HRDC
HUMAN RESOURCE DEVELOPMENT COUNCIL
of South Africa

Maritime Sector Skills Technical Task Team (MSSTTT) Report

Advancing skills development in the maritime sector

15 October 2014

REPUBLIC OF SOUTH AFRICA

Partnering to innovatively develop SA's human potential

Glossary of terms

AMFA	Australian Maritime and Fisheries Academy
AU	African Union
ANA	Annual National Assessment
CBMT	Competency Based Modular Training
CPUT	Cape Peninsula University of Technology
DBE	Department of Basic Education
DEDAT	Department of Economic Development and Tourism
DHET	Department of Higher Education and Training
DMR	Department of Mineral Resources
DOT	Department of Transport
DPE	Department of Public Enterprises
DTI	Department of Trade and Industry
DUT	Durban University of Technology
EEZ	Exclusive Economic Zones
ESSA	Employment Services of South Africa
FAO	Food and Agriculture Organisation
GMDSS	Global Maritime Distress Safety System
HRDCSA	Human Resource Development Council South Africa
ILO	International Labour Organisation
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IHO	International Hydrographic Organisation
IMO	International Maritime organisation
IRATA	Industrial Rope Access Trade Association
MCS	Marine Crew Services
MPA	Maritime and Port Authority
MSSTTT	Maritime Sector Skills Technical Task Team
NCP	National Cadet Programme
NDP	National Development Plan
NMMU	Nelson Mandela Metropolitan University
NQF	National Qualifications Framework
NSDS	National Skills Development Strategy

NSF	National Skills Fund
OPITO	Offshore Petroleum Industry Training Organisation
PISC	Proficiency in Survival Craft
PSSR	Personal Safety and Social Responsibility
PST	Personal Safety Training
PWC	PriceWaterhouseCoopers
RPL	Recognition of Prior Learning
SADC	Southern African Development Community
SAIMI	SA International Maritime Institute
SAMTRA	SA Maritime Training Academy
SAOGA	SA Oil and Gas Alliance
SAQA	South African Qualifications Authority
STCW	Standards for Training Certification and Watchkeeping
SETA	Sector Education and Training
TETA	Transport Education and Training Authority
TNPA	Transnet National Ports Authority
TVET	Technical Vocational Education and Training
UCT	University of Cape Town
UIF	Unemployment Insurance Fund
UN	United Nations
UNCLOS	United Nations Convention on the Law Of the Seas
UNCTAD	United Conference on Trade and Development
UKZN	University of KwaZulu Natal
UWC	University of the Western Cape
WTO	World Trade Organisation (WTO)

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Executive Summary

South Africa (SA) has a skills crisis that mirrors global conditions, characterised by a mismatch between the available pool of employees and market demand which has been linked to a number of factors including state of the education system. Shortages of skills and the need for skills development have been identified as a challenge in a number of industries including the maritime sector. The Human Resource Development Council SA (HRDCSA) established the Maritime Sector Skills Technical Task Team (MSSTTT) in September 2013 to investigate blockages within the maritime skills development pipeline and to propose measures that can be implemented to address those.

The maritime sector has huge potential to contribute to economic growth and development, job creation and building an inclusive society, thus addressing the triple challenges of poverty, joblessness and inequality. Boasting a coastline of around 3,000km, the country has the potential to offer enormous maritime economic opportunities. The SA maritime sector contributed about 13,6% (R55 billion) to the Gross Domestic Product (GDP) in 2013 and according to the World Bank, about 60% of the country's GDP is generated through trade. Even though SA is a maritime trading country, it does not currently have any ships on its registry and thus makes the country a consumer of international maritime transport which represents a significant expenditure for the country.

Approximately 98% of South Africa's total trade (in volume) is carried by ships, which translates into about 13 000 ship calls handling trade through SA ports, employing about 60 000 seafarers. SA only has about 3 500 seafarers and the global demand for seafarers is around 250 000. The country needs to produce about 720 Officers and 1 200 Ratings per year to meet its target of 12 000 seafarers by 2019. More investment in skills development is therefore needed to boost production capacity within the sector.

Supply of skills within the sector is very limited. Currently there about three high schools that offer maritime studies at basic education level. Maritime training at basic education level presents a huge skills development potential and has assisted in awareness creation about the industry. Furthermore, maritime education at basic education level establishes a good foundation for further maritime related studies at higher education level. At higher education level, only two public institutions (Cape Peninsula University of Technology (CPUT) and Durban University of Technology (DUT)) currently offer undergraduate studies that present candidates with an opportunity to further qualify as a seafarer. Nelson Mandela Metropolitan University has indicated that it will also offer marine engineering studies. However, there are currently no Technical Vocational Education and Training (TVET) colleges that offer maritime related training. Efforts are underway to enable these colleges to offer maritime artisan training (Ratings training).

In respect of demand for skills, the sector employment was around 316 000 in 2010 and this number is expected to increase to about 1 million in 2033 provided that there are adequate interventions to address challenges (including skills development) within the sector to ensure growth.

A number of skills development challenges within the maritime sector have been identified which include, amongst others, inadequate capacity and infrastructure for maritime education

and training; lack of suitable institutional and funding arrangements; limited employment opportunities; and inadequate marketing and support for maritime industry. A number of initiatives to address these challenges have been proposed and these include; amongst others:

- Develop National Maritime Education and Training Policy;
- Develop a comprehensive marketing strategy from basic to higher education level;
- Build centres of excellence in each province to improve awareness;
- Create Maritime Skills Development Fund;
- Investment in maritime education infrastructure at higher education institutions;
- Improve production capacity at higher education institutions. Currently CPUT and DUT enrol about 200 students each per annum. SA plans to produce between 720 officers and 1200 Ratings per year;
- Create and run programmes to expose teachers to the maritime industry; and
- Closer cooperation between industry and TVET Colleges in respect of curriculum development.

Some of the blockages initially identified by the Task Team are currently being addressed by the Operation Phakisa process – a government initiative aimed at unlocking growth and delivery in the ocean economy. It is projected that the maritime industry has a potential to make a contribution of between R129 billion and R177 billion to GDP by 2033, thus creating between 800 000 and 1 000 000 jobs. Shortage of skills has often been cited as a major constraint to economic growth. In light of projected growth within the maritime sector, it is imperative that all the relevant stakeholders put more effort in addressing the identified skills challenges to ensure growth and job creation within the maritime sector.

1. Introduction

South Africa (SA) has a skills crisis that mirrors global conditions characterised by a mismatch between the available pool of employees and market demand which has been linked to a number of factors, chief amongst those being the state of the education system. The quality of the SA education system has been ranked 146th out of 148 countries in the 2013/14 World Economic Forum Global Competitiveness Report (quality of maths and science 148th). Former Deputy President Kgalema Motlanthe asserted that the skills development problems in the country could be attributed to the weakness in the education and training system, starting from early childhood development and continuing right through the school and post-school system and ongoing workplace professional development.

Skills development has been linked to economic growth and the National Development Plan (NDP) concurs with this view - the Vision 2030 document highlights that the key to sustainable employment and economic growth in South Africa is through education and skills development. It further states that transforming the economy and creating sustainable expansion for job creation means that the rate of economic growth needs to exceed 5% a year on average and this could be brought about by an expanded skills base through better education and vocational training. The NDP views skills development as being necessary to build a socially cohesive society.

The National Skills Development Strategy (NSDS) III has identified a number of challenges that have an impact on the ability of SA's economy to expand and provide increased employment opportunities and these include, amongst others:

- Poor work readiness and inadequate skills levels of a number young people leaving formal secondary and tertiary education to enter the labour market for the first time. This problem is exacerbated by inadequate linkages between institutional and workplace learning.
- Continuing skills shortages in the artisanal, technical and professional fields that are fundamental to the development and growth of our economy.
- Those who have been unemployed for a long time and have no entry-level skills, work experience or work-based training, and lack basic numeracy and literacy skills that would enable them to obtain work.
- There are blockages within the system which include a lack of synergy between the various post-school sub-systems (e.g. universities, Technical Vocational Education and Training (TVET) colleges, SETAs); a lack of clarity on expected roles of the various components of the skills development system; and the silo approach that prevents partnerships and alignments needed to improve effectiveness.
- There is a lack of coherent strategies within economic and industrial sectors, which is exacerbated by the lack of systematic skills development to support and sustain growth and development.
- There is a need for more substantial programmes that will improve qualifications, support career-pathing, enable greater flexibility and mobility, and increase productivity.

- There is an urban bias to economic development resulting in skills development for rural areas being neglected.

The government has come up with a number of initiatives to address skills development challenges and these include, amongst others, the:

- The Skills Development Act aimed at addressing two main priorities, that is, the need to reverse apartheid imbalances and create a more inclusive and cohesive society; and the need to improve skills and increase productivity and competitiveness.
- The Human Resources Development Strategy for South Africa, which sets broad priorities until 2030, and seeks to ensure universal access to quality basic education focusing on significant improvement in skills to meet the demands of a growing economy.
- The NSDS III which is aimed at achieving a skilled and capable workforce that contributes to and shares in, the benefits and opportunities of economic expansion and an inclusive growth path. The Strategy is aimed at increasing access to high quality and relevant education and training and skills development opportunities, including workplace learning and experience, to enable effective participation in the economy by all South Africans.

The skills shortage issue has been a cause for concern around the world. The 2014 Price Waterhouse Coopers (PWC) global survey of more than 1,300 CEOs highlighted the availability of key skills as the second-biggest threat to business growth, just after the increasing tax burden. About 63% of CEOs surveyed were concerned about the availability of key skills (58% in 2013). This highlights the need for skills development across the globe.

Shortages of skills and the need for skills development have been identified as a challenge in a number of industries including the maritime sector. The maritime sector has huge potential to contribute to economic growth and development, job creation and building an inclusive society, thus addressing the triple challenges of poverty, joblessness and inequality. The employees in the maritime sector (specifically seafarers) need to be adequately skilled to deal with normal and emergency situations and be able to adapt to culturally diverse environments. The demand and supply of skills in the maritime sector is considered in terms of three occupational categories, namely:

- Seafarers, technically skilled occupations (artisans, engineers and technicians),
- Management and technical professionals – which are in demand in each of the primary maritime subsectors; and
- Occupations within the operational support services (stevedoring, forwarding and clearing, port operations, ship chandelling etc.).

The Human Resource Development Council SA (HRDCSA) established the Maritime Sector Skills Technical Task Team (MSSTTT) in September 2013 to investigate blockages within the maritime skills development pipeline and to propose measures that can be implemented to address those. The work of the Task Team supports Commitment 2 of the Human Resource Development Strategy: "*We will ensure increase the number of appropriately skilled people to meet the demands of our current and emerging economic and social development priorities*".

The purpose of this document, therefore, is to present the work that has been done by this Task Team.

2. Problem statement

Inroads have been made in the bid to improve skills in the maritime sector through a number of initiatives have been launched by a number of stakeholders including SA Maritime Safety Authority (SAMSA), Transnet, Department of Transport (DOT), DHET, and other players in the maritime industry. Despite these initiatives, there are still challenges that need to be addressed to ensure that the relevant skills are available to service the entire maritime sector (including tapping into employment opportunities in the international market) to ensure maximum growth in the sector. Specifically the following areas need to be addressed:

- ***The infrastructure capacity.*** There is a need to research and quantify such infrastructure facilities required, including training simulators, workshop facilities, classrooms and ships. SAMSA estimates about R7 billion is required for skilling, creating and protecting the estimated 400,000 jobs in the next 8 to 12 years.
- ***The cost of producing maritime skills*** is high. The cost of training a Deck Officer around R220 000, whilst the cost of training an Engine Cadet is about R380 000.
- ***The foundational knowledge***, particularly in maths, science, engineering and technology will make or break our efforts to position and mainstream maritime as a key sector in the South African economy. The need to join hands with Basic Education and TVET Colleges in particular is critical.
- ***Lack of water culture and maritime awareness,*** inability to swim by a majority of black kids and familiarity of water and water related activities. This renders maritime to be far from the minds and eliminates career possibilities especially if the sea is feared.
- ***The ship ownership*** for South Africa needs to be addressed as the lack of ships on the South African ship registry limits the training capacity (availability of training berths) as well as employment opportunities.
- ***Non-protection of South Africa's Exclusive Economic Zones (EEZ)*** results in lost opportunities for employment of SA seafarers on vessels operating exclusively in SA's EEZ (government operated vessels, fishing vessels and vessels working in offshore oil, gas and mining operations as well as coastal vessels)**.**

3. Scope of work

The scope of work of the MSSTTT would encompass the following:

- Investigate each of the challenges mentioned above as well as other challenges and come up with proposals on how they can be addressed and who the key role players will be, and what the cost will be for implementing.
- Identify the skills shortages in the maritime sector.
- Identify critical skills required in the maritime sector.
- The timelines for implementation of the proposed measures should be clearly highlighted.

- Provide pathways to be followed in addressing the shortage of skills in the maritime sector.
- Identify key role players and determining the cost of implementation; and
- Provide a report to the Council in which information on the above issues is documented with recommendations that can assist the identified implementing bodies in ensuring the successful acquisition and growth of the Maritime skills and therefore the growth of the Sector in the short, medium and long-term.

4. Methodology

In conducting its work the MSSTTT followed the process below:

- Two work streams to deal with the demand-side and supply-side issues were created. Two documents that looked at blockages and proposed recommendations were therefore compiled.
- A literature review of skills development issues which looked at existing material on blockages within the maritime pipeline was compiled.
- Documents on skills development initiatives by SAMSA, Transnet, Moses Kotane Institute Transport Education and Training Authority (TETA), and the Department of Trade and Industry (dti) were assessed.
- Relevant stakeholders including, academia; basic education institutions; shipping, ship repair ,logistics, offshore diving, offshore oil and gas companies and associations were consulted.
- Linkages with other HRDCSA Task Teams were reviewed.
- A working group was formed to deal with additional issues such as Ratings training.
- Deliberations within the Task Team – the Task Team met 10 times during the period it had been given to complete its work.

This report, therefore, was compiled taking into account all the information received throughout the abovementioned process.

