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FROM THE DIRECTOR

This issue of *Waterline* includes our regular articles on stevedoring performance, port interface costs, port performance and crew to berth ratios. A feature article covers port interface costs at Burnie.


The discussion of stevedoring performance in *Waterline* now focuses on indicators expressed in containers per hour. This approach is generally considered to provide a more rigorous basis for productivity comparisons than indicators expressed in teus per hour. At this stage, the teu-based measures will be retained for the Port Interface Cost Index and port performance data.

Stephen Hunter
Director


IN BRIEF

Stevedoring performance


Due to delays in receiving key data for Sydney, the December quarter indicators cover only four ports. It is expected that the data for Sydney, and the five-port averages, will be published in the June issue of *Waterline*. If these data become available in time, they will be released prior to the June issue.

In the December quarter, crane rates increased at Brisbane (16.9 containers per hour), Adelaide (19.6 containers per hour) and Fremantle (18.2 containers per hour). Net rates and elapsed rates generally improved at these three ports. At Melbourne, there were declines in the crane rate (17.8 containers per hour), net rate and elapsed rate. 


Waterfront reliability

The BTCE has identified some gaps in the reliability data that are currently available from the providers of waterfront services. Alternative data sources are being developed for several indicators. 


Port Interface Cost Index

Between January–June and July–December 1996, the national Port Interface Cost Index declined by 0.6 per cent for an import teu and by 0.7 per cent for an export teu. The reductions in the national index mainly reflected lower port and related charges per teu at three ports and lower road transport charges at two ports. 


Burnie

Port interface costs at Burnie increased slightly in 1996. The available data indicate that several components of port interface costs are relatively low at Burnie. However, caution should be used in drawing conclusions from the relative costs indicated by the data. 


Port performance - financial

There was significant variation in the financial performance of individual port authorities/ corporations in 1995/96. Factors affecting performance included asset revaluations, restructuring of capital and income tax equivalent payments. 

Port performance - non-financial

Total cargo throughput (bulk and general cargo) at the five mainland capital city ports declined by 0.8 per cent between January–June and July–December 1996. Container traffic (teus) increased by 9.5 per cent. Median ship turnaround time increased at three of the four ports for which data are available. 

Crew to berth ratios

Crew to berth ratios for Australian merchant and offshore shipping increased in the December quarter 1996. The ratios remained above the targets agreed as part of the shipping industry reform process. 

STEVEDORING PERFORMANCE

Commencing with this issue of *Waterline*, the discussion of stevedoring performance will focus on indicators expressed in containers per hour. These indicators provide a more rigorous basis for productivity comparisons than measures expressed in teus per hour because they are not affected by variations in the mix of 20 foot and 40 foot containers. A range of major industry participants have also stated that container-based indicators are the most appropriate basis for productivity measurement.

The available information suggests that the five-port average crane rate was 10–11 containers per hour at the beginning of the WIRA process and around 16 containers per hour at the end of the process. *Waterline* data (table 1) indicate that the figure was 18 containers per hour in the September quarter 1996.

[NB. Some containers per hour figures for the March, June and September quarters of 1996 have been revised to incorporate amended weighting figures provided to the BTCE. The figures in question are highlighted in the table. No change is greater than 0.3 of a container and the majority are of the order of 0.2 of a container.]

Waterline has traditionally reported stevedoring indicators on the basis of teus per hour as this format was adopted in the earlier data published by WIRA. The teu-based data, which are presented in figures 1 to 6 and table 12, will be retained in *Waterline* for the purposes of long-term historical comparison.

December quarter data

This issue of *Waterline* contains stevedoring performance data up to the December quarter 1996 for Brisbane, Melbourne, Adelaide and Fremantle.

The data for Sydney, and the five-port averages, cover the period to the September quarter 1996. As a result of difficulties with a new computer system at one of the Sydney container terminals, the December quarter data for Sydney were not available for this issue of *Waterline*. It is expected that the data will be published in the June issue.

Table 1 presents the stevedoring performance data over the last four or five quarters in terms of containers (ie moves) per hour. The data for Brisbane, Sydney, Melbourne and Fremantle are averages for the terminals operated by P&O Ports and Patrick at each port. The Adelaide data cover the SeaLand terminal.

Five-port average

Due to the unavailability of a complete set of stevedoring performance data for Sydney, the BTCE has been unable to prepare the five-port averages for the December quarter in this issue.

Brisbane

Stevedoring performance at Brisbane generally improved in the December quarter.

The crane rate was 16.9 containers per hour, up from 16.5 containers per hour in the previous quarter.

The net rate remained steady at 20.4 containers per hour in the December quarter. Average crane intensity was 1.22 compared with 1.24 in the previous quarter.

Brisbane's elapsed rate was 17.4 containers per hour in the December quarter, up slightly from 17.2 containers per hour in the September quarter. On a per crane basis the figure increased to 14.2 containers per hour, from 13.8 containers per hour in the previous quarter.

The average proportion of elapsed time not worked at Brisbane was 15.0 per cent in the December quarter, compared with 15.6 per cent in the September quarter.

Sydney

Due to difficulties with a new computer system at one of the Sydney container terminals, the operator was not able to extract performance data for the December quarter.

Melbourne

At Melbourne, there was a decline in stevedoring performance in the December quarter. This followed improvements in the previous three quarters associated with major upgrading of facilities and equipment at

the container terminals. The decline in the December quarter reflected difficulties associated with the introduction of a new enterprise-based agreement at one of the terminals.

The crane rate at Melbourne was 17.8 containers per hour in the December quarter, down from 19.6 containers per hour in the previous quarter.

The net rate declined to 21.7 containers per hour in the December quarter from 25.6 containers per hour in the September quarter. Average crane intensity was 1.21 compared with 1.31 in the previous quarter.

Melbourne's elapsed rate was 17.9 containers per hour in the December quarter, down from 21.1 containers per hour in the September quarter. On a per crane basis the figure declined to 14.8 containers per hour, from 16.2 containers per hour in the previous quarter.

The average proportion of elapsed time not worked at Melbourne was 17.8 per cent in the December quarter, virtually unchanged from the figure of 17.6 per cent in the September quarter.

Adelaide

Adelaide's stevedoring performance improved in the December quarter.

The crane rate increased to 19.6 containers per hour, from 19.3 containers per hour in the previous quarter. This continued the general upward trend over the period covered by [table 1](#).

The net rate rose to 23.1 containers per hour in the December quarter from 22.8 containers per hour in the September quarter. Average crane intensity was unchanged at 1.18.

Adelaide's elapsed rate was 22.6 containers per hour in the December quarter, up from 22.2 containers per hour in the September quarter. On a per crane basis the figure rose to 19.2 containers per hour, from 18.8 containers per hour in the previous quarter.

Adelaide continued to have a very low proportion of time not worked. The average proportion of elapsed time not worked was 2.2 per cent in the December quarter, compared with 2.6 per cent in the previous quarter.

Fremantle

Stevedoring performance at Fremantle improved in the December quarter, partly reversing the decline in the September quarter which followed two consecutive quarters of productivity increases. Factors contributing to improved performance included the consolidation of the container berths, the introduction of new enterprise-based agreements at the terminals and the installation of a new crane.

Fremantle's crane rate was 18.2 containers per hour in the December quarter, up from 17.8 containers per hour in the previous quarter.

The net rate rose to 20.5 containers per hour in the December quarter from 19.4 containers per hour in the September quarter. Average crane intensity was 1.12 compared with 1.09 in the previous quarter.

Fremantle's elapsed rate was 15.6 containers per hour in the December quarter, up from 13.4 containers per hour in the September quarter. On a per crane basis the figure rose to 13.9 containers per hour, from 12.3 containers per hour in the previous quarter.

The average proportion of elapsed time not worked at Fremantle was 23.9 per cent in the December quarter, down from 31.0 per cent in the September quarter.

Teus per hour

[Figures 1 to 6](#) and [table 12](#) present the stevedoring indicators in terms of teus per hour over the period from the WIRA process. They cover the same ship calls as the containers per hour data in [table 1](#).

The performance changes indicated by the teu-based measures between the September and December quarters were generally in the same direction as the changes indicated by the container-based measures. The only differences were at Brisbane where there was a significant variation in the mix of 20 foot and 40 foot containers over the period.

RELIABILITY

Issue 9 of *Waterline* presented the proposed indicators of waterfront reliability which have been developed in consultation with major industry participants.

In late December the BTCE formally requested port authorities/corporations and container terminal operators at the five mainland capital city ports to provide data for the indicators. Approaches were also made to several other providers of waterfront services.

Responses from the industry indicate that there are some gaps in the reliability data that are available from the providers of waterfront services at Australian ports. The availability of data for non-stevedoring aspects of reliability varies significantly between ports. In relation to the stevedoring indicators, one terminal operator has provided about one-half of the data requested by the BTCE.

As there appear to be some significant gaps in the available data for waterfront reliability indicators, the BTCE has reviewed the proposed indicators. Alternative data sources are being developed for several indicators in consultation with major industry participants.

PORT INTERFACE COST INDEX

The Port Interface Cost Index provides a measure of shore-based shipping costs for containers moved through Australia's mainland capital city ports. It incorporates the charges of various providers of waterfront-related services. These charges represent costs to shipping lines and shippers.

The major components of the Port Interface Cost Index are port and related charges, stevedoring charges and land-based charges. The index is calculated for individual ports and on a national basis.

Cost parameters

The representative ship used to calculate port and related charges for July–December 1996 was unchanged from the ship used in the previous period (table 2).

The average number of teus exchanged per port call for ships in the representative range increased at Brisbane (9.9 per cent), Melbourne (3.6 per cent) and Fremantle (3.6 per cent) between January–June 1996 and July–December 1996. There were declines at Sydney (3.1 per cent) and Adelaide (4.2 per cent).

Port and related charges per ship visit

The port and related charges in the Port Interface Cost Index incorporate ship-based and cargo-based components. The ship-based charges are conservancy (previously called State government), tonnage, pilotage, towage, mooring/unmooring and berth hire. The cargo-based charges are wharfage, harbour dues and berth charge (previously called berthing).

The last two rows in table 3 provide information on total ship-based charges and empty teu charges *per ship visit* for the representative ship. Information on port and related charges *per teu* (ie charges per ship visit divided by average teu exchange) is presented in the rest of the table.

