



# W A T E R L I N E

SEPTEMBER 1997 ISSUE NO. 12

BUREAU OF TRANSPORT AND  
COMMUNICATIONS ECONOMICS

## FROM THE DIRECTOR

This issue of *Waterline* contains our quarterly articles on stevedoring productivity, waterfront reliability and crew to berth ratios. There are also articles on the Port Interface Cost Index and port performance (non-financial), which are published six-monthly.


The BTCE is continuing to examine options for refining and improving the performance indicators used in *Waterline*. A current priority is to increase the number of shipping lines involved in the survey of waterfront reliability. Forthcoming issues of *Waterline* will include feature articles on various waterfront-related activities such as those of customs brokers.

Stephen Hunter  
Director


## IN BRIEF

### Stevedoring productivity


Overall productivity at Australia's major container terminals improved in the June quarter. Provisional data indicate that the five-port average crane rate increased to 18.3 containers per hour, from 17.4 containers per hour in the previous quarter. There were also rises in the five-port average net rate (23.6 containers per hour) and elapsed rate (19.0 containers per hour).

Crane rates increased at Sydney (17.7 containers per hour provisional) and Adelaide (21.0 containers per hour) in the June quarter. There were declines at Brisbane (16.4 containers per hour) and Fremantle (19.0 containers per hour). Melbourne's crane rate was unchanged (19.0 containers per hour). 


### Waterfront reliability

A berth was available within four hours of the scheduled time for 90 per cent of ship calls in the June quarter. Availability of pilots and tugs within one hour of the confirmed time remained close to 100 per cent. Various ship calls were also affected by other sources of waiting time. Initial data indicate that the consistency of stevedoring performance varied significantly between ports in the June quarter. 

### Port Interface Cost Index


Between July–December 1996 and January–June 1997, the national Port Interface Cost Index declined by 2.0 per cent for an import teu and by 2.2 per cent for an export teu. The reductions in the national index mainly reflected a fall in the average stevedoring charge. 

### Port performance - non-financial

Total cargo throughput (bulk and general cargo) at the five mainland capital city ports increased by 6.6 per cent between July–December 1996 and January–June 1997. Container traffic (teus) declined by 3.5 per cent over this period. Median ship turnaround time fell at most of the mainland capital city ports. 

### Crew to berth ratios

The crew to berth ratio for merchant shipping declined to 2.130 in the June quarter. This was similar to the figure of 2.133 at the beginning of the monitoring process in 1993.

The crew to berth ratio for offshore shipping increased to 2.379 in the June quarter. This was the highest figure for offshore shipping since the beginning of the monitoring process in 1995 (initial level 2.327). 

## STEVEDORING PRODUCTIVITY

**Table 1** presents information on stevedoring productivity at Australia's major container terminals over the period to the end of the June quarter 1997. The indicators are expressed in containers per hour which provides the most rigorous basis for productivity comparisons.


The data for Brisbane, Sydney, Melbourne and Fremantle are averages for the major terminals operated by P&O Ports and Patrick. The Adelaide data cover the SeaLand terminal.

### Five-port average

**Table 1** indicates that overall productivity at Australia's major container terminals increased in the June quarter 1997. The crane rate and net rate data are provisional and may be subject to change following further review of one Sydney terminal operator's March and June quarter figures.

The five-port average *crane rate* (productivity per crane while the ship is worked) was 18.3 containers per hour in the June quarter, up from 17.4 containers per hour in the March quarter.

The five-port average *net rate* (total productivity while the ship is worked) increased to 23.6 containers per hour in the June quarter from 21.3 containers per hour in the March quarter.


The five-port average *elapsed rate* (total productivity based on the time labour is aboard the ship) was 19.0 containers per hour in the June quarter, up from 18.6 containers per hour in the March quarter. 

### Brisbane

Stevedoring productivity at Brisbane declined in the June quarter.

The crane rate was 16.4 containers per hour, down from 17.3 containers per hour in the previous quarter.

Brisbane's net rate declined to 18.7 containers per hour in the June quarter from 19.4 containers per hour in the March quarter. The elapsed rate was 16.6 containers per hour, down from 17.3 containers per hour in the previous quarter.

The proportion of elapsed time not worked averaged 11.5 per cent at Brisbane over the June quarter, compared with 10.8 per cent in the March quarter. 

### Sydney

The available data indicate that Sydney's stevedoring productivity improved in the June quarter. The crane rate and net rate data are provisional and may be subject to change following further review of one terminal operator's March and June quarter figures.

The crane rate at Sydney was 17.7 containers per hour in the June quarter, up from 14.9 containers per hour in the previous quarter.

Sydney's net rate increased to 25.5 containers per hour in the June quarter from 20.0 containers per hour in the March quarter. The elapsed rate was 18.5 containers per hour, up from 18.2 containers per hour in the previous quarter.

Changes to one Sydney terminal operator's reporting processes contributed to part of the June quarter increase in the crane rate and the net rate. 

### Melbourne

Melbourne's crane rate was unchanged at 19.0 containers per hour in the June quarter. There were improvements in the net rate and the elapsed rate.

The net rate increased to 24.0 containers per hour in the June quarter from 23.0 containers per hour in the March quarter. The increase reflected a rise in average crane intensity over the period.

Melbourne's elapsed rate was 20.3 containers per hour in the June quarter, up from 19.5 containers per hour in the March quarter.

The proportion of elapsed time not worked averaged 15.4 per cent at Melbourne over the June quarter. This was similar to the March quarter figure of 15.3 per cent. 


## Adelaide

Adelaide's stevedoring productivity improved in the June quarter.

The crane rate was 21.0 containers per hour, up from 19.6 containers per hour in the previous quarter.

The net rate rose to 29.1 containers per hour in the June quarter from 24.6 containers per hour in the March quarter. A rise in average crane intensity contributed to the increase in the net rate.

Adelaide's elapsed rate was 28.3 containers per hour in the June quarter, up from 24.0 containers per hour in the March quarter.


The average proportion of elapsed time not worked at Adelaide was 2.7 per cent in the June quarter, compared with 2.4 per cent in the March quarter. 

## Fremantle

Stevedoring productivity at Fremantle declined in the June quarter.

The crane rate was 19.0 containers per hour, down from 19.4 containers per hour in the previous quarter.

Fremantle's net rate declined to 19.8 containers per hour in the June quarter from 20.6 containers per hour in the March quarter. The elapsed rate was 15.9 containers per hour, down from 16.2 containers per hour in the previous quarter.

The proportion of elapsed time not worked averaged 19.5 per cent at Fremantle over the June quarter. This was below the March quarter figure of 21.5 per cent. 

## Teus per hour

**Figures 1 to 6** and **table 10** present the stevedoring productivity indicators in terms of *teus* per hour. These data are retained in *Waterline* for the purposes of long-term historical comparison. They are not directly comparable with the data in **table 1** which are expressed in *containers* per hour.

The teu-based and container-based data generally indicate similar trends in productivity in the June quarter.

## WATERFRONT RELIABILITY

*Waterline* 11 presented the first data for the reliability indicators developed by the BTCE in consultation with major industry participants. This article provides updated and expanded information for the March and June quarters 1997.

## Ship arrival

The definitions for the two ship arrival indicators have been amended following a review of available data and discussions with the AAPMA. The indicators are based on the proportion of ships arriving within one hour (plus or minus) of the scheduled arrival time. The scheduled time is the most recent advice available to the port authority/corporation, at 24 hours prior to actual arrival for one indicator and within the last 24 hours prior to actual arrival for the other indicator.

Preliminary data for three mainland capital city ports indicate that the proportion of container ship arrivals within one hour of the scheduled time available at 24 hours prior to actual arrival ranged from around 50 per cent to 60 per cent at individual ports in the June quarter. Information for the second indicator will be published in the next issue of *Waterline*.

## Berth availability, pilotage, towage

**Table 2** presents information on berth availability, pilotage and towage for container ships at the five mainland capital city ports in the June quarter. The data cover 252 ship calls, equivalent to 28 per cent of total ship calls at the major container terminals during the period. The proportion at individual ports ranges from 17 per cent (Brisbane) to 42 per cent (Adelaide).

