second Officer/Mate	Third Engineer	Galley Hands
Third Officer/Mate	Fourth Engineer	
Deck Officer (Cadet)	Engine Officer (Cadet)	
Deck Ratings	Electrical Officer	
	Engine Room Ratings	

DECK DEPARTMENT

Master/Captain

NQF 8

The Master or Captain is in overall command of the ship and is ultimately responsible for the safe navigation and operation of the vessel. The master keeps no regular watch, but when the ship is in pilotage, close waters, particularly bad weather or when conditions dictate, they will closely oversee the navigation of the ship. The Captain is the owner's representative and deals with charterers, port agents and cargo formalities.

Key tasks:

- Command the ship.
- Be present on the bridge when arriving and leaving the port. Be present on the bridge in times of emergency.
- Sign the Bill of Lading for cargo.
- Arrange for provisions such as stores, fuel, cash etc.
- Deal with port authorities, immigration authorities, custom authorities etc. Undertake disciplinary action on board the vessel.
- Provide the order to abandon ship in case of emergency.

Entry requirements/training:

To become a Master, you must hold a Master Mariners Certificate of Competency (CoC). Some smaller ships may require a lesser certificate with a Command Endorsement. (See the section on education and training at the end of this chapter.)

Career advancement:

A Master can obtain tickets for specialised routes such as an Ice Captain or for bigger vessels.

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■ Chief Officer/Mate

NQF 7

The Chief Officer is responsible for the day-to-day working of the deck crew and for the stowage, loading, carriage and discharge of the cargo. While at sea the Chief Officer will keep the morning and evening watches and needs to hold a Chief Mate's CoC.

Key tasks:

- Prepare load/discharge plans for cargo.
- Undertake morning and evening watches (4am to 8 am and 4pm to 8 pm) In charge of deck ratings, Bosun, Able Seaman, Chief Cook and Steward. Acts as the vessel's safety officer.
- Oversees deck maintenance and deck machinery. GMDSS communications.
- Handling mooring stations.
- In charge of anchoring the vessel at anchorage. Keeping records.

Entry requirements/training:

The Chief Officer is a person holding Deck Class-II certificate of competency. Chief Officers may also hold the Class-I CoC. (See the section on education and training at the end of this chapter.)

Career advancement:

With further experience or exams they can become a Master.



DECK DEPARTMENT

■ Second Officer/Mate

NQF 6

The Second Officer is the ship's navigator and has the prime responsibility of the upkeep of charts and passage planning. At sea the Second Officer will keep watches and, in port, shares cargo watches with the Third Mate. Interestingly, the Second Mate is often the ship's medical officer.

Key tasks:

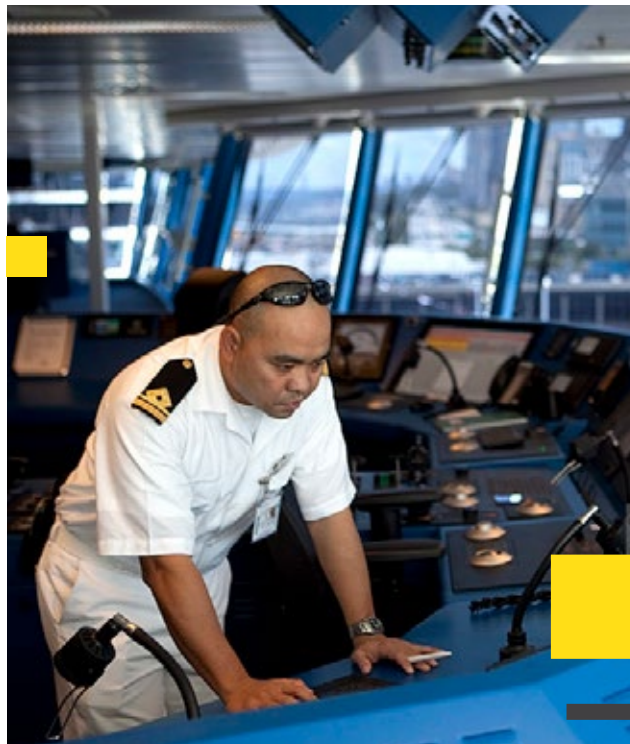
- Route planning.
- Undertake watches (Midnight to 4am and Midday to 4 pm). Correcting charts, sailing directions etc.
- Prepare noon reports. Test bridge equipment.
- Prepare deck log each month. GMDSS communication.
- Maintain ship's library and publications.

Entry requirements/training:

The Second Officer holds a Deck Class-III certificate of competency and may hold the Class-I, Class -II CoC as well. (See the section on education and training at the end of this chapter.)

Career advancement:

With further experience or exams they can become a Chief Mate.



Third Officer/Mate

NQF 7

The Third Mate is fourth in command and assists both the Chief Mate and Second Mate; keeps the morning and evening 8-12 watches at sea and shares watches with the Second Mate in port. The Third Mate is also responsible for the ship's lifesaving and firefighting equipment.

Key tasks:

- Maintenance of lifesaving equipment and firefighting equipment. Undertake watches (8pm to midnight and 8am to midday).
- Correcting charts, sailing directions etc. Prepare drill reports.
- GMDSS communication.
- Assist Chief Mate during cargo loading.

Entry requirements/training:

The Third Officer holds a Deck Class-III certificate of competency, and may hold the Class-I, Class -II CoC as well. (See the section on education and training at the end of this chapter.)

Career advancement:

With further experience they will become a Second Mate.



DECK DEPARTMENT

Deck Ratings

NQF 1-3

Mariners without a certificate of competence are called ratings. They assist in tasks that can arise during a voyage from mooring and cleaning to general maintenance and repair work. These are physically challenging jobs and have to be done regardless of the weather or sea conditions.

Ratings include the following positions:

BOSUN

The Bosun (boatswain) is the highest unlicensed rating in the deck department and is generally instructed by the Chief Mate. They will direct the work of the Able Seamen and Ordinary Seaman on board.

Key tasks:

They are responsible for the ship's hull and all its components, including its rigging, anchors, cables, sails, deck maintenance and small boat operations. A Bosun needs to be well versed in seamanship practices and must. They are also tasked with supervising the work of the Able Seaman and Ordinary Seaman in the course of their work to carry out maintenance on board. With significant responsibility on deck, the bosun is the highest paid of the deck ratings.

Entry requirements/training:

A Bosun generally works their way up to the position having gained experience as an Able Seaman and Ordinary Seaman. As with all crew on board a vessel, the bosun will be required to complete a number of on board safety related courses as well as firefighting courses.

ABLE SEAMAN

An Able Seaman (AB) works under the Bosun completing tasks as required.

Key tasks:

The Able Seaman is tasked with working the mooring lines, operating deck gear, standing anchor details and working cargo. The AB also stands a navigational watch as a lookout.

Entry requirements/training:

The AB usually comes on board initially as an Ordinary Seaman and, with some experience and proficiency, is promoted to the position of Able Seaman.

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ORDINARY SEAMAN

The Ordinary Seaman (OS) is the lowest ranking personnel in the deck department and is tasked with helping the AB.

Key tasks:

An ordinary seaman is assigned deck jobs as a trainee on ships. These responsibilities include painting, standing guard and standing duty at the helm of the ship as required during berthing and mooring.

Entry requirements/training:

The Ordinary Seaman is essentially a trainee position and does not require any initial qualifications apart from the mandatory safety courses required by international law to work on board any seagoing vessel. Working and gaining experience as a trainee followed by a couple of years as ordinary seaman allows an individual to get a promotion as an able seaman.

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ENGINE DEPARTMENT

■ Chief Engineering Officer

NQF 8

The Chief Engineer is effectively the ship's technical manager and is responsible for the operation and upkeep of all machinery and engineering systems as well as the structural integrity of the ship.

Key tasks:

- Plans work schedule for the engine room.
- Undertakes bunker calculations.
- Handles engine during critical periods.
- Submits reports to the Master.
- In charge of engine during any emergency.

Entry requirements/training:

The Chief Engineer holds Engine Class – I Certificate (Unlimited/ Foreign going). (See the section on education and training at the end of this chapter.)



Second Engineering Officer

NQF 7

The Second Engineer is responsible for the day-to-day management of the engineers and engine room crew. Their prime responsibility is the main engines as well as spare gear and stores.

Key tasks:

- Assistant to the Chief Engineer.
- All machinery items, steering gear, pumps, auxiliary machinery and main engine maintenance fall under him.
- Undertakes engine watches (4am to 8am and 4 pm to 8 pm).
- Provides daily work schedule to engine ratings, fitters, oilers and wipers. Makes repair lists.

Entry requirements/training:

The Second Engineer holds an Engine Class – II Certificate (Unlimited/Foreign going). He may hold the Class-I CoC as well. (See the section on education and training at the end of this chapter.)

Career advancement:

With further experience they may become a Chief Engineer.



ENGINE DEPARTMENT

Third Engineering Officer

NQF 6

The Third Engineer works closely with the Second Engineer and often has the prime responsibility for the ship's electrical plant (generators). They will also assist with any main engine upkeep. In the absence of a dedicated Electrician or Electro-Technical Officer, the Third Engineer would also be responsible for the ship's electrics.

Key tasks:

- Operation and maintenance of generators.
- Operation and maintenance of boilers.
- Undertakes engine watches (Midnight to 4am and Midday to 4pm).
- Conducts boiler water testing.
- Operation and maintenance of propulsion machinery cylinder head mountings.

Entry requirements/training:

The Third Engineer holds an Engine Class – III Certificate (Unlimited/ Foreign going), and may hold the Class-I , Class- II CoC as well. (See the section on education and training at the end of this chapter.)

Career advancement:

With further experience they will become a Second Engineer.



■ Fourth Engineering Officer

NQF 5

The Fourth Engineer assists with all aspects of machinery upkeep. They are usually responsible for the fueling and daily monitoring of fuel supplies.

Key tasks:

- Taking bunkers and assisting with bunker calculations. Operation and maintenance of sewage plant.
- Operation and maintenance of incinerator. Operation and maintenance of oily water separator.
- Operation and maintenance of fresh water generator. Operation and maintenance of air compressor.

Entry requirements/training:

The Fourth Engineer holds an Engine Class – III Certificate (Unlimited/Foreign going) and may hold the Class-I, Class- II CoC as well. (See the section on education and training at the end of this chapter.)

Career advancement:

With further experience they may become a Third Engineer.



ENGINE DEPARTMENT

Electrical/Electro-Technical Officer

NQF 4

Some ships carry an Electrical or Electro-Technical Officer (ETO) responsible for monitoring all electronic and electrical equipment on board to maximise the operational safety and efficiency of the vessel under the Chief Engineer's overview.

Key tasks:

- Maintenance and testing.
- New installations and commissioning.
- Filing and reporting.
- Spares and inventory records and ordering.
- Risk assessment.

Entry requirements/training:

The ETO needs to have completed not less than 12 months of combined workshop skills training and approved seagoing service as part of an approved training programme of which not less than six months should be seagoing service as part of an approved training programme or; not less than 36 months of combined workshop skills training and approved seagoing service of which not less than 30 months should be seagoing service in the engine department. This must be documented in an approved training record book. They must have completed approved education and training program meeting the standards of competence specified in section A-III/6 of the STCW Code.



Engine Room Ratings

NQF 1-3

The engine room ratings assist the engineers with machinery upkeep and watchkeeping.

Ratings on board a vessel include:

FITTER

The fitter works under the Second Engineer but is considered the “chief” of the engine ratings.

Key tasks:

The Ship Fitter undertakes welding, grinding, boring and gas cutting on board. They are tasked with assisting with maintenance and working on pumps and engine equipment and water purifiers. They will also check the conditions of the tools and safety equipment and acts as the storekeeper.

Entry requirements/training:

While some positions may require one to have a ship fitter qualification, generally on-the-job or apprenticeship training is provided to someone with a high school diploma or equivalent. Mandatory safety courses are required by international law to work on board any seagoing vessel.

OILER

An oiler works under the Ship Fitter and undertakes maintenance work in the engine room.

Key tasks:

The Oiler cleans and maintains the engine room. In addition they will help with maintenance and repairs of the engine at the direction of the engineers. The Oiler will need to be familiar with the handling of various equipment and machinery parts and will report to their superior officer any defect found.

Entry requirements/training:

A high school diploma or equivalent is required along with the mandatory safety courses required by international law to work on board any seagoing vessel. An oiler will necessarily have spent time on board as a Wiper before being promoted.

ENGINE DEPARTMENT

Engine Room Ratings

NQF 1-3

WIPER

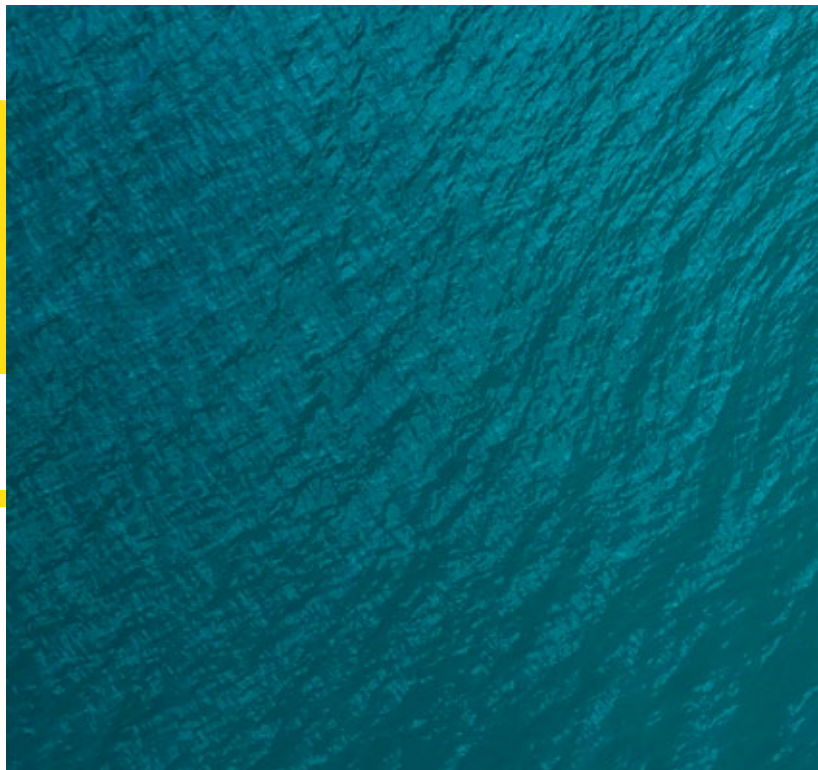
The wiper is the most junior rating in the engine room.

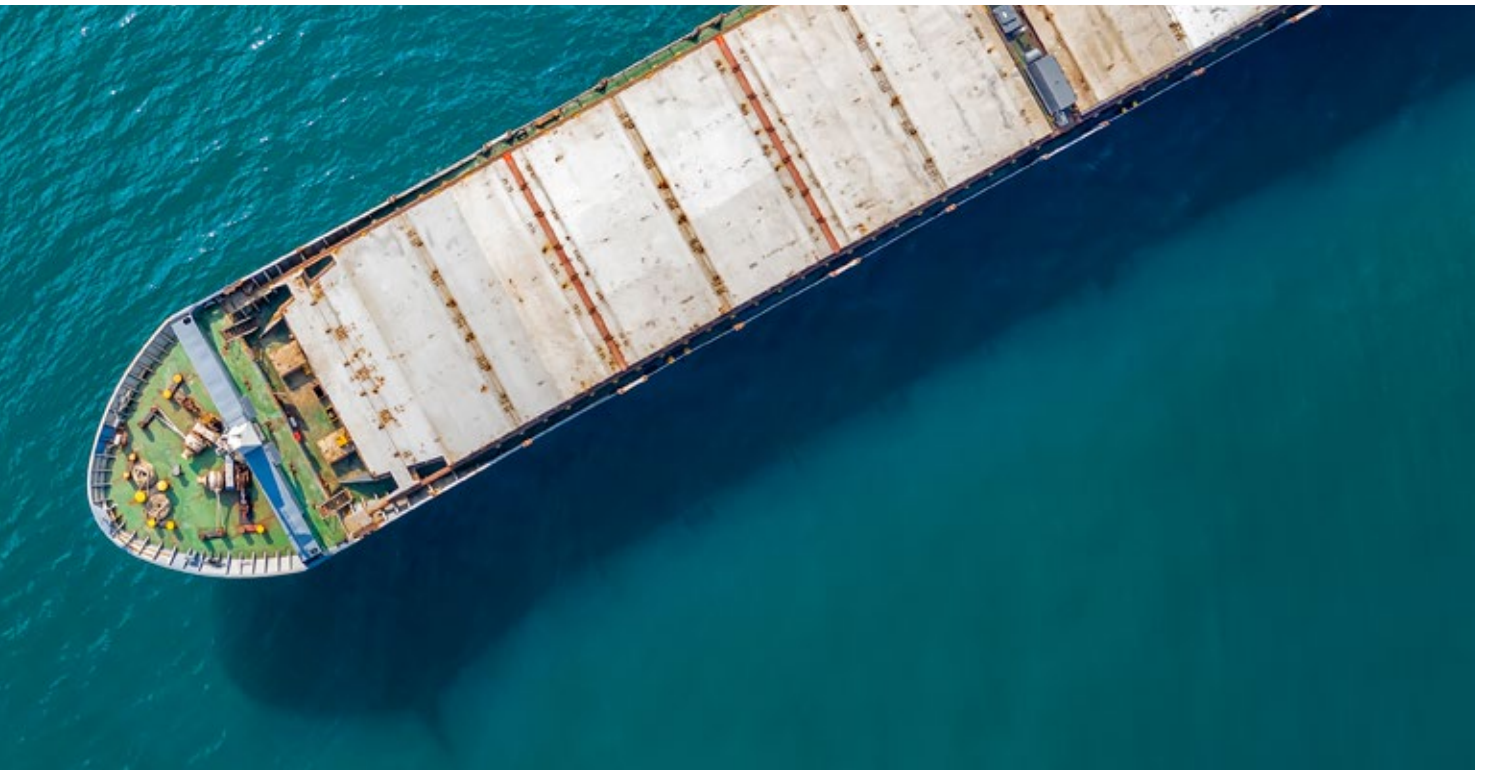
Key tasks:

The Wiper undertakes cleaning jobs in the engine room and can also help the engineers overhaul machinery.

Entry requirements/training:

A high school diploma or equivalent is required along with the mandatory safety courses required by international law to work on board any seagoing vessel.







TRAINING & EDUCATION

A variety of options exist for training in South Africa. Institutions providing education range from universities offering tuition for degrees; academies and schools of education and training for seafarers.

A cadet programme was instituted in South Africa to help develop local seafarers. The programme provides an entry point for many youngsters with ambitions of a career at sea. In addition, the country is strengthening its maritime education with the aim of growing the potential of the maritime economy.

Apart from the qualifications required to be an officer at sea or a qualified rating, seafarers also need to complete a number of safety related training courses before they work on a ship.

These include:

- First Aid at Sea.
- Marine Fire Fighting.
- Security Awareness.
- Personal Survival Techniques.

Other requirements for boarding a ship include:

- Seafarer Medical.
- Letter of employment from the shipping company.
- A Seaman's Book.

In this section we concentrate on seafaring training specifically for the merchant navy. There are, however, other seafaring opportunities that exist in the fishing industry, superyacht industry, offshore oil and gas sector and the port sector. It should also be noted that the training and certification requirements change from time to time and that the South African Maritime Safety Authority (SAMSA) will put into place any new requirements as required by international regulations and conventions.

The obligation to provide seagoing training to junior officers falls to the ship's captain and senior officers while at sea. Records of seagoing training are signed off by the responsible ship's officer to provide evidence that the required practical training has been undertaken in accordance with the home country's Port State Control examination.

TRAINING & EDUCATION

■ The National Cadet Programme

South Africa runs a National Cadet Programme (NCP) that was initiated by the South African Maritime Safety Authority (SAMSA), and has now been assimilated under the South African International Maritime Institute (SAIMI). SAIMI promotes the collaboration of role-players in the sector to foster skills development as well as to lead academic institutions that are facilitating the growth of the oceans' economy.

The NCP aims to increase the pool of qualified seafarers for South African and international ships by securing the practical sea time training required for students to complete their qualifications.

These qualifications are currently offered through programmes at the Cape Peninsula University of Technology (CPUT); Durban University of Technology (DUT) and Nelson Mandela University; simulator and professional training through private training providers and experiential learning aboard the SA Agulhas or other vessels offering training berths to cadets.

The following training programmes are included in the NCP:

- Deck Officer (Cadet)
- Engineer Officer (Cadet)



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■ The International Convention on Standards of Training, Certification & Watchkeeping

The international sourcing of seafarers onto a single vessel requires that all seafarers, no matter where they come from, receive the same standards of training. As such the global shipping community needed to ensure that a set of standards was in place to guarantee that all seafarers are properly, as well as uniformly, trained to recognise potential danger and to react in a competent and safe manner.

The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) was adopted in 1978 and came into force in April 1984. Major revisions to the Convention were undertaken in 1995 and again in 2010 to meet the needs of an evolving shipping sector as well as the more technologically advanced ship.

The 1978 STCW Convention was the first to establish basic requirements on training, certification and watchkeeping for seafarers on an international level. Previously the standards of training of officers and ratings were established by individual governments, usually without reference to practices in other countries. As a result, standards and procedures varied widely, even though shipping is the most international of all industries.

The Convention prescribes minimum standards relating to training, certification and watchkeeping for seafarers that countries are obliged to meet or exceed.

Revisions to STCW in 1995 undertook to respond to new requirements of the shipping industry and eliminate ambiguities that allowed for interpretations. These came into force in February 1997. Divided into two parts: Part A of the Code became mandatory, while Part B was recommended.

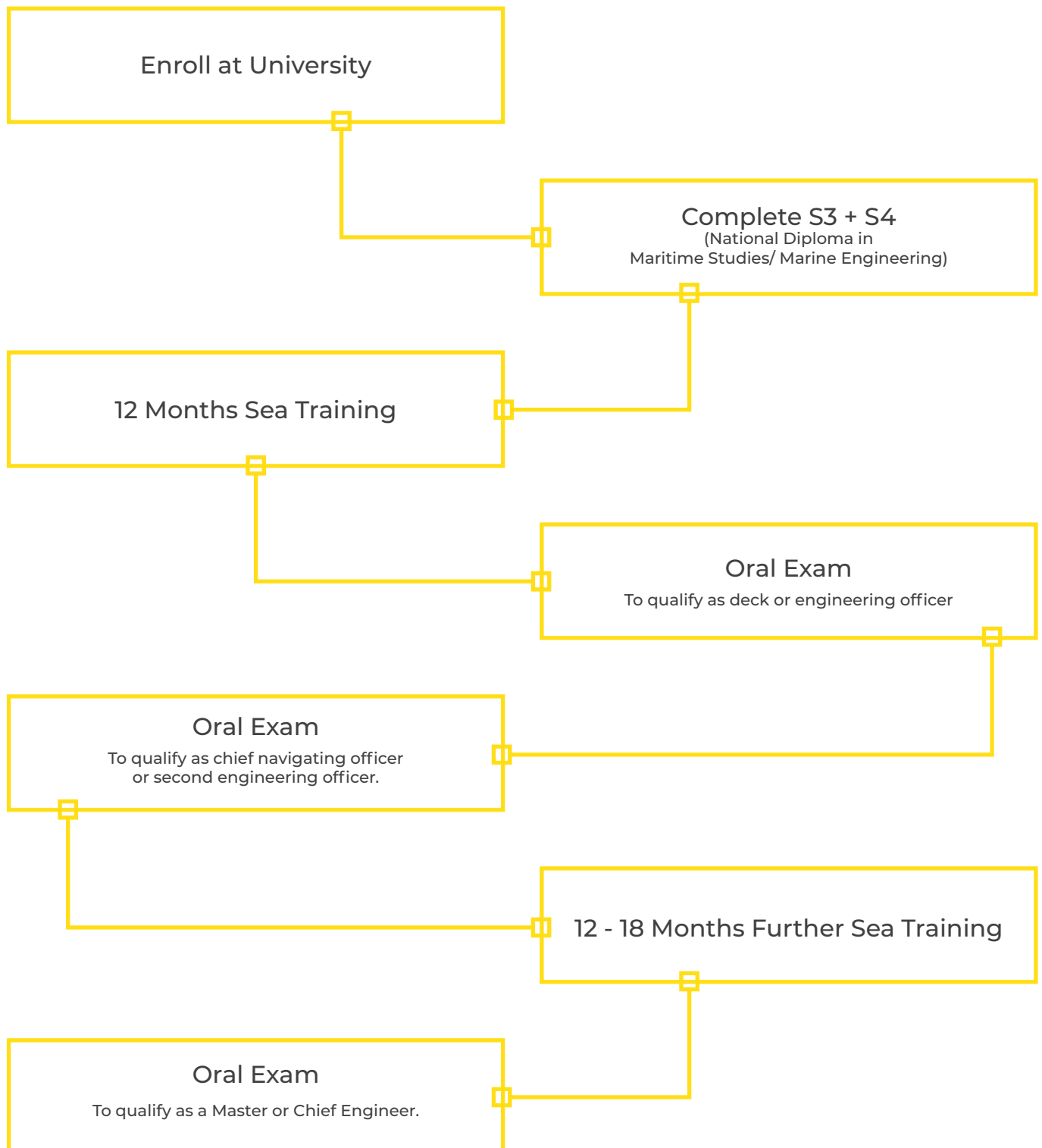
In addition, the technical annex was divided into regulations that could make it easier for future revisions and updating if necessary.

Another major change was the requirement for Parties to the Convention to provide detailed confirmation of their ability to administrate compliance to STCW. The Manila amendments to the STCW Convention and Code were adopted in June 2010, marking another major revision of the STCW Convention and Code.

These came into force in January 2012 and were aimed at bringing the Convention up to date with developments as well as to enable them to address anticipated issues that would emerge in the foreseeable future.

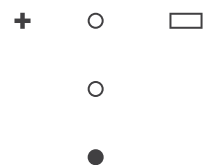
TRAINING & EDUCATION

Progression from Cadet to Captain



SAQA Relevant Certificates, Diplomas & Degrees

QUALIFICATION	INSTITUTION	TYPE	NQF LEVEL	CREDITS
National Diploma: Maritime Studies	Cape Peninsula University of Technology	National Diploma	6	360
National Higher Diploma: Maritime	Cape Peninsula University of Technology	National Higher Diploma	7	120
Postgraduate Diploma in Maritime	University of KwaZulu Natal	Post Graduate Diploma	7	120
Advanced Diploma in Marine Engineering	Durban University of Technology	Advanced Diploma	7	120
Bachelor of Engineering Technology in Marine Engineering	Nelson Mandela University	First Degree	7	360
Postgraduate Diploma in Maritime Studies	Nelson Mandela University	Post Graduate Diploma	8	120
Bachelor of Commerce Honours in Maritime Studies	University of Stellenbosch	Honours Degree	8	120
Master of Commerce in Maritime Studies	University of KwaZulu Natal	Master's Degree	9	180
Master of Philosophy in Maritime Studies	Nelson Mandela University	Master's Degree	9	180



MARINE TRANSPORT

INTRODUCTION

The transport of goods by sea is crucial to ongoing international trade. Without ships that carry cargo from one country to another, it would be impossible for the world to move the quantity of goods that is currently represented by global trade between the continents. There is just no other feasible transport option available. About 90 per cent of all trade is carried by ships.

This maritime transport sector forms a logistics chain from the source where goods are manufactured or mined by the exporter to the eventual destination where these goods are sold to the importer. Moving along this chain, the goods will change from one form of transport to another. Tracking, controlling and facilitating this movement requires human intervention. This intervention is represented by the many jobs that ensure that cargo is transported as efficiently as possible from source to destination.