Table 3 indicates that total ship-based charges *per ship visit* were unchanged at Brisbane and Fremantle between January–June 1996 and July–December 1996. There was a minor change at Adelaide as a result of a slight increase in average berth time which affected the time-based tonnage charge.

Ship-based charges per ship visit declined at Sydney following a 10.9 per cent reduction in the tonnage charge from 1 July 1996. There was also a decline at Melbourne as a result of a 35.4 per cent reduction in mooring/unmooring charges (excluding launch hire). This reduction more than offset a rise in time-based berth hire charges attributable to higher average berth time at Melbourne.

Table 3 indicates that, for an operator of a vessel similar in size to the representative ship, Fremantle (\$17 902) had the lowest total ship-based charges per ship visit in July–December 1996. It was followed by Brisbane (\$19 840) and Adelaide (\$19 873).

Port and related charges per teu

The level of *ship-based charges per teu* provides an indication of the potential impact of ship-based charges on shippers. This measure is affected by the total charges per ship visit and by the number of teus exchanged per visit. With a given level of charges per ship visit, a reduction in the number of teus exchanged will result in a higher charge per teu to bring the ship into the port. Conversely, an increase in the average exchange will reduce the cost per teu with a given level of charges per ship visit.

Ship-based charges per teu declined at Brisbane (9.1 per cent), Sydney (0.5 per cent), Melbourne (3.7 per cent) and Fremantle (3.5 per cent) between January–June 1996 and July–December 1996. These declines mainly reflected the reductions in ship-based charges per ship visit at Sydney and Melbourne, and the increases in average exchanges at Brisbane, Melbourne and Fremantle. Ship-based charges per teu increased at Adelaide (4.9 per cent) as a result of the decline in the average teu exchange.

Cargo-based charges for loaded containers were unchanged at Brisbane, Sydney and Fremantle in the July–December period. At Melbourne, a 20 per cent reduction in wharfage on loaded and empty containers took effect from 1 July 1996. Wharfage on empty containers at Sydney was reduced to \$10 per teu from \$25 per teu. Published charges were unchanged at Adelaide, but an increase in the proportion of containers loaded with primary produce (concessional charge) resulted in a slight reduction in the weighted average charge for loaded export containers at the port.

Overall, *port and related charges per teu* (ship-based charges per teu plus cargo-based charges) for loaded export containers declined at Brisbane (4.2 per cent), Sydney (0.2 per cent), Melbourne (12.0 per cent) and Fremantle (1.8 per cent). There was an increase of 2.3 per cent at Adelaide.

Stevedoring charges per teu

The stevedoring charges used in this issue of *Waterline* are the preliminary figures for 1995 obtained from the Australian Competition and Consumer Commission (ACCC). The national weighted average revenue for the ACCC's sample of container terminal operations was \$203 per teu in 1995. The stevedoring charges in [table 4](#) will be updated when data for 1996 become available.

Land-based charges per teu

Information on customs brokers' fees and road transport charges is contained in [table 4](#). There were no major changes in these fees and charges between January–June 1996 and July–December 1996.

Customs brokers' fees at Brisbane, Melbourne and Adelaide (exports) were unchanged in July–December 1996 compared with the previous period. There were minor changes ranging between \$1 per teu and \$3 per teu at Sydney (increase), Adelaide (decline for imports) and Fremantle (increase). As a result of an increase in the number of survey respondents, customs brokers' fees at Adelaide and Fremantle are now reported separately rather than as a combined average.

Road transport charges rose marginally at Melbourne, Adelaide and Fremantle between January–June 1996 and July–December 1996. The increases at these ports ranged between \$1 per teu and \$3 per teu. There were reductions of a similar magnitude at Brisbane and Sydney.

Indexes for individual ports

[Table 4](#) provides details of port interface costs for individual ports in July–December 1996 and the previous half-year. It indicates that total costs (charges) per teu declined at Brisbane, Sydney and Melbourne. There were increases at Adelaide and Fremantle.

The factors contributing to the changes in port interface costs at each port are shown in [figure 7](#). Port and related charges per teu were the major source of change at Brisbane, Melbourne and Adelaide. They also had a significant impact at Fremantle. Customs brokers' fees contributed to the movements in port interface costs at Sydney, Adelaide (imports only) and Fremantle. Changes in road transport charges affected all ports.

National index

Data on the national Port Interface Cost Index are presented in [table 5](#). In overall terms, the index declined by 0.6 per cent for an import teu and by 0.7 per cent for an export teu between January–June 1996 and July–December 1996. In real terms, the falls were 1.6 per cent for imports and 1.7 per cent for exports.

The reductions in the national index mainly reflected lower port and related charges per teu at three ports (particularly Melbourne) and lower road transport charges at two ports. These reductions were partly offset by higher port and related charges at one port, increases in customs brokers' fees at two ports, and higher road transport charges at three ports. Since the national index is an average (weighted by teu throughput at each port) for the five mainland capital city ports, developments at Sydney and Melbourne have a major impact on the national outcome.

PORT INTERFACE COSTS AT BURNIE

The BTCE's Port Interface Cost Index provides information on changes in shore-based shipping costs for container traffic at the five mainland capital city ports. These ports handle most of Australia's containerised sea cargo. However, there are also significant movements of containers at Burnie and several other Australian ports.

This article describes the services and facilities for container traffic at Burnie. It also provides estimates of port interface costs at Burnie using the methodology developed for the Port Interface Cost Index.

Trade and services

Burnie, which is located on the north coast of Tasmania, is Australia's fifth largest container port in terms of the total number of containers handled. It services ships in both the coastal and overseas trades.

Burnie handles substantial amounts of bulk cargo as well as containerised and non-containerised general cargo. The major commodities in 1995/96 included general cargo (1.6 million revenue tonnes), mineral concentrates (0.6 million revenue tonnes), vegetables (0.4 million revenue tonnes) and paper (0.4 million revenue tonnes).

Total throughput of bulk and general cargo at Burnie was almost 5.3 million revenue tonnes in 1995/96. Domestic movements accounted for 4.1 million revenue tonnes and the remaining cargo was for the overseas trades.

Container traffic totalled 119 669 teus in 1995/96, an increase of 15 287 teus on the previous year. The majority of this traffic (101 593 teus) was carried on domestic services by Brambles Shipping which operates two ships between Melbourne and Burnie. The company has its own terminal at Burnie.

Most of the remaining 18 076 teus handled at Burnie in 1995/96 involved ships operating in the overseas trades. The services comprised:

- a fortnightly South East Asia service operated by MISC/Nedlloyd/MOL (369 494 revenue tonnes of cargo);
- a monthly South East Asia service operated by ANRO (89 927 revenue tonnes of cargo);
- a monthly European service operated by P&O (48 698 revenue tonnes of cargo); and
- a service, mainly to Japan, operated by COSCO during the vegetable export season (44 882 revenue tonnes of cargo).

In addition to the terminal operated by Brambles, Burnie has two berths for the handling of container ships. Each berth is served by a container crane owned by the Burnie Port Authority. There is a single lift 80 tonne post-Panamax portainer crane at one berth and a twin lift 65 tonne portainer crane at the other berth. Stevedoring services are provided by Patrick and P&O Ports which pay for the use of the container cranes. Other facilities for container traffic include 322 refrigerated container outlets and a ramp for stern loading and unloading.

Pilotage and mooring/unmooring services at Burnie are provided by the port authority. Towage services are operated by a private company, owned by Brambles, which has two tugs operating from Burnie. A vessel similar to the representative ship used in the Port Interface Cost Index typically requires two tugs to berth at Burnie, and departs without towage assistance.

Cost estimates

Table 6 presents estimates of port and related charges at Burnie using the methodology developed for the Port Interface Cost Index.

The ship parameters used to estimate the costs are outlined in table 2. Most of the container ship calls at Burnie involve the Brambles vessels, which are significantly smaller than the representative ship used in *Waterline* (15 000 to 20 000 grt range). The estimates of port interface costs at Burnie are therefore based on ships operating in the overseas trades rather than on ships providing coastal services.

There were 12 calls by vessels in the representative ship range at Burnie in the first half of 1996 and 10 calls in the second half of the year. The average exchanges for these ships were:

- 458 teus, comprising 277 loaded (51 inwards and 226 outwards) and 181 empties in January–June 1996; and
- 454 teus, comprising 275 loaded (80 inwards and 195 outwards) and 179 empties in July–December 1996.

Table 6 indicates that there are four ship-based charges at Burnie—tonnage, pilotage, towage and mooring/unmooring. Wharfage is the only cargo-based charge at Burnie.

Table 7 provides details of port interface costs at Burnie in 1996. In line with the approach used for the five mainland capital city ports, the stevedoring charge is the national average figure prepared by the ACCC.

The BTCE had some difficulty in obtaining data on customs brokers' fees for Burnie as the small number of companies operating in the port raised issues of commercial confidentiality. The fees in table 7 are therefore based on responses to a BTCE survey of major Tasmanian customs brokers.

Information on road transport charges for containers was obtained from several companies providing services in the Burnie area. The charges reflect the relatively short distances between the port and warehouses in Burnie, and the absence of truck delays.

The estimates of port interface costs reported in *Waterline* are primarily intended as indicators of movements in the performance of individual ports over time. Tables 6 and 7 indicate that port interface costs at Burnie increased slightly between January–June 1996 and July–December 1996. The increase reflected rises in tonnage, pilotage, mooring/unmooring and wharfage charges in the July–December period.

A comparison of table 7 with the data for the mainland capital city ports in table 4 indicates that Burnie has lower ship-based charges and higher cargo-based charges (for imports) than the other ports. This reflects significant differences in the structures of port charges.

The data in tables 4 and 7 also indicate that total port interface costs at Burnie are lower than those at the mainland capital city ports, with the major contributing factors being ship-based charges and road transport charges. Caution should be used in drawing conclusions from the relative costs indicated by the data as there are significant differences between ports in factors such as:

- traffic levels;
- patterns of ship calls (including ship sizes);
- physical characteristics (eg distances between the port and warehouse facilities); and
- port authority/corporation pricing practices.

The use of national weighted average revenue for the stevedoring component also means that inter-port variations in stevedoring charges are not captured by the *Waterline* data. In addition, the methodology used to estimate port interface costs does not include service quality or delay costs.

Concluding comments

Burnie is Australia's fifth largest container port in terms of the total number of containers handled. Port interface costs at Burnie increased slightly in the second half of 1996. The available data indicate that several components of port interface costs are relatively low at Burnie, although caution should be used in drawing conclusions from the relative costs indicated by the data.

