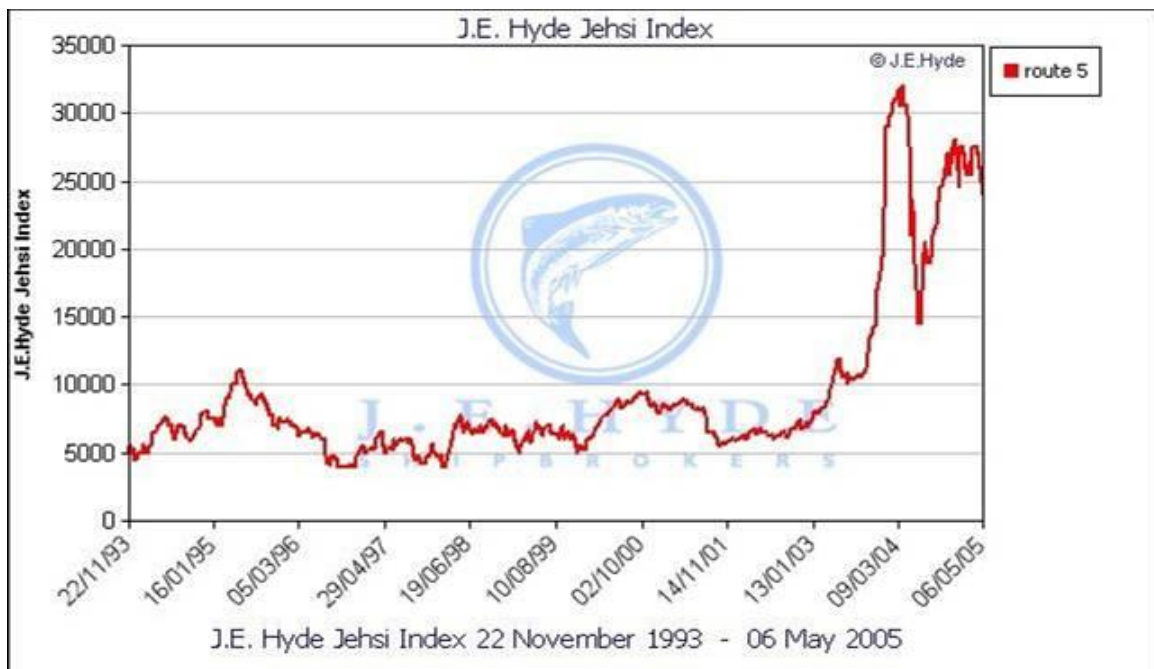


1.1 INTRODUCTION

World shipping activity over the last three years has seen an increase in demand for ships and freight rates have climbed considerably on the back of that rising demand.¹ World trade has increased and with South Africa's strategic positioning, it would be reasonable to expect that a spin off of the increase in shipping activity would be an increase in ships calling at South African ports for bunkers and replenishment of stores.

Figure 1.1 Freight market index



Bunkering is the supply of fuel oils to ships. The word originates from the days of coal fired engines, with the bunker being the place on board the ship where the coal was stored. Today it refers to marine fuel products such as the following:

Heavy fuel oil (HFO/IFO/MFO): usually in the range of 120cst through to 380cst, this product is used for the running of the ship's main engine whilst on sea

¹ JE Hyde Jehsi Index

passage, with the average ship burning around 22 metric tons per day². The trend today is for more and more ships to use 380cst and in Singapore, the world's biggest bunker port, we are seeing an increase in the sale of this product.³

Marine Gas Oil (MGO): this product is a distillate and is fairly well refined. The ship's generators are run on it and when the ship is looking to come into port the main engines are changed over to gas oil, as it allows for quicker responses from the main engine. A ship will burn around 1.8 to 2.5 metric tons per day⁴.

Marine Diesel Oil (MDO): this is not as refined as gas oil but costs around \$10.00 less than MGO. It serves the same function as MGO.

Modern ships are being built so as to limit their need for MGO and MDO and are now able to maneuver whilst still burning heavy fuel oils⁵.

Geographically South Africa is ideally positioned to take advantage of the east – west trade of ships opting not to use the Suez Canal on their way up to Europe, as well as the increase in shipping activity from the Far East to the west coast of the African continent and the trade between the east coast of South America and the Far East.

The port of Durban handles approximately 70% of all the bunker ships that call at South African ports⁶ and will appropriately be the focus of the study into the decline of the number of bunker callers. The other bunker ports are Cape Town and Richards Bay, although the latter caters mostly to the supply of ships that are working cargoes in the port. It is interesting to note that the bunker volumes from

² Figures as supplied by Atlas Trading & Shipping a grain trader operating ships trading South America & South Africa

³ Port of Singapore bunker statistics

⁴ Average figures taken from records of Congen Charter Parties reflecting agreed consumption rates

⁵ European Commission – Study/C.1/101/2002. Advice on impact of Reduction in sulphur content of marine fuels marketed in the EU

⁶ Ian Grayston September 2005 IBIA South Africa circular to members

this port have increased by some 25% which is attributable to the increase port activity both on the coal export and the general cargo.⁷ South Africa has very little opposition in bunker supply on a cost basis from its neighbours, extending as far up as Lagos on the west coast and Aden on the east coast of Africa⁸. South Africa is in fact the cheapest supplier of bunker fuel in the Southern Hemisphere⁹. The main competitor for the trade going through to Europe is from the Canary Islands.

1.2 BACKGROUND OF THE STUDY

There has been a marked decline in the number of ships calling for the sole purpose of bunkering¹⁰. The Association of Ships Agents and Brokers of Southern Africa, (ASABOSA), whose members rely on the bunker ship market as a significant contributor to their overall revenue, felt that it was essential to establish what the economic impact of a bunker caller was to the city of Durban¹¹. At this point it is important to mention that this situation is not restricted just to Durban, it has also had a serious impact on the bunker business in Cape Town.

Durban however handles approximately 70% of the South African bunker business¹² and it was felt that as the main economic factors, being the cost of bunkers and the NPA charges are common to both ports that the study of the main port would suffice as a model for both. Information from the IBIA, South Africa (International Bunker Industry Association) suggest that the problem is also greater in Durban which in 2004 saw a decline in overall bunker sales of 20% whilst Cape Town is down by 5% for the same period.

⁷ Ian Grayston's September 2005 IBIA South Africa circular to members

⁸ Taken from regularly published bunker prices from companies such as OW Bunkers and Cockett Marine

⁹ OW Bunkers bunker price records

¹⁰ NPA statistical records

¹¹ Minutes of ASABOSA National Council and branch meetings recorded this fact.

¹² Ian Grayston's September 2005 IBIA South Africa circular to members

There was a need for research to be undertaken to establish that it was not simply the agents who benefited from these types of port callers, but it was the greater Durban business community that benefited. There are a multitude of areas where these ships inject expenditure with the following areas being identified.¹³

- Marine infrastructure – quay walls, entrance channel, buoys and lights, berth and channel depths
- Pilot service, tug service and berthing staff
- Supply of fresh water and garbage removal
- Security service and stowaway search services
- Bunkers of various grades ie IFO, MGO and MDO
- Supply of ship stores and supplies
- Medical services
- The delivery of ships spares
- The ship repair yards
- The requirement of having ship surveyors on board either for class or insurance related matters
- Maritime lawyers for legal services
- The delivery of cash to master
- The need for local transport whether in the form of company supplied transport or the local taxi community
- Hotel accommodation
- Entertainment both formal and informal

If a multiple beneficiary theory could be established, then there would be the opportunity to present this argument to the National Port Authority, The Durban Metropolitan Council, the oil majors and all other parties who gained an economic

¹³ Jones T 2005 The Provision of Services to Bunker Callers in the Port of Durban – A Survey of the Economic Impact on the Durban Metropolitan Economy

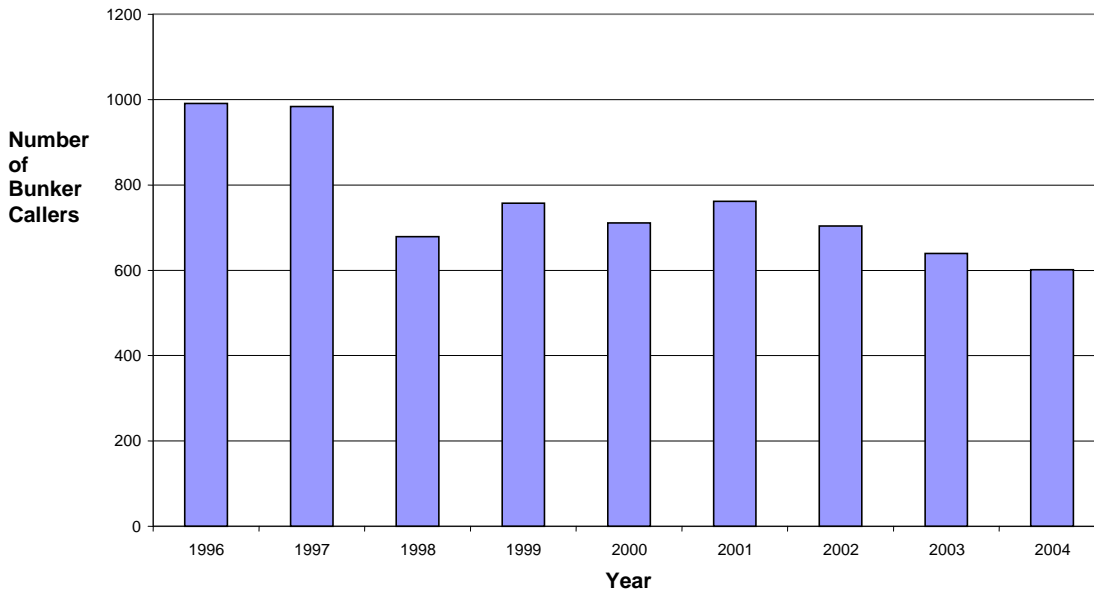
benefit from these ships. This survey was undertaken by Professor Trevor Jones of the Centre for Maritime Economics & Law of the University KwaZulu Natal.

The survey found that changes in shipping trends, with bigger more fuel efficient ships calling at the port, had resulted in an overall decrease in the number of ships that called at Durban over the measured period from 1996 through to 2004. This was however a global trend and has more to do with ship owners striving to achieve economies of scale and more cost efficient ships¹⁴. The figures obtained by Professor Jones are backed up by the statistic kept by the National Port Authority, which reflects an increase in cargoes through the port, at the same time as the numbers of actual callers has decreased. The port marine department's records of ships according to their gross tonnage work well as an additional cross reference and they concur with the supposition that we have fewer but bigger ships using the port.

The report observes that the number of bunker only callers has decreased considerably from 991 calls a year in 1996 down to 601 ships in 2004, a decrease of 40% in the numbers calling.

¹⁴ Jones T 2005, The provision of Services to Bunker Callers in the Port of Durban – A Survey of the Economic Impact on the Durban Metropolitan Economy

Figure 1: 2 Bunker Callers in the Port of Durban, 1996-2004



Source: National Port Authority, September 2005.

The economic impact of the loss of 382 ships calling purely for bunkers, if we assume that we should have at least kept the number of ships calling at a stable rate, is high with Professor Jones establishing the loss as per the details below

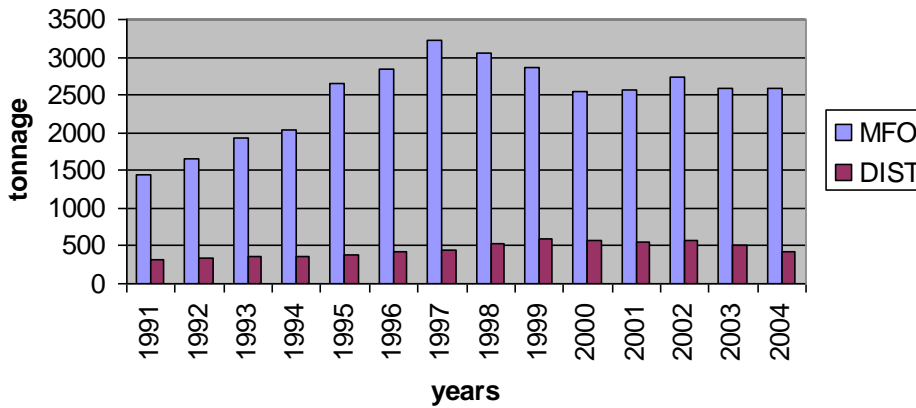
- R433 million on bunker fuel
- R26.7 million for the services provided by the NPA
- R21.5 million to the ship chandelling industry
- R3.8 million to the ships agency industry
- R820.000 to local transport companies and the hotels who provide transport and accommodation for crew
- R205 000 to the local medical industry
- R806 000 in the form of communication expenditure including courier services

Over and above these amounts, that he was able to quantify, there is a myriad of miscellaneous services that it is not possible to quantify. The final economic

impact of the loss of bunker callers to Durban is calculated at R488.7million in direct first round expenditure and if a multiplier effect is taken into consideration then the total loss equated to 2005 figures is R838 million per annum.

Coupled to the report conducted by Professor Jones, the IBIA South Africa (International Bunker Industry Association) has also noted with concern that there is an overall decline in the sales of bunker fuel in South Africa

Figure 1.3: Total Sales Period 1991 -2004 000mts



Source IBIA South Africa September 2005

Their figures indicate that there has been no effective and sustained growth in the industry over the last 10 years, with total sales in 2004 being less than what was achieved in 1995. There was steady growth from 1991 to 1997, thereafter sales have declined and are now in fact 25% less than what they were in 1997. During the period 2000 to 2004, whilst it appears that sales are recovering it has in fact been a case of 7% increase in the 2001/2002 period, followed by a decrease of 6% in 2002/2003 and a recovery of 6.8% in 2004. This in effect means that sales have grown by only 2% overall over this period. At this growth

rate it will take the industry a further 12 to 13 years to get back to where they were in 1997¹⁵

It is felt by industry¹⁶ that a contributing factor to the recent decline in bunker business (since 2002) is that the National Port Authorities did away with the concession given by discounting pilot services. Up until the end of the financial year 2002 the NPA gave a 50% discount on the cost of the pilot¹⁷.

Example: vessel with a gross tonnage of 18000mt

Pilot service in 2002 cost R3200.04

Pilot service in 2005 cost R14757.86

This equates to an increase of 350%

More importantly is the fact that in 2002 the NPA looked to realign their port charges to realistic figures and to do away with the wharfage charge that had been raised against cargo interests¹⁸. The goal was to charge ship related costs against the ship. The drive to restructure the tariff occurred at a time of a steeply depreciating Rand¹⁹, which served to absorb much of the impact of the tariff increases that were implemented.

According to figures obtained from Nedbank in September 2005, the exchange rate in January 2002 was in the range of R8.50 to the USD, in July of the same year the Rand had lost value and was trading at R12.00 to the USD. This equated to a 40% decline in value. At the same time the port costs were increased by an average of 31%²⁰ and so the impact of the increase in tariff was not initially felt by the shipping lines.

¹⁵ IBIA Circular September 2005

¹⁶ ASABOSA petitioning to the NPA at the regular meetings between the two parties in this regard is in their minutes of those meetings

¹⁷ NPA published tariffs reflected this discount and its demise over the years that it was phased out

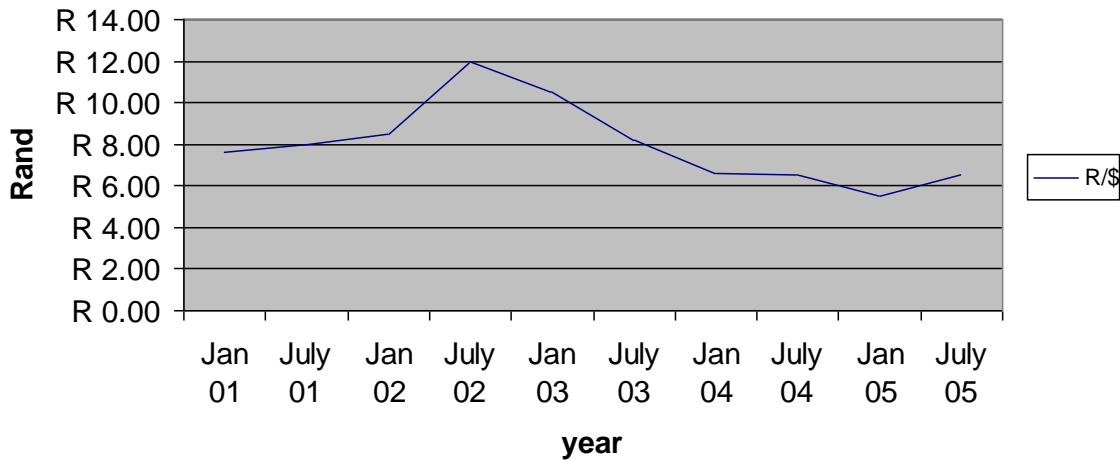
¹⁸ ASABOSA /NPA meeting minutes record this change of tact by the NPA or Portnet as it was then referred to.

