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Break Bulk Shipping Study

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EXECUTIVE SUMMARY

The study was initiated by the Shipping Australia Break Bulk Cargo Working Group in order to find out more about the different types of general cargo being handled at Australian ports, the adequacy of the facilities available at ports, to compare the costs between ports of a port call of a ship carrying break bulk cargo and provide an indicative value that this sector makes to the Australian economy.

Interviews were conducted with a wide variety of organisations including port authorities, stevedores, terminal operators, shipping companies and importers. Some statistics were provided by shipping companies and a large amount of data obtained from publications and websites. The ports of Brisbane and Port Kembla were the subject of special case studies.

From this wide variety of sources it became apparent that the level of awareness of this important sector of Australia's international trade was far below that enjoyed by the dry bulk, container and motor vehicle trades. That lack of awareness was evident in an understanding of the types of cargoes that these ships discharged in Australian ports and the special needs that some of these cargoes have. This was most apparent in the generally reported lack of port facilities especially in relation to the availability in the port of undercover storage for vulnerable products. This situation was not anticipated considering that the major cargoes discharged included those commodities that needed protection such as steel and newsprint. Port Kembla obviously benefited from facilities in the Inner Harbour being relatively new.

As a result of this study, it is hoped to lift the profile of this important sector of our industry so that the identified deficiencies can be addressed and break bulk shipping allowed to reach its full potential.

Berthing facilities at some ports were also reported to be inadequate. At Townsville, Newcastle and Adelaide some facilities were old and in need of upgrading to increase the depth of water alongside, to extending the length of the berth face to be able to accommodate larger ships and strengthen the decking to enable heavier loads to be landed.

At Melbourne the current understanding of the planned port development will place a severe strain on berth availability for break bulk shipping in the future.

At Brisbane, Port Kembla and Port Adelaide berthing priority procedures are in operation which often disadvantage break bulk cargo ships in favour of car carriers. It was understood that these systems were based on giving priority to ships that have a quick turnaround in port. Sharing berths between general cargo vessels with break bulk cargo and pure car and truck carriers and large roll-on/roll-off vessels causes serious problems for all. The answer must lie in providing separate berths for these different sectors because of those very different characteristics.

Based on applying tariff charges for a port call by a typically sized general cargo ship at the ports handling the most break bulk cargoes, it was found that towage was the largest cost component; at some ports towage made up over 50% of the total of the port

charges incurred. Even at ports where two tug services were available, towage charges were still the highest component.

This study was not able to include stevedoring charges as these were commercially confidential. However, SAL received complaints regarding high stevedoring costs. It was suggested to SAL that the high cost resulted from the land valuation imposed by the port authority on the terminal operator. In some ports, sufficient labour to work all ships alongside around the clock was not available causing further delays to the ship.

The economic benefit to Australia was considered in terms of the contribution made by shipping services in transporting those products not necessarily available in Australia, but considered important to stimulate economic growth. Those products largely comprised project material, machinery for mining, resource development and agriculture and steel for manufacturing and infrastructure projects.

The study found that in the two States where resource development in mining particularly, was at its highest level – Queensland and Western Australia, some port and berth facilities appeared to be the most inadequate. The ports identified with these problems in Queensland were Townsville and Brisbane and in Western Australia - Fremantle and Dampier. The project cargoes and other cargoes vital to this development as well as infrastructure construction are essential in supporting the industries that make such an important contribution to economic growth.

In other States where large steel imports similarly support heavy industry and manufacturing and therefore employment, port facilities were often reported as ill-equipped to efficiently handle consignments of steel some of which are very large.

At a time when Australia is committed to adapting to alternative sources of power generation, the importation of wind generators is expected to increase significantly. This equipment is highly valuable and often difficult to handle because of the length of some blades and susceptibility to damage. The availability of suitable shore-based handling equipment and skilled workers becomes essential and these were reported as often in short supply.

The conclusions reached in this study are not surprising but they do, for the first time, substantiate the many problems previously identified by those involved and reinforce the absolute necessity of addressing the shortcomings as a matter of some urgency. Besides the poor general awareness of the section’s problems and economic contribution, the conclusions reached pointed to the lack of adequate infrastructure, including the lack of undercover storage, shortage of labour and especially skilled labour, the problems arising from the operation of different berthing systems, strong competition in stevedoring services/terminal operation could be of benefit and the level of port costs was considered a possible impediment to future development.

A number of areas for improvement were identified:

a. Raise the profile of the industry

b. Encourage port authorities to develop separate berths for general cargo vessels and those vessels carrying wheeled cargo and agricultural equipment.

c. Establish a genuinely representative consultative mechanism for all stakeholders involved in break bulk cargoes in ports where it is a significant trade to improve the efficiency of operations, eg. the use of portable temporary warehouses where appropriate.

d. Encourage increased competition in stevedoring/terminal management where the overall benefits have been clearly identified.

e. Port authority charges should be kept at a reasonable level to ensure Australia remains internationally competitive.

f. Tackle the labour issues identified in the conclusions.

g. Develop valid, workable and realistic indicators of performance in ports so that a port's performance can be ranked against national or even international benchmarks and results made publically available.

h. Development of port based data community systems to, among other matters, provide a platform for facilitating information exchange, promoting collaborative problem-solving activity and fostering co-operative action in pursuit of a common objective.

Implementation of these recommendations for improvement will greatly assist break bulk shipping in meeting their customer's requirements for the long term seamless delivery of cargo. In addition, they will encourage port authorities to upgrade infrastructure planning and development with the objective of removing current port user dissatisfaction with port congestion, berth availability, inadequate labour supply, lack of skills and storage facilities.

An effective IT communications platform would facilitate information exchange, promote collaborative problem-solving activity and foster co-operative action. The platform could be designed to link the operation of port service providers as well as port users, resulting in the efficient operation of the port as a shared responsibility. SAL's promotion of port based data community systems is consistent with this policy objective.

1 BREAK BULK CARGO

1.1 Definition

Break bulk cargo is also defined as general cargo. Such cargo is loaded into ships as individual pieces or unitised on pallets, in bundles and is not containerised nor in the form of dry or liquid bulk consignments in whole or part shiploads.

1.2 Types of Break Bulk Cargo

The SAL Break Bulk Working Group agreed that the cargoes to which this study refers should generally exclude and include the following:

To be excluded:

- Dry/Liquid bulk cargoes e.g. ore/oil/coal/woodchips and built-up motor vehicles and trucks because of the specialised nature of these trades.

To be included:

- Unpacked motor vehicles to the extent only when they compete with the break bulk cargo for wharf space and facilities.
- Heavy lifts and project cargoes e.g. wind power generating equipment on ships that use break bulk wharves and facilities.
- Timber, steel and other non-bulk commodities.

Break bulk commodities that move through Australian ports as reported by members of the Break Bulk Working Group include:

Table 1: Principal Break Bulk Cargoes Imported in to/Exported out of Australia

Machinery	Steel	Project Cargoes	General Cargoes	Others
Farm Machinery	Coil	Oilfield Equipment	Timber Veneer	Timber
Mining (including tyres)	Pipes	Refinery Equipment	Oilfield/Drilling Equipment	Newsprint
Civil Engineering	Angles and channel	Pipes for mining industry	Bulker Bags eg. Ammonium Nitrate	Paper pulp
	Merchant bar	Power Generation	Boats (Yacht)	Defence Equipment
	Plate	Transformers	Copper	
		Windmills	Zinc	
		Steel structures	Construction Modules	
			Locomotives	

Sources: Statistics provided by break bulk shipping lines.
Shipping Companies' feedback in SAL breakbulk study questionnaires and interviews.

Shipping company interviews and visits to Port Kembla and Brisbane indicate that the majority of break bulk cargoes by volume are steel, machinery and timber.

2 THE IMPORTANCE OF BREAK BULK CARGO

2.1 The Nature of Break Bulk Cargo

Although most seaborne general cargoes are now containerised with resultant benefits – reduction in cargo handling, reducing the possibility of loss and damage and providing better protection - break bulk cargo will remain an extremely important cargo into the future. In particular, shipments of oversized and heavyweight items e.g. mining machinery, excavators, construction steel, refinery equipment for oil projects, generators and turbines for renewable electrical generation that cannot fit into containers, are all considered to be break bulk cargo.

Some steel products might be suitable for containers however according to one major steel importer, *"Most steel products have never been conducive to being containerised for sea transportation. The heavy package weights and over dimensional sizes plus the sheer volume of shipments means that these cargoes must be shipped break bulk."*. All of these cargoes are critically important for future infrastructure development in Australia such as railways, roads, ports, power plants and wind farm projects, housing and manufacturing.

2.2 Value of Break Bulk Cargo

Traditionally, many high value products and goods were packaged and shipped as break bulk cargoes and this situation has not changed. Today, most of the break bulk cargoes carried remain highly valuable products e.g. windmills, power generator, steel products. One break bulk working group member also indicated that much of the break bulk cargoes carried by their ships comprise highly valuable commodities.

2.3 Volume of Break Bulk Cargo

Imports and exports of break bulk cargo through Australian ports account for a significant percentage of total cargo volume carried by some major carriers. Seven of the ten shipping companies interviewed indicated that break bulk cargo plays a significant role in their business (see to Table 2). For some carriers imports of break bulk cargoes accounts for approximately 95% to 100% of the total cargo volume discharged at Australian ports. Exports range from 40% of the total cargo volume loaded by some carriers, to 100% for others. For two major carriers alone, their total inward and outward break bulk carryings reached more than 1 million revenue tonnes in 2008/2009.

Table 2: Shipping lines/agents playing a significant role in the carriage of break bulk cargo to/from Australia
For a list of abbreviations please refer to Appendix 2.

NYK
POST
INCHCAPE SHIPPING
GAC
WWL
AAL
MSA
SWIRE
SPLIETHOFF/ASIAWORLD
OLDENDORFF
GEARBULK
INDIAN OCEAN SHIPPING AGENTS

One global ship agency company that handles 8,500 port calls per year in Australia indicated that while break bulk cargo only represented approximately 5% of its business, that volume as a proportion of the total cargo handled by ships on their account reached more than a quarter of a million tonnes in/out

Australia. As a further indicator of the significant amount of project cargoes coming into Australia, one company has designed special equipment to handle these cargoes, e.g. the Samson heavy-lift trailer, rolltrailer, jack-up trailer, the air shuttle trailer and the Greenhofer, rubber tyred bogies and bolsters.

Port authorities, stevedores and importers/exporters interviewed verified the significance of break bulk shipping to Australia. Newcastle Port Corporation reported strong break bulk trade with 49.5% growth rate during the period of 1st July 2008 to end of March 2009 despite the downturn in the global economy. During an interview with the Port of Brisbane Corporation, SAL was advised that the Corporation had taken the potential of break bulk cargo into account in future planning at their Port West development. This project was originally intended to be used for motor vehicle pre-delivery inspection (PDI) and medium to long-term storage of motor vehicles. This is now being reconsidered to be constructed as three dedicated wharves for cars and general cargoes. P&O Automotive General Stevedores also commented that they expect break bulk cargo volume particularly project cargo volume, to increase in the next few years. Furthermore, importers/exporters also indicated a significant increase in break bulk cargo volume in 2008 and were confident of the future as noted below:

- Stemcor Australia Pty Ltd and CMC Australia Limited, two major steel importers in Australia, alone accounted for a total import volume in 2008 of approximately 850,000 tonnes. Despite the economic downturn, they both expressed confidence in the future of steel imports.
- Innovative Timber Ideas, a major timber importer, expressed a preference to move more of their timber products in break bulk form. Their product and logistics/distribution arrangements are more suited to timber being imported in packs rather than containers.
- Caterpillar Logistics Services Inc. described how their large machines and equipment supplies support several important projects and industries in Australia. In Melbourne alone, Caterpillar provides machinery for 40-50 projects simultaneously; it has also won the machinery supply contract for the Olympic Dam expansion project in South Australia for which more than 500 over dimensional and heavy machines are expected to be imported into Australia over the next five years.

Australia is not the only nation experiencing substantial growth in break bulk cargo through its ports. The increasing demand for steel and project cargoes has been stimulated by massive government spending on infrastructure improvements worldwide which in turn has stimulated the break bulk sector. As a result the sector is expected to experience continuous growth with the expectation of increased break bulk shipping services provided by various shipping lines. Consequently, the major project cargo shippers such as General Electronic, France's Alstom and German industrial giant Siemens will no longer have to rely on older and slower tonnage to transport their turbines and electrical power equipment.

3 GENERAL CARGO SHIPS

General cargo vessels account for a respectable proportion of the world merchant fleet. At the beginning of 2008, the total number of general cargo ships in service was 17,647 totalling 105 million DWT worldwide (Shipping Statistics Marketing Review- SSMR 2008). This amounted to 9.4% of the total tonnage of merchant vessels that includes tankers, bulk carriers, container ships, general cargo ships and passenger ships (SSMR 2008; UNCTAD 2008).

A steady growth in the number of general cargo ships worldwide reflects the strong and stable traffic growth internationally. For example during the period 2003 to 2007, 2,013 general cargo vessels with a total of 14.5 million were added to the world fleet (SSMR 2008). The scrapping level for general cargo vessels was extremely low because of the strong level of demand for break bulk tonnage (Plume 2006; SSMR 2008). In 2007 new orders for 800 general cargo vessels at 10.4 million DWT were placed with shipbuilding yards and only 191 general cargo vessels with a total tonnage volume of 1.1 DWT were reported to have been broken up (SSMR 2008, 1 & 2).

Table 3: Orders For New Ship Buildings

Orders at start of year	Order book multi-purpose general cargo ships (total)	DWT (A$, million)	Change compared to previous year
2007	1057	13.8	55.1% increase
2008	1421	8.7	50.0%

Source: Shipping Statistics and Marketing Review (2008)

It is worth noting that single and multi deck ships are not separated in the order book entries.

When trade grew sharply in 2007/2008, ships suitable for carrying break bulk cargo were still in short supply (Ferrulli 2007; SSMR 2008). The substantial growth in cargo opportunities also attracted others to the break bulk market. For example, six Suezmax vessels from Frontline, an oil tanker company, were converted to heavy lift vessels while established break bulk operators were preparing to take delivery of new multipurpose ships (Dynaliners 2009). An SAL member reported that since early 2008 they have had on order ten 31,000 dwt multipurpose vessels with 700 tonnes heavy lift capacity each (Dynaliners 2009). Rickmers Linie ordered four up to eight 24,000 dwt multipurpose vessels in July 2008 (Dynaliners 2009).

However, a downturn occurred after the 2008 global financial crisis hit resulting in a large number of new building cancellations by major operators beginning in mid 2008 (Dynaliners 2009). Despite this 73.5% of the general cargo vessels i.e., 1,057 vessels, in the order book are still expected to be delivered by the end of 2009 which will provide significant extra capacity for break bulk cargo (SSMR 2008). The new orders for general cargo vessels are expected to continue growing at 3.5% annually through 2012, less than other segments but nonetheless significant (Lloyd's Register Fairplay 2009; MarineTalk 2009).

In the Australian break bulk trade the average size of multipurpose vessels is typically in the 15,000 DWT to 30,000 DWT range, with a small number of vessels – mostly RoRo, up to 40,000 DWT that are employed on round-the-world services (see Table 4).

Table 4: Vessels Employed in Australian Break Bulk Trades – Sizes and Services

Shipping lines	Vessel Sizes (DWT)	Service Types
Austral Asia Line	17,000-30,000	Liner/Tramp
Swire	23,000-30,400	Liner/Tramp
Spliethoff	12,000-22,000	Liner/Tramp
Wallenius Wilhelmsen	16,900-40,000	Liner
Oldendorff	Approx. 30,000	Tramp
Gearbulk	Approx. 40,000	Liner/Tramp

Source: Shipping Company Interviews and Official Websites.

The majority of multi-purpose general cargo ships have squared hatches, box shaped holds and the ability to adjust the tweendecks to different heights to provide easier access for cargoes. Break bulk operators not only run tramp services in Australia, calling at ports as per cargo demand, but also provide services on a liner basis, maintaining regular schedules to fixed ports.

4 INTERNATIONAL SIGNIFICANCE OF BREAK BULK CARGO

Break bulk, the forgotten cousin of the global shipping industry, has received international attention recently mainly due to the large number of major infrastructure and commercial projects underway worldwide e.g. mining projects and renewable wind power projects. The demand for break bulk cargo space for machinery, equipment and components needed for construction of these projects has been strengthening for some time across Europe, North America, South America, Middle East, Asia and Africa as well as for Australia (Barnard 2007). Although the global economic downturn caused by the GFC has softened the demand for many break bulk cargoes, the long term international significance of break bulk cargo to be moved by sea cannot be discounted.