PORT PERFORMANCE - FINANCIAL

Information on the financial performance of the five mainland capital city port authorities/corporations in 1994/95 and 1995/96 is presented in [table 8](#).

The comparability of the Melbourne and Adelaide data over the two years is affected by the restructuring of the port authorities/corporations at these ports. Financial data for 1995/96 are not available for Melbourne as the Port of Melbourne Authority was replaced by three entities from 1 March 1996. The 1994/95 data for Adelaide cover January–June 1995, the initial period of operation of Ports Corp South Australia.

As a result of these factors, this article focuses on changes in the financial performance of the port authorities/corporations at Brisbane, Sydney and Fremantle. Some aspects of performance at Adelaide are also discussed.

The financial performance of individual port authorities/corporations in 1995/96 was affected by several factors including asset revaluations, restructuring of capital and the commencement of income tax equivalent payments. The Sydney Ports Authority was corporatised on 1 July 1995 and Fremantle's port authority was commercialised after the period covered by [table 8](#) (from 1 July 1996).

Earnings and assets

Earnings before interest and tax (EBIT) of the Brisbane and Sydney port corporations declined in 1995/96. There was no change in the EBIT of Fremantle's port authority. Adelaide's port corporation was particularly affected by an abnormal item of -\$49.3 million associated with the restructuring process.

Operating profit after income tax of the Brisbane and Sydney port corporations declined in 1995/96. There was an increase at Fremantle.

Average total assets of the Sydney and Adelaide port corporations declined in 1995/96. The reduction at Sydney followed a complete asset valuation with an effective date of 1 July 1995. There were increases in average total assets at Brisbane and Fremantle.

Return on assets (EBIT as a proportion of total assets) generally declined in 1995/96. The decline at Brisbane reflected lower EBIT and higher assets. Lower EBIT offset reductions in assets to result in a lower return on assets at Sydney (and Adelaide). At Fremantle, EBIT was steady but total assets increased.

Dividends

Dividends paid by the Brisbane and Sydney (and Adelaide) port corporations declined in 1995/96. Fremantle's port authority did not pay a formal dividend in 1994/95 or 1995/96 due to its high level of debt.

The *dividend payout ratios* of the Brisbane and Sydney port corporations increased in 1995/96 as the reductions in dividends were less than the declines in operating profits. There was no change in the dividend payout ratio of Fremantle's port authority, as a dividend was not paid in either 1994/95 or 1995/96.

Debt and equity

Total debt of Sydney's port corporation increased in 1995/96. A restructuring of the Sydney port corporation's capital in June 1996 included the repayment of Maritime Services Board borrowings and the drawdown of \$150 million debt. Brisbane's port corporation made a small borrowing in 1995/96 in the form of a five-year finance lease. The debt of the Adelaide and Fremantle port authorities/corporations declined in 1995/96.

Total equity of the Brisbane and Fremantle port authorities/corporations increased in 1995/96. At Fremantle, the increase in equity reflected several factors including a revaluation of berths and jetties and the phased assumption by the WA Treasury of responsibility for payments relating to the superannuation pension liability for past employees. There were reductions in the equity of the Sydney and Adelaide port corporations. The restructuring of the Sydney port corporation's capital included a return of capital to shareholders.

Debt/equity ratios of the Sydney and Adelaide port corporations rose significantly in 1995/96. The ratio of Brisbane's port corporation was virtually unchanged.

PORT PERFORMANCE - NON-FINANCIAL

Information on aspects of non-financial performance for the five mainland capital city ports in 1996 is presented in [table 9](#).

Cargo throughput

Total cargo throughput (bulk and general cargo) at the five ports declined by 0.8 per cent between January–June 1996 and July–December 1996. Declines in throughput at Fremantle, and to a lesser extent at Brisbane, offset increases at the other ports.

The decline in total cargo throughput in July–December 1996 followed a rise of 9.6 per cent in the previous half-year. Total cargo throughput in July–December 1996 was 8.8 per cent higher than throughput in the corresponding half-year of 1995.

The tonnage of *non-containerised, general cargo* handled at the five ports increased by 10.1 per cent in July–December 1996 compared with January–June 1996. There were increases in cargo at all ports except Fremantle.

Container traffic (teus) at the five ports increased by 9.5 per cent in July–December 1996 compared with the January–June period. Total teus increased at Brisbane (6.7 per cent), Sydney (10.7 per cent), Melbourne (9.8 per cent), Adelaide (25.8 per cent) and Fremantle (1.9 per cent). Overall for the five ports, there were increases in full import teus (14.9 per cent), full export teus (7.6 per cent) and empty export teus (2.1 per cent), and a marginal decrease in empty import teus (0.1 per cent).

In the calendar year 1996, a total of 2.2 million teus were exchanged at the five ports. This represented a 7.4 per cent increase over the 1995 figure.

The data in [table 9](#) cover all containers handled at the five mainland capital city ports. They include movements at all terminals and multi-purpose berths, whether by lifting or by movement across the ramps of roll-on/roll-off ships. [Table 9](#) therefore provides a more comprehensive measure of container traffic than [table 12](#) which focuses on containers handled at major container terminals in the five ports.

Employment

Comparable data on average total employment over the two periods covered by [table 9](#) are available for four of the port authorities/corporations.

Total employment at these port authorities/corporations (ie excluding Melbourne) fell by 1.3 per cent between January–June 1996 and July–December 1996. Employment declined at Fremantle (4.7 per cent) and Adelaide (4.2 per cent), increased at Brisbane (3.1 per cent) and was unchanged at Sydney.

Ship turnaround time

Data on ship turnaround times in July–December 1996 are available for four of the mainland capital city ports. Information for Fremantle has been delayed due to technical difficulties with the port authority's statistical reporting system.

The median turnaround time for ships calling at container terminals increased at Brisbane, Sydney and Melbourne in July–December 1996 compared with the January–June period. There was a decline at Adelaide. These changes partly reflected the variations in average teu exchanges noted in the earlier discussion of the Port Interface Cost Index.

The indicator of median turnaround time is based on total time in port (usually measured from port boundary to port boundary). It is not directly comparable with the estimated stevedoring time for a 560 teu exchange (based on time between labour first ordered and last labour off the ship) that has also been reported in earlier issues of *Waterline*.

The 95th percentile ship turnaround time declined at Sydney and Adelaide between January–June 1996 and July–December 1996. There were increases at Brisbane and Melbourne. The 95th percentile figure indicates the turnaround time that is equalled or bettered by 95 per cent of ships using a particular port. It provides a partial indicator of the variability of ship turnaround time at each port.

CREW TO BERTH RATIOS

The shipping industry reform process in Australia has included targets for reductions in the crew to berth ratios for merchant and offshore shipping. As part of this process, the BTCE has been monitoring crew to berth ratios for merchant shipping (since the September quarter 1993) and offshore shipping (since the March quarter 1995).

For the purposes of the monitoring process, the crew to berth ratio is defined as the number of seafarer days paid over a period of time, divided by the number of berth days the ship/s operated. Berth days operated is defined as the sum, over the period, of the number of people normally required each day by the relevant statutory authority and the ship operator to be employed in order to carry out the work of the ship/s in a safe and efficient manner.

Issue 9 of *Waterline* described the monitoring process, the methodology used by the BTCE and trends in the ratios up to the end of the September quarter 1996. A key finding was that the targets for reductions in crew to berth ratios had not been achieved.

This article updates the information on crew to berth ratios for Australian merchant and offshore shipping with data for the December quarter 1996.

Merchant shipping

Figure 8 presents data on the crew to berth ratio, and its components, for Australian merchant shipping over the period from the September quarter 1993 to the December quarter 1996.

The overall crew to berth ratio for merchant shipping was 2.247 in the December quarter, up from 2.195 in the September quarter. This was the highest ratio since the beginning of the monitoring process (initial level 2.133). It was well above the reform objective of 2.000.

The 2.4 per cent increase in the December quarter appears to be mainly attributable to additional crew requirements associated with the transfer of several ships between operators. Such transfers usually involve temporary increases in crew numbers while the new crews become familiar with different management practices and ship characteristics. The overall crew to berth ratio for the ship operators that were not involved in ship transfers during the December quarter increased only marginally (by 0.4 per cent) in this period.

Ship time is the largest component of the crew to berth ratio for merchant shipping. The ship time ratio was 1.093 in the December quarter, up from 1.041 in the September quarter (initial level 1.025). This increase appears to mainly reflect the extra crew requirements associated with the transfer of ships between operators.

Accrued leave (formerly called recreation leave in *Waterline*) gives effect to leave with pay for weekends and public holidays worked, annual leave with pay of five weeks per annum, sick leave, compassionate leave and leave in lieu of a 35-hour week. The accrued leave ratio increased to 1.003 in the December quarter from 0.981 in the September quarter (initial level 0.971).

Compensation leave is the third largest component of the crew to berth ratio for merchant shipping. The compensation leave ratio was 0.077 in the December quarter, down from 0.090 in the September quarter (initial level 0.073).

The *long service leave* ratio for the merchant fleet was virtually unchanged at 0.037 in the December quarter 1996 (initial level 0.035).

The remaining components accounted for less than 2 per cent of the overall crew to berth ratio in the December quarter. The *study leave* ratio increased to 0.027 in the December quarter from 0.023 in the September quarter (initial level 0.024). The *training and other paid leave* ratio declined to 0.010 from 0.024 over this period (initial level 0.006).

Table 10 shows the individual components of the crew to berth ratio for the merchant shipping fleet, by crew classification, in the December quarter. Engineers had the highest ratio (2.379) followed by deck officers (2.290), integrated ratings (2.177) and catering crew (2.166).

The ratios for deck officers and engineers in the December quarter were the highest figures recorded for these categories since the monitoring process commenced in the September quarter 1993. The increase appears to be associated with the transfer of ships between operators.

Offshore shipping

Figure 9 presents data on the crew to berth ratio, and its components, for Australian offshore shipping over the period from the March quarter 1995 to the December quarter 1996.

The overall crew to berth ratio for offshore shipping was 2.343 in the December quarter, up marginally from 2.338 in the September quarter. The December quarter ratio was above the figure at the beginning of the monitoring process (initial level 2.327).