¹⁹ Nedbank September 2005 exchange rate figures as reflected in figure 1.4

²⁰ NPA annually published tariff book

Shortly after the completion of the tariff restructuring, in 2004, the Rand increased in strength against the US Dollar ²¹ which resulted in our port costs dramatically increasing by around 40% on the exchange rate, coupled with the 31% increase in tariffs, giving an effective increase of 71%, making our port costs very uncompetitive.

Figure 1.4 : Rand/Dollar Exchange Rate



Source: Nedbank September 2005

This figure is taken from the exchange rate graph supplied by Nedbank which reflects the Rand value against the USD over the last 5 years

The final factor that needs to be taken into account, if we are to look at all the possible reasons for the falling off of bunker ships is the cost of bunkers at Durban and the cost to bunker at the port, both in terms of time and actual costs incurred. The main bunker ports that could be considered as competitors to Durban on the global shipping routes are Singapore, Canary Islands, Rotterdam and San Lorenzo/Santos.²²

²¹ Nedbank September 2005 recorded Rand Dollar performance

²² World Trade Routes reflect most trade is moving from Far East through to Europe – find details

Singapore is the number one bunker port in the world²³ and as a large percentage of world trade is now generated in the Far East, ship owners sailing to or from this region will always consider every port against Singapore.

The Canary Islands are the next logical place to bunker if the ship has bunkered at Singapore and wants to avoid calling Durban on the way to Europe. They are also an option if calling West African ports, as the sailing distance is not far depending on the ships next intended port of call.

San Lorenzo and Santos are recorded as frequent last port of calls in research carried out on the number of laden bunker ships calling Durban on their way to the east,²⁴ as well as many of the ships returning from the east empty.

Bunker statistical figures²⁵ reveal that South Africa is competitive on the price of IFO 180cst, with the only area where there is a short coming is that we do not supply fuel of 380cst. The cost of distillates, MGO and MDO is however far higher than Singapore or Rotterdam but is competitive with the price offered in South American ports.

All of the above factors have had a role to play in the declining bunker business and it would not be possible to conduct research into how to encourage bunker callers unless all of the above are taken into consideration.

1.3 Motivation for the Research

The motivation behind this research is to identify what factors relating to bunker ports can be considered from a South African context and utilized, so as to make

²³ European Commission – Study/C.1/101/2002. Advice on impact of Reduction in sulphur content of marine fuels marketed in the EU

²⁴ NPA SAFREP records of port callers August – November 2005

²⁵ OW Bunkers price lists 2002 to 2006

the choice of bunkering at Durban one that owners will always take into consideration when considering voyage routing and costs.

1.4 Value of the Research

It is the goal of this research to find ways of encouraging ships to once more call at Durban for their bunker requirements. If this can be achieved not only will there be a positive economic impact to the city, but there will also be a greater level of communication between all role players who presently appear to work in isolation.

1.5 Problem Statement

All of the factors outlined in the background information are not controllable by the ships agency companies. The National Port Authority is able to assist in offering a discount on the port dues, but they cannot offer discounts on actual operations, as these have a cost factor which needs to be covered²⁶. It is also the NPA's opinion that they should not be the party discounting their services for the benefit of everyone else and they would like to see other parties in the chain offer incentives²⁷.

In a meeting between ASABOSA, Engen's Drikus Kotze and IBIA's Chairman, Andre Baard to discuss the bunker problems in February 2006, Engen advised that the bunker fuel price is based upon international crude oil prices. It is a by-product of the refining process and is not the oil majors' main concern. Their aim is to obtain as much white oil products from the crude oil and to minimize the amount of residue left. The final quantity of bunker fuel produced is dependent upon the crude slate and what white oil requirements need to be met. This apparently makes it difficult for the majors to predict what volume of fuel oil they

²⁶ NPA/ASABOSA bunker meeting October 2005

²⁷ Bunker forum meeting April 2006

will have for sale each month. The sale of this commodity as bunker fuel is the cheapest option to the majors. The alternative is to export it to other ports, but with the present world shipping prices²⁸ this is a more expensive option. It is therefore in their best interest to keep the price competitive and encourage bunkering activities.

The Rand Dollar exchange rate is not something we can depend upon, it is rather something we need to take into consideration as a short term factor. The tendency in the past to look at the Rand's decline against the dollar as a long range factor has perhaps contributed to the present decline in business that we now have.

A survey was conducted by IBIA (Appendix 1) into what was felt to be the major factors responsible for the decline in bunker sales and whilst there are many factors reflected in this survey, two factors stood out well above the rest. Interestingly enough they are only two factors that it is possible to control, the feast or famine effect of bunker supply from the majors and the time/cost factor. A bunker call is a cost call; there is the cost of the port charges, the cost of the bunkers and the cost in terms of time that the ship loses whilst she is in port taking bunkers. The cost of a ships time in port is quantifiable, it is the daily charter price that the owner could obtain or that the charterer is paying.

This research will look at the hypothesis that if we can decrease the time the ship spends in Durban receiving bunkers we will make the overall cost to the owners cheaper and thereby encourage them to use Durban as their bunker port of choice. Effectively this will mean looking at the supply chain in its current form and identifying processes within the operation that can be streamlined or changed to improve overall efficiency.

²⁸ JE Hyde Jehsi Index

Unfortunately if we do not have a reliable stock of the product then regardless as to how fast we can deliver we will be viewed as unreliable²⁹. The promotion of Durban as a world bunker port can only be achieved if both of these factors are resolved.

1.6 Objectives of the Study

This study will look to achieving the following

- Identify the types of vessels that call at Durban for bunkering
- Identify the trade routes for the most common bunker callers
- Analyse all service providers current modus operandi and supply chain
- Analyse other ports, particularly Singapore and Gibraltar as to how they provide service to the bunker trade and determine whether there are any efficiencies that could be adapted to improve turn around time at Durban.
- Review the options of barge verses pipeline delivery
- Analyse the supply chain and the parties involved and their relationships
- Establish what value added services Durban can and does presently offer
- Establish workable ways in which all role players in the bunker operation can shorten the time the ship spends in port.

1.7 Research Methodology

The research will be mainly of a quantitative nature, in that it will seek to evaluate relationships using numerical techniques such as statistics. Most of the information that will be relied upon will be of a secondary data nature. Such data will consist of written text, published and unpublished articles, minutes of meetings held between various role players and case studies. It is hoped to be able to collect primary data directly from ship owners and charterers, although

²⁹ Email communications received by ASABOSA members from principals confirm that they view our bunker supply as unreliable

past experience in this regard has however yielded very little information³⁰. Case study information on other ports which have successfully built up their reputations as bunker ports will be reviewed. The quantitative research will also be backed up with interviews of the main players within the industry to ensure that the research is addressing the important issues.

An advantage of using more than one method is that it allows for triangulation to take place. By using different data collection methods within this research project it ensures that what the data is saying is properly interpreted.

1.8 Limitations of the Research

The research being undertaken is new to the South African context and will be of an exploratory nature. The shipping industry is one that is governed by supply and demand³¹ and the world markets are constantly evolving and changing. The port of Durban does have restrictions on the size of ships that are able to use the port and so the focus of the research will have to be kept within these boundaries³².

Durban Port restrictions

Daylight

Length Overall – 244 meters

Beam – 35 meters

Draft – 11.90 meters

Night time

Length Overall – 200 meters

Beam – 30 meters

Draft -11.90 meters

³⁰ Past requests by ASABOSA to its members requesting feedback from their principals has not yielded significant response

³¹ Tutorship Economics of carriage by sea

³² NPA published port restrictions in Ports of Southern Africa 2006 edition

Even within these boundaries there is still a wide spectrum of examples to be chosen from which may not give the same answers. This research will therefore focus on the handysize market of ships which are able to use Durban as a port of call and have a gross tonnage in the 15000 to 20000mt range. This range was noted from port lists to be the most common group of bunker callers over a three month period.³³

The agency industry is also very competitive and obtaining information from other agents may not always be possible and so any research will have to be based on neutral organisations statistics and to a degree generalisation of world trade factors.

It is envisaged that the nature of change that will need to be embarked upon will be capital intensive and that there will need to be structural changes as to the way the bunker fuel is delivered. None of these proposed changes can be accomplished overnight and so whilst the hypothesis might be proved in theory there will be a considerable time lag before we see any experimentation confirming the recommendations.

1.9 Structure of the Dissertation

- **1.9.1 – Chapter 2**

In this chapter the available literature on the subject of the economic impact of bunker ships on a port and why they are beneficial to the port will be reviewed. In this regard work by Professor Trevor Jones: The Provision of services to Bunker Callers in the port of Durban – A Survey of the Economic Impact on the Durban Metropolitan Economy, University of KwaZulu – Natal, 2005, and the Bureau of Transport (BTE) Regional

³³ NPA SAFREP reports August to November 2005

Impact of the Port of Mackay, February 2001 will be used to establish the fact that the area being researched is of importance.

Other literature commenting on the success and failure of certain policies adopted by ports in the handling of bunker business will also be reviewed as this will help to establish exactly where Durban is in respect to her opposition. A SWOT analysis on Durban as a bunker port will be carried out to identify her strengths and weaknesses. The supply chain and its current dynamics will be analyzed to see where there is scope for improvement through operational efficiencies or through vertical integration both forward and back along the chain. This will be used in conjunction with the Platts-Gregory procedure to give a good base as to the extent of the problem and to identify what the current supply chain is offering and what in fact the ship owner wants. This will allow the formulation of a strategy in how to analyze the present situation and what factors need to be considered in the research methodology.

- **1.9.2 – Chapter 3**

The background and history of Durban bunkering will be reviewed in this chapter, as will world trade patterns and voyage costs for a typical bunker caller. Qualitative survey figures supplied by the NPA will be used to give the present and past position of Durban and confirm that there has been a decline in the bunker callers. These figures will also be used to establish what type and size of ship, as well as her trading routes can be used as a model for the discussion on reducing time in port and thereby reducing costs. The figures supplied by the IBIA and from various publications such as Fairplay will be used for accurate data on world bunker prices and the charter market.

Research into actual costs over the period where a recorded decline of bunker callers was noted will be calculated and the potential savings possible by implementing time saving techniques will be reviewed to ascertain their significance.

The role players within the bunker industry will be identified and the part that they play will be reviewed. This will be done taking into cognizance the delays along the supply chain that are reflected in the sample of 71 bunker callers that called over the period of the first ten months of 2006

- **1.9.3 – Chapter 4**

The hypothesis of this research is that less time in port will be a considerable saving to the ship owner. The strategy formulated in chapter 2 will need to be put to the test. The Platt – Gregory model analyzed in chapter two will be completed to reflect the bunker market requirements and achieved or envisaged performance. There is no possibility of implementing the proposed changes within the short term and so this testing will be of a theoretical nature. Nevertheless the figures used will be from the world market and will have a realistic bearing on the problem.

- **1.9.4 – Chapter 5**

The research that has so far been collated is put into practice and the results of the research are then verified to see if in fact the findings will make a difference to the number of bunker callers that come to Durban. From the theoretical results obtained it will be possible to approach the major role players within the industry and the city to try and fast track some of the areas of improvement that have been identified. This chapter is of great importance in that it highlights future areas of study in an area where very little study has been undertaken before. Future areas of

research that can be reviewed are the bunker products that the port supplies, the berthing options provided for bunker ships and the proposed widening of the harbour entrance, which will result in a change in the types of ships able to call at Durban.

1.10 Conclusion

The research into how to encourage owners and charterers to view Durban as their bunker port of choice when they are calculating voyage estimates is one that will prove beneficial to the economy not just of Durban but also of South Africa.

A theoretical model will be developed that will take cognizance of all the cost factors and will focus on reducing those costs. The reasoning for this approach is that the cost implications to shipping are the only quantifiable factors that are controllable.

It is hoped that by giving the theoretical hypothesis, the major role players within the port and the city will be encouraged to embark on their practical requirements. This in turn will ensure that Durban is a successful bunker port

Chapter 2

2.1 Introduction

The significance of the bunker industry and the benefits that it brings to the local economy has not been lost on numerous ports around the world and these ports have been very active in trying to encourage this business³⁴. The Bureau of Transport Economic Report on the Regional Impact of the Port of Mackay indicates that for every \$1 million of output generated within the port, there is a direct effect of 7.4 jobs generated, with a flow on effect of 10.1 making a total impact of 17.5 jobs generated. It goes on to suggest that each cargo working vessel that calls in the port is responsible for the creation of 3.3 jobs per year.

The Jones report³⁵ indicated that the direct loss to the port of Durban in monetary terms for each bunker ship that did not call was in the region of R1.3million. This was based on a bunker price of \$240/tonne for fuel oil and \$430/tonne for gas oil. As Fig 2.1 illustrates the average price of bunkers today is \$317/tonne for fuel oil and \$580/tonne for gas oil³⁶, which makes the loss revenue per ship at R1.5 million.

| | |
|---------------------------------|-------------|
| Port Costs | R75215.00 |
| Bunker costs @ R7.00 to the USD | R1430730.00 |
| Agency Costs ³⁷ | R10040.00 |
| Total | R1515985.00 |

³⁴ Marketing correspondence from the ports of Singapore and Gibraltar as well as the IBIA port reports show there is an emphasis on promoting bunker callers

³⁵ **The Provision of services to bunker callers in the port of Durban**

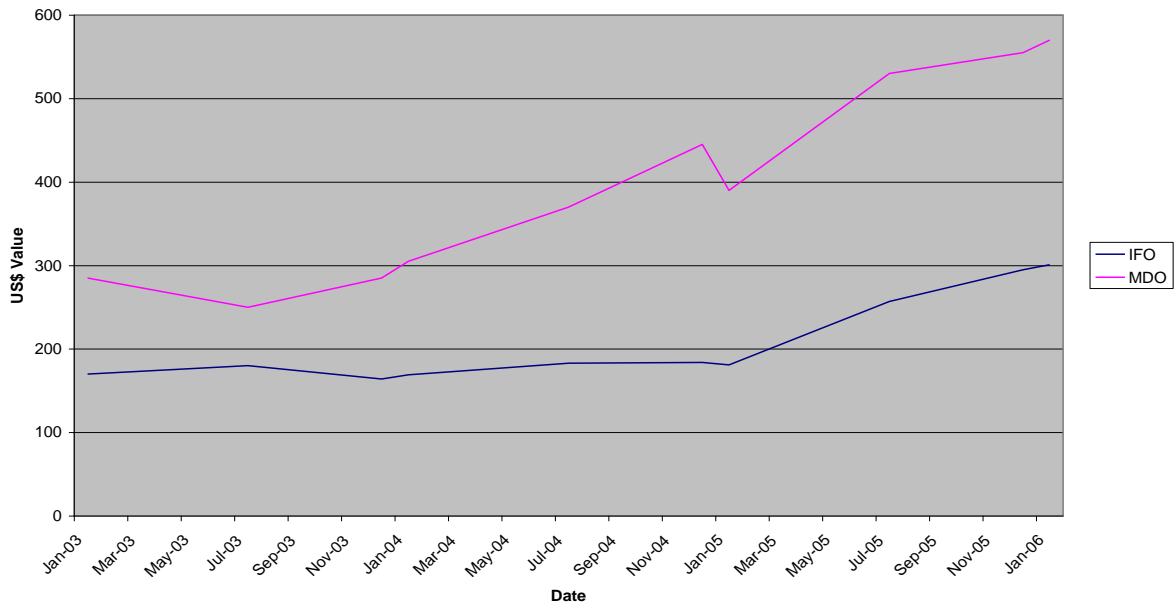
³⁶ OW Bunker Figures 2002 -2006

³⁷ As per figures established by Professor Jones in his report to ASABOSA

The significance of the impact of these lost ships in terms of job opportunities lost is high, if the BTE report figures are used as it equates to 643 direct jobs and 1522 overall.

