

**An evaluation and assessment of ship repair opportunities for South Africa using  
the Port of Durban as a case study in an attempt to develop a Framework Plan for  
the Ship Repair Industry in the Port of Durban.**

By

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## DECLARATION

I declare that the dissertation submitted for the Master of Business Administration degree at the Graduate School of Business, University of Natal, has not previously been submitted for a degree at this or any other University, and is my own work. All the sources used or quoted have been indicated with due acknowledgement by means of complete reference.

I further declare that this research has not been previously accepted for any degree and is not being currently submitted in candidature for any degree.

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G.B. Jonkers

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Date

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- Mr. G. Pulford, International Marketing and Sales Executive, Dormac Marine Engineering (Pty) Ltd.

## **DEDICATION**

This work I dedicate to my loving, supportive and understanding wife, Christina Jonkers and my daughter Abigail Faith Jonkers. Their continued support, motivation and encouragement to this work were invaluable. Thank you!

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## **ABSTRACT**

Over the last couple of years the ship repair industry in South Africa and in particular Durban has expanded significantly and the potential and opportunities for growth are still significant. This should be regarded as a positive sign for the industry that is currently enjoying a high level of demand for its services. This in turn has far reaching economic impacts upstream in the economy in terms of employment, revenue and income generation.

The opportunities currently presented to the industry in the Port of Durban are vast and require exploitation. The Port of Durban, however, has physical constraints that are at present being addressed, but also structural and operational inefficiencies that hamper the full exploitation of such opportunities. The absence of a Development Framework Plan, in which these opportunities can be exploited, further aggravates the situation, much to the frustration of local ship repairers.

This dissertation seeks to evaluate and assess opportunities currently presented to the industry in the Port of Durban. It further seeks to put a framework in place to best exploit such opportunities.

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## **CHAPTER 1**

### **1.1 INTRODUCTION**

Shipyards are industrial plants located in suitable water area such as a harbour basin, a bay or a river, for the building, repair and maintenance of ships. They are generally classified as shipbuilding yards, which produce new ships, ship repair yards, which are mainly involved in the repair and maintenance of ships and yards that carry out both the production and repair of ships. The equipment associated with each type of yard will therefore depend on the prevailing type of production. Thus in ship repair yards, where ship building will be of secondary importance, the main criteria are the size and the type of the ships repaired, whether large, medium or small (Mazurkiewicz, 1980, 1).

The South African coastline has seven commercial ports namely, Richards Bay, Durban, East London, Port Elizabeth, Mossel Bay, Cape Town and Saldanha Bay, with the eighth in its early developmental phases, namely, Coega. The Port of Durban is regarded as South Africa's busiest port and is further believed to be one of the largest ports in Africa (ISL, 2001). The Port of Durban has experienced significant growth over the last 10 years in terms of volumes and number of vessels calling, which inevitably places pressure on all activities and industries within the port. The ship repair industry in the port is one of such industries that has benefited from this growth as vessels discharging cargo also dock for repairs to be carried out.

The ship repair industry has grown since the commencement of the ship repair business and with the inauguration of the Prince Edward Graving Dock in the Port of Durban in 1925. The former Portnet, now the National Ports Authority of South Africa (NPA), was the sole provider of infrastructure such as the graving dock and the floating dock, while private operators carried out the requested repairs. As the market grew, however, the NPA found itself continuously in a situation where vessels had to be turned away for repairs as docks were fully occupied. This resulted in the introduction of a second floating dock in May 1999 by Elgin Brown and Hamer (EBH). Currently the Port has three ship repairers namely, the National Ports Authority, Dormac Marine and Engineering (Pty) Ltd and Elgin Brown and Hamer (Pty) Ltd. The facilities

currently available in the port for commercial ship repairs are two floating docks, one graving dock and repair berths. The Naval syncrolift facility, located on Salisbury Island in the port, includes a further possible repair site, but is unfortunately not open for commercial use (this point will be discussed in later sections).

After the divisionalisation process of Portnet was completed in 2000, the NPA received no less than three applications from ship repair operators for additional repair facilities in 2001. The proposals received were:

- Proposal 1: Joint Management agreement for the lease of the NPA Ship Repair Quay
- Proposal 2: The construction of a new Graving Dock
- Proposal 3: The operation of a third Floating Dock

In the absence of a Development Framework Plan for the Ship Repair Industry in the Port of Durban it is problematical to decide which of the developments should go ahead, and which proposal should receive priority over the others. The capital investment for such infrastructure is astronomical and such a decision cannot be taken lightly. The opportunities for ship repair needs to be thoroughly assessed as to the reasons for vessels calling for ship repairs. Once this has been done a Framework Plan will be developed.

## **1.2 STRUCTURE OF DISSERTATION**

The dissertation is structured as follows:

- Chapter 2: Research Design and Methodology
- Chapter 3: The Global Ship Repair Market
- Chapter 4: Ship Repair and the Economy
- Chapter 5: The South African Ship Repair Industry
- Chapter 6: Ship Repair – Port of Durban
- Chapter 7: Ship Repair Development Framework - Durban
- Chapter 8: Conclusion

## **CHAPTER 2**

### **2.1 RESEARCH DESIGN AND METHODOLOGY**

#### **2.1.1 Literature Review**

The review of literature for this dissertation was not an easy task as very little information has been published on ship repair and publications available were extremely expensive to obtain for the purpose of inclusion in this work. The bulk of the information particularly pertaining to the South African and Durban ship repair industry was obtained by means of interviews as indicated below.

As far as the global or international scene is concerned, reliance from Internet sources had to suffice. The publication by the United Kingdom based Ocean Shipping Consultants in 1999 (OSC) was used quite extensively, especially for forecasting future growth scenarios.

#### **2.1.2 Research Design**

Due to unavailability of information on the South African Ship Repair industry, exploratory research was conducted and the case study method applied with the purpose of investigating ship repair opportunities presented to the Port of Durban. Knowledge and information gained from this were used to develop the framework plan in which such opportunities could be fully exploited to make the Ship Repair Industry, Port of Durban the destination of choice for vessel repairs.

#### **2.1.3 Sample and Sampling Technique**

The Port of Durban currently has three ship repairers serving more or less the same markets. All the ship repairers were interviewed for the gathering of primary data, which in this case made the sample equal to the population and vice versa. The study is specific to the port of Durban and therefore the other national ship repairers were excluded from the interviews.



#### **2.1.4 Method of Data Collection**

Unstructured personal (face-to-face) interviews with open-ended questions were conducted in order to obtain as much information as possible from the respondents. In an attempt to overcome some of the shortcomings of this technique, the participants were motivated to respond, whilst establishing credibility and trust with them was of high priority.

As noted above, open-ended questionnaires were prepared (see Appendix II) and all participants were asked the same questions. Permission was not obtained to utilize a recording device and therefore all responses were recorded in writing.

#### **2.1.5 Data Analysis Techniques**

The type of information collected was not quantified. The data collected was interpreted and analyzed with the view that it will provide new integrative insights into the ship repair opportunities for the Port of Durban. Secondary statistics were obtained from Ship Repairers that in turn were plotted on histograms and line graphs. From this an attempt was made to forecast growth in the industry.

#### **2.1.6 Ethical Requirements**

Information obtained from the different ship repairers was dealt with as confidential.

## CHAPTER 3

### 3.1 GLOBAL SHIP REPAIR MARKET



In 2000 the global ship repair market had an estimated turnover of approximately 8.5 billion USD which includes the 1 million USD cruise ship repair market segment. The global ship repair is, however, facing a situation of overcapacity with large fresh capacities

being set up in low cost nations such as China, Vietnam and the Baltic Region. It is further suggested with research conducted by OSC that the global ship repair market would grow by 2.1% annually to 2005 while maintaining a long-term growth of around 2% to 2015 (OSC, 1999).

In the near term markets are expected to be strengthened by repairs to single hulled 1970s built vessels in order to continue trading through to their phase-out dates (IMO 13G). A notable weakening in ship repair demand growth is expected over 2004/07 as a significant volume of Very Large Crude Carriers (VLCC) and Suezmax tonnage is removed from the market under the regulations. The repair needs for the 1990s-built double-hull tankers have yet to be fully utilised (OSC Ltd., 1999). Even though the latter would not be candidates for the Durban-based industry, or at least not within the present marine parameters of the port, it signifies an opportunity that is worth exploring.

Over the longer-term, fleet expansion within the larger tanker and bulk markets, supported by a rapidly expanding container fleet, is set to underpin steady repair demand growth between 2010 and 2015. The most significant impact on forward repair demand will be attributable to the large-scale container fleet expansion programs set to dominate longer-term markets. Between 2001 and 2005, underlying repair demand from the fully cellular container market is expected to rise by 26.4%, compared to an additional 32% rise between 2005 and 2010. Over the long-term period, 2010 to 2015, repair demand for container vessels is set to increase by a further 26.6% (OSC Ltd., 1999)

Even though it was suggested that the international ship repair industry is entering a period of extensive change and uncertainty, an aged world fleet continues to create a growing market for repair and maintenance services (<http://www.naval.ca>). This is especially so as regulations get tougher, port state inspections get stricter and classification societies work to regain their credibility. The growing pressure experienced from legislative and regulatory bodies originate from institutions such as:

### **International Maritime Organisation (IMO)**

In April 2001, the IMO introduced new mandatory phase-out requirements, which is contained within the new revised MARPOL Annex I Regulation 13G. The implications of this ruling is that:

- ❑ An estimated 2,200 tankers must be withdrawn from service between now and 2015;
- ❑ In excess of 300 tankers will be scrapped well before they have reached what has been considered a normal lifespan of 23 – 25 years in 2015; and
- ❑ The phase-out of single-hull tankers will be accelerated.

The commencement on July 1<sup>st</sup>, 2002 of the International Convention for the Safety of Life at Sea (SOLAS) requirement that Enhanced Survey Programme (ESP) vessels over 15 years age be dry-docked twice in every five years, further adds to the pressure.

**Classification Societies** – According to the International Association of Classification Societies, ship classification, as a minimum, is to be regarded as the development and worldwide implementation of published Rules and/or Regulations which will provide for:

- the structural strength of (and where necessary the watertight integrity of) all essential parts of the hull and its appendages; and
- the safety and reliability of the propulsion and steering systems, and those other features and auxiliary systems which have been built into the ship in order to establish and maintain basic conditions on board,

thereby enabling the ship to operate in its intended service (<http://www.iacs.org.uk>). Table 1 below summarises a few of the Classification Societies.

**Table 1: Classification Societies**

American Bureau of Shipping	Hellenic Register of Shipping
Bureau Veritas	Korean Register of Shipping
China Classification Society	Lloyds Register of Shipping
Det Norske Veritas	Polish Register of Shipping
Germanischer Lloyd	Registro Italiano Navale

Source: <http://www.nee.gr>

**Port State Control Agencies** – Port State Control (PSC) is the inspection of foreign ships in national ports to verify that the condition of the ship and its equipment comply with the requirements of international regulations and that the ship is manned and operated in compliance with these rules. The primary responsibility for ships' standards rests with the flag State - but port State control provides a "safety net" to catch substandard ships (<http://www.imo.org>). Some of the agencies ensuring that the above takes place include the American Maritime Officers and the International Organization of Masters, Mates and Pilots.

**Environmental Pressure Groups** – In this case, the International Maritime Organization (IMO) has been the forerunner in ensuring safer shipping and cleaner oceans. The most important convention regulating and preventing marine pollution by ships is the IMO International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78). It covers accidental and operational oil pollution as well as pollution by chemicals, goods in packaged form, sewage, garbage and air pollution. The IMO's Intervention Convention affirms the right of a coastal State to take measures on the high seas to prevent, mitigate or eliminate danger to its coastline from a maritime casualty. The International Convention on Oil Pollution Preparedness, Response and Co-operation (OPRC), 1990, provides a global framework for international co-operation in combating major incidents or threats of marine pollution. A protocol to this convention (HNS Protocol) covers marine pollution by hazardous and noxious substances (<http://www.imo.org>).

**Salvage Association** – Salvage refers to the act, process, or business of rescuing vessels or their cargoes from loss at sea. The list of service expertise offered by a typical Salvage Association is captured in Table 2 below.

**Table 2: List of Service Expertise**

CASUALTY MANAGEMENT	RISK MANAGEMENT
<b>Hull</b>	<u>Risk assessment</u>
<u>Damage Surveys</u>	<u>Cargo projects</u>
<ul style="list-style-type: none"> <li>- Speed and angle of blow surveys</li> <li>- Advice on repairs and costs</li> <li>- Preparation of repair specifications</li> <li>- Negotiation of repair accounts</li> </ul>	<u>Civil engineering projects</u> <u>Survey and advice for:</u> <ul style="list-style-type: none"> <li>- Voyage or towage</li> <li>- Vessel lay-up or reactivation</li> </ul>
<u>Advice on salvage operations and wreck removal</u> <u>Casualty Investigation</u> <ul style="list-style-type: none"> <li>- Casualty co-ordination</li> </ul>	<ul style="list-style-type: none"> <li>- Mooring arrangements</li> <li>- Cargo load-out, stowage and towage</li> </ul>
<u>Damage Engineering</u> <ul style="list-style-type: none"> <li>- Third party liability surveys</li> <li>- General average surveys</li> </ul>	<u>Shipyard inspections</u> <u>Condition surveys</u> <u>Feasibility studies</u>
<b>Cargo</b> <u>Advice on underwater location and recovery</u> <ul style="list-style-type: none"> <li>- Hull or machinery surveys</li> <li>- Advice on damage limitation and mitigation of loss</li> <li>- Speed and angle of blow surveys</li> </ul>	<u>Damage Surveys</u> <ul style="list-style-type: none"> <li>- Investigation of cause</li> <li>- Casualty co-ordination</li> <li>- General average surveys</li> <li>- Third party liability surveys</li> </ul>

Source: <http://www.wreckage.org/>

As regulations are getting tougher, the international offshore industry is also producing a growing volume of demand for significant upgrade and conversion contracts. One needs to bear in mind though that industry capacity has also been growing, hence resulting in the overcapacity as mentioned above. Not only have new docks been added to the international inventory, but also yards in China and elsewhere have emerged as competent, affordable alternatives to more established repair centres.



The global ship repair market is further characterised by the phenomena of mergers and acquisitions. The big yards tend to get bigger while the small and the unsuccessful yards are absorbed by larger yards. The direct adverse result of this is the lowering of workforce numbers especially in the case of small independent yards in developing countries. A further (positive) consequence is that the larger yards are positioned to offer a more international service, by becoming internationally more price competitive. The bigger yards further carve niche areas of specialisation and are relying more heavily on new technology and more efficient work processes to create this competitive edge for themselves.

Instead of attempting to complete a full evaluation of all the ship repair yards globally, attention in the sections to follow will focus on broad defined regional geographical market developments.

### **3.1.1 Asia**

The research conducted by OSC (1999) suggests that the expansion of new ship repair facilities within Asia – especially in China and Vietnam – is expected to have a profound impact on established facilities such as Singapore and other major competitors in the Middle East and Japan. The Chinese governmental support for the development and expansion of its ship repair industry is expected to maintain a downward pressure on forward prices, hence giving the Chinese yards a competitive advantage over other yards within the region, which have to make do without government support. Indications are also that foreign investment in Chinese repair facilities is set to expand, while yards in Hong Kong, Singapore and Japan focus attention on joint venture projects in order to establish facilities supported by a low cost base.

Mainland China further emerges on a worldwide basis as the cheapest area in which to carry out steelwork. Price levels are quoted as low as \$1/kg compared to Singapore's \$2-2.5/kg (<http://www.marinelog.com>). The reason for such low quotes in the Chinese yards is a result of their entry into the quoting process for simple steelwork. Competition within Mainland China could push price levels down even further, making China without a doubt the cheapest area in which to carry out steelwork. The ongoing investment in facilities and skills is set to sustain

long-term growth, and increase the volume of higher value repairs and conversion contracts over up to 2015.

On the rest of the Asian continent the companies performing ship repair activities are quite widespread as indicated in Table 3 below.

**Table 3: Number of Yards on the Asian Continent**

Region	Number of Companies
China	2
India	2
Korea	14
Philippines	1
Russia	1
Singapore	2
UAE	1

Source: <http://www.sea007korea.com>

The typical range of services provided by these companies include:

- ❑ Ship repair and underwater repair;
- ❑ Spares for turbocharger and diesel engines;
- ❑ Equipment supply;
- ❑ Reefer machinery;
- ❑ Steelwork;
- ❑ Installation of machinery components;
- ❑ Spare parts supply; and
- ❑ Electronic systems (<http://www.sea007korea.com>).

### 3.1.2 Far East

Singapore has a total dry-dock capacity of 3.5 million dwt, following the opening of a 360,000 dwt facility at Keppel and a 400,000 dwt unit in Jurong (<http://www.marinelog.com>). Both of these added facilities are wide enough to handle double-hulled Ultra Large Crude Carriers (ULCC). In a further attempt to stay ahead of competition, the yards in Keppel and Sembawang have also invested in ship repair facilities outside Singapore where normal dry-dockings are offered at more competitive cost, while keeping the more technically challenging upgrading and conversion work in Singapore.

In 1996 Singapore's Economic Development Board (EDB) reported a decline in activities compared to the previous year. The report states that "the republic's repairers noted a slight decline in the numbers of vessels handled and the average size of each job was about 5% to 10% smaller, while margins per job went down by 1 to 2%." The EDB attributed this decline in activities to a general downturn in ship repair worldwide and increased competition experienced from the Mid East yards and China, keen competition between local yards and the strengthening of the Singapore dollar. With the additional facilities, the yards in Singapore have subsequently seen a turnaround of the situation.

### 3.1.3 Europe

As a result of the lower cost repairers in Singapore, China and the Middle East, the European repairers have little choice but to focus their attention on intra-regional markets. They further continue to venture into more complex conversions and specialist activities in an attempt to create a niche market for themselves. During the 1990s the European repair yards have mainly been characterised by:

- **Privatisation and Restructuring** – As an example, reference will be made to the privatisation of the Ukrainian Shipyards that started in 1994, with specific reference to Okean, Leninska Kuznya and Zaliv (Predominantly shipbuilding yards, with ship repairs not excluded). All three shipyards followed the same method of privatisation at the same time as the mass privatisation program was started in Ukraine. In line with the Ukrainian



legislation, (Presidential Decree “On Unified System of Privatisation Institutions in Ukraine”) each shipyard registered a certain amount of shares with the State Property Fund from where a privatisation plan was developed after which the sale and distribution of shares followed according to the outlined plan. Each shipyard completed the process of privatisation that resulted with registration of shipyards as joint-stock companies. Leninska Kuznya was the first shipyard to complete the process. It took 2 years to sell 100% of shares. Okean shipyard sold all shares in six years to a foreign strategic partner. Zaliv needed seven years to privatise completely and over the years it had several problems. Its first strategic investor, an English shipbuilding company was not able to provide the shipyard with enough financial support and after four years it ended up selling its shares back to a bigger Ukrainian company (<http://www.ocean.otr.usm.edu>).

- ❑ **A shift to more flexible work practices encompassing a greater degree of subcontracted work** – This involves a greater variety of tasks, for example, welders who can weld with multiple metals using multiple methods. This necessitated the development of a well trained, motivated, and flexible labour force that communicates openly from the lowest levels on the shop floor to the highest levels of management. These work practices further imply that workers are committed to an aggressive cross-training program that includes team-oriented assignments to improve process efficiency (<http://www.fas.org>). However, it did not come without a price. For example, total employment in the UK on shipbuilding and ship repair fell from 91,000 in 1977 to about 48,000 in 1986 on completion of the Government's privatisation programme and stood at about 11,000 in 2000 (<http://www.wemt.nl>).

As a means of attracting more business, emphasis by North West European yards on quality, expertise and tight scheduling helped to bolster repair and conversion activities in the region. However, strong regional competition is expected to characterise developments, with most yards keen to expand the volume of higher-value work. The study conducted by OSC (1999) indicates that restructuring, mergers and cost cutting continue to overshadow repair developments across Northern Europe.

### *a. Central Europe*

As far as ship repair is concerned 14% of all European ship repair works is carried out in Poland, of which 50% takes place in the Gdansk Repair Shipyard, which is further one of the biggest in Poland. The yard employs in the region of 2,500 people and work carried out includes building of new vessels, conversions, lengthening, overhauls, tank cleaning, propeller repairs, etc (<http://www.europa.eu.int>).

In a study, entitled, “The Shipbuilding and Ship Repair Sectors in the Candidate Countries: Poland, Estonia, the Czech Republic, Hungary and Slovenia” conducted by NOBE Independent Centre for Economic Studies in 1999, Poland emerged as the forerunner in all three categories investigated. Table 4 further reveals that during the study, 35 shipyards in operation were identified out of which 10 were predominately newbuilding yards, 8 were mixed shipyards and 17 were repairing yards, with the latter being the area of focus in this section. The success of the Polish repair yards can thus be attributed to the diversification of their production through the implementation of more complicated repairs which includes:

- ❑ Vessel conversions;
- ❑ Conversions; and
- ❑ Construction of seabed oil extraction equipment.

**Table 4: Shipyards by Type of Activities**

<b>Focus</b>	<b>Poland</b>	<b>Estonia</b>	<b>Hungary</b>	<b>Slovenia</b>	<b>Czech Republic</b>	<b>Total</b>
<b>Newbuilding Only</b>	9	0	0	0	1	<b>10</b>
<b>Mixed</b>	13	2	0	0	2	<b>17</b>
<b>Repair Only</b>	4	0	3	1	0	<b>8</b>
<b>Total</b>	<b>26</b>	<b>2</b>	<b>3</b>	<b>1</b>	<b>3</b>	<b>35</b>

Source: NOBE Independent Centre for Economic Studies (<http://www.europa.eu.int>)

The study further revealed that since the beginning of the 1990s, a downward trend has been experienced in the number of employees employed in the five shipyards. The 1999 data showed that only 3.7% of the total number of employees of 33,200 are employed exclusively in the repair industry, with Poland once again reflecting the highest number of employees. The report further states the two primary repair yard sectors in Poland and Estonia, given the high level of export-orientation and the effort to improve the quality and range of services, should be able to cope with international competition. Growing labour costs, however, need to be kept under control, as it might hurt the competitiveness of the yards (<http://www.europa.eu.int>).

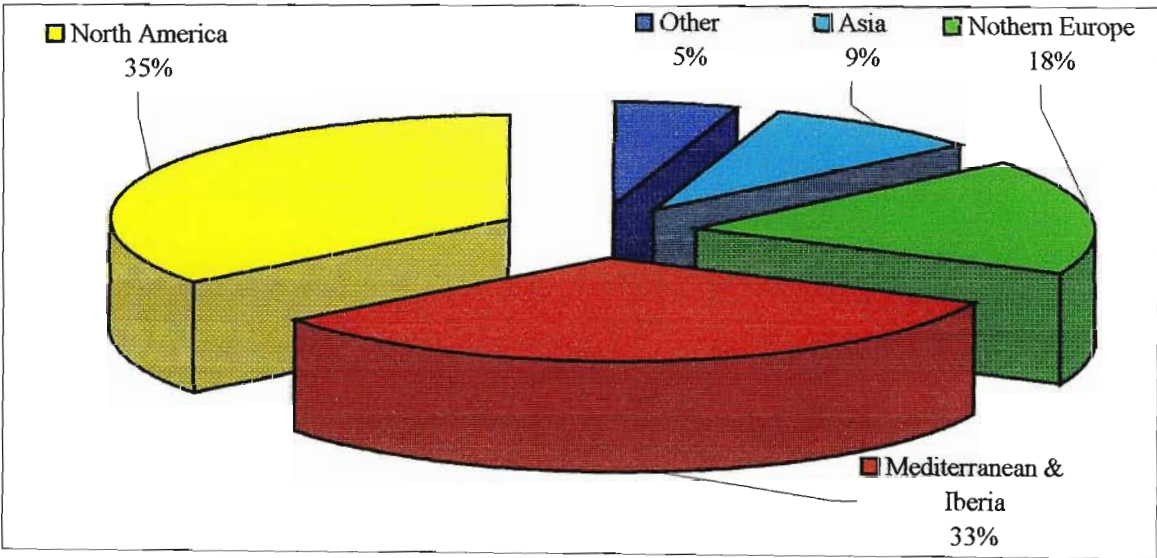
### ***b. Southern Europe and the Mediterranean***

The repair yards in Southern Europe can be found in Spain, Portugal, Italy, Croatia, Malta and Greece. While some of these yards are experiencing problems, other yards are bailed out by their governments.