Accrued leave (formerly called recreation leave in *Waterline*) is the largest component of the crew to berth ratio for offshore shipping. It comprises paid leave to compensate for work on public holidays, intervals of leave associated with the two-crew duty system, annual leave and time spent travelling in off-duty time. The standard work to leave ratio for offshore shipping is one day's work accrues 1.153 days leave. The accrued leave ratio was 1.153 in the December quarter, down marginally from 1.157 in the September quarter (initial level 1.151).

Ship time reflects days paid for ship duty (which may include travelling time and days signing on and off). The ship time ratio was 1.026 in the December quarter, virtually unchanged from the September quarter figure of 1.025 (initial level 1.021).

Compensation leave is the third largest component of the crew to berth ratio for the offshore fleet. The compensation leave ratio increased to 0.116 in the December quarter from 0.104 in the September quarter (initial figure 0.100).

The *long service leave* ratio for the offshore fleet was unchanged at 0.038 in the December quarter (initial level 0.038).

The remaining components accounted for less than 1 per cent of the overall crew to berth ratio in the December quarter. The *study leave* ratio fell to 0.010 in the December quarter from 0.014 in the September quarter (initial level 0.013). The *training and other paid leave* ratio was 0.000 in both periods (initial level 0.003).

Table 11 shows the individual components of the crew to berth ratio for the offshore shipping fleet, by crew classification, in the December quarter. Integrated ratings had the highest ratio (2.404) followed by deck officers (2.320), catering crew (2.288) and engineers (2.276).

Concluding comments

The crew to berth ratio for merchant shipping increased in the December quarter. The increase appears to be mainly attributable to additional crew temporarily required for the transfer of several ships between operators. There was a marginal rise in the overall crew to berth ratio for offshore shipping over the period. Crew to berth ratios for both merchant and offshore shipping remained above the targets agreed as part of the shipping industry reform process in Australia.

TABLES

TABLE 1 CONTAINER TERMINAL PERFORMANCE INDICATORS - CONTAINERS PER HOUR

Port/indicator	Quarter				
	Dec 1995	Mar 1996	Jun 1996	Sep 1996	Dec 1996
Brisbane					
Crane rate	15.8	17.6	16.7	16.5	16.9
Elapsed rate	17.0	19.0 ^r	17.2	17.2 ^r	17.4
Net rate	20.6	21.5	20.4	20.4	20.4
Sydney					
Crane rate	15.0	15.6 ^r	16.0 ^r	16.1 ^r	a
Elapsed rate	17.6	18.9 ^r	17.6	18.2	a
Net rate	21.0	22.1 ^r	22.4	23.3	a
Melbourne					
Crane rate	16.3	17.0	18.4	19.6	17.8
Elapsed rate	18.8	20.2	20.5	21.1	17.9
Net rate	21.9	23.4	25.9 ^r	25.6	21.7
Adelaide					
Crane rate	18.8	18.9	18.2	19.3	19.6
Elapsed rate	22.8	23.3	22.0	22.2	22.6
Net rate	23.3	23.8	22.5	22.8	23.1
Fremantle					
Crane rate	16.2	17.9	20.0	17.8	18.2
Elapsed rate	13.4	15.7	14.8	13.4	15.6
Net rate	16.7	18.9	20.0	19.4 ^r	20.5
Five ports					
Crane rate	15.9	16.9	17.7	18.0	a
Elapsed rate	17.7	19.3	18.6	19.0	a
Net rate	20.9	22.3	23.4	23.5	a

^r **REVISED TO INCORPORATE AMENDED WEIGHTING FACTORS PROVIDED TO THE BTCE.**

a. Data not available at time of publication.

Sources Patrick, P&O Ports and SeaLand.



TABLE 2 PARAMETERS USED IN THE PORT INTERFACE COST INDEX, 1996

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996
Vessel size										
GRT	17215	17215	17215	17215	17215	17215	17215	17215	17215	17215
NRT	8372	8372	8372	8372	8372	8372	8372	8372	8372	8372
LOA (metres)	-	-	-	-	176	176	-	-	-	-
Teus exchanged^a										
Total	343	377	748	725	675	699	215	206	281	291
Loaded	264	292	620	600	570	590	168	161	231	242
Empty	79	85	128	125	105	109	47	45	50	49
Loaded inwards	92	124	390	375	-	-	59	56	-	-
Loaded outwards	172	168	230	225	-	-	109	105	-	-
Primary produce	-	-	-	-	-	-	33	41	-	-
Ship call parameters^a										
Number of port calls	3	3	3	3	3	3	3	4	5	5
Elapsed berth time (hrs)	22	23	41	41	33	35	15	15	22	20

- not required.

a. Mean value for ships between 15 000 and 20 000 grt.

Sources BTCE estimates based on ship call data supplied by port authorities/corporations and other port service providers.



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TABLE 3 PORT AND RELATED CHARGES, 1996

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996
Ship-based charges (\$/teu)										
Conservancy	9.19	8.35	-	-	-	-	6.98	7.31	2.82	2.72
Tonnage	-	-	10.59	9.73	10.20	9.85	17.18	18.10	9.01	8.69
Pilotage	14.96	13.60	4.55	4.69	8.13	7.85	10.91	11.43	7.83	7.56
Towage	29.52	26.84	13.07	13.48	10.89	10.52	57.12	59.83	40.16	38.74
Mooring & unmooring	4.20	3.82	4.21	4.34	4.22	3.18	-	-	3.92	3.78
Berth hire ^a	-	-	-	-	11.61	12.00	-	-	-	-
Total^b	57.87	52.61	32.41	32.25	45.05	43.40	92.19	96.67	63.74	61.49
Cargo-based charges (\$/teu)										
Wharfage										
Imports	26.00	26.00	60.00	60.00	46.75	37.40	65.00	65.00	49.79	49.79
Exports	26.00	26.00	45.00	45.00	46.75	37.40	62.00	61.09	49.79	49.79
Harbour dues	42.00	42.00	-	-	-	-	-	-	-	-
Berth charge	-	-	-	-	-	-	-	-	14.63	14.63
Total port and related charges (\$/teu)^b										
Loaded imports	125.87	120.61	92.41	92.25	91.80	80.80	157.19	161.67	128.16	125.91
Loaded exports	125.87	120.61	77.41	77.25	91.80	80.80	154.19	157.77	128.16	125.91
Charges per ship visit (\$/visit)										
Total ship-based charges	19840	19840	24241	23380	30411	30330	19853	19873	17902	17902
Empty teus ^c	1126	1211	3200	1250	1428	1186	0	0	405	397

- not applicable.

a. Charged by stevedores and itemised separately from basic stevedoring charge.

b. Components may not sum to totals due to rounding.

c. Sum of wharfage, harbour dues and berth charge per empty teu, multiplied by average exchange of empty teus.

Note Port and related charges are based on the parameters described in table 2.

Sources BTCE estimates based on: ship call data supplied by port authorities/corporations; and price schedules of port authorities/corporations, towage operators and pilotage service providers.

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TABLE 4 PORT INTERFACE COSTS, 1996

	(\$/teu)									
	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996
Imports										
Ship-based charges	58	53	32	32	45	43	92	97	64	61
Cargo-based charges	68	68	60	60	47	37	65	65	64	64
Stevedoring ^p	203	203	203	203	203	203	203	203	203	203
Customs brokers' fees	121	121	153	154	138	138	135	134	135	136
Road transport charges	175	174	290	287	246	248	155	156	185	188
Total imports^a	625	619	739	737	679	670	650	654	651	654
Exports										
Ship-based charges	58	53	32	32	45	43	92	97	64	61
Cargo-based charges	68	68	45	45	47	37	62	61	64	64
Stevedoring ^p	203	203	203	203	203	203	203	203	203	203
Customs brokers' fees	79	79	108	110	89	89	71	71	71	74
Road transport charges	175	174	290	287	246	248	155	156	185	188
Total exports^a	582	576	678	677	630	621	583	588	588	591

p Provisional pending updating of stevedoring figures provided by the ACCC which is the only official national source of stevedoring charges in Australia.

a. Components may not sum to totals due to rounding.

Note Based on parameters described in table 2.

Sources BTCE estimates based on: ship call data supplied by port authorities/corporations; price schedules of port authorities/corporations, towage operators and pilotage service providers; surveys of customs brokers and road transport operators; and stevedoring charges data supplied by the ACCC.



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TABLE 5 THE NATIONAL PORT INTERFACE COST INDEX

(\$/teu)

	Jul-Dec 1992	Jan-Jun 1993	Jul-Dec 1993	Jan-Jun 1994	Jul-Dec 1994	Jan-Jun 1995	Jul-Dec 1995	Jan-Jun 1996	Jul-Dec 1996
Imports	696	675	670	690	684	697	696	689	684
Exports	617	608	612	633	624	633	636	633	629

Sources BTCE estimates based on: ship call data supplied by port authorities/corporations; price schedules of port authorities/corporations, towage operators and pilotage service providers; surveys of customs brokers and road transport operators; and stevedoring charges data supplied by the ACCC.

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TABLE 6 PORT AND RELATED CHARGES AT BURNIE, 1996

	Jan-Jun 1996	Jul-Dec 1996
Ship-based charges (\$/teu)		
Conservancy	-	-
Tonnage	2.05	2.19
Pilotage	2.09	2.21
Towage	14.74	14.88
Mooring & unmooring	0.39	0.70
Berth hire	-	-
Total^a	19.27	19.98
Cargo-based charges (\$/teu)		
Wharfage		
Imports	105.45	110.75
Exports	54.35	57.35
Harbour dues	-	-
Berth charge	-	-
Total port and related charges (\$/teu)		
Loaded imports	124.72	130.73
Loaded exports	73.62	77.33
Charges per ship visit (\$/visit)		
Total ship-based charges	8833	9073
Empty teus ^b	2730	2831

- not applicable

a. Components may not sum to totals due to rounding.

b. Estimated by multiplying cargo-based charges per empty teu (ie wharfage) by average exchange of empty teus.

Sources BTCE estimates based on ship call data supplied by port authority, and price schedules of port authority and towage operator.