In order to highlight the efforts that need to be made to encourage the growth of bunker business the ports of Singapore and Gibraltar will be discussed as will the efforts of other closer ports to obtain business away from Durban.

Fig 2. 1 Durban Bunker Prices



The graph illustrates the somewhat rapid rise in the price of distillates at Durban and the increase in IFO since January 2005

2.2 Singapore.

Singapore is the world's busiest port, attracting 135386 calls in 2003.³⁸ It is the dominant player in the bunker industry due to its geographical position, its role as

³⁸ Singapore Port Authority published figures

a major refinery and as a hub port for containers. It has a refining capacity of 1.2million barrels per day which allows for the sale of 20.4 mt of bunkers. From 1999 through to 2003 the port has shown a 15.2% increase in bunker volumes sold³⁹.

The port actively encourages bunker callers and has introduced 380cst to meet the growing demand for this product. Sales figures suggest that the volume of IFO 380cst has a higher sales potential than the IFO 180cst⁴⁰. They have also introduced a special bunkering anchorage scheme, known as SBA. These have proved popular in keeping the cost to ship owners down and some 7 million tons of bunkers sold, have been through the SBA slots. The port added a further four of these slots in February 2006 due to the demand from owners who enjoy a 40% rebate on port costs when opting for these slots⁴¹.

The Maritime and Port Authority of Singapore, the equivalent to our National Port Authority, has introduced the Singapore Standard for Bunkering. This is known as the Code of Practice for Bunkering by Bunker Tankers, or CP60, and as of May 2005 all bunker suppliers, bunker craft and surveyors had to comply with these regulations. GAC Bunker Fuels Representative, Madeline Lee has stated in the IBIA web site port report on Singapore, that this initiative has been copied by other ports. Correspondence from the Gibraltar Port Authority indicates that they are one such port that has followed this initiative⁴².

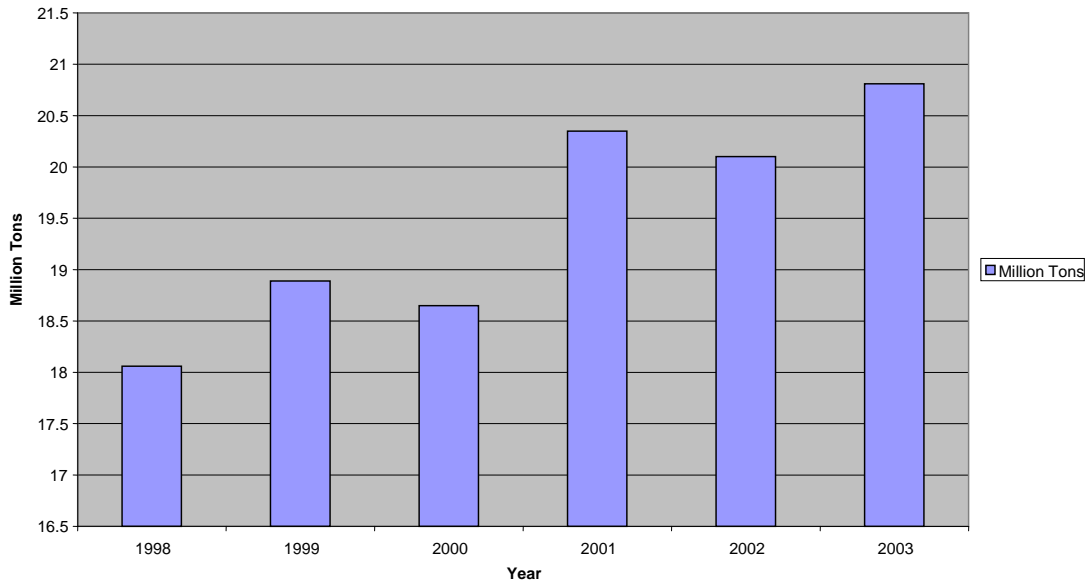
³⁹ European Commission – Study/C.1/101/2002. Advice on impact of Reduction in sulphur content of marine fuels marketed in the EU

⁴⁰ Singapore Economic Development Board 2004

⁴¹ Welcome address by the Singapore Minister of State Finance & Transport, Mrs Lim Hwee Hua, at the 14th Singapore International Bunkering Conference 27th September 2006

⁴² IBIA port report on Gibraltar

Figure 2.2 Singapore Bunker sales



Source: Singapore Economic Development Board, Feb 2004

2.3 Gibraltar.

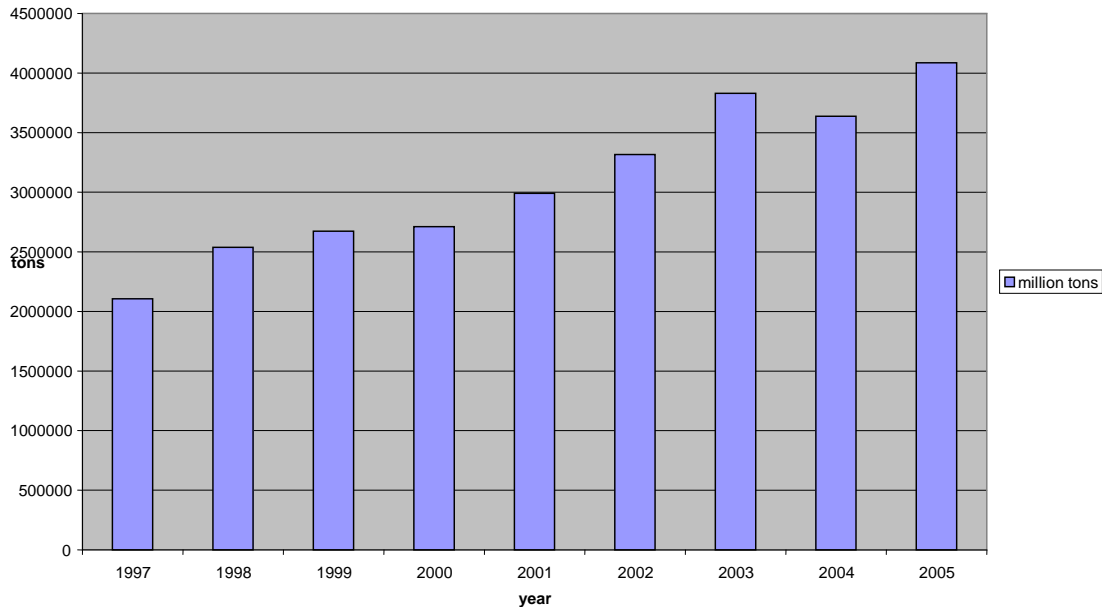
The Government of Gibraltar stepped in to promote the port as a bunker port and whilst the initial success was based on gaining bunker business away from Spanish ports, the growth has more to do with the proactive input of all the role players. The Minister for Trade, Joe Holliday, states in an interview with Gibraltar Shipping Show case, 2005, that whilst part of their success is related to their geographical position, it has more to do with their reputation for efficient service, high quality and competitively priced bunkers, as well as the implementation of the Bunkering Code of Practice.⁴³

One of the attractions of the port's position is that vessels do not need to deviate from their course in order to obtain bunker services. The fact that bunkers can be

⁴³ Interview of the Minister of Trade, Joe Holiday with the Gibraltar Shipping Showcase June 2006

taken by barge at anchorage is also an asset. The bunker business at this port has grown from 1617 ships in 1991 to 5367 bunker callers in 2005.⁴⁴

Fig 2.3 Gibraltar Annual Bunker sales



Source: Gibraltar Port Authority

The above graph reflects an increase of 94% in bunkers sold over a period where sales in South Africa have shown a 25% decline (figure 1.2). Gibraltar is not seen as a competitor to South Africa in the supply of bunkers, but is used as an example due to the fact that it too, is strategically positioned. Admittedly with over 80000 ships sailing through the Western Entrance to the Mediterranean it has a far larger target market⁴⁵, but it also has more competitors for bunkers than South Africa, in that ships calling there have the option of bunkering Singapore, Colombo, Aden, Port Said, Rotterdam and numerous other ports, both in the

⁴⁴ IBIA port report on Gibraltar, with a cross check using the European Commission – Study/C.1/101/2002. Advice on impact of Reduction in sulphur content of marine fuels marketed in the EU

⁴⁵ European Commission – Study/C.1/101/2002. Advice on impact of Reduction in sulphur content of marine fuels marketed in the EU

Mediterranean and the European coast. Yet despite this, it is showing a healthy industry that is growing both in number of ships and tonnage sold⁴⁶.

2.4 Argentina

Research of the ships calling at Durban for bunkers⁴⁷ shows that a large portion of these ships are either on their way from or on their way to ports in Argentina. The option is always there for the owner to load sufficient bunkers at Singapore for refueling in Argentina and there again taking sufficient so that there is no need for the ship to stop here on its way East. Research figures show that this does not always happen, with there being a fairly large quantity of these ships calling at Durban. Knowledge of the bunker market there is needed in order to ascertain the reasons for this and hopefully capitalize on it.

The IBIA port report on Argentina states that ninety percent of the bunker trade is based around the ports on the Parana River, Rosario, San Lorenzo, and Buenos Aires. Bahia Blanca, which is to the South of Buenos Aires, is also an active load port and offers bunker facilities. It caters for 20% of the country's bunker business with the ports on the Parana River accounting for the other 80%. The country handles in the region of 650000mt of bunkers per annum. The bunker market is a free market with the majority of the fixtures being spot⁴⁸. The price is based on the WTI crude index and the fuel prices in the US Gulf. Prices quoted are higher than South Africa which links its price to the Singapore price.⁴⁹

According to the IBIA report the market is not growing and recent crisis with the economy and the bunker market have not helped with building the reputation for

⁴⁶ Gibraltar Port Authority figures

⁴⁷ NPA SAFREP statistics over the period August to November 2005.

⁴⁸ IBIA Port Report on Argentinean Ports and bunkers

⁴⁹ Regular presentation of bunker prices by publications such as Fairplay and Cockett Marine bunker Market Report for example Sept 7 2005 which reflects a difference in MFO of \$10.00 per ton

reliable supply, despite the good quality of the bunker fuel available. The IBIA report goes on to advise there are also a number of additional charges to be added to the price such as the boom charge of \$650 and Customs expenses of \$300 - \$350 which is added at all ports. For the purposes of this research it is important to note that ships calling at the South American ports are doing so for the purpose of loading or discharging cargo, they are not utilizing the port for a bunker call.⁵⁰

2.5 Durban bunker market

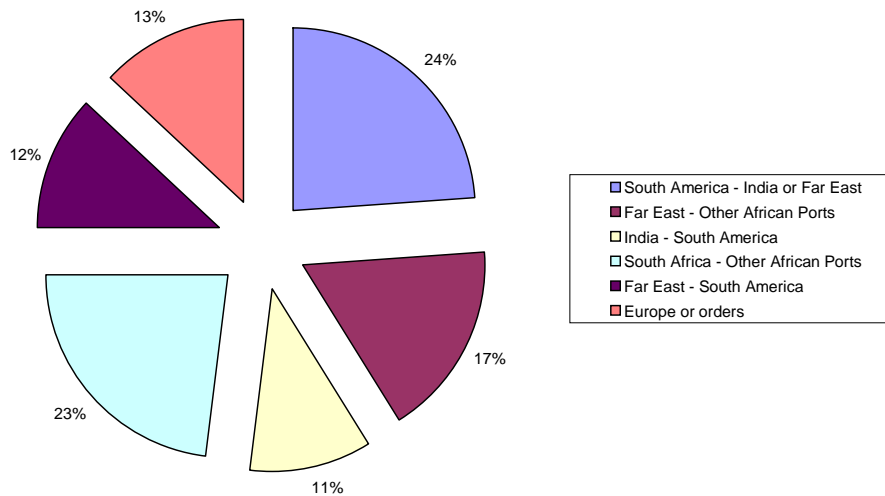
The figures and number of ships that call at Durban has already been discussed in Chapter 1, but a breakdown of the routing will serve to identify on which trade routes our main bunker business comes from. A robust sample of vessels calling at Durban for the purpose of taking bunkers was obtained using the SAFREP Reports from August to November 2005. These reports are issued on a regular basis by the National Port Authority.(Appendix 2) They give the last port, next port, arrival time, departure time and the gross tonnage for every vessel that arrives or departs that day. This was then linked with the daily port list (Appendix 3) to ascertain how many of these ships were in fact bunker callers and as a further check the time in port and the berth utilized were used to confirm that they were in fact only here for bunkers. A total of a 136 bunker ships were identified from these lists

It was established that 24% of these ships were on their way from South American ports through to either India or the Far East. A further 17% were on their way from the Far East going to other African ports, whilst trade from India to South America accounted for 11%. African ports featured prominently with 23% of the ships either having come from an African port or looking to call at another African Port after leaving Durban (this excludes other South African Ports). The

⁵⁰ NPA SAFREP statistics for the period from August to November 2005

return trade to South America was low at only 12% This would suggest that these ships are returning in ballast from the Far East and are therefore taking full bunkers in Singapore to reduce the cost of the ballast voyage. There was a percentage of ships where it was not possible to identify the next port of call as it was stated as orders and these have been grouped in with the Europe callers as the percentage is small and not of significance in the overall analysis of bunker ship.

Figure 2.4 Routing of Bunker Ships



2.6 SWOT analysis of Durban

In order to ascertain why bunker business comes to Durban or why it does not, it is necessary to look at what the port offers to customers and what are the weaknesses of the port in supplying the service.

From this it will be possible to ascertain some of the opportunities and threats that are available or are posed to the port. This is important as the Platts-Gregory procedure will be used to ascertain the current market position of the industry.

The Platts-Gregory procedure has three phases. It firstly looks to identify the threats and opportunities of the market, what the market wants and how the present operation functions. The second phase is to look at how the existing operation is working and finally to identify what needs to be done in order to improve the service being offered to the customer.

2.6.1 Strengths

- Geographical position: The port is ideally situated to cater for trade coming from the Far East and India through to Africa and South America. Trade from West Africa through to the Far East and up to the Middle East. Similarly ships loading in South America for the Far East and India can make use of Durban for bunkering. The distance from Bahia Blanca to Durban at 4540 nautical miles is approximately midway between the load ports and Singapore, a further 4843 nautical miles, thereby allowing ships to maximize cargo intake.
- Durban is the home to two of the countries biggest refineries, SAPREF refines on behalf of BP and Shell and is responsible for 35% of the country's refining capacity and Engen which refines a further 30%.⁵¹The bunker fuel produced is of a good quality and there are seldom disputes as to the quantity supplied⁵²
- The bunker industry complies with the IMO Marpol Annex VI and all other International safety and quality standards. Of significance here is that the

⁵¹ Creamer Media publishers of Engineering News 12/09/03

⁵² On going communications with owners and SAPREF reveal that the disputes as to quality are minimal and where there are problems these are quickly resolved. This was evidenced in October 2006 when off spec IFO was supplied and SAPREF immediately contacted all affected parties to resolve the problem.

South African Government has still to become a signatory of the is agreement⁵³

- Safe harbour with highly trained pilots, powerful tugs and secure quays
- Safe anchorage with no danger of pirate attacks. Vessel Tracking System (VTS) also assists in advising the ship should they be in danger of dragging the anchor or coming too close to other vessels.
- High standard of agency service is offered.⁵⁴ The communications systems and infrastructure available allows owners, charterers and ships masters to know what the current situation is with regard to the port call on a 24 hour 7 days a week basis
- High quality auxiliary services from ship chandlers, ship repair industry, electronic technicians, laundry, ships spares delivery, hotels and transportation for on signing and off sign crew and easy arrangement for the delivery of cash to master makes the port an ideal stop over for owners who require prompt services in the short duration that a bunker call usually is.

2.6.2 Weaknesses

A survey was conducted by IBIA South Africa in June 2006, (Appendix 1) initially among their membership to ascertain a list of the factors they felt had caused the shrinkage of the bunker business in South Africa. There were 16 factors identified and a survey was sent out to the greater shipping community to ascertain the top 10 factors industry felt were the chief problem areas. The response to this survey were received both verbally and in writing with the following percentages make up of those replying

Ships agents 46%

Bunker Traders 33%

⁵³ Dag Olav Halle of DNV Petroleum Services in his report on Marpol Annex VI Implementation of the 19 July 2005

⁵⁴ Marketing report feedback received by South African ships agencies on their travels throughout the world.