5. The state of the maritime sector in SA

5.1 Background

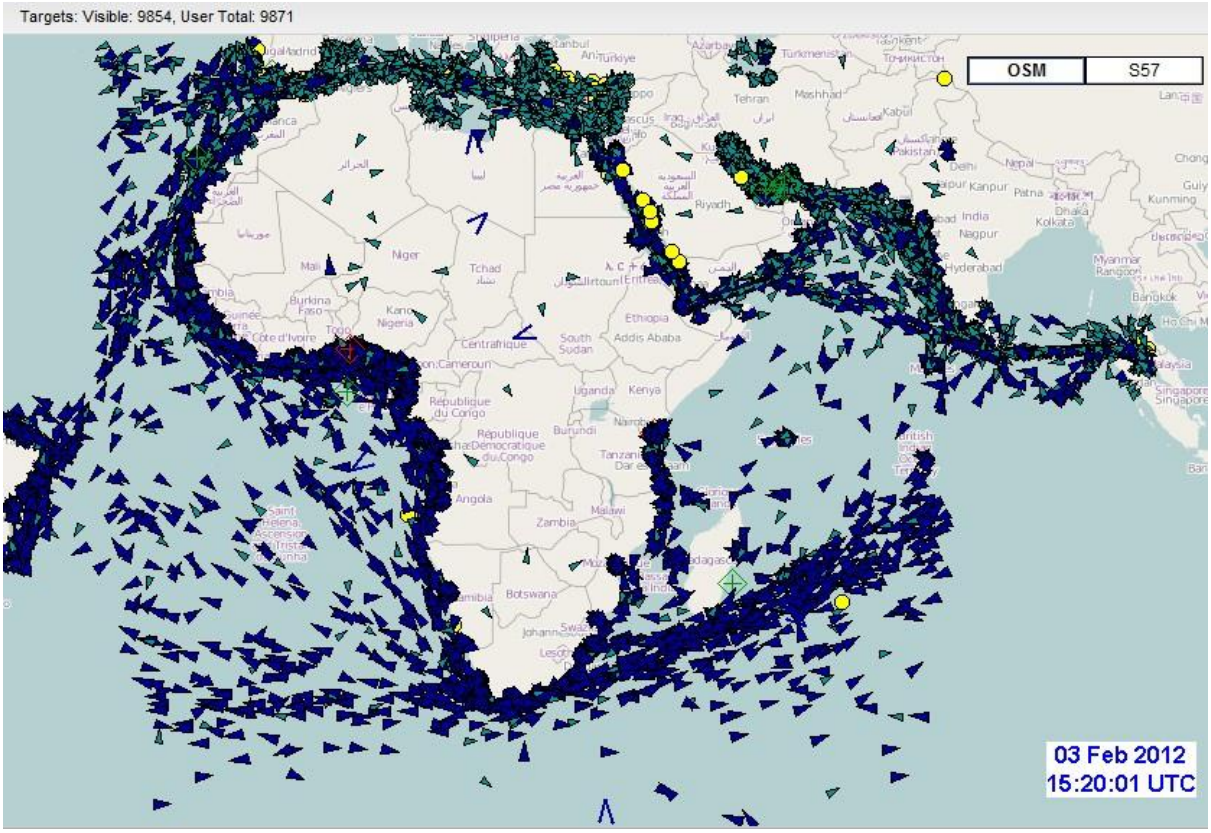
According to the SAMSA 2011 Maritime Skills Study, the maritime sector includes all enterprises engaged in the business of designing, constructing, manufacturing, acquiring, operating, supplying, repairing and/or maintaining vessels, or component parts thereof; the management and/or operating of shipping lines; stevedoring, and customs brokerage services; the management and operation of shipyards, dry docks, harbours, marinas, slipways and marine repair shops; shipping and freight forwarding services and similar enterprises. In addition to shipping transport and ports services, maritime related enterprises and activities are also concerned with resource exploitation at sea, the leisure and tourism industries, professional business services; physical policing of the shoreline and the public service.

South Africa has a land mass of 1,2 million square kilometres with a coastline of around 3,000km, and therefore has the potential to offer enormous maritime economic opportunities. Maritime transport in SA is seen as an enabling industry that does not only exist to meet goals inherent to transport, but also other national and social objectives such as, amongst others, economic growth, increased trade, regional integration, and access to employment opportunities. According to SAMSA, the country is primarily an export-oriented economy with a haulage of cargo that generates approximately 1 310 billion ton-miles (the overall tonnage carried over the total distance to market) of sea trade activity on an annual basis, which translates to approximately 6% of world sea trade.

South Africa is also located along one of the busiest and oldest international shipping trade route, the Cape Route. Its position is also the junction from the Far East, Europe, and Americas, and it takes approximately 21 days of sailing from each of the destinations, making South Africa an ideal halfway station for international trade. Despite its distance to market SA, is amongst the top 15 trading countries and generates about 3,5% of the world's seaborne trade (SAMSA Annual Report, 2014).

There are on average 1,500 ships on the South African coastline on any given day. These ships mainly constitute passing traffic and a very small percentage of those ships call into the South African ports. This presents an opportunity as a halfway station along a busy route. South Africa is ideally positioned to service East-West cargo traffic that is too large for the Suez Canal; and African offshore oil and gas vessels/rigs that are drilling in Mozambique and Namibia. Furthermore, SA could service (repair) these ships - total repair costs are largely driven by labour costs and South Africa's labour costs are much lower that its European counterparts. **Figure 1** below depicts the amount of traffic that passes through SA shores.

5.1.1 Figure 1 - Amount of traffic that passes through SA shore



Source: SAMSA

There are two distinct types of maritime activities in any country – the local maritime activities as well as international maritime activities. The conduct and operations for the domestic activities are governed by domestic laws that do not have to comply with international instruments. Aspects governed by domestic law include training for port operations, ship repair skills, professionals, cargo and terminal operations, oil and gas operations etc.

The conduct and operations at sea are governed by a number of multilateral instruments and institutions as the sector is subject to international, continental, regional governance and frameworks. The institutions include, amongst others, the:

- United Nations (UN) and its specialised agencies such as the International Maritime organisation (IMO),
- International Labour Organisation (ILO),
- Food and Agriculture Organisation of the UN (FAO),
- World Trade Organisation (WTO),
- United Conference on Trade and Development (UNCTAD),
- United Nations Convention on the Law Of the Seas (UNCLOS)
- nongovernmental organisations such as International Hydrographic Organisation (IHO),
- International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), and

- Other organs such as African Union (AU), Southern African Development Community (SADC); and South African government departments at various levels of governance.
- Offshore Petroleum Industry Training Organisation (OPITO),
- Industrial Rope Access Trade Association(IRATA)

5.2 Economic contribution of the maritime sector

According to the SAMSA 2014 Annual Report, 90% of world trade is carried by sea and the volume of trade is expected to increase significantly due to the expansion in world population and economy. The global seaborne trade increased by 4,3% in 2013 and the world fleet increased by about 9%. Africa's contribution to world seaborne trade in 2013 was 3,1%, however, this is expected to improve due to the vast resources and increased consumption. Oil and Gas finds within the SADC region present growth opportunities for the region and the continent.

Even though SA is a maritime trading country, it does not currently have any ships on its registry. In the absence of the ship registry[1], the country is therefore a consumer of international maritime transport which represents a significant expenditure for the country. The SA maritime sector contributed about 13,6% (R55 billion) to GDP in 2013. According to the World Bank, about 60% of the country's GDP is generated through trade. Approximately 98% of South Africa's total trade (in volume) is carried by ships, which translates into about 13 000 ship calls handling trade through SA ports, employing about 60 000 seafarers. SA has about 3 500 seafarers meaning that there is a huge opportunity for the employment of SA seafarers. The country needs to produce about 720 Officers and 1 200 Ratings per year to meet the target of 12 000 seafarers by 2019. Furthermore, the earning potential from employment of seafarers on international trading ships is significant. The average annual earnings per officer is about USD68 000 (tax-free). These earnings from international shipping activities constitute foreign direct earnings to the economy.

It is reported (SAMSA Annual Report) that SA spent about R31,8 billion on infrastructure improvements at its ports in 2013. Jones (2005) argued that when vessels call at a port, economic activity in the host economy is energised at a number of levels in a number of industries. These activities would include ships' agency business, ship repair activity, the services of ship suppliers and chandlers, terminal operators and port warehousemen, stevedores, road hauliers and rail service providers distributing seaborne freight flows, the clearing & forwarding industry. Another 1994/95 study by Jones on the impact of the activities of the port of Durban on the metropolitan economy estimated the number of full-time annual jobs associated with the direct port-ancillary activities was between 25 000 and 28 000, and between 7 000-8 000 jobs created through less directly port-related activities.

The economic opportunities for home-owned shipping fleets are clear and these include job creation and attendant spin-offs for a wide range of other economic activities. However, SA is missing out on these benefits as there is no ship on its register. By the late 1990s after the last of

[1] The proposed tax exemptions on the Tax Amendment Bill, 2013 are expected to encourage ship owners to register ships in SA. The new shipping tax regime will exempt ship owners from capital gains tax, income tax, and dividend tax. The proposal will also allow qualifying shipping companies to use currencies other than the SA Rand. Furthermore, officers and crew on ships under SA flag will be wholly exempt from income tax.

the South African ship owning companies exited the country, South Africa was left with no ships on its register, and the last ship was deregistered in 2010.

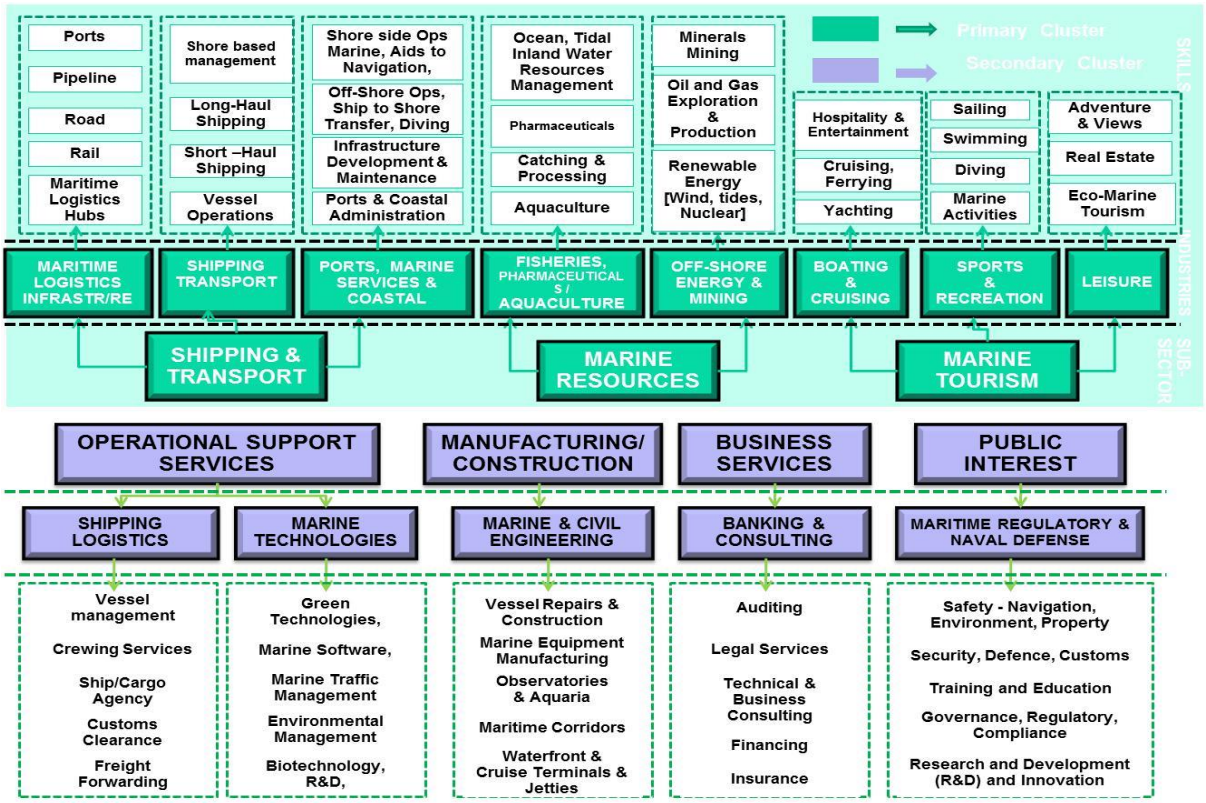
5.3 Maritime education and training in SA

Maritime training standards in SA are regulated in terms of the IMO Convention, STCW 95 (as amended). SA is a signatory to the convention and SAMSA is the implementing authority that presides over seafarer qualifications. Maritime training in SA has been viewed in a positive light internationally as the country is on the IMO White List – a premier status that enables international recognition of qualifications produced by that country. The SAMSA mandate requires maritime training institutions and programmes to be accredited by SAMSA. In terms of the National Qualifications Framework (NQF), the South African Qualifications Authority (SAQA) presides over all qualifications issued in SA. This disconnect creates a challenge as employers usually prefer to employ those in possession of a SAMSA accredited qualification (especially seafaring) that is not necessarily accredited by a SETA (TETA in particular). This conflict may have an impact on skills development within the maritime sector, particularly in seafaring. There is a dire need for SAMSA/DHET and all SETAs to resolve this issue.

There are, however, other operational categories that require skills outside the STCW framework. These include all the management, professional and other operational support occupations in the maritime industry which are generated and regulated in terms of normal education system.

A number of skills development initiatives exist within the sector and these will be discussed below. The maritime skills landscape is illustrated in the **Figure 2** below. The diagram depicts the different maritime clusters and the skills profiles within each cluster.

5.3.1 Figure 2 – Maritime Sector Skills Landscape



Source: SAMSA

The maritime sector is made up of seven clusters (three primary and four secondary industry clusters), representing sub-sectors of the maritime sector. The three primary industry clusters include all those maritime industries that represent the economic foundation of the sector, namely:

- **Shipping and transport**, which includes maritime logistics infrastructure, shipping transport and ports, marine services and coastal administration;
- **Marine resources**, which includes, fishing; pharmaceuticals and aquaculture; as well as off-shore energy and mining; and
- **Marine tourism**, which is broken down into boating and cruising, sports and recreation and leisure.

The four secondary industry clusters include:

- **Operational support services**, which includes shipping logistics and marine technologies;
- **Manufacturing and construction** which includes civil engineering; marine manufacturing (ship/boat building, component manufacturing); ship repair and maintenance (ship modifications, oil and gas structures, etc.)
- **Business services**, which look at maritime specialised professionals within the banking, legal, insurance, ICT and consulting domain;
- **The public interest cluster**, which looks at public maritime functions and services (maritime regulatory and naval defence); enforcement; emergency and disaster management).

6. The supply of skills in the maritime sector

This section looks at the supply of skills from the basic education level to tertiary level, including private education and training institutions and information on Officers and Ratings.