CARGO & VESSEL INSURANCE

CLEARING & FORWARDING



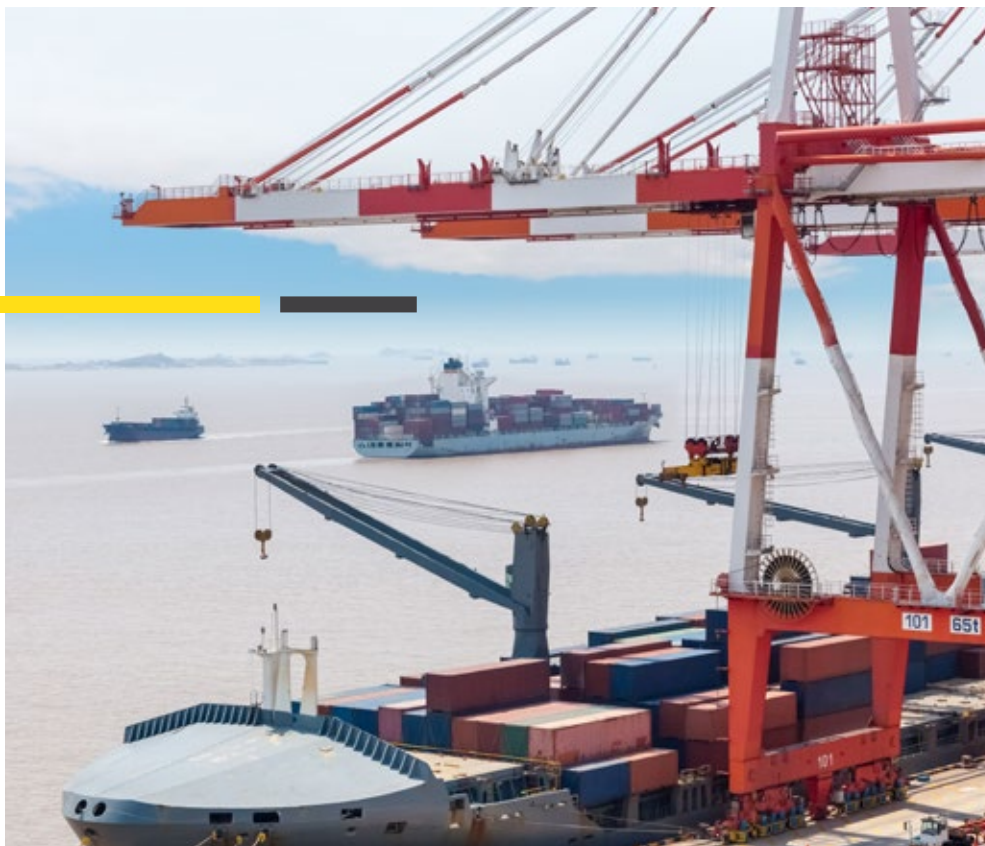
This dynamic and fast paced industry has been characterised by significant technological advances over the last two decades and continues to be impacted by technology associated with the Fourth Industrial Revolution. It is said that cyber developments such as blockchain could influence trade and transport. In addition, cybersecurity is an area that will attract much attention and require the skills of future workers in the coming years.

THE WORKING ENVIRONMENT

The work environment for those associated with maritime transport can be varied and includes office workers and administrative staff as well as those that physically involved in moving cargo within the harbours.

Working within the port environment moving cargo on and off vessels can be stressful. Here time really is money. Any delay in loading or discharging a vessel adds unnecessary expense to the cost of trade. The ship needs to keep moving in order to remain economically viable. Shift work is therefore common, but the ability to undertake loading and discharging operations may also be impacted by the weather.

On the whole, working within the maritime logistics chain in any capacity requires an individual to be meticulous about detail and cognisant of the need to work efficiently.





Harbour Master

NQF 8-9

The Harbour Master is the custodian of all aspects of safety of waterways and navigation within the port. This highly responsible and demanding position ensures that all ships visiting the port comply with local and international regulations and that their safety, whilst visiting or passing the port, is ensured. The position requires significant experience and knowledge of the port and maritime environments.

From the initial information provided by the ship, the Harbour Master will need to allocate a suitable berth and apply any restrictions needed to ensure the safe berthing of the vessel. They will designate a safe

pilot-boarding area and provide a passage plan for the ship at every stage of its movement from the pilot station to arriving alongside the quayside. A good knowledge of the various types of vessels calling at the port is necessary. The success or otherwise of a ship's stay in a port ultimately relates to the level of service provided by The Harbour Master's team.

The Harbour Master also plays a key role in the development and implementation of a safety management system which manages the hazards and risks associated with port operations along with any preparations for emergencies.

Key tasks:

- Manage team of pilots and tug masters including allocation of duties and training.
- Recruit marine personnel and update records.
- Manage Vessel Traffic Services (VTS).
- Ensure safety of navigation through the planning of all vessels and movements.
- Manage pollution control in the port.
- Coordinate response to incidents in port and emergency situations.
- Liaise with relevant government agencies, statutory bodies and emergency services.
- Implement port procedures.

Entry requirements/training:

A Harbour Master usually has a marine background as a senior ranking seafarer with an added Diploma in Port Management or a Harbour Master Certificate. They have usually also had experience as a tug master and pilot within a port. A post graduate degree in management or business is also useful.

Career advancement:

Further advancement within the port management structure is available to Harbour Masters who gain additional business skills.



Terminal Manager

NQF 8

The Terminal Manager is responsible for planning, administering and reviewing the operations within a single terminal in a port in order to ensure efficiencies, minimise costs and maintain safety standards. They must manage all aspects of the port terminal to ensure that the required throughput of cargo is maintained in order to meet the needs of calling vessels.

Key tasks:

- Oversee terminal budget.
- Develop and deliver business plans to meet terminal commitments. Ensure that safety and health standards are implemented and adhered to. Liaise with industry stakeholders and represent the port on committees.
- Supervise inventory management of freight as it enters and leaves the harbour.

Entry requirements/training:

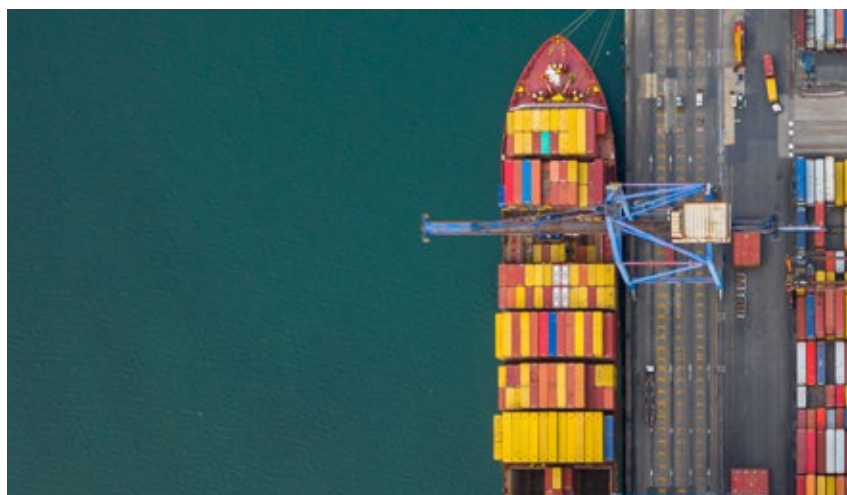
A background in engineering, logistics and business is required for the position. Although there is no specific degree or diploma in terminal management, Terminal Managers need to have experience in a similar environment and knowledge of the computer management systems involved in running a terminal.

Career advancement:

Further advancement within the port management structure is available to Terminal Managers who gain additional business and management skills.

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Port Planner

NQF 8-10

Port facilities need to adapt to increases in trade and the production of bigger and bigger vessels that require deeper berths and more quay space. The Port Planner needs to ensure that the future investment in infrastructure of the port accurately adapts to these changes. The position requires a keen understanding of international economics and trade as well as the impact that global policies may have on local trade volumes.

Data needs to be analysed to make forecasts about the type of additional infrastructure that should be planned for future developments within the port. This may include additional berth space, deeper drafts (dredging), more laydown space or the acquisition of different quayside equipment such as gantries and cranes. It could also involve decisions around allocation of space within the port for bulk storage, ship repair or leisure activities.

Key tasks:

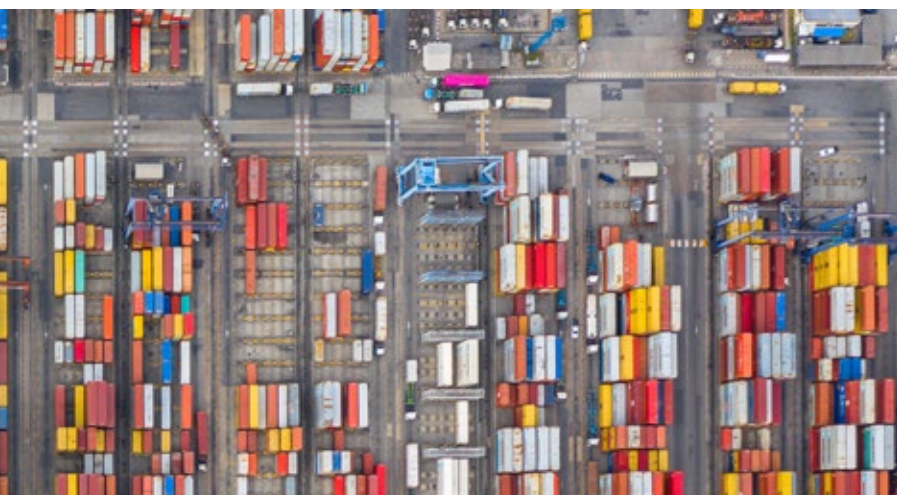
- Collection and analysis of port land use and economic data.
- Collection and analysis of terminal/port throughput statistics.
- Monitoring and evaluating trade patterns and maritime trends.
- Manage port consultants.
- Preparing and performing market forecasts and studies.

Entry requirements/training:

A degree in Urban Planning, Architecture, Public Administration, Civil Engineering, Economics or related fields with experience in the port or logistics environment. A Port Planner will likely work as a trainee port planner or assistant port planner before being promoted.

Career advancement:

Further advancement within the port management structure is available to Port Planners who gain additional business and management skills.



Marine Pilot

NQF 7-8

The crew on vessels calling in foreign ports may not necessarily know the port as well as a local seafarer who uses the port on a daily basis. For this reason most large ports employ Pilots that are sent out to meet ships at a designated point and then take over command while the ship enters and leaves the port. They are specialists in the local weather, tides, water depths and currents, and need to ensure that the visiting vessel is safely berthed before disembarking.

Pilots board the visiting vessel while it is still at sea and must be physically fit enough to climb or descend a pilot's ladder (often a rope ladder hanging off the side of a ship) from a small pilot vessel that comes alongside the bigger ship. In some ports a helicopter service is used to deploy or fetch the pilot. In both instances, the pilot needs to be conscious of safety. A Pilot needs to be confident and able to communicate with the visiting team on the bridge in order to install confidence and adherence to their direction.

Key tasks:

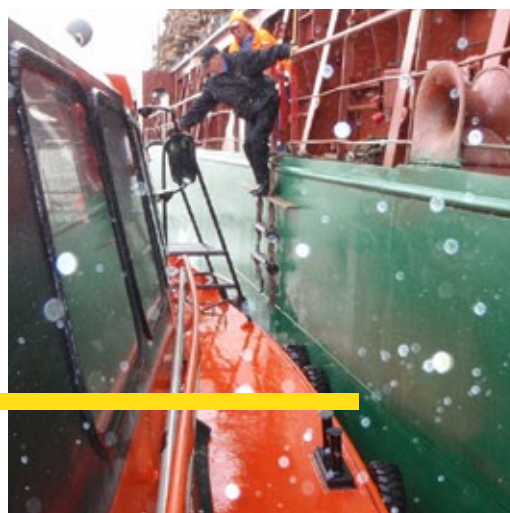
- Consult weather reports, maps, charts and navigational equipment.
- Meet visiting vessels and join the bridge team.
- Plot and direct the ship's course into port, determining speed and communicating with tug masters.
- Have a knowledge all navigational hazards such as buoys, sandbars, or wrecks in the port.

Entry requirements/training:

National Certificate in Marine Pilotage. Most Marine Pilots have an extensive background at sea as Master.

Career advancement:

Working for port authorities, many marine pilots advance in their careers to take up positions as Harbour Master.



Tug Master

NQF 7-8

Tug Masters working on harbour tugs are on standby to assist with the berthing and unberthing of ships in their ports. They work closely with the Harbour Master, Ship's Master and Marine Pilots to guide vessels into the port.

The Tug Master must have detailed knowledge of the local port waters, tides and currents and should expect to work within a range of weather conditions. Working hours can be long and irregular, but are usually arranged in shifts. The advantage of being a harbour tug master is that, unlike most seafarers, you will return home on a daily basis.

Key tasks:

- Meet visiting ships at anchor before entering the port.
- Either attach by way of rope or assist by pushing and nudging vessel into berth.
- Liaise with Marine Pilot during berthing.
- Liaise with Mooring Master during mooring.

Entry requirements/training:

You will need a relevant seagoing Certificate and experience at sea before taking up a position on a harbour tug and moving up the ranks to become a Tug Master.

Career advancement:

Working for port authorities, many Tug Masters advance in their careers to take up positions as Marine Pilots and even Harbour Masters.



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Mooring / Berthing Master

NQF 7-8

A Mooring Master is tasked to direct the berthing and un-berthing of all types and sizes of ships at a port or terminal in accordance with the shipowner's and port's marine procedures and safety requirements. The mooring or berthing of a ship can be a difficult procedure and one that should only be attempted by qualified professionals. Taking into account weather conditions, the effect of the load the ship is carrying, currents, swell and so on, mean that no two berthings are the same.

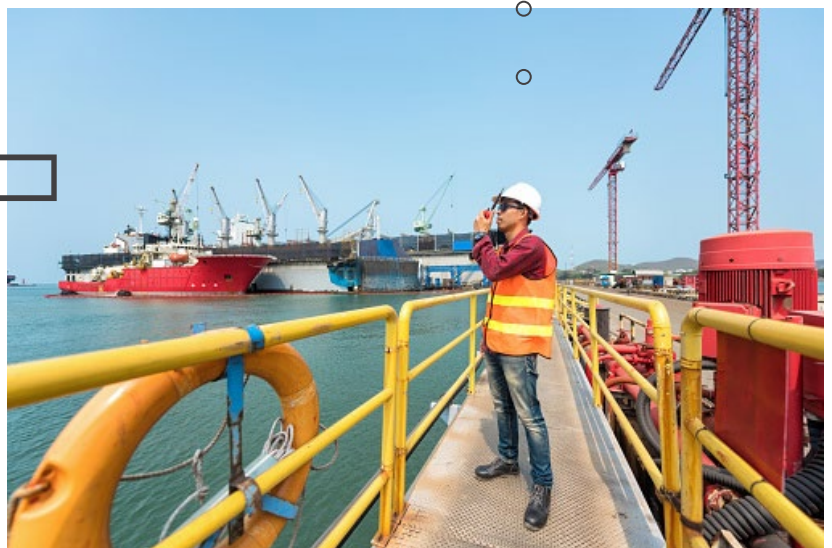
Acting as the ship's adviser, and the terminal representative on board a vessel, the Mooring Master's responsibility could include mooring, loading/discharging, unmooring, and communications with shore, among other things.

Key tasks:

- Communicate effectively and clearly.
- Manage a team of shore hands.
- Communicate with pilots and tug masters.
- Oversee connection of hoses and mooring ropes.

Entry requirements/training:

To take on this demanding job, a Mooring Master must have a master's ticket and normally a number of years' experience as a ship's master at sea. Previous experience as a pilot is also often seen as an asset.



Vessel Traffic Controller

NQF 4-7

A Vessel Traffic Controller are employed by Port Authorities to ensure the safe passage of vessels entering or leaving port. They need to allocate or dispatch marine resources and communicate with all port users. A Vessel Traffic Controller/Operator is responsible for the coordination of ships within the port or harbour. They work to avoid collisions or incidents by managing movements from a port control centre. To help them meet this goal, Vessel Traffic Controllers need to be proficient in the use of computerised Vessel Traffic Management systems. Working shifts to cover the 24-hour, seven days a week demands of the role, they may also offer traffic information and arrange for launches to take Pilots out to ships.

Key tasks:

- Communicate effectively and clearly.
- Monitor, inform, advise and direct the movement of vessel traffic in the port precinct. Gather, analyse and disseminate nautical data and navigational safety information.
- Coordinate advisory information between participating and non-participating vessels and small craft, many of which may be involved activities such as regattas, fishing or other marine events.
- Provide radar tracking or other sensor information in support of search and rescue missions. Operate a variety of surveillance sensors, communications, and data

Entry requirements/training:

While in the past VTS operators were generally sourced from ex-seafarers, increasing demand and a lack of seafarers to take on these roles, has opened up this career to other candidates. The Port Authority seeks candidates who have a National Diploma in Maritime Studies along with a certificate in Vessel Traffic Systems endorsed by the International Association of Lighthouse Authorities (IALA). Certificates or qualifications relating to port operations may also be required.



The job title of stevedore is used synonymously with many other career titles including longshoreman, dock worker, and ship loader. The main job a stevedore does is to load and unload ship cargo efficiently and safely. Depending on the operating hours of a port, a Stevedore could expect to work various shifts to ensure the efficient loading and unloading of cargo as it arrives in the port. They are an essential link in the supply chain. The work is generally manual and physically demanding, and Stevedores will spend periods of time outside or within the ship's hold, depending on the type of cargo being handled.

In some ports the Stevedore has a wide range of responsibilities including the physical loading, securing and unloading of cargo; driving vehicles to transport cargo within the port, and operating highly technical loading and unloading equipment. In other ports the work may be narrower, for example some Stevedores work solely as crane drivers.

Stevedores can also operate as:

LOADERS: Attach and position straps, cables and hooks to boxes or containers before they are winched or lifted off or onto the ship. Guide the crates out of or into the hold while maintaining safety standards.

WINCH OPERATORS: Work the winch machinery that lifts the cargo and coordinate the work to ensure the safety of the loaders. Some training in heavy lifting machinery is necessary.

CRANE OPERATORS: Crane and tower operators need training for operating and maintaining the large machines. Like winch operators, crane operators need a precise sense of spatial relationships and the ability to coordinate movements with loading crews.

STRADDLE CARRIER OPERATIONS: Stevedores operate straddle carriers, a piece of heavy equipment used to stack cargo containers, up to four high, in a port's storage area or facility. They also retrieve containers from storage in order to reload them on trucks, barges and freight trains. Straddle carrier operators are often charged with recording the weight and contents of containers. They may also be responsible for the repair and maintenance of the machines.

ENTRY REQUIREMENTS: These positions usually require a Matric Certificate with a driver's licence. On the job training is generally provided including simulator courses for crane and straddle carrier operators.

CAREER ADVANCEMENT: With suitable training, stevedores can advance within the port terminal structure.

Ships' Agent

NQF 4-7

A Ship's Agent works on behalf of shipowners, managers and charterers within ports to ensure that the ship is adequately and efficiently serviced. They ensure that essential supplies, crew transfers, customs documentation and waste declarations are all arranged with the port authorities and other regulatory authorities in the port. As such, they need to have a clear understanding of local laws and legislation as well as a good network of reliable service providers that they can engage on behalf of the shipowners. They provide local knowledge for the vessel in a foreign port.

Key tasks:

- Update shipping company on activities within the port.
- Liaising with port authority for port services required (pilot, berth, tugs). Arrange for fresh water and provisions.
- Arrange for bunker delivery if needed.
- Organise crew transfers and transport if necessary. Organise contracts with stevedores.
- Complete documents for customs and port authorities. Organise maintenance work if required.

Entry requirements/training:

Most ships' agents gain on the job training and experience working at a ships' agency. A junior agent will require a Matric Certificate and need to be computer literate. Knowledge of foreign languages is useful.

Career advancement:

With enough experience and contacts, a successful ship's agent may consider starting their own agency and becoming an entrepreneur.



Freight Forwarder & Clearer

NQF 4-5

Freight Forwarders assist companies to negotiate the legislative and administrative requirements associated with moving goods from one country to another via customs. They facilitate the import/export process by establishing the best method and route for moving large volumes of goods from the point of origin to the destination. Some Freight Forwarders specialise in specific commodities.

Forwarders and Clearers need to keep their clients informed throughout the whole process and report back to them at every stage. Today's technological world has greatly enhanced the visibility of cargo as it moves from one transport mode to another. This helps Freight Forwarders and their clients keep constant track of their goods.

Key tasks:

- Liaising with clients and preparing quotes. Organising packaging requirements where necessary. Booking cargo for shipping.
- Handling customs documentation and regulatory requirements. Liaising with transport providers and terminal facilities.
- Monitoring the movement of cargo.

Entry requirements/training:

Freight Forwarders require a National Certificate or National Diploma in Freight Forwarding and Customs Compliance in order to operate.

Career advancement:

A significant percentage of freight forwarders are self-employed, running their businesses as proprietors or partners. They also sometimes operate as freight and transport consultants and/or customs brokers. Specialist forwarders and clearers can create a niche market that focuses either on either specific regional or commodity solutions for clients.



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TRAINING & EDUCATION

A variety of options exist for training in South Africa. Institutions providing education range from universities offering tuition for degrees; academies and schools of education and training.



TRAINING & EDUCATION

SAQA Relevant Certificates, Diplomas & Degrees

QUALIFICATION	INSTITUTION	TYPE	NQF LEVEL	CREDITS
National Certificate: Freight Forwarding and Customs Compliance	SGB Transport and Logistics Operations	Certificate	03	130
	Maritime School and Transport College			
National Certificate: Freight Handling	Maritime School and Transport College	Certificate	03	
Shipping Practice	Maritime School and Transport College	Certificate	04	
Further Education and Training Certificate: Freight Forwarding and Customs Compliance	SGB Transport and Logistics Operations	Certificate	04	135
Further Education Training Certificate: Harbour Watchkeeping	SGB Transport and Logistics Operations	Certificate	04	135
National Diploma: Freight Forwarding and Customs Compliance	SGB Transport and Logistics Operations	National Diploma	05	246
National Diploma: Freight Logistics	Maritime School and Transport College	National Diploma	05	
Conduct Vessel Traffic System remote pilotage	SGB Transport and Logistics Operations		TBA	10





MARINE MANUFACTURING

INTRODUCTION

Marine Manufacturing is defined as the manufacture and repair as well as maintenance of marine components, equipment and vessels such as ships and boats. It is a diverse sub sector that requires skill and knowledge of specific types of manufacturing, materials and products as well as of the different stages of the production process from design to planning, to manufacture, to fitting and commissioning. Many of the jobs in this sector require a baseline qualification, with on the job training to develop the specialisation required.

The boat building and shipbuilding sector in South Africa is divided into the manufacture of leisure boats and commercial boats. Generally, most of the leisure boats produced are luxury catamarans and South Africa is the second largest builder of catamarans in the world, after France.

Shipbuilding and repair projects require the services of large numbers of artisans, technicians, engineers, semi-skilled workers and managers. The two main hubs for shipbuilding and repair are in Durban and Cape Town, and there is also a smaller ship builder hub located in Port Elizabeth.

Shipbuilding needs skilled artisans like shipwrights, welders, boilermakers, fitters, diesel fitters, electricians, riggers, pipefitters, painters/coating and scaffolders. In the engineering and technical space, the sector needs a range of different skills including destructive testing specialists, corrosion inspectors and environmental and quality officers. At management level, project managers and estimators are vital for the work to be undertaken efficiently, cost effectively and safely.

The shipbuilding and repair industry is a complex and specialised industry and in South Africa we have built many ships over the years, mostly for state owned enterprises and government. Generally, ships are constructed from steel, metal alloy or aluminium and they use a construction method called “frame and plate”.

THE WORKING ENVIRONMENT

There are a range of employment opportunities in these sectors including project managers, boat builders, fitters, installers, finishers, quality assurance, procurement, stores and a range of other support functions and technical expertise.

Some boats are built using composite materials and there are different stages to the build process, using a mould method of construction. Ship building on the other hand uses a method of construction called “frame and plate” where a metal or aluminium frame is constructed, and the sides of the boat are welded to the frame. As with boat building, ship building offers a number of different employment opportunities. Both ship building and boat building are a construction environment where you work with your hands, handle overhead gantries, drive forklifts and other lifting equipment.

Working in a factory with fibreglass and composites is a dusty environment and fibreglass can make your skin itch. If you have dust allergies think carefully before signing up for boat building.

Marine equipment manufacturing varies enormously from sail and mast production to rope production to valves, propellers, shafts and much more. These production environments are specialist areas and qualifications to qualify as a fitter and turner, or toolmaker, or pattern cutter would be recommended to join this sub sector.



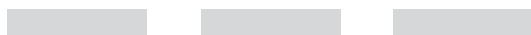
MARINE MANUFACTURING SECTORS

Fishing Leisure Military Government



MARINE MANUFACTURING PRODUCTS

Boats Ships Equipment



MARINE MANUFACTURING SERVICES

Repairs Refit Maintenance Design



PRODUCTION PROCESS IN THE MARINE MANUFACTURING SECTORS

Design —○— Plan —○— Manufacture —○— Fit —○— Quality Assurance —○— Commission —○— Float

Marine Spray Painter

NQF 2+

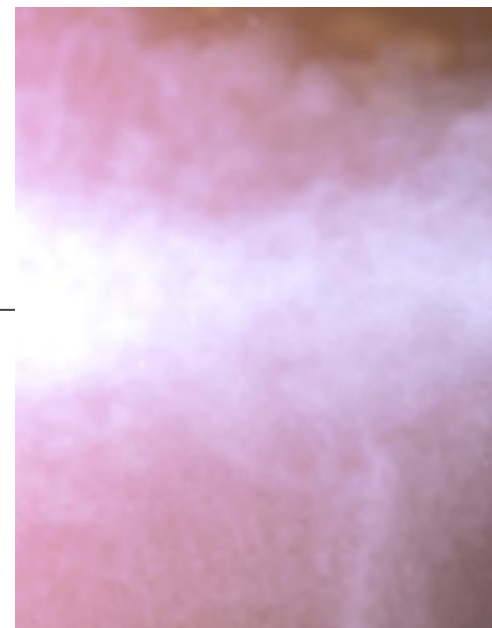
Spray painting a boat is not a regular or simple task and it requires specialised equipment and experience. Boats generally have a very smooth and high gloss finish and you will need to work under an experienced marine spray painter to gain the necessary experience and knowledge. Boats require significant surface preparation before spraying can start. You will need to wear protective clothing and a respirator and the boat will need to have a plastic sheet tent around it, or if it is a small boat it could fit into a spray booth. There are always new technologies and paints on the market and you will need to stay up to date with paint application and methods. You will also need to understand the effect temperature and humidity has on paint application and drying.

As a spray painter you will be working with products such as antifouling, primers, epoxy coatings, polyurethane paints and coatings, zinc coatings, vinyl paints and modified acrylic coatings. Using a spray gun, you need to have the correct line pressure and technique as well as know the time needed between coats of paint. This means the job suits someone who is a perfectionist and is patient. You must enjoy practical and manual activity and be prepared to stand and bend/crouch all day. You will need good hand eye co-ordination as well as normal colour vision. Being physically fit is important and you must not have any breathing problems or allergies to paints or thinners.

Key tasks:

- Prepare the hull surface (this includes taping, filling, fairing, sanding, dusting, priming)
- Mix the paint/chemicals
- Using a spray gun apply the primer and paint coats
- Rub down the surface between coats
- Apply the bootstripe
- Polish
- Clean the work area and equipment

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Entry requirements/training:

There is no formal way to become a marine spray painter, but if you took a National Certificate: Automotive Spray Painting (NQF Level 2, SAQA 64410) learnership offered by a TVET College you would gain some of the basic knowledge and practical aspects of spray painting. You would need the equivalent of an NQF Level 1 to register for the course. Bear in mind the physical constraints discussed above (colour blindness, allergies or physically unfit for practical work all day).

Career advancement:

A good marine spray painter with experience will be in demand in South Africa, but there are not lots of jobs. Generally, a boat builder will outsource the spray painting to a professional team. If you join such a team as a trainee you can work your way up and take on more complex spray jobs as you become more experienced. Eventually you could set up your own business. Refurbishing and spray painting older boats is also another opportunity to set up your own business and provide private boat owners with a service.

Associated job opportunities:

Because marine spray painting is the pinnacle of spray painting, you could also look at work opportunities in the aeronautical sector, where high-end finishes and attention to detail are required. The automotive sector will also offer opportunities for a good spray painter; that could either be in an automotive factory or working for a body repair shop.



Junior Boat Builder

NQF 4

As a boat builder you are responsible for all aspects of construction on a boat. This includes the hull, deck and bulkheads, the external fittings, as well as all the systems (eg electrical, plumbing, electronics) and all the interiors and equipment inside the boat. Boats can be built out of fibreglass (or what the industry calls composites because it includes core strengthening materials such as balsa and other foam materials).

Boats can also be built from wood, although it is not popular to build wooden boats anymore. But wood is an important material that you will work with a lot in a boat building factory. Boats can also be built from steel and aluminium. So, you need to know about a wide range of materials and every single part of building a boat. Remember, you can't build half a boat - it won't float!

There are many different types of boats and ships and they are differentiated by their size and weight as well as the function they perform. An easy way to remember it is "you can put a boat on a ship, but you can't put a ship on a boat".

Remember even after you have completed your three-year qualification, you will require at least another 8 – 10 years' experience before you will be considered a Master Boat Builder in the industry. Boat building is a practical job and you must enjoy working with your hands and building things. It's also useful to know that items on a boat are called by different names and you will learn a whole new vocabulary. For example, a toilet is a "head", a kitchen is a "galley", left is "port" and right is "starboard".