In the USA, break bulk cargo has been perceived as an important one for the shipping industry and is expected to remain strong at least for the next ten years (GlobalSecurity.org n.d.). Although the global economic recession threatens to slow the overall increase in containerized trade to/from the USA, the growth of breakbulk business is not likely to slow to the same extent. The main break bulk ports in the USA are attracting new break bulk services to handle the increasing traffic (Leach 2008). For instance, in March, 2009, South Carolina Port Authority reported a 26.5% increase in break bulk volume for this fiscal year, compared with 2008 (Bird 2009). The cargoes included machinery and wind turbine equipment and are providing steady business for break bulk ports and carriers (Leach 2007; Nodar 2008). Interestingly, US ports are seeing sizeable volumes of used equipment being shipped to the Middle East, West Africa, India, China, South America and Russia (Leach 2008). The interest in wind power has seen a considerable rise in the number of vessels that carried wind energy components to a number of East Coast US ports (Nodar 2008).

In Canada, various players (e.g. freight forwarders and exporters) involved in international trade reported a capacity shortage for break bulk cargo. Some exporters are also struggling to find available space on a limited number of vessels (Horibe 2008). Others have to book shipments for break bulk cargoes weeks in advance (Horibe 2008). They also strongly believe that shipping services in the break bulk sector must improve due to the high demand for resources, mining, oil and gas development and exploration in Canada (Horibe 2008). Despite the global downturn forcing delays and cancellations of some energy and infrastructure projects from Canada to Australia, the lack of vessel space for over-dimensional equipment and understaffing at shipping lines are the existing problems and will affect the future development worldwide when trade recovers (Horibe 2008).

In a special break bulk report in Canada's weekly transportation and trade logistics magazine—Canadian Sailings' - Kathlyn Horibe (2008) stated that "*Break bulk is definitely a smaller piece of the transport pie, but its importance can never be undervalued. We'll always have a need for heavy industry, power generation and refineries, but we may lose the infrastructure and ability to rebuild these industries in Canada.* "

In Europe, although break bulk is a relatively small business compared with container handling, European ports still support break bulk operations. In particular, Europe's top ports (e.g. Rotterdam) are refocusing their efforts on break bulk and general cargo now because they consider break bulk adds greater value (Barnard 2008). Also, the 4th

annual break bulk European conference and exhibition was held in Antwerp— for decades Europe's most important gateway for steel products—on 26-28 May, 2009 (Port of Rotterdam). The allure of break bulk in Europe was partially aroused by Babcock and Brown Infrastructure (BBI), a Sydney based unit of Australia's second-largest investment bank (Barnard 2008). They announced break bulk cargo handling acquisition at several European ports from Finland to Italy (Barnard 2008). As BBI has demonstrated, there are still plenty of benefits (e.g. strong and stable traffic growth, lucrative untapped consolidation prospects, solid operating margin for well-run operations) to be exploited in the "unfashionable" break bulk sector although severe uncertainty will be faced by them (Barnard 2008).

Asian break bulk and project cargo shipping has experienced double digit growth annually in the past few years. According to the Breakbulk Asia Transportation Conference in Singapore (17 & 18 Feb, 2009), the demand for break bulk cargo especially project cargo remains strong in China and South East Asian countries. Despite being heavily hit by the economic crisis, China continues to invest multibillion dollars in infrastructure projects such as refineries, highways, power plants and airports resulting in an on-going strong demand for break bulk imports. Moreover, many Chinese ports are experiencing a boom in break bulk shipments to and from Africa because of China's growing infrastructure investment aid to Africa (McLymont 2008).

Some African countries, whose economies have been increasing at the rate of 5-6% annually in last ten years, need large scale infrastructure projects such as new transportation and power plants to support further growth (McLymont 2008). With large amounts of cash reserves provided by China ($1.6 trillion), USA ($62 billion) and other western countries, substantial infrastructure projects that are going to benefit African countries will boost the demand for break bulk imports (McLymont 2008).

In summary, international awareness of the importance of break bulk shipping will continue increasing due to the global demand for break bulk cargo which is projected to be strong especially for timber, steel, machinery and other oversize equipment for worldwide investment on infrastructure development and resources exploration.

5 AUSTRALIAN PORTS WHERE BREAK BULK CARGO IS HANDLED

5.1 Ports

According to the Journal of Commerce's Breakbulk ports directory, 52 ports in the USA, 9 ports in South America, 6 ports in Europe, 6 ports in Africa and 11 ports in Asia have been identified as major break bulk harbours (Brooks 2009). Only 1 port in the Australia-New Zealand area - Port Nelson, was included (Brooks 2009). The 85 ports mentioned in the directory are not all-inclusive, but they represent international awareness of those ports. Australia, which has at least 27 port handling break bulk cargo, deserves to be included, as this report demonstrates.

Most of Australia's major ports and many regional ports are involved in break bulk activities. A large variety of break bulk cargoes are handled at these ports; the main types being steel, machinery, timber, general cargoes including project cargoes.

Figure 1: Ports in Australia Where Break Bulk Cargo is Handled

Few of these ports have rail connections to the berths where break bulk cargo is discharged/loaded. Rail is not always the preferred method of transporting this cargo mainly due to double handling required at some stage in the movement. Generally, cargo handling equipment for break bulk cargo at most break bulk ports comprises only basic equipment such as forklifts and in some cases shore cranes, while some ports lack adequate undercover storage areas for weather sensitive products. Appendix 1 shows

that almost half of the 27 ports listed have no covered storage areas for at least one or two of their break bulk berths.

5.2 Principal Break Bulk Ports

5.1.1 Townsville

The Port of Townsville is one of Queensland's fastest growing ports and acts as a gateway for export commodities, mainly minerals, sourced from the West and North-West of the State as well as Raw Sugar from plantations to the North, West and South of the port. The port is also the entry point for crucial imports to service these regions e.g. mining equipment, construction steel and cement. During the 2007/2008 financial year, the port handled 780 vessels and almost 10 million tonnes of cargo, achieved an average berth utilisation of 32% and reached a net profit of A$7,164,597 almost five-times its target of A$1,538,345 (The Port of Townsville 2007-2008 Annual Report).

At Townsville three berths can be used for handling break bulk cargoes. These are Berth 3, Berth 8 and Berth 10. Berth 3 is a 283.5 metre general purpose wharf that services containerised cargo, mineral exports, fertilizer imports, and live cattle exports (by rail). This berth is leased to Xstrata and operated by Northern Shipping and Stevedoring Pty Ltd.

Berth 8 is a 213 metre multi-purpose wharf equipped with bunker pipelines and used for frozen beef, scrap metal, timber, general cargo and fertiliser. Berth 10 is leased to Patrick Stevedoring and is a 160 metre general purpose berth occasionally shared with Australian Defence Force vessels. Typical cargoes handled over this wharf include containerised trade, general cargo, and livestock.

From interviews conducted with lines operating services into Townsville, three major deficiencies in handling break bulk cargoes were mentioned.

1. Although 3 berths are used for handling break bulk cargoes, berth availability is still a problem. In particular, break bulk cargoes compete with containers and bulk cargoes at Berth 3. At Berth 8, despite the concrete piles underneath the wharf deck is cracked; trade currently handled at Berth 7, mainly bulk minerals, might be transferred to Berth 8 due to the deteriorating condition and the planned demolition of Berth 7. Berth 10 is operated by Patricks and is predominantly used for the container trade. The Australian Defence Force is planning to operate new Panamax sized amphibious vessels from Berth 10 regularly in the near future, which will make berth availability at Townsville of greater concern.
2. The second deficiency is lack of cargo handling equipment. One of the carriers interviewed stated that Berth 3 is the only berth with a shore crane.
3. The availability of sufficient shed space for break bulk cargo is also a problem at Townsville.

Both Townsville port and North Queensland mineral exports are set for growth and expansion as more cargoes (e.g. mining equipment, building steel, rail wagons) that can only be accommodated on break bulk vessels, will go through this port. The importance that the port authority gives to this growth potential is not apparent. For instance,

according to the Port of Townsville Annual Report 2007/2008, most of the strategies on port infrastructure development and port expansion were not achieved although the Board approved a 10% increase in berthage and harbour dues implemented on 1 July 2008 (The Port of Townsville 2007-2008 Annual Report).

Since this report was compiled the port authority has announced a further increase in port authority charges will be implemented from 1 July 2009. Also, that tenders have now been called for concrete remediation work on Berths 1, 8, 9 and 10.

5.1.2 Brisbane

See Section 7 Case Studies

5.1.3 Newcastle

The Port of Newcastle is an important economic and trade centre for New South Wales, in particular the Hunter Valley and much of the north and northwest of the State; the port authority is the Newcastle Port Corporation (NPC). It is one of the world's largest coal export ports, with coal representing 90% of the total throughput tonnage. Since trade diversification is an important focus for the port, NPC is dedicated to developments in other bulk commodities e.g. grains, alumina, mineral concentrates and general cargoes e.g. aluminium, steel, machinery and heavy equipment for the mining industry or other projects. For example, recently four gas turbines totalling in excess of 1,680 tonnes arrived at Newcastle West Basin in 2008 from Rotterdam bound for the Colongra Power Station project on the NSW Central Coast.

During 2007-2008 financial year the port handled around 3,000 ship movements, achieved a trade throughput of 93 million tonnes valued at A$10.3 billion, and produced a profit after income tax of more than A$12 million. In the 2008-2009 financial year the port is expected to reach another throughput record of about 96 million tonnes despite the downturn in the global economy. Steel and other general cargo trade during the July 2008 - March 2009 period has increased by 149,964 tonnes or 49.5% compared to the corresponding period in 2007-2008 (NPC 2009).

No. 1 Eastern Basin, No.2 Eastern Basin and No. 4 Western Basin are the locations of the port's break bulk cargo activity. Eastern Basin services a variety of break bulk cargoes such as aluminium, steel and timber products. It includes two common user berths—No. 1 and No. 2 Eastern Basin— where the depth of water is 11.6 metres and berth lengths of 200 metres and 185 metres respectively. They share a 4ha stacking area and a 7120m^2 warehouse on the wharf. No. 4 Western Basin is a 258-metre heavy duty cargo berth with 11.6 metres depth alongside catering for all types of break bulk cargo including project cargo such as power generators and rail wagons. Back-up storage areas of 1.5 hectares and a stern ramp are available at this berth.

Besides being one of Australia's high volume tonnage throughput ports, Newcastle is one of its oldest and as a result some facilities are outdated and inadequate for the efficient handling of the quantity and type of cargoes now arriving in Newcastle. In regard to the efficiency of wharf facilities, a member indicated that the quay length at East Basin is not enough for its current geared ships let alone its new generation vessels due later in 2009. Problems about insufficient water depth alongside East Basin and the

limitation of pavement weight loading at West Basin were reported by another member. Also, there is only one shed at East Basin which is insufficient for storing all of the weather sensitive products e.g. steel. When the shed is full, shipping companies face the risk of cargo damage or otherwise have to store vulnerable cargoes in warehouses away from the port area.

Road and rail connection to/from the port have been reported as inadequate when compared for example, at Port Kembla, which is a cost to shipping lines. One major carrier reported that the F3 Freeway from Newcastle to Sydney does not provide direct access to cargo destinations in the Sydney region and weight limits on some bridges apply whereas direct to importers premises delivery by road from Port Kembla to Sydney, is largely unimpeded. It was stated that the only berth with an adequate rail connection is West Basin No. 4.

There is also a natural constraint at Newcastle that is almost impossible to overcome—the port will close 15 days a year on average due to bad weather which causes a surge in the port and can restrict ship movements.

Through its strategic planning, the Newcastle Port Corporation is encouraging growth in new general cargo trade e.g. steel whilst at the same time maintaining the growth in existing trade. According to the NPC website, considerable planning is being undertaken now and will continue into the future, aimed at further diversifying cargo moving through the port which will steadily increase the number and types of ships visiting the port. In particular, the former BHP site at Mayfield, now the Intertrade Industrial Park, will be developed to be an eight-hectare general cargo facility which can cater for a wide variety of cargo from steel, machinery to other specialist cargoes. However, in the Port Corporation's view, the new upgrade project at the former steelmaking site will remove the need to construct a planned A$2 million cargo storage and distribution shed at West Basin.

5.1.4 Port Kembla

Refer to Section 7 Case Study

5.1.5 Melbourne

The Port of Melbourne is situated at the hub of a logistics network which extends to South Australia, Western Australia, regional New South Wales, the East Coast of the Australian mainland and Tasmania. Melbourne is Australia's largest container port and also an important gateway for break bulk, liquid bulk, dry bulk cargoes, motor vehicles and other

Table 5: Total Trade by Cargo Type Melbourne– 2007-2008

Cargo type	% Contribution	Revenue Tonnes
Containerised	71%	53,707,305
Break bulk	12%	9,910,258
Liquid bulk	7%	5,022,172
Dry bulk	5%	3,192,088
Other	5%	3,882,350
Total	100%	75,714,173

Source: Annual Report 2007-2008 (PoMC)

commodities (see Table 5). Break bulk cargo which includes motor vehicles, timber, paper, iron and steel contributes about 12% of total cargo throughput in revenue tonnes.

The Port of Melbourne Corporation (PoMC) owns and leases 34 commercial berths at five docks and at river wharves handling more than 3500 commercial ship calls each year (PoMC 2008). In 2007-2008, operational performance in the Port reached approximately A$90 million in exports handled on average each day (PoMC 2008). Total port trade grew 6.7% to reach a record 75.7 million revenue tonnes (30.8 mass tonnes) with a solid revenue of A$171.5 million (an increase of A$29.4 million compared with 2006-2007) and operating profit after income tax of A$43.3 million for 2007-2008 (an increase of $21.4 million compared with 2006-2007). In particular, A$97.2 million was generated by wharfage only in 2007/2008 which was A$20 million more compared to the previous year (PoMC 2008).

Eight berths are usually used for handling break bulk cargo at Melbourne. Appleton B, C & D are operated by POAG as multipurpose facilities offering services for containers, general cargo and motor vehicles. The total length of this facility is 584 metres with 10.7 metres depth alongside. There are two 8500m^2 and one 7500m^2 sheds at Berth B, C and D respectively. Regarding the cargo handling facilities, Berths B & C have one 35t Favco wharf crane, twenty 35t forklifts and four mafi trailers while there is one 110t harbour crane at Berth D.

Patricks operate Webb Dock berths 3 & 4 which together provide 8ha of land for general cargo. Berth 3 is 210 metres long with a water depth of 10 metres while Berth 4&5 are 530 metres long in total and 12.5 metres deep. The shore side facilities offered by Patricks are one 13,000 m^2 shed, twelve 28-35 tonne and fifteen 2-16 tonne forklifts.

Victoria Dock is another common user general cargo berth where bulk and break bulk cargo e.g. timber, steel, paper products and cement imports are handled. This berth is 200 metres in length with 9.4 metres in depth alongside with 5,516 m^2 shed space. In addition, the remaining two berths are located at South Wharf 28 and 29 with 292 metres in total of berth face and 9.4 metres of water depth, which are managed by PoMC to be used either as a lay-up berth or as a common user facility.

Various deficiencies in Melbourne's breakbulk facilities were advised during interviews with shipping companies and importers. Shipping lines indicated that the progressive reduction in the number of break bulk berths is a primary concern. The number of break bulk berths has declined from 14 in 1999/2000 to 8 in 2009 with further possible reductions decreasing that number to 6 or less (PoMC 2000). A member stated that break bulk vessels might not be able to call at Melbourne within 10 years unless the PoMC plans long term facilities for break bulk cargo. Another member was also concerned about the fierce competition for berths between shipping lines that could emerge in the near future due to lack of sufficient berth availability.

The lack of undercover storage at Melbourne was also commented on by four interviewees. Although shed space provided at the port is proportionally better compared to other ports, it is still insufficient due to the larger amount of weather sensitive cargoes discharged, e.g. Melbourne is the major discharge port for CMC and Stemcor—two of the largest steel importers in Australia. The other significant deficiency is related to the lifting capacity and cost of shore cranes at Port of

Melbourne. For example, it was reported that the crane cost is A$20,000 in Melbourne compared with A$2,700 in Southampton for similarly rated cranes, and the lifting capacity of the Favco crane at Appleton Dock B&C is only 35 tonnes. Other productivity impediments advised by major break bulk shipping lines were insufficient skilled labour, pavement restriction at Appleton Dock and insufficient operating hours for receival and delivery.