6.1 Basic Education Level

This level supplies all post-schooling streams that predominantly become further education and training streams. There have been efforts to create specialised schools that would function as Centres of Excellence. The Department of Basic Education (DBE) Focus Schools initiative is one such example which the maritime industry skills development pipeline could benefit from. Currently, there are initiatives by individual schools to position themselves as maritime specialised high schools. However, these are individual initiatives that are not supported by any policy or framework, resulting in a lack of maritime curricula standardisation and guidelines for educator competencies. This, therefore, results in varying degrees of success.

DBE has now recognised the importance of maritime studies and has hence included the maritime subjects at high schools such as Maritime Economics and Nautical Science as the fields of focus in its policy document for Focus Schools. Maritime studies form part of the key strategic areas for skills development in the country hence the inclusion of the maritime subjects as part of the Focus Schools policy by the Department.

Schools that are currently engaged in maritime training or initiatives that support maritime training in high schools are discussed below.

6.1.1 Lawhill Maritime Centre

The Lawhill Maritime Centre was established in 1997 and offers Maritime Economics and Nautical Science studies for learners in Grades 10 -12. The school has boarding facilities, which enables it to accept learners from all regions in the country. In 2012, the Lawhill Maritime Studies programme, which is funded by the shipping industry and pioneered by shipping line Safmarine, won the international Seatrade 'Investment in People' Award in London. The award was in recognition of Lawhill's effectiveness in addressing youth unemployment and poverty in South Africa through providing students with maritime-related skills while they were still at school. More than 300 students have graduated from the programme since its inception and many of them have pursued careers either at sea (cadets or ratings on merchant vessels or in the fishing industry), in the Navy, and in the shipping industry ashore (ships' agents; shipbrokers; clearing & forwarding industry, or bunkering, etc.). On average there are about 25 to 30 matric learners passing through the maritime course at Lawhill each year. Currently there are 134 learners doing maritime studies in Grades 10 - 12. Lawhill has managed to place some of its learners during the course of study on Safmarine containerships, the SA Agulhas and Unicorn Tankers for short voyages as part of its endeavour to increase learner understanding of seafaring. It has been suggested that the Lawhill model be used as a base for replication in other provinces.

The biggest challenge in maritime training at schools is to find experienced teachers to present the courses. For instance, to become a Nautical Science teacher, one needs to be a qualified Navigating Officer. Teachers with navigation qualifications require higher salaries.

6.1.2 Sithengile High School

Sithengile offers a Maritime Economics and Nautical Studies to Grades 10-12. In its drive to ensure an increase in a number of learners who can access employment in the maritime industry, the KwaZulu-Natal (KZN) Department of Education intends to develop Sithengile High School as a fully-fledged maritime centre offering maritime subjects in 2014. The Department has undertaken to also increase the number of maritime schools (which will offer shore and sea-based studies from Grades 8-12) within the province and learners with good Grade 6 Annual National Assessment (ANA) results will be recruited from all primary schools in the province.

As part of its offering, Sithengile has a 9 month part-time sponsored course -'Understanding Shipping' - which also provides the students with an opportunity to visit ships. On completion of the course, learners receive an Understanding Shipping Beginners Certificate. Learners are encouraged to undertake work experience to develop relationships with industry stakeholders and this also provides channels for learners to be absorbed into the industry on completion of secondary school.

The school currently has 131 students enrolled for maritime studies (51 of which are enrolled for both Maritime Economics and Nautical Studies).

6.1.3 New Forest High

New Forest High School is a co-educational government school that is situated in Woodlands, Durban. It was one of the first schools in KZN that introduced Maritime Economics as a subject to Grades 10-12. The subject has been on offer for the past 15 years. As a state school, the school does not receive any financial support for the provision of the subject and has to rely on funding from the industry and a limited amount of school funds. In 2013 the school had a complement of 86 learners in Grades 10-12.

6.1.4 The Moses Kotane Institute - Maritime Educator Professional Development and Continuous Professional Development Programme

The Institute was formed by the KZN Economic Development Department and focuses on development of educators intending to or are teaching Maritime Economics and Nautical Sciences in high schools. The objectives of the programme include:

- Providing an educator development support aimed at improving the teaching standards and content of Maritime Economics and Nautical Sciences in schools offering those subjects.
- Empowering participating schools and teachers with the relevant knowledge of the Maritime Industry in order to produce better informed learners.
- Providing teachers with insights into the commercial aspects of the maritime industry.
- Creating a support mechanism for cluster of educators in order to develop a sustainable Maritime Studies programme in schools.

6.1.5 Conclusion and recommendations – Basic Education

A fundamental tenet of education is that educators must be sufficiently knowledgeable in their subject matter to effectively deliver the content to learners. It is therefore a requirement that educators have appropriate experience of the maritime industry with the relevant subject

matter expertise necessary to deliver the content to the required standard. However, there is a challenge of inadequate supply of qualified maritime educators, which could be addressed by, amongst others, investment in development programmes for teachers and employing retired experts in the maritime field.

There are a number of initiatives underway intended at providing maritime subjects to a range of schools countrywide. In the absence of any formal protocols relating to offering maritime subjects, these initiatives are implemented in an uncoordinated manner and without clear guidelines on curriculum content, selection of educators or content delivery. Individual basic education initiatives have not been supported by any policy or framework and the approach varied depending on who led the initiative which often resulted in varying degrees of success. The recently approved DBE policy on Focus Schools is expected to play a significant role in addressing these issues.

Maritime training at basic education level presents a huge skills development potential and has assisted in awareness creation about the industry. The establishment of a coordinated maritime schools programme will support a number of strategic objectives that include; creating increased awareness of the maritime industry, appropriately channel learners who become interested in the industry, establish a good foundation for further maritime related studies at TVET and higher education level, which in turn should have a positive effect on academic success rates.

The following recommendations are therefore proposed:

- Guidelines for maritime high schools need to be developed and should include issues related to infrastructure (ideally with boarding facilities); human resources (with maritime/seafaring background); curriculum; funding and support; and industry links.
- Ensure that a Maths and Science curriculum aligns with both HET and Industry requirements.
- Increased support for maritime high schools in a coordinated manner that initially builds on current centres of excellence.
- Provide funding assistance to enable resourcing of schools with the necessary subject matter experts.
- Differentiation in respect remuneration for educators specialised in navigation in order to attract them from the shipping industry.
- Increase the delivery capability of the current programmes through technology will enable increased learner numbers without a commensurate increase in educators. This can be achieved by implementing an e-Learning system.
- The model used by the current successful schools needs to be studied for purposes of countrywide implementation.
- Over and above the identified issues, there is a need to adopt a uniform approach to the infrastructure requirements at these schools (e.g. boarding facilities).

6.2 Tertiary Education level

From basic education level, learners have an option of joining the seafaring and non-seafaring skills streams. The non-seafaring streams generally fall within the onshore marine support sector, particularly port operations as well as professional services. The onshore marine support sector employs cargo handling and logistics facilitation skills including stevedoring, ship handling, ship agencies, forwarding and clearing, and customs. There are no public institutions that provide qualifications for these skills and there are only a few private institutions that provide this training. These private institutions are often linked to international institutions which make this training very expensive. The skills for professional services are provided through specialised maritime education programmes at higher education institutions – undergraduate and postgraduate degree studies. **Table 1** below illustrates some of the maritime studies offered by some SA universities.

6.2.1 Table 1 – Maritime studies at SA universities

Course	UKZN	NMMU	UCT	STELLENBOSCH	RHODES	WITS	UWC	NMMU	DUT	CPUT
Maritime Economics	X			X						
Maritime Law	X		X							
Maritime Civil Engineering				X						
Maritime Environmental Sciences		X			X					
Petroleum Geoscience							X			
Petro-Chemical Engineering						X				
Naval Architecture				X						
Marine Resources			X		X			X		
Shipping / Transport									X	X
Marine Tourism								X		
Business Services	X		X					X	X	
Public interest				X				X		

Source: University websites

The seafaring qualifications are broken down into domestic (port operations, coastal and fishing) and international qualifications (regulated by SAMSA in terms of STCW). The seafaring qualification (STCW) is offered by two public institutions in SA, namely, Cape Peninsula University of Technology (CPUT) and Durban University of Technology (DUT) which are discussed below.

6.2.2 Cape Peninsula University of Technology (CPUT)

The Department of Maritime Studies at CPUT offers maritime studies in Engineering and Navigation from S1 to S4 (Semester 1 to Semester 4). **Table 2** below illustrates the number of enrolments at the institution for the period 2009-2013. The total number of students enrolled for maritime studies during this period amounted to 1 193, of which 20% were female. The average annual enrolment was about 239 during this five-year period.

6.2.2.1 Table 2 – Enrolments at CPUT (2009-2013)

	2009			2010			2011			2012			2013		
Qualification Name	**F**	**M**	**TOTAL**	**F**	**M**	**TOTAL**	**F**	**M**	**TOTAL**	**F**	**M**	**TOTAL**	**F**	**M**	**TOTAL**
ND: ENGINEERING: MARINE ENG	13	58	**71**	16	83	**99**	13	76	**89**	14	73	**87**	22	91	**113**
NHD: MARITIME STUDIES[2]	0	14	**14**	1	6	**7**	1	9	**10**	0	6	**6**	0	1	**1**
ND: MARITIME STUDIES	32	113	**145**	41	111	**152**	26	103	**129**	26	91	**117**	28	125	**153**
Total	45	185	**230**	58	200	**258**	40	188	**228**	40	170	**210**	50	217	**267**

Source: Cape Peninsula University of Technology

As illustrated in **Table 3** below, the total number of graduates in Maritime Studies ranged between 30 and 40 during the period under review. The low levels of graduates can be mainly attributed to the fact that after going for workplace integrated learning (cadetship), the majority of the students stay on at sea and do not return to complete their studies.

6.2.2.2 Table 3 – Graduates at CPUT (2009-2013)

QUALIFICATION NAME	2009	2010	2011	2012	2013
ND: ENGINEERING: MECHANICAL: MARINE ENG		3	1	5	9
NHD: MARITIME STUDIES	11	7	7	5	3
ND: MARITIME STUDIES	19	27	26	28	28
Total	**30**	**37**	**34**	**38**	**40**

Source: Cape Peninsula University of Technology

CPUT also hosts a Survival Centre – a practical training centre where sea-going students receive their mandatory safety training. The school offers courses such as safety training, survival training, seaman training, GMDSS, Personal Safety Training (PST), Personal Safety and Social Responsibility (PSSR).

6.2.3 Durban University of Technology (DUT)

DUT offers a two-year National Diploma in Maritime Studies (Navigation) followed by a year of cadetship in the maritime industry. It also offers a two-year Non-Diploma Marine Engineering programme. **Table 4** below illustrates the number of enrolments for the National Diploma in Maritime Studies for the period 2009-2013. The total number of students enrolled for maritime studies during this period amounted to 1 142 of which 34% were female. The average annual enrolment was about 228 during the period under review.

[2] National Higher Diploma has been discontinued.

6.2.3.1 Table 4 - Enrolments at DUT (2009-2013)

	2009			2010			2011			2012			2013		
Qualification Name	**F**	**M**	**TOTAL**	**F**	**M**	**TOTAL**	**F**	**M**	**TOTAL**	**F**	**M**	**TOTAL**	**F**	**M**	**TOTAL**
ND: MARITIME STUDIES	62	117	**179**	64	132	**196**	74	142	**216**	90	175	**265**	97	189	**286**

Source: Durban University of Technology

The total number of graduates in Maritime Studies ranged between 6 and 45 between 2009 and 2012 (**Table 5**)

6.2.3.2 Table 5 – Graduates at DUT (2009-2013)

QUALIFICATION NAME	2009	2010	2011	2012	2013[3]
ND: MARITIME STUDIES	7	6	21	45	0

Source: Durban University of Technology

6.2.4 Technical Vocational Education and Training (TVET) colleges

TVET Colleges currently produce artisan skills, which serve as the base skills required for the maritime manufacturing, vessels construction and repair industry. There are, however, no TVET colleges involved in maritime training beyond the basic production of artisans. There is currently an initiative by SAMSA to assist selected TVET Colleges to start maritime training programmes for Ratings and workshop training of marine engineering students.

6.2.5 SA International Maritime Institute (SAIMI)

Education and skills development are critical to the growth of the maritime sector. According to SAMSA, the needs of the sector are unlikely to be serviced from a single institution or one central point but rather a collaboration of multiple institutions servicing the maritime sector across the major maritime nodes in the country. This would take form of collaboration of industry and other stakeholders; and educational institutions, ranging from schools and colleges to local and international Universities.

The establishment of a co-ordinating entity and a focal point for the tertiary education and research in the sector has been proposed. The SA International Maritime Institute (SAMI), which will form a knowledge base for the maritime sector, will be established to cover a broad range of services including co-ordination and promotion of maritime education through research. The Institute, however, will not be able to play a role in policy formulation but rather service institutions that have this specific responsibility. The Institute will primarily focus on South Africa and Southern Africa, but will have some form of collaboration with the rest of the African continent and international universities mainly at postgraduate level.

According to SAMSA, the proposed functions of the SAIMI will be to:

- Promote the maritime sector as a significant potential contributor to SA GDP;
- Build a national and international brand for maritime education, making South Africa and individual centres known for excellence in selected fields;

[3] 2013 Graduate information not available

- Co-ordination of education in the sector across all levels by adding value to the activities of participating institutions;
- Development and provision of facilities, including equipment, for shared use by educational programmes and institutions to attract research projects that will develop collaboration, knowledge and resource sharing;
- Become the knowledge base for the maritime sector with the expertise of specialists located in participating institutions;
- Promote the integrity, reputation and recognition of the maritime sector within the higher education community and society at large;
- Advance postgraduate and undergraduate scholarships through a variety of innovations, including collaborative supervision of doctoral students by two or more universities, which could include South African universities collaborating with universities outside South Africa;

The Institute will be based at the Nelson Mandela Metropolitan University (NMMU) and is expected to be launched by the end of 2014.

6.2.6 Conclusion and Recommendations – Tertiary Education

Capacity to produce seafarers at higher education level in SA is too low. Both CPUT and DUT enrol on average about 478 students per annum and SA needs to produce about 720 Officers and 1 200 Ratings per year to meet the target of 12 000 seafarers by 2019. The low rate of production is mainly due to, amongst others:

- Lack of qualified lecturers;
- Unavailability of lecturing space; and
- Funding for simulation and laboratory facilities.

There is currently an initiative to provide seafarer training at NMMU in the Eastern Cape to increase the throughput rate of seafarers. There is a myriad of institutions that offer various maritime studies for seafarers and non-seafarers, however, there is very little coordination between the institutions resulting in ineffective maritime higher education and training. The proposed establishment of SAIMI is intended to coordinate planning and provision maritime training at higher education level.