*Berth availability* indicates the proportion of ship arrivals where the berth is available within 4 hours of the

scheduled berthing time. The five-port average figure was 90 per cent in the June quarter, compared with 92 per cent in the March quarter. Shipping lines indicated that the major factors contributing to berth delays in the June quarter were congestion, late completion of work on preceding vessels and industrial action.

*Pilotage* measures the proportion of ship movements where the pilot is available to board the ship within one hour of the confirmed ship arrival/departure time. The five-port average figure was 99.6 per cent in the June quarter, similar to the March quarter figure of 100 per cent. Shipping lines advised that the two delays in the June quarter resulted from industrial action by pilot boat crews.

*Towage* indicates the proportion of ship movements where the tug is available to assist the ship within one hour of the confirmed ship arrival/departure time. The five-port average figure was 99.2 per cent in the June quarter, similar to the March quarter figure of 100 per cent. Shipping lines indicated that the three delays in the June quarter resulted from problems with the previous tug job (2) and industrial action by tug crews (1).

## Stevedoring

Some preliminary information on container stevedoring, based on a combination of December and March quarter data, was published in *Waterline* 11. March quarter data have now been received from both P&O Ports and Patrick.

*Cargo receipt* is the proportion of receipts (exports) completed by the stevedore's cut-off. In the March quarter cargo receipt averaged 91 per cent at Brisbane, 93 per cent at Sydney and 95 per cent at Melbourne. The proportion for Brisbane is substantially higher than the preliminary figure published in *Waterline* 11, due to the revision of one operator's data. Information for Fremantle will be included in *Waterline* 13.

*Stevedoring completion* is the proportion of ship visits where stevedoring completion time is within one hour (plus or minus) of the time initially agreed when the overall work program for the ship is prepared. In the March quarter stevedoring completion was 72 per cent at Brisbane and 27 per cent at Sydney. Data are not available for Melbourne and Fremantle as one of the terminal operators does not record the information at these ports.

*Stevedoring rate* is the proportion of ship visits where the average crane rate for the ship is within 2 containers per hour (plus or minus) of the quarterly average crane rate for the terminal. In the March quarter, the proportion was around 57 per cent at Brisbane, 66 per cent at Sydney, 61 per cent at Melbourne and 31 per cent at Fremantle. The inter-port variation reflects, at least in part, differences in the mix of operations (eg the extent of restows).

## Other waiting time

The ten shipping lines which supplied data on berth availability, pilotage and towage for [table 2](#) also provided information on other sources of ship waiting time. There were 106 ship calls affected by other waiting time (excluding ship schedule adjustments) in the June quarter.

Specific information on the sources of waiting time was provided for 86 of these ship calls. Some ship calls were affected by two or three incidents. Five factors accounted for 68 per cent of the waiting time incidents in the June quarter:

- early ship arrival—18 ship calls (including 10 at Melbourne and 4 at Fremantle), with waiting time ranging from 2.5 hours to 39.6 hours;
- early completion of stevedoring—15 ship calls (including 9 at Melbourne and 4 at Adelaide), with waiting time ranging from 0.5 hours to 5.9 hours;
- industrial action—13 ship calls (including 5 at Sydney and 4 at Brisbane), with waiting time ranging from 1.1 hours to 24.0 hours;
- crane breakdown—12 ship calls (including 9 at Brisbane), with waiting time ranging from 0.4 hours to 4.0 hours; and
- awaiting labour—12 ship calls (including 7 at Melbourne and 4 at Sydney), with waiting time ranging from 1.0 hour to 23.0 hours.

Waiting time will impose additional costs on shipping lines if the time could otherwise have been used productively.

## Concluding comments

A berth was available within four hours of the scheduled time for 90 per cent of ship calls in the June quarter. Availability of pilots and tugs within one hour of the confirmed time remained close to 100 per cent. Various ship calls were also affected by other sources of waiting time. Initial data indicate that the consistency of stevedoring performance varied significantly between ports over the period.

The BTCE will be undertaking more detailed analysis of reliability issues as data for additional quarters become available.

## PORT INTERFACE COST INDEX

The Port Interface Cost Index provides a measure of shore-based shipping costs (charges) for containers moved through Australia's mainland capital city ports. Information for the period to January–June 1997 is presented in **tables 3 to 6**.

### Cost parameters

The basic parameters used in the Port Interface Cost Index cover the representative ship, teus exchanged and other ship call information.

**Table 3** indicates that there was no change in the size of the representative ship used to calculate port and related charges for January–June 1997. The number of port calls for the representative ship increased at Sydney and Fremantle, and elapsed berth time fell at these ports.

In the latest period the average number of teus exchanged per port call for ships in the representative range declined at Brisbane (8.2 per cent), Sydney (1.7 per cent) and Melbourne (0.3 per cent). There were increases at Fremantle (13.4 per cent) and Adelaide (0.5 per cent).

### Charges per ship visit

**Table 4** outlines the components of port and related charges at the five mainland capital city ports. The last two rows of the table present information on total ship-based charges and empty teu charges per ship visit for the representative ship.

*Total ship-based charges per ship visit* declined at Brisbane between July–December 1996 and January–June 1997 as a result of a 29 per cent reduction in conservancy. There was also a decline at Fremantle following a 3.6 per cent reduction in towage charges. Scheduled charges were unchanged at the other ports. However, a marginal fall in average berth time, which reduced the time-based payment for berth hire, resulted in a slight decline in total ship-based charges per ship visit at Melbourne.

**Table 4** indicates that, for an operator of a vessel similar in size to the representative ship, Fremantle (\$17 278) had the lowest total ship-based charges per ship visit in January–June 1997. It was followed by Brisbane (\$19 157) and Adelaide (\$19 873).

Since January–June 1997, there have been reductions in tonnage charges at Melbourne and Sydney and a decrease in pilotage charges at Fremantle. These changes will be incorporated in the next Port Interface Cost Index (July–December 1997) which will be reported in the March 1998 issue of Waterline.

### Port and related charges per teu

Port and related charges per teu incorporate ship-based charges per teu (ie ship-based charges per ship visit divided by average teu exchange) and cargo-based charges.

*Ship-based charges per teu* provide an indication of the potential impact of ship-based charges on shippers. Between July–December 1996 and January–June 1997 ship-based charges per teu increased at Brisbane (5.1 per cent) and Sydney (1.6 per cent) as a result of the reductions in average teu exchanges

noted earlier. There was a fall at Fremantle (14.7 per cent) due to the higher average exchange and lower towage charges. Ship-based charges per teu fell slightly at Melbourne and Adelaide in response to the marginal rises in average teu exchanges at these ports.

*Cargo-based charges* for loaded containers were generally unchanged in January–June 1997 compared with July–December 1996. At Adelaide, a decrease in the proportion of containers loaded with primary produce (concessional charge) resulted in a slight increase 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 Fremantle (7.2 per cent), Adelaide (0.3 per cent) and Melbourne (0.04 per cent). There were increases at Brisbane (2.2 per cent) and Sydney (0.7 per cent).

Since January–June 1997, there have been reductions in wharfage charges at Melbourne, Adelaide and Fremantle. These changes will be incorporated in the next Port Interface Cost Index July–December 1997) which will be reported in the March 1998 issue of *Waterline*.

## Stevedoring charges per teu

The ACCC's latest survey of container terminal operations indicates that weighted average revenue for container stevedoring was \$203 per teu in 1995. The BTCE is currently working to obtain more recent data on average stevedoring charges for inclusion in *Waterline*. As an interim measure, information from industry sources has been used to prepare a provisional estimate for January–June 1997.

A range of shipping lines and terminal operators have advised the BTCE that stevedoring charges per teu declined by 5–10 per cent between 1995 and mid-1997. The reductions generally occurred in late 1996 and in the first half of 1997. They reflect several factors including the continued trend to stevedoring contracts based on rates per lift (rather than separate rates for 20 foot and 40 foot containers) and declines in charges, particularly for 40 foot containers.