- ❑ In 1996 for example, the future of Portugal's Lisnave became more secure after a government guarantee on a \$24 million loan to permit financial restructuring of the company. The rescue package entailed the splitting of Lisnave into two companies with the main one taking on the role of a private company free of debt. The shareholders include Germany's Blohm and Voss, which holds 45%, the same number as the private Mello group with the state taking up the other 10%.
- ❑ The Croatian government's intervention has taken on a slightly different approach in that they rationalized shipbuilding and repair by job cutting and selling of non-core businesses.
- ❑ The losses experienced in the Maltese dry-dock continues, with the government balking at pumping millions more into the yard. As a consequence the government is seeking to scrap the employee-run management of the yard in favour of the management committee.
- ❑ In Greece, the yards are still subject to political instability, which has been endemic for many years while the privatisation process in the country is slow (<http://www.marinelog.com>).

The Mediterranean yards continue to face increased competition from expanding yards in the Black Sea and the cheaper yards in Asia for inter-regional traders. The core activities of the Mediterranean yards include general repair work, but as a result of competition more attention in these yards are also given to specialist services and for this reason Italy continues to make inroads in attracting cruise ship contracts. According to Figure 1 below the Mediterranean and Iberia provided for a third of global cruise repairs. Both Italy and Greece emerged as key repair and conversion centres, particularly the yards of Giorgio del Porto, T. Mariotti, Hellenic Shipyards and the repair community in Piraeus. The reason for the success in the cruise repair industry stems from the fact that they are low-cost providers, while maintaining high quality and timely repairs and refurbishments (OSC, 1999).

**Figure 1: Cruise Market: Number of Repair and Conversion Events by Region**



Source: Steller Carson Associates, 1999 (<http://www.stellercarson.com>)

Indications are that these contracts are expected to form a substantial proportion of forward business, while yards in Turkey and Croatia also expanded their activities to more complex repair work and conversions (OSC, 1999).



Overall, South European ship repairers are expected to witness continued downward pressure on prices up to 2015 due to the build up of lower cost facilities in Asia, as well as competition from nearby repairers in the Baltic, East Mediterranean and to a lesser extend the Black Sea.

#### **3.1.4 North America**

The US repair market remains focused on the captive Jones Act vessels and government contracts. Naval and cruise repairs form an integral part of repair work in the States even though the former has experienced significant decreases over the last few years. The lack of funding for required Navy ship maintenance has reached an alarming stage, according to U.S. ship repair interests. The Port of San Diego Ship Repair Association calls the funding shortfall for ship repair and maintenance in fiscal year 2000 "a disturbing trend" with the shortfalls not confined to one region. The association says this will impact both the Atlantic and Pacific Fleets. For example, the total FY '00 shortfall for the Pacific Fleet surface ship maintenance is \$90 million, out of which \$60 million is required for ships home-ported in San Diego (<http://www.marinelog.com>).

The cruise industry has however shed some light on the dwindling naval repairs and maintenance, in the sense that the U.S. yards are emerging as major players in the \$1 billion cruise ship repair market. During 1999 for example, North American shipyards performed 36% (43) of the 120 of global cruise ship repairs and conversions with an estimated global cruise ship repair and conversion market of some \$1 billion. (<http://www.marinelog.com>). Table 5 below further indicates that in 1999, scheduled dry dockings were the largest market segment both by total dollar value and number of events. According to Steller Carson Associates the US yards are now trusted with scheduled dockings, and have further emerged as preferred providers for ships home-ported in North America (<http://www.stellercarson.com>).

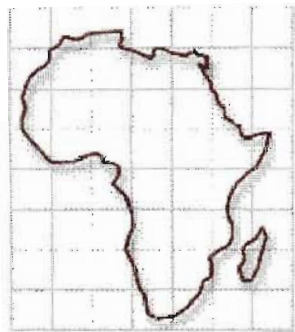
**Table 5: Worldwide Events: Cruise Ship Repair Market (1999)**

Event Type	No. of Events	% of Total
Scheduled Dry-docking	73	61%
Refit & Overhaul	18	15%
Major Conversion & Lengthening	2	2%
Voyage Repair	10	8%
Scheduled Wet Docking	17	14%
<b>Total</b>	<b>120</b>	<b>100%</b>

Source: Steller Carson Associates (<http://www.stellercarson.com>)

Currently between the United States of America and Canada there are no less than 42 shipyards with the US having 35 and Canada 7 yards. At these 42 yards, vessels are built, repaired and maintained (<http://www.marsit.com>).

**3.1.5 Africa**



According to the research by OSC (1999) the African ship repair investment is expected to concentrate on specific local needs. In the case of the North and West Coast, attempts will be made to capitalise on regional shipping movements supplemented by offshore contracts. Egyptian facilities are expected to attract vessels transiting the Suez Canal, with a new floating dock likely to attract an increasing number of contracts up to 2015. Table 6 below indicates the development of a fairly stable overall African dry-dock capacity to 2003, by size sector.

**Table 6: Africa Ship Repair Capacity Development to 2003 – by Size Sector**

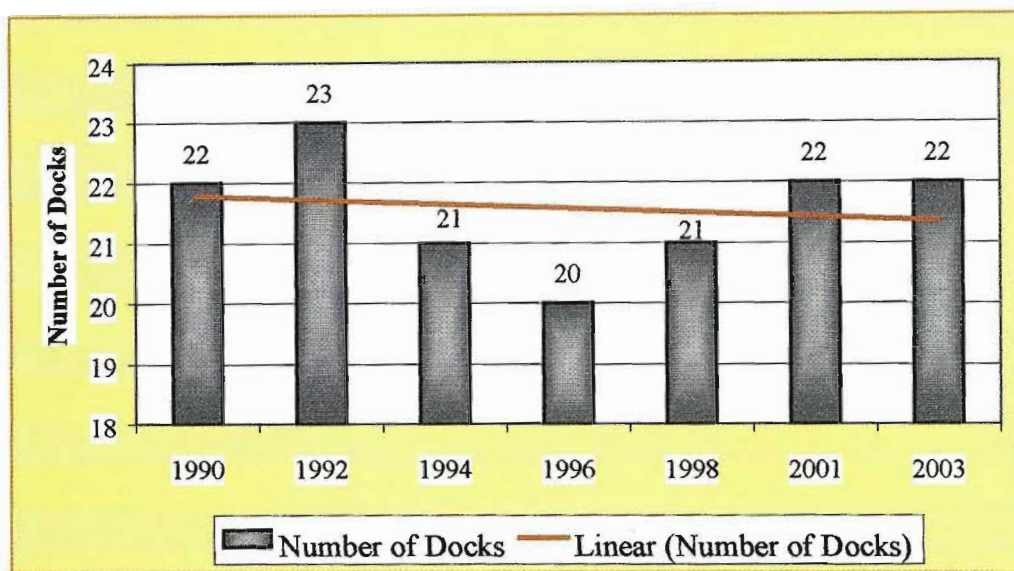
(Number of Docks and Capacity)

<b>Size Year</b>	<b>10/25</b>	<b>25/50</b>	<b>50/80</b>	<b>80/100</b>	<b>100/140</b>	<b>140/200</b>	<b>200/350</b>	<b>350+</b>	<b>Total</b>
<b>1990</b>	5	10	3	1	1	2	0	0	<b>22</b>
<b>1992</b>	5	11	4	1	1	1	0	0	<b>23</b>
<b>1994</b>	7	8	3	1	2	0	0	0	<b>31</b>
<b>1996</b>	9	5	3	1	2	0	0	0	<b>20</b>
<b>1998</b>	9	5	3	1	3	0	0	0	<b>21</b>
<b>2001</b>	10	5	3	1	3	0	0	0	<b>22</b>
<b>2003</b>	10	5	3	1	3	0	0	0	<b>22</b>
<b>Growth</b>	<b>5</b>	<b>-5</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>-2</b>	<b>0</b>	<b>0</b>	<b>0</b>

Source: Ocean Shipping Consultants Ltd (1999)

From Table 6 it becomes apparent that Africa's highest expected capacity development is found in the 10/25,000 ton-size sector. At the time the OSC conducted their study in 1999, it was envisaged that capacity development for the aforementioned sector would double up from 5 docks in 1990 to 10 docks in 2003, while just the reverse was forecasted for the 25/50,000 ton-size sector. Figure 2 below depicts the total number of docks added for the respective years as indicated in Table 6 above. From Figure 2 the outlook for additional dry-dock capacity on the African continent is expected to remain fairly stable, as depicted by the linear trend line.

**Figure 2: Total Ship Repair Development to 2003 (Number of Docks)**



Source: Ocean Shipping Consultants Ltd (1999)

In attempt to further embellish the African ship repair activities, focus is now turned towards specific yards on the African Continent except the South African yards, as these will be discussed in the chapters to follow.

#### *a. Kenya*



Located on the Eastern Seaboard of the African Continent, bordering the Indian Ocean, between Somalia and Tanzania, Kenya is regarded as the regional hub for trade and finance in East Africa. The country is however hampered by corruption and reliance on several primary goods whose prices remain low. Kenya further experienced strong economic growth in 1995 and 1996, but has since stagnated, with GDP growth falling to keep up with the rate of population growth. In 2002 growth fell below 1% as a result of erratic rains, low investor confidence, meagre donor support and political infighting up to the elections (<http://www.cia.gov>).

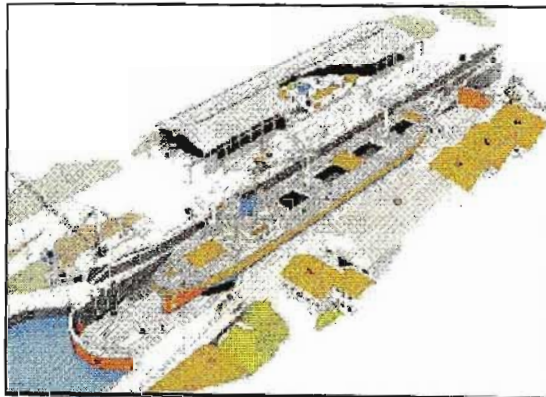




Kenya Ports Authority manages the port of Mombasa. The port of is strategically situated to serve the rich commercial, agricultural and industrial hinterland of Kenya and the land-locked countries of Uganda, Rwanda, Burundi, and Eastern part of the Democratic Republic of Congo and Southern Sudan, among others. In addition to general facilities associated with any port, the port of Mombasa also provides for the repairs of vessels. It has one of the largest dry-dock facilities along the East African Coastline and offers comprehensive ship repair services (<http://www.kenya-ports.com>).

The dry-dock is operated by African Marine and General Engineering Company Limited and Graphic 1 below illustrates the site layout of the facility. The dock measures 180 metres in length, a dock width of 26.40 metres and an entrance width of 24.75 metres.

**Graphic 1: African Marine Company Site Layout**



Source: <http://www.africanmarine.com>

The company further operates a smaller construction dock with a length of 40 metres and a dock and gate width of 18 metres. These facilities have enhanced Mombasa as a major and vital repair port along the East African Coastline. African Marine & General Engineering Company Limited has been in operation in Mombasa since 1997 and operates a certified dry dock facility. The services provided include repairs of vessels up to 170m in length, steelwork and fabrications, mechanical work, plumbing, electrical work, foundry, ship building and electronics, to mention

but a few. Vessels sailing between Europe, the Cape, India and the Far East are targeted for repair work (<http://www.africanmarine.com>).

### ***b. Cameroon***



Cameroon is located on the Western Seaboard of Africa, bordering the Bight of Biafra, between Equatorial Guinea and Nigeria. Due to its oil resources and favourable agricultural conditions, Cameroon has one of the best-endowed primary commodity economies in sub-Saharan Africa. Despite this the country does, however, face many of the serious problems facing other underdeveloped countries, such as a top-heavy civil service and a generally unfavourable climate for business enterprise. The economy grew by 5% in 2002 in real terms (<http://www.cia.gov>).



With its big port under the management of the Cameroon National Ports Authority, Douala is the 'economic capital' and business centre of Cameroon. Douala is situated on the southeastern shore of the Wouri River estuary, on the Atlantic coast with the port located 24km upstream on the left hand bank on the River Wouri. The port is mainly an export port for timber, cocoa, coffee, bananas, cotton, and aluminium and handles most of the country's overseas trade (<http://www.otal.com>).

A new impetus was given to the ship repair activity with the creation, some ten years ago, of a self-sufficient entity, with parastatal status, the Cameroon Shipyard and Heavy Industry. It took over from the Ports Authority all activities relating to ships' repair. Existing facilities comprise:

- ❑ Three floating docks of 500, 1,000 and 10,000 tons capacity respectively;
- ❑ A 200 m repair quay;
- ❑ A workshop equipped with various machine tools (<http://www.camnet.cm>).

### *c. Ghana*



Located on the West African Seaboard, bordering the Gulf of Guinea, between Cote d'Ivoire and Togo, Ghana is well endowed with natural resources and has roughly twice the per capita output of the poorer countries in West Africa.

Despite this Ghana remains heavily dependent on international financial and technical assistance even though gold, timber, and cocoa production are major sources of foreign exchange. The domestic economy revolves around subsistence agriculture, which accounts for 36% of GDP and employs 60% of the work force, mainly small landholders. The gross domestic product - real growth rate - was 5.8% in 2002 (<http://www.cia.gov>).

Established in 1986 as a result of a merger of 3 companies, Ghana Port Authority, Ghana Cargo Handling Company and Takoradi Lighterage Company Limited, the Ghana Ports and Harbours Authority (GPHA) is responsible for the operation and maintenance and the development of the Ghana ports. GPHA is further also responsible for the operation and management, as well as safety and environmental issues of the maritime ports of Ghana (<http://www.winne.com>). GPHA manages both principal ports in Ghana, namely Takoradi and Tema. Takoradi located on the Gulf of Guinea, is one of Ghana's two principal ports. The port has 8 deep-water berths, which handle vessels carrying manganese, bauxite, as well as oil tankers and a coaster. Tema is the second of Ghana's two principal ports with 12 berths (<http://www.pbm.xgulf.org>).



PSC-Tema Ship yard Ltd, boasts one of the largest shipyards and dry-docks on the African Continent as can be noted in Table 7 below.

**Table 7: PSC-Tema Dry-docks & Slipway Specifications**

<b>Description</b>	<b>Dry-dock 1</b>	<b>Dry-dock 2</b>	<b>Slipway</b>
Length	277.40 m	106.70 m	38.70 m
Width	45.40 m	13.70 m	12.80 m
Draught	6.70 m	5.50 m	N/A
Crane 1	60 tons	N/A	N/A
Crane 2	80 tons	N/A	N/A
DWT	100,000	10,000	N/A
Capacity – Haul	N/A	N/A	150 tons
Fitting out Quay	N/A	N/A	182.90 m

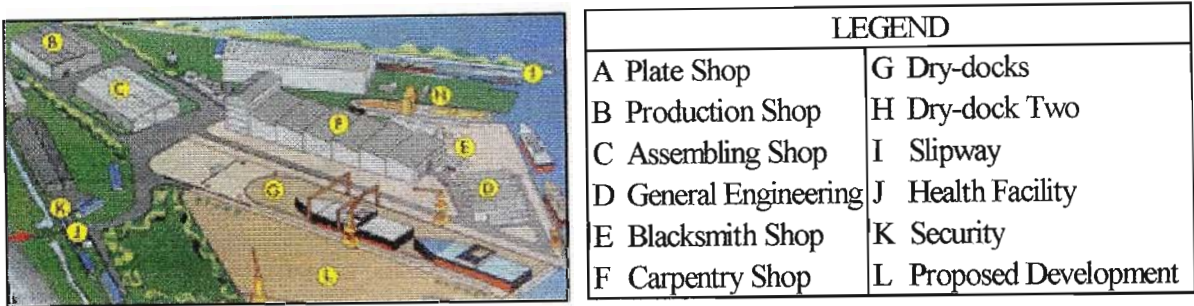
Source: <http://www.psc-tema.com>

PSC Tema is part of the Penang Shipbuilding and Construction (PSC) group and regards itself as a leader in shipbuilding and repair, marine, oil and gas and civil engineering. As part of PSC-Tema's strategy to become one of the most modern and efficient shipyards in Africa, it plans to draw on PSC's worldwide assets. PSC-Tema has further diversified from its core business of ship repair by expanding its efforts and resources into shipbuilding and develops additional support services in container repairs, fabrication works and mining. The yard is able to service both commercial and naval clients, with ongoing transfer of technology and resources from PSC, PSC-Tema is well poised to be a world-class player.

All ship repairs including general engineering work are carried out at PSC-Tema as indicated by Graphic 2 below.





Graphic 2: PSC-Tema Facilities



Source: <http://www.psc.tema.com>

The yard targets naval, commercial, offshore supply/support, deep-sea fishing vessels, and derrick-laying and cargo barges.

*d. Egypt*

 Egypt is located in the Northern part of the African continent, bordering the  Mediterranean Sea, between Libya and the Gaza Strip, and the Red Sea North of Sudan, and further includes the Asian Sinai Peninsula. By following the International Monetary Fund's (IMF) advice on fiscal, monetary and structural reform policies, Egypt was successful in improving its macroeconomic performance throughout most of the last decade. Even though regional tensions continue to hold back the prospects of economic expansion, the development of a gas export market is regarded as a major bright star for future growth prospects. In 2002 Egypt reported a 1.7% GDP real growth rate (<http://www.cia.gov>). Four principal ports, namely, Alexandria, Port Said, Sharm El Sheikh and Suez, service Egypt.

**Alexandria Port** is the main port in the Arab Republic of Egypt and is located at the western end of the river Nile Delta at the Mediterranean Sea. It is considered the second most important city in Egypt and its main port through which three quarters of the country's foreign trade passes. Dikheilah Bay is the natural geographical western extension and configuration of Alexandria port. The new port, known as El-Dikheilah accommodates foreign trade traffic, which increases every year and was opened in 1986. **Port Said** was constructed with the digging of the Suez Canal in 1869 and is located in the Suez Canal at its northern entrance on the Mediterranean Sea.

Port Said port plays a major role in handling Egypt's foreign trade as well as world trade cargo either crossing therein, or via the Suez Canal. Port Said Shipyard operates three floating docks, 5,000 tons, 10,000 tons and 25,000 tons respectively as well as floating and salvage cranes of up to 500 tons lifting capacity with 60 metres lifting height (<http://www.lethsuez.com>)

**Sharm El Sheikh Port** is located approximately 360 km from Suez and 490 km from Cairo, at the head of the triangle of the Sinai Peninsula and at the point where both the Gulf of Suez and the Gulf of Aqaba meet with South Sinai. The port is mainly for tourism, yachting and diving, and is also a base from which to visit the holy and ancient area of Saint Catherine. **Suez Port** is situated on the northern side of the Suez Gulf and is ideal for the reception and departure of passengers, general cargo vessels, consumer goods and crops. Long ago it was considered the essential port for pilgrims to the Holy House (kaaba). It plays an essential role in the exchange of cargo and foreign trade in east Africa, South-east Asia and Eastern Arabia. The port serves passenger vessels, cargo vessels as well as tugs, barges and vessels under repair (<http://www.medcruise.com>).

#### *e. Namibia*



Namibia, formerly South-West Africa is located in Southern Africa, bordering the South Atlantic between Angola and South Africa with Windhoek as the capital and the largest city. With a rich source for gem quality diamonds, Namibia's mining sector contributes the largest portion of GDP and accounted for 20% of GDP in 2002. The Namibian economy is therefore heavily dependent on the extraction and processing of minerals for export. In 2002 the Namibian economy experienced a real growth of 3.2% (<http://www.cia.gov>). Two ports serve Namibia namely, Walvis Bay and Lüderitz, of which both resorts under the Namibian Port Authority (Namport).



Ship repairs in Namibia are carried at the Walvis Bay Syncrolift (Figure 3), which is owned, operated and maintained by Namport. The syncrolift was upgraded in 1997 with repairs to the concrete structure, refurbishment of electrical work and the installation of new safety equipment. The facility has the capacity of lifting vessels up to 2,000 tons displacement,

70 metres in length overall and 12 metres breadth and targets the fishing boats, the oil industry vessels as well as offshore supply boats. Most of the oil industry activity currently takes place off the West African states of Angola, Nigeria and Congo, placing Walvis Bay in an advantageous point to attract vessels requiring repairs. Dry-docking, repair work, repainting of vessels as well as a wide range of specialist services are carried out at the Walvis Bay Syncrolift (<http://www.namport.com>).

**Figure 3: Walvis Bay Syncrolift**



Source: <http://www.namport.com>

#### *f. Mozambique*



Mozambique, republic in south eastern Africa, is bounded on the north by Tanzania, on the east by the Mozambique Channel of the Indian Ocean, on the south and southwest by South Africa and Swaziland and on the west by Zimbabwe, Zambia, and Malawi. Mozambique gained independence from Portugal in 1975 and has a predominantly agricultural economy (<http://www.cia.gov>).

As the 1990s began the economy was still recovering from the independence struggle and the departure of skilled Portuguese personnel that was worsened by a severe drought and by a

protracted civil war. Most plantations and industries, formerly foreign-owned, have been nationalized, and central plans have guided economic policy. In 1990, however, the government turned toward the free market. Economic prospects improved with the signing of a peace accord in 1992. However, Mozambique faced the costs of reintegrating thousands of people displaced by war and demobilizing troops. In the early 1990s the estimated gross domestic product was \$1.75 billion, or only about \$104 per capita, leaving Mozambique as one of the poorest countries in the world (Microsoft Encarta Encyclopaedia, 1997). However, in 2002 Mozambique posted an 8% real growth rate, as a result of political stability and sound economic policies, which in turn has encouraged foreign investment (<http://www.cia.gov>).

Mozambique has six ports on its coastline, namely, Beira, Inhambane, Maputo, Nacala, Pemba and Quelimane. Limited ship repairs are carried in Mozambique and these are restricted to the two primary ports in Mozambique with limited repairs carried out at the port of Nacala, while major and minor repairs are available in the Port of Maputo. The port boasts a 1,200-ton dry-dock with a maximum width of 13metres, length of 80metres, and depth in excess of 4metres. The port installed a floating dock capable of accommodating vessels up to 4,500-tons.