Barge owners 7%

Ship owners 7%

Oil Majors 7%

The survey scores were derived by taking the top four reasons given by each participant and weighting these with a reverse value from 4 to 1 and then adding up the accumulative scores to obtain the top ten reasons. These are listed below but where the area overlaps or could be considered as the same root cause, for example poor service levels in port, bunker callers not a priority for the NPA and lack of competent pilots, they are seen to be related items and consequently grouped together.

- High port costs. A cost comparison for an 18000GRT ship calling at Singapore, Gibraltar and Durban gives the following port costs. Singapore US\$2000; Gibraltar US\$1821; Durban US\$11723. These figures were supplied by ISS Ships Agents at the respective ports, with the exchange rate being taken as R14.00 to the Pound and R7.30 to the US Dollar, which prevailed at the time of the inquiry. Part of the reason for the large discrepancy is due to the other ports being able to supply bunkers at the outer anchorage and therefore not requiring the service of tugs.
- Unreliable product supply. The port suffers from a feast or famine scenario with bunkers not being readily available on too regular a basis. Figures supplied by Engen reflect that so far in 2006 the port has not been able to offer spot fuel oil for 30 days and spot distillates on 10 days. Figures taken back to 2002 reflect that there has been no availability of spot MFO or distillates on 113 days or 11% of this period⁵⁵.
- Poor service levels from the port. The contention is that there are regular delays in obtaining pilot service. Coupled with this is the perception that

⁵⁵ Figures of daily price and availability of bunkers as provided by Engen over this period reflect those days when either MFO or distillates have not been offered to the market. The reasoning being given as not available.

bunker callers are not a priority for the NPA and that the port lacks sufficient competent pilots

- Oil Majors do not perceive bunkers as a priority. It has been regularly stated by all of the representatives of the oil majors at the various bunker discussion forums that their business is white fuels and that bunker fuel is of less value than the crude oil from which it is derived. The general lack of communication from the Majors and SAPREF when there is a shortage of bunker product also bears testimony to this fact⁵⁶
- Poor service from the oil majors: this is both from the bunker brokers point of view in trying to obtain product and from the ship's agency point of view when bunkers are fixed directly with an oil major. It is a common occurrence for the oil major to delay advising bunker control of the stem,⁵⁷ which in turn makes it difficult for the agent to obtain priority for his ship.
- Expensive MFO, MDO and MGO prices. Durban supplies only 180cst fuel. It is priced low, but it does not match the price of Singapore or Rotterdam 380cst⁵⁸. Our distillate prices are not competitive with Singapore or Rotterdam's pricing and we are regularly in excess of \$40 per ton more expensive.⁵⁹
- Port restrictions. The port has a maximum draft at the entrance of 11.9 meters and whilst it is possible to enter on a slightly higher draft if tidal conditions permit, this is not ideal⁶⁰. There is also a limit to the length and width of the ships that the port is able to accommodate, this presently stands at 244 meters in length and 35 meters beam. Again

⁵⁶ Various written communications from ASABOSA members to the organisation's secretary and the bunker champion for Durban are evidence of this fact. Communications are circulated by the organisation to the members and are available on request

⁵⁷ ISS – Voigt ship file records of this problem on ships where the major has stemmed direct

⁵⁸ Daily market prices as published by Fairplay and Bunker World give the cost of bunkers at Fujairah, Houston, Rotterdam and Singapore. Durban prices as supplied by OW Bunkers and Cockett Marine are compared to these.

⁵⁹ OW Bunkers & Cockett Marine daily bunker prices record our costs and those of Rotterdam and Singapore

⁶⁰ Harbour Master requires any ship seeking to enter on a rising tide to sign an indemnity which can be contrary to the owners hull insurance conditions. Confirmed in communication received from owners of the MT Maersk Pearl

there is some leeway on this which is dependent on the actual ship, the pilot on duty and the prevailing weather conditions. There is a further restriction on night time berthing and sailing with the port not servicing ships in excess of 200 meters in length if they are not regular port callers. This is a safety matter and the final say rests with the duty pilot. Deeper ships transversing our oceans are unable to take advantage of Durban for bunkers as a result of these restrictions. The drive for economies of scale⁶¹ and building longer, wider and deeper ships means that this will happen more often.

In addition to the above weaknesses identified by the IBIA survey, the following factors are also of great relevance.

- Slow pumping rate via shore pipeline. One pipeline serves the Island View and New Pier berths and if there are a number of ships all using the bunker line then the rate at which bunkers can be pumped slows. The average pump rate is around 150mt/hour⁶². Ships Masters' in order to get a longer time in port have been known to request slower rates on the pretext of safety with a requested rate of 100mt/hour being a regular occurrence⁶³.
- Too few barges and control over the type of barge used lies with the Majors. The development of the D to G berths for multipurpose cargoes, the changing of New Pier 1 to containers, the new cable protectors, as well as safety requirements at New Pier 2 and the developments at Island View which have made these berths a premium and not readily available for bunker ships, has meant that more and more of the port requires bunkering by barge⁶⁴. The Majors dictate which barges are acceptable on the basis that if they do not accept the barge then responsibility for quality of the product changes ownership at the shore

⁶¹ Dr. Jean-Paul Rodrigue, Dept. of Economics & Geography, Hofstra University.

⁶² SAPREF Bunker Control figures as advised by Wendi Landi, SAPREF Bunker Manager

⁶³ Pumping rate requested by ships calling under the ISS-Voigt Agency over a protracted period of time

⁶⁴ SAPREF Wendi Landi communication to ASABOSA 12 October 2006

manifold. On approved barges the shore pipeline risk changes hands at the ship's manifold. This makes using barges not approved by the Majors unattractive to owners, as in the event of any quality complaints that they may have they must first act against the barge company and they in turn will try to claim against the Majors. The Majors are also insisting on double hulled barges from 2008 to meet with IMO requirements, despite SAMSA's permission for existing barges to continue operating on the basis that the port is considered an inland waterway.⁶⁵

- Limited storage capacity for bunker product allows international players to influence the market by waiting for the storage to reach near capacity in anticipation of a drop in price from the majors⁶⁶. The majors in turn need to move the product, as lack of storage will result in them not being able to continue refining and so they look for export opportunities. This then leads to a shortage of product on the local spot market as owners try to obtain bunkers which are now in limited availability. SAPREF exports approximately 20% of their bunker fuel⁶⁷. Engen however tries to sell all of its bunker fuel to bunker callers at Durban and Richards Bay.⁶⁸
- Marpol Annex VI Recommendations due out in 2007 are expected to call for a further reduction in the sulphur content of bunker fuel. Our present import of crude is mainly from the Arabian Gulf. This has a higher level of sulphur than bunker fuels presently supplied in South America and Singapore. It does however have the advantage of producing more bunker fuel than what would be obtainable from lower sulphur content fuel such as Bonny Light or Angolan crude⁶⁹

⁶⁵. Captain R Zanders of SAMSA comments at the ASABOSA Industry bunker meeting October 2005

⁶⁶ A Dallas of Shell comments at the bunker forum meeting 14 August 2006

⁶⁷ Confirmed by A Dallas, Shell representative at the bunker forum meeting 14 August 2006

⁶⁸ Confirmed by F Kotze, Engen representative at the bunker forum meeting June 2006

⁶⁹ Comments made by the representatives of the majors at the 12 October 2006 bunker forum meeting

2.6.3 Opportunities

- Increase in world fuel consumption means more bunkers produced⁷⁰
- World bunker consumption is increasing at a rate of 2% per annum and this trend is expected to continue⁷¹.
- Durban was rated as the 13th biggest bunker port in the world in 2001⁷² and whilst it has not seen the growth that ports ranked around it have seen, i.e. Gibraltar, there is still potential for growth if one looks at the fact that Africa currently only accounts for 6% of the world bunker trade⁷³. The World Bank has predicted continued growth for Africa, with the exception of Zimbabwe. Nedbank Guide to the Economy 7 September 2006 suggests real growth levels for 2007 & 2008 at levels in excess of 3.8%. If this growth materialises then there will be a further demand for shipping and opportunity to supply bunkers.
- IMO regulations⁷⁴ stating that by 2008 double hull barges must be in place is an opportunity for the port to be provided with barges with increased carrying capacity and quicker pumping rates⁷⁵.
- Government's considered intervention to ensure a greater participation of BEE companies in the mineral and energy field⁷⁶, coupled with the potential to provide independent storage facilities could assist in negating the current need by SAPREF to export approximately 20% of their MFO and thereby reduce the feast or famine effect.

⁷⁰ European Commission – Study/C.1/101/2002. Advice on impact of Reduction in sulphur content of marine fuels marketed in the EU

⁷¹ European Commission – Study/C.1/101/2002. Advice on impact of Reduction in sulphur content of marine fuels marketed in the EU

⁷² European Commission – Study/C.1/101/2002. Advice on impact of Reduction in sulphur content of marine fuels marketed in the EU

⁷³ Bunker World February 2006. Challenges and opportunities in the African market

⁷⁴ Marpol Annexure VI

⁷⁵ This is borne out by the fact that both Grindrods and Smit Amandla are now in the process of building new barges with pumping capacity of 1000mt an hour

⁷⁶ Michael Hamlyn Business Report August 30 2006 comments attributed to former minerals and energy minister, now Deputy President Phumzile Mlambo-Ngcuka at the parliamentary hearing held on the 29th August 2006

- Department of Mineral and Energy has acknowledged the need for another refinery to be setup in the country⁷⁷. If this is a crude oil to petroleum refinery, then this will increase the amount of bunker product that we have and should level out the feast or famine affect that we currently experience
- Completion of the 200000 barrel a day refinery in Luanda in 2007/8⁷⁸ Luanda is far closer to us than the ports of the Arabian Gulf and has low sulphur crude, 0.12 – 0.14%. 80% of the product will be exported on a regional basis so there is an opportunity for private enterprise to import bunker fuel from Luanda for resale here. In the past the cost of importing bunkers has been expensive due to the distances involved. Luanda is only 2395 nautical miles from Durban and is even closer to Cape Town.

2.6.4 Threats

- Marpol Annex VI calls for a reduction of sulphur levels in ship's fuel oil. According to Chevron Cape Town a typical analysis of MFO 180cst shows a sulphur content of 3.27%wt.(Appendix 4) This is below the present limit of 4.5%, however at the fifty third session of the Marine Environmental Protection Committee they agreed to undertake a review of the current Annex VI regulations to further reduce emissions from ships. This review should be completed by 2007 and whilst there are various options open to both ships and refineries to reduce these emissions, it is important to remember that bunker fuel represents the bottom of the barrel for refineries. For the refineries the desulphurization of heavy fuel oil will require substantial investment which could rather be used for a complete conversion of refining so that they produce very little fuel oil.⁷⁹

⁷⁷ Michael Hamlyn Business Report August 30 2006 comments attributed to the Minister of Minerals and Energy Buyelwa Sonjica

⁷⁸ Felicity Hagel. 17/1/03 Oil & Gas in Angola – Industry Canada Stat-USA market research report

⁷⁹ IMO Review of Marpol Annex VI and the NOx Technical Code

- Increased refining capacity at Singapore, Sri Lanka, Fujairah as well as other Far East ports⁸⁰. Bunker fuel oil is the bottom of the barrel but for refineries it is vital that they are able to dispose of this product if they are to continue with the refining process⁸¹. The option of selling it as ships' bunker is economically viable and is in fact being actively done by numerous ports around the world⁸². The danger to South Africa is that as refining capacity increases close to these ports, the price of our bunker fuel will not be able to stay competitive and we will see further declines in our market. This in turn will lead to the need to export larger quantities of bunker fuel, further impacting on the feast or famine scenario.
- Poor turn around times of ships will make the port unattractive to ship owners who will avoid calling for bunkers unless they are loading cargo at the port
- 380cst fuel. The trend with new ships is for them to burn 380cst fuel which is cheaper than 180cst⁸³. It has very similar qualities to the 180cst with the exception that it has a higher viscosity and has a higher carbon and vanadium content. Durban's refineries are not setup to handle this product and the cost factors presently make it unattractive to the majors⁸⁴

2.6.5 Summation of our SWOT

The ports of Singapore, Rotterdam, Gibraltar and the Canary Islands all advertise the fact that they are world class bunker ports and South Africa also needs to adopt an aggressive marketing strategy to promote our ports as world class bunker ports. In order to do so we need to focus on our strengths and negate our weaknesses. First and foremost we must have a reliable supply of bunkers

⁸⁰ European Commission – Study/C.1/101/2002. Advice on impact of Reduction in sulphur content of marine fuels marketed in the EU

⁸¹ F Kotze Engen representative at bunker meeting held in Cape Town February 2006

⁸² Figures 2.2.and 2.3 reflect the growth achieved at both Singapore & Gibraltar and the marketing correspondence issued by the two port authorities bears evidence of this fact.

⁸³ Daily bunker price reports such as those issued by OW Bunkers and other traders reflect the cost of 180cst and 380cst and show a clear differential in price

⁸⁴ Captain G Franklin SAPREF representative comments at the bunker forum meeting October 2005

available all year around. The next important factor is to reduce our costs and the length of time the ship spends at Durban obtaining her bunkers. This includes the time spent at anchorage, wasted waiting for the bunker pipes to be connected or the paperwork on completion to be signed off. Once the port is able to offer a reliable source of bunkers and to deliver these in a cost effective manner, then the advantages of our identified strengths can be marketed to the world

2.7 Supply Chain Management

The process of procuring and supplying bunkers to a ship can be viewed as a supply chain operation⁸⁵. Pycraft indicates that because the supply chain management involves the total flow of materials and information, it must take into consideration the end customer. In the bunker industry the end customer is the ship owner and it is the owner who is responsible for triggering the whole supply chain. Without his buy in there is no market, therefore no supply chain, no value being added and no possibility of any participant in the supply chain gaining any revenue.

There is a need to take the whole supply chain and analyze it in its entirety to identify where bottle necks are so that the time delays to the operation can be reduced or eliminated. If this is done then the overall time that the operation requires can be shortened. This in turn will allow the industry to be more competitive

Research by Jay Forrester⁸⁶ in the 1960's demonstrated that there are certain dynamics that exist between the various firms in the supply chain and that these can result in errors and inaccuracies which will affect the overall efficiency of the operation. This is known as the Forrester effect and it is not only caused by errors and distortion but also because each different party in the supply chain is

⁸⁵ Pycraft, et al. 2003 Operations Management

⁸⁶ Pycraft et Al 2003 Operations Management

trying to manage their specific operation as cost effective and rationally as possible.

The relationships between the various parties that make up any supply chain are different and it is these varying relationships that affect the operation and the dynamics between the various parties. An understanding of the different possible relationships needs to be gained so as to then place each party within the bunker supply chain in perspective to the other players

- Integrated hierarchy – a fully vertically integrated company that is responsible for the entire supply chain operation from raw material to dispatch of final product. An example would be a farmer who breeds the sheep, shears them for their wool, knits the jerseys from the wool which he then sells in his farm stall to the customer.
- Semi-hierarchy – the companies in the supply chain are all owned by the same holding company but run themselves as separate entities. The important distinction between these two forms of vertical integration⁸⁷ is that the latter allows for an exchange process between different companies
- Co-contracting – this describes a relationship between organisations that have long term relationships but do not merge. They tend to have transfer of equity, technology and people, which in turn leads to a reduction in freedom of action, but improves their ties with the other company and so reduces the Forrester effect.
- Coordinated contracting – this relationship consists of a prime or lead contractor who then sub-contracts other parties into the operation. There is an interchange of equipment, goods, specifications, planning and control, and payment.

⁸⁷ Pycraft et Al 2003 Operations Management

- Coordinated revenue links – this is geared towards licensing and franchising and there is an exchange of financial agreement, performance monitoring, logistics and capacity.
- Medium and long term trading commitment. This is where companies have traded with one another for long periods of time with no formal contract binding them together. The main exchanges in this type of relationship are design, performance, capacity commitment and blanket orders.
- Short-term trading commitment – this is in situations where there is only commitment to the current order with the one party ordering the service and the other supplying. These relationships tend to be based on most competitive price offered for a one off service.⁸⁸

2.8 Strategy

If a solution to the problem is to be found then there is a need to develop a strategy that will best develop any proposed solution. The Sweeney generic strategies described in Pycraft's Operations Management, suggests the current strategy being adopted by some of the role players and where they need to move to in terms of strategy development, if there is to be an improvement in customer service from the bunker operation.