Using a mid-point figure of 7.5 per cent, it is estimated that average revenue for container stevedoring has fallen by around \$15 per teu since 1995. The stevedoring charge for the Port Interface Cost Index is therefore \$188 per teu (ie \$203 - \$15) in January–June 1997. This figure is provisional and will be updated when detailed data are available.

## Land-based charges per teu

Information on customs brokers' fees and road transport charges in July–December 1996 and January–June 1997 is included in **table 5**. The average charges are based on data provided by around 40 customs brokers and 50 road transport operators.

Customs brokers' fees for imports were unchanged at most ports in January–June 1997. The only changes were a decrease of \$3 per teu at Adelaide and an increase of \$9 per teu at Fremantle. For exports, the changes were limited to marginal declines of \$1 per teu at Brisbane and Fremantle.

Road transport charges rose at all ports between July–December 1996 and January–June 1997. The increases ranged from \$1 per teu (Sydney and Adelaide) to \$4 per teu (Fremantle).

## Indexes for individual ports

**Table 5** indicates that port interface costs declined at all of the mainland capital city ports between July–December 1996 and January–June 1997.

The totals for individual ports in **table 5** should be interpreted with caution as the most significant factor in the latest period was the estimated fall of \$15 per teu in the stevedoring charge. The use of a single stevedoring charge for all ports in *Waterline* reflects the scope of the available information which is not disaggregated on an individual port basis. In practice, container stevedoring charges often vary between ports. In addition, there has reportedly been some variation in the trends in stevedoring charges at individual ports since 1995.

**Table 5** indicates that several other factors contributed to the changes in port interface costs at individual ports between July–December 1996 and January–June 1997. Port and related charges per teu were a

major factor at Fremantle and also affected Brisbane, Sydney and Adelaide. Customs brokers' fees contributed to the movements in port interface costs at Brisbane (exports only), 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 6](#). In overall terms, the index declined by 2.0 per cent for an import teu and by 2.2 per cent for an export teu between July–December 1996 and January–June 1997. In real terms, the falls were 3.1 per cent for imports and 3.3 per cent for exports.

The reductions in the national index mainly reflected the lower stevedoring charge (provisional estimate). Changes in other charges were relatively small in most cases, the major exceptions being the decline in port and related charges per teu and the increase in customs brokers' fees (imports only) at Fremantle.

## PORT PERFORMANCE - NON-FINANCIAL

Information on aspects of non-financial performance for the five mainland capital city ports in 1996/97 is presented in [table 7](#).

### Cargo throughput

*Total cargo throughput* (bulk and general cargo) at the five ports rose by 6.6 per cent between July–December 1996 and January–June 1997. There were increases at Brisbane (13.7 per cent), Adelaide (8.8 per cent) and Fremantle (17.2 per cent). Throughput declined at Sydney (3.4 per cent) and Melbourne (0.9 per cent).

The increase in total cargo throughput between July–December 1996 and January–June 1997 followed a decline of 0.6 per cent in the previous half-year. Total throughput in January–June 1997 was 6.0 per cent higher than throughput in the corresponding half-year of 1996, reflecting increases at all ports over the period.

The tonnage of *non-containerised general cargo* handled at the five ports declined by 3.1 per cent between July–December 1996 and January–June 1997. There were reductions at Sydney (5.3 per cent), Melbourne (10.5 per cent) and Adelaide (14.6 per cent). Tonnages increased at Brisbane (10.2 per cent) and Fremantle (15.0 per cent). The tonnage of non-containerised general cargo handled at the five ports in January–June 1997 was 4.0 per cent higher than the tonnage in the corresponding half-year of 1996.

*Container traffic* (teus) at the five ports declined by 3.5 per cent over the period from July–December 1996 to January–June 1997. There were reductions at Sydney (4.2 per cent), Melbourne (4.8 per cent), Adelaide (3.4 per cent) and Fremantle (0.9 per cent). Container traffic increased at Brisbane (0.8 per cent). Overall for the five ports, there were decreases in full import teus (5.1 per cent), empty import teus (7.2 per cent) and empty export teus (8.9 per cent). Full export teus increased by 0.4 per cent.

In 1996/97, a total of almost 2.3 million teus were exchanged at the five mainland capital city ports. This represented a 7.3 per cent increase over the 1995/96 figure.

### Employment

[Table 7](#) indicates that total employment at the five mainland capital city port authorities/corporations fell by 5.1 per cent between July–December 1996 and January–June 1997. Employment declined at Brisbane (9.7 per cent), Sydney (5.8 per cent), Adelaide (0.5 per cent) and Fremantle (5.9 per cent). There was a slight increase at Melbourne (2.9 per cent).

Employment at the mainland capital city port authorities/corporations has fallen by around 52 per cent since the first data (covering July–December 1993) were published in *Waterline* 1.

## Ship turnaround time

The median turnaround time for ships calling at the container terminals declined at Brisbane, Sydney, Adelaide and Fremantle in January–June 1997 compared with the July–December 1996 period. There was a marginal increase at Melbourne.

The 95th percentile ship turnaround time fell at Sydney, Melbourne, Adelaide and Fremantle between July–December 1996 and January–June 1997. There was an increase at Brisbane. The 95th percentile figure indicates the turnaround time that is equalled or bettered by 95 per cent of ships using a particular port.

## CREW TO BERTH RATIOS

The BTCE monitors crew to berth ratios for Australian merchant and offshore shipping on a quarterly basis. The results of the monitoring process have been reported in *Waterline* since the December 1996 issue.

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 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.

This article updates the information on crew to berth ratios for Australian merchant and offshore shipping with data for the June quarter 1997.

## Merchant shipping

**Figure 7** presents information on the crew to berth ratio, and its components, for Australian merchant shipping over the period from the September quarter 1993 to the June quarter 1997.

During the preparation of the June quarter figures, several ship operators revised their data for the two preceding quarters to more accurately reflect the definitions used in the monitoring process. These revisions affected the overall crew to berth ratios as well as the ship time, accrued leave, compensation and long service leave components. The revised crew to berth ratios are 2.191 (previously 2.247) for the December quarter 1996 and 2.139 (previously 2.174) for the March quarter 1997. The BTCE regularly audits the data collection and processing systems of ship operators involved in the crew to berth monitoring process.

The *crew to berth ratio* for merchant shipping was 2.130 in the June quarter, down from the revised March quarter figure of 2.139. The initial level at the beginning of the monitoring process in the September quarter 1993 was 2.133. Major changes over the latest period were a reduction in the compensation ratio and an increase in the study leave ratio.

*Ship time* is the largest component of the crew to berth ratio for merchant shipping. The ship time ratio was 1.033 in the June quarter, compared with 1.035 (revised) in the March quarter (initial level 1.025).

*Accrued leave* (initially 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 was 0.969 in the June quarter, similar to the figure of 0.970 (revised) in the March 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 declined to 0.061 in the June quarter from 0.077 (revised) in the March quarter (initial level 0.073).

The *long service leave* ratio for merchant shipping was unchanged at 0.035 in the June quarter (initial level 0.035).

The *study leave* ratio increased to 0.025 in the June quarter from 0.016 in the March quarter (initial level 0.024).

The *training and other paid leave* ratio was 0.006 in the June quarter compared with 0.005 in the March quarter (initial level 0.006).



**Table 8** shows the individual components of the crew to berth ratio for merchant shipping, by crew classification, in the June quarter. Engineers had the highest ratio (2.152) followed by deck officers (2.134), catering crew (2.129) and integrated ratings (2.113).

## Offshore shipping

**Figure 8** 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 June quarter 1997.

The *crew to berth ratio* for offshore shipping was 2.379 in the June quarter, up from 2.373 in the March quarter. The increase mainly reflected a rise in the study leave ratio, which more than offset falls in the ship time and compensation ratios. The June quarter figure was the highest crew to berth ratio for offshore shipping since the beginning of the monitoring process (initial level of 2.327 in the March quarter 1995).

*Accrued leave* (initially 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 accrued leave ratio was unchanged at 1.153 in the June 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 1.019 in the June quarter, down from 1.037 in the March quarter (initial level 1.021).