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TABLE 7 PORT INTERFACE COSTS AT BURNIE, 1996

	(\$/teu)	
	Jan-Jun 1996	Jul-Dec 1996
Imports		
Ship-based charges	19	20
Cargo-based charges	105	111
Stevedoring ^p	203	203
Customs brokers' fees ^a	118	118
Road transport charges	90	90
Total imports^b	536	542
Exports		
Ship-based charges	19	20
Cargo-based charges	54	57
Stevedoring ^p	203	203
Customs brokers' fees ^a	81	81
Road transport charges	90	90
Total exports^b	448	452

p Provisional pending updating of stevedoring figures by the ACCC.

a. To protect the confidentiality of figures for Burnie operators, customs brokers' fees are an average for customs brokers at several Tasmanian ports.

b. Components may not sum to totals due to rounding.

Sources *BTCE estimates based on: ship call data provided by port authority; price schedules of port authority and towage operator; survey of customs brokers and road transport operators; and stevedoring charges data supplied by the ACCC.*



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TABLE 8 FINANCIAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORT AUTHORITIES/CORPORATIONS, 1994/95 & 1995/96

Indicator	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	1994/95	1995/96	1994/95	1995/96	1994/95	1995/96	1994/95 ^f	1995/96	1994/95	1995/96
	<i>per cent</i>									
Return on assets ^a	7.9	5.8	18.2	15.8	15.9	e	1.0	-23.6 ^g	15.7 ⁱ	14.6
Dividend payout ratio ^b	33.0	38.8	51.4	56.5	32.9	e	-171.5	-7.8 ^g	0.0	0.0
Debt/equity ^c	0.0	0.1	28.3	109.3	117.0	e	112.6	133.0	h	1490.2
	<i>\$ million</i>									
EBIT ^d	29.0	22.6	62.3	49.8	83.6	e	1.9	-32.0 ^g	14.5 ⁱ	14.5
Average total assets in service	368.8	390.5	341.6	314.5	525.0	e	182.5	135.2	91.9	99.1
Dividends paid	9.6	5.8	21.1	15.1	12.0	e	3.7	3.4	0.0	0.0
Operating profit ^d	29.0	15.0	41.1	26.8	36.4	e	-2.2	-43.3 ^g	7.8 ⁱ	8.3
Total debt	0.0	0.4	60.7	150.0	236.9	e	72.1	65.5	63.6 ⁱ	54.5
Total equity	353.5	375.6	214.3	137.2	202.5	e	64.0	49.2	-19.9	3.7

a. EBIT as a proportion of total assets. EBIT is earnings before interest and tax.

b. Dividends paid out as a proportion of operating profit.

c. Total debt as a proportion of total equity.

d. Includes abnormals.

e. The Melbourne Port Corporation commenced operation on 1 March 1996 as port landlord, being one of three entities taking over the functions of the former Port of Melbourne Authority. Thus consistent financial data are not available for the 12 month period ending 30 June 1996.

f. Covers Ports Corp South Australia over its initial 6 months of operation from 5 January 1995 to 30 June 1995. 1994/95 data in Waterline 6 were a consolidation of the Department of Marine & Harbors and Ports Corp South Australia for the full financial year.

g. Industry Commission definitions used in Waterline include abnormal items. 1995/96 figures for Adelaide include abnormals of -\$49.3 million which relate to a write-down in asset values to accommodate a change in accounting policy to use deprival values. EBIT before abnormals was \$17.3 million, operating profit after tax and before abnormals was \$6.0 million and return on assets before abnormals was 12.8 per cent in 1995/96.

h. Calculation of debt/equity not appropriate as the Fremantle Port Authority had negative equity in 1994/95 in terms of the definitions used in Waterline.

i. Figure revised in line with amendments to State Treasurer's Instructions.

Note Accounts are based on historic costs.

Source AAPMA.



TABLE 9 NON-FINANCIAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORTS, 1996

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle		Five Ports ^c	
	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996	Jan-Jun 1996	Jul-Dec 1996
Total cargo throughput ('000 tonnes)	9575	9449	10268	10851	9025	9271	2616	2867	11330	10056	42815	42494
Non-containerised general cargo ('000 tonnes)^a	332	374	382	414	933	1071	133	151	380	369	2159	2378
Containerised cargo (teus exchanged)												
Full import	39286	44765	167875	192764	193089	222273	9004	12144	41908	46610	451162	518556
Empty import	24942	22918	10170	10304	36082	37955	6030	8239	12165	9857	89389	89273
Full export	55527	60295	107105	116017	186167	201630	19167	22959	44661	42936	412627	443837
Empty export	7491	7774	51809	54032	43884	42350	1567	1668	6994	8315	111745	114139
Total teus	127246	135752	336959	373117	459222	504208	35768	45010	105728	107718	1064923	1165805
Average total employment	229	236	243	243	287 ^d	69 ^e	214	205	213	203	1186	na
Turnaround time (hrs)^b												
Median result	26.8	31.6	39.0	41.0	35.8	38.0	20.2	18.5	28.4	na	-	-
95th percentile	48.0	51.3	75.7	73.9	69.6	77.9	48.1	38.8	75.8	na	-	-

- not applicable

na not available

a. Excludes bulk cargoes.

b. Turnaround times refer only to ships calling at container terminals. Comparisons between ports are not appropriate since each port has a different set of parameters to measure the turnaround time. Normally, only inter-temporal comparison at individual ports is of use.

c. Components may not sum to totals due to rounding.

d. Incorporates Melbourne Port Corporation, Melbourne Port Services Pty Ltd and Port of Melbourne Authority (Shell) employees. Victorian Channels Authority employees are not included. Figure is the total as at 30 June 1996, not an average for the six-month period.

e. This figure applies to Melbourne Port Corporation only; ie. excludes Melbourne Port Services Pty Ltd and Port of Melbourne Authority (Shell) employees.

Source AAPMA.



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TABLE 10 MERCHANT SHIPPING CREW TO BERTH RATIOS BY ACTIVITY AND CREW CLASSIFICATION, DECEMBER QUARTER 1996

Crew type	Ship time	Accrued leave	Compensation	Long service leave	Study leave	Training & other	Total ^a
Deck officers	1.137	1.018	0.016	0.037	0.040	0.042	2.290
Engineers	1.173	1.048	0.037	0.039	0.078	0.005	2.379
All officers	1.155	1.033	0.027	0.038	0.059	0.023	2.336
Integrated ratings	1.045	0.982	0.115	0.036	0.000	0.000	2.177
Catering crew	1.033	0.967	0.130	0.035	0.000	0.000	2.166
All ratings	1.041	0.978	0.119	0.036	0.000	0.000	2.174
All crew	1.093	1.003	0.077	0.037	0.027	0.010	2.247

a. Components may not sum to totals due to rounding.

Source Data provided by ship operators.



TABLE 11 OFFSHORE SHIPPING CREW TO BERTH RATIOS BY ACTIVITY AND CREW CLASSIFICATION, DECEMBER QUARTER 1996

Crew type	Ship time	Accrued leave	Compensation	Long service leave	Study leave	Training & other	Total ^a
Deck officers	1.046	1.153	0.073	0.038	0.010	0.000	2.320
Engineers	1.012	1.153	0.042	0.037	0.031	0.000	2.276
All officers	1.030	1.153	0.058	0.038	0.020	0.000	2.299
Integrated ratings	1.018	1.153	0.193	0.039	0.000	0.000	2.404
Catering crew	1.037	1.153	0.060	0.037	0.000	0.000	2.288
All ratings	1.022	1.153	0.170	0.039	0.000	0.000	2.384
All crew	1.026	1.153	0.116	0.038	0.010	0.000	2.343

a. Components may not sum to totals due to rounding.

Source Data provided by ship operators.



TABLE 12 CONTAINER TERMINAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORTS - TEUS PER HOUR

	Mar-92	Jun-92	Sep-92	Sep-93	Dec-93	Mar-94	Jun-94	Sep-94	Dec-94	Mar-95	Jun-95	Sep-95	Dec-95	Mar-96	Jun-96	Sep-96	Dec-96	
Brisbane																			
Ships handled	85	96	93	na	106	111	112	140	140	187	136	123	135	132	124	133	140	141	
Total teus	28235	39058	45055	na	49622	46529	37820	52983	51596	50574	41723	47065	58851	46439	39037 ^r	51008 ^r	66115 ^r	62904	
Crane rate	17.0	18.0	19.8	na	21.2	21.1	20.4	20.8	20.3	18.9	18.4	18.0	18.6	18.9	20.0	19.9	20.6 ^r	20.6	
Elapsed rate	19.6	21.2	25.6	na	26.6	24.6	20.9	22.6	21.5	19.6	17.8	18.6	19.5	21.0	21.5 ^r	20.5	20.9 ^r	21.1	
Net rate	21.1	22.9	27.4	na	29.4	27.5	23.9	25.9	25.7	23.4	20.9	21.6	22.5	24.6	24.4	24.3	25.1	24.9	
Sydney																			
Ships handled	105	109	112	na	205	238	177	240	223	221	218	202	192	203	206	216	228	a	
Total teus	71702	68359	81287	na	124028	139321	116914	129586	142659	152326	144868	140113	148431	143746	146038 ^r	148290 ^r	156344 ^r	a	
Crane rate	18.6	19.8	20.9	na	19.8	20.4	16.4	18.5	16.9	16.0	18.9	18.1	19.3	18.5	19.5 ^r	19.9 ^r	20.3 ^r	a	
Elapsed rate	19.9	22.9	24.1	na	22.6	22.0	18.7	20.8	19.4	20.3	21.6	20.7	23.4	21.8	23.8 ^r	22.1 ^r	23.1	a	
Net rate	26.3	31.2	30.4	na	29.4	28.3	28.3	29.1	25.0	26.3	28.0	26.6	29.9	25.7	28.0 ^r	27.9 ^r	29.5	a	
Melbourne																			
Ships handled	108	121	121	na	235	306	211	265	267	244	265	228	221	227	228	262	274	282	
Total teus	73441	82757	86486	na	129687	143350	153420	158849	159039	180134	173338	152983	161943	173566	162911 ^r	170884 ^r	203371 ^r	202376	
Crane rate	16.7	18.1	19.4	na	22.3	18.9	19.7	19.1	18.5	20.2	20.8	19.4	19.8	19.6	20.5	22.3	24.5	22.4	
Elapsed rate	19.2	20.9	22.6	na	25.9	20.0	19.5	19.2	17.9	21.5	23.9	23.7	24.1	22.8	24.4	25.0	26.5 ^r	22.1	
Net rate	22.1	23.9	24.9	na	29.3	22.9	23.8	22.7	21.3	25.8	26.9	25.9	26.6	26.4	28.3	31.7 ^r	32.2 ^r	27.2	
Adelaide																			
Ships handled	22	20	21	na	21	26	28	34	31	33	35	50	34	42	47	63	70	74	
Total teus	10810	10710	10763	na	9650	12616	13243	12461	13167	15038	16832	21676	14319	17318	15955	18803	20519	23351	
Crane rate	19.8	18.7	19.1	na	19.8	20.9	20.6	19.1	19.8	20.2	21.5	20.2	20.9	21.4	21.5	21.5	22.7	24.0	
Elapsed rate	27.2	24.4	25.9	na	23.1	25.5	27.8	24.7	24.6	24.2	24.9	24.9	24.9	26.1	26.6	26.1	26.2	27.7	
Net rate	28.2	25.0	27.9	na	26.1	26.6	29.8	25.7	26.0	25.7	25.3	25.7	26.5	26.7	27.2	26.7	26.8	28.3	
Fremantle																			
Ships handled	71	75	72	na	116	115	127	135	121	124	128	136	139	124	143	153	159	161	
Total teus	25403	26572	27690	na	37566	40910	40587	40986	36635	46969	44388	45308	50050	44662	47597 ^r	51113 ^r	50791 ^r	55593	
Crane rate	21.0	18.6	20.4	na	19.0	19.8	19.8	19.3	21.6	22.9	20.2	19.3	19.5	19.2	21.2	23.4	20.8	21.5	
Elapsed rate	16.8	15.1	18.2	na	13.1	15.5	15.2	14.6	14.9	16.5	17.7	15.5	17.7	15.8	18.3 ^r	17.6 ^r	16.0	18.6	
Net rate	21.0	18.6	21.4	na	19.4	21.0	19.8	19.5	21.8	23.4	21.6	20.5	21.1	19.8	22.2	23.5	22.6 ^r	24.2	
Five Ports																			
Ships handled	391	421	419	na	683	796	745	814	782	809	782	739	721	728	748	827	871	a	
Total teus	209591	227456	251281	na	350553	382726	361984	394865	403096	445041	421149	407145	433594	425731	411538 ^r	440098 ^r	497140 ^r	a	
Crane rate	18.0	18.7	20.1	na	20.9	19.9	18.8	19.2	18.5	18.9	19.9	18.9	19.5	19.2	20.3	21.3 ^r	22.3	a	
Elapsed rate	19.4	20.7	23.1	na	23.4	21.0	19.2	19.9	18.9	20.4	21.9	21.2	22.5	21.7	23.2	22.6	23.6	a	
Net rate	23.3	24.7	26.5	na	28.2	25.3	25.0	25.0	23.4	25.4	26.1	25.0	26.5	25.3	27.1 ^r	28.5	29.1	a	