In 2007/2008 the PoMC invested A$175.3m in capital expenditure projects of which only 0.7% was spent on break bulk facilities (PoMC, 2008). As a major port for national container traffic, handling around 36% of the nation's container trade, the majority of expenditure appears aimed at coping with increasing container traffic, e.g. Channel Deepening Project expenditure in 2007/2008 of A$126.8 million with much larger amounts budgeted for future years until completion and rehabilitation works for container berths at Swanson Dock over A$40 million. Consequently, PoMC's primary future plan appears to be to ensure sufficient capacity to accommodate the container trade demand which is forecast to grow to 8 million TEU by 2035 or 22,000 containers on average every day (PoMC, 2008). PoMC's plan to reduce break bulk berths is expected to commence in 2013/2014. Consequently, all the general cargo traffic currently moving through that berth will then have to move through Appleton Dock berths B, C & D, Victoria Dock and South Wharf or newly constructed facilities. However, if new general cargo berths are not constructed, draft constraints at South Wharf and capacity limitations at Victoria Dock, will mean a substantial amount of break bulk cargo will be forced to use Appleton Dock B, C & D. This will place a greater strain on the already limited capacity, leading to intense competition between shipping lines for a paucity of berths.

"Port Futures", a Government report to be released later this year will hopefully address these identified deficiencies.

5.1.6 Port Adelaide

Port Adelaide, situated at the centre of Australia's southern coast, provides South Australia with a gateway for exporting grains, wine, motor vehicles and automotive components, ores and concentrates. The port management comprises a 99-year land lease and port operating license held by Flinders Ports. SAL was advised that the main break bulk cargo handled at Adelaide is general cargo, steel, scrap, logs and equipment for wind power generation.

Table 6: Break bulk cargo volume in Port Adelaide

Years	Break Bulk (Tonnes)	Non-containerised Cargo (Tonnes)	% of Break Bulk in Non-containerised Trade
2003	248,308	8,865,904	2.80%
2004	294,094	8,209,114	3.58%
2005	300,032	9,426,416	3.18%
2006	211,005	8,060,484	2.62%
2007	193,066	9,127,580	2.12%
2008	195,585	8,850,589	2.21%
Average	**240,348**	**8,756,681**	**2.75%**

Source: SAL calculation based on Port Statistics (Flinders Ports 2009)

In the 2007/2008 fiscal year, 1,200 vessels carrying 179,135 TEUs and nearly 9 million tonnes of non-containerised cargoes were handled in the port. The volume of break bulk cargo is relatively small and only accounts for about 2.2% of non-containerised trade in 2007/2008 (see table 6).

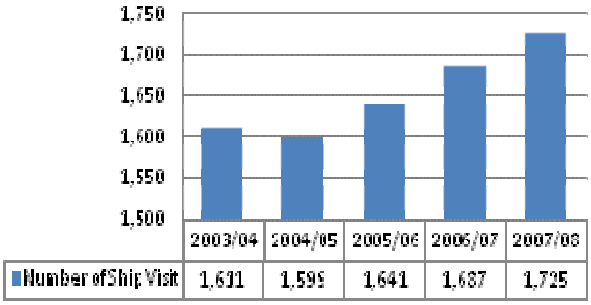
Six berths, which are leased by Flinders Ports to Patricks and POAG, are used for handling break bulk cargo. Inner Harbour berths numbers 18, 19 and 20 have 178, 168 and 163 metres in length of wharf face respectively and 10 metre depth alongside. The storage spaces in the transit sheds at these three berths are 4092m^2, 2877m^2 and 2640m^2. Inner Harbour berth 29 is 245 meters long and 10 metres deep with a wharf face of 163 metres in length. A small backup shed is located here. Osborne, an inner harbour location, comprises two berths; Osborne 1 is 208 metres long with 10 metre depth alongside while Osborne 2 is 159 meters long with 9.4 metre depth. Since only a few breakbulk shipping lines call at Port Adelaide, the undercover storage area is generally sufficient. However, there is insufficient cargo handling equipment i.e. cranes, at these berths.

Berth priority and undercover storage are two prominent issues at Port Adelaide. In particular at the Outer Harbour car carriers have berth priority over break bulk vessels resulting in vessels with break bulk cargo having to use Inner Harbour berths. However, with the draught at Inner Harbour berths only 10 metres this adds to uncertainty of berth availability and impedes break bulk vessel operation to a great extent. Another major deficiency is the poor condition of cargo sheds – leaking roofs - at the Inner Harbour berths. A line reported that they had experienced damage to newsprint at these sheds. Berth priority is also given to cruise ships at an Outer Harbour berth.

Port Adelaide is expected to experience strong growth from the import of wind generators and associated equipment with the construction of the world's largest wind farm south of Adelaide. However, there is some doubt about the capability of existing shore cranes to handle this volume of cargo. One major carrier, indicated that Flinders Ports is not willing to invest in cargo handling facilities citing several reasons for this e.g. pavement weight constraints for new cranes. The future port development blueprint proposed by Flinders Ports appears to be concentrated on the bulk and container trade. Resulting from the expected continuation of the mining boom, Flinders Ports has demonstrated their commitment to develop Port Adelaide as a major bulk cargo handling facility for Southern Australia. For instance, a new multiuser bulk handling port facility on a portion of land beside existing Berth 29 in the Inner Harbour of Port Adelaide is to be developed with the expected unprecedented growth of the mining industry in South Australia. Similarly, Flinders Ports also want to develop the Outer Harbour of Port Adelaide as a central hub for the import and export container trade. Flinders Ports has signed a joint venture agreement with DP World operator of the Adelaide Container Terminal, which include a 30-year concession for DP World's operation in the port.

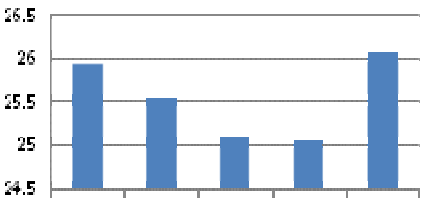
5.2.7 Fremantle

Figure 2: SHIP VISIT FROM 2003/04 to 2007/08



	2003/04	2004/05	2005/06	2006/07	2007/08
Number of Ship Visit	1,611	1,599	1,641	1,687	1,725

Figure 3: TRADE VOLUME FROM 2003/04 to 2007/08



	2003/04	2004/05	2005/06	2006/07	2007/08
Trade Volume (million mass tonnes)	25.94	25.55	25.11	25.85	26.08

Source: Fremantle Ports Annual Report 2003/04 – 2007/08

The Port of Fremantle is managed and operated by Fremantle Ports, a WA State Government enterprise. The port is an important strategic gateway for the trade to/from with Asia, Middle East, Africa and Europe and is well positioned to be the first or last Australian port call for those trades. It is also the biggest and busiest general cargo port in Western Australia handling approximately 82% by value of the State's seaborne imports and 27% of the value of the State's seaborne exports (Fremantle Ports, 2008). The port operates from Inner Harbour at Fremantle and Outer Harbour at Kwinana. Outer Harbour berths are leased by Fremantle Ports to private operators Alcoa, BP and Co-operative Bulk Handling. The Inner Harbour provides facilities for handling livestock exports, motor vehicle imports, other general cargo trade, cruise ships and visiting naval vessels and also includes the only two dedicated container terminals in Western Australia handling almost all of the container trade for the State. The Outer Harbour is one of Australia's major bulk cargo handling facilities for grain, petroleum, liquid petroleum gas, alumina, iron ore, coal, fertiliser, sulphur, pig iron and other bulk commodities.

During 2007/2008, the number of ship visits reached 1,725, a slight increase of 2.3% compared with 2006/2007(see Figure 2). In the year 2007/2008 Fremantle Ports declared a 16.6% rise in revenue and 47.9% growth in profit after tax, to a new record of A$122.5 million and A$17.9 million respectively. The total volume of imports and exports that passed through Fremantle in that year reached 26.08 million tonnes valued at A$24 billion (see Figure 3), of which break bulk cargo accounted for approximately 3.2% of import volume and 4.2% of export volume.

In the Fremantle Ports' Annual Report 2007/2008 the strong growth of break bulk cargo was highlighted and it was pointed out that the growth rate of break bulk cargo was higher than total trade volume growth rate of 4%. Figures for iron and steel break bulk imports showed a growth rate of 8.5% (Fremantle Ports, 2008). Other break bulk cargoes to show significant growth were imports of industrial and agricultural machinery and vehicles and exports of scrap metal. In order to cope with the buoyancy of the break bulk import/export trade, Austral Asia Line (AAL), Wallenius Wilhelmsen, Spliethoff and Pacific Orient Sea Transport (Post) all provide regular break bulk services to Fremantle.

Berths 1, 2, 11 and 12 at North Quay are the four common user berths with 11 metres depth of water alongside that are used for handling break bulk cargo in Fremantle. Berths 1 and 2 are 207 metres and 175 metres long respectively. The storage areas at these two berths are 16,130m^2 and 7,495m^2 open stacking areas without any common user undercover storage space. At Berth 11 and 12, the berth lengths are 196 metres and 233 metres with 26,203m^2 and 12,906m^2 open spaces for stacking cargoes respectively. There is an old shed at Berth 11 and 12 used for break bulk cargo. Break bulk cargo is handled by ship's gear and there are few cargo handling facilities provided by stevedores—Patrick and POAG.

In 2007/2008 Fremantle Ports reported the overall satisfaction with services provided by Fremantle Port fell significantly to 88% compared with 95% in 2005/2006 (Fremantle Ports 2006, 2008). The average delay on berth availability is 3.1 hours at Inner Harbour and 75 hours at Outer Harbour (Fremantle Ports, 2008). Both shipping lines and steel importers reported that undercover storage area is in short supply nationally and Fremantle is the port where this occurs most. It was indicated that insufficient undercover storage is provided on Berth 1 and 2 and shipping companies require shed storage at those wharves in order to protect vulnerable products such as steel. But, the shed capacity is too small and can be quickly filled up. Any party who does not secure shed space risks possible damage to their cargoes. Similarly, it was commented that Berth 11 and 12 has an inappropriate shed with open end faced west, which cannot stop the wind from the west risking damage to their vulnerable cargoes.

Another major deficiency closely aligned with shed space is the inadequate free storage period of 3 days. Stemcor argued that some of their cargoes such as an 8,000 tonnes steel shipment need at least 5 days for delivery but the port authority would not extend the free storage period resulting in substantial storage costs. Another major deficiency is insufficient berth availability resulting in berth competition. In 2000, a wide range of non-containerised cargoes including steel, timber, agricultural machinery, cables and paper was handled at both North Quay and Victoria Quay (Fremantle Development Plan 2000), but now the operation of break bulk cargo has been limited to the four berths at North Quay.

The shortage of break bulk cargo handling facilities forces shipping lines to spend more money on hiring facilities which build up the cost structure for break bulk cargoes. Most shipping lines also reported their dissatisfaction with stevedores' services and charges. In particular, it was advised that the stevedoring services provided by Patrick are inadequate due to lack of labour availability and shortage of stevedoring skills and experience. However, another comment was received that over the past 12 months Patricks have become proactive and competitive. They have engaged industry both shipping and cargo to ensure effective consultation before a vessel arrives and they are allowing delivery during discharge to avoid cargo going into storage. Other deficiencies reported at Fremantle are insufficient wharf space for large consignments, congestion on the road approach to the berths and no manned security gate or security checking, causing port congestion, damage to and theft of cargoes.

In Fremantle Port's Annual Report (2008), the break bulk shipping services and their associated trade volume have been identified as a potential growth sector to Fremantle's future trade. Fremantle Ports stated their concern at the significant stacking area required by break bulk imports and exports and in consequence they will continue to

work with shipping lines to introduce better cargo handling plans at the common user berths in the Inner Harbour. However, their priorities of capital expenditure in the next five years are more associated with bulk and container trade, e.g. the expansion of bulk and container facilities in Outer Harbour.

5.1.8 Dampier

The Port of Dampier is managed by the Dampier Port Authority (DPA) a Western Australian State Government owned corporation. The port is situated at the heart of the resource boom in the Pilbara and continues to be a major centre for unprecedented growth in energy resource exports and for the development of the oil and gas industry on the North West Shelf. In the 2007/2008 financial year, Dampier has been confirmed as the world's largest bulk export port and has reached a new trade volume record of 133.95 million tonnes which was supported by 4029 ship calls during the year (DPA, 2008). DPA revenue and net profit achieved A$26.79 million and A$4.59 million respectively in 2007/2008 (DPA 2008).

The principal cargoes at Dampier are iron ore (83.5% of total throughput), salt, LNG, LPG, Ammonia, Condensate and general cargo. According to the Dampier Port Development Plan, the type of general cargo includes supplies for oil and gas rigs, fabricated steel structure, rail equipment, bulk/bagged/palletted cargoes and supplies for local construction projects. In the period 2007/2008, 31.41% of total imports comprised general cargo required for the construction and exploration activity in the Dampier region although the overall volume of general cargo only account for 0.28% of total cargo volume.

Five general cargo wharves and berthing facilities are mentioned in the Dampier Port Development Plan; these are:

- Dampier Cargo Wharf (DCW), built in 1981/82 and extended in 1994, consists of a concrete deck with a main wharf face of 209.65 metres and an inner face of 143.2 metres. The main or western berth has a declared depth of 10 metres and can accept vessels of up to 35,000 tonne deadweight. The eastern side is suitable for small craft and supply ships. DCW has a laydown area of 6,100m2 which provides sufficient capacity for the existing general cargo trade. The wharf has been specially strengthened for heavy lift cargo but structural repair work now in progress will involve temporary restrictions. However, DCW is outdated and in need of an upgrade to handle the expected trade volume in the future. For instance the existing layout of the facility hinders efficient general cargo handling and transfers and a cargo laydown area immediately adjacent to the berth is similarly lacking.
- DPA Heavy Load Out Facility is a 50-metre long berth with a depth alongside of 5.5 metres. It was built in 2003 as a temporary facility to support North West Shelf Venture (NWSV) Trunk Line Expansion Project (TSEP) and cannot be relied upon as a permanent facility beyond 2013.
- Pilbara Iron Service Wharf, managed and maintained by Rio Tinto Iron Ore, has a 69.5-metre wharf face. This swinging basin is 243.8 metres long with the approaching depth of 6.4 metres at eastern side and 6.7 metres at western side. This facility built in 1965 is used for petroleum imports only.

- Mermaid Marine Australia (MMA) Supply Base Wharf has 216 metres berth space adjacent to 12ha of laydown area and 3,700m2 undercover storage areas. MMA—Australia's largest marine services provider to the offshore oil and gas industry—provides cranes (up to 150 tonnes) and forklifts (up to 16 tonnes).
- NWSV Supply Base Wharf built in 1982 is located at Woodside Energy Limited's terminal. This facility is made up of four 50-metre berths to be used as a supply base to service rigs offshore.

Difficulties occur in operating ships with break bulk cargo at Dampier due to outdated berths lacking in wharf space, insufficient berth availability, berth priorities from a break bulk cargo interest perspective, limited R&D operation hours and a shortage of undercover storage area. According to the berth descriptions detailed above the existing general cargo wharves are either of outdated construction or designed for temporary use only. Existing general cargo berths are not long enough to take more than one large vessel at a time and demand for the facility is erratic with weeks of high demand and weeks of low demand (Development Plan). All cargo has to be discharged direct to transport which is time consuming and inefficient.

Berth competition had been reported by shipping lines calling at Dampier. Berth congestion has also been reported as a problem which is aggravated when general cargo ships encounter the port call of the coastal trading vessel "Kimberley Rose" which has the berth priority enforced by WA State Government. It was stated that general cargo vessels might be required to move off the berth to allow "Kimberley Rose" to berth, resulting in significant delay sometimes up to 12 to 14 days. The shortage of receival and delivery operation hours and undercover storage impedes break bulk operation in Dampier. In addition, labour issues also need to be addressed with stevedores needing to improve labour training and reliability.