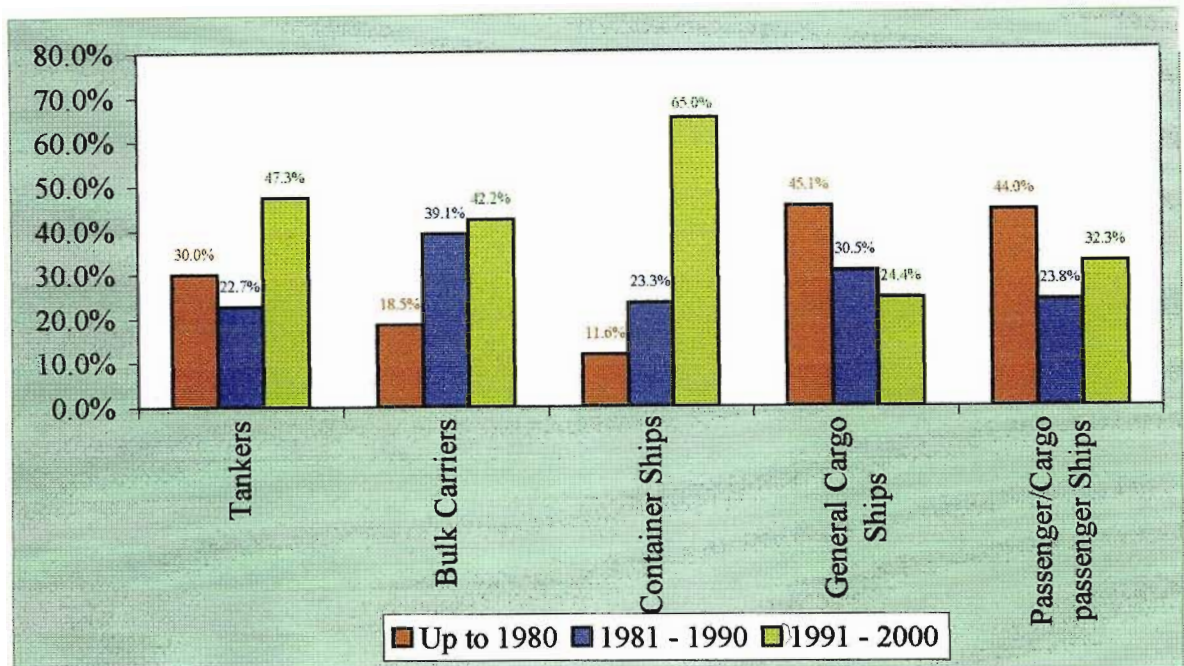
### **3.2 FACTORS INFLUENCING THE DEMAND FOR SHIP REPAIR**

The global demand for ship repair is driven by a number of general factors other than the port-specific forces behind the different market segments described in the above section.

The first of these factors is the **ageing of the international fleet**. In the international market place the world fleet continues to grow at a faster rate than demand so exacerbating the existing over- capacity of the industry. The fleet is also ageing. The Institute of Shipping Economics and Logistics, 2001 (ISL) states that despite the massive tonnage reductions and a peak in tonnage additions during 2000 and 2001, the world merchant fleet is still overaged as reported in 2000. As of January 1<sup>st</sup>, 2001, 59% of all merchant ships representing 42.9% of the total tonnage (dwt) were older than 15 years, thus they were built before 1986 (ISL, 2001).



**Figure 4: World Merchant Fleet – Age structure by major ship types as of January 1<sup>st</sup>, 2001 (Number of ships in %)**



Source: ISL, 2001

Figure 4 above depicts the age structure by major ship types as of January 1<sup>st</sup>, 2001. From this it becomes clear that general cargo ships, cargo passenger ships and oil tankers are the categories with the largest proportion of vessels older than 15 years. Aggregate ship owner repair costs are therefore expected to reflect ageing problems associated with the bulge of 1970s built tankers and early 1980s built dry-bulk carriers undergoing more frequent repairs to adhere to stringent standards. The age structure of container ships on the other hand is quite different. Looking at the fully cellular container fleet as of January 1<sup>st</sup>, 2001, 38.1% of all container ships were built during the last five years, which secures repairs over the long term as indicated in the subsequent sections below.

Secondly, **increased numbers of ships** calling at a given port will also influence the use of ship repair facilities. In a publication entitled “Defining the Future of Shipping Markets” by Martin Stopford (2000), he indicates that there will be at least another 2 billion tons of cargo in 2025. This is based on:

- ❑ The premise that the OECD region is now economically mature and growing quite slowly;
- ❑ Asia growing;
- ❑ China finding its feet, and the importance of the ring of economies around the South China Sea increasing;
- ❑ India being on the road to deregulation and growing fast;
- ❑ The hope that over the next twenty five years the ex-Soviet states will overcome their difficulties and become a more substantial economic force; and
- ❑ Latin America continues to grow with each decade gaining critical mass as a centre of trade.

The spin-off of the above-mentioned continual trade growth would result in more vessels introduced into the transportation system. With the near-term fleet growth expected to remain strong and the medium to long-term expected to accelerate, ports worldwide can therefore brace themselves for more frequent vessel calls as higher volumes are being traded.

Lastly, the **cyclical nature of freight markets**. An upturn in the world shipping market implies that ship owners and operators will start to receive better rates, have better margins and therefore spend more money on the repair and maintenance of their craft. In times of economic downturn, operators will tend to lay-up some of their excess capacity and scrap the oldest vessels, which will also affect ship repairers business. Bulk is currently on a “bull run” of unprecedented proportion, with stratospheric rates, while oil is unstable with liner rates recovering.

### **3.3 GLOBAL SHIP REPAIR DEMAND OUTLOOK**

According to OSC (1999) the main feature of overall industry development is one of progressive expansion in underlying repair demand, supporting an aggregate growth rate of 2.1% per annum over the 2001 to 2005 period, accelerating to an aggregate 2.5% per annum between 2006 and 2010 before easing to around 2.0% per annum between 2011 and 2015. The underlying demand is set to expand by just over 13% from 1999 to 2005 and by more than 29% over the entire forecast period.

Whilst near-term markets are expected to be bolstered by repairs to single-hulled 1970s-built tonnage in order to continue trading through their phase out dates (IMO 13G), a notable weakening in the repair demand growth is expected over 2004/07 as a significant volume of VLCC and Suezmax tonnage is removed from the market under the regulations. This fall in demand growth is expected to reflect the much lower proportion of older vessels within the merchant fleet. It has to be stated, however, that repair needs for 1990s built double-hull tankers have yet to be fully realised, with vessels characterised by extensive internal spaces susceptible to corrosion and increased inspections (OSC, 1999).

Fleet growth over the medium- to long-term is expected to accelerate, supported by stronger Asian economic growth, and rapidly expanding container and cruise fleets. Aggregate ship repair costs are expected to reflect ageing problems associated with vessels over the age of 15 years. These ships account for just over 46% of the current world fleet.

Over the long-term, fleet expansion within the larger tanker and bulk markets, supported by a rapidly expanding container fleet is set to underpin steady repair demand growth between 2010 and 2015. Age profiles are expected to support a reduction in vessels over 15 years of age through to 2010, in contrast to an expanding proportion of older vessels towards 2015, particularly within the container fleet (OSC, 1999).

The most significant impact on forward demand will be attributable to the large-scale container fleet expansion programmes set to dominate longer-term markets. Underlying repair demand from the fully cellular container market is expected to rise by 24.3% from 1999 to 2005 and by a further 43% between 2005 and 2010. The two largest sectors, tankers and dry/bulk combination carriers are expected to show an increase of about 18% to 2010 in contrast to a 24% decline from the general cargo fleet (OSC, 1999).

### **3.4 IMPLICATIONS FOR SHIP REPAIR YARDS**

Ocean Shipping Consultants (1999) list no less than eight implications the above outlook has for ship repair yards. These implications include:

- ❑ Expanding activity in low-cost yards is set to remain a key influence on global price developments, as well as competitive pressures over the period 2001 to 2015.
- ❑ In Asia, low-cost facilities in China, Vietnam, Indonesia and India are expected to compete with established facilities in Singapore, as well as the Middle East.
- ❑ In Europe, low-cost facilities in the Baltic, East Mediterranean and Black Sea are expected to maintain their competitive pressure on higher-cost yards in North/West Europe over the near to medium term.
- ❑ Inherent problems associated with excess regional capacity are expected to encourage specialisation and the development of niche markets. Cost cutting and productivity programmes are expected to characterise forward developments in higher-cost facilities within the United States and Europe.
- ❑ The removal of single-hulled 1970s built tankers to IMO regulations is expected to have a profound impact on the profile of tanker repair activity over the near term, reducing the volume of older tankers within the fleet. However, repair demand on ageing double-hulled vessels has not been fully assessed, with enclosed spaces likely to require an increasing level of maintenance as ships age.
- ❑ Overall merchant fleet growth over the medium- to long-term is expected to accelerate, supported by a rapidly expanding container fleet and more modest growth among the major sectors. Yards located within major container ports are expected to benefit from expanding fleet capacity throughout 2001 to 2015.
- ❑ Rising costs in Singapore and South Korea are expected to encourage joint ventures, with investment, training and expertise switching to new facilities in low labour cost regions.

Overall, ship repair yards worldwide are expected to focus on cost cutting and productivity programs overshadowed by heightened competition and limited price escalation. Ship repair yards are expected to develop a flexible approach to vessel needs, in terms of management, contract type and the location of the ship during repairs – alongside, docked, or on passage. Increased competition for major repair works, and limited opportunities to specialise in high volume contracts, are expected to encourage ship repair yards to develop subcontracting practices to remain profitable on a diet of minor or small jobs (OSC Ltd., 1999).

## CHAPTER 4

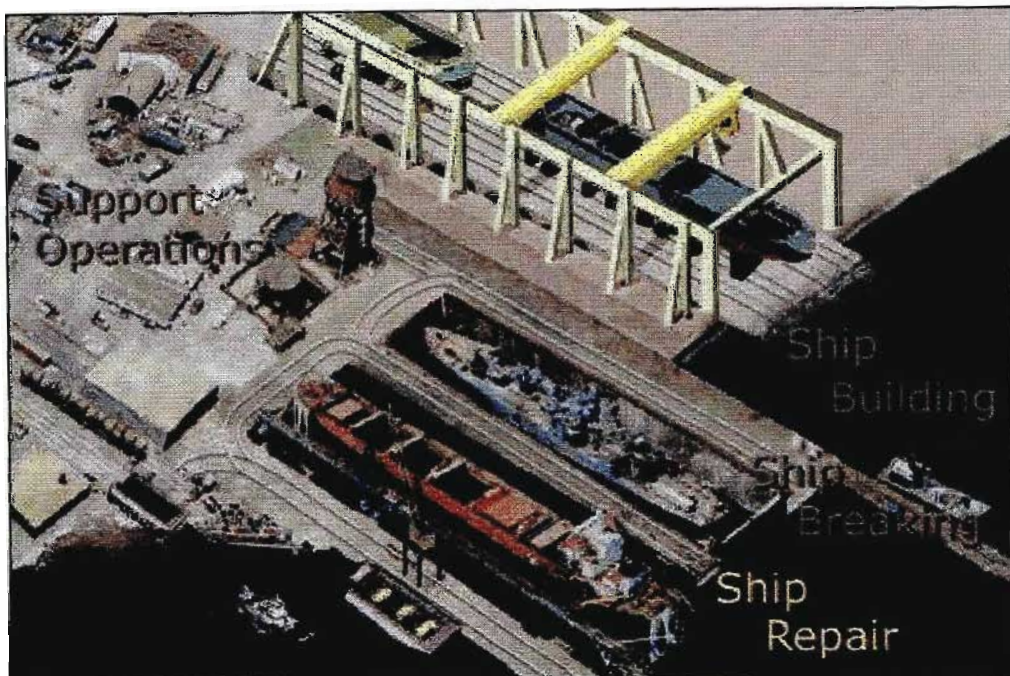
### 4.1 SHIP REPAIR AND THE ECONOMY

#### 4.1.1 Services Rendered by Ship Repair Yards

The main components of services rendered by ship yards as depicted in Graphic 3 below include:

- ❑ Ship Building
- ❑ Ship Breaking
- ❑ Ship Repair
- ❑ Support Operations

**Graphic 3: Ship Building, Breaking, Repair and Support Operations**



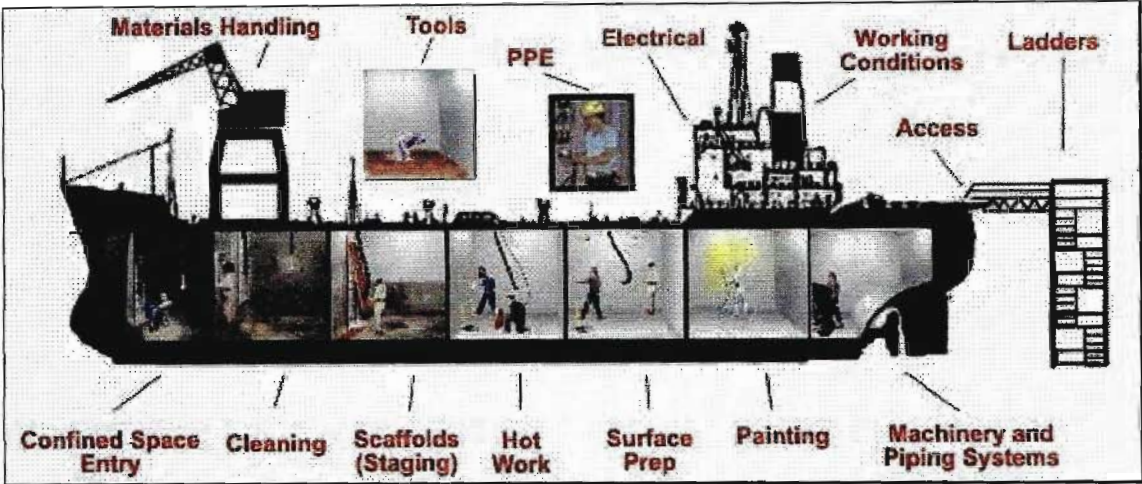
Source: (<http://www.osha-slc.gov>)

The former two of the abovementioned components fall outside the scope of this study. While ship repair is the main area of focus, the absence of the appropriate supporting operations makes the task impossible, hence the inclusion in the study.



Ship repair predominantly includes the repair and maintenance of ships with the major activities occurring during repair as captured in Graphic 4 below.

**Graphic 4: Ship Repair Activities**



Source: (<http://www.osha-slc.gov>)

Ship repair further includes the altering, converting, installing, cleaning, painting and maintaining of vessels. These repairs can be done at shipyard facilities or at any other location where there is navigable waters. The next sections will attempt to highlight the most important activities carried out during ship repairs including a brief description of what each activity involves.

***a. Materials Handling***

Cranes, hoisting apparatus (such as chain falls, winches, and marine railways) and their accompanying rigging gear, are used to move and lift materials and equipment during ship repair operations. Rigging methods and equipment are used to attach heavy loads of lifting devices such as cranes, derricks, or chain falls. Rigging equipment may include: rope, chains, or synthetic webbing slings, which connect the loads to lifting machinery by means of hooks or shackles.

### ***b. Personal Protective Equipment (PPE)***

Workers protection is one of the primary requirements for any shipyard due to the inherent danger involved in ship repair. The reason for this is the fact that ship repair activities are some of the most hazardous shipyard operations.

### ***c. Cleaning and Other Cold Work***

Cleaning and other cold work often require manual activities such as scraping, mucking, pumping, or gas freeing (removing liquid residues). The general steps to follow for safe cleaning and cold work involve proper cleaning preparation and the actual operations.

### ***d. Hot Work***

Hot work refers to the use of open fires, flames and work involving the application of heat by means of tools or equipment. It includes the unintentional application of heat, for example by the use of power tools or hot rivets or hot particles from welding or cutting operations, burning, abrasive blasting and other heat-producing operations. A lot of hot work is undertaken in connection with construction, maintenance or repair operations.

### ***e. Painting and Other Coating***

The painting of vessels can be divided into two categories:

- ❑ New Construction Painting
- ❑ Maintenance Painting.

While the former is applicable to ship building, and not addressed here, the latter can be further divided into two sub-categories:

- ❑ Painting alongside the berth; and
- ❑ Dry-docking – This is normally the time when major repairs are done. It covers the inspection of underwater hulls, sandblasting interior areas, painting and coating to protect the steel from corrosion by the cargo.

A number of factors influence the selection of specific coatings, which include:

- ❑ The types of cargo that will be carried;
- ❑ The type of cleaning between cargoes;
- ❑ The temperature of the cargo during loading;
- ❑ The storage temperature; and
- ❑ The length of the time the cargo will be stored (<http://www.paint-the-net.com>).

The activities discussed above are by no means an exhaustive list of the activities carried out during repair works, but attempt only to highlight the most pertinent ones. As can be noted from Graphic 4 above, ship repair does cover quite a wide spectrum of activities.

## **4.2 DRY-DOCKING COSTS**

Ships are sometimes referred to as cities at sea and vary from huge aircraft carriers and very large crude carriers to barges that supply them and the tugs that push them out to sea. Ships are floating factories subjected to immersion in water and the most severe weather the earth has to offer. In addition they are subjected to bending stress, abrasion from cargo and passage through the water, chemical attack, dissimilar metal corrosion, radical temperature changes, extreme UV attack, biological organisms and just about any other type of corrosion that Mother Nature so efficiently provides (<http://www.paint-the-net.com>).

Dry-docking costs are amongst the most expensive elements of any ship's lifetime operational costs. Ship repair yards are quite aware of this, hence the intense competition as owners/managers always look for the best deals within the general repair market within their favoured geographical areas. Mostly ships will dry-dock on routes upon which they trade and deviation is becoming very uncommon nowadays even though the major conversions might still be attracted by the cheapest yards (<http://www.marinelog.com>). The basic repair cost especially labour and steel components remain the most important determining factor though when negotiating a repair operation.



The overcapacity as mentioned previously, even though problematic to repair yards, seems to be working in the favour of ship owners. The reason is that the overcapacity almost always results in significant differences between repair quotes, sometimes by as much as 50%, depending on workloads in the various yards (<http://www.marinelog.com>).

Quality of work and the steel used in the repair operation is another important factor when negotiating a repair operation. Many of the traditional ship owners are now looking more seriously at the quality issue, especially if it means spending a little bit more time than would be required in a cheaper yard. Also to be noted here is the fact that the cheaper yard scenario applies mainly in the general repair market and not in the conversion markets. The latter involves extensive engineering and design requirements, which restrict the cheaper yards from entering these markets. Exceptions however do occur, as in the case of Poland where Remontowa, Gdansk, has become one of the major players in the European conversion market (<http://www.marinelog.com>).

The unpredictability of Mother Nature therefore makes planning and preparation key to a successful dry-docking. The cost of having a ship out of service added to the daily cost of dry-docking necessitate that all materials and equipment to perform the job be onsite prior to a vessel's arrival at the dock. A well-planned and prepared operation requires that material for each planned activity as well as additional material for "unplanned" work be available, to ensure that no time is wasted acquiring such materials. It becomes therefore pertinent that detailed records of every activity be kept over the period the vessel is dry-docked, as claims can be very costly especially those pertaining to underwater coating failure. Knowing what happened, how and when will resolve many issues and will make the next dry-docking easier.

### **4.3 ECONOMIC IMPLICATIONS**

The contribution of ship repair to the economy extends beyond the physical repair work, and the direct and indirect employment created and profits generated by repair firms. Other factors to take into consideration when determining the contribution of ship repair to any economy include:

- Purchases from ship suppliers (backward linkages);

- Acquisition of equipment and material (local and international);
- Revenues accruing to the respective port authority for the pilotage, tuggage and berthing (dry-docking) of vessels;
- Provision of infrastructure such as cranes and dry- and floating-docks; and
- Supply of labour.

The above list is by no means exhaustive but attempts to include the most obvious contributions and apart from this a number of other auxiliary activities and tasks are also performed. Marine engineering aspects and the supply of marine equipment are but two other such tasks that have a positive effect on employment creation and income (revenue) generation. Other firms employed in the repair work would be those concerning with the hydraulics, electronics, painting and cleaning, repair of propellers and refrigeration equipment, as well as maintenance of fire fighting equipment, electrical works and ships architecture and design. The equipment suppliers include firms providing and installing navigation, communication and safety equipment, and cargo-handling gear.

The contribution of ship crews is a further aspect that should not be underestimated. Smith (2002) estimates that ship crews spend on average 10% of their wages away from home of which a percentage is spent in the port where the vessel is destined for dry-docking and repair work. The length of stay in the port for repairs will ultimately determine how much will be spent in the local economy of the port. Smith's study further discloses that crews on board ships calling at South African ports for repairs during the year 2000 spent approximately R23 million, assuming an average crew of 22 per ship calling for repairs. Oilrigs are said to generate even more income as it employee in the region of 75 crewmembers. Smith estimates that their spending added another R6 million to the amount of R23 million in 2000.

The economic principle that becomes evident through this discussion is the substantial multiplier effects of the ship repair industry. In a monograph entitled, "The Port of Durban and the Durban Metropolitan Economy" by Trevor Jones (1997, 45) it is quoted that a study by a major German shipyard claimed that every frontline job created in shipbuilding generates nine jobs in linked

ancillary activities. While ship repair is dealt with in this work and not shipbuilding, needless to say that an expansion of repair activities should have significant knock-on effects. Table 8 summarising the contributions from the ship repair industry to the South African economy further confirms this. These figures although initially pertaining to the Port of Cape Town and its contribution to the Western Cape, was updated and now include figures for all three major ship repair ports (Cape Town, East London and Durban).

**Table 8: Contribution of SA Ship Repair to SA Economy (2000)**

CATEGORY	AMOUNT (RM)
Crew spending	29
Port revenue	36
Repairers' revenue	450
Purchases from ship suppliers	560
Subcontracted repair work	750
<b>TOTAL</b>	<b>1,825</b>

Source: Smith, A. (2002)

In South Africa the ship repair industry employs approximately 1,700 people which includes permanent and contract workers, but excludes staff employed by subcontractors, supply firms and employees of smaller marine engineering firms (Smith, 2002). The South African ship repair industry is discussed in more detail in Chapter 5.

## CHAPTER 5

### 5.1 SOUTH AFRICAN SHIP REPAIR INDUSTRY

Appropriate before starting this chapter on the South African ship repair industry, would be reference to a quote from a publication of the then South African Railways and Harbours entitled “The New Graving Dock at Durban Natal”, published in Johannesburg in July 1924. It states:

*“To keep pace with the shipping trade already established and the expansion there is every reason to anticipate, it is, therefore, desirable that adequate port and terminal facilities, the equal at least of those provided at ports in other parts of the world, should be available to encourage shipping to Union ports. And not at least important of such facilities are those for enabling the cleaning and repairing of vessels. Indeed, a graving dock although seldom, if ever, showing an adequate return on cost, is a necessary adjunct to any port of even moderate size and quite indispensable where there is a likelihood of such services being required by large ocean vessels.” (SAR&H, 1924, 3)*

The purpose for the quote, even though it intended to refer to the Port of Durban, proved over the span of time to be very relevant for all ports in South Africa, especially those intending to provide ship repair facilities. Today ship repair yards in South Africa extend from Cape Town, Simons Town up to East London through to the Port of Durban even Richards Bay. The biggest of these yards are located in the harbours of Cape Town, Durban and East London as indicated in Table 9 below.

#### 5.1.1 South African Ship Repair Facilities

The construction of the first dry-dock in South Africa commenced in the Port of Cape Town in 1876 and was completed and inaugurated on 20 October 1882. Since then ship repair facilities in South Africa have expanded with the development of the seven commercial ports around the

coast. Currently three of these ports host internationally-competitive facilities with a fourth repair destination added very recently when Simons Town repair facilities were opened for commercial use. Table 9 below summarises the existing repair facilities on the South African coastline. These will be discussed in more detail below, while special attention will be given to the Port of Durban repair facilities in Chapter 6.