6.3 Private Education and Training

In addition to the academic aspects of maritime training, there is mandatory safety training which is currently offered by private training institutions. These are predominantly safety and medical related courses. There are about 55 private institutions that offer maritime related training in SA. Some of courses offered at these institutions include, amongst others, medical training; safety training; survival training; seamanship training; tanker training; Global Maritime Distress Safety System (GMDSS); navigation courses; STCW revalidation courses; radio operating training; motorman training; skipper training; rigging and slinging training; Marine Pilot and Tug Master training; and accelerated Deck and Engine cadet training programmes. The cadet training is discussed in detail below.

6.3.1 Cadet training

In order to qualify as a seafarer, one is required to have practical training (sea-time) obtained on a sea-going commercial vessel. This is typically obtained from trading vessels that are registered in any particular country. Historically, the SA fleet operated mainly by Safmarine and Unicorn provided all the cadetship requirements for the country. With the demise of the SA flagged ships there was a huge challenge in securing cadetship berths for SA seafarers.

SA does not have its own ships, and foreign shipping companies have no obligation to take on SA cadets which continues to affect trainees' ability to obtain the requisite sea-time and hence their ability to qualify as seafarers. Transnet has always had a seafarer training programme for their own requirements wherein they would pay international shipping companies to take on SA cadets. SAMSA does the same – pays foreign shipping companies to train cadets.

Out of the total number of cadets that were trained, only a few were absorbed by industry. In light of this, SAMSA initiated a national cadetship programme with the intention of sourcing cadetship berths for SA cadets; however, not all of those waiting for berths were absorbed due the slow rate of securing companies that were willing to take SA cadets[4]. SAMSA also acquired the SA Agulhas[5] in order to address this challenge; however, the vessel is not a cargo-carrying vessel and thus cannot provide for the full requirements in order to qualify. Consequently cadets undergo some of their sea-time training on this vessel before transferring to companies that participate in the national cadet project to obtain the balance of their sea time. SAMSA pays these companies to take on these cadets. Once they qualify, most companies recruit these cadets.

Cadet training is very costly. **Table 6** and **7** below depict the typical cadet training costs. Costs vary between companies and may be higher or lower (about 10% variance) than these. This is a representative indication of costs per budget category.

6.3.1.1 Table 6 – Cost of training a Deck Cadet

Cost item	Amount
Training admin fees	R12 000
Cadet allowances	R36 000
Course fees	R61 577
Uniform and safety gear	R5 000
Airfare/Visas/Agency cost	R22 500
Accommodation and meals	R46 450
Local travel/ transport	R10 950
Medical costs	R8 570
Virtual recoveries	R12 750
Miscellaneous	R 400
Total	**R216 197**

Source: SAMTRA

[4] Shipping companies have an obligation to provide berths for nationality of where the ship is registered or as directed by the country of registry.

[5] The SA Agulhas consists of high-tech classrooms, with full-time lecturers on board. The vessel can accommodate up to 90 cadets who are rotated every 3-4 months.

6.3.1.2 Table 7 – Cost of training an Engineer Cadet

Cost item	Amount
Admin fees	R29 000
Cadet allowances	R54 000
Course fees	R102 915
Uniform and safety gear	R8 500
Airfare/Visas/Agency cost	R47 300
Accommodation and meals	R85 090
Local travel/ transport	R500
Medical costs	R6 850
Virtual recoveries	R36 450
Miscellaneous	R2 750
Total	**R373 355**

Source: SAMTRA

Engineer Cadet course fees mostly comprise the costs for Workshops Training, which is a requirement for qualification. These costs could be reduced if DHET could include delivery of this training into industry standards, alternatively ensuring well-resourced workshop facilities in the training institutions, which is currently not the case.

The management and administration of the cadetship programmes (NCP) by SAMSA is provided by SA Maritime Training Academy (SAMTRA) and Marine Crew Services (MCS). The management services include sourcing of the cadetship as well the marketing of SA seafarers. These management services are also provided to clients from West Africa. Since the inception of the National Cadet Programme in 2011, SAMTRA and MCS have trained about 414 cadets (as at end December 2013).

6.3.2 Training of Ratings

Ratings have been identified as an area that could contribute to job creation and provide access to the maritime industry due to lower qualification requirements. Ratings include Able Seaman, Ordinary Seaman, Oilers, Wipers, Motorman, Pumpman, Cooks, Stewards, Messman, Fitters, and Welders. However, very little emphasis has been placed on the training of Ratings and the number of South African Ratings presently in employment has declined over the years. A typical complement of a vessel requires more Ratings on board than Officers (typically a ratio of 1:4). The training of Ratings is shorter in duration than that of Officers and thus less expensive.

Ratings are mainly classified into two categories, namely, Ordinary Seaman and Able Seaman. One first qualifies as an Ordinary Seaman and then becomes an Able Seaman after fulfilling further skills development requirements. The qualification process of Ratings entails the following:

- ***Ordinary Seaman (Deck or Engine)***

  The preliminary courses that an Ordinary Seaman has to complete include First Aid, Survival, Firefighting, Medical, Security, and PSSR. About 2-6 months of sea-service training and a training Record Book is required. On completion, a candidate obtains a Certificate of Proficiency.

- ***Able Seaman (Deck or Engine)***

  The preliminary training for an Able Seaman includes Proficiency in Survival Craft (PISC) and an Able Seaman course which takes about 2 weeks. For a Deck Rating, 6-12 months of sea-service training is required (6 months - accelerated training; 12 months – ordinary training). For an Engine Rating, 12 to 18 months sea-service training and the 2nd Half of Training Record Book is required (12 months- accelerated training; 18 months – ordinary training).

The minimum age required is 16 years for an Ordinary Seaman and 18 years for an Able Seaman. A person can be employable from Ordinary Seaman level but some companies prefer those at Able Seaman level.

A MSSTTT workshop held with some of the employers[6] of ratings in the industry identified a number of challenges with the employment of Ratings. These included:

- There is a shortage of ratings to meet the current demand due to a lack of production initiatives (e.g. similar initiatives to cadet programmes which employers can tap into). Currently most programmes are employer initiated. Maersk Offshore moved from manning 19 to 7 vessels with SA Ratings due to limited supply.
- The Collective Bargaining Agreement (CBA) is only specific to Singaporean registered vessels and does not recognise a SA seafarer. It categorises SA seafarers as UK seafarers which makes them too expensive in terms of UK seafarer rates. As a result Maersk (commercial fleet) cut down their production of ratings in 2010 in favour of Indian and other Far Eastern Countries due to issues relating to the cost of the CBA.
- There have been instances of lack of discipline of SA ratings.
- Tax issues in the coastal trade affect the cost of employment. Seafarers employed on coastal trade do not enjoy the tax-free benefit that seafarers on ships trading internationally receive. This results in a cost disadvantage for local companies competing for coastal business. The ratings are typically on a 25 – 30% tax bracket, which becomes the cost disadvantage both for the employers and employees who have an option to work on a tax free offshore regime.
- The source of Ratings for shipping companies in Philippines is drying up due to the decline in the quality of seafarers as well as the considerable increase in cost of those seafarers. This means that there will be more shortages in the number of their Ratings produced internationally and offers South Africa a window of opportunity in this regard.
- There is no public institution that offers training for Ratings. There are about 55 private training institutions in the country, with a challenge of varying quality standards driven by commercial pressures.
- There were sufficient training providers in Cape Town, but not enough spread throughout the country. This leaves the candidates with long distances to travel to attend courses thus incurring travel and lodging costs.

[6] Maersk, Smit, Transnet, Unicorn

There are a number of initiatives aimed at increasing the number of Ratings in the industry (**Table 8**).

6.3.2.1 Table 8 – Initiatives to increase the number of Ratings in SA

Initiative	Description
SAMSA/DHET/TVET Colleges initiative	• Partnership between DHET and SAMSA to develop a Hybrid Integrated Programme that will bring private providers and TVET colleges together to provide training • 12 TVET Colleges identified by DHET, but only 5 had the capability to kick-off • To work with TETA and QTCO to recognise the Ratings qualification. • Training will be twofold – training at the TVET College and sea-time training. • Approach – bring in the unemployed from TVET colleges (at N2 level), that have a proper maths qualification (not Maths literacy) not necessarily with high scores, and train them as ordinary seafarers. • At the end of the programme candidates get a Certificate of Proficiency as Able Seamen (Engine).
Transnet (Port Operations Training)	100 intakes annually for the next 3 years.
Maersk programme	To train and employ 20-25 ordinary seafarers per year in partnership with SAMSA/SAMTRA for sea-time training (mainly Deck, Engine, Catering)
Klaveness programme	To train 12 Ratings per year
Smit Amandla Marine	To train and employ 10-12 candidates per year (taken "off the street"
Unicorn	• Supports SAMSA/SAMTRA ratings training scheme by selecting 5 to 10 deck/Engine trainees per year. • +/-8 trainees per year (taken directly from colleges/schools/"off the street")

6.3.3 Conclusion and Recommendations – Private education and training

There is very limited public institution capacity to provide mandatory courses required as part of training of seafarers. This training is only offered at the Cape Peninsula University of Technology's Survival Centre. Although there is a proliferation of private institutions offering this training, there is no even distribution of this capacity countrywide resulting, in this training taking longer to complete, thus delaying the qualification of the seafarers.

The lack of SA registered vessels will continue to affect all the training efforts in that the seatime, which is the most critical part of the training of seafarers. The following recommendations in respect of Ratings training are listed below:

- There should be a National Ratings Programme which the industry can tap into; along the same lines as the National Cadetship Program.
- The selection standards / criteria for Ratings need to be revisited in respect of the quality of the rating to ensure success of training;
- The capacity of training institutions should be increased, in order to ensure an even spread of training facilities. Such training should be available in public training institutions and the quality of training needs to be maintained (there should be collaboration between public and private institutions);
- An employer body/forum for lobbying purposes and to also deal with the challenges relating to employment of Ratings should be considered.
- The model of management and administration of the NCP by dedicated agencies has been very effective; however more efforts need to be put on the promotion of SA Seafarer training in order to attract more international companies to employ SA seafarers.

6.4 Number of seafarers in South Africa

Seafarers are categorised as Officers (skilled and operate at Operations and Management level in the vessel) and Ratings (semi-skilled, support or general worker level). The former comprise of Navigating, Engineering and Communications/Electro-tech Officers and the latter is made up of Deck, Engineer and Catering Ratings.

6.4.1 The number entry level officers SA

Table 9 below depicts the number of certified seafarers in SA. According to SAMSA, there were about 414 new seafarers certified (Officer of the Watch) between 2008 and 2013 – about 60% of this amount were Deck Officers.

6.4.1.1 Table 9 – Number of qualifying officers

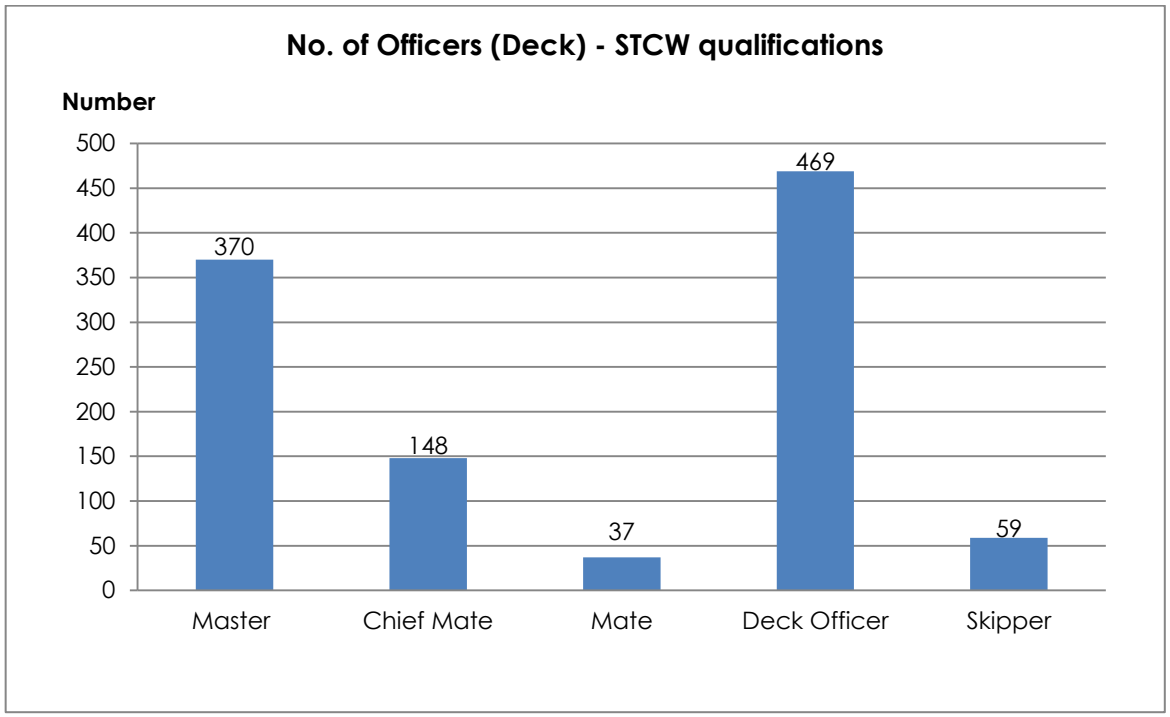
Period	Deck Officers	Engineers	Total
2008	38	26	**64**
2009	25	29	**54**
2010	31	18	**49**
2011	45	19	**64**
2012	54	43	**97**
2013	56	30	**86**
Total	**249**	**165**	**414**

Source: SAMSA

6.4.2 Number of Officers with STCW qualifications

The number of SA Officers with STCW qualifications as at end June 2014 is depicted in **Figure 3** and **Figure 4** below. There are currently about 1 926 Officers with STCW qualifications. Occupations on Deck represented about 56% of this amount. The largest number of Officers fell within the Deck Officer category at 469. This is the entry level qualification and is largely populated by Black people (59%) (**Figure 5**). The next big category was that of a Master at 370, which is the most senior occupation level within Deck occupations. This category is largely made up of Whites at 88%. The Chief Mate level is an intermediate category to which Deck officers progress from entry level upon meeting the training criteria as well as sea-time requirements. This figure is much lower due (148) to the fact that the training programmes at the Deck Officer level are only starting to gain traction and those newly qualified Deck Officers are yet to progress to the Chief Mate level.