*Compensation leave* is the third largest component of the crew to berth ratio for offshore shipping. The compensation leave ratio decreased to 0.113 in the June quarter from 0.119 in the March quarter (initial level 0.100).

The *long service leave* ratio for offshore shipping was unchanged at 0.039 in the June quarter (initial level 0.038).

The *study leave* ratio increased to 0.055 in the June quarter from 0.025 in the March quarter. The June quarter study leave ratio was the highest figure for offshore shipping since the beginning of the monitoring process (initial level 0.013).

The *training and other paid leave* ratio was unchanged at 0.000 in the June quarter (initial level 0.003).

**Table 9** shows the individual components of the crew to berth ratio for offshore shipping, by crew classification, in the June quarter. Deck officers had the highest ratio (2.442) followed by catering crew (2.404), integrated ratings (2.372) and engineers (2.318).

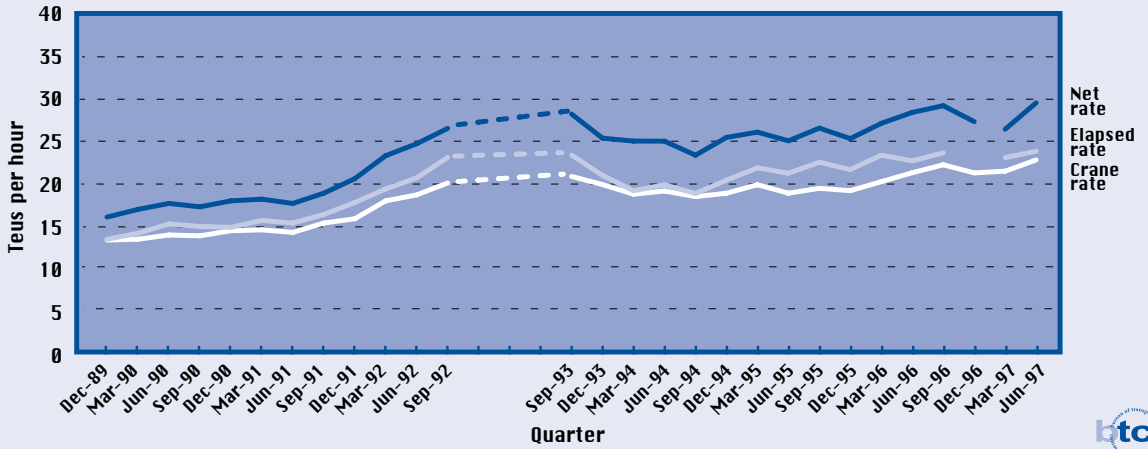
## Concluding comments

The crew to berth ratio for merchant shipping declined to 2.130 in the June quarter. This was similar to the figure of 2.133 at the beginning of the monitoring process in the September quarter 1993.

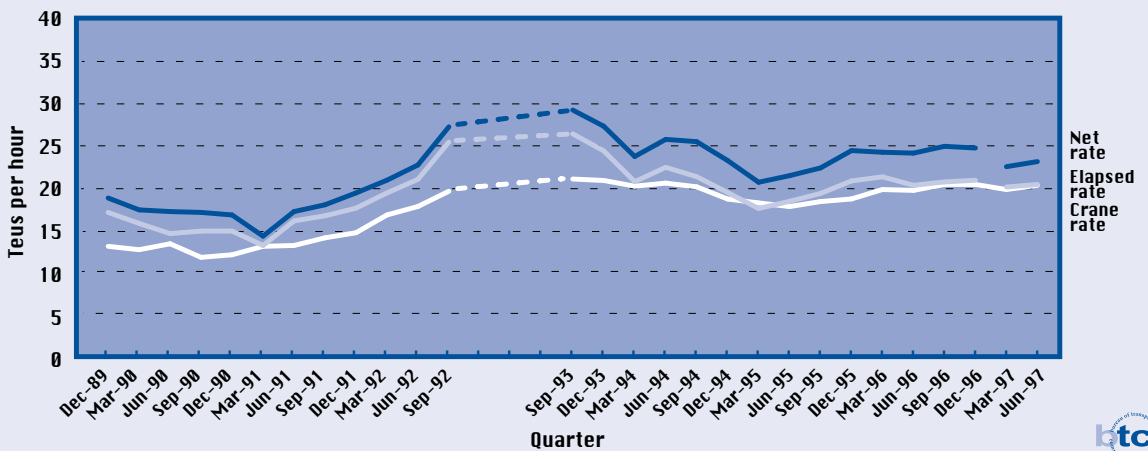
The crew to berth ratio for offshore shipping increased to 2.379 in the June quarter, mainly reflecting a rise in the study leave ratio. This was the highest figure for offshore shipping since the beginning of the monitoring process in the March quarter 1995 (initial level 2.327).