Key tasks:

- Hull and deck construction or lamination. Bulkhead installation.
- Interior fit out and marine joiner.
- Systems installation including electrics, electronics, plumbing and propulsion systems. "Commission" the boat by checking that everything works



Entry requirements/training:

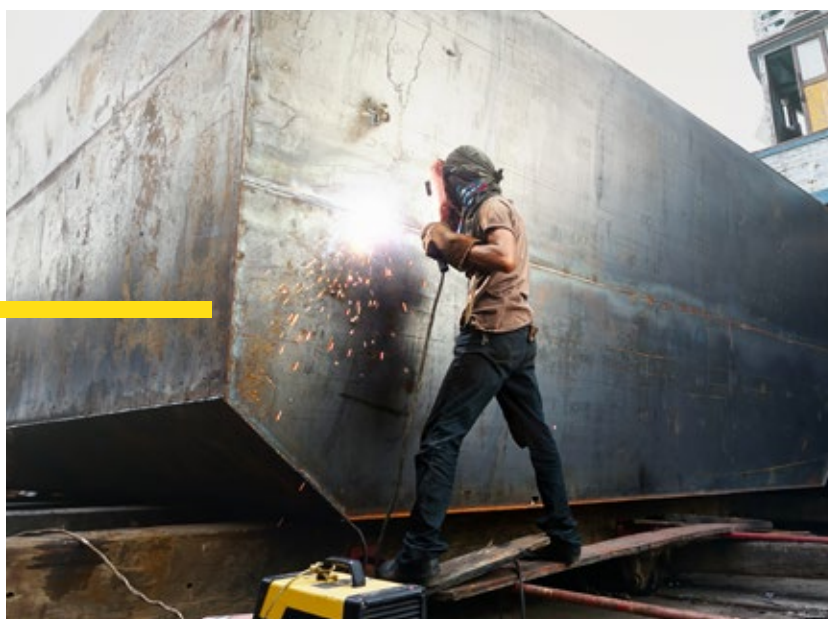
If you follow a formal study course you will need a minimum of Grade 9 preferably with Maths/ Maths Lit and English. You can also learn “on the job” and start at the bottom as a laminator and work your way up.

Career advancement:

If you want to be a boat builder and one day be able to own your own factory and produce boats, you will need to have all-round experience of every aspect of boat building. You can gain this through a qualification and then years of experience and working your way up from junior boat builder to senior boat builder to production manager. South Africa has a robust leisure and commercial boat building industry with companies producing ski boats, semi rigid inflatables, pontoon boats, support vessels, luxury cruising boats, day sailors and super yachts. This means there are opportunities to find work in the industry. Your work placement, while you are studying, is a good time to decide which company you might like to approach for a permanent position when you finish your studies. You could also consider work opportunities overseas once you have some experience.

Associated job opportunities:

As an experienced boat builder, you could explore the world of yacht design or naval architecture, as you would have gained the practical experience to inform a career in design. If you aspire to own a boat building factory that designs niche vessels, you will need to acquire a comprehensive knowledge of boat building as well as an understanding of markets.



VESSEL CONSTRUCTION / REPAIR

■ Shipbuilder

NQF 4

A career in shipbuilding involves the construction of ships and floating vessels in a shipyard. A Shipbuilder will need to construct sections of the ship, superstructures and components in metal using cutting, joining, forming and shaping techniques. They will also work in wood and composites/fibreglass at times. Shipbuilders might also be called upon to do repairs, item fabrication, the removal, overhaul and testing of equipment and fittings.

Entry requirements/training:

As a Shipbuilder you must be able to work at heights, as well as comfortable working in confined and awkward spaces. You are often required to work under severe conditions, and you need to be robust, confident in your ability and have a sound awareness of safety requirements at every stage of the job. Being a team player is also very important.

Career advancement:

Even after you have completed your trade test certificate, you will still need a minimum of three years' experience on the job in the marine environment to be considered an experienced Shipbuilder. You will learn every day as work conditions will change depending on the vessel you are working on and whether the ship/submarine/floating structure is in a dry dock or in the water.

Associated job opportunities:

Shipbuilders have strong metal working and systems skills, and these could be used effectively in the Oil and Gas sector.



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Boilermaker

NQF 4

Many people enter the shipbuilding and repair industries with a Boilermaker qualification. A Boilermaker manufactures and builds structures from steel plates. These structures include boilers for steam engines, pressure vessels, bridges, ships and more. This is a physical job and, like shipbuilding, you will need to work in tight spaces and in noisy, hot and damp environments at times. You will be working with a team and the earning potential is good especially once you become a qualified and experienced Boilermaker. To enjoy this job, you must have good manual dexterity and eye-hand co-ordination. You must be responsible, alert and careful and be able to focus on your work under noisy working conditions.

Key tasks:

A Boilermaker must develop drawings and make calculations before establishing a job procedure. They must mark out plate and cut the metal plate to the correct dimensions with cutting torches. A Boilermaker must be able to use tools to bend, roll and heat metal, as well as assemble parts and weld them in place.

Entry requirements/training:

To enter a Boilermaker apprenticeship, you must have a Grade 9 Certificate with a pass in Mathematics and Physical Science.

Career advancement:

The qualification also forms the basis for further learning in the field of engineering fabrication where you can specialise in one of the fabrication or welding skills areas at NQF Level 5. Boilermakers can find work in a variety of different sectors. You could start work in a shipyard, but you could also work in an engineering factory, a construction company, a railway, an iron or steel plant or a petroleum refinery.

Associated job opportunities:

Having a Boilermaker qualification allows you to progress to supervisory levels. It is suitable for application in various industries, such as the Mining and Minerals Industry; Chemical; PetroChemical; Metal, Engineering and related industries so you have other sectoral opportunities open to you.



Composite Worker

NQF 2-8

In South Africa we produce many boats using fibreglass and other composite materials, as they are light and strong. Ships also require components and parts manufactured from composites. There are a range of different techniques used, from basic hand lay up using glass or cloth and resin, to more advanced techniques such as vacuum bagging and vacuum infusion.

A composite worker follows written specifications and works in a production environment with fibreglass and resin. This means they must wear protective clothing and they must work well in a team, as well as being able to work with minimal supervision. This is a physical job that requires being on your feet for long periods of time and sometimes having to lift heavy objects. When trimming, cutting and sanding fibreglass, a lot of dust is created and strict safety guidelines must be followed as a composite worker. A composite worker will report on mixing of resins and log materials and quantities to a supervisor and must be able to accurately follow the build specifications supplied.

Key tasks:

- Assemble, fabricate and repair products from composite parts and materials.
- Track, record and document work, materials, and products.
- Fabricate and prepare moulds.
- Lay out composite materials for moulding.

Entry requirements/training:

Most composite work is learned on the job, but there are some short courses and University of Technology and University courses available. Qualifications for composite technician jobs often include computer and engineering skills, but there is no specific educational path for this career. Some employers may require experience in manufacturing, engineering or a related field, certification, or a bachelor's degree or higher for composite technician positions.

Career advancement:

This is career with clear opportunities for advancement. For example, you could start as a semi-skilled worker grinding and sanding or cutting balsa. You could then become a laminator or a gel coast finisher (NQF level 2 – 4). The next step up is an infusion operator (NQF 4 – 6) and finally a composite engineer (NQF 7 – 10).

Associated job opportunities:

Composites is one of the fastest growing manufacturing technologies in the world as people look for lighter and stronger manufacturing materials and methods. This means composites are also used in the automotive, aerospace, construction and wind energy sectors. Composites are also used to manufacture surf boards, kiteboards and skateboards, so you will have many different job opportunities if you decide not to work in the marine sector.

Mast Builder

NQF 4+

All sailing yachts will have a mast which is used to hoist the boat's sails. Mast building is a highly specialised job that requires a wide range of knowledge including materials, machining, spray finishing and more. The mast is one of the most dynamic and complex components of a sailing yacht where the mast has the job of transferring the power generated by the wind and sails into the yacht. A mast is supported by rigging and a rig package would include masts, spars, crossbeams and longerons. As a mast builder you would also build these. As a mast and rig builder, you will also have to install the mast and rig on a boat. This means working with cranes to "step" the mast or put it correctly in place on the boat. Once the mast is "stepped" you will need to go up the mast and check on things, so you need a head for heights. This work is done outdoors and is physical, so one would need to be an active fit person. You will also work closely with the sail manufacturers who will install the sails once the mast is correctly in place and the rig is supporting the mast.

A knowledge and love of sailing is very important as mast builders learn on the job. There is lots of measuring and so you need to be accurate and have high attention to details. With no formal qualifications you will need to establish your own reputation. Being punctual, hardworking and keen to learn are important.

Key tasks:

- Aluminium CNC cutting and welding
- Advanced carbon fibre work including vacuum infusion and operation of an autoclave interpreting drawings
- Measuring and marking
- Drilling, cutting, installing of precision parts Operating filament winding machines Spray painting and finishing
- Quality control

Entry requirements/training:

There is no formal qualification and you will learn on the job. Being good at maths and having a love for sailing is a good starting point. If you are good at engineering and you enjoy working with your hands in a high-precision industry, this job could be for you. You need to be accurate and reliable and able to work well in a team. Being good at solving problems and having a knowledge of composite materials and aluminium helps.

Career advancement:

As you gain more and more experience in a mast building facility you will move from being a junior mast builder to a senior mast builder. One day with enough experience, you could own the manufacturing facility and employ other people to work with you. You will need to stay on top of boat design trends and work closely with yacht designers who specify the type of "rig" for a particular sailing boat.

Marine Engine Fitter

NQF 4

A marine engine fitter installs, repairs, services and overhauls marine engines. This could be on a ship or on a boat and there are many different types of engines. If you are interested in this trade you will need to be good at working with your hands; have good hearing and vision; be a problem solver; be physically fit and a hard worker. You could work for a boat or ship builder installing engines on land, or you could be at sea maintaining and repairing diesel engines, hydraulics, pumps and piping systems, refrigeration systems and welding. On a large ship this work can be noisy, dirty and dangerous and you cannot suffer from sea sickness as you will need to work below decks in a hot and confined engine room. For more information on working in the engine department on board a ship, see the section on seafarers in this booklet.

Key tasks:

- Measuring and marking
- Assembling and fitting
- Adjusting and fitting
- Cleaning and lubricating Troubleshooting Repairing equipment
- Inspecting, maintaining and installing Keeping records
- Interpret drawings and engine specifications
- Install engines in position using hoisting equipment
- Test engines and make adjustments (both to the engine itself and the engine bed)
- Dismantle, replace and reassemble engine auxiliaries, pumps, ventilation system, steering gear and cylinder heads
- Repair and maintain filters Test and service injectors Check and test cooling systems
- Overhaul fuel pumps, carburettors, fuel filters and air cleaners Do basic welding and sheet metal work
- Work with the lubrication system
- Work with steering shafts and propellers
- Work on starters, ignitions, charging systems and batteries Overhaul air compressors, fuel feeds and fuel injection systems

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Entry requirements/training:

The closest qualification for a marine engine fitter in South Africa is a learnership with the SA Navy: Mechanical Fitter (Machinery). This will give you sea going experience and the opportunity to work on ships engines. All junior officers receive their orientation training at the Naval College at Gordon's Bay. Officers who have the required academic aptitude are sent to the University of Stellenbosch to be trained as engineers. Those who wish to become naval technical officers, study at the Cape Technikon. Entry requirements are a Grade 10 and you must be physically fit and bilingual.

A generic Mechanical Fitter apprenticeship at Level 4 is also offered by the QCTO (94021) and will be offered at TVETs. You will only receive generic mechanical knowledge and would need to gain the marine specialization with on the job training.

Career advancement:

You could further your career and become a Chief Engineer on a ship. You would need to study further at a University of Technology following the international career path as defined by the International Maritime Organisation. (See the section on seafarers in this booklet for more information)

Associated job opportunities:

A fitter can work in a number of different sectors with the skills set you acquire. This could be the mining industry, the forestry industry, the transport industry, the agricultural industry and others. A good work ethic, timekeeping and accurate work and reporting will ensure associated job opportunities are available to you.



■ Outboard Engine Technician

NQF 4+

Outboard motors are marine engines that are mounted on the back of a boat. It is a unit with the driveshaft and propeller underwater and the engine above it. As the engine drives and spins the shaft and the propeller thrust is created and the boat moves forward.

If you are interested in powerboats, from small ski boats to high speed boats to fishing boats, you might be interested in becoming an Outboard Engine Technician. Outboard engines have been around for over 100 years and recently the engine technology has advanced so much outboard engines can be more complex than the engine on a Mercedes C class motorcar. Four stroke engines replaced two stroke engines as they have less emissions and recently there are more and more powerful motors being produced. We have also seen the introduction of electric outboard motors recently.

Being interested in engines and how they work is important. You will need to know about how engines are configured, fuel cycles, combustion chambers, air intakes, valves, cranks, flywheels and engine performance. The next step is understanding the water and marine environment for an engine. You will need to know about hydrodynamics and how propellers work and how they work with different shapes and sizes of boats. There's a lot to learn but being curious about how things work and enjoying boats is a good starting point.

Key tasks:

- Fitting outboard systems Replacing parts Disassembling engines Keeping records of service Diagnosing fuel problems Lubricating outboards
- Running wiring and control systems Trouble shooting: inspecting and testing Diagnostics
- Maintenance and repair



Entry requirements/training:

There are a few formal training courses at NQF Level 4 that would give you good baseline entry skills and the theory to become an outboard technician. These include:

- Occupational Certificate: Small Engine Mechanic (QCTO 98813)
- Occupational Certificate: Motorcycle Mechanic (QCTO 97591)
- Occupational Certificate: Mechanical Fitter (QCTO 94021)
- Occupational Certificate: Fitter and Turner (QCTO 94021)

Alternatively, you could approach an outboard engine Original Equipment Manufacturer (Yamaha, Suzuki, Mercury, Honda) to work as a trainee and, with experience, you will receive engine brand training. This would be the preferred career path as engines are changing and developing all the time and this would help you stay ahead of the industry innovations and competitive brand developments.

Career advancement:

Starting as a trainee mechanic you will work under an experienced technician and you will carry out routine services as well as assist the technician. Over time you will learn on the job and take on more complicated work including diagnostics. Good outboard engine mechanics are in demand in the country, so you can develop a satisfactory career in the marine industry. You can work your way up to supervisory roles, or even work as a sales representative for an engine OEM. There is also scope to eventually open your own business to service and repair outboards. Usually, these kinds of business also sell boats that the engines are used on.

Associated job opportunities:

Having knowledge of petrol engines, you could extend your skills into lawn mower repairs, or cross skill to become a car mechanic. You could work with chainsaws and motorbikes or explore other jobs where fitting and turning and engine knowledge would be valued.





Marine Electrician

NQF 4-6

A marine electrician is a specialist trade that ensures the safe installation, maintenance and repair of electrical systems on boats and ships. Water and electricity don't mix, therefore a marine electrician must take precautions when installing components and must understand the dynamics of water on the electrical system, such as electrolysis. All marine electrical work must be done to international standards whether you are working on a boat or a ship. Working conditions can be cramped at times as you may need to work below decks and in tight spaces. If you need to work when the vessel is at sea, this can be hot and dirty work.

A marine electrician should be able to work with very little supervision and must be able to follow wiring specifications accurately. Troubleshooting is a major part of a marine electrician's work and a logical and analytical mind to tackle problem solving is important. So too is keeping to maintenance schedules and maintaining accurate records of work. A marine electrician has a very important role to play, as a boat or ship without power or without key systems functioning properly is a safety hazard.

As a marine electrician you will work with wiring, batteries, engines and electrical equipment for navigation and communication on a vessel. Work could involve installing new components or upgrading older systems.

Key tasks:

- Repair or replace wiring equipment or fixtures.
- Examine electrical wiring, equipment, or fixtures, using testing devices like ohmmeters, voltmeters, or oscilloscopes.
- Use power construction equipment, measuring devices, power tools, and testing equipment.
- Diagnose faulty systems or parts, using equipment and hand tools to find the reason for a breakdown.
- Inspect electrical systems, equipment, or parts to spot hazards or defects.
- Prepare sketches or follow blueprints to see the placement of wiring or equipment. Work on the installation of ground leads and connect power cables to equipment.
- Direct or train other employees to install, maintain, or repair electrical wiring, equipment, or fixtures.



Entry requirements/training:

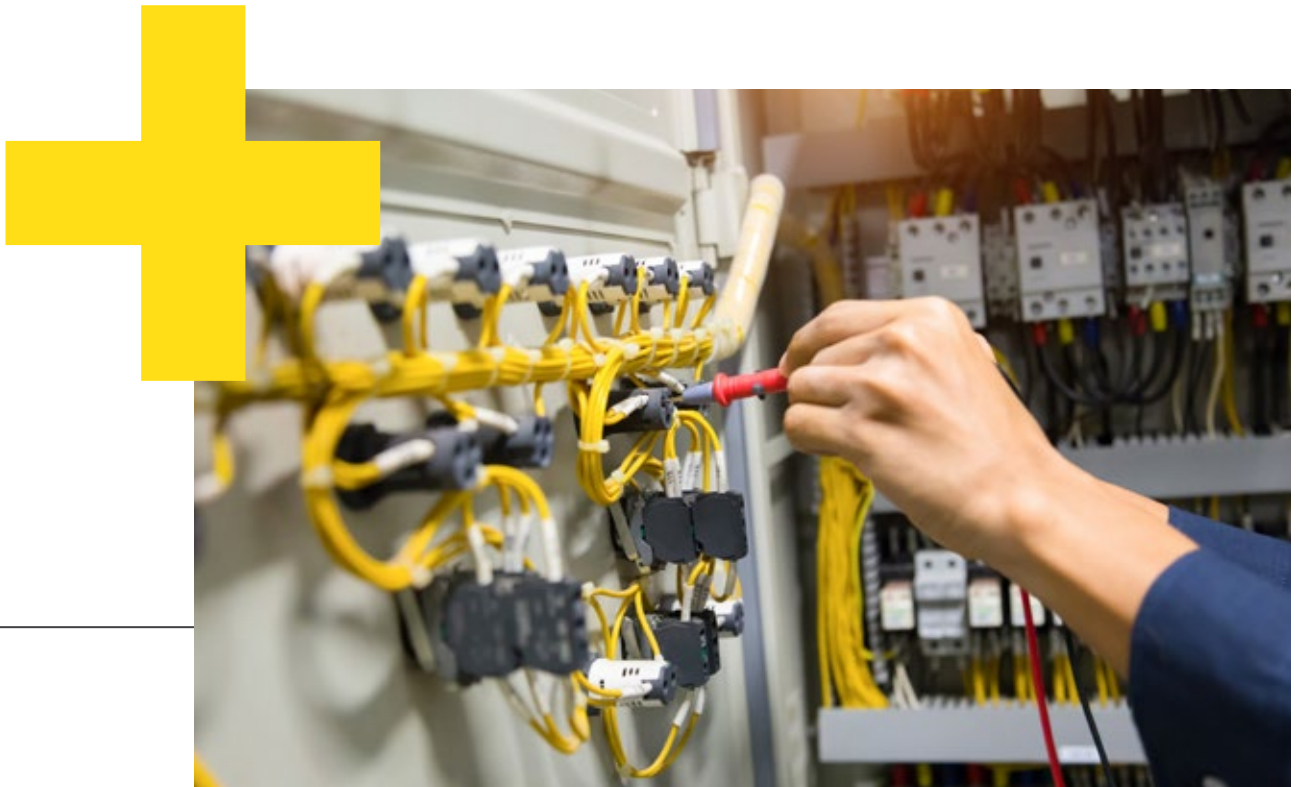
Currently there is no marine electrical qualification in South Africa, but you could study to be an electrician and then specialise through on the job learning of all the marine related aspects of the job. A knowledge of electronics is an added advantage. Strong mathematical acumen and a problem solving is important.

Career advancement:

With technological advances and wireless technologies, as a Marine electrician you will need to stay up to date with developments. Some of the latest technologies are found on boats with new equipment and electronics. For example, boats powered entirely by electricity are becoming more popular as globally we aim to lower our carbon footprint.

Associated job opportunities:

With a qualification as an electrician you can always find work onshore. However, marine electricians are in short supply and you may find the remuneration in the marine sector is better than a job in the residential or commercial electrical field. You could also look at specialising in electronics on luxury yachts. Or you could specialise in PLCs in the fishing industry.





Naval Architect

NQF 9-10

A Naval Architect is an engineer who is responsible for the design, classification, survey, construction and/or repair of ships, marine vessels and offshore structures for commercial and military purposes, although they can also work with recreational or leisure vessels. A naval architect can work with a range of different vessels: merchant ships, oil tankers, cargo ships, passenger ferries, cruise ships, warships, icebreakers, workboats, recreational boats and offshore platforms.

A Naval Architect needs a creative, enquiring and logical mind with strong communication skills, sound judgement and leadership. This is a demanding job and you must enjoy technical and engineering work as well as having an aptitude for mathematics and physics. You must have strong computing and technical design aptitude to succeed in this career as you will need to use complex mathematical and physical models to ensure the design is technically sound and meets all the safety rules and standards laid down by Classification Societies and governments. Remember, they said the Titanic would never sink and it did. This is why Naval Architects must qualify at the highest level – hundreds of people's lives are in their hands.

Key tasks:

The design of a vessel is the key task of a naval architect. Because the design must include every single detail of the vessel, naval architects must have an understanding of many different types of engineering and they must stay at the forefront of technology. They must ensure that a safe, environmentally sound and seaworthy design is produced that fits all the requirements of the vessel.

Entry requirements/training:

Naval Architecture is a demanding degree course at a university, and you should have a strong aptitude in mathematics and physics and be adept at using computer soft- ware and modelling.



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Career advancement:

As a Naval Architect you need to keep up to date with modern technology and take advantage of new career opportunities as they arise. Continuing Professional Development (or CPD) is essential and you can get this through attending courses and conferences organised by professional institutions as well as by reading technical journals and papers. In South Africa the South African Institute of Marine Engineers and Naval Architects (SAIMENA) is the professional body overseeing this specialist branch of engineering and they are linked to the Engineering Council of South Africa (ECSA).

Associated job opportunities:

Naval Architects have a wide range of employment opportunities. There is a wide variety of work and it is not easy to categorise all the opportunities, but you could find work in: design, construction and repair, consultancy, marketing and sales, operations, regulation, research and development and education and training. This means you can find work in large companies or small companies, or run your own business, or work in a government department. Naval architects can find work in shipyards, with design businesses, with classification societies, with regulatory bodies such as SAMSA and with the Navy.

Depending on your own particular area of interest you could become a specialist in one field or develop broad experience. With this senior professional qualification, your skills will also be valued in top management posts, even outside the maritime field.

There is currently a global shortage of well-qualified naval architects and consequently the job prospects are very good.



Yacht Designer

NQF 8-9

Yacht designers are an important part of the conceptual and manufacturing process for leisure sail and power boats. As designers of a luxury item, they use their creative and industrial design abilities to create boats that are attractive and stylish for their clients. To succeed in this career you must have a strong sense of aesthetics, function and design. This must be backed by analytical and problem solving abilities. A good business sense and people skills are also the foundation of a successful career in designing luxury boats. This is an office job, but you will visit the boat building factory when your boat is being built and you will be required to help with sea trials and commissioning of the boat when it is put in the water.

Becoming a yacht designer takes time so you need to be committed to your career. It can be rewarding but it is also highly demanding. You need to be extremely accurate, be able to juggle different clients' demands, manage project timing and the number of hours to complete a design with your team. You will spend long hours at your computer, but there is great satisfaction in "solving the puzzle" of each design and creating new and interesting boats that make your clients go "Wow!".

Key tasks:

Yacht Designers will create beautiful boats that not only meet their clients' requirements, but also the international standards for boat construction and safety. They will produce drawings and models and prototypes as well as finalise manufacturing specifications for every single aspect of the boat/yacht.

Entry requirements/training:

A number of students in South Africa who completed the Yacht and Boat Building Certificate course, completed some work in a boat yard before moving into a yacht design office where they learn and study on the job. You must have an aptitude for mathematics, algebra, geometry and trigonometry. Learning to work on software programmes such as AutoCAD, Rhino and Maxsurf will help you.

Career advancement:

There are a number of different ways you can become a yacht designer. You could follow a naval architecture degree and then specialise in designing yachts and boats, but it would be a long route to follow. Generally Yacht Designers start out as sailors, boat builders, boat owners and boat designers learning on the job. A degree in engineering or industrial design will help, but you will need to be curious about the refined styling of boats and not just the mechanics of the design. There are a handful of schools for yacht design globally, but nothing is available in South Africa (except for correspondence study which needs extreme dedication and discipline).

Associated job opportunities:

Most Yacht Designers aspire to become world renowned for their boat designs. They would like to be known and remembered for their styling in the boating world and to become “a name” in the boating industry.



Marine Draughtsman

NQF 4

A Marine Draughtsman creates the technical drawings (interior and exterior) for the boat builders to construct the boats and ships designed by Naval Architects and Yacht Designers. Similarly to Naval Architects and Yacht Designers, you have to work very accurately and have patience and perseverance. This requires long periods of concentration doing detailed work, so ask yourself if you are the kind of person who can remain focused for long periods of time. You will need good eyesight or good spectacles and you must enjoy computer work and being able to transfer concepts onto paper.

Key tasks:

Creating final scale drawings using CAD and other marine draughting software. This can include 2D and 3D fabrication drawings, specifying building dimensions, materials and procedures, so the drawings can be used and referenced during construction of the vessel. A Marine Draughtsman needs to know about Classification Society approval and construction and have a knowledge of the strength of materials.

Entry requirements/training:

There are a number of institutions offering a National Certificate Multi-Disciplinary Draughting. To study draughting, you will need a senior certificate with English and Math Literacy (minimum). They also accept a relevant N3 qualification. However, these general draughting courses will not give you any exposure to marine concepts and terminology. The Academy IDT in Cape Town is currently the only provider offering the National Certificate Multi-Disciplinary Draughting with Marine Draughting modules. This enables you to find work with a Naval Architect or Yacht Designer.



Career advancement:

Once you have completed a multi-purpose draughting certificate qualification, you could pursue a diploma course in other areas of specialisation such as architectural technology, structural steelwork detailing, industrial and product design and even 3D design visualisation if you don't want to work in the marine industry any more. Or you could look at yacht design or naval architecture as a way to advance your career opportunities.

Associated job opportunities:

As a Marine Draughtsman, you will have an opportunity to find work in a naval architecture firm, with a yacht designer or within a boat building yard. There are fewer opportunities for establishing your own business, as marine draughtsmen work as part of a team of designers and engineers either in the planning or production of ships and boats. You can enter other draughting specialisations outside of the marine industry. For example, you could use your skills in a civil engineering firm or an architectural business.



OTHER MARINE MANUFACTURING OPPORTUNITIES

Sailmaker

NQF 2-6

Sail making is an exciting manufacturing sector that uses the latest technologies, science of sail design and fibres to produce sails for yachts. This means yachts are sailing with better speed and control than ever before. If you love sailing and are interested in applying the latest technology to make sails that really catch the wind and survive the toughest conditions, then you might consider a career in sail making. The design of a sail is the first step in a complex and technologically challenging process.

A Sailmaker will understand and use different production processes for making sails and will work with teams of like-minded, enthusiastic and dedicated people, searching for stronger, lighter and better performing sails.

Key tasks:

- Use CAD design software to generate moulds to suit the sail designs.
- Generate panel patterns for the construction team to cut out and stitch.
- Responsible for correctly stitching accurate sails from many panels. The quality of stitching acknowledge of materials and yarns is essential and a Sailmaker works to very fine tolerances, so that the sails offer minimum wind resistance or drag at the seams.

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Entry requirements/training:

There is no formal qualification to work in a sail loft but if you love sailing and you like working with your hands and the latest technologies, you could work your way up from entry level to supervisory level. A qualification in machining or pattern cutting could be an advantage, and a willingness to learn on the job.

Career advancement:

With new technologies, sail making is always advancing and you will learn on the job every day. You could advance to a career in customer care and sales for the sail loft. With years of experience manufacturing sails, you could take this knowledge of the product to build client relationships and sell the product. This will involve going out on boats with your clients and assessing their needs. Sail making is a highly competitive industry, so knowing your product and the technological specifications will place you at an advantage over other sailmakers.

Associated job opportunities:

Sailmakers don't just manufacture sails for yachts, they also manufacture sails for kites, kite surfers, windsurfers and hanggliders. As technology and materials improve, the areas in which sail cloth can be used will expand and new opportunities for the application of the technology will occur. There are also companies recycling old sails to make bags and accessories.