The four listed generic strategies are described as follows

- The Caretaker strategy: often employed by organisations who believe, rightly or wrongly that they have little or no competitors in their particular market. The focus is on the operation working efficiently and reliably but with no input in terms of investment or change.
- The Marketer strategy: this is adopted by companies who experience an increase in competition and respond to this increase by improving or extending their level of service to their customers. In the bunker industry

⁸⁸ Pycraft et Al 2003 Operations Management

this could be by improving quality levels and increasing service levels. The essence of this strategy is that there are no fundamental changes, but the operation is expected to adapt through improved planning and control, developing better work place practices and quality management systems.

- The reorganizer strategy: this requires a change in the way things are done by investing in new technology and new methods of doing the work. Pycraft suggests that this leads to enhanced flexibility, which in turn allows for a quick response to changes in marketing strategy.
- The innovator Strategy: this is a combination of the marketer and the reorganizer strategy. It requires a high degree of integration between product, operations and marketing and if achieved it means that the operation is able to give high levels of customer service.

2.9 Conclusion

In chapter three the individual relationships between all the parties who make up the bunker supply chain will be analysed on the basis of the above types of relationships to identify possibilities to change these relationships in order to improve the supply chain.

The aim is to look at the relationships, then the strategies of each party as they currently are and to see that if by using the Platt-Gregory procedure it is not possible to develop a more proactive strategy and if so what would be needed to achieve the goal.

The recorded delay times as obtained from ISS-Voigt and John T Rennie's for bunker ships calling at Durban (Appendix 5) provide an excellent base for reviewing the current operation will be related back to the identified party in the supply chain. It is hoped that by suggesting changes in the relationships between the parties in the supply chain that it will be possible to reduce the delays and improve overall efficiencies.

Chapter 3

3.1 Introduction

Fuel oil was first used to propel ships in the 1850s⁸⁹. In the early 1900's liquid fuel was seen as a way of enhancing speed and operating flexibility and with the advent of World War 1 there was a substantial increase in the use of fuel oil at sea. (This was due to the efforts of Winston Churchill, Admiral Jackie Fisher of the Royal Navy and Marcus Samuel of Shell). In the 1920's 70% of ships still relied on coal, but this gradually decreased with more and more vessels using steam turbine and diesel propulsion engines. The oil crisis in the 1970's saw a decline in bunker demand and also an improvement in the operating efficiencies of marine engines. This trend has continued through to today with there being a strong focus on improvements to ships technology, not just with respect to the engines but also on how to reduce water resistance using antifouling paints and polishing propellers. There has also been a strong drive towards environmental considerations with sulphur reduction being just one of the factors under consideration. World bunker sales are now back at the levels they were prior to 1973. This is mainly due to an increase in world trade, as ships now burn far less fuel than they did in the past.⁹⁰

The Jones Report commissioned by ASABOSA, states that Durban in the late 19th and early 20th century, with her ideal geographical position and the availability of coal from the Northern Kwa-Zulu Natal area, was able to take advantage of the east west trade routes and offer bunker facilities for ships passing. This was further developed with the superseding of coal by fuel and the Suez crisis of 1956-57 and 1967-1975 which were boom times for the port with respect to bunker callers. The fact that there are two of the countries largest

⁸⁹ European Commission – Study/C.1/101/2002. Advice on impact of Reduction in sulphur content of marine fuels marketed in the EU

⁹⁰ European Commission – Study/C.1/101/2002. Advice on impact of Reduction in sulphur content of marine fuels marketed in the EU

refineries in Durban has also allowed the port to continue to develop as a bunker port.

The refining of crude oil into useful products results in there being a residue product that cannot be easily absorbed into the local industry, but which is ideally suited for use as ships bunkers⁹¹. The trade in ship bunkers offers the oil majors a ready and profitable vent for what is essentially considered by them to be a waste product.

3.2 Bunker Market Determinants.

What trade a ship will embark on and what the major trade routes are is determined by market forces. Factors that affect the volume of sea trade on any given trade routes are varied, but with the change in world trade so too is there a change in world bunkers, the volume used and the ports where they are stemmed. The following factors are those which have a bearing on bunkers volumes consumed and these all can have a positive or a negative impact on the bunker consumption.⁹²

- Changes in volume of sea trade in terms of tons per nautical mile
- Growth of world shipping tonnage, the changes in the size of ships built.
- The scrapping of older ships

3.3 Bunker Supply Chain relationships.

In Chapter two we established that the supply chain is dependent upon the ship owner who is responsible for triggering the whole process; if he does not opt to

⁹¹ Jones T 2005 The Provision of Services to Bunker Callers in the Port of Durban – A Survey of the Economic Impact on the Durban Metropolitan Economy

⁹² European Commission – Study/C.1/101/2002. Advice on impact of Reduction in sulphur content of marine fuels marketed in the EU European Commission – Study/C.1/101/2002. Advice on impact of Reduction in sulphur content of marine fuels marketed in the EU

buy bunkers at Durban then the whole supply chain lies dormant. The relationship that the owner has with each party in the supply chain needs to be identified and in order to do this it is necessary to also explain the function of each link of the supply chain.

- Owner - bunker broker. This is usually the first link in the supply chain. The owner decides he needs to bunker at a specific port and he contacts a broker to find out the cost of bunkers and their availability. ⁹³This relationship can either be integrated-hierarchy if the company is big enough to feel it benefits from an in house brokerage; semi-hierarchy where the holding company is involved in shipping and feels that having a company within the group that specializes in bunker brokering would be beneficial; medium-/ long-term trading commitment where the ship owner has dealt with an independent broker for a long time; or short-term trading contract where the owner advertises on the spot market that he is looking for a bunker stem and he takes the stem from the party offering the most competitive rate.
- Owner- Agent. Having decided to bunker at a port the owner must now find an agent to attend to his ship's call and coordinate the bunker operations. The function of the agent in the operation is vital as he is the owners representative and acts as the owner in absentia throughout the operation⁹⁴. The relationship with the Agent is similar to that with the bunker broker, i.e. integrated-hierarchy, semi-integrated hierarchy, medium-/long-term trading commitment or short-term trading commitment
- Owner- Port Authority. In South Africa the port authority is the NPA and the owner on deciding to bunker at a South African port enters into a contract with the NPA who are then responsible for providing a safe berth and prompt service to the owner's ship. This relationship in the supply chain is usually done through the agent who in fact enters into the contract

⁹³ Standard practice as confirmed by bunker brokers working in the South African market

⁹⁴ Tutorship Port Agency, functions and responsibilities of an agent

on behalf of the owner as soon as he nominates the ship to the NPA and asks for service to bring the ship into the harbour. The owner's relationship with the NPA is either a medium-/long-term trading relationship, if the ship is on a liner service that calls at the port regularly or a short-term trading commitment if he is operating a tramp service and the ship just happens to be passing this way. The agent's relationship with the port is a long-term trading relationship as the NPA have the monopoly on the port services and there is no other party that the agent can enter into negotiations with for the services the NPA offer.⁹⁵

- Owner-Majors. The owner does not have a relationship with the particular major the bunker broker has procured the bunker stem from, unless he has decided to deal directly with the Majors in-ouse bunker broker. In most cases the bunker broker is the party who has the contract with the major. If the owner is of the opinion that the major has not performed he needs to take this up with his broker who in turn will take the issue up with the majors⁹⁶.
- Owners-SAPREF & owners – bunker barge. SAPREF bunker control is responsible for the delivery of the bunkers to the ship either by shore pipeline or by supplying the product to the barge. They are also responsible for the stock of bunkers kept at site 3 in Island View. Again the owner does not have a direct relationship with SAPREF bunker control, but is contracted to them via the bunker broker. Any failure by SAPREF bunker control to perform efficiently is a breach of the contract that the owner has entered into when he agreed to buy bunkers at the port. The relationship here with SAPREF bunker control is either one of medium -/ long -term trading commitment or short-term trading commitment

The above relationships would suggest that the owners' relationship with each party in the supply chain is disjointed and that the supply chain is not a seamless

⁹⁵ NPA Harbour Regulations

⁹⁶ Communication received from bunker Control after the supply of off spec bunkers to ships in October 2006

operation. The best way to describe the supply chain relationships would be coordinated contracting. The relationships between the other parties in the supply chain suggest that this is a problem as there is no clear flow or continuity in the relationships.

- Agent – Bunker broker. Unless there is an integrated or semi-hierarchy relationship between the parties then there is no formal relationship or obligation between these two parties. The broker will let the agent know he is placing the stem with SAPREF and the agent will chase the broker to ensure that this is done. There is no other communication on the operation with each party working in isolation
- Agent - Major. If the major is not acting as the broker then there is no relationship formal or otherwise between these two parties
- NPA – Major, Broker, or Sapref. The NPA has a relationship with the owner through the agent. They do have contractual relations with SAPREF on the use of land and facilities which enable them to supply bunkers to ships as well as other operational functions. There is however not any relationship within the supply chain operation that would assist in speeding up the process of bringing the ship in, bunkering her and sailing her. The NPA depends on the agent to update them as to when their services will be required and the berth vacated⁹⁷.

The above relationships between the various parties in the supply chain suggests that they are disjointed with no clear contractual responsibilities between the parties and no one party being ultimately responsible to the ship owner for the overall operation. Instead the owner is seen as the prime contractor when they should in fact only be seen as the customer.

⁹⁷ This is standard port operating procedure as laid out by the port regulations.

3.4 Bunkering Decision

Owners and charterers on working out voyage calculations and where to take bunkers will take into consideration the quality and availability of bunkers at the various ports along the planned voyage⁹⁸. Thereafter the decision on where and how much to bunker can be broken down into three options

- Bunker at load port for a round trip; this decreases cargo intake
- Bunker at load port to reach discharge port; maximize cargo intake
- Bunker at intermediate point of voyage; lengthening the overall voyage in terms of distance and time

3.5 Ships Routing

In order to establish where the majority of our bunker callers are coming from and going to, as well as the size of these ships, a breakdown of the ships over a three month period was taken and the following criteria was extrapolated

An overall sample of 136 ships (Appendix 2) was identified as bunker callers from the NPA SAFREP lists. These were then split into groups according to their gross registered tonnage (GRT). The reason for this is that the GRT is the basis used by the NPA to calculate their revenue from a port caller⁹⁹.

1. 0 – 5000mt. Five ships in this range called of which three had either come from or were going to another African port
2. 5001 – 10000mt. There were 18 ships in the gross tonnage range with a total of 8 of these either coming from or going to a South American port

⁹⁸ Standard operating practices as confirmed by ship operating companies Atlas Trading and Shipping and Island View Shipping

⁹⁹ NPA Harbour Tariff issued annually on the 1st April

3. 10001 -15000mt. 17 ships reflected in this range but only 3 of these had a South American port in their routing
4. 15001 – 20000mt. This is the biggest category of callers by far at 43 ships of which 21 had either started or expected to complete their voyage at a South American port.
5. 20001 – 25000mt. The second biggest category of callers with most of these ships either being Handy, handymax or Panamax in size. Again we see that a sizeable proportion of these are routed to or from South America, 9 in total.
6. 25001 – 30000mt. There is sixteen ships in this group with five of them falling into the South American callers. Of interest is that over a quarter of them had stated orders as their next port of call.
7. 30001mt and over. There were a total of 13 ships in this range, none of which were looking to call or had called at a South American port.

3.6 Voyage costs basis Durban bunker option

Port calls of ships in the 15000- 20000mt reflect the biggest volume of trade, either coming from South America or going back to there. If the average gross tonnage for the ships that called in that range is taken it works out to be 16442mt. From this the port costs for a bunker call at Durban can be calculated and the daily hire costs for a ship of this size can be obtained from the various publications around that show the charter rates for all sizes of ships. For the purposes of this calculation we have used the present daily hire rate of \$17000.00, which is indicated as the average price by L Dens Shipbrokers 12 September 2006 Market Comment.

If we are to maintain the exchange rate of R7.00 to the USD as suggested earlier, when making a comparison of costs then the additional cost to be added to the bunker call of 12 hours would be R59472.00

| | |
|--------------------------|------------|
| Daily Hire | \$17000.00 |
| Hire per hour (17000/24) | = \$708.00 |
| 12 hour hire | =\$8496.00 |
| Exchange rate of R7.00 | =R59472.00 |

Durban Port costs basis using the 2006 NPA published tariff and calculating the port costs on a maximum of 12 hours in port . This allows for the maximum discount of 65% on the port dues. Figures have been rounded up.

| Table 3.1 Port costs basis GRT 16442mt | |
|---|-------------|
| SERVICE | RANDS |
| Port Dues | R 4,831.00 |
| Light Dues | R 7,318.00 |
| SAMSA Levy | R 3,453.00 |
| VTS Charge | R 4,275.00 |
| Pilot Service | R 15,172.00 |
| Tugs | R 33,655.00 |
| Berthing staff | R 3,826.00 |
| Running lines | R 1,253.00 |
| Fire watch | R 1,432.00 |
| Total | R 75,215.00 |

The agency fee structure in South African ports allows for an agent to offer discounts on the ASABOSA tariff and Professor Jones¹⁰⁰ ascertained in his research that on average the agency fee levied was R10040.00.

¹⁰⁰ Jones T 2005, The provision of services to bunker callers in the port of Durban – A survey of the economic impact on the Durban metropolitan economy

The total costs applicable for a ship to call Durban for a bunker call are as follows

| | |
|-----------------------------------|------------|
| Lost time 12 hours daily hire fee | R59472.00 |
| Port costs | R75215.00 |
| Agency costs | R10040.00 |
| Total | R144727.00 |

3.7 Revenue saved or earned by using Durban

The cost of bunkers in South America is on average \$10.00 a ton more expensive than in Durban¹⁰¹. The average bunker quantity of IFO taken is 600mt¹⁰². For a ship sailing full or wanting to maximize cargo uplift at South America they would only be looking to take sufficient bunkers to get them to Durban, with the balance of the fuel needed to get them through to either the port of discharge, or Singapore as the next option, being taken at Durban. The distance from ports in the Buenos Aires range to Durban is 4540 nautical miles. The distance from Durban to Singapore is a further 4843 nautical miles. It is usual practice for ships to steam at economical speeds and the average consumption for a handy size ship would be 25 mt per day at 13 knots.¹⁰³ In effect this means that the ship would take 16 days to reach Singapore from Durban and with the accepted safety margin of 3 days additional fuel¹⁰⁴, she would need to have on board 475mt additional fuel if she was looking to sail direct from load port to Singapore.

¹⁰¹ OW Bunkers daily bunker price lists

¹⁰² Jones T 2005, The provision of services to bunker callers in the port of Durban – A survey of the economic impact on the Durban metropolitan economy

¹⁰³ Figures as provided by Atlas Trading and Shipping, a ship operating company trading grains out of South America on a time charter basis

¹⁰⁴ Standard ship operating practice as confirmed by Island View Shipping and Atlas Trading and Shipping, both companies heavily involved in the operating of ships on time charter and voyage charter basis.

If the ship opts to bunker at Durban she can load an additional 475mt of cargo at load port. Present freight rate for grain products is around \$40.00¹⁰⁵ a ton which equates to \$19000.00. The ship would also be saving \$10.00 per ton on the fuel that she did not have to uplift at Argentina¹⁰⁶ making an additional saving of \$4750.00.

| | |
|---|------------|
| Total revenue saved in Rand terms | |
| Additional freight earned \$19000 @ R7.00 | R133000.00 |
| Bunker price differential | R33250.00 |
| Total | R166250.00 |
| Less total costs | R144755.00 |
| Nett gain | R21495.00 |

3.8 Supply

Bunker ships will only call if there is sufficient bunker fuel available to them and correspondence received by agents and forwarded through to ASABOSA indicates that there is presently a substantial amount of business that is being turned away due to no bunkers being available¹⁰⁷. This is also backed up by the Fairplay Daily News report 8th August 2006 which reports that 11 ships had cancelled calls due to no product being available.

At present the supply of bunker fuels is in the hands of the majors. They sell this product via their in house brokers as well as through the various bunker brokers

¹⁰⁵ Freight market indicators as provided by Atlas Trading and Shipping a major grain trader out of South America, but also available through publications such as –give details

¹⁰⁶ World bunker prices as supplied by OW Bunkers

¹⁰⁷ ASABSOA correspondence received from agents advising that owners have opted to bunker elsewhere due to no fuel being available

both based in South Africa as well as internationally¹⁰⁸. The sale can be done on a contract basis where the majors undertake to provide bunkers to an owner for a stated period of time at an agreed price. If the product is not available then the major has the responsibility to provide bunkers at the next or nearest port of call at the contract price¹⁰⁹. It is therefore in the interests of the major to ensure they have sufficient bunker stock available to meet their contractual obligations. This was in fact the case in Durban over part of July, August and September 2006 when Shell and BP had sufficient stock to meet their contractual obligations, but they are unable to provide product for the spot market¹¹⁰.