**FIGURES**

**FIGURE 1 FIVE MAJOR PORTS STEVEDORING PERFORMANCE—TEUS PER HOUR**

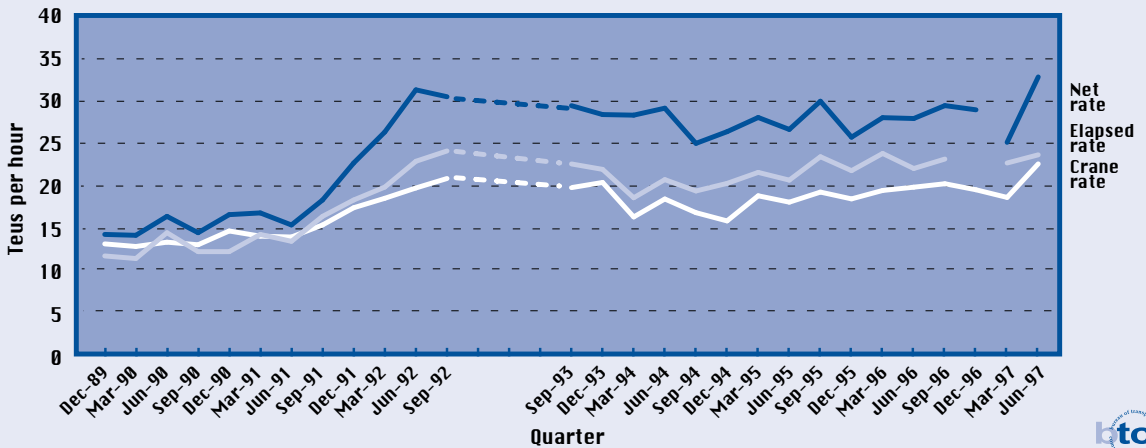


**FIGURE 2 BRISBANE CONTAINER TERMINALS PERFORMANCE—TEUS PER HOUR**

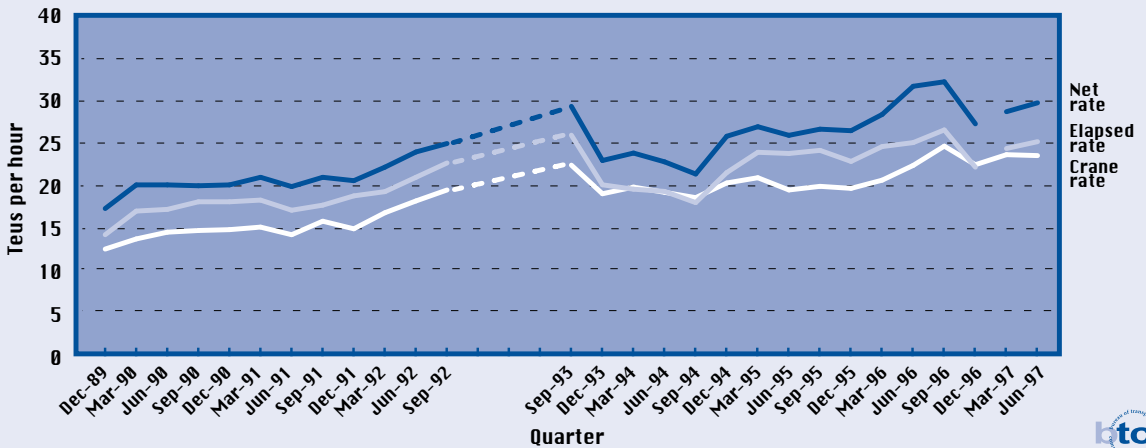


**FIGURES**

**FIGURE 3 SYDNEY CONTAINER TERMINALS PERFORMANCE—TEUS PER HOUR**

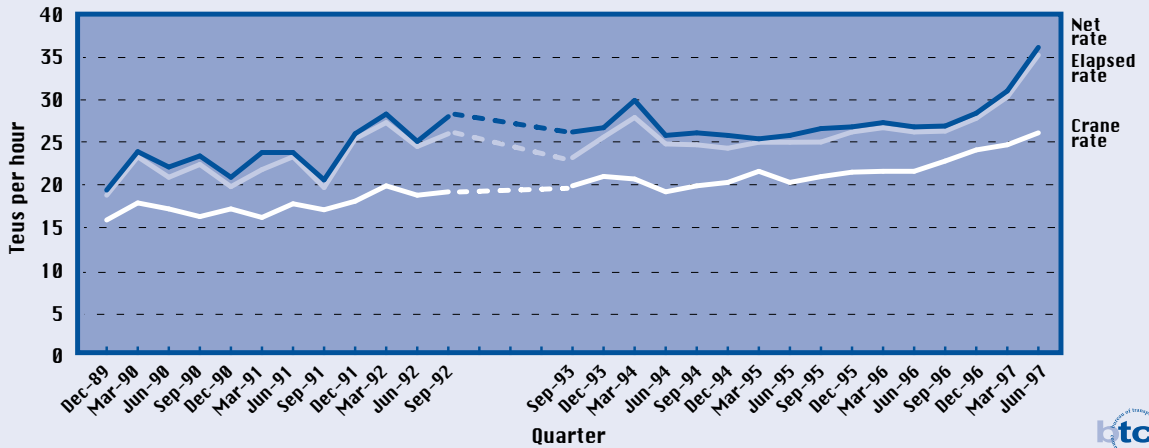


**FIGURE 4 MELBOURNE CONTAINER TERMINALS PERFORMANCE—TEUS PER HOUR**

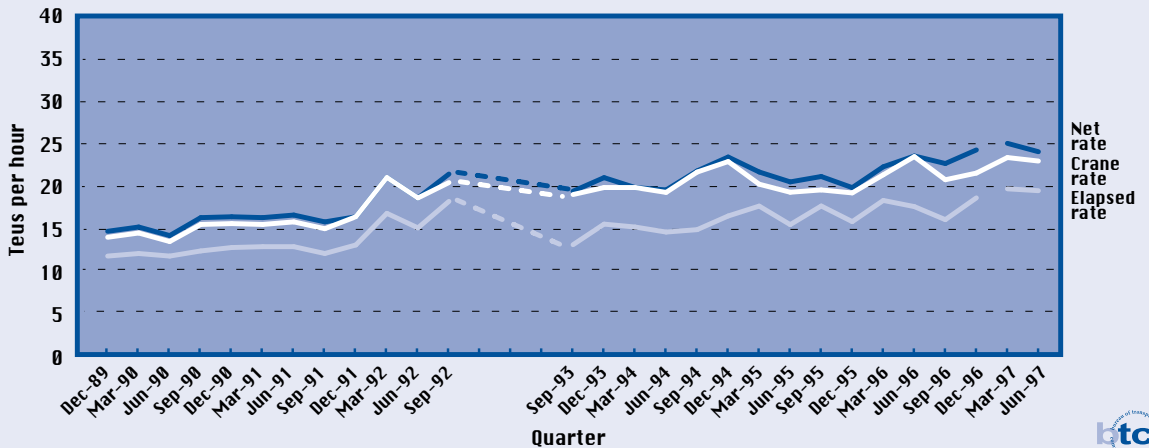


**FIGURES**

**FIGURE 5 ADELAIDE CONTAINER TERMINAL PERFORMANCE—TEUS PER HOUR**

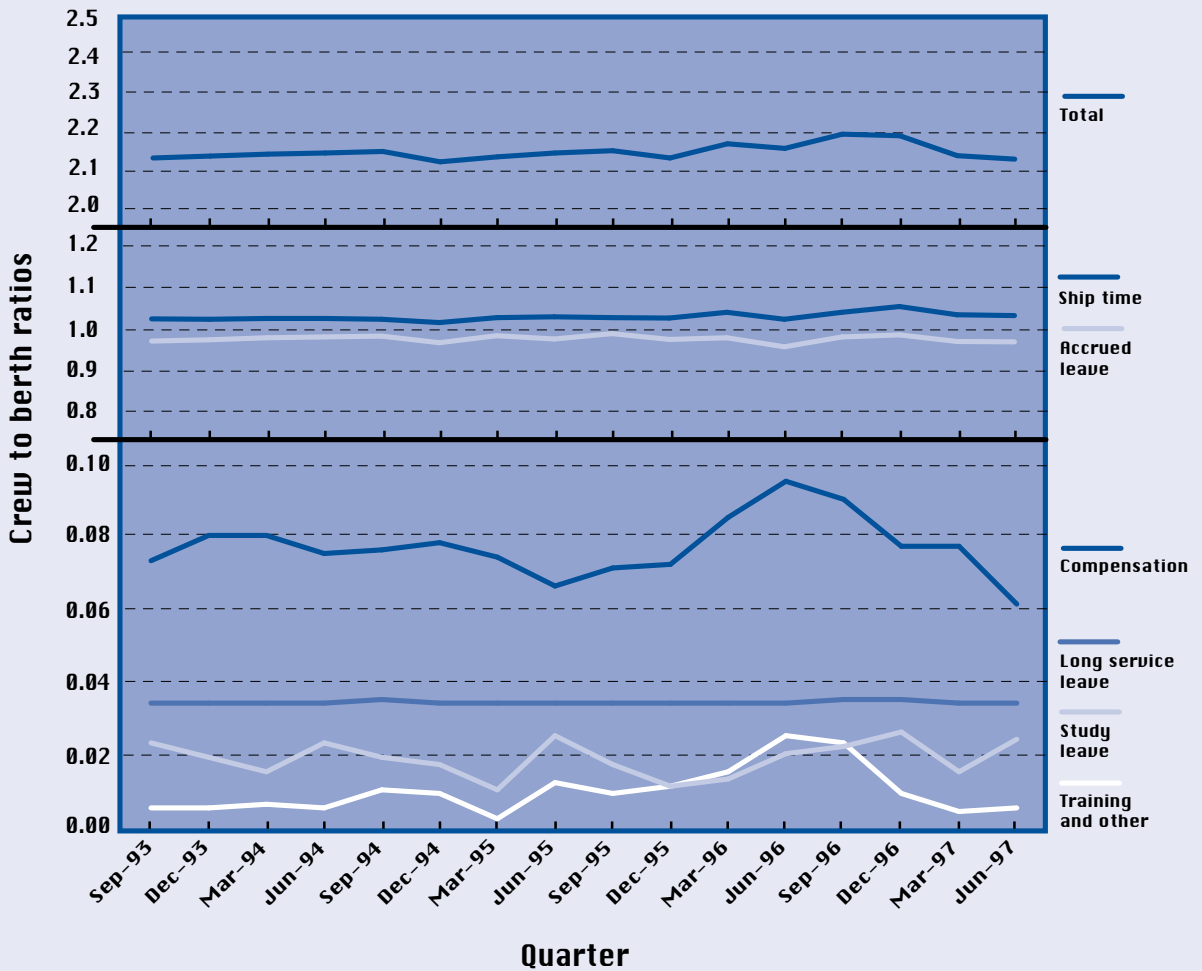


**FIGURE 6 FREMANTLE CONTAINER TERMINALS PERFORMANCE—TEUS PER HOUR**



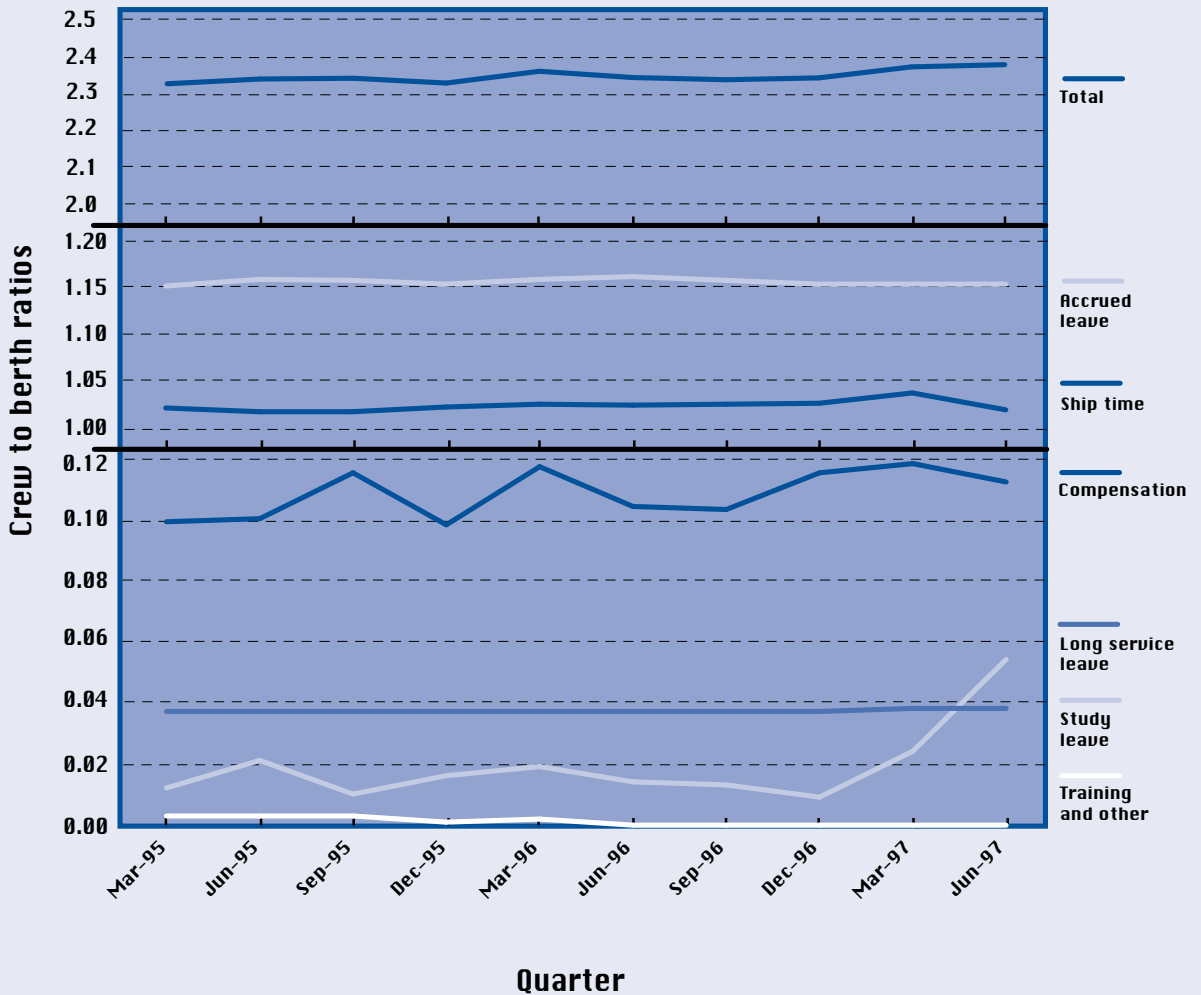
**FIGURES**

**FIGURE 7 CREW TO BERTH RATIOS—AUSTRALIAN MERCHANT SHIPPING**



**FIGURES**

**FIGURE 8 CREW TO BERTH RATIOS—AUSTRALIAN OFFSHORE SHIPPING**



# TABLES

**TABLE 1 CONTAINER TERMINAL PERFORMANCE INDICATORS—  
CONTAINERS PER HOUR**

Port/indicator	Quarter						
	Dec-95	Mar-96	Jun-96	Sep-96	Dec-96	Mar-97	Jun-97
<b>Brisbane</b>							
Crane rate	15.8	17.6	16.7	16.5	16.9	17.3	16.4
Elapsed rate	17.0	19.0	17.2	17.2	17.4	17.3	16.6
Net rate	20.6	21.5	20.4	20.4	20.4	19.4	18.7
<b>Sydney</b>							
Crane rate	15.0	15.6	16.0	16.1	15.4	14.9 <sup>P</sup>	17.7 <sup>P</sup>
Elapsed rate	17.6	18.9	17.6	18.2	a	18.2	18.5
Net rate	21.0	22.1	22.4	23.3	22.7	20.0 <sup>P</sup>	25.5 <sup>P</sup>
<b>Melbourne</b>							
Crane rate	16.3	17.0	18.4	19.6	17.8	19.0	19.0
Elapsed rate	18.8	20.2	20.5	21.1	17.9	19.5	20.3
Net rate	21.9	23.4	25.9	25.6	21.7	23.0	24.0
<b>Adelaide</b>							
Crane rate	18.8	18.9	18.2	19.3	19.6	19.6	21.0
Elapsed rate	22.8	23.3	22.0	22.2	22.6	24.0	28.3
Net rate	23.3	23.8	22.5	22.8	23.1	24.6	29.1
<b>Fremantle</b>							
Crane rate	16.2	17.9	20.0	17.8	18.2	19.4	19.0
Elapsed rate	13.4	15.7	14.8	13.4	15.6	16.2	15.9
Net rate	16.7	18.9	20.0	19.4	20.5	20.6	19.8
<b>Five ports</b>							
Crane rate	15.9	16.9	17.7	18.0	17.1	17.4 <sup>P</sup>	18.3 <sup>P</sup>
Elapsed rate	17.7	19.3	18.6	19.0	a	18.6	19.0
Net rate	20.9	22.3	23.4	23.5	21.8	21.3 <sup>P</sup>	23.6 <sup>P</sup>