**Table 9: Existing Ship Repair Facilities**

Location	Facility	Length	Width	Depth	Lifting Capacity
<b>Cape Town</b>	Graving Dock I	369 m	45 m	14 m	14 m
	Graving Dock II	161 m	20 m	8 m	8 m
	Syncrolift	61 m	15 m	N/A	1,750 tons
<b>Durban</b>	Graving Dock	352 m	42 m	13 m	N/A
	Floating Dock I	155 m	24 m	7 m	10,500 tons
	Floating Dock II	61 m	15 m	7 m	4,500 tons
	Syncrolift (Navy)	Not available	Not available	Not available	Not available
<b>East London</b>	Graving Dock	200 m	23 m	10 m	N/A
<b>Simons Town</b>	Graving Dock	231 m	28 m	11 m	N/A

Source: National Ports Authority & SA Navy

The following sections discuss the ship repair facilities in South Africa very briefly. In the case of Durban reference is made to occupation rates while in the case of the other ports reference is made to number of dry-dockings.

#### *a. Port of Cape Town:*



The Port of Cape Town is a full-service general cargo port. It is world-renowned for its deciduous fruit, perishable and frozen products exports with the fishing industry based in the port being of major importance. Over the past centuries the port has evolved from a halfway supply station on the East-West trade routes of yesteryear to a modern deepwater port on the southern

most tip of Africa. The port is further ideally situated to serve as a hub for cargoes between Europe, the Americas, Africa, Asia and Oceania. In 2001 the Port of Cape Town handled 5% of total cargo (tonnage) handled at South African Ports, which equates to 7,816,848 tons.

The port, regarded as the Tavern of the Seas caters for general cargo on a common user basis, is handling an increasing number of containers<sup>1</sup> and has become an important repair facility, especially for the west coast oil and diamond mining industries. The port offers extensive ship repair facilities with the main dry dock, known as Sturrock Dry Dock, having an overall docking capability of 369 metres length and 45 metres width at the entrance top plus a depth of 14 metres. The dock can be divided into two sections of varying lengths to accommodate two vessels at the same time. The Robinson Dry Dock in the Victoria Basin measures 161 metres in length with an entrance top of 20 metres and a depth of 8 metres, accommodating smaller vessels especially those associated with the fishing industry. The port also has a syncrolift capable of handling ships up to 61metres in length, 15metres beam and 1,750 tons, as well as a repair quay situated in the Duncan Dock (<http://www.ports.co.za>).

The bulk of ship repair activities and all oilrig repairs take place in the Port of Cape Town with Durban being second and East London third. Figure 5 below depicts ship repair activities in the Port of Cape Town. The sharp decline in the number of vessels repaired in the Port of Cape Town can be attributed to the increased number of large oilrigs and ocean going vessels. These

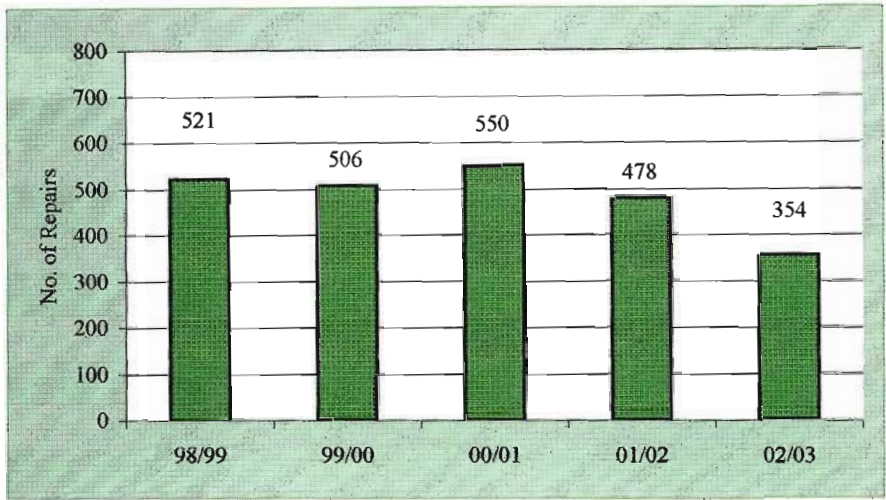
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<sup>1</sup> In 2001 the Port of Cape Town Handled 25% of total containerised cargo in South Africa which equates to 479, 248 TEU's.



vessels take up a larger portion of the ship repair capacity due to their size and duration of their stay in the repair facilities in the port.

**Figure 5: Port of Cape Town: Ship Repair Activities**  
**(Number of Vessels Repaired)**



Source: National Ports Authority

The port of Cape Town’s main competition will emanate from two sources namely, Simons Town’s Selborne dock should it be commercialised and Namport should the current call for tenders (2003) to conduct a feasibility study into dry-docking expansions deem successful. Namport, as indicated in Chapter 3 above, already competes with the Port of Cape Town for the smaller work as the dock targets fishing boats, oil industry vessels and offshore supply boats. With the proposal call for a new ship repair facility, the Port of Cape Town indicated that additional capacity is needed to service the smaller vessel market. Only time will tell who will win the race and the statement made by the Port Manager, Sanjay Govan, in the March 2003 edition of the Freight and Trading Weekly (FTW), can therefore be concurred with: “If we snooze we lose.”

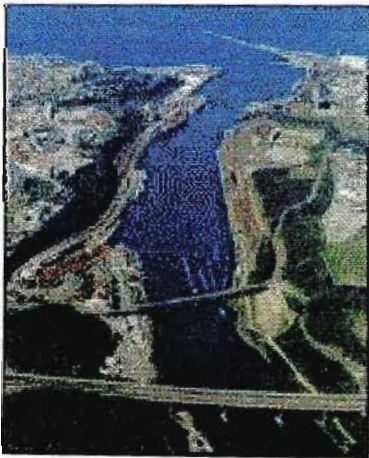
As far as future prospects for ship repair in the Port of Cape Town is concerned, the port is bracing itself to take advantage of, and cash in, on two hugely lucrative industries: oil and gas exploration in West Africa and ship repair. According to the FTW (March 2003, 2), estimates



indicate that the financial spin-off from a single fishing trawler undergoing repairs in Cape Town is around R1 million while that of a huge oil vessel like the Glas Dowr, calling in for a refit and lasting several months, is said to exceed R200 million. Whether or not the Simons Town dock encourages even greater use by commercial enterprise, the pressure on available mooring space in Cape Town docks for the progressively expanding oil and gem mining operations off West Africa, is growing.

In an attempt to meet the current and future demand for ship repair, the Port of Cape Town has issued a Proposal Call inviting proposals for the construction and operation of a further ship repair facility under a Fixed Term Build, Own, Operate and Transfer (BOOT) concession<sup>2</sup>. According to the proposal, the reason for adding a fourth repair facility is the Port's lack of capacity to meet the demand for ship repair facilities, with facilities being fully booked up to eight months in advance.

#### ***b. Port of East London***



The Port of East London is the only commercial river port on the South African coastline and is situated at the mouth of the Buffalo River on the East Coast of South Africa. A major motor assembly plant is located in East London and a world-class four-level car terminal serves the import and export of fully built-up vehicles, which makes up the largest commodity handled at the port. The port further has the largest grain silo which is said to be the most efficient bulk-handling facility for free-flowing bulk products on the Southern African coastline. The silo has a storage capacity of 76,000 tons and a loading rate of 1,200 tons per hour and was specifically built for exports. The Port of East London handled 1% of the total cargo (tonnage) handled at South African ports in 2001, which equates to 1,405,196 tons.

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<sup>2</sup> BOOT: where ownership of land and facilities conveys to the concessionaire, but is transferred back at an agreed price at the end of the concession period

The repair facilities in East London include the Princess Elizabeth Dry-dock as depicted in Figure 6 below.

**Figure 6: Princess Elizabeth Dry-dock – East London**

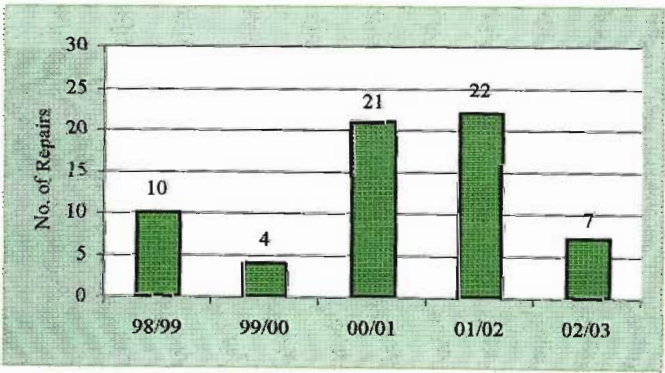


Source: <http://www.elsy.co.za>

As indicated in Table 9 above, the dock does have the capacity to accommodate vessels with a beam of 10 metres draft and 23 metres width, with an overall length of 200 metres. Even though Elgin Brown and Hamer Pty Ltd (EBH) operates a shipyard in East London and utilises the dock, it is quite under utilised as indicated in Figure 7 below. The reasons for this include:

- ❑ The port of East London does not enjoy the terminal port status as Durban;
- ❑ The maximum draught in the port is 10.4 metres; and
- ❑ The principal deepsea callers are car carriers and grain bulkers.

**Figure 7: Port of East London: Ship Repair Activities  
(Number of Vessel Repairs)**



Source: National Ports Authority

### *c. Port of Durban (Briefly)*



The Port of Durban is regarded as the gateway to southern Africa, due to its status as being one of the busiest ports in Southern Africa. It is further regarded as a premier cargo and container port, with strong growth prospects for containers, motor vehicles, and liquid and dry-bulk cargoes. In 2001 the port handled 20% of total cargo handled at South African ports,

which equates to 31,788,050 tons. The port further handles the highest volume of containerised cargo in South Africa and handled 64% of all containerised cargo in 2001.

The ship repair facilities in the port of Durban for commercial repairs include:

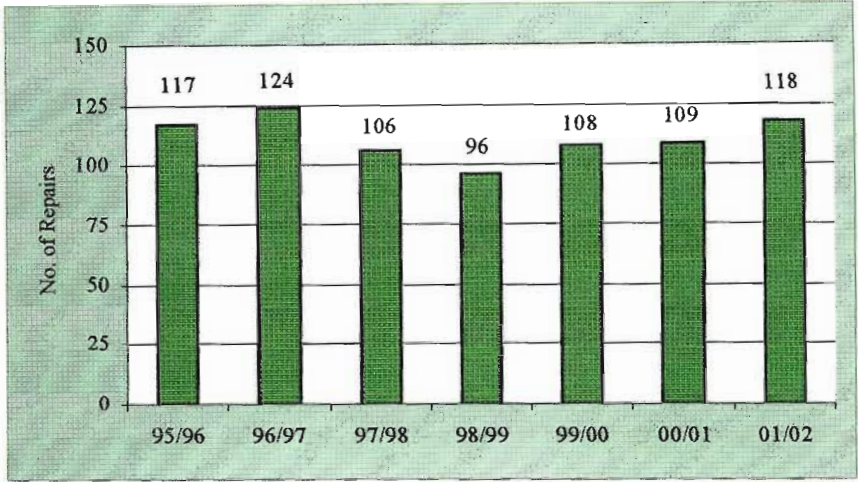
- The Prince Edward Graving (Dry) Dock;
- Two floating docks;
- A repair quay;
- A slipway; and
- Workshops.

A syncrolift is also located on the Salisbury Island in the port. This facility belongs to the South African Navy and is not open for commercial use (more detail to follow in subsequent sections).

Figure 8 below indicates that the NPA repair facilities experienced a gradual decline in activities up to 1998/99. Subsequent to that more vessels have called for repairs but repairs were not quite at the levels as attained in 1996/97. The recovery is partly due to the introduction of a floating dock by Elgin Brown & Hamer in May 1999.



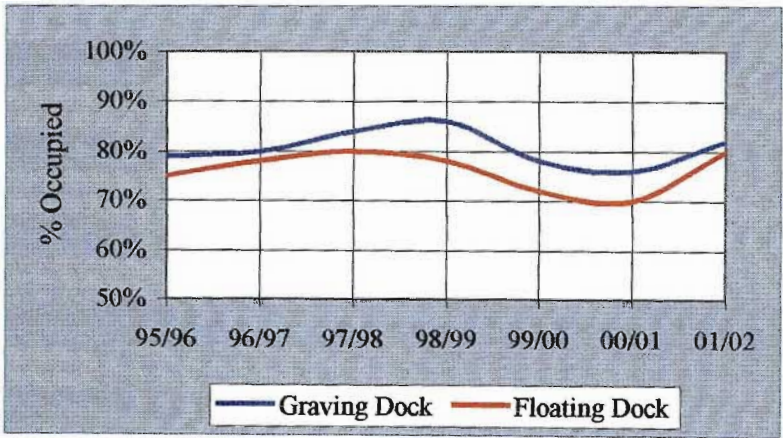
**Figure 8: Port of Durban: NPA Dry-dock & Floating Dock Repair Activities**  
**(Number of Vessels Repairs)**



Source: NPA Statistics

The dry- and floating dock occupancy rate is fairly high as indicated in Figure 9 below and varies between 70% to just over 85%. A further interesting trend emerging from Figure 9 is the close correlation observed between the occupancy rates of the two facilities.

**Figure 9: Port of Durban: Repair Activities**  
**(% Occupation)**

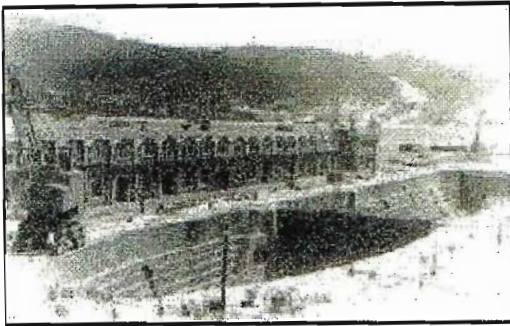


Source: National Ports Authority

#### ***d. Port of Elizabeth & Mossel Bay***

Both Port Elizabeth and Mossel Bay have very limited ship repair facilities and repairs are mainly done alongside. Mossel Bay ship repairs came as quite a surprise with 55 vessels undergoing repairs as per information received from the National Ports Authority at the end of the financial year 2002/03. This obviously signifies minor repair works, but further highlights the continual growth of repair work on the South African coastline.

#### ***e. Simons Town Dockyard***



In addition to the abovementioned ship repair facilities on the South African Coastline, there is the Selborne Dock, the naval graving dock at Simons Town, controlled by the Naval Authorities as depicted in adjacent picture (Selborne Dry-dock 1910, <http://www.simonstown.com>). The Simons Town

Naval Base serves as the fleet command quarters of the South African Navy and is undergoing restructuring. In a press release dated 12 March 2003, the Minister of Defence announced that the Defence Council of the South African National Defence Force (SANDF) has approved the running and management of the transformation process of the Simons Town Naval Dockyard by Armscor. According to the press release the decision was necessitated to provide effective and professional logistic support to the South African Navy and also to utilise and manage the dockyard's capacity on a sound economic and commercial basis. Armscor, the Secretary of Defence and the South African Navy will jointly manage this transformation process.

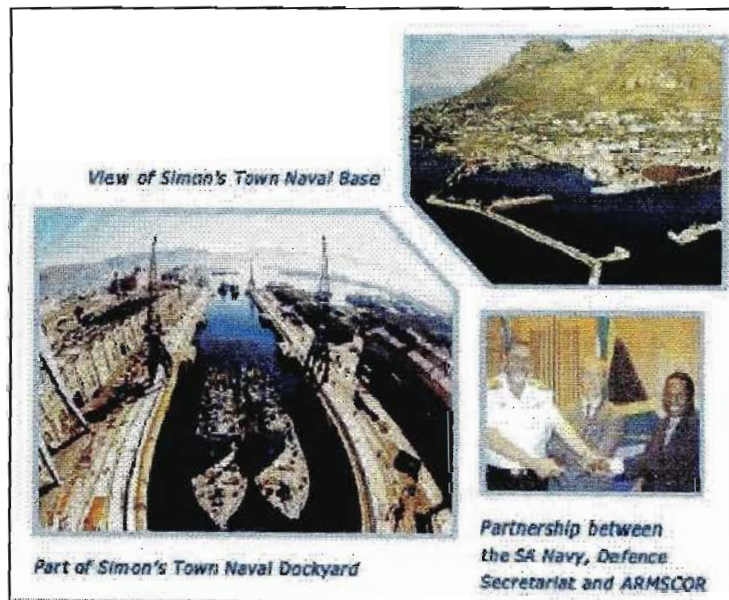
An upgrade to the Selborne dry-dock was recently completed in order to prepare the dock for commercial use. Even though the dock was open for commercial use in 2002 for a very short period, subsequent to that it has only been used for Naval Vessels. From the statement above by the Minister of Defence, it seems likely that the dock might be opened for commercial use in the near future. There is, of course, good reason why the naval base should progressively turn to commercial working to reduce the financial burden on taxpayers required to meet cost of

maintaining the base and its associated expenses. This shift in focus has become quite a common phenomenon internationally:

- ❑ The French have turned their major naval terminal at Brest to commercial ship repair and engineering;
- ❑ The Brazilians have gone even further by discussing of ro-ro ships suitable for chartering to commercial uses in peace-time, but suitable for immediate requisitioning in wartime for moving troops and military hardware;
- ❑ The Americans have rented out navy depots to private enterprise; and
- ❑ In Britain it is common knowledge that former navy bases have already gone over to commercial operating after 40 years of maintenance at taxpayer's expense (<http://www.cbn.co.za>).

Figure 10 below depicts the Naval Base and Dockyard, as it currently looks as well the signing of the Memorandum of Understanding, between Armscor, the Secretary of Defence and the South African Navy on Friday, 15 April 2003 at the Armscor Building in Pretoria.

**Figure 10: Simons Town Naval Base and Dockyard**



Source: <http://www.armscor.co.za>



#### *f. Future: Port of Richards Bay*



The port of Richards Bay, located 100 nautical miles north east of Durban on the KwaZulu-Natal coast, is a relatively young port by international standards and only opened for business on 1 April 1976. At present the port is South Africa's leading port in terms of cargo volumes and handles in excess of 80 million tons per annum, representing 55% of all cargo handled at South Africa's seaborne cargo trade. The port is also home to

the largest single coal-exporting terminal in the world, which exports steam coal. One of the inherent strengths of the port is its deep-water infrastructure, with a maximum permissible draught of 17.5 metres while further offering a repair quay of 300 metres in length and 7.7 metres in depth (<http://www.npa.co.za>).

The plan to develop Richards Bay as a major ship repair destination, is indeed an interesting one. This is as a result of a call for tenders for a R1.2 billion dry-dock at the port after prolonged negotiations with development company, Rowdock, were unsuccessful. Four years of negotiations between the National Ports Authority and Rowdock were deemed futile, when the latter failed to comply fully with all the conditions attached to the lease agreement for the site. As a result, and following a bid for the dry-dock by another development company Kayloi Corporation, a decision was made to put the project out on tender (<http://btimes.co.za>). It is envisaged that the dock will not be competing with existing docks on the South African coastline and that specific ship sizes will be targeted including container, iron ore and oil vessels. The project's feasibility is based on research indicating:

- ❑ A strong global demand for ship repair facilities;
- ❑ An ageing international fleet requiring more frequent dry docking; and
- ❑ The increasing number of larger vessels calling at southern African ports (<http://www.btimes.co.za>).



## 5.1.2 Profile of the South African Ship Repair Industry

### *a. Infrastructure*

International regulation makes the regular dry-docking of vessels compulsory and as indicated in Chapter 3 above. With legislation in this regard becoming stricter, vessels will be finding themselves more frequently in dry docks for inspections, repairs, repainting or any other activity influencing the seaworthiness of the vessel. The facilities required for such operations are naturally of a high capital cost, and the initial capital layout, especially for a modern state of the art dry-dock can be astronomical. The graving docks in Cape Town and Durban have proven that with age come more expenses<sup>3</sup> and to maximise profits, these facilities must be utilised to their fullest capacity.

A typical dry-dock's design length will be 5 to 10 metres greater than the length of the largest ship, the width 4-6 metres greater than its beam and the depth 0.5 to 1 metres greater than the draught. Cranes run on rails along the sidewalls, whilst a repairing berth may be located on the outer side of the lateral wall, which will permit use of cranes for both facilities. Other infrastructure and equipment associated with the dock includes but is not limited to:

- ❑ **Pumps** – Refers to the devices used to raise, transfer, or compress liquids in this case water. In the case of the dock these pumps draw water from the main sump and deliver through the return wall into the bay.
- ❑ **Pump House/Station** – Refers to the physical building which houses the pumps, which consists of the pump house floor, the pump house well and the pumping machinery.
- ❑ **Caisson and caisson chambers** – Refers to hollow cylindrical or square tube used as a foundation, or to provide a working space for construction projects below ground or underwater. Caissons can be up to 10 metres (up to 33 ft) in diameter and are usually made of concrete or steel. The chambers represent a dock in miniature into which the caisson is drawn to allow a ship to pass in or out.

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<sup>3</sup> 2001/2002 Total Expenses on the NPA Durban Graving Dock: R9, 658,817.

- ❑ **Keel and Bilge Blocks** – Refers to various kinds of supports that transfer the loads from the ships to the dock floor slabs. The purpose of the supports is to maintain the vertical position of the section or block of the ship.
- ❑ **Capstans** – Refers to the thick revolving cylinder for winding the cables. These can be used for warping ships during docking and undocking. Capstans ensure that the vessel is controlled in any position during the process of docking or undocking.
- ❑ **Bollards** – Refers to the post on quay for securing the ropes to and in each system the mooring bollards are also used to keep the ship in position after docking.
- ❑ **Dockside equipment** – Refers to the fresh water, salt water, compressed air and electric supply services.

A floating dock can alternatively be used and is capable to add significant flexibility to the operation. This is especially effective where the bearing strength of the soil is insufficient for conventional dry-docking and the water is deep enough to accommodate the floating dock. A floating dock is normally a steel structure, comprising a horizontal float (apron), and two sidewalls that keep the structure stable and rigid during operation characterised by open ends on both sides in its length. Floating docks are characterised by their lifting capacity, which corresponds to the ship's displacement tonnage. Usually a 20,000-ton dock can accommodate an empty vessel of 50,000 – 60,000 dwt.

The biggest advantage of floating docks is their mobility. This allows the operator to move the facility within a port to accommodate flexibility in berthing requirements. Sharing of a floating dock between ports allows ports to have flexibility in their ship repair capacity while the biggest disadvantage is the high maintenance and operational costs involved. South Africa only has two floating docks on its coastline, both based in Durban.

The syncrolift facility adds the third dimension to South Africa's ship repair infrastructure. There are currently two such facilities, one in the Port of Cape Town and the other at the Naval Base on Salisbury Island in the Port of Durban; the latter as indicated above is not open for commercial use.

### ***b. Technology***

The ship repair industry is not an industry known for rapid technological innovation and development. The technological evolution with regard to shipping is limited to the world of ship design and the provision of electronic equipment and navigational systems where everything these days are centrally controlled by computers.

However, during the past few years some technological advances in the physical ship repair industry have been made. Dormac Pty Ltd, the major player in the ship repair industry in Durban, introduced a unique cofferdam system of repairing ships without having to enter a dry- or floating dock. An added advantage of this new technology emanates from the fact that vessels are not required to offload cargo, to carry out repairs. The cofferdam has been specially designed, developed and patented by Dormac to carry out any repair work required on damaged rudders as though in the dry-dock. The cofferdam technology entails a water diversion or fluid retention system for use in open water and is used for construction, rehabilitation, and flood protection and inspection projects. By utilising a unique freestanding steel support system and impervious fabric membrane, the technique allows many types of in-water construction and repairs to be accomplished in “dry conditions” (<http://www.cofferdam.co.za>).