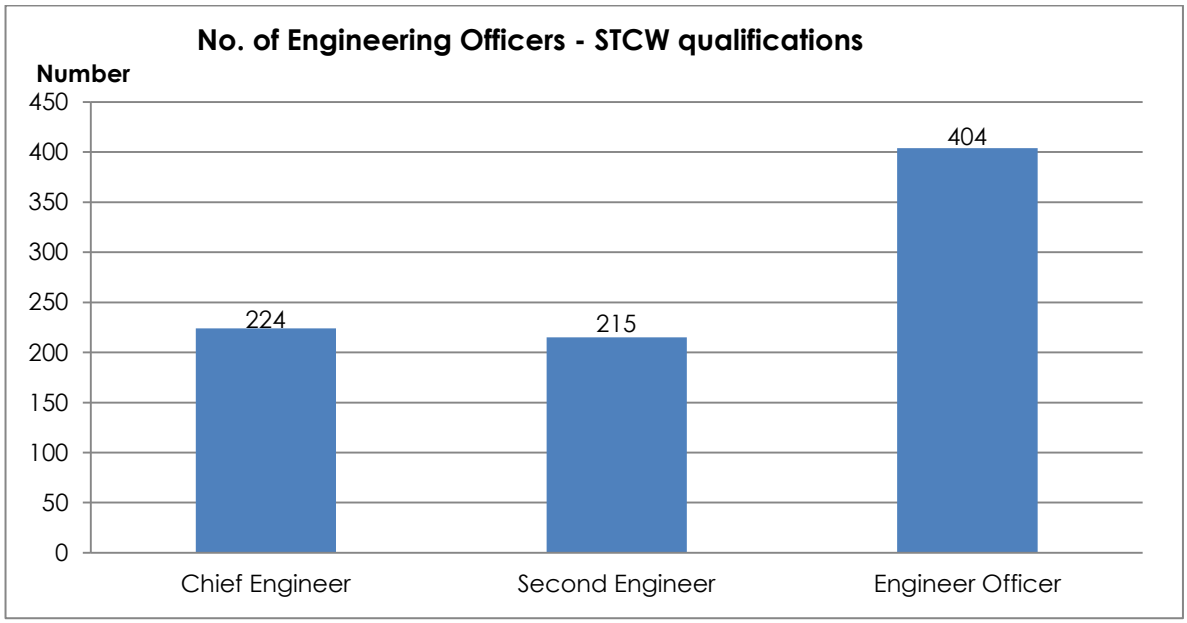
6.4.2.1 Figure 3 – No. of Officers (Deck): STCW qualifications



Source: SAMSA

Of the total number of officers, engineering officers represented about 44%. The largest category within engineering was that of an Engineer Officer (404) – the lowest occupation level within the engineering category. The most senior occupation is that of a Chief Engineer, with 224 officers recorded at the end of June 2014 and is largely composed of White people at 86% (**Figure 5**). The majority of Blacks fell within the Engineer Officer category at 57%.

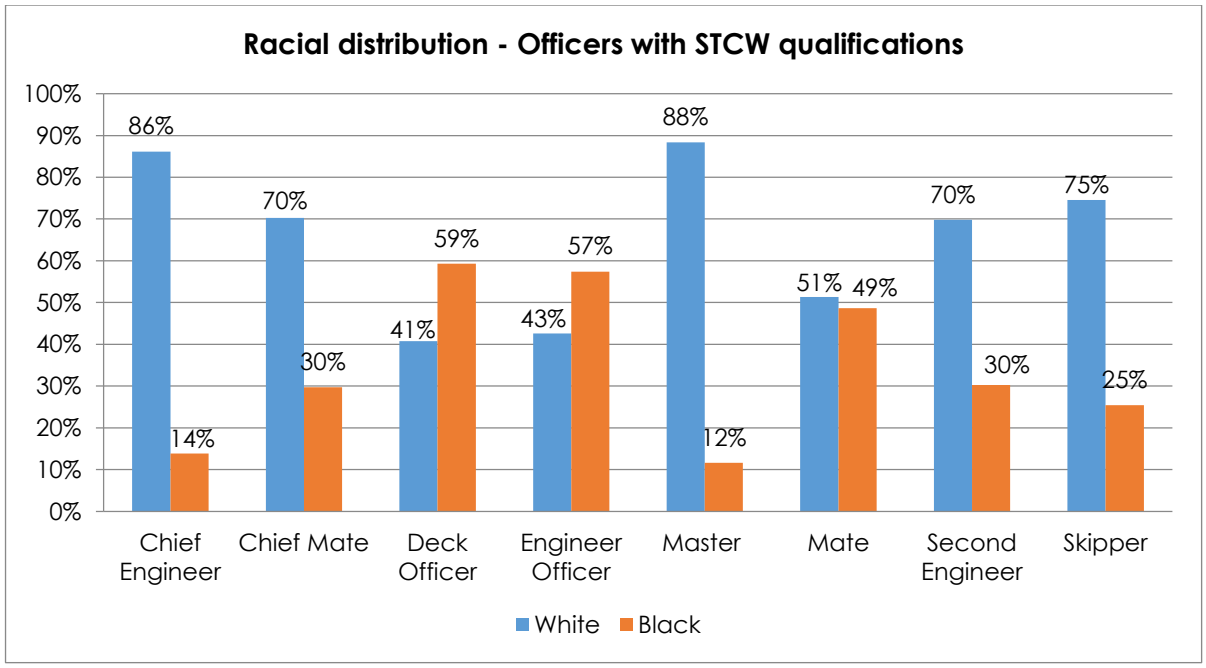
6.4.2.2 *Figure 4 – No. of Engineering Officers: STCW qualifications*



Source: SAMSA

As illustrated in **Figure 5** below, the senior officer positions within the maritime industry are largely dominated by White people. This emphasises the need to expedite skills development programmes to ensure transformation within the industry.

6.4.2.3 *Figure 5 – Racial distribution: Officers with STCW qualifications*

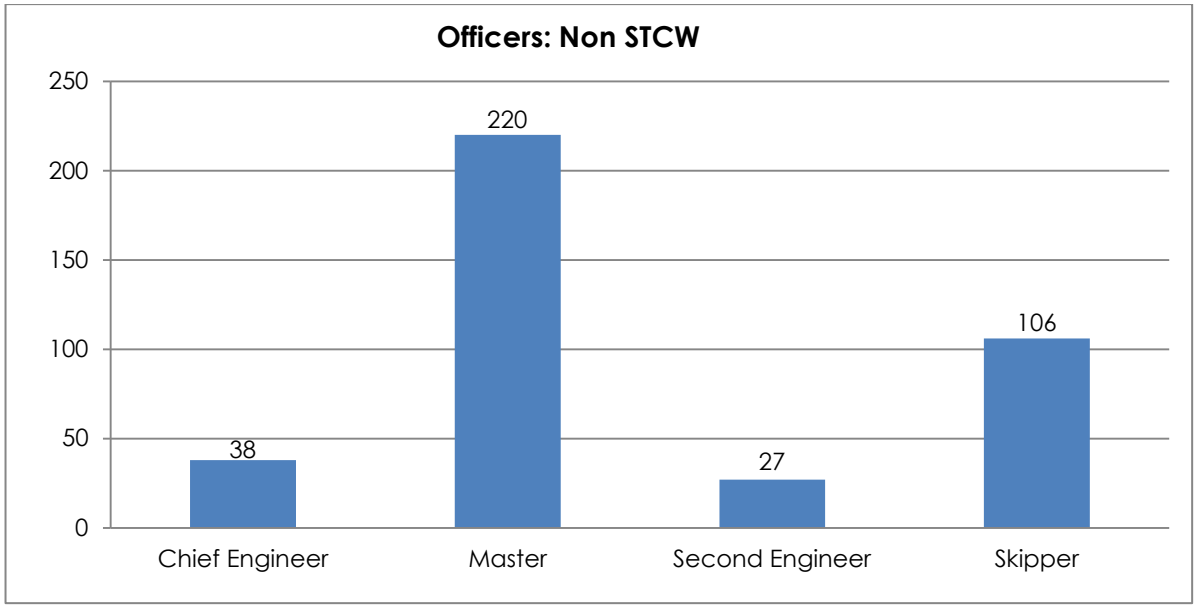


Source: SAMSA

6.4.3 Officers with Non-STCW qualifications

The total number of officers with Non-STCW qualifications amounted to 391 (**Figure 6**). The largest category was that of a Master at 220 and is largely composed of Black people at 70%. This brings the total number of Officers (STCW and Non-STCW) to 2 317.

6.4.3.1 *Figure 6 - Officers with Non-STCW qualifications*

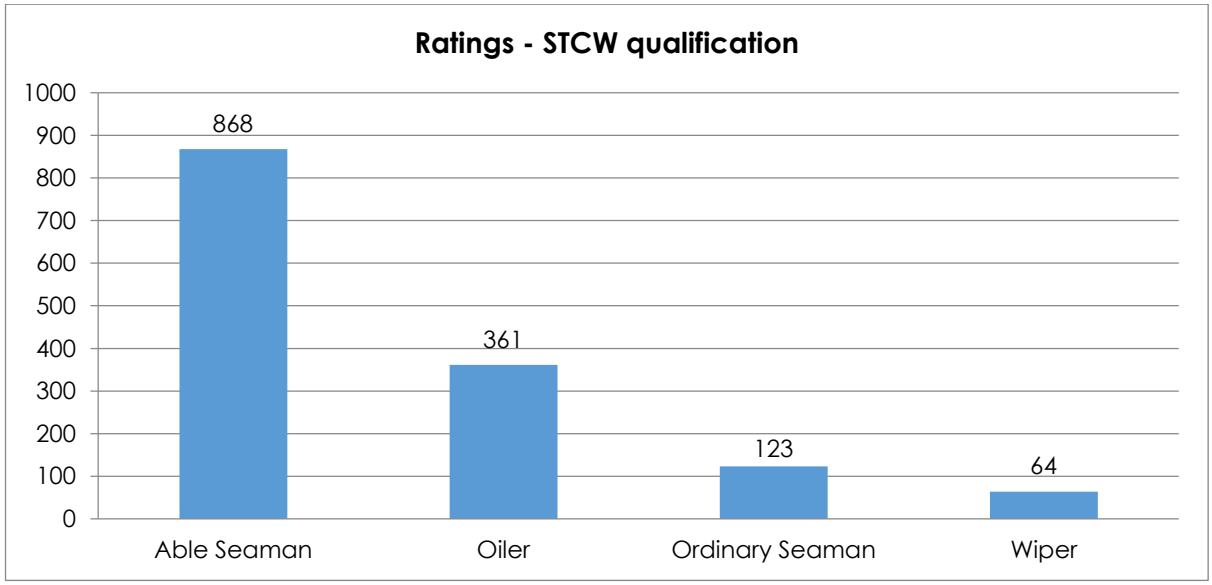


Source: SAMSA

6.4.4 Ratings with STCW Qualifications

As depicted in **Figure 7** below there are currently about 1 416 Ratings with STCW qualifications. The bulk of these Ratings were Able Seamen at 868. The majority of the ratings were Black people at around 80%.

6.4.4.1 *Figure 7 – Number of Ratings with STCW qualification*

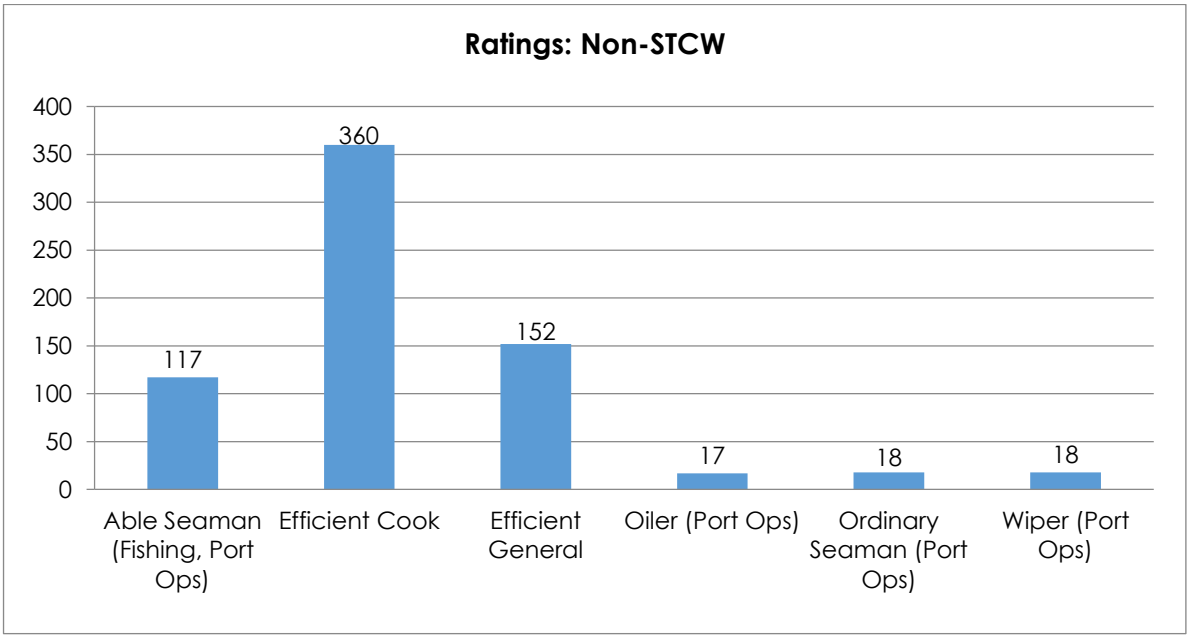


Source: SAMSA

6.4.5 Ratings with Non-STCW qualifications

The total number of Ratings with Non- STCW qualifications was 682 (**Figure 8**). This brings the total number of Ratings (STCW and Non-STCW) to 2 098.

6.4.5.1 *Figure 8 - Ratings with Non-STCW qualifications*



Source: SAMSA

6.4.6 Conclusion and Recommendations – Seafarers in SA

Historically, the training of seafarers for foreign-going vessels was predominantly undertaken for the manning of national flagged vessels. Since the demise of the South African flagged fleet, seafarer training was mainly discontinued with the exception of a small number of Officer Cadets in order to meet port operations requirements. It is pleasing to note that through the recent capacity building programmes and support of Transnet, SAMSA and other industry players; officer cadet training has increased substantially to support both local and international employment requirements.

Seafarer training is costly and funding should be made available to support the training of seafarers. In the case of countries such as the Philippines, seafarer training is subsidised by government, and the country earns its highest foreign revenue through the export of its seafarer skills. The Philippines, through its various marine training schools, produces thousands of qualified seafarers annually for employment in the international market (Philippines provides about 60% of 1,5 million seafarers employed in international shipping). South Africa produces only a few as illustrated above.