*p* Provisional. One Sydney terminal operator has updated its systems to improve the processing of data on non-working time. The non-operational delays recorded at that terminal are now almost 50 per cent higher than in previous quarters. Productivity has improved in Sydney during 1997, but the changed reporting processes have contributed to part of the reported June quarter increase for that port. The March and June quarter figures may be subject to change following further review of the data.

*a* Data not available at time of publication.

*Notes* 1. Elapsed rates and net rates from March quarter 1997 onwards are not directly comparable with earlier figures (except at Adelaide) due to changes in a terminal operator's information systems.

2. The data in this table are expressed in containers per hour and therefore are not directly comparable with the teus per hour data in table 10.

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



# TABLES

**TABLE 2 AVAILABILITY OF BERTH, PILOTAGE AND TOWAGE SERVICES AT SCHEDULED/CONFIRMED TIME, JUNE QUARTER 1997**

*(Number of ship calls)*

Port/operation	Delay (hrs)								Total no. of ship calls
	0	1	2	3	4	5-10	11-20	>20	
<b>Brisbane</b>									
Berth availability	24	0	0	0	0	1	1	2	28
Pilotage	27	1	0	0	0	0	0	0	28
Towage	28	0	0	0	0	0	0	0	28
<b>Sydney</b>									
Berth availability	60	0	0	0	0	3	4	1	68
Pilotage	67	0	0	0	0	0	1	0	68
Towage	67	0	0	0	0	1	0	0	68
<b>Melbourne</b>									
Berth availability	69	0	1	2	0	4	2	1	79
Pilotage	79	0	0	0	0	0	0	0	79
Towage	79	0	0	0	0	0	0	0	79
<b>Adelaide</b>									
Berth availability	24	0	0	1	0	1	1	0	27
Pilotage	27	0	0	0	0	0	0	0	27
Towage	26	1	0	0	0	0	0	0	27
<b>Fremantle</b>									
Berth availability	47	0	0	0	0	1	1	1	50
Pilotage	50	0	0	0	0	0	0	0	50
Towage	49	0	0	1	0	0	0	0	50
<b>Five ports</b>									
Berth availability	224	0	1	3	0	10	9	5	252
Pilotage	250	1	0	0	0	0	1	0	252
Towage	249	1	0	1	0	1	0	0	252

*Note* Data for individual ports should be interpreted with caution as there may be significant inter-port variation in factors such as the proportion of ship calls that involve fixed-day sailings.