na not available

a. Data not available at time of publication.

r Revised to incorporate amended traffic data (weighting factors) provided to the BTCE.

Notes 1. To the end of the September quarter 1992, award shift breaks are included in the measure of time which is used to calculate the net rate and the crane rate. From the September quarter 1993, award shift breaks are excluded from the measure of time in these two indicators. This means that the rates for the earlier period would be higher if they had been prepared on the same basis as the rates for the period from the September quarter 1993.

2. For data back to the December quarter 1989, refer to Waterline 2.

Sources WIRA, Patrick, P&O Ports and SeaLand.

INDEX OF WATERLINE ARTICLES—ISSUES 1 TO 9

Subject	Issue	Date	Pages	Coverage of article ^a
Coal ports in Australia	6	March 1996	10–13	Ports, terminals, capacity and operational changes, performance
Comparing port charges—methodology	4	October 1995	9–11	Teu exchanges and comparisons of port charges
Crew to berth ratios	9	December 1996	7–11	Recent trends for Australian merchant and offshore shipping
Distribution of benefits of waterfront reform	3	May 1995	11–14	Stevedoring, ship operators, importers, exporters
International comparisons of waterfront performance	4	October 1995	11–13	Overview of recent work
	5	December 1995	9–11	New Zealand ports
	6	March 1996	13–16	Asian ports
	7	June 1996	12–14	European ports
	8	September 1996	14	New Zealand (timber & steel coil)
Liner shipping	5	December 1995	11–13	Conference/non-conference shares in Australian trades to 1994/95
Non-containerised general cargo	8	September 1996	11–14	Cargoes, ships, ports, stevedoring, performance data
Port authority financial performance	1	July 1994	4–6	1992/93
	3	May 1995	5–6	1993/94
	6	March 1996	7–9	1994/95
Port charging—structures and terminologies	9	December 1996	11–13	Australia's six largest container ports
Port Interface Cost Index	1	July 1994	2–5	July–December 1993
	2	December 1994	2–5	January–June 1994
	3	May 1995	2–5	July–December 1994
	5	December 1995	2–5	January–June 1995
	7	June 1996	6–9	July–December 1995
	8	September 1996	6–9	January–June 1996
Port non-financial performance	1	July 1994	4–6	July–December 1993
	2	December 1994	5, 9	January–June 1994
	3	May 1995	6–7	July–December 1994
	6	March 1996	8–9	January–June 1995
	7	June 1996	10–11	July–December 1995
	8	September 1996	10–11	January–June 1996
Reliability	6	March 1996	6–7	Stevedoring industrial disputes
	7	June 1996	11–12	Concepts and available data
	9	December 1996	6–7	Proposed indicators
Stevedoring performance ^b	1	July 1994	5–11	December quarter 1993
	2	December 1994	6–11	March & June quarters 1994
	3	May 1995	7–11, 15	September & December quarters 1994
	4	October 1995	2–9, 15	March & June quarters 1995
	5	December 1995	5–9, 15	September quarter 1995
	6	March 1996	2–7, 19	December quarter 1995
	7	June 1996	2–6, 15	March quarter 1996
	8	September 1996	2–5, 15	June quarter 1996
	9	December 1996	2–5, 15	September quarter 1996

a. Period is latest quarter or half-year covered. Articles may also include earlier data.

b. For earliest available data on stevedoring performance (from December quarter 1989), see issue 1 (table 7) or issue 2 (table 6).

FIGURES

FIGURE 1 FIVE MAJOR PORTS STEVEDORING PERFORMANCE – TEUS PER HOUR

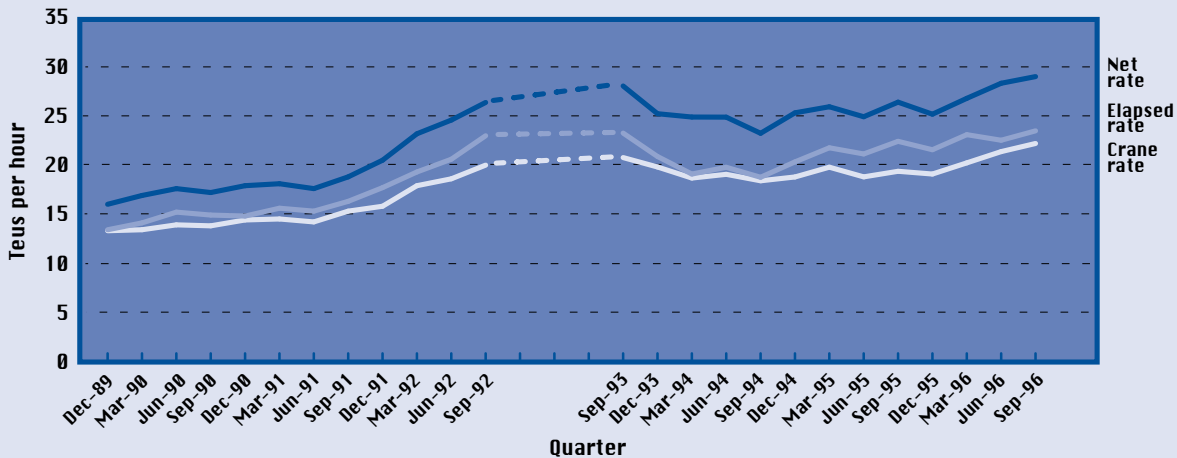
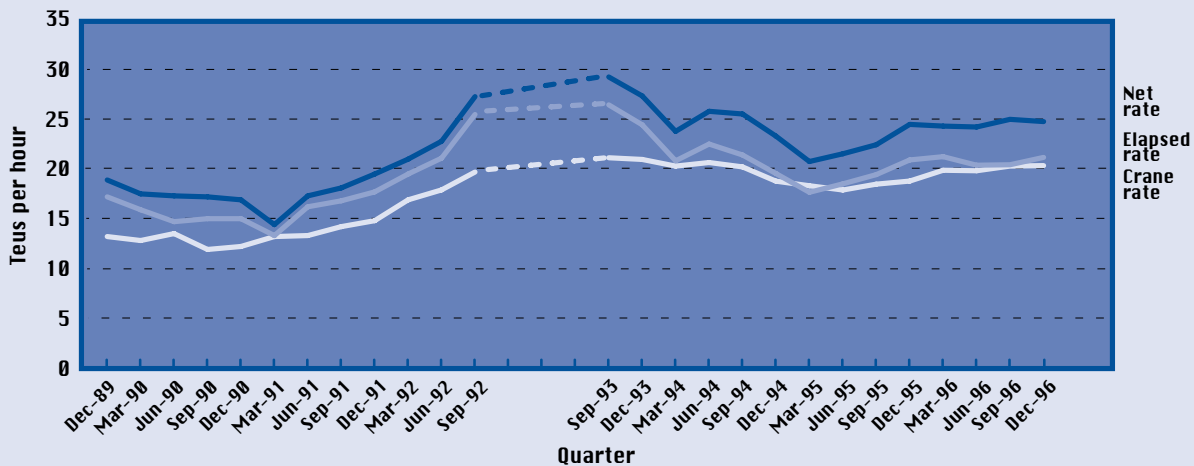


FIGURE 2 BRISBANE CONTAINER TERMINALS PERFORMANCE – TEUS PER HOUR



Notes To the end of the September quarter 1992, award shift breaks are included in the measure of time which is used to calculate the net rate and the crane rate. From the September quarter 1993, award shift breaks are excluded from the measure of time in these two indicators. This means that the rates for the earlier period would be higher if they had been prepared on the same basis as the rates for the period from the September quarter 1993. Data are unavailable for December quarter 1992 to June quarter 1993.

Sources WIRA, Patrick, P&O Ports and SeaLand.