OTHER MARINE MANUFACTURING OPPORTUNITIES



Trawl Gear Assembler

NQF 4-8

South Africa operates 52 deep sea fishing trawlers and they catch 160,000 tonnes of fish a year. These off-shore fishing boats tow a net or trawl to catch the fish. The trawl performance and associated engineering in the commercial fishing sector is where fishing boats strive to gain an operational advantage over their competitors. The design of the trawl and its hydrodynamic performance must be designed for the fish behaviours, selection, fuel consumption, seafood sustainability and environmental impact. This is the technical side of the fishing industry.

To assemble a trawl gear, you need to work closely with fishing boat skippers and fleet managers to understand their needs and adapt new trawls, materials and fishing gear to meet the client's requirements and fishing conditions. The trawl is made from net and wire cable with handling equipment such as winches, net drums and lifting tackle on the boat to help handle the trawl gear. You will work in a factory environment to assemble the trawl to the client's specifications. You will work with your hands and have an understanding of lifting equipment and strength testing.

Key tasks:

- Joining sections of net using a method called "lacing".
- Attaching head rope and foot rope.
- Fitting floats and sinkers.
- Attaching roller wire and chain.
- Fitting shackles.

Entry requirements/training:

This is a manual job and you need to enjoy working with your hands and it is useful to have an understanding of strength tests and lifting loads. You will learn everything on the job, but a good entry requirement is many years working in the commercial fishing industry in South Africa.

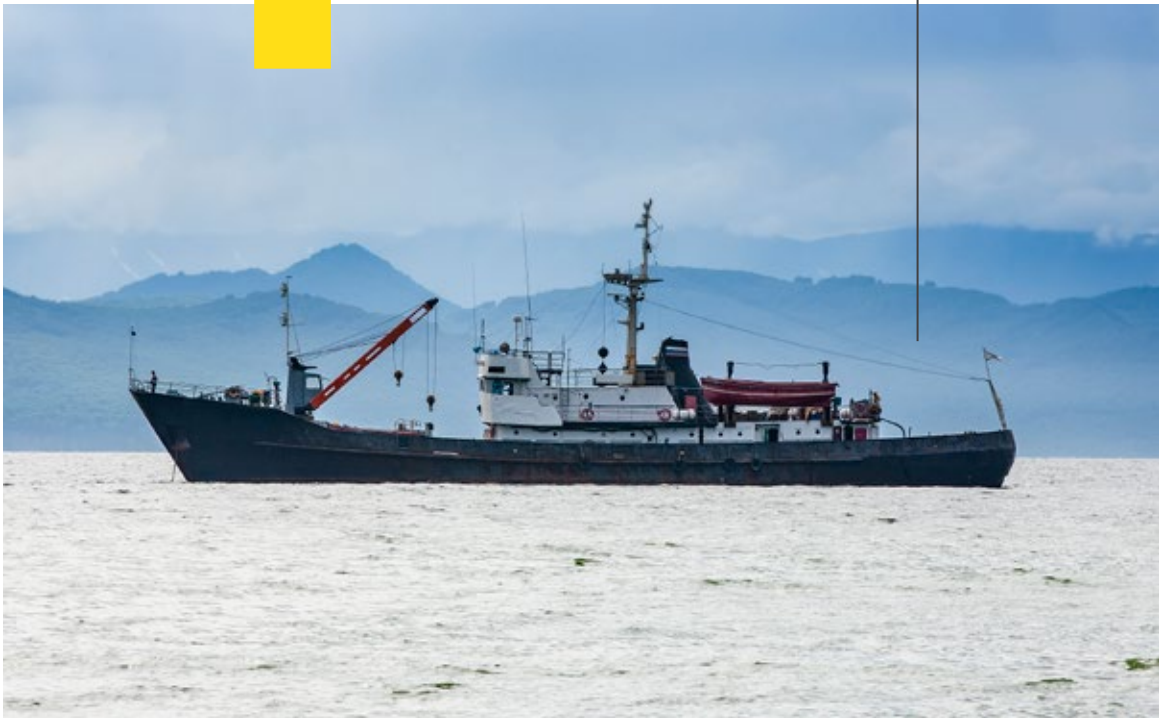
Career advancement:

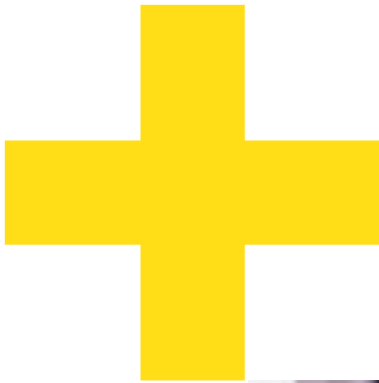
As this is a very competitive aspect of the deep-sea fishing industry, research and development into the competitive advantages of trawl design and performance is an area you could advance into. This could involve a better understanding of hydrodynamics and computer simulation of the trawl performance, or underwater recordings of the trawl in order to improve the design. An understanding of abrasion, breakage strengths and rope shrinkage will all help with research and development of the design.

Associated job opportunities:

Experience in fabrication could lead to other opportunities in the marine engineering field.

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TRAINING & EDUCATION

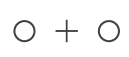
A variety of options exist for training in South Africa. Institutions providing education range from universities offering tuition for degrees; academies and schools of education and training.



TRAINING & EDUCATION



QUALIFICATION	INSTITUTION	TYPE	NQF LEVEL	CREDITS
Yacht and Boat Building	False Bay College, Cape Town	National Certificate	04	404
Boat Builder	False Bay College, Cape Town	Occupational Certificate	04	360
MSc Naval Architecture	Newcastle University, United Kingdom	Masters	International	
MSc Naval Architecture	University College of London, United Kingdom	Masters	International	
M Eng (Naval Architecture)	University of Strathclyde, Glasgow, United Kingdom	Masters	International	
Yacht and Boat Design	Westlawn Institute, United States of America	Correspondence	International	
Yacht Design	The Landing School, Maine, United States of America	Diploma	International	
Masters Yacht Design	ISAD, Milan, Italy	Masters	International	
Multi-Disciplinary Draughting	Academy IDT, Cape Town	National Certificate	04	130
Ship builder	SA Navy	Occupational Certificate	04	437
Boilermaker	TVET Colleges and Private Training providers	Occupational Certificate	04	395
National Certificate: Polymer Composite Fabrication	Plastics SA	National Certificate	04	154





FISHING



INTRODUCTION

South Africa's fishing sector comprises three distinct sub-sectors: commercial, small-scale and recreational. All three co-exist along the length of the country's coastline, which spans two major ocean currents, and at several inland sites. The commercial sector alone employs over 25,000 people, with thousands more due to be accommodated in the new small-scale fishery which was launched in 2018.

As arguably South Africa's oldest livelihood, fishing provides the lifeblood of many coastal communities and is deeply embedded in the social fabric. Abundant biodiversity across our 1.5 million km² offshore exclusive economic zone currently supports 22 commercial fisheries and underpins extensive scientific research – with the 1938 discovery of the 'living fossil' coelacanth species in South African waters being one notable example. More than 10,000 species of marine plants and animals have been recorded in our waters.

The role of scientific and government monitoring of South Africa's marine resources is increasingly in the public spotlight due to impacts of population growth, climate change, and illegal and overfishing. In managing the resource, government seeks to balance the interrelated objectives of sustainable economic development, conservation, and transformation.

Employment in the commercial fishing sector spans the entire skills spectrum, from unskilled entry-level workers who receive in-house training, to highly-skilled professionals working either onshore or at sea – or both.

In offshore fishing the crew complement, including the officers, depends on the size of the vessel. Larger fishing vessels require a captain and up to three officers, whereas smaller vessels generally do not require the same level of expertise.

THE WORKING ENVIRONMENT

Fishing takes place in almost all corners of South Africa, including the furthest reach of the country's exclusive economic zone (EEZ). To ply their trade commercial fishers must brave some of the most treacherous sea conditions worldwide and are sometimes required to stay at sea for months at a time. The work can be risky, although modern safety standards aim to ensure that accidents are few and far between.

Many people enter the fishing industry by virtue of having grown up in coastal communities where fishing forms part of their cultural inheritance; others choose fishing for economic reasons and have to acclimatise to often unusual conditions. A love of adventure and the outdoors (and the ability to manage seasickness!) is advisable for anybody hoping to further their career at sea.

Inland commercial fishing is still in its infancy and limited to only a few experimental sites. Inland fishing can also be subsistence and small-scale, or recreational.

In the commercial sector, fishing jobs are generally divisible into two main categories: offshore-based jobs (deck) and shore-based jobs. Both are vitally important to the fishing trade and employ thousands, particularly in large coastal processing plants that are characterised by shift work and stringent hygienic conditions. Teamwork is essential in most work streams.

Marine species migrate across international boundaries and as such fishing activities and research often involve international collaboration, particularly for researchers and scientists who share knowledge with colleagues abroad.





Deckhand & Factory Hand (Aka Spare Hand Or Fish Hand)

NQF 1

This is an entry-level seafarer job encompassing multiple and varied tasks. Deckhands are required to assist wherever needed aboard, including in the engine room or galley. No specific prior qualification is required, although communication skills and seagoing experience are preferred. South African Maritime Safety Authority regulations require all seafarers to complete pre-sea certificates and medical exams to address safety concerns. Deckhands will be largely occupied with fishing activities such as shooting and hauling or repairing fishing gear such as nets, traps and lines. Each sector deploys different gear to catch their main target species in different ways and gear must be deployed correctly to work effectively.

Factory hands fulfil a similar broad range of support tasks inside a vessel's fish processing factory and are particularly important aboard the country's fleet of large factory freezers. Factory hands may be called upon to assist in a multitude of tasks ranging from cleaning factory equipment or supporting factory staff in their duties. Entry-level deckhands and factory hands should be mentally and physically prepared for long periods at sea.

Key tasks:

- Baiting hooks and managing nets.
- Cleaning vessels / facilities and basic maintenance.
- Cleaning and packing fish.

Entry requirements/training:

Entry level jobs require no prior qualifications or work experience. However, a reasonable level of education is required, preferably a matric pass. Employers also look for proficiency in English, the international language of the sea, as well as inter-personal skills. All seafarers require valid seafarer certificates issued by the South African Maritime Safety Authority (SAMSA). A range of training courses are on offer from SAMSA-accredited service providers. Deckhands require an Ordinary Seafarer Certificate as per SAMSA regulations (see qualifications list for more information).



Leading Deckhand / Bosun / Deck Officer Fishing

NQF 1-3

A leading deckhand provides guidance and leadership to other deckhands and therefore has more responsibilities in addition to the usual deckhand tasks such as hauling nets and repairing equipment, or assisting wherever required aboard a fishing vessel.

Leading deckhands are sometimes required to assist the navigational officer and take over the navigational watch. A more intimate knowledge of vessel operations and procedures is required, as well as more seafaring experience. This position is generally associated with larger ocean-going vessels that require someone to take charge of several inexperienced deckhands. The bosun or deck officer fishing is also sometimes referred to as the second mate and refers to the person who controls the deck. The bosun is sometimes required to assist the skipper with watch-keeping and other duties.

Key tasks:

- Monitoring and up-skilling deckhands.
- Assisting with basic deckhand tasks.
- Liaising with the skipper.

Entry requirements/training:

Previous work experience in fishing is required, in particular work as a deckhand. Leadership qualities and basic management skills are recommended. An Able Seafarer Deck certificate is also required.



Skipper / First Mate (Skipper Fishing Under 24m)

NQF 4-7

These two jobs require both a wide range of seafaring skills and extensive previous onboard experience. A skipper is ultimately in charge of navigating a fishing vessel, whereas the first mate is generally the second-in-command. First Mates are permitted to act as skipper of a vessel up to 24m, assuming they have all the necessary qualifications. Skippers and first mates must make decisions relating to the safety of the vessel and crew. As such they assume significantly more responsibility than the bosun or deck officer. Skippers are generally restricted to operate within South Africa's 200 nautical mile limit, which encompasses the country's exclusive economic zone (unless they have 'unlimited' certification).

Skippers / first mates require extensive navigational experience and training, including in emergency safety and medical procedures.

Skippers are ultimately responsible for the safety of their crew and must be able to work under pressure. They must at times delegate responsibilities to other crew members, but must as far as possible must be aware of all aspects of the vessel and crew management.

Key tasks:

- Assume ultimate responsibility for the safety of the crew.
- Navigate the vessel.
- Communicate with other vessels or shore personnel.

Entry requirements/training:

Extensive work experience and sea-hours are required to qualify as a skipper or first mate, with most successful candidates working their way up through the deckhand ranks. Skippers must typically function well under pressure and work well with people. A SAMSA-accredited certificate of competency for master and deck officers is required.

Career advancement:

Fishing skippers and first mates sometimes migrate to the merchant navy and can up-skill themselves accordingly via the relevant training courses. A seagoing skipper with extensive experience may also consider working as a shore skipper.

Fishing Master

NQF 7-8

A Fishing Master takes charge of all fishing operations aboard a fishing vessel, including catching and preserving of the catch. The Fishing Master also supervises the entire spectrum of fishing activities, from net deployments to cleaning, and is responsible for planning the fishing schedule and determining fishing location. The job requires managing the ship and includes administration duties such as record-keeping. They are responsible for dealing with shore authorities and port's officials on matters such as health and safety.

Fishing Masters will typically spend a significant amount of time navigating and must be trained accordingly. Extensive ocean-going experience is required. They must also be knowledgeable about fish catch limits and other compliance issues, and are ultimately responsible for the catch.

Shore skippers are typically ex-seagoing skippers based on land who offer support to seagoing skippers. They provide advice and support whenever required, whether of a technical or management nature.

Key tasks:

- Plan fishing schedules.
- Oversee deployment of fishing nets / lines.
- Discuss possible fishing locations with the skipper.

Entry requirements/training:

Extensive fishing experience required in addition to a SAMSA-accredited certificate of competency for master and deck officers. The Fishing Master generally works on larger ocean-going vessels and generally has some form of scientific training and qualification. A national certificate: fishing operations may also be required. Extensive fishing experience is required in addition to a SAMSA-accredited Certificate of Competency (CoC) for master and deck officers. The Fishing Master generally works on larger ocean-going vessels and has some form of scientific training and qualification.

Career advancement:

Fishing Masters may also qualify as skippers or migrate to shore-based jobs in some form of marine science.

Seafood Processor (Both Shore & Seagoing)

NQF 1-3

This job title encompasses several different jobs, each with their own unique functions and responsibilities. Factory workers, factory supervisors and food quality inspectors may all work together under a factory manager aboard a single fishing vessel – typically a large factory freezer that can spend months at a time out at sea.

These jobs entail working with food processing machinery and thereby require the requisite training, usually at a shore fish processing facility. Food science qualifications may be required. Job descriptions may include grading and packaging of processed items. Seafood process workers may work interchangeably on land or at sea, but generally the job begins in a shore facility.

The increasing prevalence of quality control in fishing has resulted in a growing number of opportunities for food quality inspectors, particularly as markets become more competitive and discerning. The food quality inspector must monitor bacteria count, fish odours and flavour, blemishes and freshness, to name just some of the considerations.

Key tasks:

- Handle processing machinery.
- Grade and pack fish.
- Clean and maintain equipment.

Entry requirements/training:

Seafood processing includes a wide range of job types at various levels, from entry-level factory workers where no formal prior training is required (and only basic level of education) to relatively well qualified positions. All posts involve extensive in-house training and familiarisation with plant machinery, whether at sea or ashore. Factory supervisors would require some form of management training, while food quality inspectors would require experience in food production and knowledge of food laws. A SAMSA-accredited certificate is required.

Career advancement:

Entry-level workers can progress to more senior factory positions via accredited training, while food quality inspectors might consider a degree in food science and employment in other processing plants.



Engineers & Engineering Services

NQF 4-8

Fishing provides ample opportunity for engineers with various levels of training and work experience. The entry-level 'greasers' or 'oilers' are generally assistants who work their way up via in-house training. However even trainee 'greasers' must acclimatise to additional pressures of work in a confined space or under potentially life-threatening conditions when travelling in the deep sea. The imperative of vessel safety demands a steep learning curve for oceangoing engineers.

More senior posts include the second engineer, third engineer, and chief engineer, with different training required for different vessels. The chief engineer is a prestigious position aboard a vessel and comes with weighty responsibilities, notably the mechanical wellbeing of the vessel and its all-important engines. These include monitoring engines and mechanical systems, and overseeing repairs.

Engineering skills acquired in non-fishing related sectors can be adapted to the fishing environment.

Engineering skills are also required at onshore fish processing facilities, as well as in the boat building environment.

Key tasks:

- Maintain and repair vessel engines.
- Alert the skipper / first mate in the event of mechanical problems.
- Record engine data and check tools.

Entry requirements/training:

Entry-level jobs as 'greasers' or 'oilers' on a fishing trawler may require little more than basic school education, although in-house and on-the-job training is required. A second tier greaser, called a M3 greaser, requires a M3 Efficient Certificate. The next level up is a M4 greaser who requires a M4 Efficient Certificate. Familiarity with engines and equipment is imperative.

More senior posts would require formal tertiary education engineering qualifications. Entry level jobs would require at least an Able Seafarer Deck certificate, and more senior posts must acquire a certificate of competency as: Chief Engineer, Chief Engineer (<3000 kW), Second Engineer, Second Engineer (<3000 kW), Engineer Officer, Electro-Technical Officer.

Fish Marketing & Advocacy / Administration

NQF 4-7

Buoyed by government small-scale fishing initiatives, an increasing number of fishermen are becoming directly involved in the marketing and distribution of their produce. Increasing globalisation and international trade have created new marketing opportunities, with larger commercial companies relying heavily on marketing expertise.

Marketing dynamics peculiar to the domestic market have spawned local industry marketing expertise. Fish marketers typically serve as the link between the primary producers, the fishers, and the retailers. They negotiate with potential clients, help determine prices, and create new markets for fish products either domestically or abroad.

Marketers require a diverse skill-set encompassing financial markets and macro-economics. The bulk of South Africa's deepsea catch is exported, which underscores the need for marketers with knowledge of the international trading environment.

Industry fishing associations also create work opportunities for administrators and industry promoters whose role is to bolster the profile of both specific fishing sectors and the industry in general. Civil society groups working closely with fishing communities require staff with knowledge of the local industry.

Key tasks:

- Liaise with established and potential buyers and retail outlets.
- Negotiate prices.
- Develop new markets.

Entry requirements/training:

Formal marketing positions in the private sector require formal marketing qualifications at tertiary education level. Small-scale fishers may employ the services of informal marketers who rely more on entrepreneurial skills and their knowledge of the fishing industry. Industry administrators may benefit from training in business administration. Other roles may require a wide range of skills depending upon the specific job description. Fishing rights activists may have a background in social science or legal services.



Fisheries Scientist / Biologist

NQF 7-9

South Africa's famous marine biodiversity has spawned an equally diverse set of opportunities for marine scientists, with many South Africans among the top professionals worldwide in their respective fields. Fisheries scientists and biologists are specialists in their field who play a crucial role in most aspects of fishing, from commercial offshore to land-based aquaculture. Detailed knowledge of the marine environment is the starting point of any major fishing endeavour, be it small-scale or deep-sea trawling.

Fisheries scientists are equally important to the private and public sector, providing the necessary knowledge and data to inform decisions around resource management and exploitation.

Experimental fisheries and conservation initiatives are particularly dependent upon several aspects of marine science. Fisheries scientists are also instrumental in establishing and monitoring South Africa's marine protected areas. They also provide valuable feedback regarding fishing quotas via scientific working groups.

In addition they help companies evolve ever more sophisticated technology to track fish and understand ocean dynamics. In this regard a career in marine science offers opportunities for international collaboration and cross-sectoral research. South Africa is party to several binding international scientific agreements that underpin many ongoing research projects.

Fisheries scientists have a critical ongoing role in understanding the impact of climate change on South Africa's fisheries.



Key tasks:

- Research fish biology (including genetics), biodiversity and population dynamics.
- Measure and model wild fish stock population levels and advise on sustainable Total Allowable Catches in each sector.
- Study ocean chemistry, currents and temperatures as well as plankton populations and their impact on fish populations which feed on them.
- Address the environmental impacts of fishing.
- Study climate change and its impacts on fish biodiversity and populations. Assess the viability of harvesting (or farming) different

Entry requirements/training:

Fisheries scientists require a formal qualification from a tertiary institution. A background in biology, science and mathematics at school level is a necessary springboard. Further training may be required depending upon the particular work stream. A vessel monitor would require specific further training in the form of a National Certificate: Fisheries Observation, either onshore or offshore.

Career advancement:

Marine scientists might also choose to further their studies in the form of post-graduate studies, with the possibility of a career in academia or government service.





Fishing Tourism Operator

NQF 1-3

International tourism and small business development initiatives create opportunities for fishing entrepreneurs who seek to do more than simply catch fish. Fishing tourism ventures are already a valuable source of income in a market likely to benefit from the emerging small-scale fishing sector. This is a growth area particularly for recreational fishers who own boats, as well as for newly-established coastal cooperatives looking for new commercial ventures in an era of generally declining wild fish stocks.

South Africa's abundance of big game fish like tuna is a major tourist draw-card. So too are inland fish farms stocked with popular species like bass and trout. Whale watching, shark cage diving, and dolphin adventures are other opportunities arising from a rich coastal biodiversity. Fishing tourism also extends into the retail trade, with some commercial boats contracting direct with fish restaurants.

The development of small-scale fishing also offers opportunities for fishing community visits and tours of small-boat fishing harbours at the heart of many coastal communities.

Key tasks:

- Accompany tourists on fishing trips.
- Maintain and navigate small fishing vessels.
- Marketing.

Entry requirements/training:

Experience with boats and marketing is preferable, but no formal training is required. Entrepreneurial skills are required to grow business opportunities. Tourism operators require a Tour Operators Certificate from an accredited training organisation.

Career advancement:

Further development may include business management training or short-course tourism qualifications as well as the opportunity to start one's own marine tourism endeavour.

Corporate Finance & Management

NQF 8-9

Fishing companies large and small require management skills ranging from finance to human relations. The South African commercial fishing sector generates an annual GDP of around R6-billion, of which a significant portion is ploughed back into fishing communities. Many senior managers work their way up through the ranks, while others are sourced from outside the sector.

Chief executives and managing directors of large fishing companies must navigate both economic and political terrain. Some management concerns are peculiar to the fishing industry, such as considerations around fishing quotas and purchasing vessels; other functions are not sector-specific, such as engaging clients or effecting economic empowerment.

Key tasks:

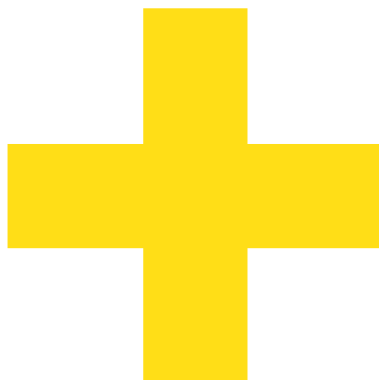
- Chair meetings to discuss company strategies and policy.
- Interact with government, regulatory stakeholders and investors.
- Manage and monitor financial affairs.

Entry requirements/training:

Senior management posts require extensive formal training and work experience, although not necessarily in the fishing industry. Business administration and finance qualifications are essential.

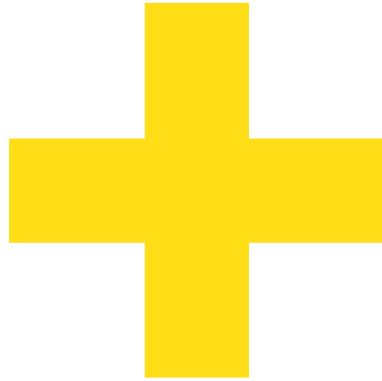
Career advancement:

Top managers have transferable skills and can migrate to other industrial sectors.

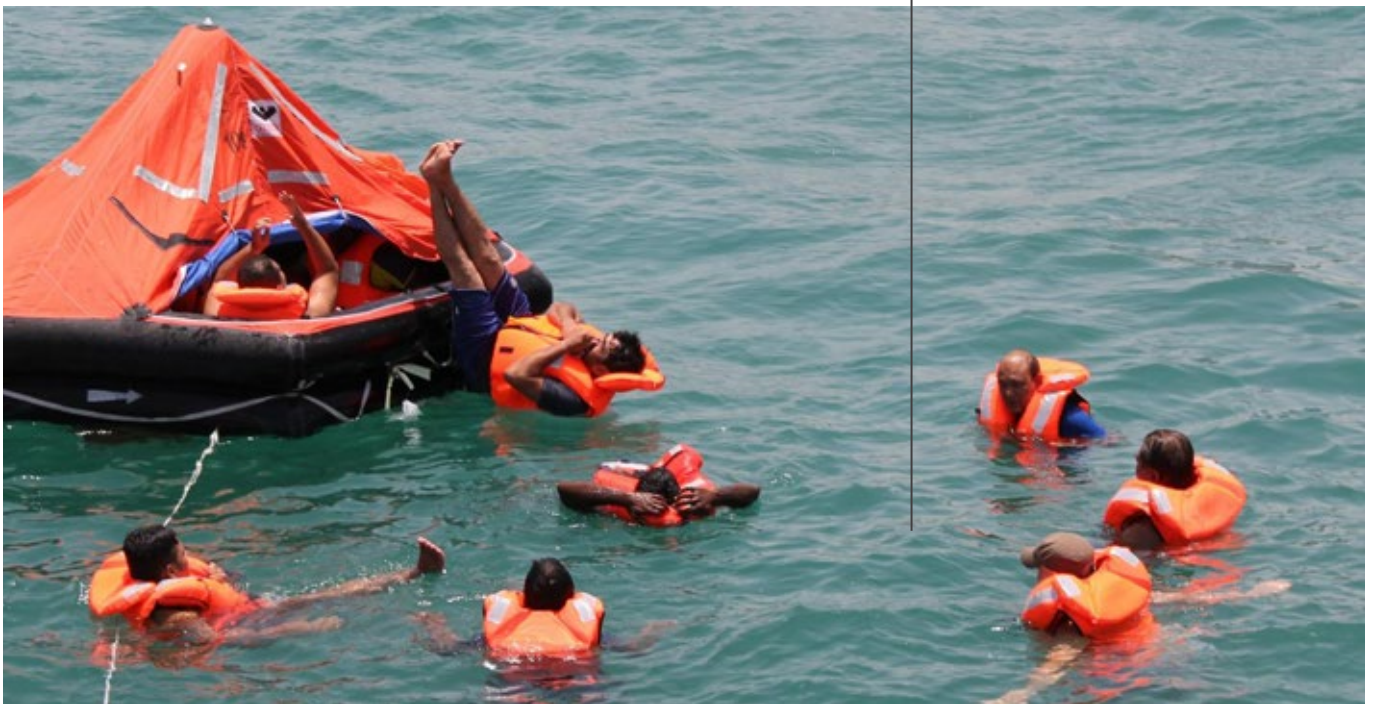


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TRAINING & EDUCATION

With such a wide variety of potential careers, fishing qualifications are equally diverse, ranging from entry-level in-house training courses to post-doctoral studies. Education and training opportunities have also evolved over many years in tandem with industrial development. As a result there are numerous options for anybody setting off on a fishing career path, whether on a deep-sea trawler or behind a desk at corporate headquarters.

In general education and training is divisible into seafarer and land-based skills, with seafarer training largely circumscribed by the International Convention on Standards of Training, Certification and Watchkeeping (read more in the Seafarers section of this booklet).