The spot bunker market is roughly 50% of the South African market¹¹¹. It works on the owner looking to take advantage of the prevailing price as and when he needs fuel. He will look to see what the prevailing prices are and hope to obtain a cheap rate from one of the players in the market. It is this market that causes the majors the most problems, as customers will hold off on stemming bunkers if they feel there is a possibility of the price coming down. The problem then comes in with the storage tanks becoming full and the majors needing to export bunker fuel in order to keep the refinery running¹¹².

Stock management is a problem and the majors have readily admitted to this fact¹¹³. The SAPREF refinery is designed and operated to maximize petrol and diesel production and the majors will not forego white fuel production in order to provide bunker fuel¹¹⁴. Bunker fuel is seen as a by product and market volumes are dictated by the refinery production, not market demand.¹¹⁵

¹⁰⁸ Confirmed by the representatives of the majors at the bunker meeting held in Durban 14 August 2006

¹⁰⁹ contractual agreements kindly explained by F Kotze of Engen

¹¹⁰ Email communication from SAPREF to ASABOSA Secretary at beginning of refinery shutdown

¹¹¹ Confirmed by the representatives of the majors at the October 2006 bunker forum meeting

¹¹² A. Dallas Shell representative at the 14 August 2006 bunker forum meeting

¹¹³ A. Dallas Shell representative at the 14 August 2006 bunker forum meeting

¹¹⁴ Confirmed by F Kotze Engen Representative at bunker forum meeting June 2006

¹¹⁵ Email communication received by ASABOSA from SAPREF confirming this stand point 31st May 2006

After the extended shutdown of the country's refineries in December 2005 Engen's Mike Stead advised at the conference on future fuels¹¹⁶ that in future the refineries would look to having only one refinery down at a time. In July 2006 two of the countries three refineries that are able to supply bunker fuel were again experiencing shutdowns and the impact on the bunker industry has been high.¹¹⁷

A fourth refinery would assist in ensuring that when the annual shut downs come about the country still has sufficient refining capability to meet the demand. This refinery would need to refine crude oil into petroleum products. A further possible solution is that a freeing up of the bunker market to allow the participation of independents who would be able to import bunkers when local supplies dry up, which would help stabilize the market supply. The problem of this is that the local majors will compete with them direct on price when they do have stock and any independent would not be competitive as a consequence of the cost of importing products. The interests of the country should be taken into consideration and government intervention could be used not only to force the majors hand but also to introduce Black Economic Empowerment into the oil industry which according to the Minister of Mineral and Energy is currently not at the desired level¹¹⁸

3.9 Delays by supply chain participants

Earlier calculations show that if the ship's port call can be kept to less than 12 hours then the owner is able to make the bunker call a profitable call. Communications received through ASABOSA from owners propose that a port stay of less than eight hours would be seen as optimum and would prove attractive to owners as this is what is being achieved at Singapore.

¹¹⁶ Ingrid Salgado. Cape Argus news report – Last year's shortage of fuels hold a lesson

¹¹⁷ Communications received from ship owners indicating they would not be bunkering at Durban due to no bunkers being available

¹¹⁸ Michael Hamlyn Business Report August 30 2006 comments attributed to former minerals and energy minister, now Deputy President Phumzile Mlambo-Ngcuka at the parliamentary hearing held on the 29th August 2006

An analysis¹¹⁹ of seventy one ships that called at Durban for the sole purpose of bunkering reveals that the average turn around time at Durban is double this at sixteen hours. The actual time taken to bunker a ship is less than the time that the ship spends waiting for the various service providers to fulfill their function in the supply chain. A breakdown of the bottlenecks in the supply chain is as follows:

| | |
|---|--------------------|
| Average delay awaiting pilot service on arrival | 4 hours 16 minutes |
| Average time waiting bunker connection | 2 hours 58 minutes |
| Average delay on completion of bunkers due to disconnecting and waiting pilot | 2 hours 54 minutes |
| Total downtime | 10 hours 8 minutes |
| | |
| Average bunkering time | 5 hours 45 minutes |

If these times could be reduced then the option of bunkering at Durban would be far more attractive as there would then be the distinct possibility that the owner would make money by opting to take the additional freight and bunker here.

3.10 Conclusion

Product availability is vital and if this could be accomplished then the port would be in a position to look to attracting more bunker callers. A 12 hour total port stay from the time that the ship arrives until she has sailed gives an overall saving to the ship owner of US\$3071.00 (R21495 divided by R7.00 to the USD), which equates to four hours hire. This would suggest that we should be an attractive option for owners wishing to maximize freight uplift, yet we are still not seeing an increase in bunker sales. The reason for this is that the slightest delay to the

¹¹⁹ Times taken from bunker ships attended to by ISS-Voigt Shipping and John T Rennie's over the first ten months of 2006

ship would mean that all saving are lost and Durban currently cannot guarantee the turn around time of under 12 hours.

Figures taken of seventy one bunker callers from those handled by ISS-Voigt Shipping and John T Rennies indicate that the average port stay for a bunker caller is just less than sixteen hours. This in effect means that the call is a cost call, with no benefit being gained by the owner. This is also not taking into account the cheaper bunker prices offered in Singapore for marine diesel and gas oil which are usually \$50.00 per mt cheaper than Durban prices¹²⁰. It is therefore unattractive to the owner to risk incurring high levels of cost for such a small and not guaranteed level of return. In order to encourage more bunker callers the time spent in port and the actual port costs will need to be reduced. The proposed means of achieving this will be explored in chapter 4

¹²⁰ World bunker prices as published by Cockett Marine and Fairplay

Chapter 4

4.1 Introduction

The present system of receiving service needs to be reviewed so that any time wasting can be identified and suggestions as to how to minimize this lost time be implemented. It is also hoped that by reviewing the procedure, ways of reducing the costs can also be identified. The ideal situation should be to reduce the time the ship spends at the port and to reduce the costs, so as to save some of the money the owner spends on lost hire whilst the ship is bunkering.

In order to achieve a quicker turn around time the current supply chain relationships will need to be reviewed, with ideally some form of vertical integration taking place so that one party in the supply chain has more control. In chapter three it was established that the owner is presently the only constant link in the chain and his relationship with some of the other links is tenuous as it is either being achieved through an agent or a broker

4.2 Current modus Operandi

We have looked at the supply chain relationships in Chapter two and identified what types of relationships the various parties have with one another. It is now essential that the functions currently performed by each party be analysed to see how each party fits into the supply chain.

4.2.1 Voyage routing decision

Prior to the ship undertaking a voyage the owner will have carried out his voyage calculations as to how much cargo he can uplift, where the ship will bunker, what

are the costs of the voyage and what are the expected returns¹²¹. If Durban is to fit into his voyage calculations then he needs to know that there is an available supply of bunker fuel at the port. The risk of the ship sailing towards Durban and requiring fuel to complete the voyage only to find that there is none available is far too great for the owner to take. They will always hedge on the side of safety. The reason for this is simple, a ship with no fuel cannot continue sailing and will require the services of a salvage tug to bring her to a safe port. The resultant costs of a Lloyds open form salvage award far outweigh any slight gain on freight achieved by opting to bunker in Durban. This means that a reputation for not always having bunkers will impact on the owners thinking and may dissuade them from calling, despite what the port is able to offer in terms of service and efficiencies.

4.2.2 Agency function

The owner appoints an agent to attend to the ship and the responsibility of the agent is to advise the port and bunker control of the expected arrival time of the ship and to update all parties on a daily basis¹²². Currently there is a shortage of bunker berths available at Durban. This is due to the upgrading that is being carried out at the Island View berths and a decision was taken at the IVLBF (Island View Liquid Bulk Forum) that bunker vessels would not be a priority at these berths as working ships needed to be accommodated¹²³. This in effect means that bunkering by pipeline is restricted to Island View 1 and 9 as well as the New Pier berths 101, 102, 103 and 104, depending on cargo work. At present there is a considerable amount of work being done at the 101 to 104 berths which the NPA are developing into the Pier 1 container terminal¹²⁴. This has resulted in bunker control not being able to work there, especially at night as

¹²¹ Institute of Chartered Shipbrokers Tutorship course material on dry bulk chartering

¹²² ISS-Voigt ISO 9001-2000 operational procedures

¹²³ Minutes from the IVLBF meetings in 2005 confirm this action be taken

¹²⁴ NPA & SAPO are busy with this project which is expected to be completed in 2007

there is no lighting¹²⁵. This in effect means that more and more of the port require bunkering by barge.

4.2.3 National Port Authority Function

The port berth planning office needs to remain flexible with the limited available berths and will only advise the agent of the proposed berth the day before if the ship is arriving early the next morning, or on the morning of the day the ship is arriving for afternoon or evening callers¹²⁶. A major problem with the berth allocation is when the ship on the berth is delayed, as this has an impact on the next ship that has been allocated that berth.¹²⁷

4.2.3.1 Pilot service

The port operates on a slot system for pilot service and caters for four ship movements per two hour period¹²⁸. On average the port has 30 ship movements per day¹²⁹. The main congestion periods are 0600hrs and 1400hrs which are the stevedore shift change over times and consequently targeted by ships that are looking to shift berth¹³⁰. Using the port slot berthing records (appendix 6) over a three week period a total of 522 port movements were recorded of which 212 were not at the original required time. A total of 26 bunker ships were identified over this same period of these 21 experienced a delay either on arrival or departure. The average delay as recorded by the NPA Port Control was 1hour 16

¹²⁵ Wendi Landi email to ASABOSA advising bunkering difficulties and raised at the 12 October 2006 bunker forum meeting.

¹²⁶ NPA Berth Planners office standard operating procedure.

¹²⁷ ASABOSA members have confirmed this is the case in discussions at the slot berthing meetings and bunker meetings.

¹²⁸ Slot berthing system was implemented in 2004 after numerous meetings between the NPA, ASABOSA, CLOF and ASL

¹²⁹ Averages obtained from the NPA records of the slot pilot system as shared with ASABOSA on a monthly basis

¹³⁰ NPA slot berthing meetings with ASABOSA in 2004 confirmed these times

minutes¹³¹. Of interest is the fact that these recorded figures do not tally with the delay times recorded by the agency companies. This is something that needs to be investigated, as either the port system of recording delays is incorrect or the port is capable of achieving better turn around times over short periods. From the time that the pilot boards the ship until she is all fast is around the 1hour 20 minute mark¹³²

4.2.3.2 Tugs

The tug will link up with the ship once she has crossed into the harbour and will be made fast to the ship by means of a wire. The tug stays with the ship until she has made fast to the berth and then she is released to attend to other work. The tug charge is the same regardless as to whether the ship berths at BMA or Maydon Wharf 15¹³³. In effect the ships that berth closer to the harbour entrance subsidise those that berth furthest from the entrance.

4.2.4 SAPREF Bunker Control

Bunker control is advised of the ship's intended arrival when they receive the stem for the bunkers, either from the Majors in house broker or from the independent bunker broker involved¹³⁴. Their next confirmation of the ship and when she is actually expected to arrive comes from the ships agent. The standard practice is that the agent will phone to check on whether the bunker stem is in place and for what quantities¹³⁵. Thereafter he will update bunker control as to any changes in ETA. Once the ship has come onto the berth he is again required to contact bunker control to advise them the ship is all fast. Only then do they look to dispatching a bunker gang to the ship. The connecting up of the shore bunker pipes to the ship's manifold should not take long, provided that

¹³¹ NPA slot pilot system records

¹³² ISS-Voigt Shipping records of bunker ship January to September 2006

¹³³ NPA annually published tariff

¹³⁴ SAPREF bunker procedures

¹³⁵ ISS-Voigt ISO 9001:2000 operating procedures

the ship's agent has ascertained in advance that the ship's manifold connection is of the correct standard, ASA 52¹³⁶. Delays when ships do not have the correct connection type are becoming less as most modern ships now comply¹³⁷. The average pump rate achieved is 150mt/hour for IFO and approximately 50mt/hour for marine diesel and gas oil¹³⁸. These are not pumped simultaneously, with the usual practice being to supply the fuel oil first and then the distillate.

On completion of the bunker operation Bunker Control require an hour to complete their documentation¹³⁹.

4.2.5 Sailing

The port, customs and immigration require a minimum of two hours notice of when the ship expects to sail¹⁴⁰. It is preferable to give the port far more warning than this, so that they are able to plan properly. If for any reason the sailing is to be delayed then notice of the amended sailing time must be given a minimum of two hours before the initial planned sailing. ASABOSA members have provided a long list of factors that delay the sailing of the ship, but the more common and avoidable ones are as follows

- delay to completion of bunkers due to shore tank changeover
- delay to completion of bunkers due to ship's tank near capacity
- delay to completion of bunkers due to slow shore pumping rate
- delay to completion of bunkers due to ship requesting a slower pumping rate than initially agreed
- delay to completion of bunkers awaiting shore staff to disconnect pipe
- delay to completion of bunkers awaiting shore staff to return with paperwork

¹³⁶ SAPREF Bunker instructions issued to ships agents giving the requirements for bunkering

¹³⁷ Confirmed by SAPREF Durban bunker control

¹³⁸ Confirmed by Wendi Landi at the bunker forum meeting 12 October 2006

¹³⁹ SAPREF bunker procedure

¹⁴⁰ NPA communication to industry advising that a minimum of two hours notice is required for pilot booking.

- Crew not returned from shore leave.
- Ship not ready to sail due to mechanical failure
- Ship not ready to sail due to awaiting stores to arrive.

A delay or amendment to the sailing time places the ship at the back of the queue for pilot service and results in a longer delay to the sailing than what the initial cause for the delay cost.

4.3 Bunker Barge Option

The new double hulled barges proposed by Grindrod and KZN Bunkers will have a carrying capacity of 4500mt of fuel oil and will be able to achieve pumping rates of 1000mt per hour¹⁴¹. Smit Amandla has still to confirm their barge developments, but it would be safe to assume they will meet the specifications of their competitors in this market. If any other competitors wish to enter the market, they too would need to provide barges that at the very least meet the performance levels of the current incumbents.

When a ship is coming into port the engine room staff is not as occupied as the deck staff and once the ship has some lines ashore the captain will ring finished with engines, thus freeing up the engine room staff until such time as the gangway is down. If the option of barging was looked at it would be possible for the barge to come alongside as soon as the ship was in position at the berth. The barge personnel are of necessity multitasked and will be responsible for tying the barge up alongside the ship, lowering the pipe from the barge onto the ship so that the ships engineering staff can connect it to the ship's manifold, pumping the product onto the ship, taking samples, lowering the pipes back onto the barge once bunkering has completed and attending to the paperwork before disconnecting and sailing.

¹⁴¹ Grindrod in house magazine and press reports confirm details of proposed bunker barges.

There are considerable savings available here to the ship by using the barge option. First and foremost is the faster pumping rate. Older ships will not wish to receive bunkers at a rate of 1000mt/hour but there will be pressure on ship's crews to receive at rates far higher than the current shore pipeline can pump at and this in itself will cut the time the ship is in port. Secondly there is not the time delay waiting for the gangway to be lowered before being able to connect up the pipes. Thirdly the paperwork is carried out on board the barge, so there is no need for bunker personnel to travel back to bunker control to obtain and complete the documentation before driving back to the ship to have the Chief Engineer sign it off.

Research of seventy one bunker callers reveals that there is an average delay between the gangway going down and the bunker pipes being connected of 2 hours 58 minutes. If this is coupled with a further delay of 2 hours 54 minutes on completion of bunkering for paperwork to be completed, (the need for bunker staff to travel back to bunker control, attend to paper work and return to the ship) and the pilot to board, then there should be scope in this lost time for efficiencies to be implemented so as to decrease the overall time spent in port. An example of this would be if the paperwork can be done simultaneously to the disconnecting of the bunker pipe

Communications received from agencies in Singapore indicate that they achieve average pump rates of around 250mt per hour on older bulk carriers¹⁴². This rate is also the lowest pumping rate indicated on the barge specifications currently available at Gibraltar and Singapore. It is not an unreasonable rate at which to pump and is considered low on modern container and bulk carriers which are geared to receiving at 1000m³ per hour¹⁴³. Previous research by Professor Trevor Jones established that the average bunker caller was stemmed for 600mt

¹⁴² ISS Ships Agency Singapore correspondence confirms this fact

¹⁴³ New barges such as that launched in January 2006 by Frateli Cosulich Brokers in Singapore are being built to pump at rates of 1500mt to meet the needs of container ships

IFO and 35mt marine diesel or alternatively 31 mt gas oil¹⁴⁴. If these figures are utilized, then it is possible for a ship to complete her bunker requirements within four hours of berthing.