*Source* Data provided by shipping lines.





# TABLES

**TABLE 3 PARAMETERS USED IN THE PORT INTERFACE COST INDEX, 1996/97**

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997
<b>Vessel size</b>										
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	-	-	-	-
<b>Teus exchanged<sup>a</sup></b>										
Total	377	346	725	713	699	697	206	207	291	330
Loaded	292	267	600	597	590	596	161	172	242	276
Empty	85	79	125	116	109	101	45	35	49	54
Loaded inwards	124	111	375	364	309	305	56	63	126	140
Loaded outwards	168	156	225	233	281	291	105	109	116	136
Primary produce	-	-	-	-	-	-	41	41	-	-
<b>Ship call parameters<sup>a</sup></b>										
Number of port calls	3	3	3	4	3	3	4	4	5	7
Elapsed berth time (hrs)	23	23	41	39	35	35	15	15	20	18

- 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.



# WATERLINE

## SEPTEMBER 1997, Issue no. 12

# TABLES

**TABLE 4 PORT AND RELATED CHARGES, 1996/97**

	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997
<b>Ship-based charges (\$/teu)</b>										
Conservancy	8.35	6.46	-	-	-	-	7.31	7.27	2.72	1.60
Tonnage	-	-	9.73	9.90	9.85	9.88	18.10	17.99	8.69	7.68
Pilotage	13.60	14.81	4.69	4.77	7.85	7.87	11.43	11.37	7.56	6.68
Towage	26.84	29.21	13.48	13.70	10.52	10.55	59.83	59.50	38.74	33.14
Mooring & unmooring	3.82	4.82	4.34	4.41	3.18	3.19	-	-	3.78	3.34
Berth hire <sup>a</sup>	-	-	-	-	12.00	11.87	-	-	-	-
<b>Total<sup>b</sup></b>	<b>52.61</b>	<b>55.30</b>	<b>32.25</b>	<b>32.78</b>	<b>43.40</b>	<b>43.37</b>	<b>96.67</b>	<b>96.13</b>	<b>61.49</b>	<b>52.43</b>
<b>Cargo-based charges (\$/teu)</b>										
Wharfage										
Imports	26.00	26.00	60.00	60.00	37.40	37.40	65.00	65.00	49.79	49.79
Exports	26.00	26.00	45.00	45.00	37.40	37.40	61.09	61.20	49.79	49.79
Harbour dues	42.00	42.00	-	-	-	-	-	-	-	-
Berth charge	-	-	-	-	-	-	-	-	14.63	14.63
<b>Total port and related charges (\$/teu)<sup>b</sup></b>										
Loaded imports	120.61	123.30	92.25	92.78	80.80	80.77	161.67	161.13	125.91	116.85
Loaded exports	120.61	123.30	77.25	77.78	80.80	80.77	157.77	157.34	125.91	116.85
<b>Charges per ship visit (\$/visit)</b>										
Total ship-based charges	19840	19157	23380	23380	30330	30211	19873	19873	17902	17278
Empty teus <sup>c</sup>	1211	1126	1250	1160	1186	1099	0	0	397	437

- 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 3.

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.



# TABLES

**TABLE 5 PORT INTERFACE COSTS, 1996/97**

	(\$/teu)									
	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997
<b>Imports</b>										
Ship-based charges	53	55	32	33	43	43	97	96	61	52
Cargo-based charges	68	68	60	60	37	37	65	65	64	64
Stevedoring <sup>p</sup>	203	188	203	188	203	188	203	188	203	188
Customs brokers' fees	121	121	154	154	138	138	134	131	136	145
Road transport charges	174	176	287	288	248	251	156	157	188	192
<b>Total imports<sup>a</sup></b>	<b>619</b>	<b>609</b>	<b>737</b>	<b>722</b>	<b>670</b>	<b>658</b>	<b>654</b>	<b>638</b>	<b>654</b>	<b>642</b>
<b>Exports</b>										
Ship-based charges	53	55	32	33	43	43	97	96	61	52
Cargo-based charges	68	68	45	45	37	37	61	61	64	64
Stevedoring <sup>p</sup>	203	188	203	188	203	188	203	188	203	188
Customs brokers' fees	79	78	110	110	89	89	71	71	74	73
Road transport charges	174	176	287	288	248	251	156	157	188	192
<b>Total exports<sup>a</sup></b>	<b>576</b>	<b>566</b>	<b>677</b>	<b>663</b>	<b>621</b>	<b>609</b>	<b>588</b>	<b>574</b>	<b>591</b>	<b>569</b>

*p* Provisional pending updating of stevedoring charge using detailed survey data.

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

*Notes* 1. Based on parameters described in table 3.

2. Waterline data on customs brokers' fees and road transport charges are collected for the purpose of monitoring trends in charges over time. They should not be used for inter-port comparisons as sample characteristics may vary between ports.

3. The stevedoring charge used in Waterline is a weighted average for several major Australian ports. Stevedoring charges vary between ports but detailed data for individual ports are not publicly available.

*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 and industry sources.

**TABLES**

**TABLE 6 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	Jan-Jun 1997
<b>Imports</b>	696	675	670	690	684	697	696	689	684	671
<b>Exports</b>	617	608	612	633	624	633	636	633	629	615

*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 and industry sources.



# WATERLINE

## SEPTEMBER 1997, Issue no. 12

# TABLES

**TABLE 7 NON-FINANCIAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORTS, 1996/97**

Indicator	Brisbane		Sydney		Melbourne		Adelaide		Fremantle		Five Ports <sup>c</sup>	
	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997	Jul-Dec 1996	Jan-Jun 1997
<b>Total cargo throughput ('000 tonnes)</b>	9449	10740	10851	10482	9271	9188	2867	3118	10100 <sup>r</sup>	11836	42538 <sup>r</sup>	45364
<b>Non-containerised general cargo ('000 tonnes)<sup>a</sup></b>	374	412	414	392	1071	959	151	129	307	<sup>r</sup>	353	2316 <sup>r</sup> 2245
<b>Containerised cargo (teus exchanged)</b>												
Full import	44765	43883	192764	180102	222273	209843	12144	13226	45420	<sup>r</sup>	44125	517366 <sup>r</sup> 491179
Empty import	22918	23720	10304	9419	37955	34265	8239	5866	9603	<sup>r</sup>	9318	89019 <sup>r</sup> 82588
Full export	60295	61627	116017	115636	201630	200601	22959	22895	41275	<sup>r</sup>	43079	442176 <sup>r</sup> 443838
Empty export	7774	7650	54032	52172	42350	35477	1668	1500	8942	<sup>r</sup>	7802	114766 <sup>r</sup> 104601
Total teus	135752	136880	373117	357329	504208	480186	45010	43487	105240	<sup>r</sup>	104324	1163327 <sup>r</sup> 1122206
<b>Average total employment</b>	236	213	243	229	69 <sup>d</sup>	71 <sup>d</sup>	205	204	203	191	956	907
<b>Turnaround time (hrs)<sup>b</sup></b>												
Median result	31.6	30.3	41.0	36.1	38.0	39.0	18.5	17.0	26.8	22.7	-	-
95th percentile	51.3	53.7	73.9	68.8	77.9	68.6	38.8	28.3	66.5	53.5	-	-

- not applicable

<sup>r</sup> Revised to reflect changes to date range selection for Fremantle Port Authority's trade statistics.

<sup>a</sup> Excludes bulk cargoes.

<sup>b</sup> 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.

<sup>c</sup> Components may not sum to totals due to rounding.