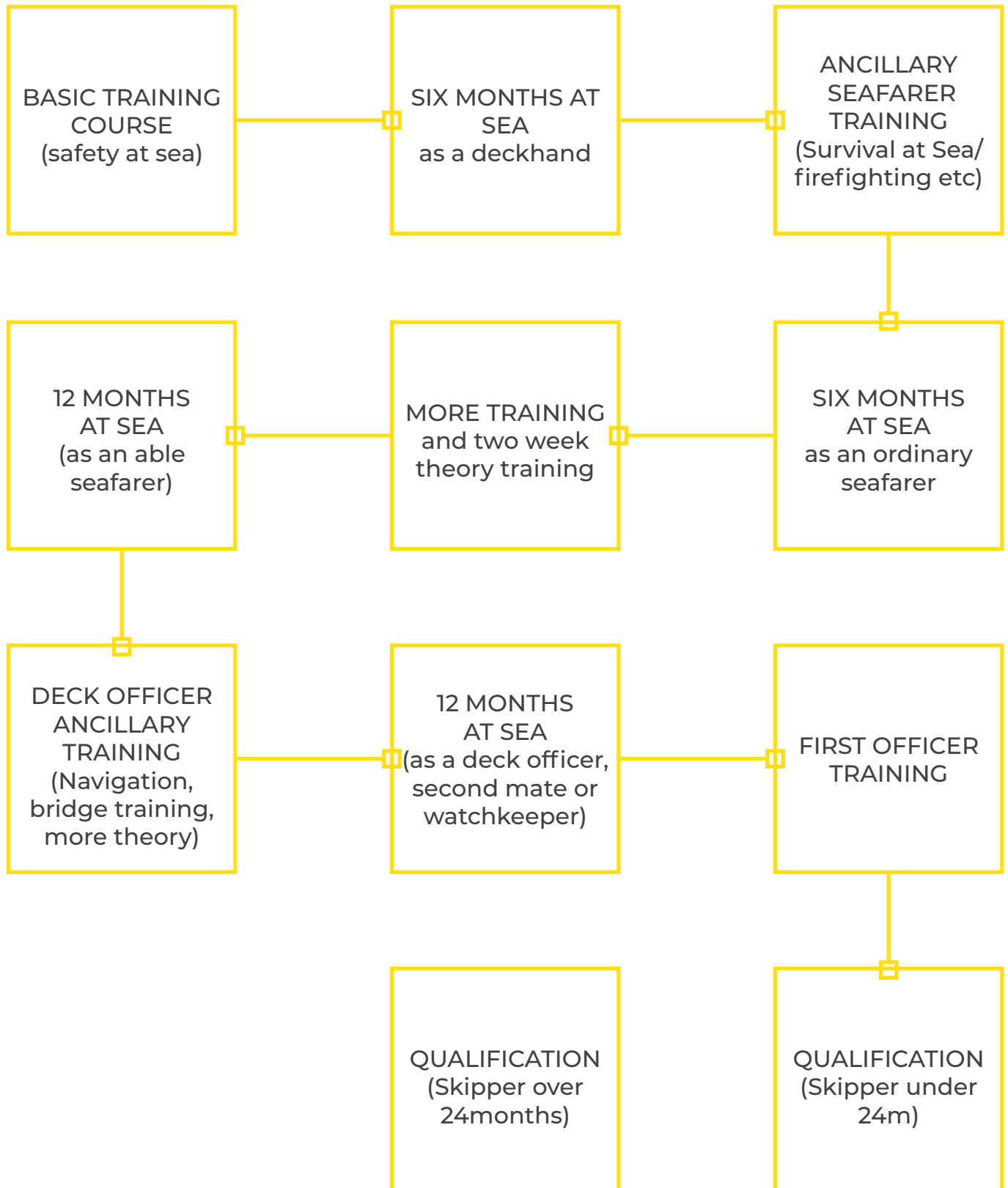
A seafarer cadet programme has been incorporated into the work of the South African International Maritime Institute (SAIMI) which aims to assist career development in several maritime sectors, including fishing.

Shore-based qualifications vary from basic education for factory workers, to post-graduate degrees for a variety of senior management and scientific positions, such as business managers and marine researchers.

The fishing industry norm minimum education level is grade 9, preferably with competence in maths and science. In this regard entry-level minimum education is slightly lower than other seafaring careers, such as commercial shipping.

TRAINING & EDUCATION

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SEAFARER TRAINING (Supplied by Sea Safety Training Group – SSTG)

Ancillary Courses (Basic Safety Courses)

- Fire Prevention and Fire Fighting – STCW A-VI/1- 2 Medical First Aid – STCW A-VI/4-1
- Personal Survival Techniques – STCW A-VI/1-1
- Personal Safety and Social Responsibilities – STCW A- VI/1-4 Elementary First Aid – STCW A-VI/1-3
- Crowd Management and Passenger Safety – STCW

Ancillary Courses (Advanced)

- Competence in Survival Craft and Rescue Boats other than FRC – STCW A-VI/2-1 Advanced Fire Fighting – STCW A-VI/3
- Medical Care – STCW A-VI/4-2

Refresher Courses

- Medical Care Refresher – STCW A-VI/4-2 Advanced Fire Fighting Refresher
- Global Maritime Distress and Safety Systems (GMDSS) Refresher – STCW A-IV/2 Survival Craft and Rescue Boats (CISC) Refresher – STCW

Familiarisation Courses

- Safety Familiarisation Training – STCW A-VI/I
- Safety Familiarisation Small Vessels <25G

Small Vessel Courses

- All Small Craft Tickets Under 9 Metres CAT: R, E, C, B
- Conversion from under 9m to over 9 metres and commercial Small Vessels <25GT

Security Courses

- Ship Security Officer
- Designated Security Duties
- Security Awareness – STCW A-VI/6-1

TRAINING & EDUCATION



Fire Fighting Courses

- Fire Fighting Induction
- Industrial Fire Fighting
- Breathing Apparatus Course

Radio & Communications Courses

- Global Maritime Distress and Safety Systems – STCW A-IV/2
- Long Range Certificate
- Short Range Certificate
- Communication 1 – STCW A-II/1

Ratings

- Ordinary Seafarer (Deck)
- Able Seafarer (Deck) – STCW A-VII/5
- Ordinary Seafarer (Engine)
- Able Seafarer (Engine)
- General Purpose Rating (Combined Study: Able Seafarer Deck and Engine)
- Efficient Cook

Electronic Navigation Courses

- Electronic Navigation Systems (Management Level)
- Electronic Navigation Systems (Operational Level) – STCW A-II/1
- Electronic Navigation Systems (Operational Level) – Fishing
- Electronic Navigation Systems (non STCW)
- Electronic Chart Display AND Information Systems

Medical Courses

- First Aid Level 1
- First Aid Level 2
- First Aid Level 3

Engineering Courses

- Marine Motorman Grade 2 (MM2)
- Marine Motorman Grade 1 (MM1)
- Marine Motorman Higher Grade (MM HG) (Coming Soon)
- Officer in Charge of an Engineering Watch (EOW)

Safety Courses

- Safety Officer Fishing Vessels over 25GT
- Safe Handling of Winches and Lifting Equipment Risk Management Fishing
- Confined Space Entry
- Hazardous Substances (Coming Soon) Lookout and Watch Keeping

Skipper & Fishing Deck Officer Courses

- Skipper Port Operations (Regulation 19)
- Skipper Fishing
- Fishing Deck Officer
- Unlimited Waters Command or High Seas Command

Master & Mate Coastal Courses

- Ship's Master
- Ship's Mate

Deck Cadet Courses

- Deck Cadets (S1 and S2) Officer in Charge of Navigational Watch

Professional Skills Courses

- Leadership and Management at Sea



TRAINING & EDUCATION

Marine Science

QUALIFICATION	INSTITUTION	TYPE	NQF LEVEL	CREDITS
Diploma in Marine Science	Cape Peninsula University of Technology	National Diploma	06	360
Advanced Diploma in Marine Science	Cape Peninsula University of Technology	Advanced Diploma	07	120







AQUACULTURE

SECTOR

05

INTRODUCTION

Aquaculture is the controlled farming, both on land and offshore, of aquatic species. Farmed animals are either sold directly to the food industry or used to replenish wild stocks in their natural environment. Aquaculture production is playing an increasingly significant role in global food security, particularly in areas of dwindling wild resources.

Growth in the sector is also driven by recent technological advances, particularly in food science and mechanical engineering. The sector is attracting an increasing share of capital investment, both from government and the private sector, due partly to a shift towards more sustainable fishing and agriculture.

South African aquaculture currently encompasses 26 animals, ranging from invertebrates like mussels and oysters, to popular fish such as trout and kabeljou. The aquaculture sector was formally incorporated into the government's Operation Phakisa development programme in 2014, resulting in significant financial investment in the form of the Aquaculture Development Fund. Initial employment targets were set at creating about 10,000 jobs per annum. South African aquaculture products are already exported into several foreign markets, including China (oysters) and Europe (finfish).

Careers in aquaculture encompass a broad range of skills and training, from entry level manual labour and construction, to scientific research, technical skills and business management.

THE WORKING ENVIRONMENT

Aquaculture farming takes place in diverse locations, ranging from small tanks in urban environments to large sea cages in remote coastal inlets. The work is mostly outdoors and often involves some form of physical activity such as cleaning or replenishing water tanks. Aquaculture farms can be big or small but generally all involve some form of mechanisation. Some tasks are solitary while others require teamwork.

Entry-level jobs require no formal qualifications, although communication skills are important.

The vast majority of aquaculture jobs are situated at the coast. However inland farms are likely to become more commonplace as the availability of sea-space and coastal land becomes more limited.



Fish Farm Worker

NQF 1

This is an entry-level post requiring minimal qualifications or previous experience. The fish farm worker is largely responsible for several repetitive tasks such as feeding fish, harvesting fish and changing water filters. Job duties vary according to the size of the farm. Tasks typically encompass a wide range of activity that may not be industry-specific, such as basic maintenance work, cleaning, or surveillance. Communication skills are important, particularly proficiency in English.

Farm work can be physically demanding and may require boat work where farms are situated in coastal bays or lagoons. Observational and practical skills are necessary, as well as the ability to work unsupervised. An interest in animals, particularly fish, is advisable.

Key tasks:

- Feeding fish, either by hand or mechanically.
- Cleaning tanks and filters/ repairing and maintaining equipment.
- Monitoring fish and water conditions / harvesting fish.

Entry requirements/training:

Only a basic level of education is required for entry-level workers, although in-house and on-the-job training is necessary.

Career advancement:

Up-skilling is also available in the form of a variety of industry-certified aquaculture courses and, where necessary, boat-handling training. Entry-level workers can progress to become team leaders or supervisors.

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Team Leader

NQF 1

This is a second-tier farm worker post that includes some leadership responsibilities. The team leader has a working knowledge of all the day-to-day fish farming tasks, such as feeding and harvesting. They also provide oversight and basic supervision. Team leaders are required to liaise closely with staff under their watch as well as with the farm supervisor. Unlike the entry level post the team leader requires previous aquaculture work experience.

Key tasks:

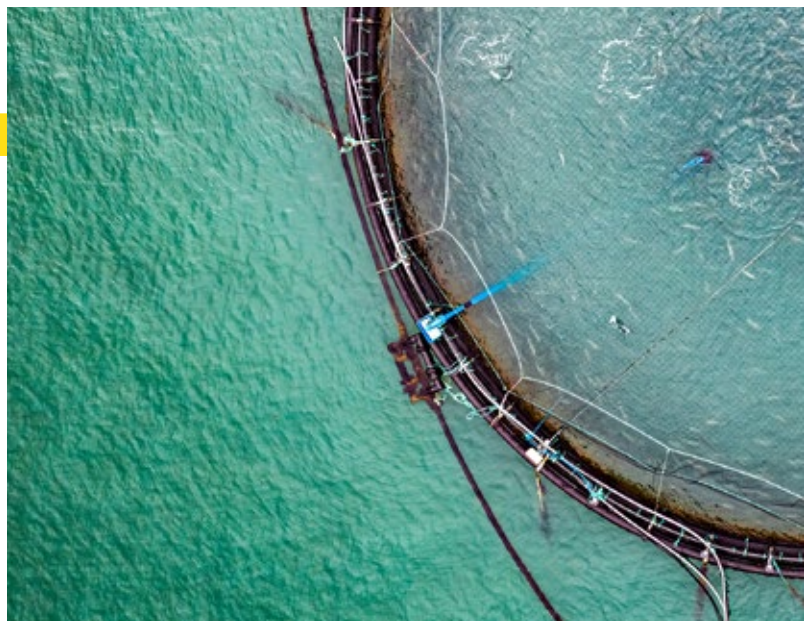
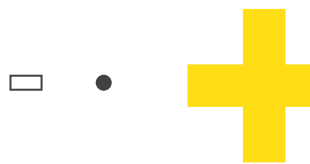
- Monitoring and motivating junior fish farm workers.
- Demonstration of basic tasks for team training.
- Liaising with the supervisor regarding farm operations and recording actions (eg mass and number of fish harvested and restocked).

Entry requirements/training:

Previous work experience is required as well as a working knowledge of farm operations. More advanced in-service training may be required, together with an industry-accredited training course.

Career advancement:

Team leaders may be suited to progress to supervisor level once they have obtained some basic leadership experience. Aquaculture work experience can be a springboard into the broader fishing industry, particularly in vertically integrated companies that operate both aquaculture and offshore divisions.



Supervisor

NQF 4

The farm supervisor typically manages two or three work teams and liaises closely with the team leader or multiple team leaders in the case of bigger farms. Management experience is required, although this can be acquired in-house and generally does not require any formal management training. Farm supervisors ensure team leaders are functioning efficiently and recording data correctly. They are called upon to monitor staff interactions and resolve conflict. Strong inter-personal skills are required.

Supervisors are generally drawn from the existing staff pool and have a good general knowledge of the functioning of the aquaculture farm. They may also be called upon to help with in-house training and mentoring of entry-level fish farm workers.

Key tasks:

- Liaise with the production or farm manager regarding personnel issues.
- Handle conflict resolution where required.
- Allocate daily tasks to Team Leaders
- Monitor TLs to ensure they function optimally with their teams in terms of technical skills and relationships

Entry requirements/training:

Previous work experience is essential. However a supervisor does not necessarily require any formal training. The key requirement is an in-depth knowledge of the facility where he/she is employed.



Production Manager

NQF 4-7

Production managers are responsible for the overall functioning and output of product from the farm, including species breeding programmes. On smaller farms this role may be combined with overall farm management, but on bigger farms the two roles are distinct. Production managers oversee the production process, from hatching eggs to harvesting the fish for sale. Processes may vary depending upon the species involved. Knowledge of multiple species may be required. The production manager is ultimately responsible for breeding schedules, feeding volumes, and monitoring the condition of the stock. They must also manage water quality and have a detailed understanding of the aquaculture regulatory environment.

Basic administrative skills are required for detailed record-keeping. Technological training is also useful to help with farm innovation and the optimal management of fish tanks or other farm infrastructure.

Key tasks:

- Calculating breeding programmes and feeding regimes.
- Recording and analysing breeding data.
- Research relevant technological and scientific material in order to keep the farm up-to-date. Management of stock quantities and mass per tank.
- Monitoring and managing growth rates.
- Analysing data collected by TLs and collated by Supervisors. Genetic management.
- Stock management inclusive of hardware and feed.

Entry requirements/training:

A scientific or agriculture background is required, generally a BSc Hons degree or similar. Production managers have typically obtained some form of qualification in either aquatic science, environmental science or marine resource management.

Career advancement:

Production managers are well suited to progress to farm managers once they have acquired the necessary work experience. Additional finance and/or business skills would be required, particularly on larger commercial farms.

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Farm Manager

NQF 7-8

The Farm Manager must oversee all aspects of the aquaculture farm, including production and finances. Farm managers generally have a strong biological science and/or personnel management background and often have previous work experience in other industries.

Farm managers provide overall leadership and operational guidance. The post requires a willingness to work long hours, often outdoors, and sometimes under pressure. Farm managers and their staff may be required to live in remote areas for extended periods of time as farms are sometimes located on the urban periphery or in underdeveloped coastal areas.

A background in business administration and finance is useful when tackling these responsibilities. Managers are also required to interact with government and civil society stakeholders, such as service providers, I&APs, auditors and government regulators.

Key tasks:

- Liaise with staff and provide overall leadership.
- Oversee all farm processes and functions, particularly the key farming aspects such as fish breeding.
- Interact with outside stakeholders, such as contractors or government regulators.
- Monitor farm finances / business plans / sales / HR / legislative compliance.

Entry requirements/training:

A degree or diploma in agriculture is preferred. Alternatively a degree or diploma in a scientific field, such as zoology or ichthyology would be considered relevant. Farm managers also require finance and business administration skills, as well as sound leadership and communication skills. Aquaculture-specific skills are vital, either from a tertiary institution or from an industry-accredited service provider.



Seafood Processor / Machine Operator

NQF 1-3

Seafood processors or machine operators play a vital role in the industrial process and may work in an on-site processing facility or far removed from the aquaculture farm in a completely separate facility. A recent Agri- Seta booklet defined the seafood processor as somebody who “sets, operates and attends machinery used to process fish”. The job is also known by several other names – depending upon the specialisation – such as fish canning process worker or fish processing machine operator.

Machine operators are typically associated with onshore fish processing facilities or large factory freezers. However the growth of commercial aquaculture has seen the advent of facilities dedicated to processing aquaculture produce.

This job requires standing work and basic machinist skills which can be acquired in-house or via accredited training courses. Tasks include wrapping and packaging of aquaculture produce, generally in cool conditions where hygiene standards are extremely important. Manual dexterity, team-work and good hand-eye coordination are necessary. Work can be seasonal.

Key tasks:

- Clean seafood products.
- Operate fish processing machines.
- Work as part of a processing team on a production line.

Entry requirements/training:

Entry-level jobs require little or no previous training, although a high-level of school education is preferred, particularly language skills. A National Certificate: Fish and Seafood Processing is required to work in a fish processing facility.

Career advancement:

Seafood processors are able to transfer their skills to multiple facilities within the agro-processing industry. Their skills are also suited to work aboard factory freezer vessels that require staff willing to work under pressure.



Aquaculture Researcher / Aquatic Biologist

NQF 7-9

Researchers are primarily concerned with finding new and innovative ways of improving farm efficiency, or developing new techniques and processes to either streamline operations or develop new farming opportunities. The exponential growth of aquaculture, both in South Africa and abroad, has led to bigger farms and more harvested species. Increased production has spawned experimental research projects across the globe.

Aquaculture researchers may be employed directly by private aquaculture companies or by institutes or government departments conducting aquaculture research. The sector also offers many international research and training opportunities. The South African government has identified three key research areas: species diversification and competitiveness; animal health and diseases; interaction between the environment and agriculture.

Key tasks:

- Research and develop culture technology for finfish and invertebrate species.
- Improve biosecurity of aquaculture activities through targeted surveillance, development of diagnostic methods, epidemiological research, and the development of preventative measures for promoting and maintaining a healthy culture environment.
- Promote understanding of the interactions between environment, economics and aquaculture.

Entry requirements/training:

Scientific training and formal qualifications are essential, with a minimum MSc requirement. Post-graduate studies are preferred, depending upon the size of the business. Researchers in this field need a thorough knowledge of aquatic biology and general grounding in scientific research, in addition to experience in running clinical trials.

Career advancement:

Researchers at this level can migrate to careers in academia.





Aquaculture Maintenance & Engineering Services

NQF 1-8

Aquaculture engineering is a growing multi-disciplinary field primarily concerned with designing and maintaining sea cages, ponds and water reticulation systems. The rapid growth of this career path mirrors the growth of global aquaculture production – which now accounts for more than half of all seafood products consumed. According to a recent AgriSeta skills booklet, an aquaculture engineer “plans, organises, directs, controls and coordinates the design and construction of engineering and process plants in an aquaculture farm/plant context”.

While some skills may be acquired in-house, aquaculture engineers typically have diverse experience across multiple sectors. Maintenance experience specific to individual farms would be required or developed over time.

Engineers working in marine environments would need marine engineering design, installation and maintenance skills as well as, in some cases training in oceanography and hydrodynamics.

Key tasks:

- Build / design / maintain water reticulation systems.
- Design and build water ponds or cages.
- Research innovative ways of improving aquaculture infrastructure.
- Design marine structures and installations as well as help with identifying and sourcing the necessary building materials.

Entry requirements/training:

Entry-level jobs require little or no formal training other than high school education. However more skilled or senior jobs require academic or technical specialised training, both in-house and via external service providers. A chief engineer would require a formal engineering qualification including aquaculture specialisation.

Career advancement:

Aquaculture engineers can easily migrate into other industrial sectors that also involve water reticulation systems, such as mining. Engineering skills are generally in short supply, both in South Africa and in many parts of the world.

Food Scientist

NQF 7-9

Food scientists are particularly important in large-scale farming operations where quality control of export product is particularly important in light of product certification. The job requires a solid grasp of the food and retail regulatory environment.

South Africa's AgriSeta defines the food scientist as follows: "Studies the physical and chemical properties of food and beverages and develops new and improved food and beverage products, and sets standards for producing, packaging and marketing food and beverages. Relevant alternative titles: Food safety standards manager, Food technologist, Protein development technologist."

Key tasks:

- Sample aquaculture products.
- Liaise with product quality inspectors.
- Monitor fish processing.
- Research and study new potential products.

Entry requirements/training:

This is a specialised job requiring tertiary-level qualification in food science, available from several South African tertiary institutions.

Career advancement:

Food scientists can migrate to other industrial sectors, particularly retail. They play a crucial role in government monitoring and regulation.





Small-Scale Farmer

NQF 1-4

Small-scale aquaculture is a new field prompted by the introduction of South Africa's new small-scale fishing policy. Traditional fishers are being encouraged to form community cooperatives to manage and control their own fishing quotas and business opportunities – with help from outside service providers. Small-scale aquaculture farms have been identified as a possible engine of economic growth in historically under-developed coastal communities.

Small-scale aquaculture farmers would share joint management control of their business ventures. They might share the work load between themselves or employ outside contractors, depending upon the size of the operation. Small-scale farmers are generally involved in every aspect of the business.

Key tasks:

- Basic facility maintenance
- Manage and monitor fish stock.
- Perform basic administrative functions.

Entry requirements/training:

Small-scale aquaculture farmers, if successful, could either advance to larger-scale enterprises or seek work in established commercial ventures. The hands-on nature of their work is good training for future employment in various alternative capacities, although that would require up-skilling in the form of industry-accredited courses.

Career advancement:

Small-scale farmers may also be involved in other fishing activities, such as line-fishing, diving, or tourism-related boating. Business skills and experience acquired in one area could be used in other cooperative ventures.



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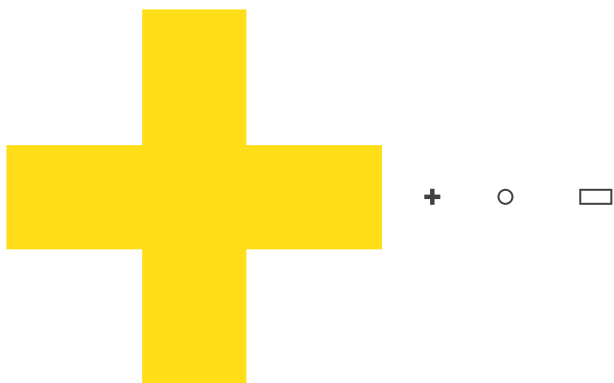
TRAINING & EDUCATION

There are currently relatively few formal qualifications linked to commercial aquaculture compared with qualifications associated with commercial fishing. However this is changing, with several options already available and others likely to come online in future as the aquaculture sector expands.

Aquaculture has now been incorporated into some existing tertiary education courses, although to date there is no dedicated aquaculture degree. There are however a number of post-graduate options, such as a post-graduate diploma at Stellenbosch University. Aquaculture is also offered as a course component of degrees such as marine science and agriculture.

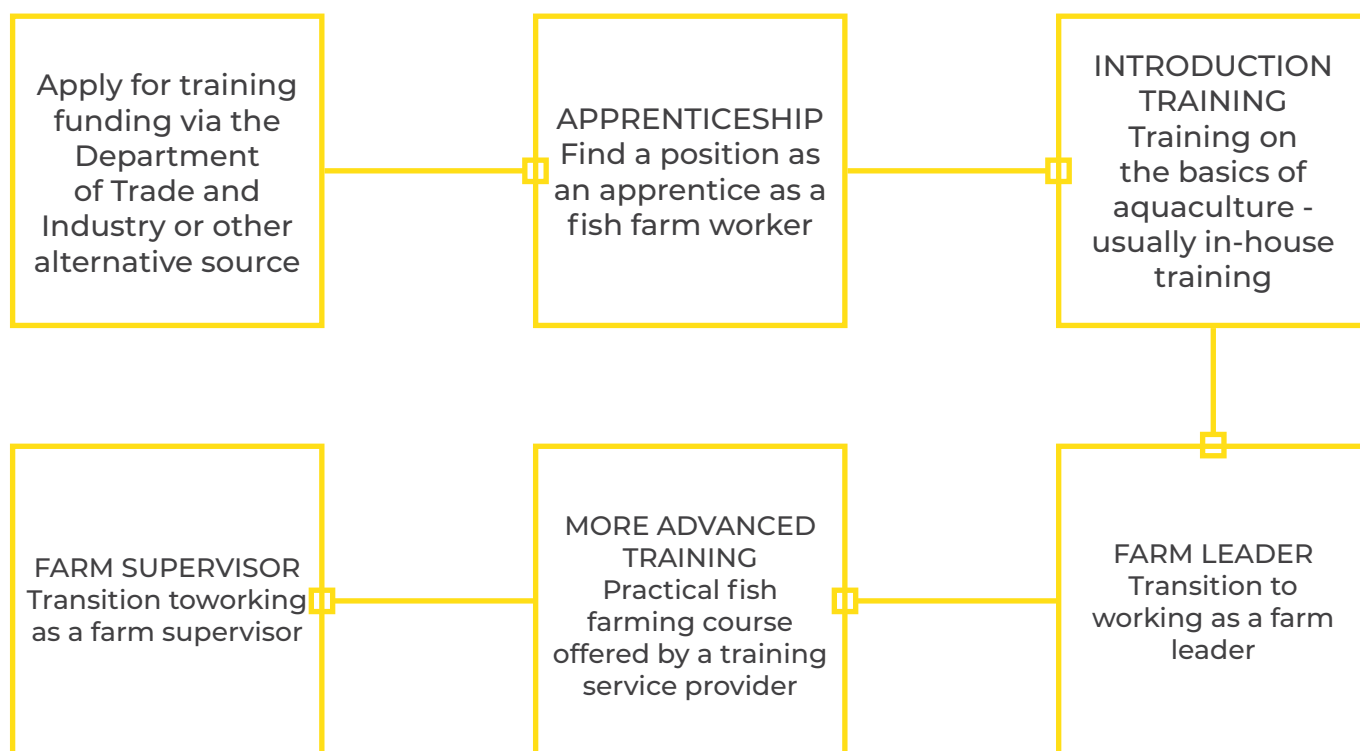
By contrast there is a fully-fledged Aquaculture Engineering degree at the University of KwaZulu-Natal.

Most commercial aquaculture farms favour senior staff with some form of formal training, with agriculture and marine science particularly highly regarded. Entry-level jobs require little or no training, although on-the-job training is imperative.



TRAINING & EDUCATION

Working Towards a Career in Aquaculture



Aquaculture Innovations

Courses:

- Practical Fish Farmer Course (5 days of life on a fish farm - Grahamstown)
- Aquaculture System Management Course (3 days theory – Pretoria)
- Commercial Aquaponics Course (2 day theory & practical – Pretoria and Grahamstown)
- Combined Aquaculture and Aquaponics Course (4 days theory – various countries)

Contact Details: www.aquaafrika.co.za | info@aquaafrika.co.za | Tel: +27 46 622 3690

David Fincham Aquaculture

Courses:

- David Fincham Aquaculture Training Programme

Overview:

The course covers 10 Modules and includes all the Learner Manuals, Practical session and knowledge tests. The training is conducted both off site and on the farm. Students may also achieve SETA accreditation through our SETA accredited service provider.



TRAINING & EDUCATION

Further & Higher Education Provision in Aquaculture

QUALIFICATION	INSTITUTION	TYPE	NQF LEVEL	CREDITS
Occupational Certificate: Aquaculture Farmer	AgriSETA	Occupational Certificate	04	176
Bachelor of Science	University of Zululand	First Degree	07	360
Postgraduate Diploma: Aquaculture	University of Stellenbosch	Postgraduate Diploma	08	120

University of Cape Town (Western Cape): Botany and Zoology Departments.

Provides a post graduate course in aquaculture.

Telephone +27 (0) 21 650 9111 | Web: www.uct.ac.za

Rhodes University (Eastern Cape)

Short courses in aquaculture for agriculture extension officers and veterinarians with the support from DAFF. Department of Ichthyology and Fisheries Science offers undergraduate and postgraduate course in aquaculture. An aquaculture module is offered at Rhodes University if one majors in Ichthyology and Fisheries Science within the undergraduate Bachelor of Science degree.

Telephone, +27 (0) 46 603 8111 | Web: www.ru.ac.za

Postal Address: PO Box 94 Grahamstown, 6140, South Africa

University of Western Cape:

Botany and Zoology Departments offer post graduate courses in aquaculture.

Telephone +27 (0) 21 959 2911 | Web: www.uwc.ac.za

Postal Address: Private Bag X17, Bellville, 7535, South Africa

University of KwaZulu-Natal:

Microbiology Department – offers post graduate courses in microbiological aspects related to aquaculture.

Telephone +27 31 260 8596 | Email: education@ukzn.ac.za
enquiries@ukzn.ac.za

University of the Free State

Undergraduate courses as part of freshwater ecology and post graduate courses specializing in aquatic parasitology.

Telephone +27 51 401 2634. | Email: info@ufs.ac.za

Nelson Mandela University (Eastern Cape) University Zoology Department

Undergraduate courses as part of Aquatic Ecology and Applied Aquatic Science.

Telephone (041) 504 1111. | Email: info@mandela.ac.za

University of Limpopo Science Faculty. Aquaculture Research Unit :

Offers aquaculture courses at a postgraduate level, focusing on freshwater finfish..