The pilot service would still require a two hour notice period and ships also require time to ensure that everything is ready for sailing. These checks are usually performed in advance of pilot cancelling time and should be carried out two hours before the request for pilot attendance in order to avoid any penalties for late notice of cancellation. It would be possible for a ship receiving prompt attention to complete her port stay and be underway within eight hours of her arrival.¹⁴⁵

4. 4 Port Costs

The above savings in time equate to financial savings in hours of hire saved. In chapter 3 we calculated the port costs on the basis of a 12 hour port stay. By being able to use barges we are able to complete the operation within eight hours which effectively adds a further \$2833.00 onto the saving of using Durban as a bunker port.

The factor that was identified in the IBIA survey as the crux as to why Durban was not considered an attractive bunker port was the port costs¹⁴⁶. Table 3.1 shows that the main cost factors to a bunker call are the cost of the tugs and the cost of the pilot. There was a rebate on pilotage which was phased out in 2004¹⁴⁷. The initial rebate was 50% of the pilot cost, which if table 3.1 is referred to would mean a discount of R7586.08.

¹⁴⁴ Jones T 2005 The provision of Services to Bunker Callers in the Port of Durban – A Survey of the Economic Impact on the Durban Metropolitan Economy

¹⁴⁵ ISS-Voigt Shipping recorded delays to bunker ships over 2006 reflect an average delay of 2 hrs 59 minutes from completion of bunkers to pilot on board

¹⁴⁶ IBIA South Africa survey undertaken in 2006 and attached as appendix 1

¹⁴⁷ NPA annually published tariff books of April 2004 no longer has the rebate for pilotage.

A study on Californian ports in the 1990's showed that the doing away of the sales and use tax (SUT) had a negative impact on the local bunker market¹⁴⁸. The SUT tax was raised at 7.67% on the bunker price. Research by the Legislative Analyst's Office in January 2001 found that whilst at the time of the reintroduction of the SUT tax there was a general fall off of bunker business at all American ports due to the country experiencing a recession, the drop off at Californian ports was more severe. The SUT tax was temporary rescinded for bunker fuels in 1993 and whilst there is no conclusive proof that the bunker market has grown since this, it is of interest to note that the Legislative has recommended that the rebate be made a permanent one. This would suggest that there is merit in the exemption and the rebate previously allowed on the pilot should be revisited by the NPA.

The cost of the tug service is the biggest cost factor for ships calling at Durban. If the distance steamed by the tug is looked into, it will be seen that there is cross subsidizing of the cost of tugs, with the ships calling at the BMA, Island View and Point berths subsidizing the cost of the tugs for ships berthing at the New Pier and Maydon Wharf berths¹⁴⁹. A comparison of tug cost for the same size ship at the different ports on the coast shows large discrepancies in the cost of this service¹⁵⁰.

| | |
|----------------|-----------|
| Richards Bay | R34533.00 |
| Durban | R33654.72 |
| East London | R24824.00 |
| Port Elizabeth | R21701.02 |
| Cape Town | R24041.56 |
| Saldanha Bay | R40969.34 |

¹⁴⁸ Ibele Mark A. January 2001. Sales Taxation of Bunker Fuel

¹⁴⁹ NPA Tariff under tug charges shows that the cost of the tug is per service as opposed to distance or time related. It therefore stands to reason that a ship berthing at the harbour entrance is using a tug for far less time than a ship berthing at Maydon Wharf 15.

¹⁵⁰ NPA annually published tariff

From the above example of costs it can be seen that ports with the least steaming distance between the harbour entrance and the berths are cheaper than those where the distance is considerable. If bunker ships are charged on the basis of distance as opposed to a standard tug charge, then there is scope for the cost of the tugs to be considerably reduced. The NPA will however need to review their figures as the benefit gained by bunker ships may negatively impact on other shipping movements within the port.

A further possible way to reduce the cost of the tug service is to allow modern ships equipped with bow thrusters to use this equipment for berthing and or sailing. Safety factors may require that a tug be in attendance on berthing, especially as the ships need to be facing the harbour entrance if berthed at an Island View berth. This then means that on sailing they are already facing the correct way and the bow thruster would fulfill the same function as the tug in assisting the ship to come off the quay. This would of necessity have to be ship specific as the first and foremost function of the NPA is to ensure the efficient and economic functioning of the port¹⁵¹. This would be jeopardized if they allowed every ship to sail unassisted simply on the pretext that she had bow thrusters.

4.5 Agency Costs

The current agency tariff within South Africa has also suffered as a consequence of the strengthening Rand against the US Dollar, as the agency fees virtually overnight became expensive. The world wide increase in competition among agency companies has seen the agency fees decline as companies embark on a cost strategy to maintain market share¹⁵². The average agency fee for a bunker caller is between \$500 and \$800 in Singapore¹⁵³ and Gibraltar, whilst the average fee, (agency fees are subjected to discounting), as found by Professor

¹⁵¹ National Ports Act 2005

¹⁵² ISS Ships Agency London Head Office General Manager for bulk, Allan Vermaak reporting on agency costs in New Castle Australia

¹⁵³ ISS Ships Agency bunker callers quoted agency fees at Gibraltar and Singapore

Jones of R10040.00 if converted to a US Dollar fee works out at \$1434.00. At the ASABOSA tariff recommended scale, (no discounting), it is over \$2000.00, which is the entire port fee for a bunker call at Singapore. Clearly the agency fee will also need to be reviewed and with the improvement in the ship's turnaround time a smaller hourly fee could be investigated or simply the agency fee charged at other bunker ports should be applied. ASABSOA have now employed the services of a consultant to review their tariff structure in an effort to simplify it and make it more relevant to the world market.¹⁵⁴

4.6 Conclusion

The cost of bunkering at Durban can be reduced, both in terms of time and in charges levied. The effort needed to do this is not great and the rebates offered to bunker callers should be made up by the increased number of ships that will be tempted to utilize the port for bunker calls. The major stumbling block remains the availability of product. The majors have confirmed that they presently export 20% of the bunker fuel produced¹⁵⁵ and if this could be sold to a third party it could act as a reserve. The market should be opened up to allow open competition, with the majors simply selling the product to local brokers who in turn will store and sell the bunkers at market dictated prices. The supply chain dynamics and the relationships between all of the parties is unwieldy and an investigation into how to change the current status quo so as to achieve better customer service is needed. In chapter 5 the Platts-Gregory procedure will be reviewed with the proposal of looking at backward integration along the supply chain being considered as a possible solution to the current delays in the system.

¹⁵⁴ ASABOSA National Council meeting August 2006

¹⁵⁵ Bunker forum meeting 14th August 2006 NPA Salisbury Boardroom

Chapter 5

5.1 Introduction

In the previous chapters we have identified the strengths and weaknesses that prevail in the current bunker market and what actions would need to be taken if Durban was to become a cost effective bunker port that made it attractive to owners in terms of additional revenue they could earn in freight. It is now necessary to look at what the identified weaknesses are and to see if the proposed changes as to how the current bunker operation is carried out will overcome these weaknesses and result in greater efficiencies and hence cost savings to owners.

5.2 Platts-Gregory procedure

5.2.1 Stage 1

(a) Opportunities and threats:

In Chapter two we identified the opportunities and threats to the bunker industry as follows

Opportunities

- The bunker market is a growing market worldwide and the potential for growth in Africa is big, due to the low base we are coming off of and the prediction that economic growth for the continent will be at around 3.8% for the next couple of years.
- The IMO regulations on double hulled barges and the Majors stance here has forced changes in the local market which will benefit the owners
- There is a strong desire by government to develop black economic empowerment in the fuel industry and with government buy in to the

bunker industry new players could be brought in at the expense of the current status quo

- The demand for low sulphur fuel which is seen as a scarce commodity and the development of West African oil fields which have low sulphur fuel is an opportunity for the cost effective importing of low sulphur bunker fuel in times of local refinery shutdowns and shortages.

Threats

- Marpol low sulphur regulations will mean that local refineries will need to change their refining systems. This is viewed as an expensive option and a conversion to coking residual product would be cheaper.
- Refining capacity in other centers is being targeted as profitable and with increased refining capabilities comes cheaper bunkers. There is a danger South Africa will not be able to match these prices and will either increase exports of bunkers or convert to coking plants
- 380cst fuel is cheaper and modern engines are designed to burn this product¹⁵⁶. It is available in South America and Singapore, but not here. This may result in a further decline in our bunker volumes.

(b) What the market wants

The ship owner requires a reliable supply of quality bunker fuel at a competitive price. The price is not only of the actual bunkers, but is of the entire port call. This in effect means that they require a turn around of the ship in a time that allows them to make profit on the port stay by taking additional cargo at load port. Earlier calculations show that the maximum port stay should be 12 hours and any reduction on this makes the call even more attractive.

¹⁵⁶ Numerous shipping related magazines such as Tradewinds and Fairplay on reporting of new building confirm the fact that new ships are geared towards the higher CST fuel. This was also confirmed by Island View Shipping's Mark Koen at the bunker meeting held in October 2005

(c) How the operation performs

The market, although price competitive, is unable to offer a reliable supply of bunkers. The delivery of bunkers is through a disjointed supply chain with no party being directly answerable to any of the others in the supply chain. There is a lack of efficiency and if the bunkering is conducted by pipeline the rate of pumping is slow. There are also delays in documentation which compounds the problem. Overall the present supply chain is unable to perform the bunkering of a ship within the twelve hour cut off time frame that owners would target¹⁵⁷.

5.2.2 Stage 2

The current operation as described in chapter 4 shows that a large proportion of the time that the ship spends at the port is lost time. In fact there is more time spent waiting for various services than the actual time spent on bunkering. The reasons for this are possibly the length of the supply chain, the number of different players in it, their varying relationships with the other players in the supply chain and the different strategies adopted by each of them, and the fact that they do not all necessarily view the bunker business as their prime priority.

The National Port Authority (NPA) has numerous functions as described in chapter 3 of the National Ports Act¹⁵⁸. The main function is to own, manage, control and administer ports to ensure their efficient and economic functioning, and in doing so the Authority must fulfill a multitude of tasks.

Of relevance to this research is the functions described under 11. (1)

(g) regulate and control-

(ii) the entry of vessels into ports, and their stay, movements or operations in and departures from ports.

(n) provide or arrange for tugs, pilot boats and other facilities and services for the navigation and berthing of vessels in the port.

¹⁵⁷ Recorded times as provided by ISS-Voigt Shipping and John T Rennie and attached as appendix 6

¹⁵⁸ Republic of South Africa National Ports Act 2005

The NPA has to service all ships calling at the port and the present system of berthing is on the basis of first come, first served¹⁵⁹. There are exceptions to this rule with passenger ships and foreign navy ships being accommodated at the head of the queue. There also has to be some practical considerations where the berthing order of ships is left to the discretion of the harbour master's office.

The NPA strategy could be seen as being mostly that of a caretaker strategy although they are starting to embark on a reorganizer strategy with the development of new berths, the proposal to widen the channel and the master plan concepts that they have been showing to industry over the last two years.

The majors have repeatedly stated that their business is white oils and that bunker fuel is not their main priority. Their focus is on what white fuels they are able to achieve from their slate. The sale or export of the residual as bunkers is to facilitate their ability to refine more crude¹⁶⁰.

The strategy of the majors is very much that of caretaker. They have no opposition in the market and are happy to maintain the current levels of operating.

Ship Agents deal with a wide variety of ships and principals, sometimes as liner agents dealing with one specific owner and sometimes as general agents to a multitude of ship owners and ship types. The bunker industry is only a part of the overall agency operation and in many cases the handling of these ships is left to junior operators, as they are viewed as easy ships to handle and good for training purposes. There is also an anomaly in an agent earns more revenue the longer the port stay.¹⁶¹

¹⁵⁹ This was agreed in terms of the slot berthing system implemented by the port in conjunction with ASABOSA, CLOF and ASL in 2004.

¹⁶⁰ As per comments repeatedly made by the representatives of the majors at the bunker meetings held in 2006

¹⁶¹ ASABOSA tariff allows for charges based both on commodity handled and number of days in port

The agency market is a very competitive market with agents having to compete for business not only on levels of service but also on price. The nature of the market is such that agencies need to be adopting the innovator strategy if they are to grow in the market.

Bunker brokers have an inherent interest in the bunker industry, as it is their livelihood and the sole reason for their industry being in existence. The number of brokers worldwide¹⁶² would suggest that there is money to be made out of bunkers, despite the claims of the local oil majors that it is a nuisance commodity with a lower value than the crude from which it is derived¹⁶³. The broker although involved in the sale of the bunker fuel has no control over the port call or the delivery of the bunkers as both of these functions fall to the NPA, the agent and the major who the fuel has been purchased through and the barge or pipeline.

The strategy bunker broking companies need to follow is one that caters for a very competitive market and so they too would look to adopt the innovator strategy.

Bunker barges and SAPREF bunker control are specifically there to handle bunkers. They have no other business and if the bunker business in the port declines they, along with the bunker brokers will be badly affected by this decline.

The bunker barge industry is a competitive industry, the port currently has the option of using two barge companies and when the new barges come into effect next year this will increase the number of barge operators to three. They also experience competition from the pipeline supply which is a cheaper option as barging presently comes at a \$5.00 per ton premium. This is expected to increase once the double hull barges come into operation¹⁶⁴. The strategy that

¹⁶² IBIA has 45 member companies listed as brokers

¹⁶³ IBIA has 178 companies listed as suppliers of bunkers

¹⁶⁴ Barge operators have indicated that the cost of funding the new barges will necessitate an increase in the current cost structure

needs to be adopted by this segment of the industry is at the very minimum a reorganizer strategy.

The pipeline being linked to the majors would appear to be maintaining the strategy of caretaker. There is investment, but this is restricted to maintaining the current operation as opposed to looking to change the operation.

The major role players responsible for ensuring that a bunker ship comes in and out in under 12 hours are not the parties most affected by the decline in the bunker industry.

5.2.3 Stage 3

The relationships between the various parties in the bunker operation could be reviewed in an effort to stream line the supply chain and to improve efficiencies. It would be fair to assume that the majors and the NPA would not (and should not) be party to any vertical integration, but there is logic in either the bunker broker or the agent extending his control further up or down the supply chain

The parties with the most to gain or to lose from the bunker business are the bunker broker and the actual bunker suppliers, either in the form of the barges or the shore pipeline operators. In view of the pipeline operation being slow and limited to only certain berths, it will not be considered ere as a viable option in looking to improve the turn around time of the ship. The broker is the party who initiates the bunker operation and so the focus should be on the broker vertically integrating down the supply chain. This would mean taking over the control of the agency function and the barge function and incorporating them into the brokerage. In other words the broker would tender for the owners business on an all in cost basis, with the broker then appointing the agent and the barge or pipeline to perform the work. He is then in a better position to ensure that these two parties give a high level of service as he is able to appoint the agency and barge company best suited to do this work

The relationship that the broker enters into with the agent and the barge could either be through a semi-hierarchy relationship, where there is a holding company that the brokerage, the agency and the barge or co-contracting where there is a greater level of interaction between the three parties for their mutual benefit or coordinated contracting relationship where the broker subcontracts the other two parties to fulfill the function of agent and bunker deliverer.

The advantage to the broker of entering one of the above relationships is they would have control over the time the ship is in port. They would be able to look at the option of offering the ship owner an all in price for the bunkers, which would include the agency, port costs and barging. This could be extended to guaranteeing a turn around time of under the 12 hours if the port efficiencies could be improved.