FIGURE 3 SYDNEY CONTAINER TERMINALS PERFORMANCE – TEUS PER HOUR

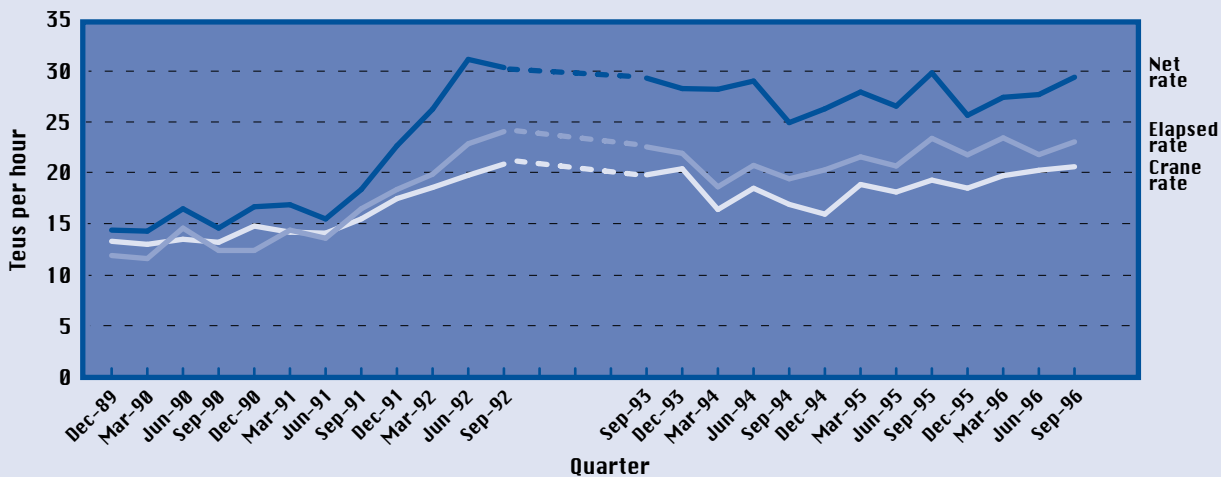
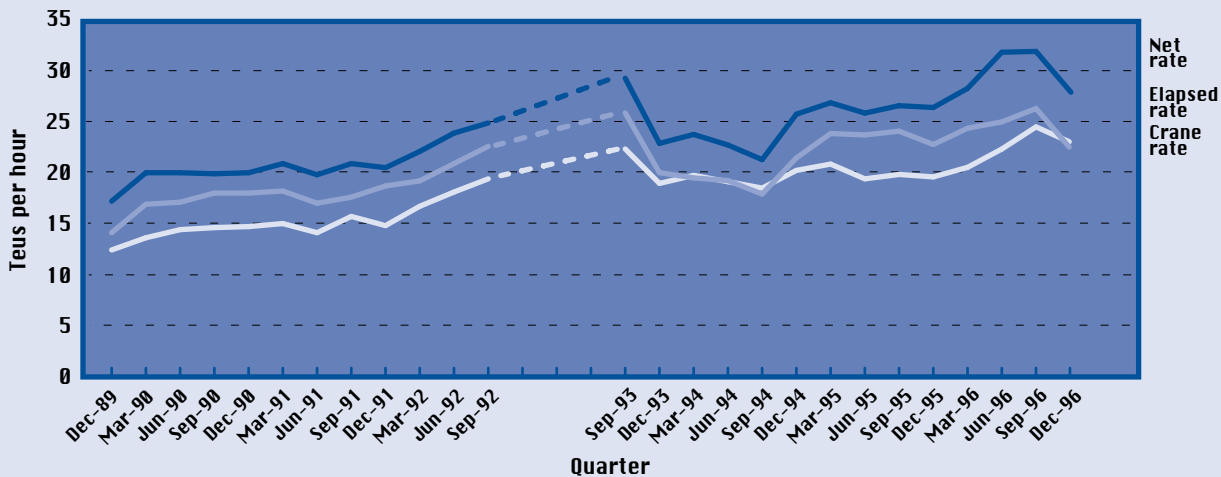


FIGURE 4 MELBOURNE CONTAINER TERMINALS PERFORMANCE – TEUS PER HOUR



Notes To the end of the September quarter 1992, award shift breaks are included in the measure of time which is used to calculate the net rate and the crane rate. From the September quarter 1993, award shift breaks are excluded from the measure of time in these two indicators. This means that the rates for the earlier period would be higher if they had been prepared on the same basis as the rates for the period from the September quarter 1993. Data are unavailable for December quarter 1992 to June quarter 1993.

Sources WIRA, Patrick, P&O Ports and SeaLand.

FIGURE 5 ADELAIDE CONTAINER TERMINAL PERFORMANCE – TEUS PER HOUR

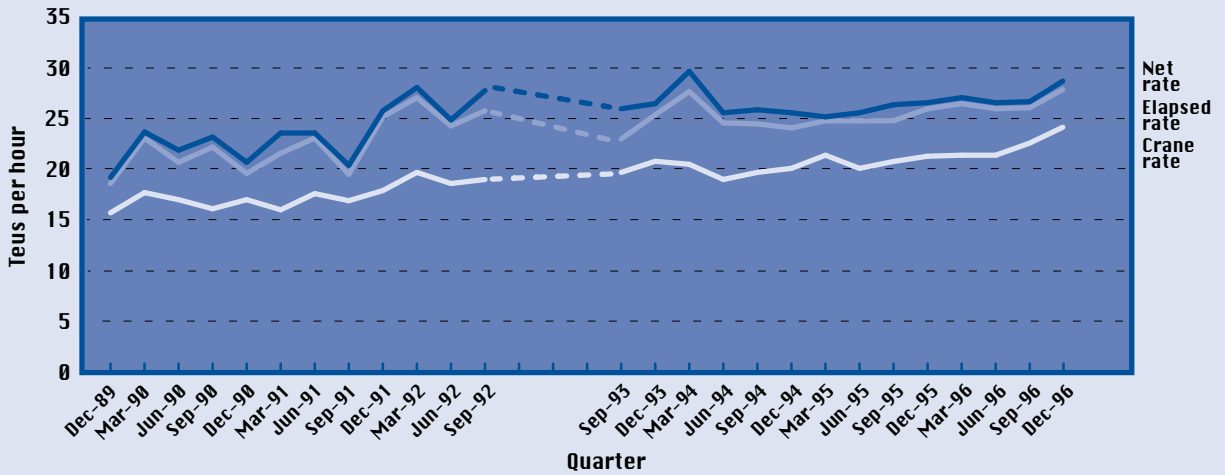
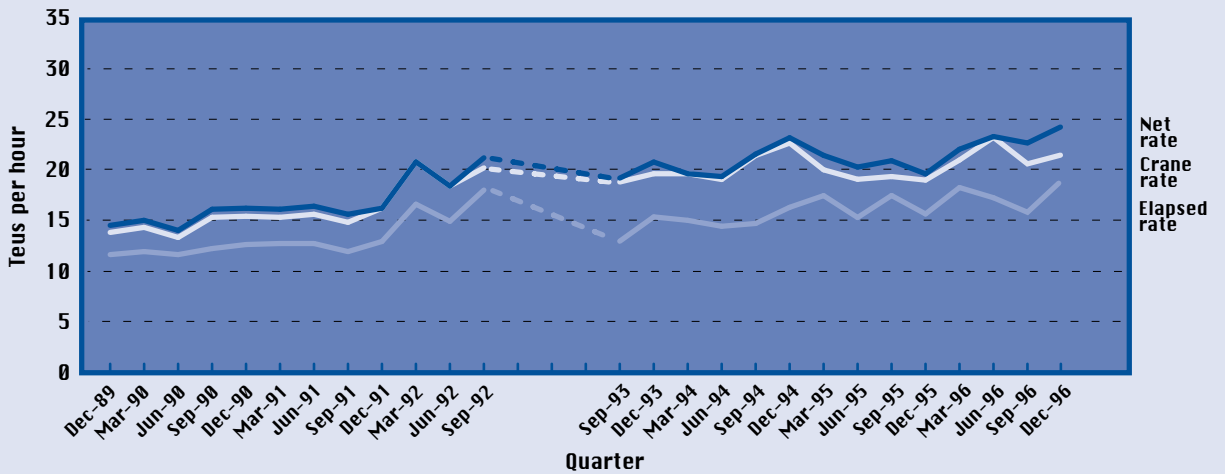


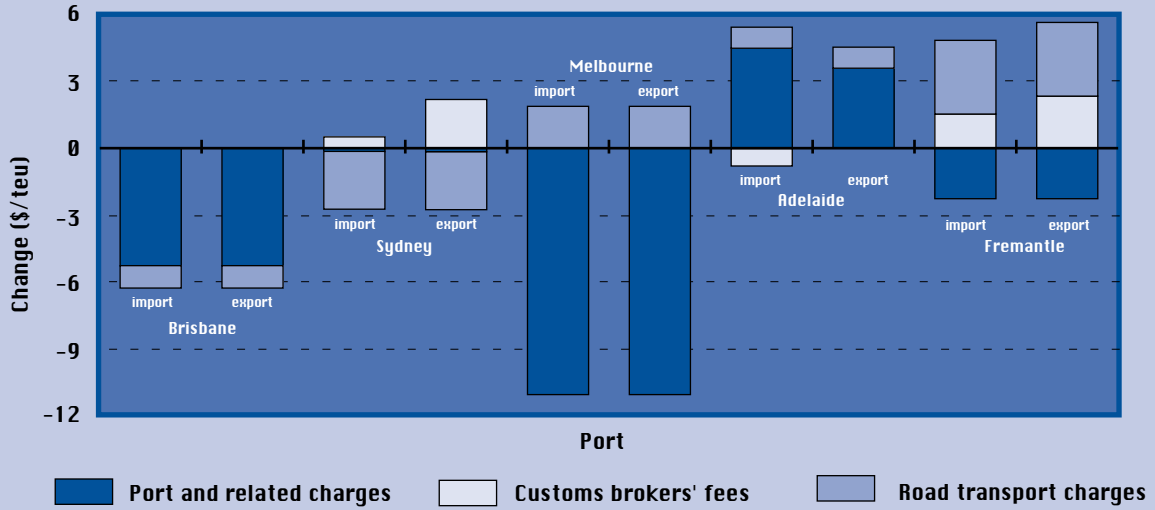
FIGURE 6 FREMANTLE CONTAINER TERMINALS PERFORMANCE – TEUS PER HOUR



Notes To the end of the September quarter 1992, award shift breaks are included in the measure of time which is used to calculate the net rate and the crane rate. From the September quarter 1993, award shift breaks are excluded from the measure of time in these two indicators. This means that the rates for the earlier period would be higher if they had been prepared on the same basis as the rates for the period from the September quarter 1993. Data are unavailable for December quarter 1992 to June quarter 1993.