Given the number of ships trading within our waters, an opportunity exists for South Africa to also supply trained and competitively priced seafarers in large numbers to foreign fleets. To assist in addressing and overcoming the challenges, South Africa needs to establish a dedicated crewing and training unit to actively campaign overseas for training berths on different classes of vessels with various ship owners for the requisite on-board training phase. Furthermore, skills development programmes need to be expedited to ensure transformation within the maritime industry.

7. Demand for skills within the maritime industry

7.1 Employment within the maritime sector

South Africa has a vibrant maritime industry that offers a lot of opportunity. The main activities are in the Ports and Logistics subsector, based in the eight commercial ports, and the fishing industry. There is a fair amount of ship building and repair albeit on the decline. There is a growing Oil and Gas industry that mainly comprises of construction and maintenance of offshore structures, logistics parks as well as the actual exploration industry.

There is a huge potential for the marine tourism industry which is largely underdeveloped. South Africa's potential opportunities are predominantly offered by the passing shipping traffic, the export of maritime skills as well as providing alternative destination for services, particularly for the oil and gas repair market off the east and west coasts of Africa. The passing traffic offers a lot of opportunity for the Bunkering Industry, which in turn attracts a lot of other services, supply of spares and repair services, crew changes, etc.

Table 10 below depicts the kind of the employment opportunities (not an exhaustive list) within the maritime industry:

7.1.1 Table 10 – Type of skills within various maritime subsectors

Port Industry (Deals with the Ship and Actual Handling of Cargo)	
Industry	**Typical Skills**
Cargo Handling and Storage	Stevedoring, Cold Storage Operators
Terminal Operations	Cargo Handling Equipment operators, terminal management
Marine Services	Vessel Traffic Services, Marine Pilots, Tug Masters, Engineers, Ratings, Berthing Masters, Berthing Shorehands
Bunkering Services	Barge Masters, Engineers, Ratings
Freight and Logistics (Services Supporting the importation/Export of Cargo)	
Industry	**Typical Skills**
Freight forwarding	International trade and logistics
Clearing and forwarding	Customs clearance, international trade
Logistics, Warehousing and Storage	Logistics management
Vessel Operations (Management and Crewing and Facilitation)	
Industry	**Typical Skills**
Vessel Management and Crewing	Vessel Manager, Crewing Manager, Ship Superintendent,
Vessel Planning	Vessel planner
Ship chartering	Maritime Economics, international trade
Vessel Operational Support	
Industry	**Typical Skills**
Ship Repair and Maintenance	Dockmaster, Boilermaker, Welder, Millwright,
Vessel Bunkering	Bunker trading, bunker handling
Vessel Agency	Ship agency
Stores and Victualing supplies (Ship chandelling)	Stores management

Source: SAMSA

A study conducted by the Department of Environmental Affairs (DEA) in 2013 on the economic potential of South Africa's oceans found that jobs linked to the ocean economy could rise to between 800 000 and 1 000 000 by 2033, more than double the level recorded in 2010 (316 000). The findings led to launch of the ocean economy leg of Operation Phakisa (Box 1 below). The study identified four potential new growth areas that were currently creating little or no contribution to GDP due to the related industries being either underdeveloped or emerging. These include Marine Transport and Manufacturing; Offshore Oil and Gas exploration; Aquaculture; and Marine protection services and ocean governance. These growth areas present new economic potential in respect of contribution to GDP and job creation as it is estimated that they could contribute to about 76% (of the ocean economy contribution) to GDP and 95% towards job creation by 2033. Growth and job creation for the ocean economy is currently driven by eight sectors (with the four sectors referred to about being the new potential growth areas). **Table 11** below depicts estimated growth and job creation in those eight sectors (2010-2033).

7.1.2 Table 11- Projected growth and job creation within the maritime sector

Sector	**GDP growth (R'bn)**		**Job creation ('000)**	
	2010	**2033**	**2010**	**2033**
Marine transport and manufacturing	***16***	***42-61***	***15***	***40-56***
Tourism	15	25-35	90	150-225
Offshore oil and gas	***4***	***11-17***	***0.4***	***0.8-1.2***
Construction	***8***	***20-21***	***162***	***390-407***
Renewable energy	0	14-17	0	0.9-1.1
Fisheries and aquaculture	***7***	***10-16***	***30***	***170-250***
Communication	4	7-10	19	32-52
Desalination	0	0.1-0.1	0	1.6-1.6
Total	**54**	**129-177**	**316**	**788-1 004**

Source: Department of Environmental Affairs

Marine transport and manufacturing is expected to be the largest contributor to economic growth and job creation. It is estimated that Marine transport could contribute R20 billion to R25 billion to GDP and 18,000 jobs b 2033, primarily driven by growth in cargo handling, with container volumes projected to increase by 6% per annum. Furthermore, the creation of the national ship registry is expected to contribute further to the growth of this sector. Marine manufacturing is expected to contribute between R22 billion and R36 billion to GDP and 22,000 to 38,000 jobs in 2033, mainly driven by repairs and refurbishment that could contribute about a 6% growth in both GDP and job creation. **Table 12** below provides detail on the contribution by the marine transport and manufacturing sector.

7.1.3 Table 12 - Projected growth and job creation for Marine Transport and Marine Manufacturing

	GDP growth (R'bn)		**Job creation ('000)**	
Marine transport	**2010**	**2033**	**2010**	**2033**
• Cargo handling	5	16-19	7	14
• Sea and coastal water transport	2	2	3	3
• Supporting transport activities	1-2	2-4	0	1

Marine manufacturing	2010	2033	2010	2033
• Repair and refurbishment	4	15-21	4	15-21
• Boat building	2	4-7	1	3-5
• Ship and offshore vessels construction	1	2-5	1	3-10
• Marine equipment manufacturing	0	1-3	0	1-2

Source: Department of Environmental Affairs

Box 1. Operation Phakisa

The Department of Environmental Affairs conducted a study in 2013 on the economic potential of ocean economy. The study found that the maritime industry had a potential to make a contribution of between R129 billion and R177 billion to GDP by 2033, from a level of R54 billion in 2010. This would result in a creation of between 800 000 and 1 000 000 jobs by 2033 from 316 000 in 2010.

As a result of the significant contribution that the maritime industry is likely to have on economic growth and job creation, the Cabinet approved the development of a 5 to 10 year strategic plan aimed at unlocking the growth in the identified new growth areas. To implement the Cabinet decision, the President of SA introduced 'Operation Phakisa' in June 2014 to unlock growth and delivery in the ocean economy. Operation Phakisa is aimed at fast-tracking the delivery of the priorities that have been outlined in the National Development Plan and is based on the Big Fast Results methodology adopted by the Malaysian government.

The initiative kicked off in July 2014 with a gathering of relevant stakeholders in "laboratories" for planning and target setting in four new growth areas that had been identified by the DEA study. These include Marine Transport and Manufacturing; Offshore Oil and Gas exploration; Aquaculture; and Marine protection services and ocean governance.

The focus areas for discussions in the four Labs were:

(a) How to increase growth in the maritime transport and manufacturing sector over the next 5 years in order to increase the contribution to GDP by the sector to between R14 billion and R23 billion and thus increase the number of jobs to 40 000-50 000?

(b) How to unlock the value of South Africa's offshore oil and gas potential through exploration (40 new exploration wells in the next ten years with several discoveries?) and production (3-5 projects under development with "first-oil" in 1 or 2 years?)

(c) How can South Africa's aquaculture sector develop new and existing farms to achieve a collective potential value of R1.5 billion and create approximately 5 500 direct jobs?

(d) How a plan can be implemented to engage all ocean stakeholders to develop an integrated approach to planning, execution and monitoring in the oceans space, and establish a mechanism to jointly ensure effective governance and enforcement of that approach within a year?

The outcomes of the Labs in respect of skills capacity building include:

(a) Training 2550 TVET College graduates on 18-month workplace-based experiential learner programme in scarce and critical trades over 5-year period;

(b) Creating dedicated occupational teams (professionals, trades, operators and seafarers);

(c) Establishing trade Recognition of Prior Learning (RPL), Competency Based Modular Training (CBMT) or Centres of Specialisation in Saldanha Bay and Richards Bay to produce required skills;

(d) Training 20 722 learners as artisans, semi-skilled workers and professionals over 5-year period;

(e) Increasing usage of Employment Services of South Africa system (ESSA) and targeted career awareness services as recruitment tools;

(f) Increasing capacity to develop skills – 1200 Ratings and 700 Officers per year;

(g) Sourcing funding to implement identified skills capacity building initiatives.

7.2 Protection of seafarers

Seafarers are employed in terms of Merchant Shipping Act which is excluded in the Labour Relations Act. They are also covered in terms of the Maritime Labour Convention (an International Labour Organistion convention, which SA is signatory of) which is enforced internationally by ITF (SATAWU in SA) as well as by Maritime Administrators (SAMSA in SA) during Port State Inspections. Furthermore, an initiative of ensuring that there is a seafarer desk in predetermined SA embassies abroad will assist in supporting seafarers wherever they may be working internationally. SAMSA also becomes involved in cases of dispute resolutions involving SA seafarers in different jurisdictions.

7.3 Conclusion and recommendations – demand for skills

Employment opportunities within the maritime sector are vast and the sector is expected to generate between R129 billion and R177 billion in GDP contribution by 2033, thus creating between 800 000 and 1 000 000 jobs. However, the supply-side constraints need to be addressed to achieve these goals. According to the DEA study the current demand for seafarers is between 20 000 and 31 000 (globally about 250 000) and SA currently has about 3 500 seafarers. It is estimated that it will take between 6-10 years (assuming production of 720 officers and 1200 ratings graduates a year) to close this gap. In addition, on-the-job training costs between R200 000 and R380 000 (Deck and Engine qualifications) per candidate. Skills development initiatives need to be expedited and partnerships formed to invest into those training programmes.

8. Skills development initiatives within the maritime sector

The different kinds of skills development initiatives within the SA maritime sector will be discussed below. This however is not an exhaustive list, only initiatives from those players that were consulted will be presented.

8.1 Transnet

8.1.1 The Cadet Programme

Over the years TNPA has made a steady progress in marine skills development. To date, a total of 525 cadets have been successfully trained in various marine fields; there are more female cadets being groomed in marine services; 51 Pilots, 70 Tug Masters, and 70 Vessel Traffic Service

Officers have been appointed in the past 5 years. Furthermore, 8 Female Managers and 19 Male Managers participated in Leadership Development Training through APEC Institution in Belgium.

The Transnet Maritime School of Excellence offers 4 maritime programmes, namely, the Marine Cadet Programme (Deck), Marine Cadet Programme (Engineering), Cargo Coordinators programme, and the Lifting Operators programme. The structure of these programmes is detailed in the **Table 13** below.

8.1.1.1 Table 13 – Structure of maritime skills development programmes (Transnet)

Programme	Number of students per intake	Duration	Programme Outcome	Intakes per year
Marine Cadet Programme (Deck)	14	30 months	Deck Officer (STCW) certificate of pass	One intake per annum
Marine Cadet Programme (Engineering)	29	40 months	Engineer officer (STCW) certificate of pass	One intake per annum
Cargo Coordinators programme	25	9 Months	Certificated operators for applicable machinery	One intake per annum
Lifting Operators programme	75	9 Months	Qualified cargo-coordinators	One intake per annum

Source: Transnet

8.2 The Department of Trade and Industry (dti) initiatives

8.2.1 Ports study

The dti commissioned research in 2013/14 in order to identify restrictions in South African ports that are hindering the expansion of ship building and repairing, oil & gas related activities, and similar types of work. The objectives of the study were to:

- Identify the key elements of a comprehensive investment promotion strategy for port-related industry, focusing on the offshore oil and gas, and ship building and repair sectors, including a review of best international practice;
- Find ways of aligning TNPA's business planning processes with the dti's investment promotion objectives;
- Recommend changes to TNPA's approach to tariff setting which would encourage the development of port-related industries without compromising TNPA's financial sustainability;
- Improve the efficiency and effectiveness of TNPA's tenant procurement process

The study was commissioned under the auspices of the Task Team that was formed between Transnet National Ports Authority (TNPA), Department of Public Enterprise (DPE) and DTI in 2012. The recommendations of the study will be used to further inform the development of initiatives within the shipbuilding/repair and oil and gas sector.

8.2.2 Boatbuilding and associated services

Under boatbuilding the dti has prioritised the following, amongst others:

- Designation of working vessels for local procurement. The research on this area has been finalised and approved by the Designation Advisory Panel.
- Establishment of a centrally funded and centralised demand-led skills programme.
- Development of the financial incentive for exporters housed in the Industrial Development Corporation. The scheme was established in 2012 and expires at the end of 2013/14 financial year
- In 2014/15 the dti will explore the feasibility of establishing a ship/ boat building and repair cluster.
- Facilitating compliance with international standards for quality, safety and environment.

8.3 SAMSA

8.3.1 National Cadetship Programme (NCP)

This programme was launched in 2011 to enable students to undergo on the job training before qualifying. These cadets have been placed on international shipping lines and the SA Agulhas. Negotiations with shipping lines operating in South Africa and some linkages with SA Embassies have been established to facilitate partnership with foreign shipping lines. About 414 cadets have been trained since inception of the NCP programme. Before the launch of the NCP, SAMSA had trained about 102 cadets. SAMSA has therefore trained about 516 cadets in total. It has been reported that there has been a 90% employment success ratio for the cadets. SAMSA has placed over 500 cadets on world fleet through the Cadet Placement Programme.

8.3.2 The Conversion Programme

The aim of the project is to convert unemployed mechanical engineering graduates into marine engineers. This would assist in increasing the production of seafarers thus reducing the pressure on existing universities of technology. The students spend 6 months at a university of technology and then are eligible to start their cadetship training.

8.3.3 Subvention of salaries for lecturers

It is expensive to attract qualified lecturing staff, with seafarer qualifications (who come from a tax free environment) to teach under employment conditions of the universities. To address this challenge the subvention programme was introduced which was aimed at attracting appropriately qualified lecturers to work at DUT and CPUT.

8.3.4 Maritime Awareness Programmes

SAMSA's maritime awareness programmes include:

- National Maritime Careers Expo and Job Summit

- Provincial Careers Expo and Job Summit;
- Open Days, Media Platforms and Careers Clinics;
- Maritime Industry Focus Weeks; and
- South Africa Maritime Industry Conference

8.3.5 The High School Programme

SAMSA plans to have 10 new maritime high schools as feeders to institutions of higher learning. Currently there is one model maritime high school (Lawhill Maritime Centre in Simon's Town) which can be replicated in other provinces.

8.3.6 Empowerment of TVET Colleges

Currently private providers offer programmes that are costly and not accessible to majority of South Africans. A total of 12 Colleges will be piloted to offer maritime education and training programmes. The aim is to initially train 500 artisans and place them in respective industries. Curriculum development in partnership with the Department of Higher Education and Training (DHET) is in progress.