A second innovation was made in the Port of Cape Town where the Robinson Dry-Dock forms part of the well-known tourism hub, the Victoria & Alfred Waterfront. Due to complaints from tourism authorities regarding the pollution caused by the spray painting of ships, ships repairers were forced to find an alternative method. As this method was largely automated, a similarly effective alternative had to be found. This led to a system where roller brushes are connected to a pipe fed with paint through a pump. This allows the artisan to effectively paint the ships with more or less the same effort than the previous spray painting method.

High-pressure water cleaning is another innovation, which resulted from pressure applied by environmentalists. The system replaced sand blasting, which contributed to significant pollution in the Port of Cape Town. This new method has the advantages that it is clean and as effective. Work does not need to be stopped in bad weather, for which the Port of Cape Town is well

known, as this method can effectively be applied in rainy weather. The major disadvantage to this innovation is that the equipment is far more expensive than that used for sandblasting

### *c. Expertise*

When looking at the history of ship repair work in South Africa as well as the decisions that influenced the construction of the first ship repair facilities, it has to be stated that the ship repairers, especially private repairers, have a long record of achievement with rich expertise developed over the years. South Africa has the advantage of having authorised ship repairers on its coastline offering specialist quality service to the shipping industry. When benchmarking against some of the top yards in the world in order to find the factors constituting expertise, the following can be listed:

- ❑ Specialist marine engineering services;
- ❑ Mobile marine services;
- ❑ Ability to carry out afloat and below water repairs;
- ❑ Equipped workshops able to provide a comprehensive service;
- ❑ Experienced and skilled workforce;
- ❑ Fast, cost effective quality service; and
- ❑ Ability to accommodate a wide range of vessel types and sizes.

South African ship repairers can therefore be ranked amongst the best in the world as the above list of services indicates combined with considerable ingenuity and innovativeness.

## **5.1.3 South African Ship Repair Markets**

### *a. The Offshore Oil Industry*

In this case the Port of Cape Town is the premier choice as the repair facilities have gained prominence as the preferred repair centre for various offshore vessels in the West African oilfields. The port is further promoted to the offshore oil industry as the “Aberdeen of the South”. The offshore oil industry was seen as an attractive option for growth in the ship repair sector because of the high level of activity off the coast of West Africa with one of the largest oil

reserves found off the coast of Angola. This is complemented by increased exploration off the Namibian and South African seaboard with an increased number of oilrigs calling at the port for repairs and maintenance.

**Assessment: A growing market**

#### ***b. Offshore Diamond Exploration Craft***

Although ship repairers in the Port of Durban have done work in the past for this particular industry, the Port of Cape Town remains the first choice for repairs. In 2002 an offshore diamond-mining vessel spent \$57 million on maintenance, repairs and refurbishment in the port. This comes as a direct spin-off from Cape Town serving this market as a logistics base with dedicated berthing and all the facilities needed such as ship repair and maintenance, bunkering, supplying of water and ships' stores etc. These vessels generally make use of the repair quay for their repair work.

**Assessment: A growing market**

#### ***c. Ocean-going Vessels***

In this category the Port of Durban, Africa's busiest port, is the main repair centre for ocean-going fleets due to its terminal port status. The reason is that vessels are usually offloaded completely and maintenance and refurbishment is done before the ship leaves for her next voyage.

**Assessment: A growing market**

#### ***d. Foreign Fishing Vessels***

The foreign fishing fleets using the Port of Cape Town as their logistics base currently utilise the Robinson Dock and the Syncrolift facilities to their fullest capacity. These craft spend on average R1 million per ship per call on repairs, maintenance and refurbishment. Due to capacity constraints in the port the overflow of these vessels are sent to East London. Even though these operators prefer to go to Cape Town a certain percentage of the fishing vessels, particularly those

operating in the Indian Ocean and the Mozambique Channel, are also calling at the Port of Durban.

The preference for Cape Town, does not come as a surprise though, as:

- Cape Town is closer to the South African fishing grounds, and vessels need not divert. The port is therefore used as a logistics base providing sufficient port infrastructure as well as services;
- The infrastructure in and around the City of Cape Town is well developed; and
- Tourism is regarded as a major attraction for many vessel operators.

**Assessment: A growing market**

#### ***e. South African Fishing Fleets***

These fleets are predominately found in the port of Cape Town and on the West Coast of South Africa, but it needs be stated that local fishing fleets have decreased significantly. The reasons for these decreases are many, but one of the most important one includes a decline in quotas for the main operators, influencing their revenue and hence their ability to maintain a large fleet.

**Assessment: A declining market**

#### ***f. Force Majeure***

The South African coastline, especially the Eastern Seaboard and the “Cape of Storms”, is well known for its stormy seas and hardly a winter pass without any incidents. The most recent events involve three vessels that ran aground between July 2002 and August 2003 off the South African Coastline. The first of these being a 10,947 gross registered tanker, the *Nino*, after it ran aground off the East London coastline in heavy seas. The vessel was salvaged and repairs were carried out in port of Durban (See Appendix I). The second involves a 31,362 gross registered tonnage cargo vessel, the *Jolly Rubino*, which ran aground on 10 September 2002 off the KwaZulu Natal north coast after a fire in the engine room, spread to the rest of the vessel, resulting in abandonment. The vessel could not be salvaged. The latest victim of the South African coast involves a 32,926 gross registered tonnage container vessel, which ran aground

outside the Port of Cape Town on the 19 August 2003 due to heavy storms. Salvage attempts during spring tide were fruitless with the last unsuccessful attempt made on 10 September 2003. Three days later though, the salvage attempt was successful and on Saturday, 13 September 2003 she was towed into deeper waters for inspection, before entering the Port of Cape Town. She was subsequently towed to the Port of Durban for repairs.

**Assessment: Unstable Market – no guarantees, but very lucrative!**

## **5.2 ISSUES FACING THE INDUSTRY**

### **5.2.1 Foreign Investment**

Apart from the floating dock, owned and operated by Elgin Brown and Hamer, in the port of Durban, the National Ports Authority of South Africa is mainly responsible for the funding of existing ship repair infrastructure in South African ports. However, due to the capital-intensive nature of the ship repair industry and growing expansion needs, ship repair companies and port authorities alike are becoming increasingly dependent on foreign investment. Government support in the form of incentives as well as the creation of an investment-friendly economy is therefore an important issue in the future of the industry. The need for foreign investment is becoming an urgent need as the NPA has clearly indicated its viewpoints, which includes:

- ❑ The NPA will no longer provide for new ship repair/dry-dock facilities; and
- ❑ New facilities will be provided via BOT initiatives.

### **5.2.2 Labour**

As the ship repair industry is largely labour-intensive, the second and most important challenge is that of labour. Labour legislation and trends, such as the basic conditions of employment, skills development, etc, in the country influence the ship repair industry. The conditions ought to be in line with the conditions and skills-levels of labour in competitive ports such as Singapore, as the input cost of labour is one of the most important factors influencing the competitiveness of a country's ship repair facilities.



Such a factor influencing the competitiveness of South African ship repair companies is the price of labour. Labour in South Africa is generally higher priced than in Eastern Europe and the Far East where the major competing ship repair yards are situated. Other trends worth mentioning is that of illegal foreign artisans, disguised as crew, which were recently brought in to do repair work on-board foreign ships calling at South African ports. This had a detrimental effect on the local repair companies (Smith, 2002).

### **5.2.3 Competitive Ports**

With foreign investment flowing into neighbouring countries such as Mozambique, in the form of Maputo Port Development Company which has a 15-year concession to build and operate a container terminal, South African Ports need to brace themselves for more competition with respect to ship repair. The current development in Maputo will in all probability result in a further upgrade of repair facilities in order to provide a more comprehensive service to vessels calling at the port. On the Western seaboard, Namport is also busy with feasibility studies to provide additional repair facilities in order to position themselves as the ship repair port of choice, targeting markets currently serviced by South African ship repairers.

### **5.2.4 Environmental Concerns**

The very nature of ship repair work, i.e., spray painting, high pressure water blasting, shot blasting, mechanical work, etc., makes it environmentally a nightmare. Environmental legislation and the “green” lobby are influencing and will increasingly influence the methods of operations in ship repair facilities. These literally force the ship repair industry to provide innovative solutions to minimise water and air pollution. One example of these innovative solutions is the way environmental concerns, raised by the V&A Waterfront, were addressed through new technological innovation in the form of paint and alternatives to sandblasting in the port of Cape Town.

### **5.2.5 Quality and Productivity**

South African ports are competing internationally and therefore have to comply with international standards for time and quality. These are the location-determining factors influencing the decision for repairs and maintenance, as vessel owners are more concerned about the turn-around-time and quality than the cost. Ocean-going vessels adhere to committed charter dates and liner schedules and therefore any delays in the maintenance of vessels may cost the owner as much \$30, 000 per day.

The emerging small businesses competing for a share of the market in the ship repair industry are a point of concern. These smaller companies generally do not have the skills or infrastructure to adhere to the tight time and quality demands placed on them by international ship owners and might result in quality deterioration.

### **5.2.6 Need for Additional Facilities**

Almost all the ship repair facilities in South African ports (except East London) are running at 100% capacity utilisation and repairers can hardly absorb the natural growth in the ship repair market. The growing need for additional repair space in both Cape Town and Durban can be regarded as the single most important challenge facing this industry. Smith (2002) estimates that the Western Cape annually lose on average R14 million for vessels turned away due to a lack of quay and repair space. The challenge for additional ship repair facilities remains unchanged.

### **5.2.7 Privatisation**

It is only in South Africa and in a few ports in Argentina where the port authority owns ship repair facilities. A number of calls from ship repair companies have gone up for the privatisation of these facilities. The main argument for the privatisation is the waste in capacity under the management of the port authority. The port authority operates on a first-come-first-serve basis and would therefore not optimise the utilisation of dry-docks. It often happens that small fishing vessels utilise only a part of the dock when it could have been fully utilised by a larger ship. The role of the Port Authority in ship repairs will be discussed at length in Chapter 6 below.

### 5.3 CHALLENGES FACING THE INDUSTRY

Ship repair facilities are well developed in line with world standards in three of the seven commercial ports in South Africa with additional developments in the pipeline. Testimony to this fact is the direct and indirect contribution of the industry in 2000 of R1.8 billion to the national economy (Smith, 2002). The continued strength of this industry lies in its ability to serve expanding markets and to remain flexible to shipping line needs and requirements. Ship repair is a derived demand and without the vessels to repair and maintain there would be no business. The facilities are strategically located in the Port of Cape Town to serve the oil industry and other related industries as indicated in aforementioned sections and the Port of Durban with its terminal port status, making it ideal to serve ocean-going vessels. An added strength is a well-developed infrastructure.

However, the growing trend noticed in all the major market segments of this industry is that the success of the South African ship repairers is very much dependent on ship repair companies' ability to perform *quality work* at world standards and within reasonable time limits. A crucial issue is therefore the ship repairers' ability to meet the global requirements for increasing advanced quality repair work on time as a competitive price.

Another challenge facing the industry, which may pose a significant barrier to increased foreign earnings, is the *lack of capacity* to accommodate the forecasted growth of 2.3% in the worldwide demand for ship repair. This challenge poses significant investment opportunities especially so for foreign direct investment. Until such time that the National Ports Authority move out of the ship repair industry, attracting foreign direct investment for future expansion will be problematic. Without the required expansion of the infrastructure, South Africa will not be able to accommodate the expected growth.

*Labour* is another area that not only influences the quality of work done, but also ultimately the number of vessels calling for repairs. The development and enhancement of South African ship repair labour in terms of skill and quality standards should on a serious and continual basis be

addressed. There should be an increased focus on training and on a continuous improvement of a productive environment in this industry.

The *single biggest challenge* to the South African ship repair industry is to remain internationally competitive, to ensure a continued growth of the industry and an improved ability to add value to the economy of the country.

## CHAPTER 6

### 6.1 THE SHIP REPAIR INDUSTRY IN THE PORT OF DURBAN

#### 6.1.1 History of Ship Repair in Durban

The first reference to be found on the subject of ship repair facilities in the Port of Durban can be dated back to the minutes of a meeting of the Natal Harbour Board held on 6 July 1888. At a subsequent Board meeting, a decision was made for the provision of a graving dock for the use of large vessels arriving at the port for the purposes of repairs. At the meeting held on the 23 July 1888, the board passed the following resolution:

*“That the Engineer in charge be requested to report as to the proper site and probable cost of a graving dock sufficient in capacity for vessels of the largest size”*

Unfortunately, a final decision to construct such a dock did not materialise, and all repairs to vessels were by means of a slipway. During 1889, 33 vessels were raised and lowered, the heaviest being the dredger “Otto”, whose deadweight with cradle and stores aboard was calculated to be about 700 tons (SAR&H, 1924, 3).

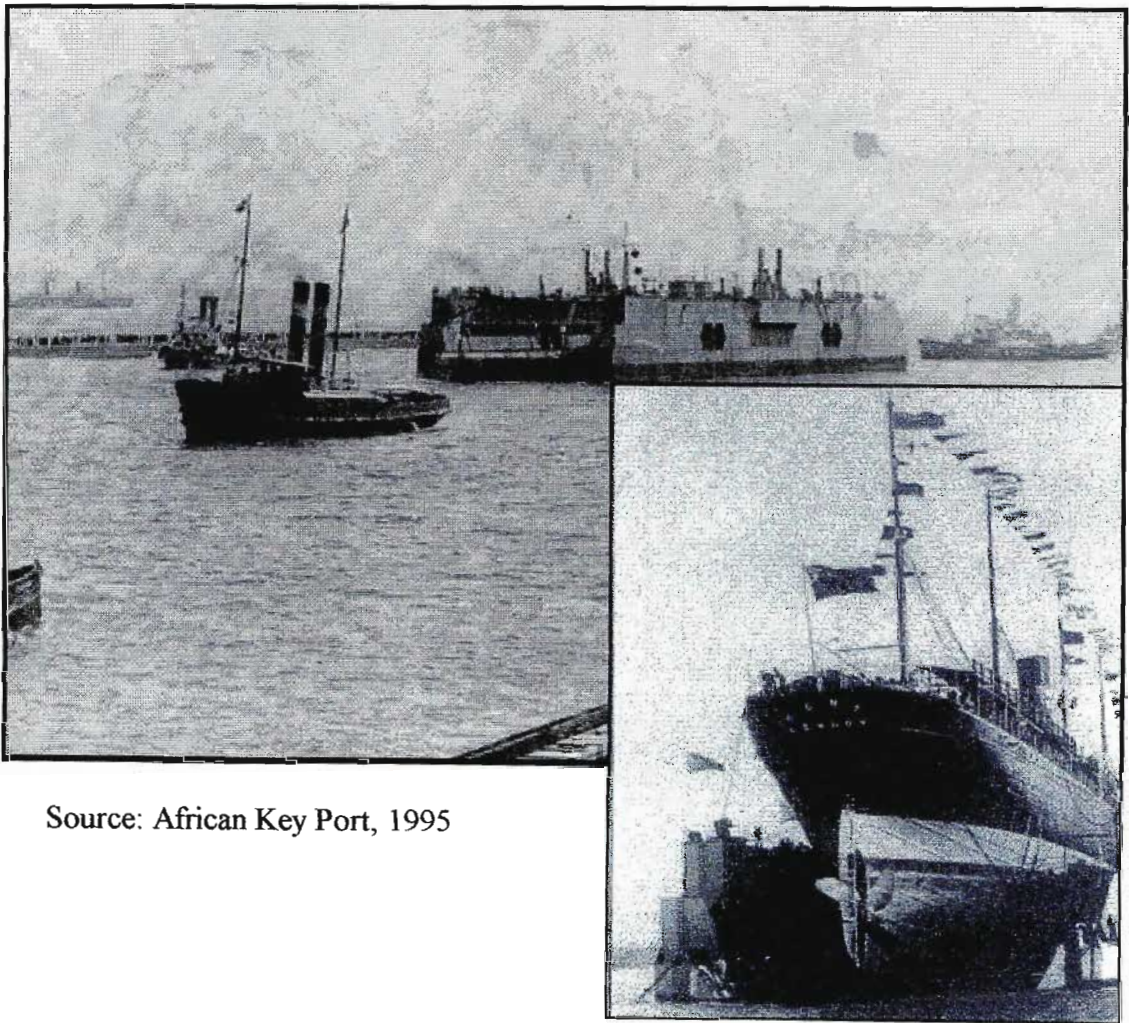
In a report dated April 1897, the question for a graving dock was raised again and the gentlemen considered it desirable

*“...that a dry-dock suitable for the largest class of ship should be constructed in the most suitable place to be found within the bay or, in lieu thereof, a floating dock of the same size and of the most improved condition.”*

Due to indecisiveness with regard to the site of the dock, a decision to invest in a dock was postponed for a second time. As a result a floating dock was ordered about 1901, but was

unfortunately wrecked in a heavy storm at Algoa Bay on its way to Durban (SAR&H, 1924, 3). Subsequently, a new floating dock, with lifting capacity of 8,500 tons, was ordered by the Natal Government and arrived on 8 February 1904 in Durban as depicted in Figure 11 below. The dock was named “Sir Walter”, in honour of Natal Governor Hutchinson with the British steamer “Kent” (insert) as the first to use the new facility in June of 1904 (Pearson, 1995, 162).

**Figure 11: Floating Dock - “Sir Walter”- Arriving in the Port**



Source: African Key Port, 1995

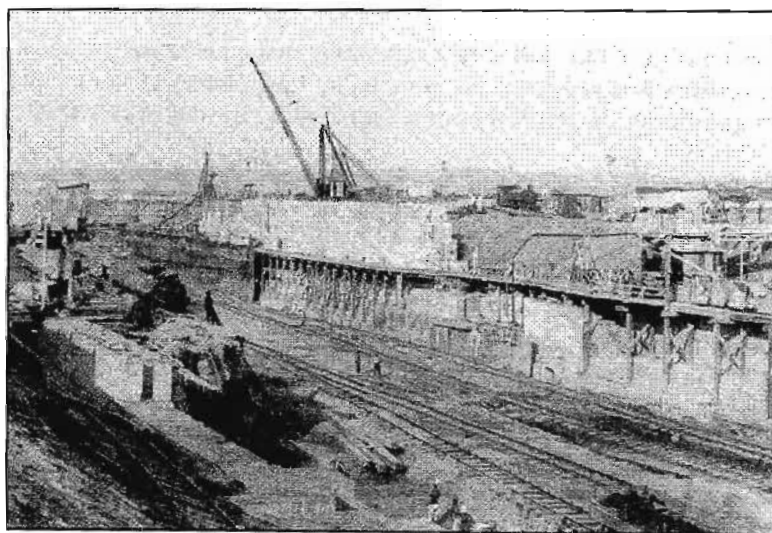
After the arrival of the “Sir Walter”, the decision to construct a graving dock at Durban was prompted by an accident that occurred at the port in 1911, when a collision between the “Inyati” and a tug resulted in damage to both vessels. It was then realised that, in the event of a similar

accident affecting vessels of like or greater dimensions, there was every possibility that the required repairs could not be carried out and that great loss would be suffered. Apart from this there were a number of key driving forces at the time that supported the construction of graving docks at more of the Union ports, capable of accommodating vessels, irrespective of size. Factors that underpinned this pressure were that:

- ❑ Larger types of vessels were being built;
- ❑ 18,000 vessels were expected to call annually at South African ports;
- ❑ The floating dock at Durban was not considered sufficient to meet requirements especially as its efficiency would be impaired in course of time;
- ❑ The graving dock at Cape Town was limited in capacity; and
- ❑ The Naval dock at Simons Town was unavailable for commercial work and the use was restricted to vessels belonging to the imperial government (SAR&H, 1924, 4).

After careful borings had satisfied the engineers in charge that a solid rock foundation was available, a final decision in the 1920s was made to build the Prince Edward graving dock at Congella. Figure 12 indicates work in progress during the construction of the dock.

**Figure 12: View of the Excavation: Prince Edward Graving Dock**



Source: African Keyport – 1995



The site was finally selected as offering the following advantages:

- ❑ Good natural foundation provided;
- ❑ Saving on coffer-dam work;
- ❑ Considerable saving in avoidance of pile foundation;
- ❑ Improved facilities afforded for dock construction; and
- ❑ Utilisation of spoil from excavations for reclaiming work in the vicinity of the dock.

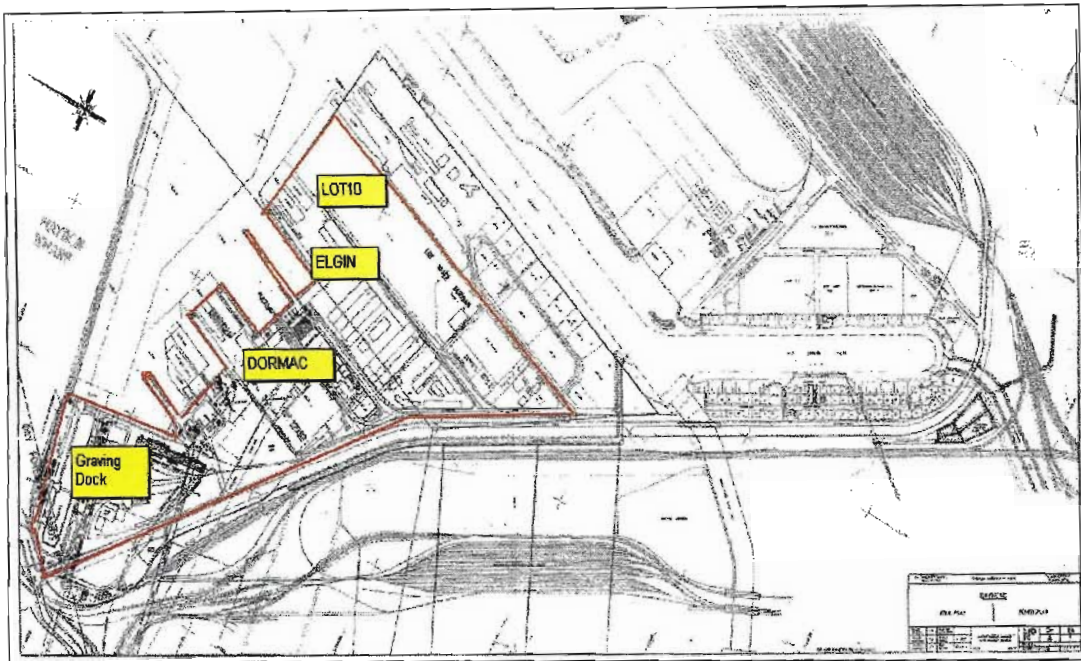
The building of the graving dock was regarded as a major step in ship repair in Durban and when the dock was opened in 1925 it was the largest dry-docking facility in the Southern hemisphere. The second floating dock, “Sir Walter” was condemned in 1937 and a third of smaller specifications arrived in that same year. The latter was decommissioned in 1995 when a second-hand floating dock was acquired. At present, this is still in operation. The Port of Durban also has a second floating dock owned and operated by EBH.