Telephone: (015) 268 2788. | Web: www.ul.co.za

University of KwaZulu-Natal:

Microbiology Department – offers post graduate courses in microbiological aspects related to aquaculture.

Contact: Telephone +27 31 260 8596 Email: education@ukzn.ac.za
enquiries@ukzn.ac.za



TRAINING & EDUCATION

Food Science

Courses:

- Practical Fish Farmer Course (5 days of life on a fish farm - Grahamstown)
- Aquaculture System Management Course (3 days theory – Pretoria)
- Commercial Aquaponics Course (2 day theory & practical – Pretoria and Grahamstown)
- Combined Aquaculture and Aquaponics Course (4 days theory – various countries)

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OFFSHORE OIL & GAS

INTRODUCTION

The Oil and Gas industry is generally divided into the upstream, midstream and downstream sectors. Most of the maritime-related career opportunities are found in the upstream and midstream sectors where offshore rigs, drilling ships, survey vessels and tankers are operational.

About 30 per cent of the world's oil is extracted offshore from fields located in areas such as the Persian Gulf, the North Sea, the Gulf of Mexico and West Africa. Offshore gas fields are similarly located. East Africa seems to be attracting more success with gas, however, and the development of the Rovuma gas field offshore Mozambique represents the single biggest investment in one project in Africa ever undertaken.

Despite a significant gas find offshore South Africa at the end of 2018, the country's territorial waters do not currently host much exploration activity for either oil or gas, but the government is actively pursuing future opportunities for investment and development in this sector.

As a highly capital-intensive industry, the oil and gas sectors do not offer much opportunity for entrepreneurship, but those with extensive experience in the sectors leave formal employment to become consultants.



THE WORKING ENVIRONMENT

Working on board an offshore rig can be physically demanding and a good level of fitness is required from crew members. Crew often work 12-hour shifts at a time, requiring a great deal of stamina and self-discipline. In addition, offshore rig workers need to understand that they will be away from home for weeks or even months at a time. While the offshore oil rig is a tough environment to work in, most modern platforms offer crew amenities that include a gym, games room, movie library and lounge.

Offshore rigs do not generally provide unlimited WiFi connectivity, however, and some people may experience a level of isolation. With a very limited South African offshore oil and gas industry, most locals working in this industry find themselves working overseas for international companies.

When not on contract on board a rig, personnel are often expected to undertake additional training or update certificates that may have expired.

In many cases, rig personnel require a measure of entrepreneurial spirit as contracts can be cyclical and not permanent in nature. Successful rig personnel with extensive experience in the field who are willing to be deployed to more remote areas can expect to earn well as they progress through the ranks.





Roustabout

NQF 1

Offshore roustabouts undertake basic labouring tasks on board an oil or gas rig that require a level of physical fitness. They are expected to work in all types of weather conditions while offloading supplies or use lifting gear and winches to move equipment on the deck of the rig. Roustabouts should be comfortable working at heights in tough conditions, team players and disciplined with a commitment to safety.

Key tasks:

- Cleaning the deck and removing obstacles that hinder work and safety.
- Heavy lifting whenever required.
- Assisting the other crew members whenever required.
- General housekeeping on the rig floor.

Entry requirements/training:

No formal tertiary education is required, but candidates need to be over 18 years of age to work offshore. Many people enter this career via an apprenticeship scheme offered by the company. Employers will generally prefer apprentices who have Matriculated with English, maths, science or design and technology. Some positions may require the individual to undertake OPITO accredited rigger, banksman and slinger training at an approved training facility. This training equips you to move equipment around the deck safely.

Career advancement:

As a roustabout, you will have the opportunity to start your career development quite quickly. With the right attitude and aptitude, you should be able to move up to a roughneck after about six months.

Associated job opportunities:

Your experience as an offshore roustabout will also allow you to work onshore in a similar capacity and may offer entry opportunities into a number of more technically-inclined and more highly skilled positions given the appropriate additional training and education.



Similarly to roustabouts, offshore roughnecks are required to undertake physically demanding work in a variety of weather conditions and, therefore, need to be physically fit. Roughnecks assist the driller, carrying out the manual operation of the systems and equipment required for the specific process. This can include adding fresh lengths of drill pipe as the drill moves deeper as well as extracting the drill. A roughneck is also tasked with cleaning, maintaining and repairing the drilling equipment. Apart from overseeing the drilling equipment, they will still need to be available for other general maintenance work on the rig.

Key tasks:

- Cleaning the deck and removing obstacles that hinder work and safety. Heavy lifting whenever required.
- Assisting the other crew members whenever required. General housekeeping on the rig floor.
- Maintain drilling equipment.
- Painting, rust removal and many other “dirty” duties.

Entry requirements/training:

While it is possible to enter this position directly through an apprenticeship programme, most roughnecks first work in the position of a roustabout. No formal tertiary education is required, but again employers prefer candidates who have Matriculated with English, maths, science or design and technology.

Career advancement:

The opportunity for advancement exists on board rigs for roughnecks to move up the ranks in the drilling crew to become a driller, assistant driller or a derrickman.

Associated job opportunities:

Your experience as an offshore roughneck will also allow you to work onshore in a similar capacity and may offer entry opportunities into a number of more technically-inclined and more highly skilled positions given the appropriate additional training and education.

Motorman / Motorhand

NQF 1-3

The primary responsibilities of the oil rig motorman (or motorhand) are to keep the engines that power the drilling equipment and some of the other rig equipment working smoothly. These engines are used to lift the drilling pipe; turn the rotary table that turns the drill bit, and for mixing and circulating drilling fluid like mud.

Equipment varies somewhat from rig to rig, but generally speaking a rig has a combination of diesel and electric engines. Motorhands spend most of their time on the engines and boilers, but also assist other oil rig crew where necessary.

Key tasks:

- Test equipment and ensure optimum functioning.
- Order tools and replacements.
- Instruct roustabouts and roughnecks.
- Assist the other crew members whenever required.
- Work with rig's boilers.

Entry requirements/training:

A motorman has gained experience while working on an offshore rig and may be promoted from the ranks of a roughneck if they show the right aptitude for mechanics. On-the-job training would be required via an apprenticeship programme. Some companies may require a motorman to have safety and first aid certificates.

Career advancement:

Opportunity for advancement exists on board rigs within the drilling department.

Associated job opportunities:

Experience as motorman will also allow you to work onshore in a similar capacity and may offer entry opportunities into a number of more technically-inclined and more highly skilled positions given the appropriate additional training and education.

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Derrickman

NQF 3

Working under the supervision of the driller and the assistant driller, the derrickman is responsible for the derrick (the mast that supports the drilling equipment) platform and will find themselves working 20 to 25 metres above the rig floor. The derrickman needs to be appropriately skilled to undertake some of the drilling operations in the absence of the driller or assistant driller. Physical fitness is once again a necessary requirement of the position.

Key tasks:

- Inspect and maintain derrick equipment.
- Prepare and write reports.
- Stack and guide the drill pipe.
- Test and lubricate motor parts.
- Control pump room and drilling fluid.

Entry requirements/training:

A derrickman needs to have previous experience in the field and have gained technical as well as mechanical knowledge. They are generally roughnecks who have gained the appropriate additional training and experience on the rigs.

Career advancement:

Opportunity for advancement exists on board rigs within the drilling department. Having gained sufficient experience and the necessary skills working under the driller, a derrickman can advance to the position of assistant driller and ultimately driller.

Associated job opportunities:

Experience as an offshore derrickman will also allow you to work onshore in a similar capacity and may offer entry opportunities into a number of more technically-inclined and more highly skilled positions given the appropriate additional training and education.





Assistant Driller

NQF 3

As the name implies, the assistant driller works closely with the driller on the drill floor. They are responsible for supervising the pump man, roughneck and derrickman and will liaise between the drill team and the driller.

Key tasks:

- Supervise drilling personnel such as the derrickman and other subordinate staff.
- Operate drill equipment.
- Monitor and control temperature and pressure of the drill.
- Record data for driller.

Entry requirements/training:

The assistant needs to have previous experience in the field and have gained technical as well as mechanical knowledge on board oil rigs.

Career advancement:

Opportunity for advancement exists on board rigs within the drilling department. Having gained sufficient experience and the necessary skills working under the driller, an assistant driller can advance to the position of driller. Completing additional courses and certificates relevant to the skills required on the job will enhance advancement opportunities. These may include additional safety and Hazmat courses amongst others.

Associated job opportunities:

Experience in the offshore drilling department will also allow you to work onshore in a similar capacity and may offer entry opportunities into a number of more technically-inclined and more highly skilled positions given the appropriate additional training and education.



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Driller / Toolpusher

NQF 3-4

The driller is essentially the team leader of the drilling crew and must be organised, disciplined and able to communicate well. The driller is tasked with operating the drilling and hoisting equipment of the oil rig, managing the rig floor as well as operating the driller's console which features monitors, brakes, clutches, throttles and a large number of gauges. With an overall understanding and knowledge of the drilling environment, the driller will monitor and ensure the safety of drilling operations by conducting safety meetings and drills, as well as documenting procedures on board and enforcing company policies.

Key tasks:

- Conduct safety meetings and drills.
- Document procedures.
- Implement policies.
- Supervise drill crew.

Entry requirements/training:

The driller will need to complete a number of certifications including specialised oil and gas safety training as well as leadership training. The driller is likely to have spent considerable time working on rigs having advanced from lower positions (with at least five years of experience or more) while demonstrating an aptitude for the work. An accredited well control certificate is also required.

Career advancement:

Having gained sufficient experience and the necessary skills to work as the head of the drilling crew, future advancement could be in the direction of rig manager, but the individual would need to undertake additional vocational training and specialised courses.

Associated job opportunities:

Experience as a driller on an offshore oil rig would translate well into a number of supervisory and technical positions ashore in the industrial or marine engineering environment.

Offshore Installation Manager

NQF 7-9

The Offshore Installation Manager (OIM) is responsible for the overall running of the entire oil rig and needs to ensure that the work on board is undertaken smoothly and safely. They are responsible for the overall production and operating costs on the rig as well as for planning, organising and implementing regulatory and safety policies. Their role on the offshore platform is similar to that of a Captain of a ship.

Key tasks:

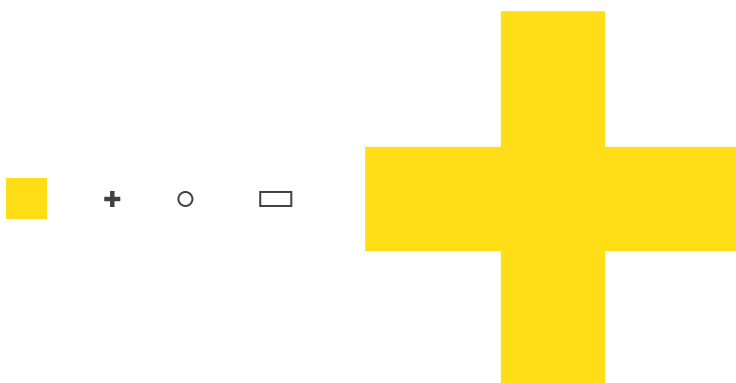
- Responsible for the overall safety and wellbeing of crew.
- Liaise with client representative about all operations on board.
- Implement safety and company policies across all departments.
- Oversee running of the offshore rig.

Entry requirements/training:

Experience is crucial and an oil rig manager needs to be licenced and registered to work in many of the established international oil fields. Most OIM's are sourced from the merchant navy. As such they will have an Unlimited Master's ticket and a DP Operator Certificate. They will receive extensive additional training in safety and crisis management before assuming control of a rig.

Associated job opportunities:

OIM's have a number of potential associated job opportunities including the option to return to the merchant navy or transfer ashore into a management position within the shipping or offshore oil and gas sectors.



Drilling / Subsea Engineer

NQF 8-10

Most offshore oil platforms also employ several petroleum or mechanical engineers to supervise operations or troubleshoot problems. These are tertiary-educated, licensed professional engineers that have post-graduate degrees or diplomas in relevant engineering subjects as well as a number of years of experience. Smaller operations might only require that engineers come out to the platform for regularly scheduled visits or inspections.

Key tasks:

- Plan, design and supervise the well plan and operations.
- Oversee logistics, contracts and costs of operation.
- Collect and analyse data.
- Forecasting.

Entry requirements/training:

To enter this profession, you will need a strong degree (BEng or MEng) in a subject such as civil engineering, chemical engineering, mechanical engineering, mineral engineering, geology or earth sciences (BSc or MSc).

Associated job opportunities:

Alternative employment avenues include: freelance consulting, academic research and specialisation in a niche area of engineering, such as mechanical design.

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Oil Rig Safety Officer

NQF 4-7

The Safety Officer assists the rig management in ensuring that the health, safety and environmental (HSE) work on the unit complies with the applicable HSE rules and regulations. They will drive campaigns, initiatives, audits, inspections and investigations relating to work safety, with particular emphasis on rules and regulations concerning emergency preparedness.

Key tasks:

- Keep records of all procedures and safety drills.
- Oversee safety and induction training on board.
- Produce accident reports.
- Undertake inspections.

Entry requirements/training:

Oil rig safety officers will need to complete rig safety programmes and earn certifications to qualify as a safety officer. Additional training they may be required to complete include Basic Offshore Safety Instruction and Emergency Training (BOSIET), Helicopter Underwater Escape Training (HUET) and Occupational Health and Safety Administration (OSHA) certifications. They may also benefit from Certified Safety Manager (CSM) training.

Associated job opportunities:

The skills associated with this position can easily be transferred ashore to most engineering facilities.



Dynamic Positioning Operators

NQF 7-9

As technology has developed, more sophisticated equipment has been deployed into the offshore oil and gas industry that includes dynamic positioning (DP) equipment on board vessels and drill ships. This equipment effectively allows the vessel to maintain a very accurate position over the seabed against currents and waves for sensitive drilling, anchoring and survey-related work through the use of a computer-controlled system that engages the vessel's propellers and thrusters.

DP Operators are certified to operate vessels that use this technology and need to work well in a pressurised environment where accuracy is essential. Due to the highly responsible nature of the role of the DPO, it is not work for the faint-hearted, and candidates will also have to be self-motivating and good communicators.

Key tasks:

- Responsible for the ship's station keeping.
- Undertake officer of the watch duties.
- Keep the vessel in a stable position directly over a fixed point on the seabed (absolute dynamic positioning).
- Keep the vessel at the same position relative to another moving object such as another ship or submarine (relative dynamic positioning).

Entry requirements/training:

The DP Operator requires a background as a certified watchkeeper within the marine transport industry (see separate chapter on opportunities as a seafarer). They will additionally have to undergo specific practical training as well as acquire specified sea-time operating a DP vessel. Training and certification is internationally accredited by the Nautical Institute and individuals should ensure that they use an approved training provider. (See more information under Training and Education below)

Career advancement:

There is no specific career advancement prospect as a DP operator, but with accumulated experience, you will have additional opportunities on more sophisticated DP systems.

Associated job opportunities:

As a DP Operator you will have a background as a watchkeeper and will have the associated career opportunities. The skills required for operating a Dynamic Positioning system are very specific to DP vessels.

Radio Operators

NQF 4-7

A Radio Officer manages and monitors all aspects of communication on the rig as well as between the rig and onshore bases, ships, helicopters and other relevant platforms. They play a vital role on board a rig in ensuring that the rig remains in contact with the rest of the world and receives timeous information in the event of an emergency.

Key tasks:

- Sending and receiving messages.
- Recording of incoming messages and maintaining a log of communications. Broadcast weather reports and warnings.
- Conduct periodic inspection and routine tests of communication equipment. Repair equipment as necessary.
- Review regulations regarding communications and report violations if they occur. Send and receive as well as interpret any coded messages.
- Determine and obtain bearings of sources of signals using direction finding procedures and equipment.
- Monitor emergency frequencies in order to detect distress calls and respond

Entry requirements/training:

A Radio Operator will require a degree in electrical technology or related field and acquire experience on a deepsea vessel.





Commercial Divers

NQF 1-4

Commercial and offshore diving is a physically and psychologically demanding career that can be dangerous if adequate training and safety measures are not adhered to. Divers need to remain calm under pressure and operate in a number of challenging environments where visibility and communication may be difficult. It does, however, offer many career pathways with an opportunity to work internationally.

Commercial divers working within the oil and gas sector are typically qualified as saturation divers. Unlike commercial divers who work at shallower depths, the saturation diver descends to depths ranging from 100m to 500m to work on the seabed. In order to accomplish this safely, the diver will first spend time in a pressurised chamber on board the ship in order to gradually become accustomed to the pressure that they will face underwater. Divers are then transferred directly into a diving bell which is lowered to allow access to the required working depth. The divers remain in a pressurised enclosed environment for the duration of their work time which can be as long as three weeks.

A diving team on board a Dive Support Vessel (DSV) can typically consist of the following members:

- Diving superintendent
- Bell diving supervisor
- Air diving supervisor
- Bell (saturation) diver
- Air (surface) diver
- Life support supervisor
- Life support technician
- Tender
- Senior dive technician
- Dive technician
- Diver medic

Key tasks:

- Communicate with workers on the rig while underwater.
- Inspect underwater structures.
- Document (video or photograph) subsea structures.
- Cut and weld using underwater welding equipment.
- Undertake other maintenance work as required.
- Assist with decommissioning of wells.

Entry requirements/training:

The basic requirement for becoming a commercial diver includes the need for a high school diploma. Commercial divers need to be at least 18 years old. Offshore divers must undergo rigorous training as well as medical testing that far exceeds the training associated with leisure SCUBA diving activities. Training needs to be undertaken at internationally accredited service providers that can issue internationally recognised certificates. Divers will also need to undergo regular medical testing to ensure that they are fit enough to work at the required depths. (See more information under Training and Education below)

Career advancement:

There is no specific career advancement prospect for commercial divers, but commercial divers, but those with experience in a number of environments and at specific depths that are able to perform inspections, surveys and welding will find specialised opportunities internationally.

Associated job opportunities:

Commercial divers with the skills to undertake skilled work underwater are sought after in a number of other maritime sectors including ship repair (underwater repairs and inspections), salvage (underwater surveys) and marine civils (underwater inspections).



Mudlogger

NQF 4-7

Mudloggers play a vital role in the acquisition and discovery of oil and gas. Without the input from the Mudlogger, the drilling operations would be significantly less efficient. Similarly to the Wellsite Geologist (see the next profile), a Mudlogger needs to gather, process and monitor information relating to drilling operations. Indeed, they assist the Wellsite Geologists and write detailed reports based on the data that is collected.

Key tasks:

- Collect and data using specialist data techniques.
- Collect and prepare mud as well as oil samples.
- Perform some maintenance work on rig.
- Perform calibration checks on laboratory equipment.
- Supervise field technicians
- Write reports.

Entry requirements/training:

A Mudlogger should obtain an undergraduate degree in geology. Candidates with degrees in physics, geochemistry, environmental geoscience, maths or engineering may also be accepted. On entering the position, most companies will provide some on-the-job training and courses that cover the various aspects of drilling. One requires significant technical acumen as much of the training will focus on specialist computer software.

Career advancement:

There is certainly scope for advancement in this career. Mudloggers can move on to become senior data engineers and could also advance to a position of Wellsite Geologist with additional tertiary education. (For more information on being a Wellsite Geologist, see the next profile).



Offshore (Wellsite) Geologist

NQF 8-9

A knowledgeable Wellsite Geologist is integral to the success of an offshore drilling campaign. The Geologist will need to study and classify rock samples from oil and gas wells in order to work out how best to proceed with any planned drilling. Tests and samples are used to create a better understanding of whether there is likely to be oil and gas under the seabed. The Wellsite Geologist will liaise with the drilling engineers, petroleum engineers and the drillers during the course of the project. In many cases, Wellsite Geologists are self-employed or work for a contracting company that offers these services.

Key tasks:

- Evaluate data before drilling starts
- Analyse additional data acquired during drilling.
- Advise on drilling hazards.
- Make decisions on suspending or continuing drilling.
- Attend meetings.
- Keep detailed records, write reports and complete well-logs.
- Communicate with onshore operations team.

Entry requirements/training:

To become a Wellsite geologist, you will require a degree or even a Master's degree in geology. Even with such a qualification, however, you will probably be required to work as a mudlogger for some time before being promoted.

Career advancement:

Having worked offshore as a Wellsite Geologist, it is possible to seek work onshore within oil and gas companies that seek senior geologists in their operational departments. There is significant scope for work as an entrepreneur or consultant for those who develop the networks and show an affinity for the analytical aspect of the work.



Other Employment Opportunities

The offshore platform needs to operate like a small town out at sea. As such there are a number of other opportunities for employment that include catering staff, medical staff, electricians, mechanics, safety officers and more that may transfer from other related engineering or mining activities onshore. Individuals considering taking their skills offshore will be attracted by the remuneration packages, but need to understand the specific rigours associated with life on board an oil rig many miles from the shore for protracted periods.

Marine crew (seafarers) with a background in the merchant navy will also find opportunities on board a platform, drillship or Floating, Production, Offloading and Storage (FPSO) platform. In addition to working offshore, the industry also offers opportunities for shore-based careers in the technical and engineering fields; the legal and legislative environment; health and safety as well as environmental monitoring fields.

There are also opportunities to work within the support industry on offshore/platform supply vessels, anchor handlers, patrol vessels or even within the aviation sector as a helicopter pilot.

Please note the chapter on marine transport and opportunities for a seafaring career for more details on these opportunities.





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TRAINING & EDUCATION

As a truly international industry, global safety and training standards are required to ensure that the multinational crews work seamlessly while on board. As such a good command of English is vital to integrate into the multicultural environment found on board.

Irrespective of the position you hold on board an offshore rig or drillship, you will need to have valid certificates in a variety of offshore survival and safety courses from an accredited OPITO training provider. OPITO is the global, not-for-profit, skills body for the energy industry that audits and accredits offshore training providers around the world to ensure that they meet an international standard. The two basic mandatory courses are:

BOSIET: Basic Offshore Induction and Emergency Training is the basic training for those wishing to work globally in the offshore oil and gas industry. It introduces workers to the specific safety issues and policies on offshore platforms and equips them with the basic emergency response knowledge.

HUET: Helicopter Underwater Evacuation Training is mandated for personnel that are transported to and from offshore platforms via helicopter. Safety aspects of helicopter transport are discussed as well as the possible dangers. A practical element includes exercises in a pool inside a “simulator” that aims to prepare trainees for evacuating from a helicopter submerged in water.

There are only a few training providers in South Africa (most notably in Cape Town and Durban) that offer accredited OPITO courses. It is advisable to confirm their accreditation before undertaking their training. International operators will not accept certificates from non-accredited training providers.

TRAINING & EDUCATION

OPITO-Accredited Training Providers in South Africa

Grindrod Shipping Training Academy: 3 courses in Durban

- BOSIET with EBS: Basic Offshore Induction and Emergency Training with Emergency Breathing System
- FOET: Further Offshore Emergency Training
- HUET: Helicopter Underwater Evacuation Training

Offshore Africa Training Centre: 8 courses in Cape Town

- BS1: Banksman and Slinger Training Stage 1
- BS3: Banksman and Slinger Training Stage 3
- BS4: Banksman and Slinger Training Stage 4
- IMIST: International Minimum Industry Safety Training
- MIST: Minimum Industry Safety Training
- R3: Rigger Competence Stage 3

Survival Offshore Training: 6 courses in Saldanha Bay

- H2S: Basic H2S Training
- BOSIET with EBS: Basic Offshore Induction and Emergency Training with Emergency Breathing System
- BOSIET (with EBS) DD: Basic Offshore Induction and Emergency Training with Emergency Breathing System, Digital Delivery
- CA-EBS: Compressed Air Emergency Breathing System (Initial Deployment Training)
- FOET: Further Offshore Emergency Training
- HUET: Helicopter Underwater Evacuation Training

Diving Qualifications & Training

There are a number of training providers in South Africa offering commercial diving courses. Before signing up with one, you do need to make sure that they are accredited with the Department of Labour. If you intend working in the international maritime sectors, then your training also needs to be undertaken by a service provider that is accredited by the International Maritime Contractors Association (IMCA).

DIVER CLASS	COURSE DURATION	QUALIFICATION
Diver Class 4	4 weeks	30 m SCUBA Commercial Diver
Diver Class 3	4 weeks	30 m SSDE Commercial Diver
Diver Class 2	4 weeks	50 m Air Diver
Saturation (Bell) Diver	4 weeks	100 m + Bell Diver

To achieve one's qualification as an Air Diver Class 2 (the very minimum a diver needs to be able to eligible for employment commercially on the whole, but especially internationally), requires 12 weeks of formal training at a dive school. Each training provider has their own specific minimum entry requirements, but life sciences, physical science and mathematics are recommended subjects for school goers.

Saturation diving requires additional training and can only be undertaken having first qualified as a Class 2 Diver and gained experience. It is important to undertake this type of training at an IMCA (International Maritime Contractors Association) approved facility. IMCA has established an International Code of Practice for Offshore Diving that helps to promote safety in the sector. Entry into saturation diver courses will require some minimum experience including:

- Holding a II 50m or equivalent IMCA recognised offshore air qualification for at least 1 year.
- Having dived commercially within the last four months / 120 days.
- Having completed 100 dives totalling at least 100 hours, none shallower than 6 msw and all in open water in Surface Supplied equipment.
- Having completed 20 dives over 15 metres.
- Have a valid Diver Medical before starting. This can be done at the dive school on first day of course.
- English Language: Be able to understand, write and be able to communicate verbally, and communicate easily with others in English.

TRAINING & EDUCATION

DP Operator Qualifications & Training

DP operator training and certification is internationally administered by the Nautical Institute – a recognised international professional body. Certification of DP operators is through a specified and regulated training programme. This programme is intended to apply to bridge watchkeepers already qualified by means of a certificate of competency as a deck officer (see the chapter on seafarers).

TRAINING FOR DP OFFICERS

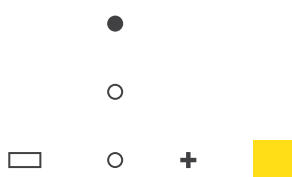
PHASE 1	A DP basic/induction course providing an introduction to the functions and use of a dynamic positioning system, at an approved training centre or organised on board; or as a trainee DPO with on board training under the supervision of a senior DP operator.
PHASE 2	Documented practical experience in the use of DP systems on DP vessels for a minimum period of 30 days as a trainee DPO after the completion of the basic/ induction course.
PHASE 3	Attendance at DP simulator courses at an approved training centre, or on board the vessel, where the course will provide training in the use of DP systems, including simulator exercises and emergency operations.
PHASE 4	All of the four phases above are witnessed and recorded by entries in a Nautical Institute DP logbook which is held by the trainee. Personal logbooks for recording of DP work carried out are issued by the Nautical Institute and IMCA.

Following completion of the above, documented confirmation (from the Master or OIM) of a minimum of six months supervised DP watchkeeping will result in the issue of a DP certificate from an approved body.

There are currently no Nautical Institute-accredited training providers in South Africa.

Geology-Related Qualifications

QUALIFICATION	INSTITUTION	TYPE	NQF LEVEL	CREDITS
Bachelor of Earth Sciences Honours in Mining and Environmental Geology	University of Venda	Honours Degree	08	120
Bachelor of Earth Sciences in Mining and Environmental Geology	University of Venda	Honours Degree	08	480
Bachelor of Science Honours in Applied Geology	University of the Western Cape	Honours Degree	08	120
Bachelor of Science Honours in Engineering and Environmental Geology	University of Pretoria	Honours Degree	08	120
Bachelor of Science Honours in Geology	Nelson Mandela University	Honours Degree	08	120
Bachelor of Science Honours in Geology	University of Johannesburg	Honours Degree	08	144
Bachelor of Science Honours in Geology	University of Limpopo	Honours Degree	08	120
Bachelor of Science Honours in Geology	University of KwaZulu-Natal	Honours Degree	08	120
Bachelor of Science Honours in Geology	University of Pretoria	Honours Degree	08	120
Bachelor of Science Honours in Geology	University of Fort Hare	Honours Degree	08	120
Bachelor of Science Honours in Mining Geology	University of Limpopo	Honours Degree	08	120
Bachelor of Science Honours in Petroleum Geology	University of the Western Cape	Honours Degree	08	120
Bachelor of Science Honours: Applied Geology: Exploration Geochemistry	University of the Western Cape	Honours Degree	08	120
Bachelor of Science Honours: Applied Geology: Hydrogeology	University of the Western Cape	Honours Degree	08	120
Bachelor of Science Honours: Geology	University of the Western Cape	Honours Degree	08	120
Bachelor of Science in Applied Geology	University of the Western Cape	First Degree	07	360
Bachelor of Science in Environmental and Engineering Geology	University of Pretoria	First Degree	07	360
Bachelor of Science in Geology	University of Limpopo	First Degree	07	368



GOVERNANCE & PROTECTION

INTRODUCTION

Marine Governance and Protection covers a wide range of different careers. In order to protect our oceans, we need a range of different scientists to help us understand every aspect of our oceans. This includes oceanographers, meteorologists, marine biologists, marine spatial planners, marine scientists, ichthyologists and more. The South African government and research institutes proactively work to understand our oceans, our fish supplies and how to protect the marine resources we have.