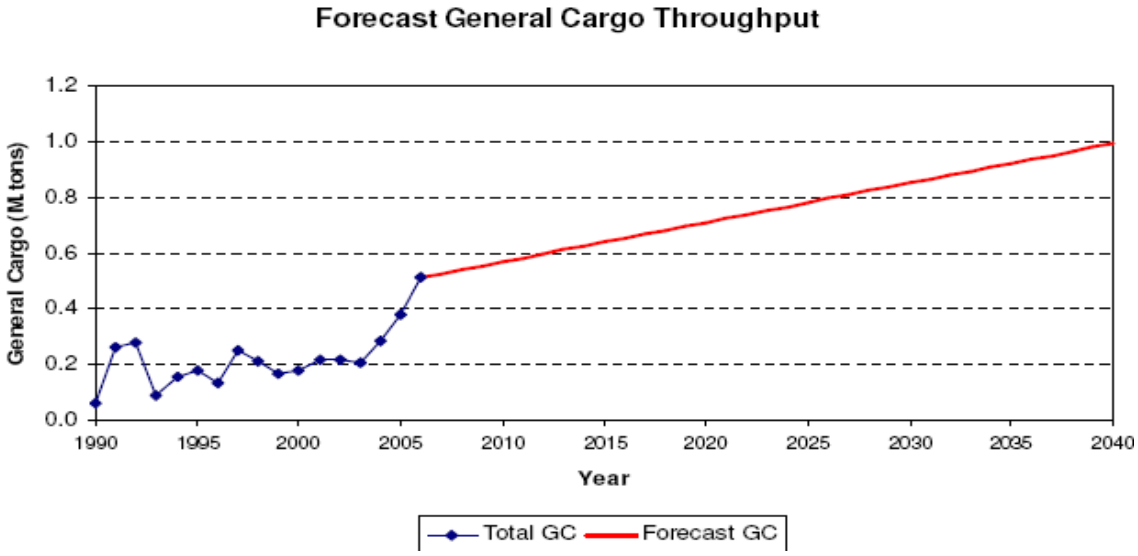


Figure 4: Forecast General Cargo Throughput
Source: The Dampier Development Plan (DPA 2008)

DPA has realised that the existing general cargo facilities will progressively either come to the end of their life or reach full capacity in the not too distant future. Meanwhile, additional general cargo berth capacity will be greatly in demand along with the anticipated average growth rate of 2.8% per annum (Figure 4). As a result, the DPA is considering three phases for future development of general cargo facilities to meet projected demand for additional space. In the first phase of 2007-2015, additional three

general cargo berths are planned and will be constructed at either Dampier or Maitland. In the second phase of 2016-2025 an additional eleven general cargo berths will be built to cater for the trade growth and replacement of the DCW. The final phase of 2026-2040, general cargo facilities at three possible areas—King Bay Industrial Estate, Dampier and Maitland Industrial Estate—might be further developed.

A member commented that provision should be made for larger PCTC and roro class vessels which will only add to the facilitation of imports of heavy machinery for mining and other infrastructure development. Issues to consider will be berth length or good dolphin systems, adequate berth strength and ramp landing areas unimpeded by wharf fixtures as well as an adequate back-up areas.

The issue of line handling (ie. mooring and unmooring) at WA regional ports in general has been an area of concern for a long time. The ports are squeezed to minimise costs and are unable to hold a permanent workforce for line handling.

6 PORT COSTS

6.1 Indicative Port Cost Comparisons for Selected Break Bulk Ports

6.1.1 Description of Port Costs

Shipping lines, importers and exporters of break bulk cargo all face a variety of port costs associated the with use of port facilities and other services, some of which are based on one-to-one commercial contracts between shipowner/operator and the service provider e.g. stevedoring companies and towage services. The table below separates these costs in different phases related to a typical ship call to discharge/load break bulk cargo.

Phase	Description	Examples of Port Cost	Service Providers
Phase 1	Arrival of the ship and On departure	Pilotage Towage Linehandling	Private provider or Port Authority, Private company Private provider, terminal operator or port authority.
Phase 2	At the Berth	Tonnage rate, conservancy, channel dues or similar.	Port Authority.
Phase 3	Landside Logistics & Cargo Distribution	Stevedoring Facility Access Fee Stevedore Access Fee	Private provider subject to contract e.g. AAT, POAG.

6.1.2 Scope of Port Cost Study

Although the users are ultimately concerned with the total costs associated with a port call, it was not possible to include all cost components in making the port to port comparison. An explanation of the various costs in the Phases identified above, are as follows;

- Phase 1 - Port charges are usually paid by the ship operator.
- Phase 2 – These are levied by the port authority and are paid by the ship operator.
- Phase 3 - Stevedoring and similar cargo costs are the subject of negotiation/agreement between the stevedore and shipping company;
- Facility Access Charges which are usually paid by stevedore and included in the stevedoring charge;
- Site occupation charges that are usually paid by stevedore and included in the stevedoring charge;
- The cost for Landside Logistics/Cargo Distribution are the responsibility of the importer and are beyond shipping companies' control.

Because of the confidential nature of charges agreed between the ship operator/stevedore/terminal operator, only the charges in Phases 1 and 2 are included in the comparison.

6.1.3 Port Cost Study Methods

The objective of the cost analyses is to provide some measure for the comparison of port charges at one port with those of another to determine where, if any, considerable differences might exist and to explain those differences. This study can be presented in at least three ways.

The first method is tabulating the standard tariff rates of port authority and port service charges at five major break bulk cargo ports in terms of tonnage handled. This would provide a basis for comparison but not in an ideal form as it would only present very basic data which SAL members already know and would not effectively address the objective.

An alternative is to calculate an average cost using actual costs incurred for vessels calling at given ports over a twelve month period. It was recognised that certain charges are negotiable between service providers and shipping lines and would require shipping companies to provide data that might be commercially sensitive. However, the data on actual costs incurred was not available.

The third method is using a standard size and type of vessel as a constant and applying the public standard tariffs of port authority and service providers to calculate the total cost. This method does permit a direct like-for-like comparison. However, it might not reflect actual costs for all ports as it ignores any negotiated costs that might exist and it does not allow for different sized ships.

It was decided to adopt the third approach for the port cost comparison study.

6.1.4 Indicative Port Cost Comparison

Tables 7 to 13 refer to the port costs for a 15,000 GT/100 metre LOA break bulk vessel and table 13 sets out indicative port call costs for a 67,000 GT/240 metre LOA large PCTC or ro ro vessel.

Table 7: Basic Assumptions for the Port Cost Comparison Study

	Unit	Conventional break bulk vessel	Larger PCTC vessels/Ro Ro
Vessel Size	GT (tonnes)	15,000	67,000
	LOA (metres)	150	240
Tugs required	On berthing	2	2
	On sailing	2	2

Total Indicative Ports Costs of a Conventional Break Bulk Vessel

Because of the significance of the towage cost to the overall port costs, two alternative formats for comparing ports were used. Alternative 1 includes tariff charges for the use of tugs provided by Svitzer. Alternative 2 for tugs provided by PB Towage; this is only applicable at Brisbane and Melbourne. The difference between the two alternatives for towage is approximately $2200 for Melbourne; Brisbane is slightly more expensive for towage under Alternative 2.

Table 8: Total Port Call Costs Incurred – excluding GST

	Alternative 1	Alternative 2
	$	$
Brisbane	20,709	19,964
Newcastle	24,206	na
Port Kembla	18,626	na
Melbourne	30,022	24,222
Fremantle	14,068	na

The next table ranks the five ports according to the different alternatives of towage service provider. Melbourne ranks as the most expensive port in both categories. In Alternative 1, the total cost excluding GST is $30,022 per port call at Melbourne which is about 24% more expensive than the closest port Newcastle. The least costly port is Fremantle at $14,068 per port call which is about 53% cheaper than Melbourne.

The change in towage provider does not alter the ranking according to the total port call cost from the highest to the lowest.

Comparison of Breakdown Cost—Alternative 1

To compare the cost components for a typical vessel entering each port, two tables are provided. Table 9 shows tariff costs and Table 10 shows costs on a percentage basis.

Table 9: Comparative Port Costs ($) – Alternative 1

	Brisbane	Newcastle	Port Kembla	Melbourne	Fremantle
	$	$	$	$	$
Pilotage	6,454	2,818	2,506	7,245	2,726
Towage	10,920	12,060	7,400	13,800	8,720
Linehandling	725	2,860	3,020	0	167
Port Authority	2,610	6,468	5,700	8,978	2,455
	$20,709	$24,206	$18,626	$30,022	$14,068

Port Authority charges are made up of Tonnage Rates, Channel Fees, Navigation Service Charges, Conservancy or similarly named charges usually based on the GT of the ship and Melbourne, Newcastle and Port Kembla are highest.

A percentage breakdown of these costs shows the percentage of total costs allotted to the various charges.

Table 10. Comparative Port Costs as a Percentage of Total Costs ($) – Alternative 1

	Brisbane	Newcastle	Port Kembla	Melbourne	Fremantle
	%	%	%	%	%
Pilotage	31.2	11.6	13.5	24.1	19.4
Towage	52.7	49.8	39.7	46	62
Linehandling	3.5	11.8	16.2	0	1.2
Port Authority	12.6	26.7	30.6	29.9	17.4
	100%	100%	100%	100%	100%

Comparison of Breakdown Cost—Alternative 2

In this analysis, PB Towage rates are used as that company is an alternative towage provider at Melbourne and Brisbane.

Table 11: Breakdown of Comparative Port Costs ($) – Alternative 2

	Brisbane	Newcastle*	Port Kembla*	Melbourne	Fremantle*
	$	$	$	$	$
Pilotage	6,454	2,818	2,506	7,245	2,726
Towage	10,000	12,060	7,400	8,000	8,720
Linehandling	900	2,860	3,020	0	167
Port Authority	2,610	6,468	5,700	8,978	2,455
	$19,964	$24,206	$18,626	$24,222	$14,068

*Costs unchanged as no alternative towage provider is available at these ports.

With the reduced towage costs, Newcastle now becomes the most expensive port for tug services.

In the following Table, these charges are again shown as a percentage of the total ship call cost.

Table 12: Comparative Port Costs as a Percentage of Total Costs ($) – Alternative 2

	Brisbane	Newcastle*	Port Kembla*	Melbourne	Fremantle*
	%	%	%	%	%
Pilotage	32.3	11.6	13.5	29.9	19.4
Towage	50.01	49.8	39.7	33	62
Linehandling	4.5	11.08	16.2	0	1.2
Port Authority	13.1	26.7	30.6	37.1	17.4
	100%	100%	100%	100%	100%

*Costs unchanged as no alternative towage provider is available at these ports.

The impact resulting from the use of the second tug provider at Brisbane is not noticeable with the percentage cost allocation the same as in Alternative 1. However, in Melbourne the cost reduction is more noticeable with towage now reduced to 47% of the total port's cost.

Total Indicative Ports Costs of a Larger PCTC vessels/Ro Ro

Table 13: Total Port Call Costs Incurred – excluding GST

	Alternative 1	Alternative 2
	$	$
Brisbane	36,788	37,967
Newcastle	91,645	na
Port Kembla	73,110	na
Melbourne	60,073	59,076
Fremantle	30,344	na

6.2 Impact of High Port Costs

Australian port authorities argue that their current charges and recently announced increases are reasonable since most charges have not been increased in the last few years. However, some of the port authorities of the ports sampled have now announced increases; Newcastle from 1 July 2009, Port Kembla from 1 December 2008, Melbourne and Fremantle from 1 July 2009. At Brisbane rates effective from 1 July 2008 including Pilotage, remain in place.

Increases in Svitzer Towage rates at Brisbane, Newcastle and Melbourne became effective from 15 June 2009. PB Towage rates fixed in 2008 remain unchanged.

While these charges impact on ship operating costs and shipowners/operators resist increases particularly under the difficult trading conditions now being experienced, the most criticism about costs at ports was related to stevedoring and associated charges. Stevedoring charges and according to some importers, storage/demurrage incurred for over-time cargo on the wharf, are due to the market domination by service providers. One major steel importer indicated that the handling cost is 20-25 dollars per tonne in Australia compared with Asian countries at about 5 dollars per tonne. Even in Japan, the labour cost is not as high as Australian ports and they generally provide seamless service with generally no damage to cargo.

Excessive port charges and cargo handling costs in Australia will impact directly and indirectly on various stakeholders and probably influence the direct port related activities undertaken by firms and organisations, shipowners, stevedores, terminal operators and importers/exporters in moving cargo through the port. For instance, because the port charges represent a large proportion of overall operating costs, the variation of port charges will have a significant impact on shipping lines especially in dealing with low margin products such as timber and steel.

High port costs could also jeopardise international trade because of a port's vital position in the international logistics chain especially for Australia. In order to maintain and encourage inbound/outbound trade in Australia, port authorities should be encouraged to provide smooth and efficient services at competitive port charges.

In addition, port users interviewed also stated that port charges are excessive in the current gloomy economic climate which will lead to a lose-lose situation for both port users and port service providers. One major carrier is already considering options for calls at Fremantle due to the excessive stevedoring costs at that port with the following three options: 1) their vessels could go to Bunbury instead of Fremantle in order to avoid the high cost; 2) they might reduce the frequency of port calls in Fremantle (once a month instead of twice); 3) they could reluctantly go direct to Melbourne and by-pass Fremantle.

The impact that high port charges particularly towage have on operating costs would be better analysed with the availability of actual port data.

7 CASE STUDIES

7.1 Brisbane

The Port of Brisbane is located in the south-east corner of Queensland and provides Southern and South-Western Queensland and Northern New South Wales with an optimum gateway for international trade. Brisbane is an important logistics location as indicated by the number of ship calls - 2,618 port calls made by over 50 shipping lines in 2007/2008. There are 28 operating cargo berths including 5 general cargo/motor vehicle berths.

The majority of port activities for Brisbane are situated at Fisherman Islands at the mouth of the Brisbane River; most of the port's break bulk facilities are located here at the AAT Terminal. The remaining facilities are located upstream at the Hamilton precinct - Maritime No. 1 and Hamilton No. 4, close to the cruise ship terminal.

The port authority is the Port of Brisbane Corporation (PBC), a Queensland Government owned entity with a commercial operating philosophy. Under PBC management the port achieved a total trade volume growth of 7.7% to reach 30.2 million tonnes valued at A$37.5 billion in 2007/2008; profit after tax reached a record result of A$438.7million, an increase of 282% on the previous year (PBC 2008).

The main break bulk imports into Brisbane include steel, building products, timber, machinery, paper and wood pulp; these account for 13.11% of its total imports while 7.61% of exports from the port comprise steel, timber and metal manufactures which are carried in break bulk form.

7.1.1 Break Bulk Cargo Traffic

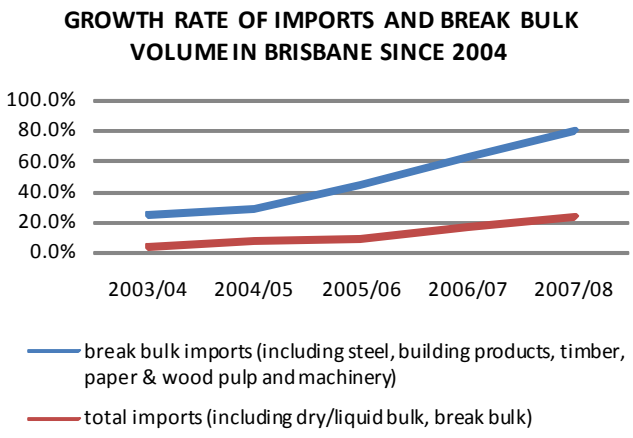


Figure 5: Comparison of Growth Rate for Import & Break Bulk Volume
Source: 2002/2003-2007/2008 PBC Annual Report

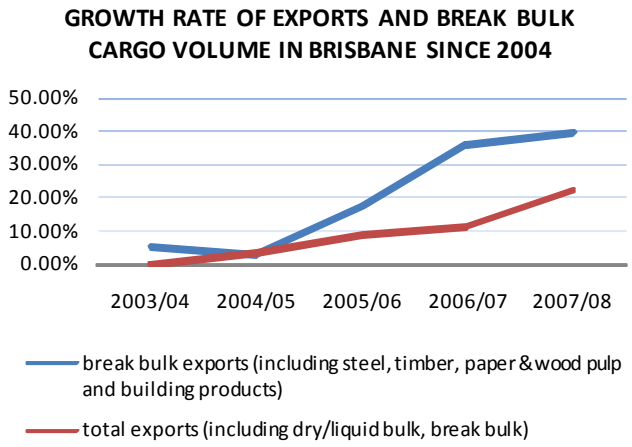


Figure 6: Comparison of Growth Rate for Export & Break bulk Volume
Source: 2002/2003-2007/2008 PBC Annual Report

Brisbane has experienced rapid growth in break bulk import/export volume which was faster than the total trade throughput growth.