### **6.1.2 The Layout**

The ship repair sites in the Port of Durban are located on the corners of Bayhead Road and South Coast Road on the Southern side of the Port as depicted in Graphic 5 below. The total area covers 78.5 hectares of which ~80% – 90% are used for ship repair and related activities. The NPA, Dormac and EBH run their separate operations from the area as zoned in Graphic 5 below. The area is regarded as formal ship repair facility as it is:

- ❑ Appropriately zoned;
- ❑ Has available docks, i.e., graving and floating docks;
- ❑ Has available quay space; and
- ❑ Has available crange.

**Graphic 5: Ship Repair Layout – Port of Durban**



Source: National Ports Authority

***a. Factors Influencing the Layout and Equipment Deployment***

- ❑ **Ship Sizes** – Durban is presently regarded as a Panamax-size vessel port, which means that the gross tonnage (GT) range of cargo vessels calling would be between 10,000 – 60,000 gross tons excluding fishing vessels with lower gross tonnage.
- ❑ **Degree of Market Competition** – A high degree of competition does exist between the two local ship repairers. The market is open for new players entering, but history has shown that the third is always bought out, merged with or shut down.
- ❑ **Common User vs. Single Operator** – NPA operates its facilities on a “common user access” principle, which implies that any of the registered ship repair repairers is free to book the facility for repairs.

- ❑ **Maintenance Cost** – The maintenance costs for the ship repair facilities are astronomical and amount to thousands annually. These costs are at present causing NPA to show a loss on areas such as the Ship Repair Quay, which is highly neglected and costing the company in the region of ~R1.5 million to operate annually.
- ❑ **Cost of Labour** – Labour cost is high while skills and productivity levels especially on the NPA side are low. This in turn makes the ship repair facilities unattractive and less competitive.

The ship repairers were requested to prioritise the abovementioned factors influencing the layout and equipment deployment from most to least important. This is captured in Table 10 below.

**Table 10: Factors Influencing Layout and Equipment Deployment**

(1 = High Priority, 3 = Moderate Priority, 5 = Low Priority)

FACTOR	DORMAC	EBH
Ship Sizes	5	1
Degree of Market Competition	2	5
Common-user principle	1	2
Maintenance Cost	4	4
Labour Cost	3	3

Source: Dormac & EBH (2003)

What becomes clear from Table 10 is that although both the companies are in the same industry and in the same line of work, their priorities differ vastly. This is understandable in both cases. Since EBH owns a floating dock, ship sizes become very important to them. One of the first assessments made deals with whether the vessel calling for repairs would fit into their dock. The second factor important to EBH deals with the common-user principle. Should the vessel not be able to fit in their own dock, the alternative is the graving dock, which in turns frees their dock for another repair. Thereafter, labour and maintenance cost follow with the degree of market competition being last on the list. For Dormac the availability of facilities is deemed to be most

important, as they do not possess their own dock (except for an alongside wet-dock quay) and consequently they rely on the availability of NPA facilities. Unavailability of the dock could put them in a predicament of losing the business to the competitor. Dormac further ranks the degree of market competition second followed by labour cost, maintenance cost and ship sizes. Ship sizes ranks last, due to the fact that Panamax-size vessels call at the port that can be accommodated in the graving dock.

### ***b. Equipment Associated with Repairs***

The equipment generally associated with repair of vessels in the port of Durban includes, but is not limited to the following:

- ❑ Large infrastructure and superstructure;
- ❑ Structural, mechanical and insulation equipment, e.g. pumps, engines etc.;
- ❑ Cleaning, painting and blasting equipment;
- ❑ Navigational electronic equipment;
- ❑ Refrigeration equipment;
- ❑ Welding and cutting equipment; and
- ❑ Marine engineering equipment.

### **6.1.3 The Players**

It is quite interesting to note that the number of main ship repairers in the Port of Durban has always varied between 2 to 4. Back in the early days (1905 – 1978) these repairers included the like of:

- ❑ Messrs African Marine and General Engineering Co Ltd, at the Point;
- ❑ Messrs James Brown Ltd, at Point; and
- ❑ Messrs Gilbert Hamer & Company (Natal) Ltd, Congella, etc.

More recently the likes of Dorbyl Marine (Pty) Ltd (Durban) and the International Marine and Construction Company (IMAC) operated in the Port and with the merger of the two companies, Dormac Marine and Engineering (Pty) Ltd was created in July 2000 (<http://www.dormac.net>).

Today the two main ship repairers in the Port of Durban are Dormac and Elgin Brown and Hamer (as a result of a merger between Brown and Hamer in 1978 followed by a take-over by Elgin Engineering in 1980).

*a. Dormac Marine and Engineering (Pty) Ltd*



Dormac, though very young as a company in its present form, is a combination of youth and dynamism, together with business values and a performance history dating back to 1903. A full spectrum of ship repair services is provided by Dormac to ship owners and operators. As indicated before, the cofferdam repair system was the brainchild of Dormac, and in addition to its marine-related activities, the company also offers a wide range of specialised engineering services to industrial customers. These services include fitting, electrical, machining, steel work, spare parts fabrication, etc whilst the facilities include:

- ❑ **Dormac Repair Quay** – with a length overall of 195metres and draft of 8 metres it can, via the use of a mooring buoy, accommodate Panamax vessels of up to 250metres length overall;
- ❑ **Dormac Machine Shop** – is ISO 9002 accredited and houses experienced artisans ensuring completion of work in accordance with the specifications provided by customers. The machine shop also houses a horizontal and vertical press, a shaper, a miller, lathes, a slotter, drilling machines and an overhead crane.
- ❑ **Dormac Steel Fabrication Shop** – is an undercover fabrication shop which is equipped with cutting, rolling, pressing, welding equipment and a furnace with capacity for shafts, rudder stock and tail shafts.
- ❑ **Dormac Pipe Shop** – is complemented by two overhead cranes of 3 tons each, where repairs and renewal of pipe work systems are carried out.

Dormac employs just over 100 permanent employees with casual labour fluctuations varying from 300 to 500 daily, depending on the workload (Hawes, 2002, 31).



Dormac's emphasis on high in-house quality procedures has ensured the awarding of the highest international quality recognition, the ISO 9002 Quality Standard. Further to this are international safety standards adhered to and the company enjoys a NOSA 4 star rating.

***b. Elgin Brown and Hamer (Pty) Ltd***



EBH has been in the ship repair business since 1908, a history of achievement that reflects a continuing record of quality that has distinguished it as one of the main ship repairers in the Port of Durban. EBH further lays claim to be the oldest ship repair company operating in South Africa. It is active in the ship repair and marine engineering services to assure rapid turnaround, quality service and competitive pricing to their clients. The company is further an authorised agent for Sulzer Marine Engines and offers equal experience with MAN/B&W, Götaverken and Pielstick power plants.

The companies comprising the Elgin Brown Group offer the full range of ship repair services to all types of ocean-going vessels, ranging from tugs and cruise liners to bulk and container vessels. These companies include and provide:

- ❑ **Electromarine (Pty) Ltd** – was founded at Cape Town in 1987 and brought into the EBH group in 1990. The company specialises in marine electrical work and motor rewinding;
- ❑ **Port Marine Contractors (Pty) Ltd** – was founded in 1990 and provides complementary and essential support service to the parent company, comprising cleaning (chemical, boiler and high pressure washing) and painting, ship structure refurbishing, wet abrasive and grit sand blasting, and tank and hold bilge cleaning;
- ❑ **Portscaff (Pty) Ltd** – was founded in 1987 and sees to all the scaffolding needs of EBH. Due to its success, the company became a thriving enterprise by the mid 1990s and currently undertakes close to 90% of Durban's marine scaffolding work.
- ❑ **Eldock (Pty) Ltd** – had its inception with a decision by the group to introduce the country's first privately-owned floating dock facility and in May 1999 the company commissioned the dock. Eldock as it is known, is South African's first privately-owned

and operated floating dock. The dock has a lifting capacity of 10,500 dwt and currently enjoys an occupancy rate of 75%.

- ❑ **East London Shipyard (Pty) Ltd** – was established in 1995 and is a joint venture between EBH and Dorbyl Marine. The graving dock, Princess Elizabeth, owned by the NPA, can accommodate handy-size bulk carriers and general cargo vessels with services including steel repairs, pipe renewals, rigging, hydraulic work, electrical work, etc and the host of other services pertaining to ship repair.
- ❑ **ZW Marine and General (Pty) Ltd** – was founded in 1992 as a small repair and building facility which took over the in-house repair functions of Unicorn Shipping Lines. The company is based in the port of Durban and managed to expand fast, adding a share of the local ship repair market to its client base. The EBH group took the company over in 1996 and now involves it in the development of special projects.

EBH employs 250 people on a permanent basis and, depending on the volume of work, up to 700 sub-contractors and casual labourers in Durban. EBH generates an average salary and wage bill of R60 million per annum (Hawes, 2002, 31).

#### **6.1.4 The Ship Repair Facilities**

The ship repair industry in Durban is currently serviced by two floating docks, one graving dock, a slipway, repair quays and workshops.

##### ***a. The Prince Edward Graving Dock***

The Prince Edward dock, completed in 1925 as indicated in earlier sections, is one of the oldest infrastructures in the Port of Durban. It has certainly stood the test of time. The dock, specifications indicated in Table 9 above, falls in the Dockyard Complex of the NPA and was specifically built to accommodate vessels of Great Britain's Royal Navy. At present the dock is till in use on a continuous basis, serving the local and international ship repair demand. Repairs and maintenance of the dock take place on a regular basis (See Appendix 1).



The significance of the dock, also making it an important attraction, arises from the fact that it can be divided into two compartments, in order to accommodate two vessels of different sizes simultaneously. When divided the outer dock measures 206.9 metres while the inner dock measures 138.68 metres. At present in excess of 70% of all repairs in the port, take place in this dock.

***b. NPA – Floating Dock***

The NPA floating dock is the fourth of its kind in the Port, with specifications indicated in Table 9 above. It has a lifting capacity of 4,500 dwt. The dock is situated in close proximity to the graving dock adjacent to Workshop 24 in Bayhead. It is used for smaller commercial-sized vessels and as a backup docking facility for the harbour tugs and smaller dredgers. The dock's dimensions are such that it can be accommodated in the graving dock should underwater inspections and maintenance be required.

While the NPA owns the above two facilities, the actual repair work is not carried out by them and the bulk of work is carried out by either Dormac or EBH. Exceptions are only made for harbour tugs, dredgers, barges, floating cranes and other port craft, which are repaired and maintained in-house by the Dockyard Manager's own marine repair workshop.

***c. EBH – Eldock***

Eldock is owned, operated and managed by the EBH group. It is the first privately-owned floating dock in South Africa and as indicated earlier has a lifting capacity of 10,500 dwt, double that of the NPA-owned floating dock, lifting vessels in the region of 30,000 gross registered tonnage. The dock was purchased second hand from Turku in Finland and was wet towed from the Baltic to South Africa by a tug on charter from Pentow Marine.

#### ***d. Slipways***

The Durban slipway has an overall length of 19.81 metres, a width of 5 metres and a total displacement of 50 tons and complements the ship repair industry.

#### ***e. Repair Quays***

No less than six repair quays can be found in the ship repair area, with length specifications ranging from 165 metres to 258 metres and depths ranging from 6.50 metres to 8 metres.

#### ***f. Workshops***

EBH, Dormac as well as the NPA have their respective workshops, located in close proximity of their operations.

### **6.1.5 Booking of Facilities**

The NPA Dockyard Complex is essentially the coordinator of the facilities and equipment under its control, and is responsible for coordinating bookings by accredited ship repairers, the docking and undocking of vessels and the provision of cramage, power and water. Initially these bookings were negotiated directly with the vessel's appointed agent and ship owner's representative, who, in turn appoint the ship repairer. Discussions with both Dormac and EBH revealed that the ship repairer is playing a more dominant role now in the process, and is longer at the end of the chain as in the past. Permission to book and dock vessels can only be done by those agents accredited by the Dry-dock Manager. A three-level booking process is now followed:

- ☐ Provisional Booking;
- ☐ Alternative Booking; or
- ☐ Confirmed booking.

A provisional booking is made and needs to be confirmed within twenty-four hours. If the provisional booking could not be confirmed, but the same repairer can confirm an alternative

booking, the dock shall remain booked for the repairer. Should this booking not be confirmed within twenty-four hours after another booking for the dock has been received, the former booking is forfeited. Both dominant ship repairers strongly favoured the booking system, and under the present conditions, viewed it as a necessity.

Dry-dock bookings are normally negotiated up to three months in advance and as indicated earlier, the NPA co-ordinates the facilities and infrastructure. The NPA uses a common-user booking system, controls the docking block and docking and un-docking operations. These functions, carried out by the Chief Dockmaster, the Dockmaster and the Millwright, all assisted by NPA labour, are now discussed in turn.

#### ***a. The use of a Common-user Booking System***

Under section 6.1.2 (a) a very brief definition is giving for the term common-user access. Under the new arrangement as discussed above, the definition still stands, as long as an accredited agent makes the booking. Both ship repairers indicated that the booking system is managed reasonably well under the circumstances.

#### ***b. Control of the Docking Block Operations***

This deals with the setting up of the dock blocks (keels and bilge blocks) according to the docking plan of the vessel. Accurate calculations and measurements from the docking plan are of extreme importance to prevent major damage or injuries when the vessel is dry-docked. It is required of each ship to be docked to have an exact docking plan including among other data:

- ❑ The draught on stern and bow;
- ❑ Displacement during docking;
- ❑ Arrangement of loads;
- ❑ Stability conditions; and
- ❑ Detailed information on damage, if any.

The Dockmaster manages the above and after all the requirements are met, the Chief Dockmaster is informed that the dock preparation is complete.

**c. Docking and Un-docking Operations**

Closely linked to the above are the docking and undocking operations. Dry-docking vessels is said to be one of the most difficult and dangerous operations carried out. It requires as indicated in (b), meticulous preparation of the ship and the dock. When the ship and its supports are properly prepared, the dock is filled with water and the dock gate is opened. The ship is then brought in, moored and positioned. Once the ship is positioned correctly, the water is pumped out leaving the ship on the bottom. On completion of ship repair activities the ship needs to leave the dock and whole process is reversed. Once all formalities are dealt with, the dock is flooded, the ship refloated and once the water level in the dock is the same level as that in the bay, the caisson is opened and the ship sails out of the dock, with the necessary support from the tugs.

**6.1.6 The Market**

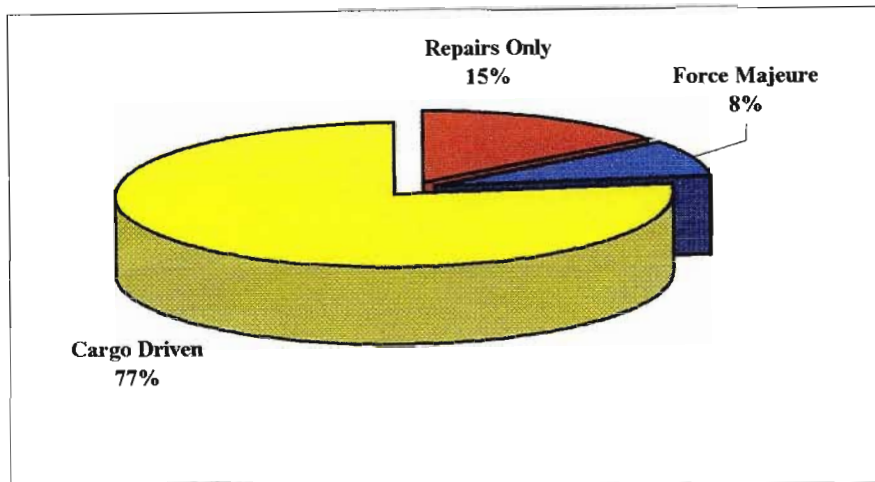
Demand for ship repairs in the Port of Durban can be divided into three broad categories. These categories are indicated in Table 11 below accompanied by the percentage market share (based on number of jobs, not revenue) per ship repairer. It is further illustrated by Figure 13 that reflects the average for the Port of Durban. These categories are discussed below.

**Table 11: Percentage of Repair Work by Repairers**  
**(By number of jobs)**

Category	Percentage		
	Dormac	EBH	Average
Repairs Only	10%	20%	15%
Cargo Driven	85%	70%	77%
Force Majeure	5%	10%	8%

Source: Dormac & EBH (2003)

**Figure 13: Durban Ship Repair Market**  
**(Average)**



Source: Dormac & EBH (2003)

***a. Terminal Status of the Port***

EBH stated that 70% of all repairs done by them is as a result of vessels calling at the Port to work cargo, while Dormac regarded this to be in the region of 85%. It would therefore be safe to say that on average 77% of repairs done on vessels in the port is a result of the Terminal Status of the Port. According to EBH, opportunities exist for an expansion of this market, once the entrance channel has been widened. It is envisaged that the entrance channel will be 220 metres at its narrowest point, widening from that point into the sea with a depth of approximately 14 metres. This means that the port will be able to accommodate post-Panamax vessels, hence the opportunity to expand the market.

The repairers emphasised the importance of efficient, additional facilities and higher productivity levels on the NPA side as this directly affects their global competitiveness.

### ***b. Classification Societies***

Classification societies require vessels to dry-dock at least every four years for routine inspection and maintenance, depending on the age of the vessel. This, however, is a market restricted to the Terminal Status of the port. Should the price not be competitive enough, the ship owner might decide to carry it out at the next port of call, if repairs are offered at more competitive rates. The repairers did, however, indicate that on average 8% of vessels call for repairs only, these include the fishing vessels from Mozambique and Madagascar.

### ***c. Force Majeure***

This is as a result of Mother Nature and should a vessel be in close proximity of Durban and experience an emergency of some nature, it will call at the Port for such repairs. This market however is the most uncertain and speculative as there is no guarantee that the sea will “deliver” a secured quota. The ship repairers regard this as the smallest part of the market and stated it to be in the region of 5%. These, however, turns out to be the most lucrative jobs. Discussions with ship repairers as well as NPA personnel revealed that a number of other repairs are conducted while the vessel is in dock.

The constraints that currently affect the industry in the Port of Durban, include:

- ❑ Lack of capacity;
- ❑ Inefficiency of craneage;
- ❑ Draft of repair quays;
- ❑ Length of repair quays; and
- ❑ Dry-dock width.

In an interview with the former Marketing Manager of Dormac, Mr. Brad Youens, in August 2002, he indicated that their research has shown, on average three vessels out of every ten seeking the use of a dry-dock facility in the Port of Durban are turned away due to the lack of dock space. A year later, this situation has remained unchanged, according the newly appointed

International Marketing and Sales Executive, Mr. Gary Pulford. EBH indicated that at least 30% of vessels are turned away due to the lack of capacity (Dormac & EBH Interviews, 2003).

As a solution to the lack of capacity problem currently experienced, Dormac suggested that the setting of the blocks should be done at night as well, as is currently not the case. Not only is a full day's revenue lost due to this, but the dock is occupied for longer as all the subsequent activities are shifted backward. Dormac states that the inflexibility and the fact that the NPA operates the dock aggravate the situation. EBH shares the latter sentiments and blames the inefficiency on the NPA, as running dry-docks are not their core business. As indicated previously, it is suggested that the dockyard complex be concessioned to a private operator on a common-user principle in order to improve efficiencies, but also to obtain the urgently-required capital investment for improvements. It is further suggested that longer repair quays be constructed with depth alongside of at least 12 metres.

Both Dormac and EBH stated that they currently serve between 60% to 70% of the market. This from an accounting perspective is not reconcilable. It has to be stated, however, that both companies combine forces on the big jobs<sup>4</sup>, but that EBH probably has a greater market share, due to the ownership of a floating dock. From a turnover perspective EBH without a doubt has a greater market share than Dormac. Dormac indicated that their turnover for the 2002 was R170 million compared to a budget of R90 million. The total turnover of the market is in the region of R500 million, which of course can vary as it is subject to exchange rates. As a percentage of total revenue Dormac thus have 34% market share (Interviews, September 2003). The balance of 66% is in all probably not all attributable to EBH, needless to say that the larger portion thereof is, as the other ship repairers are small independent players.

#### **6.1.7 Competition**

Repairers in Durban have indicated that they find themselves in a competitive industry. Two rather conflicting views were obtained with regard to the barriers to entry as Dormac indicated

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<sup>4</sup> In the case of the Sealand Express Dormac, EBH and the NPA are all performing repair work simultaneously.



that the barriers to entry are low, while EBH indicated that they are high. While both EBH and Dormac indicated that local and international competition is high, mixed responses were received for national competition. Though Dormac indicated that national competition is moderate, EBH felt it to be low, due to their representation in the other major ports, but also due to the Terminal Status of Durban. Table 12 summarises each repairers main competitors locally, nationally and internationally.

**Table 12: Competitive Rivalry**

REPAIRER	LOCAL Competitors	NATIONAL Competitors	INTERNATIONAL Competitors
<b>DORMAC</b>	- Elgin - MSC Workshop	- Elgin - Dorbyl - Globe Engineering	- Far East - Singapore & China - Vietnam & Korea
<b>EBH</b>	- Dormac	- Dorbyl - Globe Engineering	- Far East - Singapore & China - Vietnam & Korea

Source: Dormac & EBH Interviews (2003)

*a. Competitiveness*

The one aspect that influences the competitiveness of both Dormac and EBH is the tariff that the NPA currently charges the ship repairers for the dry-docking of vessels. The tariffs effective from April 1<sup>st</sup>, 2003 charged by the NPA for the dry-docking of a 10,000 gross tonnage vessel for 10 days in the ports of Durban and Cape Town are reflected in Table 13 below and sited as an illustration.

**Table 13: National Port Authority Tariffs Comparison**  
**(Durban vs. Cape Town)**

SERVICE DESCRIPTION	Port of Durban			Port of Cape Town
	2001/02	2002/03	2003/04	2003/04
Pilotage charges per service	R 2,757.00	R 5,700.00	R 5,871.00	R 2,906.60
Tugs/Craft assistance and/or	R 11,478.74	R 14,578.00	R 16,764.00	R 13,501.69
Berthing services	R 948.30	R 1,896.87	R 2,295.93	R 2,295.93
Port dues for 10 days	R 18,907.23	R 69,555.74	R 74,083.74	R 74,083.74
Berth dues for 10 days	R 12,395.40	R 39,842.60	R 42,432.50	R 42,432.50
Dry-dock booking fees	R 13,904.00	R 17,985.00	R 20,000.00	R 20,000.00
Dry-dock Preparation	R 4,023.00	R 5,123.00	R 6,148.00	R 4,608.00
Docking & undocking of Ships	R 3,102.00	R 3,878.00	R 4,654.00	R 4,654.00
Dry-dock dues first 24 hrs	R 28,700.00	R 35,880.00	R 43,056.00	R 43,050.00
Subsequent 9 days	R 208,134.00	R 264,330.00	R 317,196.00	R 158,067.00
<b>TOTAL</b>	<b>R 304,349.67</b>	<b>R 458,769.21</b>	<b>R 532,501.17</b>	<b>R 365,599.46</b>

Source: National Ports Authority Tariffs (April 2003)

From Table 13 above the following emerges:

- ❑ Charges by the NPA are quite high, and it is becoming increasingly more expensive to repair vessels in South Africa; and
- ❑ The total charges in Cape Town for the same size vessel are significantly lower (R166,902) than in Durban.

The reasons for these discrepancies are to be found in the way the tariffs are structured for Durban and Cape Town. Different rates are charged for pilotage, tugs assistance and dock preparation in the two ports. These are discussed with the assistance of Tables 14 and 15 below.