8.3.7 Universities and Universities of Technology

An on-going project to increase capacity for the production of cadets to at least 1 200 per year is in progress (currently both Durban University of Technology and Cape Peninsula University of Technology produce 478 cadets on average each per year). SAMSA plans to have regional engagement with universities to ensure articulation with TVET colleges and alignment with industry needs. Furthermore, the creation of a Regional Maritime Institute to coordinate maritime education and training, and research is in progress.

SAMSA has also forged a partnership with the UN World Maritime University to enhance knowledge and skills in the maritime sector. Currently 23 candidates were awarded MSc Fellowship scholarships and 4 were awarded with PHD scholarships. According to the agreement with UN WMU, SA will send about 20 students annually for the next 5 years.

8.3.8 Bursary Programme

This programme was piloted in the Eastern Cape and the plan is to extend the pilot to other provinces. The programme currently offers bursaries to the Lawhill Maritime Centre, CPUT and DUT. For Lawhill Maritime Centre, SAMSA will fund 23 students at a cost of about R868 320 in 2014. For CPUT and DUT, 20 students will be provided with bursaries at a cost of about R1 592 400 in 2014.

8.4 South African Oil & Gas Alliance

The South African Oil & Gas Alliance (SAOGA) focusses on promoting the upstream and midstream sectors of the oil and gas value chain, primarily in South Africa and regionally. It operates as a partnership between the public and private sectors – it receives public funding to carry out a range of industry development activities and aims to promote the interests of members.

SAOGA has a number of skills development initiatives and these include, amongst others**:**

- **The SAOGA Oil and Gas Academy –** launched in August 2014, the Academy aims to foster a coherent approach to skills development and promoting career development and training provision in the ship/rig repair and upstream/complementary Midstream Oil and Gas industries. It will specifically add value to the TVET College, Higher Education, Industry and private training provider sectors, but will seek more generally to provide information to the schooling sector and communities as well.
- **Improving the preparedness of industry for receiving apprentices and artisans into industry -** SAOGA continues to play a role, in partnership with the Western Cape Department of Economic Development and Tourism and other stakeholders, to develop and implement Oil and Gas focused "Train the Trainer" and mentorship courses. This initiative will help to bridge the gap between industry and TVET colleges. SAOGA has also developed an industry placement capacity and currently pays a stipend to more than 200 trainees placed in industry for workplace learning.
- **'Closer to industry' initiative** – aimed at addressing the gap between the TVET College output and industry workplace demand for skills through industry led quality enhancement interventions with selected TVET Colleges to ensure that skills output is in line with industry needs, including facilitating appropriate materials development. The SAOGA Skills Working Group also feeds information into the curriculum development process for the ship repair/ship building qualification.
- **Addressing the need for upskilling of staff in the Oil and Gas industry -** SAOGA has funded a number of industry demand led upskilling courses over the years.
- **Strategy for Oil and Gas Skills development** is in the process of being developed.
- **Mapping of projects to forecast the demand for skills** - SAOGA is working with industry to develop intelligence on future onshore and offshore drilling projects, refinery refurbishment projects, etc., in order to forecast the kind of skills demand likely in the future

8.5 Shipping and port-related companies

8.5.2.1 Maersk

Maersk was central to the establishment of SAMTRA and has continued to support its efforts. Maersk uses SAMTRA facilities for all its training requirements in SA. They have also heavily invested in Lawhill Maritime Centre and provide open days and awareness programmes in the Western Cape.

8.5.2.2 Unicorn

Through its training centre, Unicorn trains a large number of Ratings for its own requirements. Unicorn supports SAMSA/SAMTRA ratings training programme by selecting 5 to 10 Deck/Engine trainees per year. Furthermore, about 8 candidates per year are taken directly from colleges/schools/"off the street" for training.

8.5.2.3 Other industry players

General Botha Old Boys Association, Society of Master Mariners, SA Institute of Marine Engineers & Naval Architects provides bursaries for learners at Maritime Schools and for tertiary studies.

8.6 Conclusions and Recommendations – Skills development initiatives

There are a number skills development initiatives in the maritime industry, however there needs to be better coordination to avoid duplication and ensure efficiency. There needs to be better spread of resources to ensure that the entire industry benefits. Skills development efforts need to be continuous to ensure sustainability.

9. Funding of maritime skills development initiatives

There are a number of organisations that currently fund maritime skills development initiatives. Some of these, including the type of projects and amounts of funding are illustrated in **Table 14** below.

9.1 Table 14 - Funding of maritime skills development initiatives

Organisation	Description	Amount
TETA	Training of Cadets (2014)	R13 million
UIF	Training of 100 Female Scuba Divers (2014) Training of Ratings	R13,5 million R10 million
NSF	Maritime Skills Development Programme Implementation: • National Cadetship Programme • Training on board the vessel • Conversion Programme • Empowerment of Public FET Colleges • Subvention of salaries for maritime lecturers • Support for Cadets with disabilities • Building capacity in Institutions of Higher Learning	R93 million
NSF	Post Graduate Scholarship for Masters and Doctorate programme in Maritime Affairs at the World Maritime University	€14 000 (around R200 000 at current exchange rate)
Maersk	Training of 6 Ratings for Employment at Maersk	R522 584
Klaveness	Training of 10 Ratings for Employment at Klaveness	R2,2million

Source: SAMSA

A maritime skills development fund needs to be created to better manage all these efforts, with a specific focus on skills development in the various sub-sectors.

10. International trends - maritime skills development

10.1 United Kingdom

The United Kingdom is viewed as a leader in maritime training and one of the major shipping centres in the world. Some of the maritime skills development initiatives in this country include:

- Active maritime research – measures aimed at supporting the maritime skills base are linked to research relating to the state of labour within the maritime skills market.

- Career awareness programmes – there are a number of governmental and business led initiatives and a strategy aimed at increasing awareness about maritime careers have been implemented.
- Government assistance in maritime training – these include a training support scheme (SMarT) which offers funding to training providers for officers and ratings training. Other government support initiatives include establishing the importance of shore-based shipping services and measures to promote employment; encouraging ship registration; and determining the levels of manpower and skills shortages.
- Centralised maritime skills database.
- Private sector support in marketing careers and increasing the number of merchant ship officers.
- Tax benefits – the linkage of tonnage tax to training obligations for companies has resulted in an increased number of cadets the undergo training.

10.2 China

China has experienced sustainable growth in shipping and international trade activities. Furthermore, in China the maritime industry has always been linked to economic development. Some of the notable maritime skills development trends in China include:

- Dedicated tertiary institutions in the maritime field.
- Career pathing – students can train from undergraduate to PHD level maritime programmes.
- Formal training policy – government formulated a policy aimed at encouraging training of officers for offshore and onshore employment opportunities

10.3 Ireland

The Irish government has made a commitment to developing the maritime transport sector through the establishment of the Irish Maritime Development Office (IMDO); direct investment and different incentives for employment, training, and business. The government initiatives include an investment of €58 million into the National Maritime College of Ireland (NMCI) and through the Irish Seafarer Education Assistance Scheme (ISEAS) grant funding, training costs for shipping companies that take on NMCI cadets are lowered. The training grant covers all costs for mandatory training courses and provides a seagoing training allowance on a monthly basis for each cadet. The Irish approach, therefore, seeks to attract new entrants and encourage ship operators to provide berths.

10.4 Australia

Australia is renowned a world leader in skills development and vocational training. The country has had success in identifying skills gaps and developing focussed maritime training initiatives through partnerships with various governmental, private and academic institutions. These initiatives include:

- Support for academic institutions – existence of the Australian Maritime College provides support to maritime initiatives and training in the country.

- Fee waivers / support – the plan is to provide this to students interested in embarking in maritime studies;
- Increased funding to the national institute and to also support vocational training;
- A central database of potential and qualified skills pool, e.g., the Australian Shipowners Association developed SeaRecruit – an online application system for registering those interested in a career in maritime and disseminating information about the maritime industry and available careers. It also provides clear advice on how to upgrade qualifications for the partly qualified and advice on alternative within the sector.
- Policies to encourage growth of the shipping industry.
- The Australian Maritime and Fisheries Academy (AMFA) is recognised as a leader in providing maritime, fishing, and seafood industry-based education and development programmes domestically and internationally.

10.5 Singapore

The Maritime and Port Authority of Singapore (MPA) drives the country's maritime development initiatives whilst the Singapore Polytechnic manages training within the maritime industry. Some of the maritime education and training trends within the country include:

- A simulation centre to assist with training;
- A variety of maritime education and training qualifications by private and public sector institutions
- High quality of training with modern facilities. There are also opportunities for continuous development and attachment programmes to professorships.
- Partnerships amongst stakeholders to create awareness about the sector.
- Funding – a number of organisations provide scholarships and internships. The MPA manages the Maritime Cluster Fund for the development of human resources and business development in maritime. Students are exposed to the practical side with planned postings and rotations being made available. Businesses can also access this fund for a variety of programmes aimed at developing maritime expertise.

10.6 Lessons to be drawn from the international trends

There are a number of lessons that can be drawn by SA from the experiences of the other countries referred to above and these are listed below.

- Lack of maritime research and awareness has been identified as challenges in SA. Measures implemented in the **United Kingdom** to support the maritime skills base and public-private sector initiatives and strategies to increase awareness could be considered. Other government support initiatives implemented in the UK such as establishing measures to promote employment; encouraging ship registration; and determining the levels of manpower and skills shortages could also be looked into.
- The lack of career pathing has been identified as a blockage within the SA maritime industry and lesson therefore could be drawn from **China** in this regard.

- The **Irish** approach which seeks to attract new entrants and encourage ship operators to provide berths could be looked into. Direct investment by the government and incentives for employment, training, and business could lower training cost for SA maritime employers.
- The 2011 SAMSA Skills Study identified the absence of a maritime skills database as a challenge, so a system similar to SeaRecruit from **Australia** could be useful for the SA maritime sector. Funding for maritime vocational training as done in Australia is needed in SA. Furthermore, an industry funded education institution for the maritime industry such as AMFA could be considered for SA.

  Singapore has succeeded in pulling resources from the public and the private sector to develop maritime skills development programmes. Furthermore, the country has well established funding mechanisms supported by stakeholders, including funding targeted at business development. Similar partnerships could be beneficial to the SA maritime industry as well as the establishment of a skills development fund. It is also interesting to note that Singapore has a maritime business development fund which could be of benefit if implemented in SA.

11. Skills shortages and critical skills within the maritime sector

Skills development within the maritime sector is spread across 14 different SETAs and has resulted in a fragmented approach to skills development initiatives within the industry. The scarce and critical skills within the maritime industry and the proposed approach to address these are discussed below.

11.1 Scarce skills / skills shortages in the maritime sector

According to the Health and Welfare SETA, scarce skills or skills shortages refer to specific occupations that lack sufficient people trained to fill positions available in the labour market. Scarce skills refer to those occupations in which there are a scarcity of qualified and experienced people, currently or anticipated in the future, either as a result of unavailability of such skilled people or that they are available but do not meet employment criteria.

Table 15 below illustrates the skills shortages within maritime industry and the relevant SETA they are linked to.

11.1.1 Table 15 – Skills shortages within the maritime industry

Industry	Scarce Skills	Relevant SETAs	Proposals to address shortages
Shipping and Ports	Navigation Officers; Ship's Engineers; Engine and Deck Ratings; Hydrographers; Oceanographers; Maritime Technologists; Marine Ecologist; Meteorologists; Dockmaster; Transport and Logistics management; Vessel Traffic Management; Sea-watch and rescue operators; Port Captain / Harbour Manager	TETA; MERSETA; CATHSETA	• Skills transfer programmes • Increase capacity for training at public and private institutions • Import priority (e.g. ship masters and architects) skills as a short-term measure • Retired experts for

Offshore Oil and Gas	Geologists/Geophysicists; Engineers (Chemical, Geotechnical, Drilling, Structural, Marine, Mechanical); Deck Officers; Artisans	TETA; CHIETA; MICT; MERSETA; MQA	training and skills transfer • More funding for skills development • Increased career awareness • Reskilling the unemployed graduates and upskilling the employed
Fisheries and Aquaculture	Aquatic Health or Aquaculturalist; Deck Officers; Marine Engineers; Artisans; Ratings, Engine	TETA; AGRISETA; FOODBEV; W&RSETA	
Vessel Construction & Repairs	Naval Architects; Production Managers; Designers; Electricians; Electronics; Metal fabricators; Fitter, boiler makers and welders; Riggers; Technicians; Boat builder and Repairer,	TETA; MERSETA;	
Commercial Services	Marine Attorneys/Lawyers, Marine and Environmental Lawyers; Maritime Economists; Marine Financiers/Underwriters; Maritime Consultants, Crewing, Training, Research and innovation, business	TETA; MERSETA; INSETA; BANKSETA	
Marine Tourism	Hospitality Officers (Chefs, Stewards, etc.); Marine Conservation Officers; Dive Videographers/Photographers	TETA, FOODBEV; MERSETA; CATHSSETA; W&RSETA	

Source: SAMSA and input by MSSTTT

11.2 Critical skills within the maritime sector

The concept of critical skills or skills gap refers to the qualitative deficiencies that may occur in the skills of people who are already employed in the sector. Critical skills refer to specific key or generic (e.g. problem solving, mathematical skills, language/literacy skills, ICT skills etc.) and "top up" skills (to fill a "skills gap" that might have arisen as a result of changing technology or new forms of work) within an occupation.

According to TETA, the critical skills within the maritime industry include, amongst others:

- Business Practices & Management;
- Compulsory Standards for Training Certification and Watchkeeping (STWC) revalidation;
- Occupational Health and Safety;
- Long and Short Range Operations;
- Navigation skills;
- Fishing Technologies;
- Fishing and Merchant Marine;
- Fish hunting;
- Pilotage;
- Leadership and Management; and
- Project management (shipping)

These challenges could be addressed by, amongst others, benchmarking internationally accepted skills levels over and above the competency requirements; ensuring adequate capacity for refresher training (e.g. seafarer qualifications require revalidation after 5yrs); and where possible draw up individual skills development plans, invest in internal skills development programmes.

12. Blockages within the maritime skills development pipeline and proposed interventions

Table 16 illustrates the blockages that have been identified by the MSSTTT with proposed interventions and role players. These have been classified according to the supply-side and demand-side.