The volume of break bulk cargo trade between 2003/2004 and 2007/2008 increased from 2,100,951 tonnes to 3,429,631 tonnes - a growth of 63.24% which is almost triple the growth rate of total trade throughput at 22.78% (see Figure 5) over the same period.

Between 2003 and 2008, break bulk imports volume grew at 79.61%, with the rate exceeding 24% in 2003-2004 and 12% in 2005-2006 and 2006-2007 respectively (see Figure 6).

The cumulative growth rate of break bulk exports was 39.42% in the period of 2004-2008 (see Figure 7). In contrast, the cumulative growth rates of total imports and exports are 23.52% and 21.84% respectively since 2004, which lagged behind the cumulative growth rate of break bulk imports and exports.

According to PBC trade statistics in 2009 steel, timber, building products, paper and wood pulp are the main break bulk cargoes. Amid the economic crisis, the YTD growth rates from 1st July 08 to end of March 09 on timber imports/exports dropped significantly and were -10.00% and -6.9% respectively. Imports of building products, paper & wood pulp have also been affected by the economic downturn, with a negative YTD growth rate of -1.8% and -3.6%. Reversing that trend the YTD growth rates for iron & steel import and export were positive at 19.7% and 17.7% respectively. Generally although the YTD growth rates fell for some break bulk imports and exports, the overall YTD growth rate was an optimistic result; break bulk cargo traffic is therefore relatively positive in 2009.

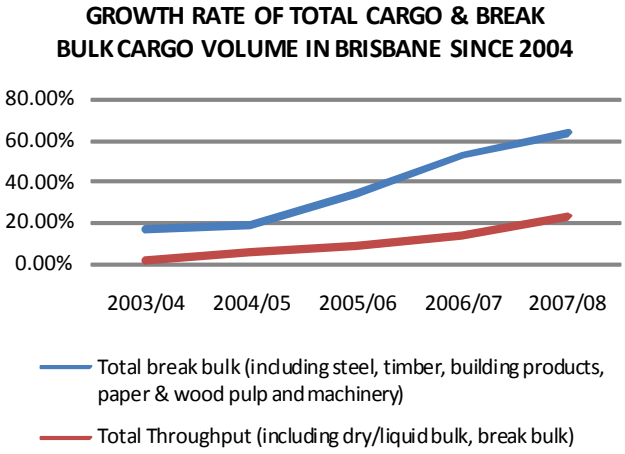


Figure 7: Comparison of Growth Rate for Total & Break Bulk Volume
Source: 2002/2003-2007/2008 PBC Annual Report

According to the State Government, Queensland is the fastest-growing state in Australia and is expecting to add approximately 90,000 new residents to the population annually for the next 23 years to 2031. Population and economic growth is driving the demand for new infrastructure development in Queensland, e.g. roads, rail links, new residential buildings and other community facilities. Queensland is also well placed to capitalise on the world's growing demand for its resources—coal, bauxite, zinc and copper that generates a need to ensure port facilities keep pace with the expected demand; this will also include land-side transport facilities to be able to handle importation of mining and construction equipment.

While the nature of infrastructure projects varies, the objective of investing in modern, efficient and sustainable infrastructure remains constant. The Queensland Government has committed more than $100 billion to planning and delivering infrastructure projects. Due to the size and weight of materials needed for most infrastructure projects, they are most economically transported by sea. One of the most preferable discharge ports for these cargoes is Brisbane because of its optimum logistics location. As a result the flow of break bulk cargo through the Port of Brisbane in the not too distant future, could reach unprecedented levels.

7.1.2 Existing Port Operations and Facilities

Ship Visits

According to interviews with shipping lines and the statistics that they provided, every major break bulk shipping line regularly serving the Australian trade e.g. Spliethoff, Austral Asia Line, Swire, Gearbulk, NYK, Wallenius Wilhelmsen Logistics and Oldendorff, call at Brisbane to discharge/load break bulk cargoes. According to these lines, the primary break bulk cargoes that they carry can be classified into three main categories—steel, timber products, farm equipment and heavy machinery for the construction, mining and gas and agricultural industries. The majority of ships carrying this cargo range between 12,000 and 30,000 dwt and require a maximum channel depth of 13.5m. A small proportion of these vessels exceed 30,000 dwt and reach over 40,000 dwt, e.g. WWL's RoRo vessels.

The frequency of port calls at Brisbane by ships with break bulk cargo is often characterised by cluster streams that place pressures on berth availability, work on and behind the berths that lead to port congestion and a need to speed-up cargo movements. Ships with break bulk cargoes are more susceptible to weather delays than container ships and delays incurred at overseas and Australian ports can at times contribute to late arrivals at Brisbane with resultant bunching. In PBC's opinion the cluster stream might also result from the production volume of certain break bulk cargoes (e.g. steel), special characteristics of some cargoes (e.g. project cargoes) and competition among shipping lines. Indicators are that there will also be more break bulk cargoes carried in car ships e.g. WWL's vessels, which will affect the efficiency of loading and discharging operations and aggravate delays already caused by clustering.

Break Bulk Cargo Berths

AAT Fisherman Islands Terminal

Description

AAT leases and manages Fisherman Islands berths 1-3 which are the main wharves for handling break bulk cargoes, motor vehicles and in some cases, containers. AAT operates as an independent facility manager with responsibility for wharf management, terminal planning and security, delivery and receival and general administration at Brisbane and other locations in major Australian ports. AAT's provides stevedores with access to the facility as long as they meet the AAT's requirements. AAT also provides PDI facilities for Motor Vehicles and operates a wide range of cargo handling equipment including a portainer crane, 2 mobile cranes, forklifts ranging from 4 to 36 tonnes capacity, RoRo equipment (Mafi) etc. This kind of operation allows greater consolidation of activity at the one location and efficient capital investment for future demand.

The continuous wharf face at Berths 1-3 is 697m long which is suitable for ships discharging/loading break bulk cargo e.g. steel, timber and machinery. In addition to break bulk cargo the AAT facility is used by a variety of other cargoes including dry

and refrigerated containers as the berths are equipped with one conventional portainer crane and access to a power supply. It is possible to berth three regular size vessels or two large size vessels (i.e. up to 200 metres long) simultaneously. The minimum depth of water alongside these wharves is 14 metres. However, the restrictions on pavement weight loading limit has significant impact on the handling of heavy lifts and project cargoes which increases the handling cost significantly due to the special equipment (e.g. jack up trailer) required.

Berth Priority

The PBC has instituted a berth priority protocol for these berths and AAT implements that procedure. The berth priority arrangements are:

"*First priority of Berth 1 and 2 will be given to PCC/PCTC Vessels discharging motor vehicles for processing at Fisherman Islands' facilities. First priority to Berth 3 will be given to RoRo, general, break bulk and containerised cargo vessels currently discharging at Fisherman Islands Berth 1 to 3 and those cargo vessels transferring from Hamilton wharves as part of the Hamilton Relocation. PCC vessels will always retain a minimum priority to any 2 berths at Fisherman Islands. The berth priorities will be maintained for up to 8 hours at the pilot station over a vessel of lesser priority. A lesser priority vessel will not be held off the Berths awaiting the arrival of the first priority vessel for longer than 8 hours.*"

If disputes arise over the priority procedure, PBC is responsible for arbitration; however, disputes requiring their intervention are rare.

PBC explained that their main reason for giving first priority to car carriers is based on the efficient operation of PCCs/PCTCs and the stronger potential for car trade in the future. In particular, the normal discharging hours for a car carrier is 8 to 24 hours while the normal time alongside for a ship with break bulk is 24 to 48 hours. Motor vehicle imports continued to be strong with an increase of 15-20% over last decade and has high growth potential in the future although the current global economic situation has caused a considerable fall in imports into Australia.

Major break bulk shipping lines argued that this berth priority practice lessens the berth availability for break bulk vessels and aggravates berth competition/congestion which leads to the conclusion that separate facilities are required for these different types of services.

Cargo Storage

Due to the substantial cargo volume handled through the AAT Terminal, shipping lines, importers and stevedores indicated that the existing sheds are, at about 15,000m^2, insufficient to allow efficient sorting and stacking of cargo or to cope with the inevitable use of the terminal as a short term warehouse space by importers for less urgent cargo. Shipping lines reported that the shortage of undercover storage area often forces vulnerable cargoes to be stored outside on the wharf or in other commercial warehouses outside the port. This is an expensive and annoying manoeuvre for cargo receivers who must double handle the cargo from wharf and truck it to the warehouses.

Due to block stacking of cargoes in the AAT facility particularly steel, the difficulties incurred in subsequently sorting and removing steel from the sheds are considerable, as is the inconvenience caused to importers seeking access to their cargoes. However, AAT argue that importers are using the shed as a warehouse rather than transit place and clearly state that they cannot allow the shed to be used for this purpose because of the scarcity of port land. They expect cargoes to move out as soon as possible in order to keep the shed facility functioning well. AAT also state that it is unacceptable to waste the limited available shed space for items that do not demand undercover protection.

Grain Berth

The grain berth is operated by GrainCorp and is used for dry bulk cargoes such as grain, woodchips, sugar and cottonseed exports. This berth has been extended by 50 metres, making the wharf now 285 metres long and can now accommodate some PCCs and RoRo vessels when it is available and suitable for those vessels. AAT berth priority arrangement also applies at the Grain Berth if it is intended to be used by these vessels. A dedicated road from the Grain Berth to the AAT Terminal has been built to help the transit of break bulk cargoes discharged at the Grain Berth. This berth has no storage facilities.

Hamilton - Maritime No. 1

Maritime No. 1 is operated by Patrick General Stevedoring. The berthing protocol of first-arrive-first-berth applies here. This berth, which is located 14.6 kilometres from the river mouth and is approximately 217 metres long and 35 metres wide with a dolphin for length extension. Minimum depth alongside is 9 metres. The wharf is a bulk liquid berth, bulk oil, chemicals and other wet bulk are discharged on the wharf, which can also be used for overflow break bulk cargoes. However, because of an absence of undercover storage facilities adjacent to the wharf, its use is restricted to certain types of break bulk cargoes that do not require that protection. Moreover, only shallow draft vessels can be operated at this berth due to insufficient water depth alongside.

Hamilton - No. 4

Hamilton No. 4 is one of the former P&O bulk and general cargo operation berths; break bulk cargo operations were relocated to Fisherman Islands in 2006. Currently, it is a multipurpose berth, managed by P&O General Stevedoring, mainly used for bulk cargo, containers and general cargo. The berth comprises a 210 metres long and 35 metres wide berth pocket with a shallow depth of 10.3 metres. Berthing priority at this berth is based on the order of arrival at the pilot station. There are some small and old sheds on the wharf which can be used as overflow facilities for break bulk cargoes. However, the shed space is too small and the berth is too old to allow the efficient operation of break bulk cargo.

Stevedoring Operations

At the general cargo berths 1-3, POAG and Patrick provide the stevedoring services. POAG, the former general cargo division of P&O Ports, operates at 17 ports around Australia and its main business is handling motor vehicle, general and bulk cargoes.

The Auto, Bulk & General division of Patrick specialises in the receival, storage and loading/discharging/delivery of motor vehicles, bulk cargoes, and specialist cargoes such as steel, paper and timber products.

As POAG stevedores about 75% of break bulk cargoes at Brisbane their operations will be used as an example representing both stevedoring companies. The majority of POAG's stevedoring business covers break bulk cargoes such as timber, steel and project cargoes. Some examples of their project cargoes are 100 tonne yachts, locomotives and a 200 tonne generator for a Queensland power station.

The availability of labour for stevedoring has evidently been a topic of some debate. Some shipping companies believe more skilled waterside workers are necessary for improving the productivity of stevedoring. One member indicated that the availability of labour does present problems when all berths are occupied resulting in a labour shortage with only one gang being available even though more are needed. However, POAG argued that they already have 140 employees at Brisbane with 80% being full time permanent employees. In order to supply a skilled workforce, POAG make sure each permanent employee has 2-3 skills and 1 skill with casual employees. POAG also provides training for some casual employees that act as a contingency when a shortage of skilled labour occurs. However, the risk of training casual employee is that they will be attracted to higher paying positions e.g. the mining industry, when trade booms. In addition to labour availability POAG stated that other challenges might also impede the efficiency of stevedoring operations as follows:

- Cargo marking is either inadequate or wrong which slows down the stevedoring operation while sorting according to discharge port/consignee, is carried out.
- Overseas ports do not always stow cargoes to mark in cargo holds which slows down the discharging rate while cargo identification is carried out;
- Sometimes, shipping agents will bring forward the vessel's ETD which places a lot of pressure on the stevedoring operation;
- Limited shed space can be filled by certain products that do not need undercover protection which ultimately leads to shed space congestion. Weather sensitive cargo not easily fitted into the overcrowded shed cannot be stored on the wharf without causing congestion and risking cargo damage.

Port Land Interface

Brisbane has both rail and road access. However, rail access at the Brisbane Multimodal Terminal (BMT) is more suitable for container traffic rather than the break bulk trade because of two major disincentives. First it is not an economic way to moving cargoes by rail where double handling is required. Secondly, transporting goods by rail may risk possible damage to weather sensitive products because rail transport might not have the proper cover to protect vulnerable products.

It was also reported that the road connection to the Port is inadequate with the road bridge limiting receival and delivery operations. In order to ease this problem, PBC has committed to several road infrastructure development projects. In particular, the duplication of Gateway Bridge is in progress including additional motorway lanes for the Gateway Bridge and improved connection to the Motorway from Lytton Road to the

Port of Brisbane Motorway. PBC is also upgrading the Lucinda Drive and Port Drive interchange which will improve safety and increase road capacity.

Users of receival and delivery services provided by AAT e.g. stevedores, importers and shipping companies, advise two major problems regarding these services. This usually involves insufficient hours of operation and the lack of planning for the receival and delivery of break bulk cargoes, resulting in port congestion. The operation hours are especially a problem when block stacking of cargoes occurs. An importer indicated that the short receival and delivery operation hours for break bulk cargoes along with block stacking of cargoes aggravates the problem of expeditious cargo delivery. On the other hand, AAT argued that the receival and delivery service is provided from 0800 to 1600 on weekdays and ad hoc services for evening, weekend and public holiday can be requested as well. However, one new argument that arises is the fairness in charging overtime to cargo receivers. For example, when cargoes are blocked by other cargoes in front of it or on top of it, receivers can be limited to 2-3 loads a day. If receivers request an extension to the delivery hours at night or at a weekend, they have to pay a premium.

Importers and shipping companies commented that major receival and delivery problems also occur with truck checking procedures at exits of the ports often leading to missing cargoes. It was reported that a lack of communication and coordination between road transport operators and AAT, results in truck queues and associated congestion. However, AAT stated that an arrangement with 5 to 6 major transport companies made in 2007 was aimed at speeding up the cargo transportation process by using electronic transmission of data. This initiative resulted in improved communication between them and greater efficiency of the transportation process by AAT updating its cargo pick-up information continuously on its website. However, some small operators will appear for cargo pick-up without informing the terminal operator in advance.

The inadequacies with the road/rail connection and receival and delivery services cause serious problems that affect overall cost, timeliness and reliability of cargo delivery.

Port Services

Port Services at Brisbane:

- Pilotage. Provided by Brisbane Marine Pilots Pty Ltd
- Towage. Two companies provide towage services - PB Towage and Svitzer.
- Linehandling. Privately provided services

Contracts for towage and line handling services are negotiated directly between shipping lines and service providers. According to interviews shipping companies are satisfied with port services and charges at Brisbane.

Port Charges

Port Authority Charges

As most cargoes are now handled at Fisherman Islands, Hamilton berths will not be included. Charges are incurred in three areas;

Port authority charges that apply to ships occupying general cargo berths 1, 2 and 3:

- Conservancy Charge (this is payable to Queensland State Government),

Stevedoring and Other Charges at Break Bulk Berths

The stevedoring cost is the subject of a contract between the shipowner/operator and either stevedore – POAG and Patrick.

AAT lease the berth, the back-up land and buildings from the Port of Brisbane Corporation. This cost is reflected in the level of the charges passed on to the stevedore and to the shipowner/operator for the ship occupying either berths 1, 2 or 3:

- Facility Access charge
- Stevedore Access Charge
- Cargo Receival and Delivery charge

These are either charged direct to the shipowner/operator or to the stevedore who might then recover the charge from the shipowner/operator or cargo owner.