<sup>d</sup> Applies to Melbourne Port Corporation only.

Source AAPMA



TABLES

**TABLE 8 MERCHANT SHIPPING CREW TO BERTH RATIOS BY ACTIVITY AND CREW CLASSIFICATION, JUNE QUARTER 1997**

Crew type	Ship time	Accrued leave	Compensation	Long service leave	Study leave	Training & other	Total <sup>a</sup>
Deck officers	1.036	0.965	0.021	0.035	0.060	0.018	2.134
Engineers	1.045	0.974	0.040	0.035	0.051	0.007	2.152
<b>All officers</b>	1.040	0.970	0.031	0.035	0.055	0.012	2.143
Integrated ratings	1.024	0.968	0.085	0.035	0.000	0.001	2.113
Catering crew	1.031	0.970	0.093	0.035	0.000	0.001	2.129
<b>All ratings</b>	1.026	0.969	0.087	0.035	0.000	0.001	2.118
<b>All crew</b>	1.033	0.969	0.061	0.035	0.025	0.006	2.130

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

Source Data provided by ship operators.



# TABLES

**TABLE 9 OFFSHORE SHIPPING CREW TO BERTH RATIOS BY ACTIVITY AND CREW CLASSIFICATION, JUNE QUARTER 1997**

<b>Crew type</b>	<b>Ship time</b>	<b>Accrued leave</b>	<b>Compensation</b>	<b>Long service leave</b>	<b>Study leave</b>	<b>Training &amp; other</b>	<b>Total<sup>a</sup></b>
Deck officers	1.019	1.153	0.072	0.040	0.157	0.000	2.442
Engineers	1.016	1.154	0.052	0.038	0.058	0.000	2.318
<b>All officers</b>	1.018	1.154	0.062	0.039	0.108	0.000	2.381
Integrated ratings	1.017	1.154	0.163	0.039	0.000	0.000	2.372
Catering crew	1.038	1.153	0.174	0.039	0.000	0.000	2.404
<b>All ratings</b>	1.020	1.153	0.165	0.039	0.000	0.000	2.377
<b>All crew</b>	1.019	1.153	0.113	0.039	0.055	0.000	2.379

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

Source Data provided by ship operators.



**TABLE 10 CONTAINER TERMINAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORTS—TEUS PER HOUR**

	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	Mar-97	Jun-97
<b>Brisbane</b>																			
Ships handled	96	93	na	106	111	112	140	140	187	136	123	135	132	124	133	140	141	156	164
Total teus	39058	45055	na	49622	46529	37820	52983	51596	50574	41723	47065	58851	46439	39037	51008	66115	62904	47471	65572
Crane rate	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	20.6	20.0	20.5
Elapsed rate	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	20.5	20.9	21.1	20.3	20.6
Net rate	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	22.7	23.3
<b>Sydney</b>																			
Ships handled	109	112	na	205	238	177	240	223	221	218	202	192	203	206	216	228	249	251	249
Total teus	68359	81287	na	124028	139321	116914	129586	142659	152326	144868	140113	148431	143746	146038	148290	156344	174982	158323	167705
Crane rate	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	19.9	20.3	19.6	18.7 <sup>P</sup>	22.6 <sup>P</sup>
Elapsed rate	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	22.1	23.1	a	22.7	23.6
Net rate	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	27.9	29.5	28.9	25.1 <sup>P</sup>	32.7 <sup>P</sup>
<b>Melbourne</b>																			
Ships handled	121	121	na	235	306	211	265	267	244	265	228	221	227	228	262	274	282	230	249
Total teus	82757	86486	na	129687	143350	153420	158849	159039	180134	173338	152983	161943	173566	162911	170884	203371	202376	162156	177070
Crane rate	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	23.6	23.5
Elapsed rate	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	22.1	24.3	25.1
Net rate	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	32.2	27.2	28.7	29.7
<b>Adelaide</b>																			
Ships handled	20	21	na	21	26	28	34	31	33	35	50	34	42	47	63	70	74	69	65
Total teus	10710	10763	na	9650	12616	13243	12461	13167	15038	16832	21676	14319	17318	15955	18803	20519	23351	21963	20933
Crane rate	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	24.6	26.0
Elapsed rate	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	30.2	35.1
Net rate	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	30.9	36.0
<b>Fremantle</b>																			
Ships handled	75	72	na	116	115	127	135	121	124	128	136	139	124	143	153	159	161	159	164
Total teus	26572	27690	na	37566	40910	40587	40986	36635	46969	44388	45308	50050	44662	47597	51113	50791	55593	51784	52092
Crane rate	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	23.3	22.9
Elapsed rate	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	17.6	16.0	18.6	19.7	19.5
Net rate	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	24.2	25.0	24.0
<b>Five ports</b>																			
Ships handled	421	419	na	683	796	655	814	782	809	782	739	721	728	748	827	871	907	865	891
Total teus	227456	251281	na	350553	382726	361984	394865	403096	445041	421149	407145	433594	425731	411538	440098	497140	519206	441697	483372
Crane rate	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	22.3	21.2	21.5 <sup>P</sup>	22.8 <sup>P</sup>
Elapsed rate	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	23.1	23.8
Net rate	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	28.5	29.1	27.2	26.4 <sup>P</sup>	29.5 <sup>P</sup>

na not available

<sup>p</sup> Provisional. One Sydney terminal operator has updated its systems to improve the processing of data on non-working time. The non-operational delays recorded at that terminal are now almost 50 per cent higher than in previous quarters. Productivity has improved in Sydney during 1997, but the changed reporting processes have contributed to part of the reported June quarter increase for that port. The March and June quarter figures may be subject to change following further review of the data.

<sup>a</sup> Data not available at time of publication.

Notes 1. Award shift breaks are included in the measure of time used to calculate net rates and crane rates to the end of the September quarter 1992, and excluded from the measure of time in later quarters.

This means that 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. Elapsed rates and net rates from March quarter 1997 onwards are not directly comparable with earlier figures (except at Adelaide) due to changes in a terminal operator's information systems.

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

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





## ABBREVIATIONS

AAPMA	Association of Australian Ports and Marine Authorities
ACCC	Australian Competition and Consumer Commission
BTCE	Bureau of Transport and Communications Economics
GRT	Gross Registered Tonnage
LOA	Length Overall
NRT	Net Registered Tonnage
teu	Twenty-foot equivalent unit
WIRA	Waterfront Industry Reform Authority

## DEFINITIONS

<b>Elapsed time</b> —the total time over which the ship is worked, measured from labour aboard to labour ashore.
<b>Elapsed rate</b> —the number of containers or teus moved per elapsed hour.
<b>Net time</b> —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.
<b>Net rate</b> —the number of containers or teus moved per net hour.
<b>Crane rate</b> —the number of containers or teus moved per net crane hour.

## ACKNOWLEDGMENTS

Contributors to this issue of *Waterline* were Kym Starr, Gita Curnow and Tim Risbey. The BTCE is particularly grateful for the assistance of the Maritime Transport Division of the Department of Workplace Relations and Small Business, the Association of Australian Ports and Marine Authorities, individual port authorities, ship operators, shipping lines, customs brokers, road transport operators, and the stevedoring companies Patrick, P&O Ports and SeaLand.

For further information on this publication, please contact Mr Kym Starr on tel (02) 6274 6857 fax (02) 6274 6816 email [kstarr@email.dot.gov.au](mailto:kstarr@email.dot.gov.au).

This publication is available free of charge from the Manager, Information Services, Bureau of Transport and Communications Economics, GPO Box 501, Canberra, ACT, 2601, Australia. Tel (02) 6274 6846.

### Internet:

<http://www.dot.gov.au/programs/btce/btcehome.htm>

ISSN 1324-4043

© Commonwealth of Australia 1997. This work is copyright. Apart from any use as permitted under the *Copyright Act 1968*, no part may be reproduced by any process without prior written permission from the Australian Government Publishing Service. Requests and inquiries concerning reproduction and rights should be addressed to the Manager, Commonwealth Information Services, Australian Government Publishing Service, GPO Box 84, Canberra, ACT 2601.