**Table 14: Pilotage and Tug Assistance Charges**  
**(Cape Town vs. Durban)**

<b>Pilotage Charges</b>	<b>Cape Town</b>	<b>Durban</b>
<i>Port Service (normal entering or leaving the port)</i>		
Basic Charge plus	R 2,000.00	R 5,871.00
Per 100 tons or part thereof	R 3.20	R 3.07
<b>Tugs Assistance and or Attendance</b>	<b>Cape Town</b>	<b>Durban</b>
<i>Per service based on ships tonnage</i>		
Up to 700	R 1,246.00	R 1,993.00
701 to 1 800	R 2,492.00	R 3,986.00
1 801 to 8 800 plus	R 2,492.00	R 3,986.00
Per 100 tons or part thereof above 8 800	R 61.41	R 84.86
8 801 to 14 100 plus	R 6,832.00	R 9,983.00
Per 100 tons or part thereof above 14 100	R 43.92	R 56.51

Source: NPA Tariff Book (April 2003)

From Table 14 above it becomes apparent that the rates charged for pilotage and tugs assistance in the Port of Durban are significantly higher than those charged at the Port of Cape Town, hence making Durban uncompetitive. In the case of the basic charge for pilotage the discrepancy is as much as 66% more for the dry-docking of a vessel in Durban than in Cape Town.

Table 15 below depicts the dry-dock dues charged by the NPA. While Durban charges a flat rate between 0 up to 30,000 tons, Cape Town charges different rates per vessel size. In other words charges are linked to vessel sizes starting at 0 up to 3,000 tons, 3,001 up to 6,000 tons, etc. The point is simply that the Port of Cape Town has a competitive advantage above the Port of Durban for the dry-docking of vessels, resulting in Durban being unattractive as a repair destination.

**Table 15: Dry-dock Dues Charged**  
**(Cape Town vs. Durban)**

Port of Cape Town	Dry-dock Dues	
	1st 24 hrs	Each Subsequent 12 hrs
Ships up to 3 000 tons plus	R 3,054.00	R 1,527.00
Per ton	R 0.89	R 0.30
3 001 up to 6 000 plus	R 4,020.00	R 2,010.00
Per ton	R 1.02	R 0.34
6 001 up to 10 000 plus	R 7,060.00	R 3,530.00
Per ton	R 1.26	R 0.49
Port of Durban	Dry-dock Dues	
	1st 24 hrs	Each Subsequent 12 hrs
0 up to 30 000 tons plus	R 7,398.00	R 3,699.00
Per ton	R 1.26	R 0.49
30 001 up to 80 000 tons plus	R 15,406.00	R 7,703.00
Per ton	R 1.26	R 0.42

Source: NPA Tariff Book (April 2003)

### 6.1.8 Opportunities

Views regarding the market share of Durban in comparison to that of the global shipping repair markets, reveal mixed perceptions. While Dormac indicated a market share of 0% - 1% and EBH indicated 1% - 3%, both felt very confident about additional ship repair opportunities for the Port of Durban, mainly due to their inability to penetrate the current global market. Dormac and EBH felt strongly that the NPA dock be concessioned and that tariffs be set at more competitive levels. This should attract more business from existing and new markets. The reason for these sentiments is found in the fact that the dock needs upgrades and regular maintenance that is currently not done satisfactorily by the NPA. EBH currently rates the condition of the dock poor with regard to ease of use, compressed air supply and water articulation, while Dormac rates it average.

EBH identified a number of other opportunities that could be attracted should the NPA concession its ship repair facilities, which included:

- ❑ **Widened Entrance Channel** – as mentioned before, the opportunity to repair post-Panamax vessels;
- ❑ **Passing Market** – referring to the vessels passing the Port of Durban en route to another port;
- ❑ **Construction in Ports** – referring to the repairing of the barges, tugs and dredgers while construction is underway in the port for example, Port of Durban 2005 project. EBH indicated that this is a project-specific market; and
- ❑ **Offshore Supply Vessels** – referring to the offshore supply and support vessels to oilrigs and diamond vessels. The prospect of oil exploration off the coast of Tanzania is regarded as one of the biggest opportunities.

According to Mr. Jens Nydahl, Managing Director Dormac Port of Durban, two specific areas of opportunities have been identified. The **first** is the potential introduction and operation of a facility aimed at providing scheduled maintenance services for Panamax-sized vessels; and the **second** is for a smaller dock focused on servicing the Indian Ocean Fishing fleets and more specifically on the demand for conversions and mid-life refits of tugs, ferries, off-shore supply, research, naval and fishing vessels (Dormac, July 2002). EBH stated that the current constraints in the Port, e.g., port entrance channel could once alleviated, create opportunities for repairs to post-Panamax vessels.

A completely unexplored opportunity lies within Salisbury Island, the Navy Base. The navy currently has a syncrolift facility, which is at the moment under utilised and with the move of the Navy to Simons Town, will become redundant. Both Dormac and EBH have shown interest in the facility and indicated that engagement with the Navy will commence shortly.

#### **6.1.9 Economic Linkages**

According to Smith (2002), the ship repair industry is extremely labour intensive and has a high multiplier effect on local marine related businesses. Mr. Rob Deane, Managing Director EBH

(Durban), has indicated however that the multiplier effect could at times be as high as 1 to 8. The marginal expansion of the industry creates additional job opportunities within the steel, electrical and electronic, paint and communications sectors. This results in a corresponding improvement in the economy.

There are many upstream industries that supply products and services to the ship repair industry, but the ones that enjoys prominence and benefit greatly include:

- ❑ **Steel Suppliers** – Steel is regarded as one the most important inputs and is used extensively in the repairing of ships’ hull and superstructure. The ship repair industry in Durban uses on average of 500 tons of steel per annum, which is obtained from two main suppliers namely, Iscor through its local distributor, MacSteel and Highveld Steel (Hawes, 2002, 23).
- ❑ **Electrical and Electronic Engineers** – The two main suppliers electrical and electronic equipment to the industry are Siemens Marine and Electrowave. Their involvement extends from design, installation, maintenance and repair of all electrical and electronic systems (Hawes, 2002, 23).
- ❑ **Paint Suppliers** – Three local suppliers, namely, International Paints, Sigma and Jotun, dominate the paint industry. These firms normally supply industry with paints manufactured locally, but do, however, sell a limited amount of imported paints.
- ❑ **Communications Experts** – The involvement of local communications companies is limited to technical queries. Their function is mainly to inspect the communications devices of the ship before departure and to assist the crew in rectifying any operational errors.
- ❑ **Labour Brokers** – Due to the labour intensiveness of the repair industry, there is a great demand for casual labour. This includes semi- and un-skilled workers and administration staff depending on the workload, employed through the services of labour brokers.

Regarding the acquiring of products and services from suppliers, both Dormac and EBH obtain the bulk of their supplies from local suppliers as summarised in Table 16 below, with the typical services sourced reflected in Table 17 (not in the least a comprehensive list).



**Table 16: Material and Equipment Acquisitions**

<b>SUPPLIERS</b>	<b>EBH</b>	<b>DORMAC</b>
<b>LOCAL</b>	70%	95%
<b>FOREIGN</b>	30%	5%

Source: Dormac & EBH

**Table 17: Typical Services & Materials Sourced**

<b>LOCAL</b>	<b>FOREIGN</b>
- Steel repairs - Pump replacements - Rewinding of motors - Paint Work	- Bearings - Valves - Specialist Services

Source: Dormac & EBH (2003)

#### **6.1.10 The Future**

Before an attempt is made to deal with industry prospects, feedback from industry regarding the strengths, weaknesses, opportunities and threats (SWOT) will be highlighted.

*a. SWOT Analysis*

**Table 18: SWOT Analysis**

<b>Strengths</b> <ul style="list-style-type: none"><li>- Existing Market/Terminal Status</li><li>- Long Established Record</li><li>- Existing Facilities</li><li>- Locality</li><li>- Repair Infrastructure</li></ul>	<b>Weaknesses</b> <ul style="list-style-type: none"><li>- NPA facilities not operated by repairers</li><li>- NPA tariffs</li><li>- Skills shortage</li><li>- Lack of training</li><li>- Lack of Capacity</li></ul>
<b>Opportunities</b> <ul style="list-style-type: none"><li>- Restructure industry in Durban</li><li>- Increase facilities</li><li>- Naval Syncrolift</li><li>- New Markets</li></ul>	<b>Threats</b> <ul style="list-style-type: none"><li>- Marginalise port at expense of other ports</li><li>- Competition (Far East Invasion)</li><li>- Exchange Rate Appreciation</li><li>- Do nothing</li></ul>

Source: Dormac & EBH (2003)

The listed strengths will, in all probability, remain the same for some time into the future. The weaknesses however, are alarming as three of the five listed, are a result of the NPA's inefficiency, much to the frustration of Dormac and EBH. These, however, can be overcome as indicated in previous and subsequent sections. As far as the opportunities are concerned, they should be exploited. In terms of the threats, most industries are subject to markets and in many instances are "spectators" to certain events. In the case of the threats this is so. Dormac and EBH counters these through vigorous marketing strategies aimed at both national and international levels.

*b. Traffic Expectation*

The ship repair demand forecasts by OSC (1999), as reflected in Table 19 below, have been accepted as realistic by both Dormac and EBH.

**Table 19: Ship Repair Demand Forecasts**

Forecast Period	% Demand Forecast
2001 – 2005	2.1%
2005 – 2010	2.5%
2010 – 2015	2.0%

Source: Ocean Shipping Consultants (1999)

The expectation of growth by the two main players is indeed an interesting one. While Dormac feels that the general level of their activities in the Port of Durban will rise by less than 10% over the next five years, EBH does not share the same sentiments. EBH feels that should the anticipated restructuring of the Dockyard Complex, i.e. concessioning, take place their activities will rise by more than 10% over the next five years.

Using the NPA facilities, due to availability of statistics, an attempt is made to forecast future traffic. Table 20 summarises the activities since 1995/96 to 2000/01 in the NPA floating dock and dry-dock.

**Table 20: NPA: Dry- and Floating dock Activity**

YEAR	TOT. G.T.	Annual Growth (Total G.T.)	NO. VES.	Annual Growth	AVG G.T. *	Annual Growth (Average G.T.)
95/96	840,209		117		7,181	
96/97	795,826	-5.28%	124	5.98%	6,418	-10.63%
97/98	691,786	-13.07%	106	-14.52%	6,526	1.69%
98/99	699,495	1.11%	96	-9.43%	7,286	11.65%
99/00	750,000	7.22%	108	12.50%	6,944	-4.69%
00/01	822,800	9.71%	108	0.00%	7,619	9.71%
01/02	978,600	18.94%	118	9.26%	8,293	8.86%
<b>Average</b>	<b>796,959</b>	<b>3.10%</b>	<b>111</b>	<b>0.63%</b>	<b>7,181</b>	<b>3%</b>

Source: NPA – Port of Durban & Author Calculations

\* Average Gross Tonnage (G.T.) is calculated by dividing Total G.T. by Number of Vessels

Based on Table 20 above an average growth rate of 3.10% has been calculated which is used as a benchmark. This reflects a much higher growth rate than forecasted internationally by OSC. The forecast of the latter is therefore used as a low growth scenario. The high growth scenario as depicted in Table 21, is calculated by averaging out the benchmark with the low growth scenario. By doing this brings the forecast in line with the international forecast.

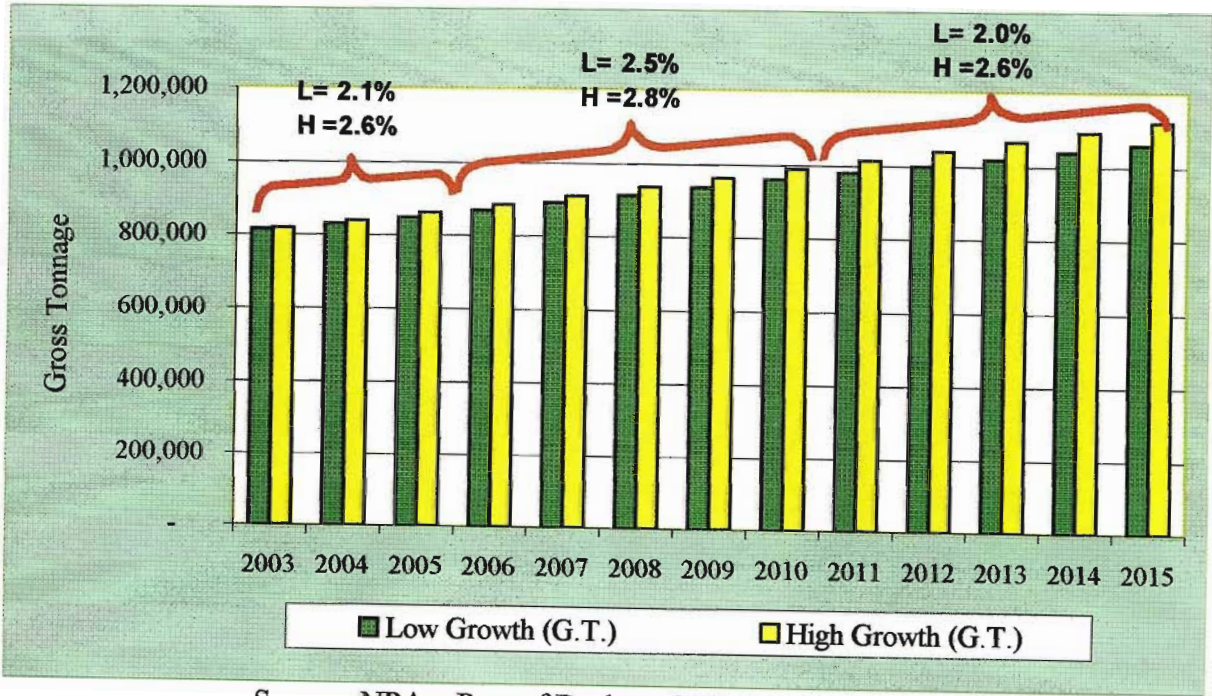
**Table 21:Forecast – Growth Scenarios**

Period	OSC 1999 (Low Growth)	Benchmark	Average (High Growth)
2001 - 2005	2.10%	3.10%	2.60%
2005 - 2010	2.50%	3.10%	2.80%
2010 - 2015	2.00%	3.10%	2.55%

Source: OSC (1999) & Author Calculations

Using the growth scenarios in Table 21, gross tonnage is forecasted and depicted in Figure 14 below.

**Figure 14: Low Growth vs. High Growth Scenarios**



Source: NPA – Port of Durban, OSC (1999) & Author

Hawes (2002) notes in his concluding remarks on the medium-term outlook for ship repair that Durban's vibrant industry faces a future of certain and increasing levels of demand and thus a favourable medium-term outlook. From Figure 14 this notion is confirmed and provides even further reason to believe that continual growth in the ship repair industry in the port is feasible. The one area to be exploited to the full is the terminal status of the port as the steady increase in trade flows to and from Durban in recent years mean that bigger ships will be visiting the port. Vessels will have the option to conduct scheduled repairs and maintenance or general repairs at the local facilities.

## **6.2 THE ROLE OF THE PORT AUTHORITY**

When assessing the statement made by the ship repairers in Durban, and the urgency of requesting the facilities of the NPA to be concessioned, a reasonable evaluation can only be conducted once the role of the Ports Authority is clearly understood. The following sections will attempt this, with reliance on UNCTAD and Worldbank Publications.

### **6.2.1 Concessions**

Concessions can be defined as arrangements whereby a private party (concessionaire) leases assets from a public authority for an extended period and has responsibility for financing specified new fixed investments during the period and for providing specified services associated with the assets. In return the concessionaire receives specified revenues from the operation of the assets; the assets revert to the public sector at expiration of the contract (<http://www.worldbank.org>).

There are two main forms of concession used in ports today:

- ❑ **Lease contracts** – where an operator enters into a long-term lease on the port land and usually is responsible for superstructure and equipment; and
- ❑ **Concession contracts** – where the operator covers investment costs and assumes all commercial risks. Such contracts are often combined with specific financing schemes such as Build, Operate and Transfer (BOT).



Lease contracts and concession contracts share the same principal characteristics:

- ❑ The Government or public Port Authority conveys specific rights to a private company;
- ❑ They have a defined term (10-50 years);
- ❑ They are geographically delimited; and
- ❑ They directly or implicitly allocate financial and operational risks (<http://www.worldbank.org>).

### 6.2.2 Role of a Port Authority

As a point of reference for the next section dealing with what should happen with the NPA ship repair facilities in the Port of Durban, this section will outline exactly what the roles and functions of a Port Authority are.

Ports usually have a governing body referred to as the Port Authority, Port Management or Port Administration. "**Port Authority**" is used widely to indicate any of these three terms. The term "Port Authority" has been defined in various ways and in 1977 a Commission of the European Union defined a Port Authority as:

*"A State Municipal public or private body that is largely responsible for the tasks of construction administration and sometimes the operation of port facilities and in certain circumstances for security."*

This definition is sufficiently broad to accommodate the various port management models existing within the European Union and elsewhere. The UNCTAD Handbook for Port Planners in Developing Countries lists the statutory powers of a National Port Authority as follows (on the assumption that operational decisions will be taken locally):

- ❑ **Investment** – Power to approve proposals for port investments in amounts above a certain figure. The criterion for approval would be that the proposal was broadly in accordance with a national plan, which the authority would maintain;
- ❑ **Financial Policy** – Power to set common financial objectives for ports (for example, required return on investment defined on a common basis), with a common policy on what infrastructure will be funded centrally versus locally; advising the Government on loan applications;



- ❑ **Tariff Policy** – Power to regulate rates and charges as required to protect the public interest;
- ❑ **Labour Policy** – Power to set common recruitment standards, a common wage structure and common qualification for promotion; power to approve common labor union procedures;
- ❑ **Licensing** – When appropriate, power to establish principles for licensing of port employees, agents, etc.;
- ❑ **Information and Research** – Power to collect, collate, analyze and disseminate statistical information on port activity for general use, and to sponsor research into port matters as required; and
- ❑ **Legal** – Power to act as legal advisor to local port authorities. Increasingly, central governments implement seaport policies through the allocation of resources rather than through the exercise of wide-ranging regulatory powers (<http://www.unctad.org>).

While central governments should pursue macro-economic objectives through an active seaport policy, Port Authority objectives should be more narrowly focused on port finances and operations. It is a widely accepted opinion among port specialists *that a Port Authority should have as a principal objective the full recovery of all port-related costs including capital costs plus an adequate return on capital*. The full recovery of costs will help a Port Authority to:

- ❑ Maintain internal cost discipline;
- ❑ Attract outside investment and establish secure long-term cash flows;
- ❑ Stimulate innovation in the various functional areas to guarantee a long-term balance between costs and revenues, especially when faced with innovations by terminal operators, port users, rival ports and hinterland operators;
- ❑ Generate internal cash flows needed to replace and expand port infrastructure and superstructure;
- ❑ Compete according to the rules of the market system, without excessive distortions of competition; and

- ❑ Put limits on cross-subsidization, which may be rational from a marketing point of view (market penetration, traffic attraction) but which can undermine financial performance (<http://www.worldbank.org>).

### 6.2.3 What should happen in Durban?

With the above in mind it is suggested that the NPA continue their role of the Port Authority and further make a decision to concession the NPA ship repair facilities, starting with the ship repair quay, then the dry-dock, then the workshop and finally the floating dock. These can be done either by individual concessions or by grouping some of the facilities, e.g., the floating dock and the workshop into a single, consolidated concession. The *primary objective* of the concession agreements will be to *transfer investment costs* from the NPA to the private sector. Concessionaires will rehabilitate infrastructure and operate the facilities or service for at least 15 years. These concessions may be "positive," when the preferred concessionaire pays the NPA for concession rights; or "negative," when the NPA pays the preferred concessionaire for the services it provides under the agreement. It is suggested that the former be pursued. The benefits of such concessions in the port sector include:

- ❑ Better and more efficient port management (especially ship repair) performed by private ship repairers with the improvement of the management capability of the port entities; such improvement often being narrowly defined as increased efficiency and upgraded operational productivity;
- ❑ Enhancement of the service quality offered to users and a reduction of the price they have to pay for ship repairs.
- ❑ Avoidance of the drawbacks associated with monopolies through the inclusion of detailed concession conditions;
- ❑ The application of private capital to socially and economically desirable projects, freeing up funds for other priority projects. In other words a reduction of the financial demands on the public sector, in particular on central government, by employing private sector resources to replace those of the public sector by generating increased or new revenue streams for the government, or both;

- ❑ The transfer of risks for construction, finance and operation of the facility to the private sector;
- ❑ The attraction and use of foreign investment and technology.

There is of course also the reverse side of the coin, in it that the concession agreements have disadvantages. Disadvantages associated with concession contracts include:

- ❑ The need for continuing close regulation and oversight;
- ❑ The system can work properly only when the legal framework permits transfer of land rights to a private party;
- ❑ Winning bids are sometimes based on unrealistic financial projections, placing the sustainability of the concession agreement in jeopardy;
- ❑ The danger that a concessionaire will not properly maintain the facilities under concession, returning them to the NPA in bad condition; or the danger that the concessionaire and the Port Authority disagree on the operational need for and financial feasibility of critical investments.

These, however, can be overcome by ensuring that the roles of the parties involved are clearly defined, while transparency throughout the concession agreement process is adhered to. The concessioning of the NPA repair facilities is in line with the government's objectives and is well aligned with the NPA's strategy. Concessions have proven to be successful and a wealth of information is available to prove this point.

Further broad reasons for pursuing reform in the ship repair industry in the Port of Durban are to be found in the World Bank Port Reform Tool Kit. These are categorised in general, administrative/managerial, financial and employment reasons. Table 22 below depicts this.

**Table 22: Reasons for Pursuing Port Reform**

<p><b>General Reasons</b></p> <ul style="list-style-type: none"> <li>• Improve port efficiency</li> <li>• Decrease costs and prices</li> <li>• Improve service quality</li> <li>• Increase competitive power</li> <li>• Change the attitude with respect to port clients</li> </ul>	<p><b>Administrative/Managerial</b></p> <ul style="list-style-type: none"> <li>• De-politize the public port administration</li> <li>• Reduce bureaucracy</li> <li>• Introduce performance based management</li> <li>• Avoid government monopolies</li> </ul>
<p><b>Financial Reasons</b></p> <ul style="list-style-type: none"> <li>• Reduce public expenditure</li> <li>• Attract foreign investment</li> <li>• Reduce commercial risks (investments) for the public sector</li> <li>• Increase private sector participation in the regional or national economy</li> </ul>	<p><b>Employment Reasons</b></p> <ul style="list-style-type: none"> <li>• Reduce the size of public administrations</li> <li>• Restructure and retrain the port labour force</li> <li>• Eliminate restrictive labour practices</li> <li>• Increase private sector employment</li> </ul>

Source: World Bank Port Reform Tool Kit

Additionally, other objectives can also be targeted by port reform schemes, such as:

- ❑ Redistributing wealth or other social objectives, especially pursued through the NPA's Black Economic Empowerment (BEE) policy;
- ❑ Attracting new or additional trade and business for the country, the port and the ship repair fraternity;
- ❑ Sharing commercial, economic, technological or management risks between the public and the private sector;
- ❑ Stimulating private entrepreneurs and investment in the economy and the transfer of skills and competencies;
- ❑ Transferring technology in the form of advanced equipment deployment or the introduction of state-of-the-art management systems.

## CHAPTER 7

### 7.1 SHIP REPAIR DEVELOPMENT FRAMEWORK - DURBAN

#### 7.1.1 RECENT DEVELOPMENTS

The most recent developments in the Ship Repair Industry in the Port of Durban have been proposals received by Dormac and EBH pertaining to further developments in the area. Three such proposals have been received and are briefly discussed below.