In order to ensure the protection of our oceans we need marine lawyers and other legal professionals to enforce legislation such as the Marine Living Resources Act. Maritime lawyers would enforce the Merchant Shipping Act.

South African National Parks and Nature Conservation entities need Parks Rangers and Environmental Officers to safeguard our Marine Protected Areas. We also need to educate people about our oceans and from 2020, the Department of Education Marine Sciences has been introduced in the school curriculum at three pilot schools in the Western Cape.

Good governance of our oceans is a global effort and there are international regulations and legislation that South Africa must comply with such as MARPOL, a convention developed by the International Maritime Organisation to eliminate pollution of our seas and oceans by ships. Surveyors and marine certification officers ensure that our ships are safe and seaworthy.

We also need our Navy to protect our waters. The Navy offers a number of career opportunities in their efforts to protect and patrol territorial waters in the region.

When ships and boats get into trouble at sea coastal States such as South Africa needs to have a system and infrastructure in place to respond. The Maritime Rescue Co-ordination Centre (MRCC) is the central body for handling maritime rescues in South Africa. They will deploy resources such as our standby tug (the SA Amandla), the Airforce, the National Sea Rescue Institute (NSRI) or direct other ships to assist when people are in distress at sea.

If a ship runs aground along the coast, there is a range of specialist skills needed to evacuate the crew off the ship as well as to ensure that the stranded ship does not damage the coastline with fuel and oil spillages.

EXAMPLES OF POSITIONS IN MARINE PROTECTION & GOVERNANCE

SAFETY & SECURITY	LEGAL	SCIENCE	MARINE CONSERVATION
SAPS Water Wing	Marine Lawyer	Oceanographer	Environmental Consultant
Navy Combat Officer	Maritime Lawyer	Meteorologist	Conservationist
Navy Weapons Operator	Shipping Lawyer	Marine Biologist	Park Ranger
Engine Room Attendants	SAMSA Surveyor	Marine Scientist	Environmental Officer
Submarine Services	P&I Club Insurers	Marine Spatial Planner	Fishery Control Officer
Navy Divers	Marine Insurers	Ichthyologist	Fishery Observer
Student Engineers	Vessel Class Inspectors	Researcher	Salvage Operator
Student Technical Officers	Special Casualty Representative	Marine Educator	Environmental Impact Assessor

+ O





Marine Surveyor

NQF 5+

Marine Surveyors assess, monitor and report on vessel condition; inspect damage and inspect equipment to ensure compliance to standards. This is a prestigious position where you are required to be highly qualified with a sound technical background, as vessels are approved based on your judgement, competence and integrity. Interestingly surveyors are not required to be licensed or qualified, but membership of the International Institute of Marine Surveyors, a professional body is well regarded.

There are different types of surveyors and you will probably need to identify early on in your career which type of surveying you would like to do:

- Government Surveyor who enforces ship safety standards
- Cargo Surveyor appointed by a cargo owner, generally for bulk goods
- Classification Surveyor who does inspections during the construction of a vessel to ensure compliance to classification society rules
- Independent Surveyor who does a wide range of tasks eg cargo, on board conditions, fuel quality, accidents at sea and more
- Yacht and Small Craft Surveyor who inspects boats used for pleasure and under 24 metres in length

There are different reasons for surveys, such as pre-purchase evaluation, insurance eligibility, insurance claim requirements and regulatory compliance.

You need to have a working knowledge of ships electrical and mechanical systems and a fundamental understanding of boat design and construction. Importantly you need to be good at observation, methodical and accurate in your work. Surveyors are either employed by government or hired on a fee basis by customers or marine insurers.

Key tasks:

- Conduct surveys to ensure standards are maintained
 - Perform inspections
 - Witness tests and the operation of safety equipment
 - Measure ship tonnage and survey load lines
 - Attend court as an expert witness
 - Investigate marine accidents
 - Determine fair market value of a vessel
 - Assess damage repair costs and replacement costs
-

Entry requirements/training:

A number of marine surveyors in South Africa have entered the profession after a successful career at sea as a Ships Master, Chief Engineer, or other senior ranking positions, but this is not the only way to gain the necessary knowledge and expertise. There are, however, many paths to becoming a Marine Surveyor. You could use your prior experience as senior seagoing personnel or you could work under an experienced surveyor and take correspondence courses. The International Institute of Marine Surveyors offers a professional Diploma course by distance learning. The Llyods Maritime Academy also offers a Diploma course and an MSc in Marine Surveying by correspondence.

Career advancement:

With marine surveying being such a broad field, you have an opportunity to branch out into different types of surveys as your expertise increases. You will build your own reputation and take on more and more complex jobs as you gain more experience. There is an opportunity to become self-employed and act as a surveyor for insurance companies or Flag States.

Associated job opportunities:

As a surveyor you could look at entering Naval Architecture or Yacht Design if you take more courses. If you are a Cargo surveyor you could look at moving into the port logistics and the freight industry.





Oceanographer

NQF 6-10

Oceanography is the study of all aspects of the ocean. Oceanography covers a wide range of topics, from marine life and ecosystems, to currents and waves, to the movement of sediments and seafloor geology. This means that oceanography is interdisciplinary as the ocean's processes cannot be studied separately.

Oceanographers in South Africa, for example, have studied the turbulent flow of water around the southern tip of Africa. This movement, known as the Agulhas Current, is part of a larger "ocean conveyor belt" that circulates water around the globe based on density, wind, and currents. Physical oceanographers have found that the amount of water flowing from the Indian Ocean to the Atlantic Ocean has increased, a process nicknamed the Agulhas leakage. The increased Agulhas leakage has been linked to global warming. Physical oceanographers predict that global warming will slow the ocean conveyor belt and radically change climate and weather patterns. As ice caps melt, sea levels rise, and the ocean becomes less salty and dense. As ocean waters warm, they also expand, which enhances sea level rise.

An oceanographer must be prepared to spend time away from home, often at sea. This means irregular hours of work and often being at sea in physically demanding conditions if sea conditions deteriorate. Being able

to conduct research and write reports while being at sea requires patience and determination. You will work with computer modelling, digital mapping and remote sensing. It is important that you are a team player, as you will be working with a group on people often in confined spaces on a vessel.

Key tasks:

Physical oceanographers study the relationship between the ocean's physical properties, the atmosphere, and the seafloor and coast. They investigate ocean temperature, density, waves, tides, and currents. They also focus on how the ocean interacts with earth's atmosphere to produce our weather and climate systems.

Entry requirements/training:

You will need to meet the University entrance requirements for an undergraduate Bachelor of Science degree.

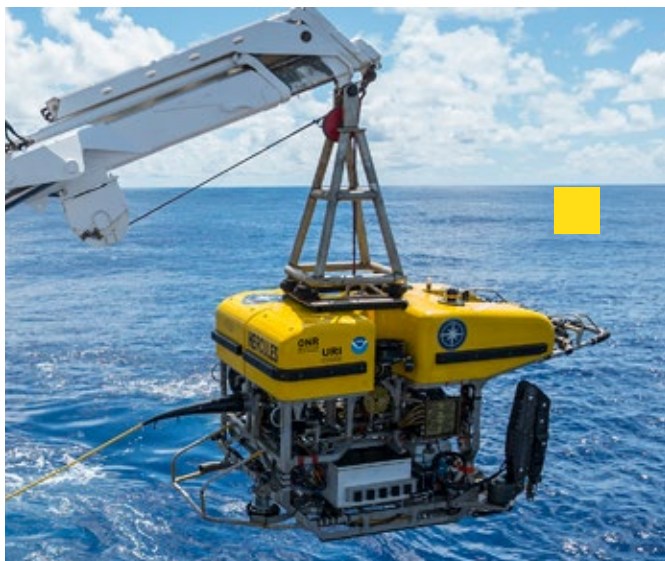
Career advancement:

Once you have completed your undergraduate degree you can continue with post graduate studies and specialise in different areas of oceanographic research. In 2016, UCT established SEAmester, a 'class afloat' where post graduate students voyage on the SA Agulhas II conducting research and interacting with young South African scientists, lecturers and field specialists in a hands-on practical environment. The ship travels off the coast of Port of St Johns and students choose a programme based on two streams: Oceans in a Changing Climate or Tools of the Trade.

UCT also has a Research Diving Unit equipped with a decompression chamber and compressor and scientific diving opportunities are available to both UCT and non-students.

Associated job opportunities:

Job opportunities exist with government, environmental agencies, the navy and with research councils. The opportunities will depend on your area of specialisation.





Marine Biologist

NQF 7-10

Marine biology is the study of life in the oceans and other saltwater environments such as estuaries and wetlands. It includes the study of marine organisms, their distribution, interactions and response to their physical and chemical environment. The fields of geology, chemistry and physics are important to marine biologists because they help to characterise organisms' behaviours and geographic distributions.

Marine Biologists can specialise in many different fields, ranging from taxonomy (describing new species) to molecular biology, or from coastal ecologists to biological oceanographers. Researchers specialise either on the taxonomy and ecology of species, or on communities or types of ecosystems.

This is not an “office” job. You will need to be out in the environment that you are studying; whether that is a beach, and estuary or the open ocean, collecting data. You will also spend time in laboratories conducting tests. You will also need to spend time writing up your findings and presenting your studies. This means that you need to be an “all-rounder” who enjoys a varied workday and someone who is prepared to put up with bad weather or rough seas when collecting the data you need.

Key tasks:

As a marine biologist you will be involved in the study of marine life including plants and algae, invertebrates as well as fish, birds and mammals. You will study marine habitats, from the deep-sea trenches to the open ocean, to reef, estuaries and intertidal zones. The growth of GPS and tracking technology has helped marine biologists enormously, as collecting scientific data is an important part of their work.



Entry requirements/training:

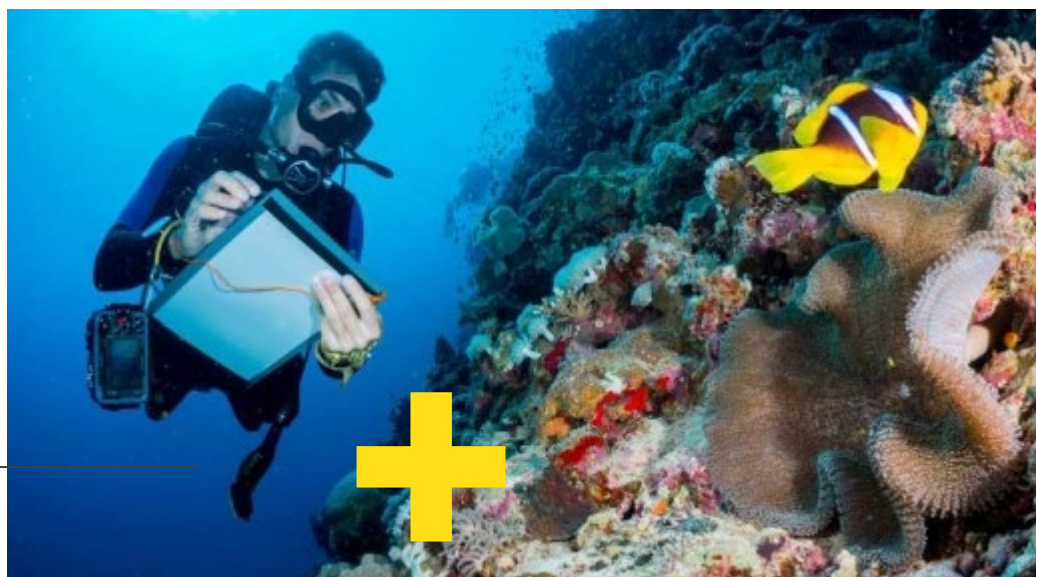
The Academic Performance Score (APS) will determine whether you can be accepted into the programme. A minimum of 28 points (excluding those for Life Orientation, which is not counted) for NSC-Deg and Matric Exemption, or 34 points for a Senior Certificate need to be reached for being considered for entry into the BSc (Marine Biology) programme. However, acceptance is also dependent on availability of places at the university.

Career advancement:

Should you wish to pursue your academic career, you would need to undertake an Honour and Masters and eventually a PhD in your specialist area of interest.

Associated job opportunities:

As a qualified Marine Biologist, you could find a job as a Environmental Consultant, Conservationist, Resource Manager, Researcher, Laboratory/Field Technician, Academic or Policy Maker. A number of different government, research and private companies require marine biologists. These include government departments, consultancies, research foundations, universities, aquariums and Non Governmental Organisations.





Marine Scientist

NQF 7-10

Marine science is broader than marine biology and includes the study of the physical and chemical aspects of the oceans, such as currents, climate, wave action, tidal effects etc. It covers marine biology, marine ecology, marine chemistry, marine geology etc.

As with a Marine Biologist, this is not an office job. You will need to enjoy the outdoors and going to sea, but you will also need to enjoy using electronic equipment and computers to process the data you collect. You need to be passionate about the environment and interacting with people to inform them about the importance of protecting our marine resources.

Key tasks:

Marine Scientists may work in the field, in an office or on a sea going vessel/floating laboratory. They may undertake experiments and research, collecting samples at sea and keeping up to date with scientific developments. Similar to marine biologists they will need to record, analyse and interpret data, use tracking technology and be able to write everything up into reports and research papers.

Entry requirements/training:

To get into a Marine Science Diploma course you will need a minimum APS Score: ECP 28 and Mainstream 30.

- English 4, Mathematics 4, Physical Science 4
- At least 50% (4) in any 3 other subjects except Life Orientation.
- At least 45% (3.5) for Physical Science or Mathematics provided they score at least 50% (4) in one of these.



Career advancement:

There are lots of different opportunities open to you as a Marine Scientist because it is a broad field of study. You will need to decide what areas of marine science you are interested in and pursue further studies in that area by taking short courses or going on to complete a university degree course. Marine Scientists work for laboratories, government agencies, research organisations, engineering companies, fisheries, marine conservation groups and coastal management organisations.

Associated job opportunities:

With a Marine Science qualification, you could pursue technical careers in climate change, marine aquaculture, oceanography, marine and coastal management, fisheries management, marine ecotourism, environmental education, marine pollution control or marine conservation.



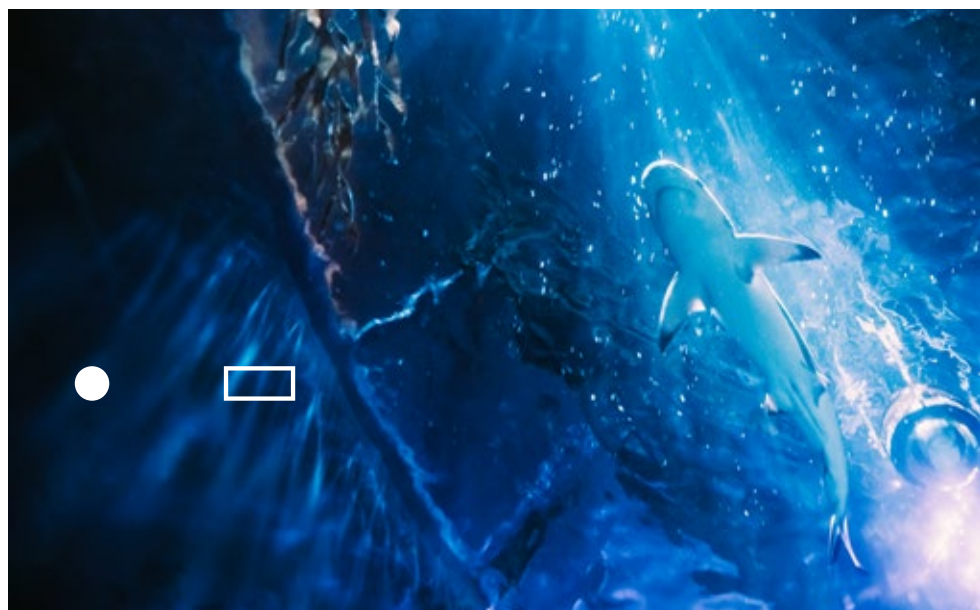
Ichthyologist

NQF 7-10

In deciding to pursue a career as an Ichthyologist you must ensure that you have a passion for a multi-dynamic work-related course that offers a variety of career options and opportunities. But what is an ichthyologist? This career path requires a person to devote to studying and managing the fishery resources, which may involve shellfish or aquatic mammals as well as fishes. This is an important aspect of protecting the marine resources and ensuring that they are not overexploited by fishing companies. As an ichthyologist you have the opportunity to work anywhere in the world where marine species exist. This profession is also closely related to marine biology so if you had considered marine biology you can proceed and specialise in ichthyology from undergraduate degree through to post-graduate studies.

Key tasks:

- Working out in the field: Collect samples, measure animals, observe behaviour, monitor water quality in tanks and record data.
- Working in the laboratory or office: Designing and conducting research, analyse findings and inventory specimens.
- Research focused work: During their research, ichthyologists may discover new species of fish and may even have the privilege of naming the new species.
- Whichever path one takes it is important to consider the advocacy of your work through writing and publishing scientific papers, attending seminars or industry events and promoting conservation efforts and presenting findings to other industry professionals.



Entry requirements/training:

The basic entry requirements for a bachelor's degree in marine biology or zoology at any accredited institution is the recommended approach. Ichthyology as a focus can be chosen after at least two years of completing either zoology or marine biology. Rhodes University's Ichthyology Department has a good reputation.

Career advancement:

A bachelor's degree is required for most entry-level ichthyology jobs, such as laboratory assistant. A master's degree in zoology or ichthyology will allow students to pursue practical and independent research on a specific topic, thus allowing them to gain skills in a variety of areas applicable to ichthyology careers. Having a Ph.D. in a field related to ichthyology typically qualifies someone for the same positions as a master's degree, as well as teaching and primary research positions in ichthyology. It may also qualify them for a higher level of pay than candidates with a master's degree.

Associated job opportunities:

Once you have successfully qualified, you can work in a number of fields including research and lecturing. Opportunities also exist within museums for curator positions as well as within aquariums. Ichthyologists are also employed by conservations agencies, within government fisheries management departments as well as on fish farms for aquaculture.





Marine Salvage Operator

NQF 4+

There are many different types of jobs in marine salvage, but there is no one structured education path to begin a career. A salvage team can comprise of many different skills sets depending on the size of the job. On a salvage vessel these could include: officers, mates, engineers, divers, welders, technicians and ROV operators. There will also be a whole team working on land in project management, finance, IT, human resources and more.

The primary job of marine salvage is to recover a ship and/or its cargo after an incident at sea. It is specialist work with dedicated crew and specialised equipment such as flotation air bags, diving equipment, underwater cutting equipment, pumps, air compressors, hydraulics and winches. Every job is different, and you will work internationally. There are different types of salvage work as a marine incident can occur far from shore where conditions are difficult or even within a harbour where the sea is calm. Cargo salvage needs to happen quickly. Wreck removal has no salvage value, but might be necessary for the safe navigation of other vessels or due to environmental concerns. Afloat salvage involves hull welding, stabilisation and fixing the structural integrity of the ship.

To work in this industry, you must be team player. It is high-risk work and no two days are ever the same. You must be technically minded, level headed, and be prepared to work long and hard hours often under dangerous conditions. Diving is one of the most useful skills in salvage and you would need to be a commercial diver, preferably with underwater welding specialisation. Because salvage divers often work at extreme depth you may also need to know about gas blending and rebreathers. (For more information about commercial diving opportunities, refer to the section on the oil and gas sector.)

Key tasks:

- Tow vessels Refloat vessels
- Undertake emergency repairs of vessels
- Pump water and keep vessels afloat
- Extinguish fires
- Evacuate crew or passengers
- Recover cargo
- Remove pollutants
- Maintain and operate specialised salvage equipment

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Entry requirements/training:

All salvage work is subject to the same licencing and certification requirements as sea going maritime workers as defined by the International Maritime Organisation. Refer to the section on seafarers for more information on this. Depending on what area of salvage you would like to go into, you will need train in that particular aspect. A number of people in the industry started their careers in the navy or merchant shipping.

Career advancement:

Due to the wide range of skills needed for salvage work, you can work your way up in the industry taking on more complex work. There is a distance learning Diploma in Marine Salvage Operation offered by the Maritime Training Academy.

Associated job opportunities:

As a specialist seafarer you will have the opportunity to enter other sea going positions either in commercial shipping or recreational boating. As a commercial diver you could enter the diamond diving industry, the oil and gas sector or undertake commercial diving work in our ports.



Hydrographic Surveyor

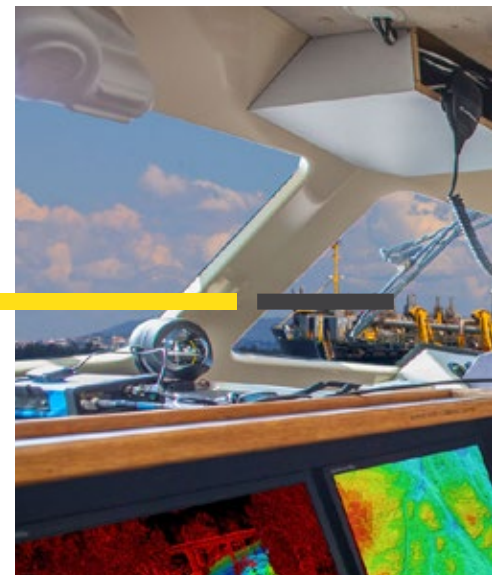
NQF 4-10

Exciting opportunities as a hydrographic surveyor enable you to use specialised equipment on survey vessels, to determine the geography of a body of water, including the depth, tide measurements, shoreline obstacles, and physical features of the water body's floor. The exciting part of this career path is that you spend time working out in the field, so if you like outdoors this is a good career choice. As a hydrographic Surveyor you should be prepared to work in adverse weather conditions and spend extensive time out on boats managing heavy measuring equipment. An extra tip would be to ensure exposure to GIS systems. The information collected by the Hydrographic Surveyor can be particularly helpful to a salvage team when tasked with lifting or retrieving vessels or structures from the seafloor.

To pursue this career you must be prepared to collect data on survey vessels and transform them into hydrographic models, which can be used for a wide variety of purposes. Most Hydrographic Surveyors use techniques like multibeam sonar and light detection to perform their jobs more accurately than ever.

Key tasks:

- Measuring and mapping the world's underwater surfaces and studying the morphology (construction) of the seabed.
- The production of charts and related information for navigation;
- Dredging;
- Locating offshore resources (oil, gas, aggregates);
- Planning dock installations.



Entry requirements/training:

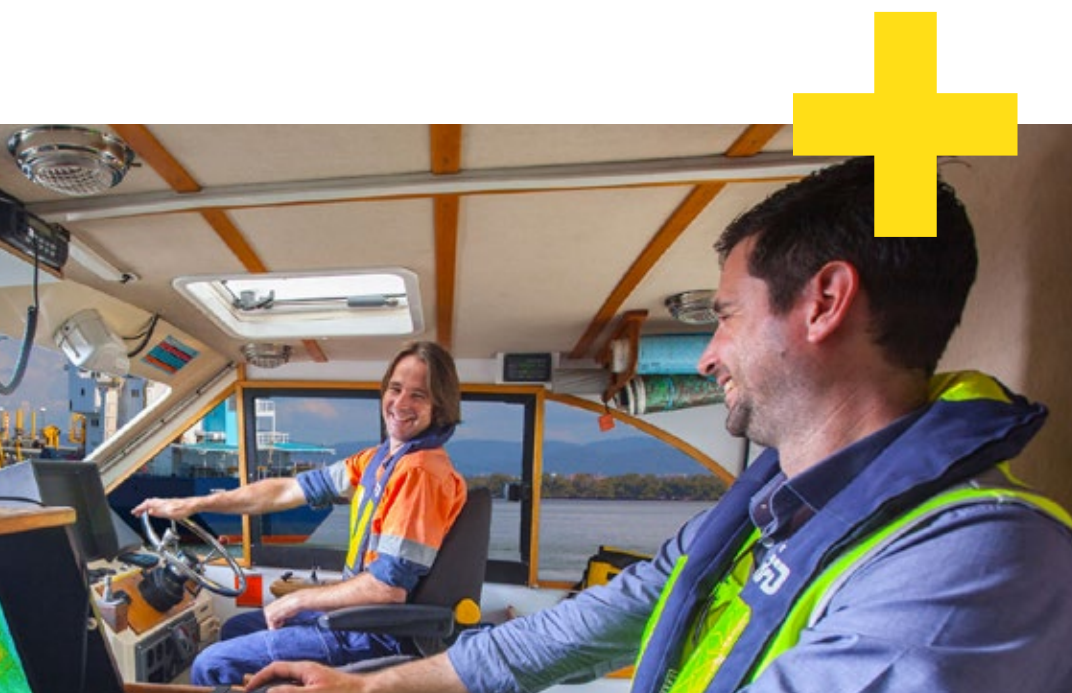
To pursue this career choice, you must enrol at a TVET to obtain a National Certificate Hydrographic Surveying at NQF Level 4. As a candidate you must display proficiency in Mathematics, Communication and English, or have several years relevant hydrographic survey experience. You can also take a graduate degree with geography, hydrogeology, geophysics and any other subject that might be related to these three.

Career advancement:

To evolve as a hydrographic surveyor note that an under graduate degree is the minimum qualification that is accepted. You need to advance and find better career opportunities as a senior surveyor by pursuing either a Masters or a Doctorate in the subject.

Associated job opportunities:

Job opportunities exist in a number of maritime-related sectors including governmental hydrographic departments responsible for producing nautical charts; harbour authorities and contract survey companies that work for private clients in the oil and gas or marine civil sectors.



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Meteorologist

NQF 6-9

Meteorologists are responsible for ensuring that weather bureaus keep pace with scientific and technological developments; that high standards are maintained, and that staff receive the necessary training. Meteorologists must therefore be well-trained academically and conversant with meteorological practice. Research is also an important task of meteorologists.

The Central Forecasting Office in Pretoria continuously receives meteorological data from various weather stations throughout the southern hemisphere. Apart from conventional meteorological data, a large and growing volume of data that includes cloud imagery, upper air temperatures, wind direction and speed which are determined by weather satellites, is regularly received and processed. This includes ocean weather systems.

Marine meteorology is a subfield of meteorology which deals with the weather and climate as well as the associated oceanographic conditions in marine, island, and coastal environments. The physical and dynamical foundations of marine meteorology are no different from other areas of meteorology, but the fundamental processes, which distinguish marine meteorology from other subfields of meteorology are the interactions between the ocean and the atmosphere.

Key tasks:

As a marine meteorologist you will focus on the understanding of and production of weather information in support of marine and coastal activities, including shipping, fishing, tourism, offshore drilling and mining operations, oil spill control, offshore wind and tidal energy harvesting, search and rescue at sea, and naval operations.



Entry requirements/training:

Meteorology is a degree programme and therefore you will need to meet the university requirements for the programme. Meteorology requires a strong scientific and mathematical mind. You must have a strong scientific aptitude and be interested in the oceans, the marine environment and weather. Good personal judgment and a strong sense of responsibility are needed to “stay the course” in what is a challenging and highly specialised career path. Before embarking on this long professional career, it is a good idea to get vacation or part time work at a weather bureau or airport to decide if this is the career for you or meet a professional meteorologist and talk to them about their career path.

Career advancement:

As a marine meteorologist you could find work with a weather bureau, the SA Navy, the CSIR or a university. Offshore drilling operations may also need a marine meteorologist and the Marine Rescue Co-ordination Centre (MRCC) will need someone to assist with weather mapping in the event of a disaster at sea.

Associated job opportunities:

If you decide you don't want to specialise in marine related weather, you could also find work at forecast offices at airports and air force stations. Meteorologists also assist vessel operators chart optimum courses for their vessels to avoid excessive sea conditions and adverse weather without delaying the vessel unnecessarily.



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Naval Combat Officer & Other Naval Careers

NQF 4-7

The South African Navy has various types of vessels such as Submarines, Frigates, a Combat Support Ship, a Hydrographic Survey Vessel, Minehunters, Offshore Patrol Vessels and Inshore Patrol Vessels. These are operated and commanded by Combat Officers.

Combat Officers are responsible for executing the Navy's main function – Maritime Warfare. These officers also serve in shore posts, including training units and the Maritime Reaction Squadron.

All officer candidates undergo a selection process to determine whether they have leadership potential. If successful, they then undergo a further nine months of officer training. During this second phase of training, the candidate will again be evaluated and then selected to either further their studies at the Military Academy in Saldanha, to study Maritime Studies at the Cape Peninsula University of Technology or they will proceed directly to the Fleet in Simon's Town.