The level of these charges has attracted criticism mainly due to the high value of the land occupied by the lessee. The Queensland Government has supported the Port of Brisbane Corporation application of commercial market values which has led to the substantial increase in costs to AAT and other lessees. In PBC's opinion, this increase is reasonable due to the following reasons:

- The port charges have not been increased since 1982.
- The current land value at the Port of Brisbane is far less than the land value elsewhere. There is a finite amount of suitably placed coastal land and low valued land attracts undesirable industries. Thus, there is a need to apply the real market valuation of port land for use by shipping and associated industries.
- PBC has invested a significant amount of money in port infrastructure and facilities recently. All the investments require a reasonable rate of return.
- All tenants have been treated fairly, thus the facility access charges have been raised as well. The high cost on some facilities such as sheds can discourage importers using the port as a distribution centre.

However, every shipping company and major importer interviewed whose ships discharge/load at Brisbane stated that port authority charges that are the basis of the AAT charges are excessive especially in the current gloomy economic climate and are consistently higher than other general cargo berths at other ports. In particular, it is felt

that the more appropriate action would be to give concessions similar to those offered by Singapore, Log Angeles, Long Beach and Malaysian ports.

7.1.3 Future Vision

The PBC has invested A$1.3 billion in development of infrastructure and assets in the last two decades on container berths, bulk terminals and break bulk berths and this is continuing. The Corporation believed that they were giving adequate attention to break bulk cargoes and they do not differentiate in their charging structure between break bulk and cars even though the throughput of cars is more productive on an hourly basis in terms of cargo handled. While some ports give preference to motor vehicles over break bulk cargoes, PBC will continue with the investment of A$60 million to provide a new general cargo berth i.e. the General Purpose Berth (see below). In addition, work on the Port West Estate is progressing and expected to provide additional capacity for break bulk cargo. To further illustrate the points made by PBC, the planning for the General Purpose Berth and Port West Estate are detailed as follows:

General Purpose Berth

- The PBC reclaimed some land from Queensland Bulk Handling Terminal to build a new general purpose berth of 260m with pavement loading of up to 350T to solve the pavement loading limit problem of only 90 tonnes at the AAT Terminal and ease the vessel congestion at the terminal.
- Construction of the General Purpose Berth is expected to be completed by early to late June 2009 at a cost of $60m, and will significantly boost break bulk cargo capacity. This new common user berth will be managed by PBC but no sheds will be built there.

Port West Estate

- The original feasibility study on Port West Estate, an 80ha lot of vacant strategic port land along the riverfront at Lytton, indicated that the estate would be used primarily for the Pre-delivery inspection (PDI), medium and long-term storage of motor vehicles.
- However, after further investigation, PBC determined that there might be an increase in the demand for motor vehicles and break bulk cargoes in the future. As a result, consideration is now being given to building three wharves on the Port West Estate which can be used for cars and general cargoes. However, there will be a draught restriction of 9.1m on vessels due to the location of the estate up-river of the bar. This development is a long term plan that will take about 7-10 years to be accomplished.

7.1.4 Possible Improvements

In planning any substantial alterations for break bulk facilities and services in Brisbane the following factors have been suggested by various parties (e.g. shipping lines, importers/exporters, stevedores) and would need to be considered:

- Increase in number of dedicated break bulk berths or general purpose berths. This could necessitate differentiating dedicated car berths from general purpose berths to facilitate improvements on berth availability for break bulk cargoes.
- Possible construction planning or extension to provide more satisfactory amounts of undercover storage space;
- Improvements to methods of cargo receival and delivery procedures e.g. operational hours, terminal-transport operator coordination in order to reduce overall congestion;
- Adjustment of port authority charges and terminal operator charges to make them more competitive;
- Repairing or strengthening of the deck where necessary.

7.2 Port Kembla

Port Kembla is well positioned to connect with Sydney and regional New South Wales - the largest market in Australia, making it an important gateway for import and export activities. The port is currently undergoing major expansion to capture new business opportunities—the growth of general and break bulk cargoes, containers and motor vehicles and coal exports. Ship visits in 2007/2008 totalled 760 which exceeded the target expectation by 11% .

The Port Kembla Port Corporation (PKPC) is a NSW State Government corporation responsible for port and shipping management at the Port. In the 2007/2008 financial year, trade through Port Kembla increased by 6.6% to reach a new record of 27.3 million revenue tonnes, which represents approximately 20% of the total trade throughput of three major NSW seaports (Annual Report and Economic Impact Study). The net operating profit after tax in 2007/2008 was A$12.1 million above the budget estimate and was almost double that of 2006/2007. The PKPC Annual Report states that this favourable outcome is predominately driven by the export of coal, coke and steel-finished products in which the coal and coke export volume increased by 10.6% over the previous year. The volume growth in steel products contributed another 9% (PKPC - Trade & Cargo).

The principal break bulk cargoes handled at Port Kembla are steel, timber, machinery, paper pulp, boats and construction material and equipment which account for 32% by volume of its total overseas imports (Figure 8) and 15% of total overseas exports (tonnage basis) (Figure 9).

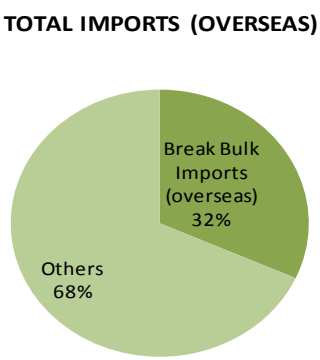


Figure 8: Percentage of Break Bulk Imports

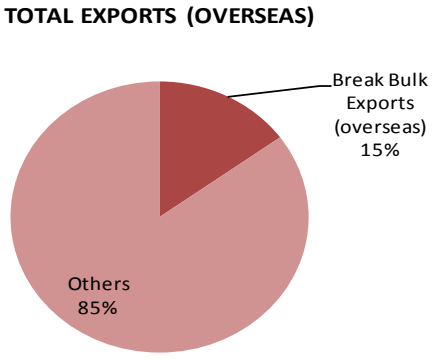


Figure 9: Percentage of Break Bulk Exports

Terminals/berths at Port Kembla are situated in both the Outer Harbour and the Inner Harbour. In the Outer Harbour Port Kembla Gateway berths 202 to 205 are on No. 6 Jetty. These berths are used for handling dry/liquid bulk and break bulk cargo including copper concentrates, fertiliser, logs and steel products.

In the Inner Harbour AAT Terminal berths 103 and 105 to 107 are the berths used for unloading/loading break bulk cargo as well as unloading motor vehicles.

BlueScope Steel terminal berths 109 and 110, a RoRo berth, are adjacent to its steel making plant and are used for exporting finished steel products and importing raw steel products. Other Bluescope berths handle imports and exports of bulk raw materials e.g. iron ore and coke.

Berth 104 is the bulk Grain Terminal (Grain Corp) which is not only used for grain export/import but is also available for motor vehicle and break bulk operations on as needed basis. In the Outer Harbour, in addition to existing break bulk berths, new general cargo berths have been planned in Port Kembla's development blueprint in the Outer Harbour as well.

The Coal Terminal berths are 101 and 102.

7.2.1 Break Bulk Cargo Traffic

Port Kembla was initially established to handle dry bulk cargoes such as coal and coke exports and later steel products and raw material imports principally iron ore. The Grain Terminal was later established at the Inner Harbour adding to dry bulk cargo which still accounts for the majority of total cargo trade handled through the port. The PKPC is keen to diversify cargoes further to add to the general and break bulk cargo, cars and containers now handled.

To illustrate, 99% of overseas non bulk export cargo in 2007/2008 was steel products manufactured by BlueScope Steel (Figure 10). The principal break bulk imports carried by shipping lines for discharge at Port Kembla are steel products, timber products, machinery and farm equipment, water craft and wind turbines. General cargo and steel products represent 86% of total overseas imports for which various importers are involved. PKPC stated that a large proportion of steel imports are ready-to-market steel products from Japan, China and Korea and are imported by CMC and Stemcor.

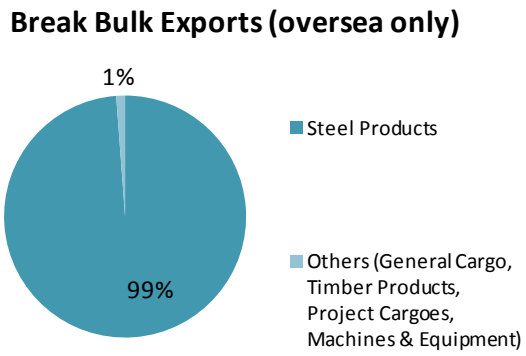


Figure 10: Break Bulk Exports (overseas) at Port Kembla

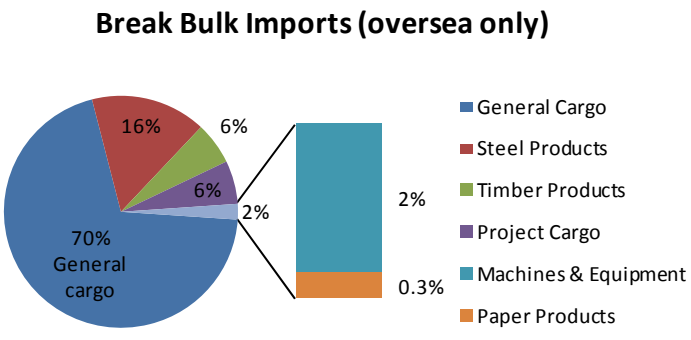


Figure 11: Break Bulk Imports (overseas) at Port Kembla

A substantial amount of machinery and equipment imports e.g. mining machinery and farm machinery are imported by Caterpillar. Another caller at Port Kembla discharges paper pulp cargo as well as wind turbines and associated equipment. It is worth mentioning that 280 wind turbines sets were discharged at Port Kembla in 2008. Two Lines commented that the import of this turbine equipment is expected to increase during 2009 and in the following years. The PKPC also expect a steady trade in the volume of break bulk cargo coming through the port which will have significant economic benefits for the Illawarra region (PKPC – Trade Opportunity).

7.2.2 Existing Port Operations

Ship Visits

Port Kembla can be classified as one of the most prominent break bulk ports in Australia with 70% of major carriers loading and unloading their break bulk cargoes through various facilities at the port. One line had 65 ship calls at Port Kembla in 2008.

The size of vessels carrying break bulk cargo mainly falls into the range of 15,000dwt to 30,000dwt. However, large RoRo vessels especially Wallenius Wilhelmsen vessels up to 240 metres long are frequent visitors of Port Kembla.

Break Bulk Berths and Facilities

AAT Terminal

Description

AAT Terminal is the main break bulk facility at Port Kembla and is used by all break bulk shipping lines. The dominant cargo handled at the terminal, in addition to break bulk cargo, are new motor vehicles. AAT provides three mobile cranes and a wide range of cargo handling equipment including forklifts suitable for RoRo ships. This facility consists of four berths in the Inner Harbour of Port Kembla as follows:

- **Berth 103.** A A$40 million construction project completed in November, 2008, converting the old ANL RoRo berth to a new general cargo berth. At 200-metre in length and a depth alongside of 12.3 metres, the berth is able to accommodate up to Panamax sized vessels. Nonetheless, the typical size of vessel visiting Berth 103 is usually in the Handymax range (35,000 tonnes to 58,000 tonnes). AAT is planning to move one of its land based cranes from Berth 107 to Berth 103. Other shore side facilities are also provided to handle all kinds of break bulk cargoes including oversize cargoes e.g. wind turbines.
- **Berths 105 and 106** were originally designed for handling container and motor vehicles although at this stage the number of containers handled is small. The continuous length of Berths 105 and 106 is 550 metres which enables two large vessels to dock simultaneously; the depth of water alongside is 15 metres. Due to the limited volume of container traffic, this berth is currently a dedicated car berth which can be also used for break bulk cargo.

- **Berth 107** has a link span that can take a heavy ramp from the larger RoRo vessels and PCTCs. The berth has a length of 290 metres with a depth alongside of 12.3 metres. 15,000m^2 undercover storage and several mobile and harbour cranes are provided by AAT at this berth as well.

Berths 103, 105 and 106 are considered to have a restrictive pavement weight loading limits which hindered break bulk cargo handling processes especially for heavy lifts and project cargoes carried by larger vessels.

Berth Priority

At the AAT Terminal, first-arrive-first-berth approach is applied to all berths except at the dedicated car berths 105 and 106. In addition to routine first priority to PCC/PCTCs, depth dependent vessels also receive an 8 hours berthing window priority as well as the priority for pilotage and tug allocation. This is the same as the priority protocol at AAT Fisherman Islands Terminal.

Shipping lines and agents indicated their dissatisfaction with this procedure. However, the CEO of the PKPC, Mr Dom Figliomeni, emphasised three points that he believed justified this procedure.

1. The discharge time and storage time for cars is short which will not greatly affect break bulk cargoes' operation.

2. Port Kembla is offering maximum flexibility of berth operations that will enable the delivery of break bulk cargo to take place at other alternative berths. In particular, the depth of most berths is ranging from 12.3m-15.5m which is enough for most all kind of ships carrying break bulk cargo. Despite the 10-metre depth constraint exists at Port Kembla Gateway, this facility still can be used for pulp and timber cargo.

3. The corporation pays a lot of attention to minimizing queuing time at berths and is trying its best to avoid congestion.

Cargo storage

Both stevedores and the major break bulk shipping lines stated that the storage area at Port Kembla AAT Terminal is sufficient. There is 15,000m^2 of shed space at Berth 107 and four small backup sheds at Berth 105-106 provide 18,000m^2 undercover storage facilities for weather sensitive cargo. Construction was completed in November, 2008 on another storage shed which provides 5,000m^2 for vulnerable cargoes e.g. steel.

AAT Terminal is able to accommodate 26,000-27,000 units of cars which is 3-4 times more than Glebe Island, with space for another 5,000 cars at the PDI Processing Precinct. With sufficient car storage areas, the expected increase in motor vehicle imports in the future is not likely to cause any wharf congestion or threaten the break bulk operation on the wharf.

Although cargo sheds at AAT Terminal have sufficient handling capacity and adequate shed condition, every steel importer and a few shipping lines, are trying to avoid

discharging steel cargoes at the AAT Terminal. The reasons, as disclosed by one importer are the excessive facility fees charged by AAT and the impractical storage period for steel cargoes.

BlueScope Steel Berth 109-110

Berths 109-113 are owned and managed by BlueScope Steel which is mainly used for supporting steel manufacturing. Only Berths 109 and 110 are break bulk berths used for handling steel exports such as steel slabs, hot-rolled coils and steel plates, stevedored by Tolls and Patricks. Berth 110 is mainly used for Ro-Ro vessels while Berth 109 is for conventional steel cargoes. Overflow BlueScope steel exports can be loaded at AAT berths. It is possible to load and discharge other than BlueScope cargoes at Berth 109, but the operations of transiting cargo from/to BlueScope berths encounter various difficulties. Thus, overflow cargoes are more likely to utilise other break bulk berths rather than BlueScope Steel Berths 109-110.

Port Kembla Gateway (No. 6 Jetty)

The Gateway consists of Berths 202-205 and is a finger/jetty structure operated as a private facility with a total length of 360 metres. Due to the depth constraints, only the outer eastern proportion of 215 metres at a depth alongside of 9-10 metres is using for berthing vessels. With a width of 30 metres, this jetty is used for handling bulk cargo e.g. sulphuric acid and copper concentrate, and is also used as an overflow facility for break bulk cargoes especially for project cargoes and heavy lifts. For example steel pipes to be used for the Sydney desalination plant were discharged here in 2008.

Because it is primarily a bulk terminal, the availability of break bulk facilities is limited; there is no general cargo shed adjacent to this facility. The shore crane at the Port Kembla Gateway is outdated and not really useful. Consequently, break bulk cargoes rely heavily on ship's gear for discharge direct-to-truck. Other constraints that impede break bulk vessel operations at this facility include the pavement weight loading limit restriction and the weighbridge located at the east end of the jetty that hinders project cargo movement operations. The size of the weighbridge makes it difficult for trucks carrying special shape project cargoes to pass through the weighbridge.

Because part of the Outer Harbour is open to the sea, in certain weather conditions a surge occurs in the harbour at a maximum of about 10-12 days a year. It was commented that the surge problem inconveniences vessel operations especially when handling heavy lifts and project cargoes. PKPC argued that there will be little impact on break bulk cargoes. Although the surge problem does not count as a serious problem, PKPC is modelling the effect of the problems caused by the surge in the effort to better manage these situations.