Sources WIRA, Patrick, P&O Ports and SeaLand.

FIGURE 7 SOURCES OF CHANGES IN PORT INTERFACE COSTS FOR INDIVIDUAL PORTS, JANUARY–JUNE 1996 TO JULY–DECEMBER 1996



Sources BTCE estimates based on: ship call data supplied by port authorities/corporations; price schedules of port authorities/corporations, towage operators and pilotage service providers; surveys of customs brokers and road transport operators; and stevedoring charges data supplied by the ACCC.

FIGURE 8 CREW TO BERTH RATIOS—AUSTRALIAN MERCHANT SHIPPING

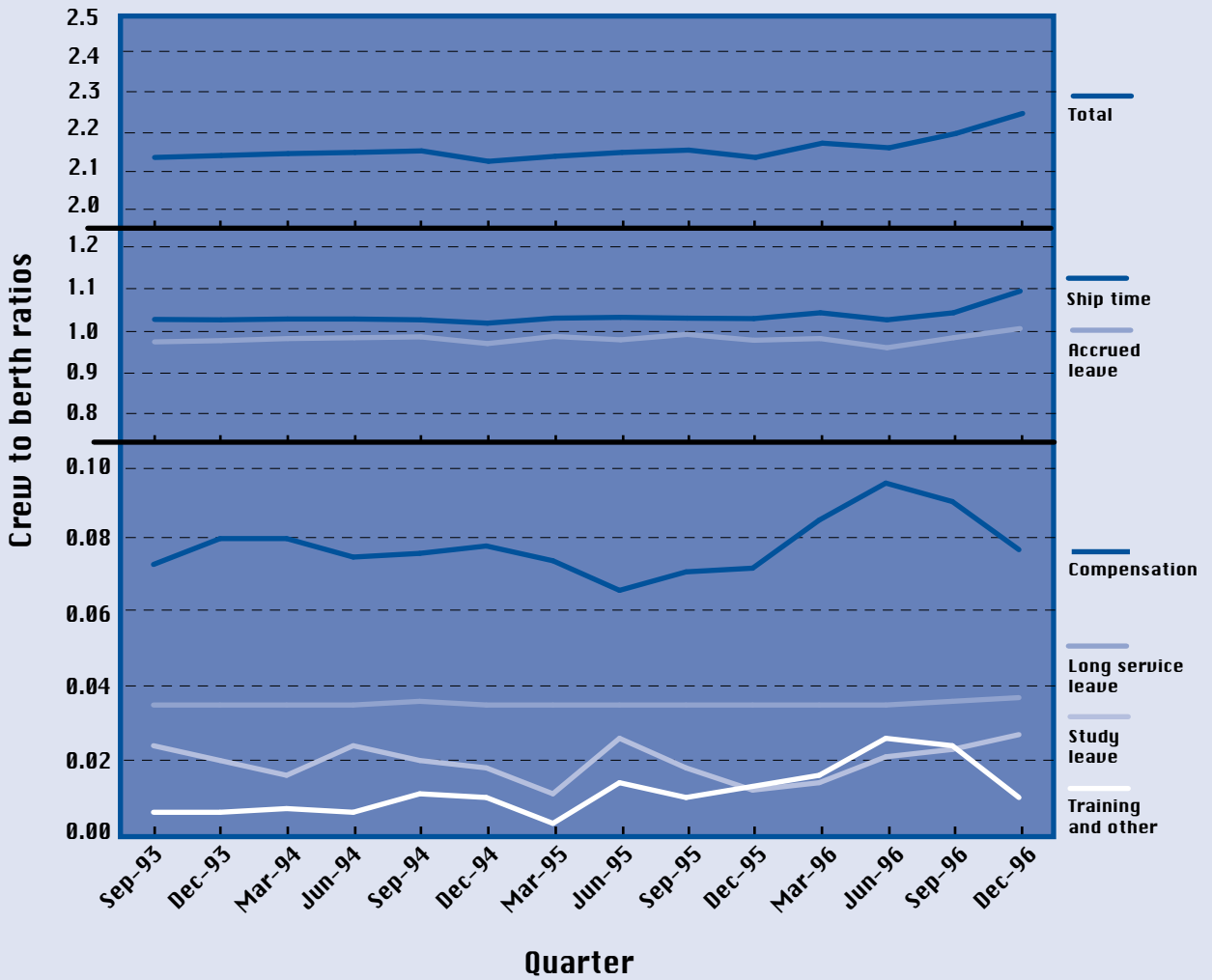
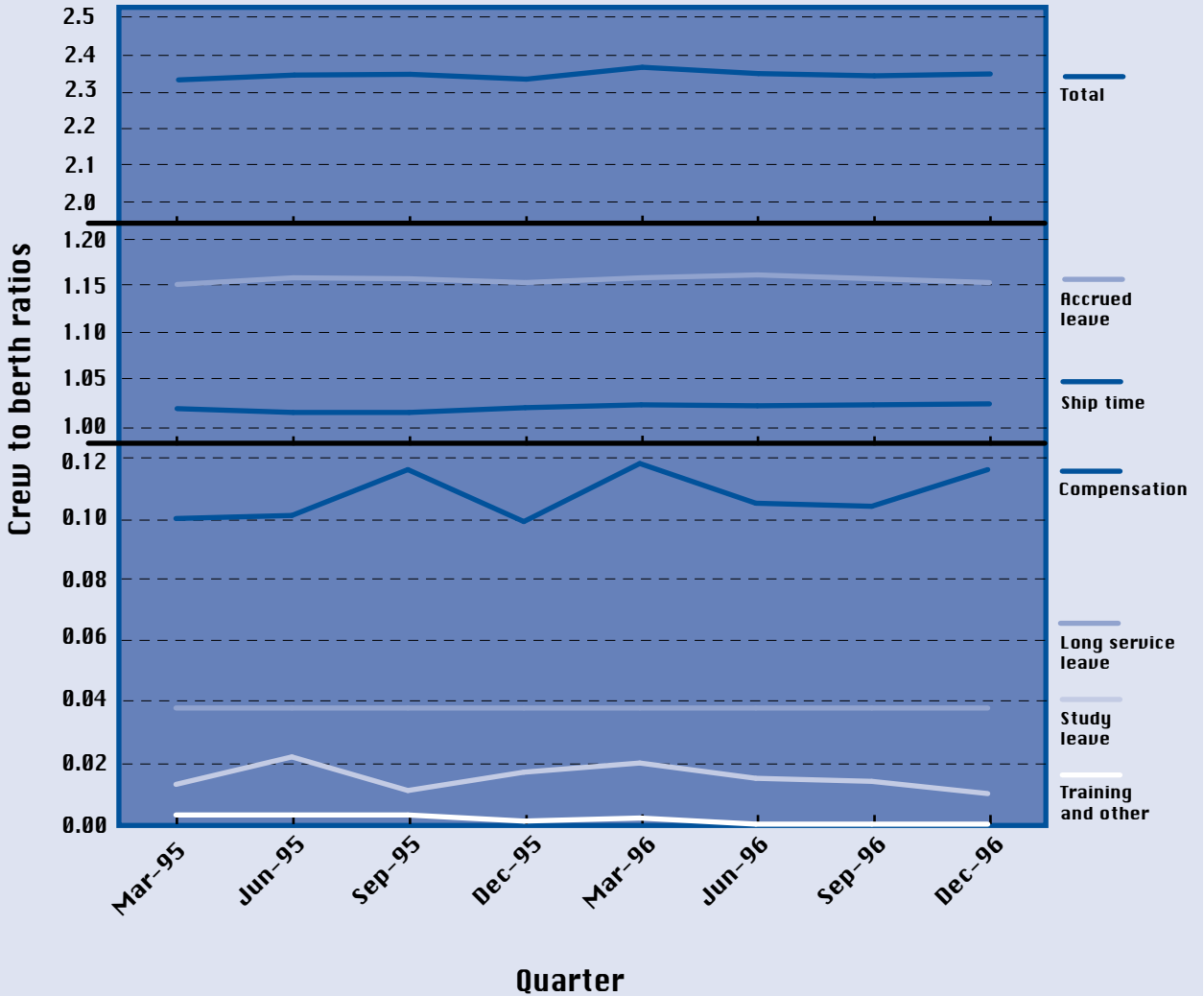


FIGURE 9 CREW TO BERTH RATIOS—AUSTRALIAN OFFSHORE SHIPPING



WATERLINE

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ABBREVIATIONS

AAPMA	Association of Australian Ports and Marine Authorities
ACCC	Australian Competition and Consumer Commission
BTCE	Bureau of Transport and Communications Economics
COSCO	China Ocean Shipping Company
GRT	Gross Registered Tonnage
LOA	Length Overall
MISC	Malaysian International Shipping Corporation
MOL	Mitsui OSK Lines
NRT	Net Registered Tonnage
teu	Twenty foot equivalent unit
WIRA	Waterfront Industry Reform Authority

DEFINITIONS

Elapsed time—the total time the ship is alongside the berth offering for work whether worked or not, measured from labour first ordered to last labour ashore.

Elapsed rate—the number of containers or teus moved per elapsed hour.

Net time—the elapsed time minus the time unable to work the ship due to award shift breaks, ship's fault, weather, awaiting cargo, industrial disputes, closed holidays or shifts not worked at the ship operator's request.

Net rate—the number of containers or teus moved per net hour.

Crane rate—the number of containers or teus moved per crane per net hour.

Crane intensity—the average number of cranes used to work the ship.

ACKNOWLEDGMENTS

Contributors to this issue of *Waterline* were Kym Starr, Stephen Wheatstone and Gita Curnow. The BTCE is particularly grateful for the assistance of the Maritime Division of the Department of Transport and Regional Development, the Association of Australian Ports and Marine Authorities, individual port authorities, the ship operators that provided data for the crew to berth ratios, the customs brokers and road transport operators that responded to the BTCE's survey of fees and charges, and the stevedoring companies Patrick, P&O Ports and SeaLand.

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