Some of the positive aspects of working in the SA Navy are job security and a virtually “free” education in your field of choice as well as the camaraderie with other navy personnel. On the downside you could be away at sea for long periods of time. Your family will need to understand your military commitments and there is a possibility of injury on the job. A calm temperament, mental stability and good physical fitness are very important. You should not suffer from sea sickness and if you become a combat officer you will need good interpersonal skills and leadership qualities.

Key tasks:

A Naval Combat Officer will be taught how to safely navigate a ship, take charge of the bridge, run a division and eventually qualify as a Principle Warfare Officer. It goes without saying that a Combat Officer needs to be a highly motivated, well-trained leader with the necessary expertise to effectively operate complex combat systems. A qualified Combat Officer is in charge of a specific section or division on board a ship – such as Operations, Navigation, Weapons.



Entry requirements/training:

- Be a South African Citizen.
- Be between the age of 18 and 22 (graduates up to the age of 26). Have completed the National Senior Certificate (Grade 12).
- Preferably be single.
- Not be area bound.
- Have no record of a criminal record.
- Comply with the medical fitness requirements for appointment in the South African National Defence Force (SANDF).

Career advancement:

Combat Officers are one of the most highly qualified people in the military environment. Although this career is personally demanding, it is very stimulating, unique and rewarding. The peak of a Combat Officer's career is taking command of a warship. Other Navy careers include: Weapons Operator, Protection Force, Engine room attendants, Submarine services, SA Navy Divers, Student Engineers and Student Technical officers.

Associated job opportunities:

As the Military Skills Development programme is structured to supply trained personnel into the SA Navy, you are guaranteed of a job with the Navy should you meet all the training and physical requirements. However, the training also prepares you for jobs in civilian life. The SA Navy relies heavily on the expertise of all serving naval officers and ratings. Discipline, dedication, hard work and a keen interest in the maritime environment will contribute to a successful career with infinite challenges and opportunities. The SA Navy has various specialisations and careers which are referred to as Musterings.



Maritime Law, Shipping Law + Marine & Environmental Law

NQF 9-10

In the maritime sector there are different areas of legal specialisation. Maritime Law covers a body of laws, conventions and treaties that govern maritime business and nautical matters. International laws govern the use of our oceans and seas and are known as the Law of the sea. Maritime law follows a separate code and it is complex and different to laws on land.

Shipping law deals with the movement of goods and passengers by sea. It is separated into 'wet' and 'dry' shipping. Wet shipping refers to incidents or issues which occur during the actual voyage; whereas dry shipping refers to all other matters such as contracts, charter agreements, construction and funding for ships, port and harbour infrastructure.

Marine and environmental law relates to protection of the marine environment. Environmental governance and understanding legal tools such as planning measures, administrative measures criminal measures and incentive-based measures to protect the marine environment are key. You will work with South African environmental regimes and laws such as the Marine Protected Areas, the Marine Living Resources Act.

As a legal practitioner you will need strong logical reasoning; a disciplined approach to work; meticulous attention to detail, and creative thought processes. Maritime lawyers will need an excellent academic record with strong verbal and written communication, people management and interpersonal skills.



Key tasks:

Maritime lawyers make the seas safe and they hold wrongdoers accountable. They help people get the compensation that they deserve when there is a breach of contract, unpaid wages or a personal injury on the seas. Maritime lawyers also help develop new maritime laws and policies for countries. Maritime law is complex. It involves a variety of civil laws including contract law, personal injury law, employment disputes and even lost treasure. For the attorneys who practice it, maritime law can provide a sound and challenging career.

The nature of disputes in the shipping sector will mostly involve issues of contractual significance; however, in some instances, there could be a requirement for you to acquire some industry-specific and technical knowledge, so having a broader understanding of the industry will help you.

Entry requirements/training:

A number of South African universities offer an undergraduate LLB qualification, which will be your entry point into marine and maritime law. After getting your basic law degree and doing your articles, you can specialise in a range of post graduate courses where you can study shipping, marine and environmental law.

Career advancement:

There are always opportunities to grow in maritime law. As new conventions are adopted by the International Maritime Organisation and South Africa promulgates new Acts, such as the Merchant Shipping Act and others, you will need to stay abreast of these developments.

Associated job opportunities:

As a qualified lawyer, there are many other legal areas where you can choose to specialise if you decide maritime and shipping law is not for you.



Fishery Control Officer & Observer

NQF 4-5

The Department of Fisheries is responsible for monitoring and inspecting the fishing sector to ensure compliance with various pieces of legislation. There are two important jobs that assist the Department carry out their mandate. Fishery Control Officers (FCOs) inspect local commercial fishing vessels at their landing site. They also inspect foreign fishing vessels and check the by-catch of the longline hake fishing vessels.

Fishery Observers, however, are placed on board fishing vessels to observe and collect data on a catch size and composition. This information is reported to the scientific and fisheries management authorities to assess and manage fish stocks. It is important to note that observers do not have a law enforcement function but they can confiscate undeclared and excess fish, issue fines for minor offences and open case dockets for serious and repeated offences.

Key tasks - Fishery Control Officers:

- Verify if Vessel Monitoring System (VMS) is reporting to the Department.
- Ensure Right holders/ Representatives are on board the vessel during fishing operations.
- At landing point ensure all fish landed from the vessels is monitored.
- Reconcile catches to determine that rights holders' fish quota allocation is not exceeded
- Refer serious and repeated offences and over-catching to Section 28 committee per fishing season.
- For foreign fishing vessels, inspect fishing permits, verify fish species onboard and fishing gear compliance.
- Conduct inspections on fish processing establishments.
- Monitor slipways and harbours.
- Conduct coastal patrols roadblocks.
- Inspect restaurants and fish shops to determine the legality of suppliers.

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Key tasks - Fishery Control Observers:

- Collect scientific data on fish catches.
- Collect data on other marine life such as birds and mammals and their reaction to fishing operations.
- Collect data on the biological state of catches, by-catch, discards, incidental mortality and fishing techniques.
- Report to the authorities.

Entry requirements/training:

As an observer on a boat, you cannot suffer from sea sickness and must be prepared to be at sea (up to 40 nautical miles off the coast) for several days. You will need to function effectively in the closed community of a fishing vessel at sea and accurately collect data while on board. In order to be qualified with a National Certificate: Fisheries Observation, you will need a Grade 12, or you will have prior experience in the fishing industry.

As a control officer, you will need to be very familiar with the fishing industry, its practices, processes and gear. Having a good relationship with the local fishing community is an added advantage and you can study for a National Certificate: Fisheries Resource Compliance through the Transport SETA at NQF level 4.

Career advancement:

As someone passionate about the fishing industry, you could pursue a seagoing career on a fishing vessel, or you could move into a supervisory or management position in a commercial fishing operation.

Associated job opportunities:

If you decide you don't want to be involved in the fishing industry, you could easily pursue other careers in conservation.





South African Police Service Water Wing

NQF 4-7

The Water Wing in the South African Police Service assists the investigating officers in retrieving bodies, firearms, explosives and any other items in the water that may be used as exhibits and aid in the investigation of a particular case. This unit also assists in water rescues during floods, drownings, crime prevention operations and disaster management exercises.

The Water Wing function is a secondary police function and covers vessel handling and visible policing as well as a diving function. Police divers are full qualified commercial Class IV Divers with skills that support dangerous diving operations in hazardous situations. Vessel handlers are trained to SAMSA standards and they assist the divers and water rescue, as well as having a visible presence to the community.

Key tasks:

- Search and recovery operations in an attempt to recover drowned victims, exhibits and other items submerged in water.
- Crime prevention operations in and on water, focusing on water safety, including policing at organised water sport and recreation events.
- Assisting in the investigation of crime-related diving and boating activities.
- To promote the image of the Police Water Wing through community awareness projects and initiatives.
- Conduct regular equipment maintenance.
- Continuously attend refresher training.

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Entry requirements/training:

To become a police officer, you will need to follow the SAPS recruitment and training programme. In year one you will do basic training and tactical policing programmes. Thereafter you become a student constable and thereafter a constable before you can progress further up the ranks of the police service. In order to meet the Water Wing requirements, you will need to train as a diver or vessel handler. In addition to this, the Divisional Order: Water Policing requires the Water Wing team to be trained in a number of specialised search and rescue skills, first aid and hazmat operations.

Career advancement:

As a member of SAPS, you can advance through the ranks to the most senior rank of General.

Associated job opportunities:

If you leave the police service, you could enter the commercial diving industry or use your skippers ticket in other boating activities, but generally most members of the Water Wing remain dedicated police officers for the duration of their careers, as it takes a special person to do this kind of work.





Marine Underwriter

NQF 4-7

If you are a good and confident communicator with excellent negotiating skills, then becoming a marine underwriter could be a possible career path to explore. To work as a marine underwriter you will have the opportunity to provide insurance coverage for boats, ships, and other naval assets. You will be responsible for providing a valuation of the vessel, crew, and items or cargo that they transport. More importantly as an underwriter you must determine risk and minimise risk potential for your clients. Underwriters need to be aware of the legislation from which the boat or ship comes as well as any jurisdiction that it may sail in. Insurance cover is an important part of ensuring the protection of the marine environment should an accident or incident at sea occur.

Key tasks:

- Examining insurance proposals
- Collecting background information and assessments of risk
- Analysing statistical data using specialist computer programmes
- Writing quotes and negotiating the terms with brokers and clients
- Determining premiums
- Wording of policies
- Preparing insurance policy terms and conditions
- Liaising with insurance brokers and customers

Entry requirements/training:

The qualifications for a marine underwriter may vary depending on the employer. Both school leavers and bachelor degree candidates can pursue a career as a marine underwriter. However, for insurance firms some may seek candidates with a specific bachelor degree that includes but not limited to business, accounting, statistics, or a related subject. In some cases, some legal knowledge is required.

Career advancement:

Having started as an assistant in an insurance firm, you can advance once you become a certified or licenced marine underwriter. You would need to take courses to be certified. These courses are important for keeping current with new insurance policies and for adjusting to new technology. Certification is often necessary for advancement to senior underwriter and underwriter management positions.

Protection Indemnity Club Insurers

NQF 4-7

Known as P&I Club insurance, a P&I club is run as a non-profit insurance co-operative for shipowners. Marine insurers are usually for-profit companies that charge customers a premium to cover ships and cargo for a time period. In contrast P&I Clubs are financed by “calls” and members contribute to the club’s common risk pool. If the risk pool cannot cover current claims the club members are asked for a further call and if the pool has a surplus the club will ask for a lower call the following year and refund the members. The P&I Club typically provides cover for open-ended risks that traditional insurers are reluctant to insure. These could include war risks or risks relating to environmental damage such as oil spills and pollution.

A P&I Club team will comprise a wide range of expertise including insurance experts, maritime lawyers, mariners, surveyors, ships operators, ship agents and customs, clearing and forwarding experts.

Key tasks:

- Insure ship owners and operators against third-party liabilities not covered by hull and machinery policies obtained. The club will usually only accept risks on chartered-in-tonnage where the member also has owned vessels entered with the organisation. Charterers club exists to offer similar cover for charterers.
- Strive to keep ‘calls on their members’ at a minimum through loss prevention methods such as information bulletins aimed at owner’s insurance officers.
- Disseminate information aimed at keeping members’ premiums down.
- Produce standard forms of letters of indemnity and protest to be used as templates.
- Issue handbooks containing club rules and lists of correspondents, which are very useful to a Master seeking advice and assistance when in any kind of trouble.

Entry requirements/training:

It is very hard to specify how you can find employment with a P&IC, but if you have experience or qualifications in shipping practice, marine law, surveying, ship services, bunkering or as sea going crew you could possibly join the team.

Career advancement:

Career advancement within a P&I Club team is achieved through years of on the job training and experience. You will be mentored by those above you and slowly you will rise through the ranks in a company.

Associated job opportunities:

Learning about marine insurance at a P&I Club you could pursue job opportunities in the for-profit insurance sector.



Special Casualty Representative

NQF 7-10

Sometimes, despite best efforts and safety procedures, ships run aground and need to be salvaged. In such cases a Special Casualty Representative (SCR) is appointed by the shipowner or the shipowner's P&I Club. The person is appointed from a pool of salvage experts and agreed upon by the Lloyd's Salvage Group. Their role is to assist in the salvage of the vessel and to minimise damage to the environment.

The Salvage Master remains in overall charge of the operation but must consider the views of the SCR and satisfy reasonable requirements. The SCR approves the Salvage Master's plan and daily reports. The SCR also prepares a daily cost schedule and final report and must ensure that equipment, personnel and procedures are not used unnecessarily in the salvage operation. The SCR must remain impartial and ensure that information is available to all parties.

Key tasks:

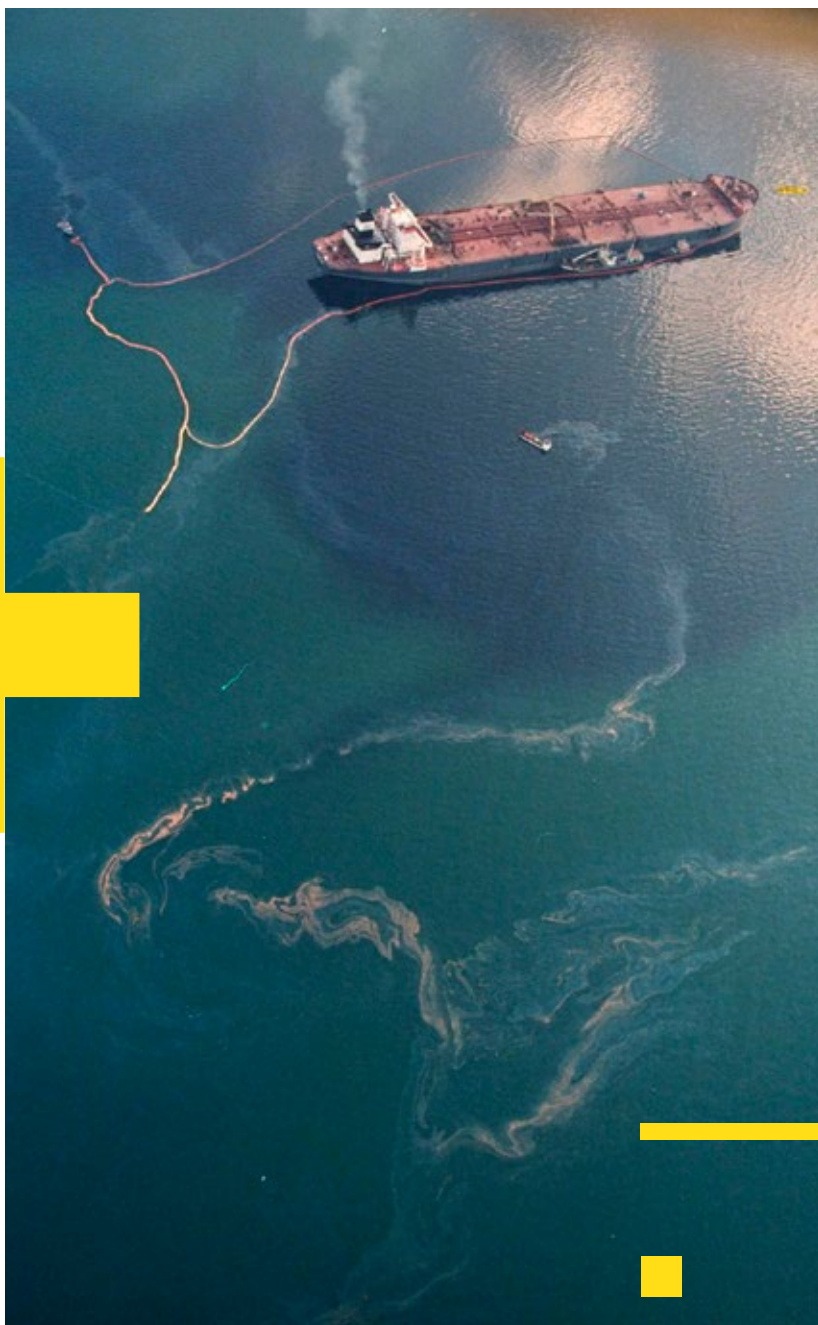
- Report, observe and consult with the Salvage Master.
- Produce Dissenting Reports (if necessary).
- Circulate the Daily Salvage Reports of the Salvage Master to interested parties.
- Produce a Final Salvage Report.

Entry requirements/training:

This is a senior maritime appointment and SCRs are generally qualified Naval Architects, Structural Engineers, Maritime Civil Engineers or Ships' Master with years of salvage experience.

Career advancement:

Generally, an SCR has reached a pinnacle point in their career and the prestige of being an SCR adds to their maritime professionalism.

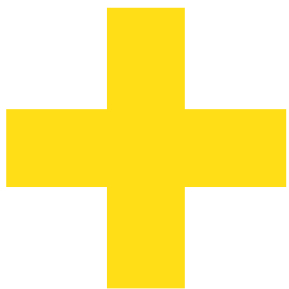


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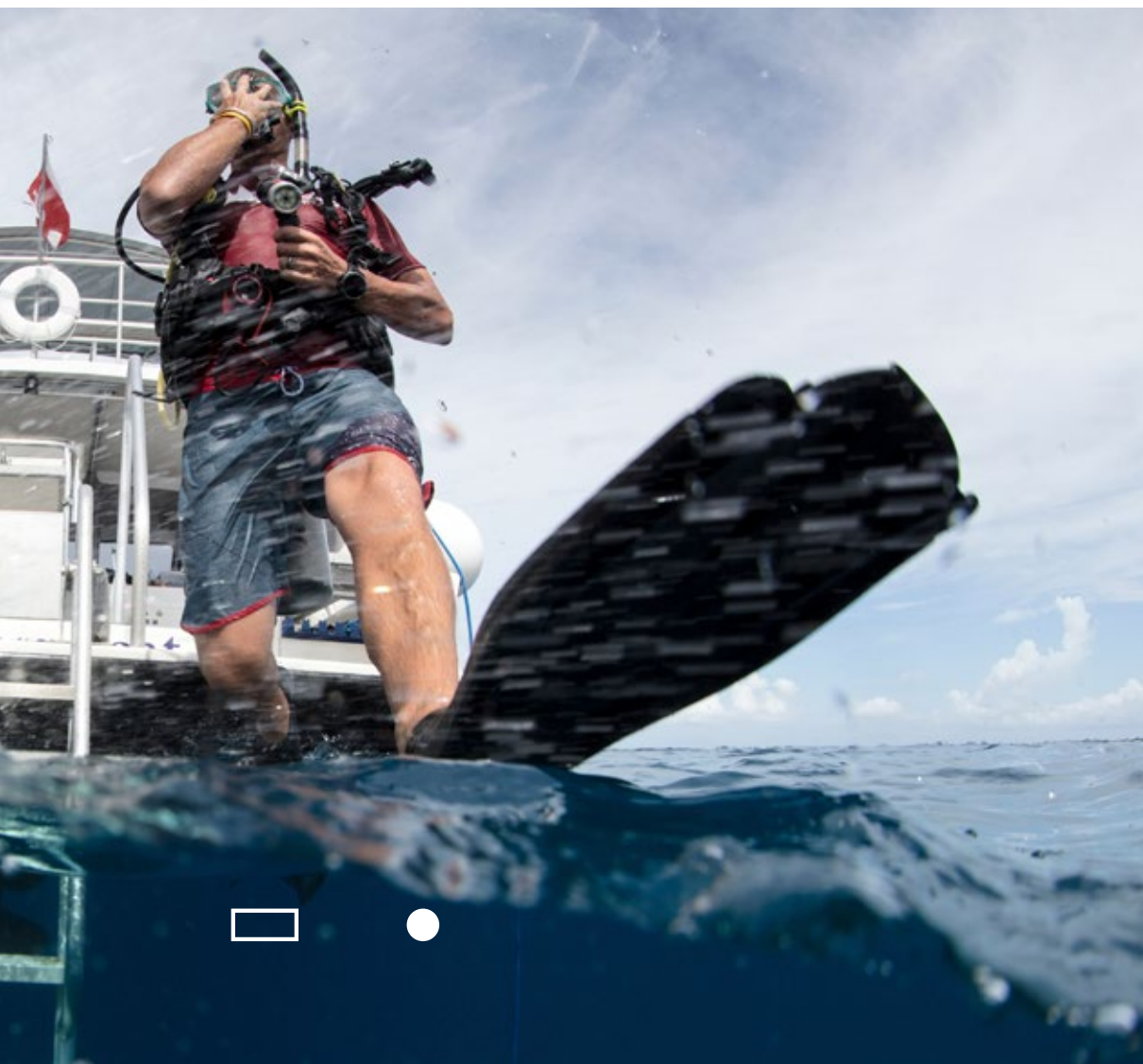


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TRAINING & EDUCATION

A variety of options exist for training in South Africa. Institutions providing education range from universities offering tuition for degrees; academies and schools of education and training.



TRAINING & EDUCATION

Relevant SAQA Certificates, Degrees & Diplomas

QUALIFICATION	INSTITUTION	TYPE	NQF LEVEL	CREDITS
National Certificate: Fisheries Observation Inshore	SGB Nature Conservation	National Certificate	04	123
Certificate Fisheries Observation Deep Sea	SGB Nature Conservation	National Certificate	05	127
National Diploma: Fisheries Resource Management	Cape Peninsula University of Technology	National Diploma	06	360
National Diploma: Oceanography	Cape Peninsula University of Technology	National Diploma	06	360
Diploma in Marine Science	Cape Peninsula University of Technology	Diploma	06	360
National Diploma: Meteorology	Tshwane University of Technology (TUT)	National Diploma	06	360
National Higher Diploma: Meteorology	Tshwane University of Technology (TUT)	National Higher Diploma	07	490
Advanced Diploma in Marine Science	Cape Peninsula University of Technology	Advanced Diploma	07	120
Bachelor of Science in Marine Biology	University of KwaZulu Natal	First Degree	07	384
Bachelor of Technology: Oceanography	Cape Peninsula University of Technology	BTech	07	480
Bachelor of Science: Oceanography	University of Cape Town	First Degree	07	
Bachelor of Science Honours in Meteorology	University of Pretoria	Honours Degree	08	120
Postgraduate Diploma: Maritime Law	University of KwaZulu Natal	Post graduate Diploma	08	128
Master of Laws in Maritime Law	University of KwaZulu Natal	Masters Degree	09	180
Master of Technology: Oceanography	Cape Peninsula University of Technology	Masters Degree	09	120
Master of Science in Meteorology	University of Pretoria	Masters Degree	09	180
Doctor of Philosophy: Meteorology	University of Pretoria	Doctoral Degree	10	360

Naval Combat Officer & Other Naval Careers

The SA Navy is the only training provider for those seeking a naval career and they aim to recruit suitable candidates to meet their staffing requirements. The Department of Defence which oversees the Navy has a Military Skills Development (MSD) programme. The MSD is the main feeder of the SA Navy and the Navy advertises opportunities in the newspaper and on their website. The MSD is a two-year programme that prepares you to be employed in the SA Navy, as well as the public and private sectors.

Entry requirements:

- Be a South African citizen.
- Be between the age of 18 and 22 (graduates up to the age of 26).
- Have completed the National Senior Certificate (Grade 12).
- Preferably be single.
- Not be area bound.
- Have no record of a criminal offence.
- Comply with the medical fitness requirements for appointment in the SANDF.
- Combat Officers applicants must have Mathematics, Physical Science at level 4 and Matric exemption.

Applicants up to the age of 26 who are in possession of an appropriate recognised University Degree or a 3-year Diploma or N4, N5 and N6 Certificate in Mechanical and Electrical Engineering are welcome to apply.

The opportunity to apply will be advertised in the national newspapers and once the application period is closed the paper selection will commence. Qualifying candidates are short listed to be invited for the MSD Selection. If selected you will then need to undergo psychometric testing, pre-employment medical assessment and interviews before final selection of candidates is made.

Course overview and subjects:

Recruits are trained in various skills ranging from Seamanship, Environmental Awareness, Musketry, Computer Skills, Basic Financial Management Skills, Hygiene and Discipline to Work Ethics.

All basic training in the South African Navy begins at SAS SALDANHA in Saldanha Bay, where Military Training for Ratings (MTR) takes place.

Officer training is carried out at the SA Naval College in Gordon's Bay, whilst specialist training is conducted at SAS SIMONSBURG in Simon's Town.

TRAINING & EDUCATION



At SAS SALDANHA candidates are selected to go to the SA Naval College where they will undergo intensive officer training before filling posts in the Combat, Logistics, Personnel and Engineering branches of the SA Navy.

Junior Ratings will receive specialised training for utilisation in musterings (functional areas) such as Combat Operators, Divers, Protection Force, Hospitality, Logistics, Radar Operators, Engine Room Attendants and Personnel Clerks.

After a period of two years' service, suitable MSD members will be recruited into the Core Service System. The remainder will be transferred to the Reserve Force for a period of five years where they will be used in posts to complement the Full Time Force.

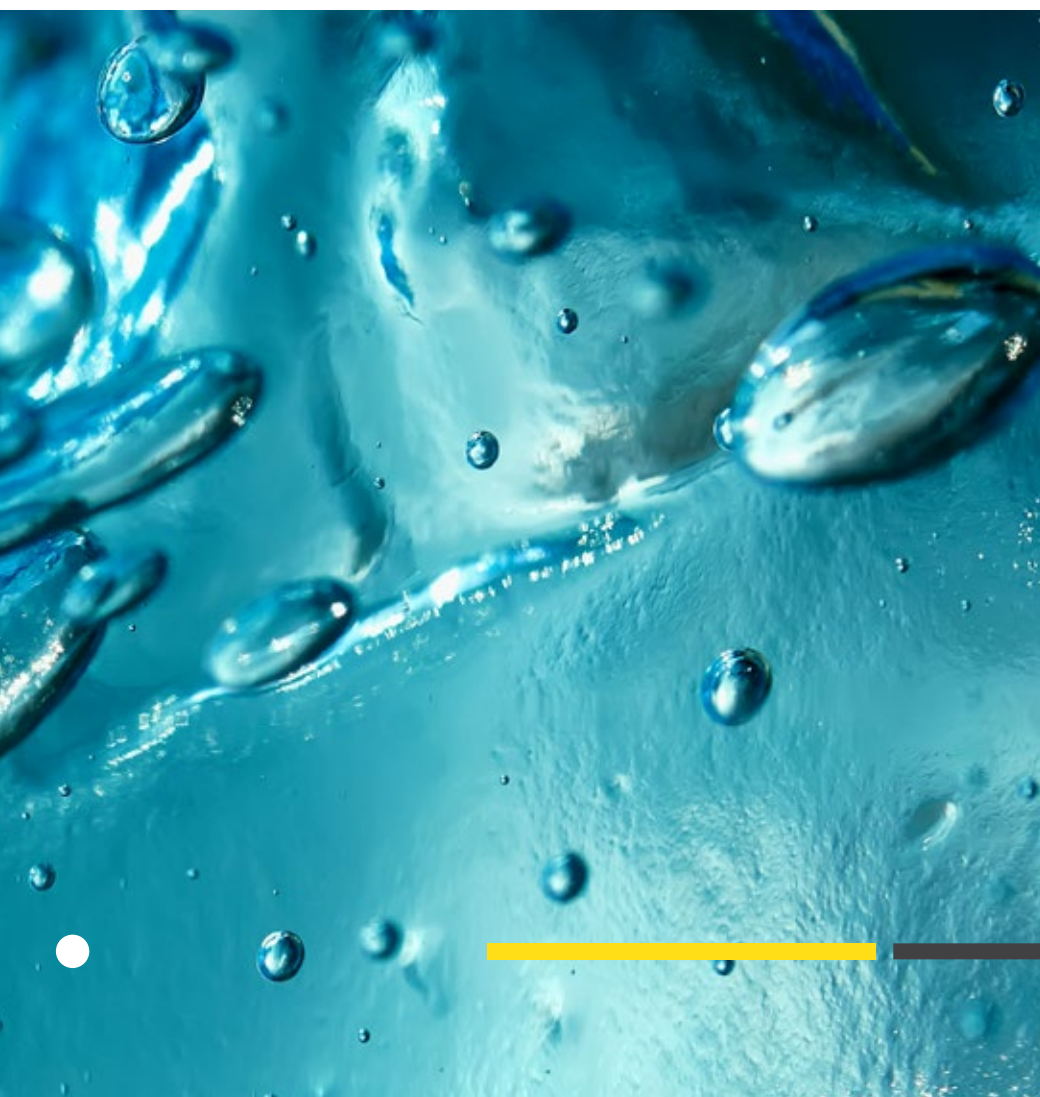
Those leaving the Navy on completion of MSD training will be equipped with skills that will make them competitive in the labour market.







THE TAKE THE PLUNGE



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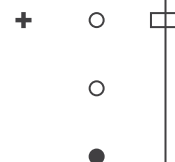
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