Grain Terminal Berth 104

Grain Berth *104* is adjacent to AAT Terminal in the Inner Harbour. This berth can be temporarily used for overflow break bulk cargoes, but the cargoes have to be removed immediately from the berths because of the absence of storage areas.

Stevedoring Operations

Major shipping lines reported that the stevedoring service quality varies from port to port. The primary elements they are concerned with about stevedoring services are labour availability and labour skills. Unlike the stevedoring services at Brisbane, none of the interviewed shipping lines had significant complaints about the stevedoring services in Port Kembla.

POAG services are used as an example to ensure consistency in companies stevedoring services between different ports. At Port Kembla POAG mainly provide stevedoring services for vessels such as PCCs, PCTCs, RoRo and multipurpose vessels. Principal cargoes handled by POAG are steel products, timber products, machinery, water craft, project cargoes (e.g. wind turbines) and bulk cargo (e.g. grain). The largest general cargo commodity handled by POAG are steel products. POAG stevedores at all break bulk berths at Port Kembla. Besides break bulk operations, POAG also provide exclusive bulk handling service for its contracted client AWB at Grain Terminal Berth 104.

The number of POAG's stevedores at Port Kembla is 130 of which 30-40 are permanent while others are casual employees. In order to maintain service quality, POAG offers training courses to new recruited employees. In the first week, an induction courses covers both theoretical and practical sections. Continuous on-the-job training is provided afterwards. Since the training fees for some cargo handling equipment are expensive, only a proportion of stevedores will be trained. Thus, it is not easy to optimise the right proportion of stevedores who will be given this kind of training. In addition to in-house training, POAG take advantage of training courses offered by WWL. WWL's training courses provide on site training courses which allow stevedores to understand WWL's unique types of ships and to experience different kinds of machinery. POAG also operate harbour cranes and ship gear in most circumstances. Occasionally, some shipping lines will insist on using their own crew to operate ship's gear. In order to preserve proficient harbour crane handling skills, POAG do prefer the shipping companies to choose harbour cranes rather than ship's gear which will give them the opportunities to practice their skills. POAG is only responsible for discharging and loading general cargoes while the delivery and receiving process are AAT's responsibility.

In addition, POAG stated that a number of challenges might hinder the efficiency of stevedoring operation as follows:

- Achieving productivity while ensuring the safe, damage free and on time delivery of cargoes;
- To handle cargo penetration such as cargo stacking, cargo stows and to access these cargoes safely;
- To provide high standard cargo care especially for those cargoes require special handling instructions, procedures, handling methods and/or training;
- To deal with cargo damage that is not caused by stevedoring.

Road/Rail Connection

Both road and rail access is available at Port Kembla however, road transport is used for the majority of inland freight transportation. The importance of the connection between industrial zones and the seaport provided by efficient, reliable and cost-effective road and rail transport have been recognised by all parties including shipping companies, port authorities, importers/exporters and trucking companies. In general, the connection is identified as adequate at Port Kembla. One member stated that road and rail connections at Port Kembla provide a more direct access to the final cargo destination than Newcastle. Moreover, PKPC plans to install a 1.2 km train connection to Berth 105 and a 2×800 metres rail extension to offer better option for access to/from the port via rail.

Despite the overall advantages of rail and road connections, some points regarding the deficiencies of these connections have been made by shipping lines. In particular, the rail access to berths is not operated on a daily basis which might impede rail transport in maximising its capability. It was indicated that daily rail access is preferred because of future increased cargo volume expected from Europe and the USA. Problems also exist with the road connection caused by occasional congestion at the entrance of the main road due to limited road width. Trucks with long or heavy loads need to drive over a roundabout outside Port Kembla port areas. This road transportation hazard might prove to be a significant disadvantage for Port Kembla in the future.

Port Services

Tug services were generally described as adequate but the pilotage service did present some problems. Regarding the tug service, more tugs could be based in Port Kembla in the future which will increase the total number of tugs from 4 to 6.

Pilotage services have been described as inadequate. A member indicated that the availability of pilots does lead to port congestion and vessel delay. For example, if another vessel receives berthing priority in preference to their vessel, it is not only delayed in berthing, it can also be delayed further through lack of a pilot. If the pilot's maximum duty hours have been reached the ship must wait until the next pilot is available.

Some lines also stated that pilots in Port Kembla are often cautious about ordering extra tugs where at most times only one is required. A ship's captain remarked to one line that they are very experienced in manoeuvring their new advanced multipurpose vessels, which have bow and stern thrusters, in a confined space. Thus, one standby tug would be sufficient in other than very difficult weather conditions.

In contrast, PKPC believed that sufficient skilled pilots (6 pilots) are provided at Port Kembla. It was also stated that the old pilot usage system could be changed to encourage a more cost effective way of using pilots. Furthermore, regarding the excessive requests of tugs by pilots, it was argued that the decision of tug usage was made only a few hours in advance and thus the excessive order of tugs is not easy to avoid despite port policy covering tug usage. Although the final number of tugs needed is up to pilot's discretion, the decision finally depends on the weather conditions and the number of ship bow/stern thrusters.

Port Charges

Port charges at Port Kembla can be classified into four categories which are a port authority charge, port services charge, terminal operator charge and stevedore charge.

Regarding the terminal operator charge, shipping lines stated that the terminal charge for ships using the Port Kembla Gateway berth is reasonable while the charge at the AAT Terminal is excessive particularly the facility access fee which despite the economic recession AAT have increased substantially. According to one line the crane hire cost at the AAT Terminal is about A$8,000 to A$10,000 which is 3-4 times that of similar equipment in Southampton.

PKPC stated that the efficient provision of services has always been the concern of PKPC to ensure neither over servicing of port facilities nor over capitalising of port funds and this has resulted in adequate port authority charges. The port authority indicated that the port authority charges are reasonable and have not increased since 1995. However, shipping lines such as WWL argued that the navigation service charge levied by PKPC is expensive.

7.2.3 Future Vision

With the completion of Inner Harbour facilities upgrade, the construction of new facilities in the Outer Harbour is planned and will continue into the future. Approaches made by the Port of Shenzhen and COSCO Shipping regarding investment in the port could enlarge general cargo handling capacity and introduce a container cargo handling capability in the Outer Harbour. PKPC is planning to build three general and bulk berths and four container berths at Outer Harbour.

The projected new general and bulk berth is expected to be opened in 2012-2013. PKPC do not plan to lease the new berths at Outer Harbour to AAT which will give break bulk operators more options to discharge and load cargoes and also provide additional flexibility of berth usage. However, PKPC considered that the new berths will probably be heavily used by bulk commodities. Thus, the port authority does not plan to build cargo storage sheds unless the trade volumes justify it.

ITI, a timber importer, is looking for a strategic partner to build a new facility at Port Kembla in late 2009 to provide cost benefits for its timber imports. The transportation cost of ITI's timber imports will be reduced by avoiding duplicate routes as they want to truck some imports to the South Coast and the ACT. Once the new facility is built, ITI is willing to maximize usage of the facility by bringing in more and more timber as break bulk cargo which might lead to growth in the break bulk trade in the future.

7.2.4 Possible Improvements

Port Kembla is a relatively newly upgraded port with generally adequate facilities for handling break bulk cargoes. PKPC is considered to be a forward looking port authority that has planned solutions for the deficiencies mentioned above e.g. the availability of berths. However, suggestions were made on how to develop Port Kembla as a better node for transportation of break bulk cargo; namely, improvements to rail and road

connections to avoid congestion in the future, allocation of new sheds in the Outer Harbour development plan, strengthening of the deck at Berth 105-106 and a possible rearrangement of the pilotage service.

8 ECONOMIC BENEFITS OF BREAK BULK CARGO

This is a subject that deserves a much more detailed analysis than this report can provide. However, the following comments are aimed at highlighting the contention that economic development of Australia in particular sectors e.g. resource development in mining, oil and gas exploration, construction and alternative energy sources, depends to a large extent, on the access to particular commodities and products transported to Australia by general cargo ships. Much of that break bulk cargo carried by these ships is not readily available in Australia and must be sourced from overseas. The role that those ships in particular perform in the supply chain is to facilitate that development by transporting such cargo from overseas to the Australian ports closest to where the demand is centred. The timely arrival and availability of the goods in many cases is crucial to the progress of the particular development.

While ships fulfil their role in the ocean transportation link, the importance of the availability of adequate port facilities to support the transfer of such cargo to landside storage and transport, cannot be over emphasised. This is equally critical in ensuring a seamless supply chain; examples of which have been given many times in the earlier sections of this report.

In the overall view of cargo transfer activities at Australian ports, in some ports more than others, research indicates that break bulk cargo clearly suffers from a lack of public awareness. This lack of awareness can easily translate into a perception that our ports are mainly concerned with the handling of bulk commodities and containers and little else. Consequently, interest in ensuring adequate infrastructure for other cargoes that might only be able to be transported in break bulk form, suffers accordingly. P&O Automotive and General Stevedoring commented, “General cargo is unique to the industry but most people don’t know how (it gets here). Without it the world would come to a grinding halt.”

The major commodities/products that move in break bulk form through Australian ports have been identified in previous sections; further details are now added in order to underline their important economic contribution.

Alternative sources of energy have received much attention from the Australian Government particularly electricity generated by wind power that will be used to supplement existing power supplies. As noted earlier very large wind farms are under construction in the ACT and are planned for South Australia. Each unit consists of the turbine generator, blades and tower. Many of the towers are built in Australia but the generators and blades are imported. The GE 1.5-megawatt wind turbine, one of the most popular models, is made up of 35-metre blades atop a 65-metre tower of 35 tonnes and 71 tonnes respectively. Another common model — Vestas V90 from Denmark — consists of 45-metre blades and an 80-metre tower, with corresponding weight of 40 tonnes and 152 tonnes. Due to the size and weight of the turbines and length of the blades, only break bulk vessels have the handling capabilities i.e. large open space holds with ship’s gear/cranes able to handle heavy lifts. These components are discharged at many ports but mostly at Brisbane, Port Kembla, Portland and Port Adelaide.

Break bulk cargo is related to a wide range of markets, resulting in a close relationship with the national economy. Steel and timber products particularly have wide uses ranging from household products to defence equipment and motor vehicle manufacturing in Australia. Major steel importers Stemcor and CMC advise that every single product they import is used in different sectors such as building, road infrastructure upgrading, mining, road/port fencing reinforcement, kitchen tops and floors.

A relatively large number of commodities imported in break bulk form are not manufactured in Australia. CMC advised that "Australian steel manufacturers cannot meet the country's demands". One carrier advised that the steel that their vessels carry consists of approximately 50% of competitive steel and 50% of non-competitive steel in which non-competitive steel is the kind not manufactured in Australia. Both steel importers also indicated that a large proportion of the steel that they import is not suitable for being carried in containers due to the heavy package weights and over dimensional sizes plus the sheer volume of shipments.

Another factor relevant to this section is that even if some of the items carried on general cargo ships and discharged at Australian ports can be manufactured in Australia, break bulk imports still provide benefits for consumers as they provide competition in the market. One importer, for instance, advised that they imported 12,000 tonnes of steel at a competitive price which pushed the local steel manufacturers to come out with their own competitive pricing.

The break bulk sector also generates employment for a large number of people not only in the industry where the imported goods are used, but also at the port, both directly and indirectly through the sometimes complicated handling procedures. POAG has made a comparison between the movement of cargo in containers and in break bulk form; 20 tonnes in a container can move with a minimum of human intervention while break bulk is very labour intensive. Every piece of break bulk cargo is touched by stevedores while some types of project cargoes are very difficult to handle and require highly skilled workers. Therefore, the break bulk operation while involving labour intensive manual handling, also requires substantial skill training.

Infrastructure development in Australia e.g. tunnel construction, rail connections, mining, power station construction require overseas supplied materials and supplementary supplies which are mainly imported in break bulk form. The required machinery, construction material for ports and every forklift are brought into Australia as break bulk cargoes. One importer commented that "steel is essential to the Australian economy and the development of the country's industry and infrastructure." As a further example, structural steelwork, cranes and other equipment used in the current upgrading of the Gateway Bridge in Brisbane, was imported in general cargo ships.

Machinery and equipment produced and imported by Caterpillar is crucial for supporting the mining industry and development projects all around Australia. Olympic Dam in South Australia will eventually become the world's largest copper and uranium mine and will result in significant benefits for the Australian economy on an unprecedented scale. As noted earlier Caterpillar won a contract with BHP Billiton to provide machines for this project which will require the import of more than 500

machines with the heaviest one weighing up to 400 tonnes, many of which will be imported as built up units.

Similar development although not on the same scale as Olympic Dam, will take place in the North West of Australia. The ports of entry for construction steel, rail lines, drilling equipment, rail wheels, rail wagons etc that will be imported, will be Dampier and Port Hedland. As already described above port infrastructure at one port – Dampier, is already in need of significant upgrade. This equipment will be carried in break bulk form and if the port is not equipped to efficiently handle this, it will create a significant impediment to future development and hinder expansion of mining industries and infrastructure development in nearby Dampier and Port Hedland.

Despite break bulk cargo being relegated to a lower position in terms of the volume moving through most Australian ports, many still recognise the importance of the break bulk cargo sector. In addition to encouraging opinions from major break bulk shipping lines as to the future of the trade, Port Kembla Port Corporation (PKPC) is one port authority that has emphasised that break bulk cargo plays a significant role in the present and future operation of the port. The corporation has set specific objectives for handling break bulk cargo at Port Kembla from the start of port development and continues to place a high value on break bulk cargo as a major part of the port business.

9 CONCLUSIONS AND CONSIDERED AREAS FOR IMPROVEMENT

9.1 Introduction

It should be recognised that there were limitations that were apparent at the beginning if this study:

- Only shipping lines that are members of Shipping Australia and who operate break bulk cargo services into Australia, with two exceptions, have been consulted.
- The study did not include break bulk cargo that is exported through Australian ports.
- The absence of previous studies and reliable trade statistics that would enable more accurate quantification of the size of the industry.
- The availability of actual costs incurred – port charges that would provide a more accurate basis for comparing the cost of a ship call between different ports and identifying the most expensive component.
- A short time frame in which to initiate the study, gather relevant data and prepare a final report.

However, the benefits of conducting the study have far outweighed these constraints.

9.2 Benefits from Undertaking the Study.

These can be generally listed as follows:

- The study has exposed an important sector of seaborne trade into Australia not previously investigated.
- The realisation of the importance of the sector in terms of the contribution these services make in providing access to goods – some very specialised, that benefit the development of Australia.
- Highlighted the commitment by certain shipping lines to this trade sector in terms of specialised ships and service structure.
- Provided insights into which organisations can make a positive contribution to this important trade sector.
- Established a basis for a more complete study in the future.

9.3 Conclusions

These have emerged as the study progressed and it is of interest that similar conclusions were made over so many different ports.

1. That the strong focus on the bulk sector, container and motor vehicle sector in Australia's maritime trade appears to have overshadowed awareness of the existence and importance of the break bulk cargo sector apart from those directly involved.

2. That the attention given to the other trade sectors is reflected in considerable development in those areas. However, investment in shore-based facilities at most ports for break bulk cargo has fallen behind the need for such infrastructure.

3. Some examples of the connection between cargo carried by general cargo ships and national development have been mentioned. This is not to put forward break bulk cargo as the only contributor, the same can also be said about other sectors. However, the unique nature of this cargo does provide the basis for differentiation and recognition of the ports through which the vital cargoes pass to projects that contribute to national economic development as well as those commodities used for consumption.

4. The strong connection between the type of break bulk cargo carried by these ships, and infrastructure development of Australia does not appear to have been widely made.

5. In some ports the benefits that could be made from stronger competition in stevedoring services do not appear to have been fully assessed.

6. That the level of port costs could be an impediment to the development of this trade.

7. Because of the nature of the cargo e.g. heavy lifts, large awkward lifts, skilled labour is in short supply and not always available. There is also a shortage of labour in some ports.

8. Berthing priorities can disadvantage break bulk cargo ships which emphasises the need for dedicated port facilities to service this sector.

9. That these factors will have a seriously negative impact on the effectiveness of the supply chain for these commodities.

9.4 Areas for improvement

These suggestions are aimed at reaching a collaborative and consensual relationship among various stakeholders in the break bulk trade rather than judge or criticise behaviour or performance.