##### *a. Proposals*

- ❑ **Lease of the NPA Ship Repair Quay** – The first proposal pertains to the Lease of the NPA Ship Repair Quay. Dormac and EBH approached NPA in April 2002 and proposed that they, in partnership, assume responsibility to act as custodian of the ship repair quay. They proposed that further to this, they also assume full responsibility for the management and maintenance of the facility to first-world standards while allowing free access to other ship repair operators.
- ❑ **Preliminary Proposal for the Construction of a New Graving Dock** – The second was a Preliminary Proposal for the Construction of a New Graving Dock in the Bayhead Area. Dormac approached NPA in May 2002 for the approval of a preliminary proposal for the construction of a new graving dock on their leasehold property. Dormac motivated this proposal on the grounds that an average of 3 to 4 vessels are turned away per quarter due to a lack of dock space.
- ❑ **Proposal for the Operation of a 3rd Floating Dock** – The third proposal was for the operation of a third floating dock. Dormac approached the NPA in June 2002 for the approval of a proposal to operate a third floating dock in the Port of Durban. The purpose of this floating dock would be to service the fishing fleets from Mozambique, Tanzania and Kenya in addition to Mauritius, Madagascar and the other Indian Ocean Islands.

### 7.1.2 SCENARIO ANALYSIS

Based on the above a number of scenarios could be derived; these are discussed below.

- **Two Floating Docks, One Graving Dock Scenario** – This represents the current situation in the port. Under this scenario, occupation ratios are in the region of 70% - 85% and between 12 and 30 vessels per annum are turned away, as a result of a lack of capacity.
- **Three Floating Docks, One Graving Dock Scenario** – This scenario includes the 3rd floating dock proposed by Dormac. This would still not fully address the number of vessels turned away as the motivation for this proposal is to expand Dormac's current market. As stated previously, Dormac intends to attract fishing fleets from Mozambique, Tanzania and Kenya in addition to Mauritius, Madagascar and the other Indian Ocean Islands.
- **Two Floating Docks, Two Graving Docks Scenario** – This scenario includes Dormac's proposal for the construction of a new graving dock. This scenario is a workable one and should reduce the number of vessels currently turned away. This proposal was specifically drawn up for the purpose of addressing this problem. This graving dock will complement the NPA dock, as it will be smaller.
- **Three Floating Docks, Two Graving Docks Scenario** – This is the "ideal" situation and it is envisaged that in this scenario no vessels will be turned away. This should comfortably accommodate all the vessels currently being turned away.

### 7.1.3 END RESULT

It is quite clear that the need for a second floating dock cannot be entirely justified as this dock is targeting new markets that in turn will simply aggravate the current situation, as more vessels will have to be turned away. If the purpose for this dock can be redefined to address current



percentage of vessels turned away, this proposal can be supported. It is also quite clear that Dormac's intention is to compete head on with EBH for the fishing fleets, which is good as it stimulates competition. The proposal for the graving dock is well justified and could probably be scrutinized more closely as the proposal is addressing servicing those vessels that are currently turned away.

Using the proposals as a background as well as the expectation of the ship repairers that there are additional ship repair opportunities to be pursued for the industry in the Port of Durban, the best starting point would be to suggest the concessioning of the NPA facilities as indicated previously. As suggested the NPA should follow a process similar to, and aligned with, all the other policies currently regulating the company.

- ❑ The **ship repair quay** is currently more of a liability than a profitable asset to the NPA, and therefore it is suggested that the concessioning process starts here. Currently the facility generates no revenue, but is costing millions to maintain and operate<sup>5</sup>. A unique opportunity exists here for BEE involvement especially as the smaller companies doing paint and welding work do not have adequate facilities. The quay could be leased to a group of BEE companies, where afloat repairs can be carried out. Alternatively the proposal received from EBH and Dormac could be entertained in a formal agreement.
- ❑ Thereafter, the **dry-dock**, followed by the **floating dock** and then the **workshop** could be considered as concession candidates. The maintenance of the NPA small craft, tugs, dredgers and the like could form part of such a concession agreement.

Once the above process has been fully implemented and is running reasonably well, an assessment needs than to be made as to whether additional facilities would still be required. It is suggested that either a third floating dock or a second dry-dock be acquired, in order to address the vessels currently not serviced. This service should preferably be provided by a third ship repairer and not by the existing companies in attempt to stimulate further competition in order to have the highest levels of productivity and efficiency. A floating dock of at least similar

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<sup>5</sup> For the 2001/02 financial year the total expenses on the ship repair quay amounted to R2, 480,000 (Includes: Labour, Energy, Material, Electrical/Civil/Mechanical Maintenance, Dredging and Other Operating Expenses).

dimensions to the Eldock is suggested while a new graving dock able to accommodate post-Panamax vessels at Lot 10 (Graphic 5), is to be considered.

The global forecast indicates growth in the underlying demand for ship repair, also described as one of progressive demand. On the local front repair contractors are also experiencing significant growth in turnover since the inception of the two floating docks, with the Durban-based ship repair market growing from a R150 million turnover to one of approximately R500 million. According to industry this comes as a direct result of the additional infrastructure. It can therefore be confidently stated that all factors point to growth in the industry in the long run and that Durban could become one of the leading ship repair destinations in the southern hemisphere.

## CHAPTER 8

### CONCLUSION

The above sections attempted to provide a point of reference that additional opportunities for the ship repair industry in the Port of Durban exist. In the final analysis it can be stated that such opportunities do exist. It has been indicated that this is an area of exploration especially pertaining to the widening and deepening of the port entrance channel already in progress in the port<sup>6</sup>. This will inevitably attract post-Panamax vessels to the port which in turn creates the opportunity for the ship repairers as the bulk of repairs carried out in Durban are cargo related (Terminal Status). Further opportunities can also be explored regarding the developments in the oil and gas industry off the west and east coast of Africa. The offshore support or supply vessel market then comes into the picture, which at the moment is not fully serviced by the repairers, highlighting the opportunity for additional facilities under a private operator.

Additional opportunities that exist include:

- ❑ Exploring and attracting container fleets;
- ❑ Creating niche areas of specialisation in new technologies and more efficient work processes; and
- ❑ Multi-skilling and multi-tasking the workforce.

The short- to medium-term intervention especially on the part of the NPA and also to make ship repairs in the port of Durban more attractive should include:

- ❑ Cost cutting measures;
- ❑ Tariff reforms;
- ❑ Enhancing expertise;
- ❑ Tight scheduling and fast turnaround time of vessels;
- ❑ Improvement of quality and range of service offering;
- ❑ Outsourcing non-core businesses; and

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<sup>6</sup> The widening and deepening of the entrance channel is done in three phases, namely, 1) Environmental Impact Assessment which is complete, 2) the removal of caissons which is work in progress and 3) actual widening and deepening which will commence once phase two is complete.

- Investigating the syncrolift opportunity at the Navy base on Salisbury Island.

Over the long run, by which time the concessioning of facilities would hopefully have been executed, it suggested that ship repairers diversify production (ship repairs) through the implementation of more complicated repairs like conversions, which in turn will attract new markets to the Durban port area.

The concessioning of ship repair facilities in the Port of Durban would not be the first of its kind to be done on a world stage. The concessioning of shipyards, both building and repair yards, is quite a common phenomenon internationally. The concessioning of the NPA ship repair facilities would, in fact, be a continuation of current concession processes in the port, particularly the Durban Deep-sea Container Terminal. Due the labour intensity of the Dockyard Complex, especially the workshop<sup>7</sup>, one begins to understand why the NPA is reluctant to make such a decision, as the yard is quite unionised. This, however, can be overcome with a wealth of international case studies available for advice and guidance on the process.

In the case of the restructuring of the management and operation of the Nigerian Ports Authority's dockyards one of the elements dealt with was organizational preparation in order to make the transition as smooth as possible. This involved the evaluation of the present workforce with respect to their capacity for further development, their willingness to participate in the restructuring process (with the possibility of moving to another location) and their motivation to work in a private company. Buy-in from labour was extremely crucial and therefore was this process regarded as one of the most urgent assignments in the restructuring plan. Further to this was the obtaining of the Unions' cooperation regarded as an essential condition<sup>8</sup>.

To be agile, the ship repairers in the port of Durban must be capable of operating profitably in a competitive environment of continual and unpredictable change. That is the challenge!

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<sup>7</sup> Total Labour Cost for the 2000/01 financial year amounted to R12,486,887 compared to a budget of R13,153,786.

<sup>8</sup> Port Organisation and Management in Developing Countries – Dr. H. Coltof (ed.)

## 9. BIBLIOGRAPHY

- a. Anderson B.M. et al, 1997. *Shipyard operational improvement through process management*.
- b. Coltof H. (ed.), 1999. *Port organisation and management in developing countries*.  
Publication of the International Maritime Transport Academy (IMTA) Rotterdam.
- c. Finzer B. et al, 2002. *Privatisation of the Ukrainian Shipyards*. University of Minnesota, USA.
- d. Hawes S., 2002. *The economic viability and benefits of shipbuilding and ship repair in Durban port*.
- e. Jones T., 1997. *The port of Durban and the Durban Metropolitan Economy*. Research Monograph No 10. Economic Research Unit, University of Natal, Durban.
- f. Mazurkiewicz B.K., 1980. *Design and construction of dry-docks*. Trans Tech Publication
- g. National Ports Authority of South Africa – Information Pack
  - Port of Cape Town
  - Port of Mosselbay
  - Port of Port Elizabeth
  - Port of East London
  - Port of Durban
  - Port of Richardsbay
- h. NOBE Final Report, 1999. *The shipbuilding and ship repair sectors in the candidate countries: Poland, Estonia, the Czech Republic, Hungary and Slovenia*. NOBE Independent Center for Economic Studies
- i. Ocean Shipping Consultants, 1999. *The world ship repair market to 2015*.
- j. Pearson T. (Captain), 1995. African Keyport – Story of the port of Durban.
- k. Shipping Statistics Yearbook 2001. Publication of the institute of shipping economics and logistics.
- l. Smith A., 2002. *The South African Ship Repair Industry*.
- m. South African Railway & Harbours, 1924. *The new graving dock at Durban, Natal*
- n. Stopford M., 2000. *Defining the future of shipping markets*
- o. United Nations Conference on Trade and Development. *Guidelines for Port Authorities and Governments on the privatisation of port facilities*.

## 10. INTERNET SOURCES

<http://www.africanmarine.com>  
<http://www.armscor.co.za>  
<http://www.asne-tw.org>  
<http://www.btimes.co.za>  
<http://www.camnet.com>  
<http://www.cbn.co.za>  
<http://www.cia.gov>  
<http://www.clarksonresearch.com>  
<http://www.cofferdam.co.za>  
<http://www.dormac.net>  
<http://www.ebh.co.za>  
<http://www.elsy.co.za>  
<http://www.europa.eu.int>  
<http://www.fas.org>  
<http://www.iacs.org.uk>  
<http://www.icons.org.au>  
<http://www.imo.org>  
<http://www.ir.zaobao.com>  
<http://www.kenya-ports.com>  
<http://www.lethsuez.com>  
<http://www.marinelink.com>  
<http://www.marinelog.com>  
<http://www.marsit.com>  
<http://www.medcruise.com>  
<http://www.motorship.com>  
<http://www.namport.com>  
<http://www.naval.ca>  
<http://www.npa.co.za>  
<http://www.osha-slc.gov>

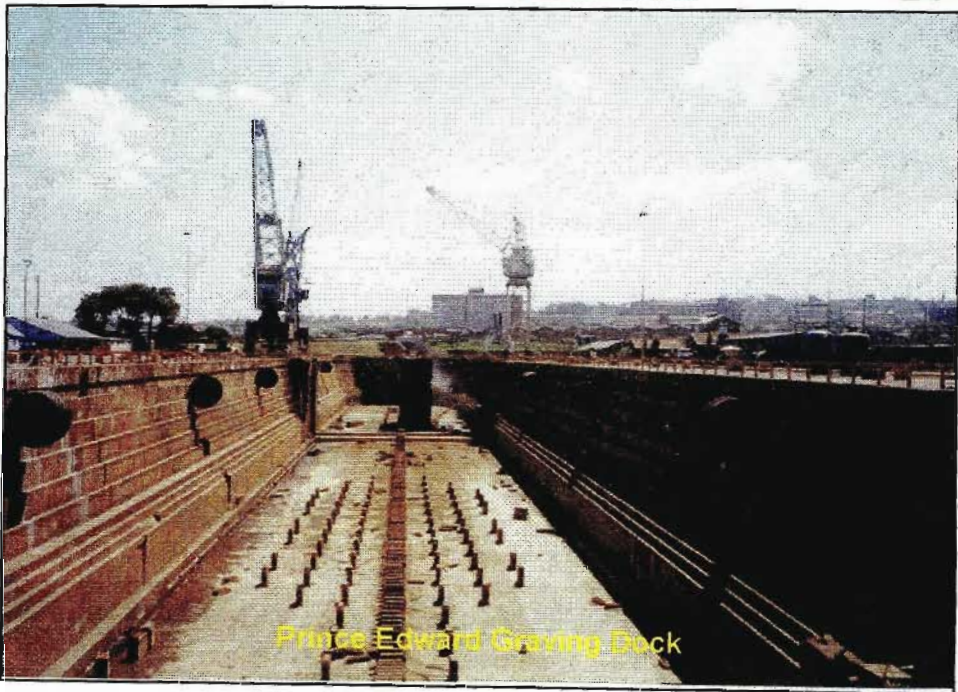
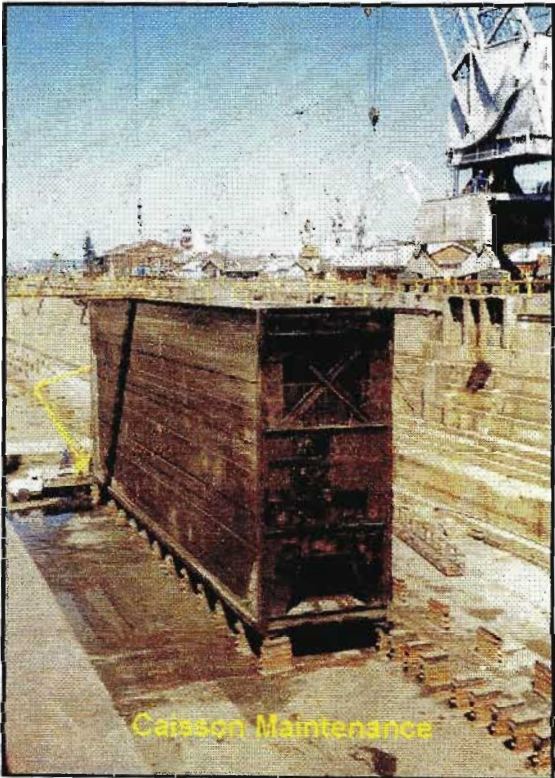


<http://www.otal.com>  
<http://www.paint-the-net.com>  
<http://www.paceshipping.net>  
<http://www.pbm.xt.gulf.org>  
<http://www.ports.co.za>  
<http://www.porttechnology.org>  
<http://www.profabril.pt>  
<http://www.psc-tema.com>  
<http://www.schiffsbank.com>  
<http://www.sea007korea.com>  
<http://www.simonstown.com>  
<http://www.singapore-window.org>  
<http://www.stellercarson.com>  
<http://www.unctad.org>  
<http://www.usm.edu>  
<http://www.wemt.nl>  
<http://www.winne.com>  
<http://www.worldbank.org>  
<http://www.wreckage.org>

**11. APPENDICES**

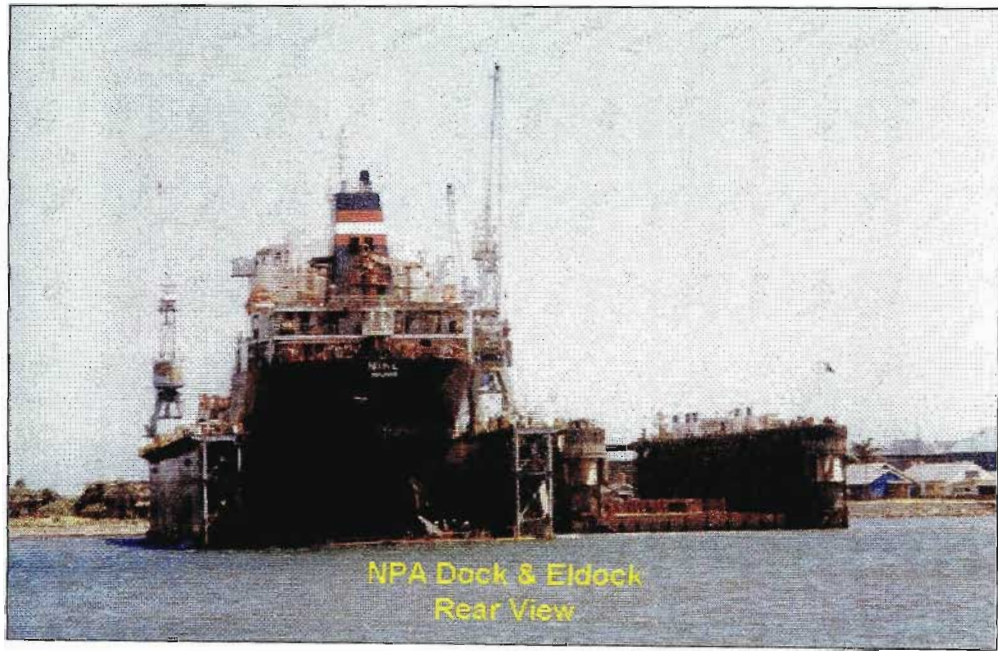
**11.1 APPENDIX I: PHOTOS OF SHIP REPAIR FACILITIES**

**11.1.1 Prince Edward Graving Dock**





11.1.2 Floating Docks



## **11.2 APPENDIX II: QUESTIONNAIRE**

**University of Natal**

Masters in Business Administration

**Dissertation:**

An evaluation and assessment of ship repair opportunities for South Africa using the Port of Durban as a case study in an attempt to develop a Framework Plan for the Ship Repair Industry in the Port of Durban

**Student:**

George Brian Jonkers

201 507 706

**QUESTIONNAIRE**

My name is George Jonkers. I am currently completing my Masters in Business Administration (MBA) specialising in Maritime Studies at the University of Natal. As part of the fulfillment of requirements I have to complete a dissertation, with my choice having reference to the ship repair industry in South Africa, and specific attention to the Port of Durban. Could I therefore kindly request of you to answer the following questions as openly and honestly as you possibly can?

The questionnaire is divided into different sections in order to address the various issues currently facing the industry.

**Structure of this questionnaire:**

**Section A: Questions concerning Markets**

**Section B: Questions concerning Competition**

**Section C: Questions concerning Operating Issues**

**Section D: Questions concerning Location, Infrastructure & Equipment**

**Section E: Questions concerning Quality Performance**

**Section F: Questions concerning Statistics and Traffic Expectations**

Allow me to thank you for participating in this questionnaire and for agreeing to the interview. Without your invaluable contribution this would not have been possible.

**Section A**

**Questions concerning Markets**

1. What % of the global ship repair market constitutes the Durban market?

0% - 1%	
1% - 3%	
3% - 5%	

2. At present are there any additional ship repair opportunities available to the industry in the Port of Durban that can be exploited? Could you mention some of the opportunities?

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3. What drives the demand for ship repairs in the Port of Durban?

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4. The demand for ship repair can be divided into three categories as specified below:

Category	%
Repair Customers (Repairs Only)	
Cargo Driven (Discharge & Repairs)	
Force Majore (Incidents)	

5. Turning our attention to capacity. How many vessels on average has been turned away due to lack of capacity per month/annum?

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6. Could you list 3 – 5 physical constraints influencing vessels calling for repairs at the Port of Durban?

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7. What types of vessels does your company currently service?

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8. What services are your company currently offering?

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9. Please comment on the following pertaining to backward linkages:

a. Indicate the % of material/equipment sourced from:

<b>Local Suppliers</b>	
<b>Imported</b>	

b. Typical material derived from:

<b>Local Suppliers</b>	-
	-
<b>Imported</b>	-
	-



## Section B

### Questions concerning Competition

1. Who would you regard as your 3 major competitors?

☐ Locally

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 -----

☐ Nationally

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 -----  
 -----

☐ Internationally

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 -----  
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2. Indicate the degree to which your company faces competition from other ship repair yards in the categories below:

Market Location	High	Moderate	Low	None
Locally				
Nationally				
Internationally				

3. How do you consider the industry your company finds itself in?

A Competitive Industry	
An Oligopolised Industry	
A Monopoly/Near Monopoly	
Dominated by Public Sector Providers	

4. How significant are the barriers to entry in the ship repair industry, particularly Durban?

High	Moderate	Low	Zero

**Section C**  
**Questions concerning Operating Issues**

1. The National Ports Authority (NPA) has a booking system in operation for dry-docking of vessels in the dry-dock and NPA owned floating dock. How exactly does the booking system work?

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2. In your opinion should the booking system be abolished?

Yes	
No	

a. Why?

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b. If you answered, “Yes” in the question above, what would you suggest as a more effective system?

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3. What do you understand by the term “common user access”? Is this managed effectively?

4. Could you express your view on the NPA’s policy regarding free-days?

5. Could you express your view on the NPA’s lay-by policy?

6. What is the % split between activities carried out in floating docks and in the dry-dock?

<b>Dockyard</b>	
<b>Floating Docks</b>	

**Section D**

**Questions concerning Location, Infrastructure & Equipment**

1. Prioritise the following factors influencing the layout and equipment deployment from most to least important.

Description	Priority
Ship Sizes	
Degree of Market Competition	
Common User vs Single User Operator	
Maintenance Cost	
Labour Cost	

2. What infrastructure and equipment is associated with your company for the repairs of vessels?

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**Section E**  
**Questions concerning Quality Performance**

1. How would you rate the quality of the dry-dock in the Port of Durban?

Good	Average	Bad

2. How would you rank the following performance variables with respect to usage of the Port of Durban?

Performance Variables	Major Problem	Minor Problem	No Problem
Ability to accommodate appropriate vessels			
Availability of common-user repair berths			
Availability of private repair berths			
Availability of dry-dock when required			
Fair competition with NPA facilities			
Port tariffs for repair facilities			

3. If you were requested to conduct a SWOT analysis of the ship repair industry in the Port of Durban, what would you list as strengths, weaknesses, opportunities and threats? List three (3) of each, please.

<p style="text-align: center;"><b>Strenghts</b></p> <p>-</p> <p>-</p> <p>-</p>	<p style="text-align: center;"><b>Weaknesses</b></p> <p>-</p> <p>-</p> <p>-</p>
<p style="text-align: center;"><b>Opportunities</b></p> <p>-</p> <p>-</p> <p>-</p>	<p style="text-align: center;"><b>Threats</b></p> <p>-</p> <p>-</p> <p>-</p>

## Section F

### Questions concerning Statistics and Traffic Expectations

Year	Forecast
2001 - 2005	2,1%
2005 - 2010	2,5%
2010 - 2015	2,0%

1. Globally the United Kingdom based company, Ocean Shipping Consultants, has prepared the above-tabled forecasts. In your view are these forecasts realistic?

Yes	
No	

- a. If your answer above is "No", could you please provide more realistic forecasts?

Year	Forecast
2001 - 2005	
2005 - 2010	
2010 - 2015	

2. Over the next five years, how would you expect the general level of your activities in the Port of Durban to change?

Rise > 10%	Rise < 10%	Remain Stable	Decrease < 10%	Decrease > 10%