12.1 Table 16 – Blockages and proposed interventions

Supply side				
No.	**Blockage**	**Proposed intervention**	**Role player**	**Proposed timelines**
1.	**Weak maritime culture and lack of maritime career awareness**. This impacts on ability to attract best candidates to the industry and results in increased likelihood of higher dropouts/failure rate.	• Develop a comprehensive marketing strategy for industry from Basic Education level to HET level. • Secure industry support and encourage private companies to assist in creating maritime awareness • Expose students to maritime careers during school holidays • There should be Centres of Maritime Excellence in each province to improve awareness. • Run carefully-planned programmes to expose teachers to the shipping industry. • Create a skills development database	SAMSA, Industry players, DoT, DHET, DST, SAOGA, Provincial departments	Short term (1-3 years)
2	**No national approach to funding of Maritime Education and Training (MET)**	• A Maritime Skills Fund in line with the international trends should be considered to better manage current and future efforts, with a specific focus on skills development in the various sub-sectors.	DHET, SAMSA, industry players	Short term (1-3 years)
3.	**Challenges at Basic Education level:** ***Quality of Basic Education standards*.** Students are ill prepared for Further Education/HET and subsequent career development and this has a potential to compromise the ability to market SA Seafarers on the global market.	• Ensure that a Maths and Science curriculum aligns with both HET and industry requirements. • Promote maritime education through DBE policy on Focus Schools which includes maritime as a focus area. • Guidelines for maritime high schools need to be developed and should include issues related to infrastructure (ideally with boarding facilities); human resources (with	DBE, SAMSA, Moses Kotane Institute, industry players	Short term (1-3 years)

	Challenges with maritime education at high school level. There is a lack of maritime related education facilities; lack of funding for maritime high schools; lack of formal curricula and inconsistency in programme delivery resulting in poor outcomes; lack of suitable subject matter expertise in Maritime Economics and Nautical Sciences to ensure quality course delivery.	maritime/seafaring background); curriculum; funding and support; and industry links. • Implement an E Learning system to increase the delivery of the current programmes • Differentiation in respect remuneration for educators specialised in navigation in order to attract them from the shipping industry • Employ retired experts as teachers • Create and run maritime programmes for teachers.		
4.	**Challenges at Higher Education and Training level.** These include: • Disconnect between the university and maritime industry resulting in output that does not match industry demand; • Differing approaches by tertiary institutions and qualifications provided (degree vs diploma); • Attracting qualified lecturing staff. • MET providers not providing full curricula for Marine Engineer students – workshops training	• Align student enrolment standards with industry requirements. • Institute a tertiary/flag state/industry remuneration consultation committee to address lecturer salaries and sponsor providers to enable recruitment of suitable professionals • Ensure availability of workshops training facilities countrywide	Higher Education Institutions, DHET, SAMSA, industry players	Short term (1-3 years)
5.	**Challenges at TVET level**. These include: • Inappropriately positioned TVET colleges to provide skills required by industry resulting from lack of engagement with industry. • Poor governance resulting in poor administration and poor quality of education. • Lack of training facilities • Lack of funding for training institutions to capacitate themselves for effective maritime training	• Closer cooperation between industry and TVET colleges in respect of funding, curriculum development and performance management. • Evaluate possibility of partnerships between TVET Colleges and private training providers. • Improve governance in line with recommendations made by the HRDC TVET Technical Task Team	DHET, SAMSA, SAOGA	Short term (1-3 years)
6.	**Lack of effectiveness in sectoral skills development due to fragmented SETA involvement with no uniform approach (14**	• Consider recommendations of the SETA review initiative by DHET including the principles used in the funding of MET.	TETA, SAMSA, DHET, SAOGA, relevant SETAs	Medium term 3-5 years

	SETAs servicing the maritime sector - different systems, requirements and objectives)	• Possibly centralise of maritime related training under one body/SETA		
7.	**Lack of a strategic perspective to MET**: • Lack of a comprehensive MET policy, strategy and control that drives institutional accreditations, curricula, standards, student numbers per provider. • Dysfunctional competition between providers, poor resource utilisation, diseconomies of scale, and consequent increased cost of MET	• MET Strategy must encompass ALL subsectors of the industry including the portability of skills within the various sub-sectors. •	SAMSA, DOT, DHET	Medium term (3-5 years)

Demand-side				
No.	**Blockage**	**Proposed intervention**	**Role player**	**Proposed timeline**
1.	**Limited industry transformation** • Foreign national companies operating in the country prefer to source skills and services internationally • There are still demographic and gender inequities in the industry.	• There should be a policy that will ensure growth of the maritime sector including localisation of services and resources in the industry. • Encourage shipping companies to take up women employees.	DOT, SAMSA	Short term (1-3 years)
2	**Available skills not specialised for maritime industry** – e.g. artisans exists but have no specialisation in maritime	• Ensure implementation of maritime competency programmes to bridge the skills gaps between the base skills and maritime skills required • Work closer with the broader artisan development programmes in the country	DHET, SAMSA	Short term (1-3 years)
3	**Lack of support for maritime research and innovation as well as lack of support for commercialisation of new products**	• Funding support for R&D • Greater collaboration between DST and industry • Need for a policy for support of R&D	DST, industry players, SAMSA	Short term (1-3 years)
4	**Mobility of SA skills to export markets hampered by entry requirements into foreign countries (visas and permits). Furthermore, there have been delays in getting imported skills into SA.**	• SA missions in foreign countries to engage the host countries regarding movement into those markets. • Home Affairs department should address the inefficiencies	DIRCO, Dep of Home Affairs, SAMSA	Short term (1-3 years)

5	**Limited leverage on opportunities arising from shipping along SA coastline**	• Engage industry on available opportunities and look at impediments in taking up those opportunities • Market SA as a one-stop service destination.	SAMSA, industry players	Short term (1-3 years)

Some of the blockages that were initially identified by the Task Team are in the process of being addressed and these are listed on **Table 17** below.

12.2 Table 17 - Blockages initially identified by MSSTTT that are in the process of being addressed

No.	Blockage	Proposed intervention	Role player	Proposed timeline	Comment
1.	**Limited ability to secure training berths for cadets to complete their sea time requirements**.	• Ensuring proper marketing of SA cadets to the international market • Better leverage of bilateral agreements between SA and its trading partners by ensuring that transport logistics are built into those agreements. • Ensure that at least 40% SA cargo is carried on SA ships.	SAMSA, SA Embassies/ Missions, DIRCO	Marketing of cadets – short term (1-3 years) Others - Medium term (3-5 years)	Operation Phakisa to address this – agreed that 40% of SA cargo to be carried on SA ships. More ships to be registered under SA flag, therefore increase production capacity (seafarers). DIRCO to also establish seafarer desks in predetermined SA embassies abroad which will also assist with marketing of SA seafarers. **MSSTTT to monitor progress.**
2.	**Challenges with provision of maritime training by private training providers**: • Lack of coordination and planning results in inefficiencies and delays in training provision. • Motivation for profit results in inconsistent standards of training.	• Centralise all MET under one body with the authority to accredit, ensure alignment with MET strategic imperatives, curriculum standards for mandatory courses &ensure best practice etc. • MET strategy development should address training provision gaps and propose steps to address these.	DHET, SAMSA, SAOGA	Medium term (3-5 years)	TVET Colleges to assist with providing maritime training. SAIMI (SA International Maritime Institute) currently being established in conjunction with Nelson Mandela Metropolitan University) and will assist with improving capacity for maritime training at TVET Colleges. **MSSTTT to monitor progress.**

3.	**Inconsistencies with SAMSA certification administration.** These include: • Availability of Oral Exam dates – long lead times for candidates which adversely impact on employment prospects. • Lead time for delivery of Certificates for mandatory courses takes too long, negatively impacting on individual's employment prospects. This situation will be exacerbated with increased maritime growth.	• Improve the Management Information System (MIS) to enable better turnaround times, benchmark best practice (other Maritime Authorities). • Make examinations a primary and not secondary function by introducing a dedicated exams department that could also assist with other SAMSA functions in event of any slack periods.	SAMSA	Short term (1-3 years)	SAMSA in the process of improving capacity to address these issues. Dedicated Office of the Chief Examiner at SAMSA created. **MSSTTT to monitor progress.**
4	**Lack of alignment of Navy training with SAMSA STCW to allow for migration into the Navy.**	• SAMSA and the Navy to engage on the feasibility of alignment.	SAMSA, Navy	Medium term (3-5 years)	SAMSA has engaged the Navy on this issue. **MSSTTT to monitor progress.**
5.	**Disconnect between SETA's NQF qualifications and SAMSA's STCW standards including OPITO and IRATA.**	• SAQA and SAMSA should work together in developing NQF and STCW aligned qualifications • Align all training that is based on international standards (OPITO, IRATA etc.) with SAMSA standards and alignment with TETA thereafter	SAQA, SAMSA, SAOGA, TETA	Medium term (3-5 years)	Operation Phakisa to address this. Furthermore, a MoU between SAMSA and SAQA has been developed. **MSSTTT to monitor progress**
6.	**Limited employment and training opportunities** **• SA has no ships in its registry;** **• Lack of relationships with foreign shipping companies to assist with training and**	• To attract ship owners to the SA registry, SA needs to ensure a competitive ship registration framework. • Cargo owners need to be encouraged and	SAMSA, DOT, DMR, DPE	Medium term (3-5 years)	These initiatives are also part of the Operation Phakisa outcomes and will be addressed via that process. **MSSTTT to monitor progress**

	employment of SA seafarers.	incentivised to ship their cargo using SA registered vessels and methods to achieve this should be developed. • Establish relationships with existing global shipping and crewing / management companies in an effort to have a meaningful impact on seafaring job creation and sustainability (export of SA seafarer skills) • Cabotage system on SA domestic cargo should be introduced to compel national shipping to play a more meaningful role in skills development.			
7	**Limited ability of the industry (Ship repair, O&G) to attract larger scale projects (e.g. FPSO conversions and upgrades) due to lack of infrastructure.**	Prioritise ship building / repair infrastructure development.	Transnet	Medium term (3-5 years)	Currently being addressed under Operation Phakisa. **MSSTTT to monitor progress.**
8	**There is a need to better support the boatbuilding industry to provide sustainable jobs**	• Policy to grow of the boatbuilding industry needed for designation for local procurement, skills development programmes, and industry accreditation standards.	DTI	Short term (1-3 years)	Currently being addressed under Operation Phakisa. **MSSTTT to monitor progress**

13. Recommendations to Council

In light of the blockages and proposed interventions highlighted above, it is recommended that the proposed programme (below) aimed at addressing skills development challenges within the maritime sector be approved, with a proposed creation of an inter-departmental structure that will monitor progress in respect of proposed interventions; manage the proposed programme; and ensure better coordination of maritime skills development initiatives to ensure efficiency and avoid duplication. The proposed programme and costs of implementation are illustrated on **Table 18** below.

13.1 Table *18 - Proposed programme to address maritime skills development challenges*

Programme	Estimated cost	Comment
(a)Skills development capacity building:		
• Development of a maritime skills database	R500 000	To be added onto the existing DOL database.
• Develop guidelines for maritime high schools which should include issues related to infrastructure (ideally with boarding facilities); human resources (with maritime/seafaring background); curriculum; funding and support	R500 000	DBE to fund
• Create body with the authority to accredit, ensure alignment with MET strategic imperatives, curriculum standards for mandatory courses and ensure best practice etc.	R3 000 000 pa	DHET; SA International Maritime Institute
• Establish maritime centres of excellence across all provinces (either at identified high schools of TVET colleges	R90 000 000, annual costs to be covered under TVET college/school budget R150 000 000 pa. This amount will decrease the more ships registered under SA flag.	Could apply a phased approach (2 provinces per year at a cost of about R20 million). DHET; Provincial departments
• Create a Maritime Skills Fund for cadetship, training ships, differentiation of lecturers' salaries, other training equipment and technologies (e.g. simulators, workshops etc.)	R150 000 000	NSF, TETA, SAMSA, UIF already cover about 80% of this cost. Transnet, Industry Players

• Create and run programmes to expose teachers to the shipping industry	R500 000 pa	NSF; SAMSA; Provincial departments
(**b) Ensure adequate institutional arrangements:** • Create legislative frameworks for appropriate institutional arrangements • Align all training that is based on international standards (OPITO, IRATA etc.) with SAMSA standards and alignment with TETA thereafter	- R2 000 000	Costs to be absorbed by relevant departments SAMSA to cover and possible support from TETA
(c) Ensure a growing maritime sector capable of creating employment opportunities: • Creation of a SA shipping registry • Market SA as a one-stop service destination (incl. SA seafarers)	- R2 000 000 pa	Costs to be absorbed by relevant departments SAMSA to cover, possible support from DIRCO through establishment of seafarer desks in certain embassies
d) Infrastructure for Maritime Education and Training • Ensure availability of workshop training facilities countrywide	R5 000 000 to establish one workshop facility. So across 9 provinces this – R45 000 000	Industry to fund this. Discussions with some industry players have taken place.

It is estimated that the administration costs for the proposed inter-departmental structure will amount to about R1 500 000 pa. The total cost of the proposed skills development programme is estimated to be around R297 000 000 (**once-off: R140 000 000; annual costs: R157 000 000**). SAMSA, NSF, TETA, UIF already cover about 80% of the stated annual costs.

14. References

1. 17th Annual Global CEO Survey, PriceWaterhouseCoopers, January 2014
2. Draft Integrated Human Resource Development Strategy For the South African Maritime Sector, SAMSA, 2014
3. Economic potential of SA's ocean, Department of Environmental Affairs, 2013 (As quoted on the Operation Phakisa Lab Fact Pack 2014)
4. Health and Welfare SETA Sector Skills Plan 2013
5. Jones, T. (2005). The Provision of Services to Bunker Callers in the Port of Durban – A Survey of the economic impact on the Durban metropolitan economy. *Centre for Maritime Economics & Law, University of KwaZulu-Natal.*
6. Maritime Sector Skills Development Study, SAMSA, September 2011
7. National Development Plan: Vision for 2030, National Planning Commission, 2011
8. National Skills Development Strategy III, Department of Higher Education and Training, 2011
9. Report on KZN Maritime Consultative Jobs Summit, SAMSA, July 2013
10. Roadmap Preparation Document for Establishment of South African International Maritime Institute (SAIMI), SAMSA, February 2014
11. SAMSA 2013/2014 Annual Report
12. SAMSA presentation on skills development programmes, September 2013
13. Speech by Former Deputy President, Kgalema Montlante at the launch of the HRDC SA Mid-term Review, September 2012
14. Transport Education and Training Authority Sector Skills Plan 2013
15. Written submissions from Lawhill Maritime Centre, SAMTRA, Moses Kotane Institute, DTI, SAOGA, SAMSA, Transnet, TETA, Unicorn
16. World Bank Data Bank, www.databank.org/data/views/reports/tableview.aspx#