Some aspects of these suggestions are not only designed for the break bulk trade but apply equally to other shipping sectors, as well as recognition of a port's primary role.

9.4.1 Realise the importance of break bulk cargo

It is suggested that SAL works with members that operate break bulk services to draw up a plan of action to widely publicise as appropriate, the break bulk sector as an integral part of the shipping industry that serves Australia.

9.4.2 Shore-based Infrastructure Development

Initiate a more cooperative and collaborative approach to involve importers/exporters, shipping agents, stevedores and trucking companies, who have no formal contractual relationship with a port, to put forward suggestions that would contribute to improving the overall productivity of ports particularly in the break bulk sector. It does not appear that any of the Australian port authorities provide a genuinely representative platform for fostering this level of communication among parties involved with break bulk shipping.

This would provide a wider understanding of infrastructure needs and the constraints that need to be overcome to meet these needs.

As noted earlier in this report, the availability of undercover storage for weather sensitive cargoes is one example of a problem that exists at many ports. In this respect it is worth while highlighting some features of portable temporary warehouses since none of the Australian ports appear to have considered or used them before. According to suppliers, the installation time for an 1850m^2 temporary warehouse is 10-14 days. In addition to its faster construction period, it provides reliable protection for vulnerable cargoes. The temporary shed also offers flexible, ease and convenience during the time of relocation. The suitability of these structures is of course, subject to the availability of suitable land in the port area accessible to vehicles and the ability to withstand prevailing weather conditions.

9.4.3 Competition in Stevedoring/Terminal Management

Comments have been made by shipping lines and importers about the inadequate level of service stevedoring companies provide but more often about the operation of terminals that operate at ports adjacent to the berth where the ships discharges. This is a difficult area in which to make suggestions for improvement as the services provided by the stevedore – working the ship, and the terminal operator receiving and delivery the cargo, are the subject of either a contract between the ship operator and the stevedore or between the stevedore and the terminal operator. In most main ports there is no choice of terminal operator when the berth and cargo area is leased from the port authority.

One idea could be to encourage port authorities to consider the benefits of competition and in cases where new port developments that will cater for break bulk cargo are planned, to ensure that competitive lessees receive full consideration.

9.4.4 Port Costs

In most cases Australian ports are basically owned by Government corporations or statutory bodies. However, as the owner of ports, governments tend to aim at achieving two incompatible goals—maximise ports' profit (to achieve positive financial performance and sufficient infrastructure development funding) and to maintain low port charges to facilitate trade at the same time. Therefore, government should clearly articulate the trade facilitation role of ports in order to establish strategies that would lead to lowest port charges coinciding with adequate financial performance and sufficient funding of ports.

In relation to port authority charges, these should be kept at a reasonable level to make them competitive internationally. This could be monitored by regular cost comparison exercises involving Australian and overseas ports and the subsequent publication of the results as a means to keep cost levels transparent.

When considering changes to charges, port authorities should be required to provide sufficient notice of planned changes. This requirement should also extend to private providers of port services – towage, pilotage and linehandling whose charges should be included in cost comparison exercises.

Port activity has a largely unrecognised multiplier effect in terms of business generation when considering the various services that depend on the port. This justifies wider government recognition, at all levels, of the contribution that the port business makes to the Australian economy.

9.4.5 Skilled Labour Supply

Due to the nature of much break bulk cargo, it is recognised that difficulties arise in ensuring sufficiently skilled workers are available when required. This is up to the employer to determine and it is only with adequate communication between the ship operator and their contracted stevedore that future requirements can be planned.

The deployment of suitably trained employees extends also to the implementation of adequate security at terminals to ensure that the opportunity for theft is minimised and the risk of wrongful release of cargoes through limited checking, is eliminated.

9.4.6 Development of Key Performance Indicators

The majority of Australian ports have developed Key Performance Indicators (KPIs) to quantify and verify their service performance e.g. a customer satisfaction survey in Fremantle and a ship queuing indicator at Port Kembla. However, the setting of appropriate KPIs is a subtle and sophisticated activity, which needs to take the trade-off between various performance indicators into account. For instance, it is often possible to reduce ship operation hours by adding more cranes, and hence increasing port charges. Therefore, port authorities should make a careful choice of KPIs which lead to trade-off of various indicators consistent with customer satisfaction and the efficient operation of the port.

The KPIs used for the current assessment of performance targets are self performance KPIs where performance of the port is compared against itself over a period time or a predetermined target to identify the improvement in performance. However, it is not that easy to ensure that the measure is valid, workable, practical and a realistic indicator of performance.

Further research and design of industry performance KPIs is needed enabling a port's performance to be compared or ranked against national or even international benchmarks. The assessment of KPIs will have real value only if the results are publicly available and are used to improve port performance.

9.4.7 Supply Chain Considerations

Ports are integrated into international supply chains and the ability of some ports to achieve a higher level of the seamless movement of cargo through the port varies considerably.

Implementation of the above recommended areas for improvement will greatly assist break bulk shipping in fully meeting their customer's requirements for the long term seamless delivery of cargo. In addition, they will encourage port authorities to upgrade infrastructure planning and development with the objective of removing current port user dissatisfaction with port congestion, and berth availability, inadequate labour supply, lack of skills and limited storage facilities.

An effective system could be designed to provide a platform for facilitating information exchange, promoting collaborative problem-solving activity and fostering cooperative action in pursuit of a common objective. This could be in the form of a communication platform where all those involved in the cargo movement e.g., importers, shipping lines, trucking companies, stevedores as well as government agencies, have access to up-to-date information such as the availability of cargo, receival/delivery times etc. The platform could be designed to link the operation of port service providers as well as port users, resulting in the efficient operation of the port as a shared responsibility. The system could be designed as a broad-based and free flowing electronic platform to promote efficient communication among various parties. This will make an important contribution to the seamless movement of cargo through the port. SAL's promotion of port based data community systems is consistent with this policy objective.

10 APPENDIX 1: AUSTRALIAN PORTS THAT HANDLE BREAK BULK CARGO

Australian Break Bulk Ports

State / Territory	Break Bulk Ports	Break Bulk Berths	Principal Break Bulk Cargoes	Rail / Road Connection	Handling Facilities	Storage Areas
QLD	Cairns	Wharves No.7-8	General Cargo	Road	Forklifts	No
		Smith's Creek Wharf	General Cargo	Road	Forklifts	1360m2 of open storage and a 1,225m2 shed
	Townsville	No. 3	Ingots, refined copper, nickel, zinc, live cattle	Road/Rail	Forklifts	No
		No. 8	Scrap metal	Road	Forklifts	Shed
		No. 10	Live cattle and mining supplies	Road	Slewing luffing crane, forklifts	No
	Mackay	M1	Mining machinery, trucks, cranes, bulldozers etc.	Road	Cranes, forklifts etc. can be hired from local companies	10,000m2 of easily accessible hard stand areas and additional lay down areas available
		M4		Road		
		M5		Road		
	Port Alma	No. 1	Scrap metal, general cargo	Road	Forklifts	576m2 shed
		No. 2	General cargo, scrap metal	Road	Forklift, general fixed leg crane	No
	Gladstone	Boyne Wharf	General cargoes, aluminium	Road	No	Sealed open area near wharf approach
		Auckland Point 1	Break bulk cargoes	Road	No	Shed owned by Globex adjacent to Auckland Point 2
		Auckland Point 3	Break bulk cargoes	Road	Mobile crane, forklifts etc. (Patrick)	No
		Auckland Point 4	General cargo, scrap metal	Road	Mobile crane, forklifts etc. (Patrick)	1.5ha of general storage, 2100m2 shed and 3.5 of heavy storage
	Brisbane	Hamilton No. 4	General cargo	Road	Forklifts	3400m2 shed
		Maritime No. 1	Project cargo	Road	No	14,000m2 open storage
		AAT Terminal	Timber, steel, paper pulp, project cargo, machinery etc.	Road	Forklifts, harbour crane & mobile cranes etc.	15,000m2 shed and 6ha open storage area
		Grain Berth	Project Cargo, general cargo	Road	Forklifts	No
		General Purpose Berth	Project Cargo, general cargo	Road	Forklifts	No

State / Territory	Break Bulk Ports	Break Bulk Berths	Principal Break Bulk Cargoes	Rail / Road Connection	Handling Facilities	Storage Areas
NSW	Newcastle	Eastern Basin 1	Aluminium, steel, timber products	Road	Forklifts	4ha stacking area, warehouse 7120m2
		Eastern Basin 2	Aluminium, steel, timber products	Road	Forklifts	Shared facilities with Eastern Basin 1
		Western Basin 4 (heavy duty berth)	Project cargoes e.g. power generators, rail wagons	Road	Stern ramp	A backup storage area of 1.5 hectares is available
	Port Kembla	Berth 103 (AAT)	Timber products, steel, general cargo, project cargo etc.	Road	Forklifts, harbour crane	5,000m2 shed
		Berth 105-106 (AAT)		Road/Rail	Forklifts, harbour cranes, mobile cranes	Various small shed with total capacity about 3,000m2
		Berth 107		Road	Forklifts, mobile cranes	15,000m2 shed
		Grain Berth 104 (overflow only)	General cargo	Road	No	No
		Berth 109-107	Steel products	Road	Privately owned by BlueScope	Privately owned by BlueScope
		Port Kembla Gateway (overflow only)	General cargo, project cargo	Road	A old luffing crane (not in use)	No
VIC	Port Hasting (Westernport)	SW1 & SW2	Steel slab, steel coil	Road	Mobile equipment are privately owned by BlueScope.	Storage areas are owned by BlueScope and are used exclusively by BlueScope
	Melbourne	Appleton Dock B, C & D	General cargo	Road/Rail	Fauco Wharf crane, mafi trailer, forklifts	2×8,500m2 shed at Berth B/C, 7,500m2 shed at Berth D, 6ha open storage area
		Webb Dock West 3 & 4	General cargo	Road	Forklifts, prime movers, ramp runners	8ha open storage areas, 13,000m2 shed at berth 3&4
		South Wharf	General cargo	Road	No	11,148m2 and 27,870m2 sheds
		Victoria Dock 24	Timber, steel, paper products	Road	No	5,516m2 shed
	Geelong	Corio Quay North 1&2	Steel, pulp	Road/Rail	Forklifts	6,500m2 hard stand storage, 2,775.5m2 shed
		Corio Quay South 1	Steel, pulp	Road/Rail	Stern ramp, forklifts	4000.5m2 shed, 1122m2 canopy
	Portland	Lascelles 1-3	Steel, aluminium ingots, sulphuric acid	Road	Forklifts, harbour luffing cranes	Storage areas available
		KSA1	Break bulk cargo	Road/Rail	Handling facility for break bulk	2530m2 shed, 0.5ha open storage areas
		KSA2	Break bulk cargo	Road/Rail	Handling facility for break bulk	5570m2 shed, 0.5ha open storage areas
		Berth 5	Break bulk cargo, logs	Road	Handling facility for break bulk	5,570m2 shed, 0.9ha open storage areas
		Berth 6	Break bulk cargo, logs, livestock	Road	Handling facility for break bulk	0.4ha open storage areas

State / Territory	Break Bulk Ports	Break Bulk Berths	Principal Break Bulk Cargoes	Rail / Road Connection	Handling Facilities	Storage Areas
SA	Port Adelaide	OH1	General cargo, steel etc.	Road	All equipment has to hire from stevedores.	3876m2 shed
		IH18	General cargo, steel, scrap, logs, windmills etc.	Road	All equipment has to hire from stevedores.	4092m2 shed
		IH19	General cargo, steel, scrap, logs, windmills, machinery etc.	Road	All equipment has to hire from stevedores.	2877m2 shed
		IH20	General cargo, steel, scrap, logs, windmills, machinery etc.	Road	All equipment has to hire from stevedores.	2640m2 shed
		IH29	General cargo, steel etc.	Road	All equipment has to hire from stevedores.	A small backup shed
		Osborne 1&2	General cargo	Road	No	No
	PortPirie	No. 5	Zinc (mainly), copper, general cargo, project cargoes e.g. windmills, locomotives	Road	All equipment has to hire from stevedores.	Open storage area only
		No. 6	Zinc (mainly), copper, project cargoes	Road	All equipment has to hire from stevedores.	Open storage area only
TAS	Bell Bay	No. 6	Project cargoes e.g. windmills, locomotives	Road/Rail	Stevedores own mobile cranes	No
		No. 2	Wheeled and mobile cargoes	Road/Rail	30t luffing, slewing & travelling crane	Shed available
		No. 3	General cargo	Road	19t slewing, luffing, grabbing, travelling crane	Transit shed 744m2
		No. 5	General cargo	Road/Rail	40t mobile harbour crane	2.5ha marshalling area
	Burnie	No. 6	Ro/Ro, conventional cargoes	Road/Rail	50t harbour crane, 40t mobile crane	3.8ha marshalling area, transit shed 1,440m2
		No. 4	General cargo	Road/Rail	Forklifts, cranes etc.	Northern marshalling storage
		No. 6	Logs, heavy lifts	Road/Rail	80t Post Panamax portainer crane	No
	Hobart	No. 7	Veneer	Road/Rail	Forklifts Container gantry crane (crane rails extend over 340m to berth No. 5)	Forest product storage, southern marshalling area
		Macquarie No. 4	Break bulk cargoes	Road		2,660m2 shed
		Macquarie No. 5	Break bulk cargoes	Road		No

State / Territory	Break Bulk Ports	Break Bulk Berths	Principal Break Bulk Cargoes	Rail / Road Connection	Handling Facilities	Storage Areas
WA	Esperance	No. 2	General cargo, nickel	Road/Rail	Cranvel mobile crane	Cosmos nickel shed
	Albany	Land backed wharf 1	General cargo, pine logs	Road	12t&5t mobile cranes, forklift trucks	Transit shed available
	Bunbury	No. 5	Scrap metal, general cargo	Road/Rail	Forklifts	A large storage area
	Fremantle	North Quay 1	Steel, timber, machinery	Road	Container crane which can use for heavy lifts as well	16,130m2 staking areas
		North Quay 2	Steel, timber, machinery	Road	Container crane	7,495m2 stacking areas
		North Quay 11	Steel, timber, machinery	Road		26,203m2 stacking areas, an old shed with open end face west (shared with No. 12)
		North Quay 12	Steel, timber, machinery	Road		12,906m2 stacking areas
	Geraldton	No. 2,3&4	Steel pipes, cattle, rail wagon	Road	None. Crane available from crane hiring companies.	No
		No. 6 (main break bulk berth)	Steel pipes, cattle, rail wagon	Road	None. Crane available from crane hiring companies.	No
	Dampier Port Hedland	Dampier Cargo Wharf (7 berths)	General cargo, mining machinery, project cargoes e.g. rail wagons, rail wheels etc.	Road	No	6,100m² lay down areas
		PHPA No. 1	livestock, general cargo, steel	Road	No	9,000m2 open hard standing space
		PHPA No. 2	General cargo, livestock, heavy lifts	Road	No	No
		PHPA No. 3	General cargo, livestock	Road	No	2,000m2 shed, 4,300m2 hard standing area
NT	Broome	Berth 4-12	Cattle, drilling equipment	Road	2×100t & 2×45t mobile crane, 28t forklifts	482m2 transit shed, land side storage facilities can be leased from Toll Mermaid Logistics Broome & Oilfield Transport Services
	Darwin	East Arm Wharf	Livestock, steel, heavy lifts e.g. machinery	Road/Rail	Gantry crane, Crawler crane, forklifts etc.	10ha of sealed hardstand, 4,000m2 transit shed

11 APPENDIX 2: ABBREVIATIONS

AAT	Australian Amalgamated Terminals Pty Limited
AAL	Austral Asia Line Pty Ltd
GAC	Gulf Agency Company (Australasia) Pty Ltd
ISS	Inchcape Shipping Services Pty Ltd
ITI	Innovative Timber Ideas
MSA	McArthur Shipping & Agency Company Pty Ltd
NYK	(Nippon Yusen Kaisha) NYK Line (Australia) Pty Ltd
PCC	Pure Car Carrier
PCTC	Pure Car and Truck Carrier
POAG	P&O Automotive and General Stevedoring
PBC	Port of Brisbane Corporation
PoMC	Port of Melbourne Corporation
PKPC	Port Kembla Port Corporation
POST	Pacific Orient Sea Transport
WWL	Wallenius Wilhelmsen Logistics

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