5.3 Port Efficiencies

Improvements to service levels and speed of response are perhaps the best way to reduce the costs of calling at Durban. They have the added value of not arising from one party discounting their fee, but from all parties raising their level of service. The IMO regulations relating to double hulled bunker barges is an ideal opportunity for the port to change over from a shore pipeline supply of bunkers to a completely barge supply operation. The ability of the barges to pump at rates far higher than what the shore pipeline can achieve means that there is an instant saving in time required to receive bunkers. It is also extremely attractive to owners with modern ships that can receive bunkers at higher rates than those used in the model, as they effectively now control their length of time in port. It is not unreasonable to work on port stays of four to six hours for a bunker call for ships receiving bunkers at 500m³ per hour and greater.

The research of the agency recorded delays¹⁶⁵ show that there is a delay to most ships calling at the port and for the bunker ships identified. This delay is currently in excess of four hours. From records taken from ships agency files it reflects that there is often a delay in the attendance to ships between the hours of 0400 to 0630hr and from 1630hrs to 1830hrs, which are the traditional pilot change over times and also those noted as when the most movements are requested¹⁶⁶. If the NPA own slot berthing records are viewed¹⁶⁷ it is evident that there are no movements after 0400hrs until 0600hrs in the morning and 1600hrs and 1800hrs in the evening. If it were possible to reduce these delays and ensure prompter attention then greater efficiencies could be obtained.

The Ports Act says that the NPA is to regulate and control vessel's entry into the port, their stay and departure. It also goes on to state that the NPA must provide or arrange for tugs, pilot boats and other facilities and services. It does not specifically state that the NPA must provide the pilots. It might therefore be possible to look at negotiating with the NPA to allow for the pilot service to become part of the bunker operators' service. This would mean that the pilot is employed directly by the bunker broker in a contractual relationship similar to those they enter into with the agency and the barge.

If the proposed discounting of the tugs is coupled to the quicker turn around of the ship it would be possible to increase the saving in costs to equate to eight hours of hire time for the ship. This additional four hours of saving on port costs and hire for the ship would make the option of maximizing cargo lift at load port and bunkering at Durban to complete the voyage a reality.

¹⁶⁵ Appendix 5

¹⁶⁶ NPA slot berthing statistical information

¹⁶⁷ Appendix 6

Port Costs basis distance travelled by the tug and a reduced port stay to 8 hours

| | |
|---------------------------|------------|
| Port costs | R61102.00 |
| 8 hours time lost on hire | R39648.00 |
| Reduced Agency fee | R7000.00 |
| Total costs | R107750.00 |

The revenue earned in additional freight plus cheaper bunkers would remain the same at R166250.00. If we convert these figures back to USD it equates to the following saving to the owner

| | |
|-----------------------------|------------|
| Total revenue earned in USD | \$23750.00 |
| Total costs incurred in USD | \$15393.00 |
| Total saved | \$8357.00 |

This equates to just under half a day's hire being saved. If this is coupled with the high level of service offered by all service providers within the Durban port, then there should be an attraction to using the port for bunkering of ships.

5.4 Port Costs

The ports of Rotterdam, Singapore and Gibraltar all offer a discount on the port dues for bunker ships¹⁶⁸. Currently the port of Durban offers a discount on the Port dues of 65%, provided that the ship completes her port call and sails within 12 hours of her arrival¹⁶⁹. There are numerous levies attached to calling at Durban in the form of VTS, Light Dues and the SAMSA levy. These add up to a substantial amount of the port cost at a combined total of R15046.00.

¹⁶⁸ IBIA port reports

¹⁶⁹ NPA annually published tariff book

| | |
|------------|-----------|
| VTS | R4275.00 |
| Light Dues | R7318.00 |
| SAMSA Levy | R3453.00 |
| Total | R15046.00 |

If the National Port Authority could take these costs into consideration when they review their tariff structure for bunker ships there should be some leeway to discount the VTS and the Light Dues (The SAMSA Levy is collected by the NPA on behalf of SAMSA but they have no say on the levy charged) as they are for services as opposed to being operational costs. The NPA has indicated at the various bunker meetings a willingness to review service charges if they are conducive to encouraging business¹⁷⁰. They are however not in a position to discount on operational costs.

The cost of tugs is by far the highest port related charge and if the distance steamed by the tug is used as a basis for the charges raised, then there is an opportunity for the NPA to charge the tug costs for bunker ships at the same rate as the tug charges in Port Elizabeth. This in itself would allow for a reduction of R11953 for the GRT used as our model.

The pilot fee is an operational fee and it may not be possible to offer the discount on this as was done in the past. The amount that the owner gained from the discount was not significant but the fact that the port offered discounts on bunker ships was a useful marketing tool. If the pilot charge is to remain the port will still be able to make mileage out of the other discounts that it could offer on strictly service related costs.

5.5 Bunker Supply

¹⁷⁰ Nisha Jones NPA representative Bunker Forum meeting 14 August 2006

Reduction in time spent in port and the streamlining of the supply chain will have no effect if the majors continue to experience problems with stock management. Figures obtained from Engen show that 11% of the time the majors are not able to offer bunkers. Coupled to this is the problem created when the majors have too much stock and then need to export it in order to continue with their stated primary function of producing white fuels¹⁷¹.

Engen's representative at the bunker forum meetings have stated that Engen try their best to ensure that all bunkers produced are sold to the local market. Shell and BP have however stated that they export approximately 20% of the bunker fuel they produce.

If the local majors were no longer acting as brokers and suppliers of a product they consider a nuisance factor, but instead simply sold the bunkers they produced to the market then opportunities would be opened up for local black economic empowerment companies to become involved in the trading and supplying of bunkers. They could look to bringing in international suppliers of bunkers in joint ventures. Their experience and global networks would allow for an efficient stock management function of the local product. The economies of scale they would be able to offer would mean that if they have to bring in additional top up stock it would not negatively affect the price. The proposed refinery in Luanda would also prove an asset due to the shorter sailing distances involved.

5.6 Conclusion

The port of Durban is able to offer a high level of service from a safe anchorage, large tugs and experienced pilots right the way through to the supply of good quality fresh water and provisions. The infrastructure of the country allows for

¹⁷¹ comments by the majors at various times over the last year at the regular bunker meetings confirm that this is their standpoint

owners to send spares to the ship that are cleared quickly and efficiently. Crew signing on and off of ships is facilitated easily with the assistance of immigration and the fact that there are adequate safe and cost effect hotels for them to utilize until the ship arrives or they are scheduled to board their departing flight. The port is a good place to take bunkers and carry out any other owner's matters. This can be marketed to the world shipping community as a worthwhile product as owners worldwide readily admit to the fact that they are impressed by the level of agency service offered in South African and they do take advantage of a port call here to carry out a myriad of requirements.

The factor that has come through clearly from owners is that they cannot take a chance on a port that cannot guarantee bunkers. There is numerous correspondence from owners to agents advising they have cancelled a port call due to a lack of bunkers, as well as correspondence from owners stating they cannot factor the port into their voyage calculations as they are not guaranteed bunkers. From a port's point of view we cannot advertise and market for a service that is unreliable. It is essential that some means of ensuring that the country's refineries and the majors work to resolving the supply problems that they have experienced over the last few years. The port of Durban and the country as a whole need the majors to commit to either providing a reliable source of bunkers, or to allowing others to do so. They have repeatedly stated it is a waste product of no value, but whilst this may be true to them, it is not true to the country as a whole. It is a valuable waste product through which we can create jobs, develop black economic empowerment and reverse the decline in the bunkering industry in South Africa by turning our ports once again into major bunkering hubs.

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Legislation

Republic of South Africa National Ports Authority Act 12 2005

Glossary

Agency Fee: The money earned by a ships agency company for attending on behalf of a ship owner to the ship. The fee is dependent on the nature of the port call and the length of tie the ship is in port.

Agent: A Company or Person who acts on behalf of the ship owner.

ASABOSA : The Agency Association to which most agents in the country are members. It was formed to give agents a common voice in discussions with the port authority and to ensure that the rights of ship owners and charterers were protected.

Beam: The width of the ship at its widest part

Berthing Gangs: NPA employs labour who are responsible for pulling the ship's mooring lines ashore and making them fast to the bollards on the wharf when the ship is berthing and to release the mooring ropes from the bollards when the ship is sailing.

BMA: Bluff Mechanical Appliance. It is the coal loading facility at the entrance to the port

Bunker Broker: A broker who sells bunkers on behalf of the majors to ship owners and charterers

Bunker Control: They are responsible for the delivery of the bunkers either directly to the ship or onto the barge that then goes to the ship and delivers the bunkers. Bunker Control is part of SAPREF and is answerable to the majors.

Bunker Gang: The team responsible for connecting up the pipes from the shore to the ship so that the bunkers can be pumped on board. They are employed by bunker control

Bunker Ships: Ships calling at a port for the sole purpose of taking bunkers

Bunkers: Fuel used by ships. Word id derived from days of coal fired engines when the bunker was the storage place for the coal.

Chandelling Industry: The supply of ship stores is carried out by the ship chandler. These supplies are fairly large in quantity, as they need to be sufficient to feed a crew of twenty odd people over a period of a month or so. They also supply all the cleaning equipment, paint, tools, and anything else that the ship may decide it needs

Charter Price: On the open market a ship owner can charter out his ship for a daily hire fee. An indicative fee for a ship of 18000mt GRT would be around \$18000.00 per day at the current market rates.

Charterer: A person or company who hires a ship either on a time charter rate (daily fee for an agreed amount of time) or voyage charter (freight rate per ton)

Comes in various types and grades, HFO (Heavy Fuel oil), IFO (Intermediary Fuel Oil) and MFO (Marine Fuel Oil) are all forms of the fuel used for running the main engine of the ship whilst on sea passage. MDO (Marine Diesel Oil) and MGO (Marine Gas Oil) are used for the ships generators and in the main engine when the ship is looking to manoeuvre in and out of ports or canals.

Cost Call: When a ship is not calling at the port to load or discharge cargo she s not making any revenue from the port call and it is therefore referred to as a cost call. Examples of cost calls are bunker calls, calls to carry out repairs or to disembark an injured crew member.

CST this refers to the quality of the HFO, IFO & MFO. The higher the figure the poorer the grade. In South Africa we can supply from 120cst up to 180cst, 120cst is a blend of IFO and MDO. Places such as Singapore now offer 380cst.

Deck Staff: Navigation Officers and deck crew consisting of a Bosun, and four to six able seamen. On berthing one officer is at the bow with some of the crew, one officer is at the stern with the balance of the crew, whilst the Captain and Chief Officer are in the bridge with a seaman on the wheel.

Distillates: Marine diesel and marine gas oil are referred to as distillates

Draft: The depth of water a ship draws, it varies as to the amount of cargo the ship has on board. Every ship has a maximum draft to which she is allowed to load. It is calculated according to her construction and the required freeboard needed to ensure she will always stay safely afloat. This is shown on the ships sides by the Plimsoll line.

Engine room staff: The engineers and greasers responsible for ensuring the engine works. Usually consists of one engineer and one greaser working down there at any given time, although they will increase this when the ship is looking to come into or sail from port.

Fairplay: A shipping magazine published on a monthly basis and seen to be an authoritative voice in the industry

Freight Rate: Price in US Dollars per metric ton that a ship owner offers to cargo interests for transporting their goods between two predetermined places. Rate is determined by prevailing market forces

Grain products: Maize, wheat, soya

Gross Tonnage (GRT): The gross registered tonnage or gross tonnage of a ship is considered to be the revenue earning capacity of the ship. It is a measure of all the enclosed spaces within a ship and it is a volumetric measurement.

Hire: The revenue earned by an owner through chartering out his ship on a time charter. It is a daily rate given in US dollars.

IBIA: International Bunker Industry Association. Its members are bunker brokers who arrange for the purchase of bunkers on behalf of ship owners at a designated port. It is an international body and whilst the South African branch members pay their fees directly to the international body they do have a local committee that tries to resolve issues pertaining to the South African members.

IMO: International Maritime Organisation, a division of the United Nations responsible for the safety of life at sea as well as the protection of the marine environment from events such as pollution by ships.

Independents: Companies with the financial ability to import fuel oil for ships as opposed to relying to the refining process undertaken by the majors

IVLBF: Island View liquid Bulk Forum, a body formed to look after the interests of the oil and chemical tankers that call at the Island View berths in Durban. It consists of ship owners, agents, the NPA, the majors and the chemical pipeline operators, being Island View Storage and PD Terminals.

Length Overall: The length of a ship from the front of the bow to the back of the stern. It is the ships maximum length.

Light Dues: a fee raised by the NPA to cover the costs of maintaining the lighthouses and bouis around our coast and in our harbours

Lloyds Open Form: A salvage agreement form, which salvage operators will insist the owner signs prior to them taking up the tow of a ship in distress. The difference in potential revenue for the salvage operator if they succeed in getting the owner to agree to Lloyds open form, as opposed to them simply hiring a tug for a couple of days, is substantial

Made fast: This is a nautical term meaning that the ship is made secure to the berth or a tug by means of mooring ropes or in the case of a tug by a steel wire.

Marpol Annex VI: An effort by the IMO to reduce the sulphur content in marine fuels as these are seen as a cause of pollution contributing to global warming

Maydon Wharf: These are the berths up at the far end of the harbour furthest away from the port entrance

Movements: This term is used to describe the process of ships coming into the port, sailing from the port or shifting berths. It is derived from the movement book which is used to record all instructions given by the pilot during the course of the operation

New Pier: Consist of the Durban Pier one container terminal and the Durban Container Terminal

NPA: National Port Authority, they are the landlords of all port land and are responsible for ensuring the most efficient commercial use of that land. The NPA also control the functions of Pilotage and tugs that are used for the berthing, sailing and shifting of ships into and out of the ports

Oil Majors: Term used to define the group of Shell, BP, Engen and Chevron, who are responsible for the importing of crude oil that is refined at the coast and who supply bunker fuel to the local market.

Pilot Services: Ships coming into or sailing from ports or shifting from one berth to another require the service of a Pilot. The Pilot is employed by the NPA, they have experience in the port where they are pilots and act as assistants to the Captain of the ship, who always has the final say.

Point Berths: These are situated to the city side of the port as you come into the harbour

Port Charges: The costs that a ship will incur in coming into a port, carrying out her business and then sailing. These include but are not limited to Port Dues, Light Dues, VTS, SAMSA Levy, Pilotage, Tugs, Berthing Gangs, Running Lines, and Agency Fees etc

Port Dues: A fee levied by the NPA against each ship calling at the port. It is to cover the cost for the use of the port and is based on the ship's gross tonnage and the number of days she spends in the port.

Principals: In the context of this dissertation it refers to ship owners or charterers to whom the agent must report and act on behalf of.

Product: Term used to group the various commodities in the marine fuel market

Pump rate: The speed at which the ship can receive the bunkers from the shore pipe as well as the speed at which bunker control can pump the product from the shore tanks to the ship

SAFREP Reports: These are issued daily by the port giving details of all the ships that arrived or sailed over the preceding 24 hours.

SAMSA: South African Maritime Safety Association. A body responsible for all maritime matters around our coast and for carrying out port State control inspections to ships calling at our ports to ensure that they are seaworthy and complying with

international safety regulations. They cover their operational costs by raising a levy against all ships calling at South African ports.

SAPREF: South African Petroleum Refineries. This consists of Shell and BP who have a joint refinery process in Durban and who store their bunker fuel in the same tank. Bunker Control is then responsible for delivering this to the ships and is answerable to SAPREF. Engen whilst not part of SAPREF works in close conjunction to them and also uses Bunker Control for the delivery of their bunkers to the ships.

Shore tank changeover: The bunkers are stored in various tanks and when a tank is close to empty it is necessary for Bunker Control to change over. The bunkering speed before they change over is far slower than normal as there is very little product in the tank.

Slot system: The day is divided into two hourly slots during which time the port is able to handle four ship movements. These can either be ships looking to enter the port, sail from the port or to shift from one berth to another. The limitation on the number of slots is due to the constraints of the harbour entrance which can only safely allow one ship to enter or to leave at a time.

Spot: A shipping term that refers to the cargo, ship or bunkers being readily available and waiting for business

Voyage Routing: A ship owner will decide prior to the ship arriving at the load port which route the ship will proceed from the load port to the port of discharge and any necessary stops along the way for bunkers

VTS: Vessel Tracking System, a RADAR based system of monitoring all ships approaching the port, all ships at the anchorage and all ships in the harbour. It is a safety system operated by the NPA and the cost is recovered against each ship that calls at the port

White Oils: Refined products such as jet fuel, paraffin, petrol, gas oil, etc that come from the refining of crude oil.

Working cargoes: Ships calling to load or discharge cargo at a specific port