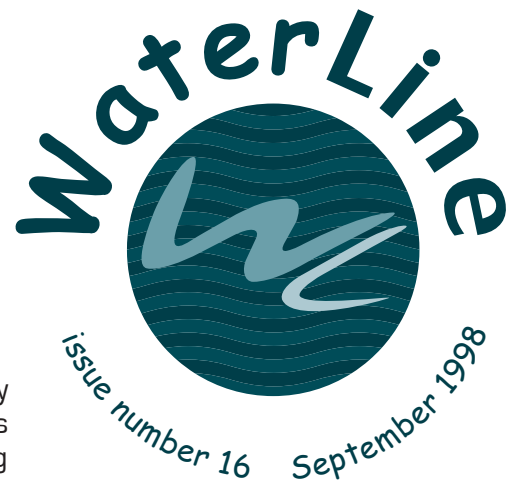


The Importance of a Range of Performance Indicators



Observant readers of *Waterline* may be curious about why the June quarter 1998 stevedoring productivity indicators appear to be 'normal' regardless of the dispute involving Patrick and the Maritime Union of Australia (MUA). The answer involves two issues:

- Patrick was unable to provide any meaningful productivity data for the work performed during the dispute and therefore the Patrick June quarter data do not include information relating to the period of the dispute; and
- a significant majority of Patrick's usual business was diverted during the dispute to other terminals operated by stevedores not involved in the dispute.



Even if Patrick had provided productivity data covering the period of the dispute, port average stevedoring performance measures such as those used by the BTE would not necessarily have been affected. This is because the *Waterline* stevedoring productivity measures are partial measures of performance based on the time the ship is being worked (in general), and because only a small number of ships were handled by Patrick during the dispute.

The effect of the dispute can be clearly seen, however, in the BTE's waterfront reliability indicators. Berth availability was down and the time spent by ships waiting for a berth increased in the June quarter, reflecting the congestion caused by the dispute. In addition there was an increase in 'other ship waiting time' directly attributable to waterfront services.

The different effect of the dispute on the productivity and reliability indicators demonstrates the value of having both measures of performance.

Excess Capacity?

The container throughput data contained in this issue of *Waterline* provide some indication of the extent of excess capacity that may exist in the Australian container stevedoring industry.

Using the stevedores' proportion of total container throughput volumes as an approximation of their share of capacity, the dispute involving Patrick and the MUA had the effect of closing down 13 per cent of total Australian stevedoring capacity for the entire June quarter. However, total Australian container throughput for the June quarter 1998 was down only 3.5 per cent on the previous quarter and was up 5.1 per cent on the June quarter 1997.

Obviously this is not a rigorous analysis and the distribution of excess capacity is not uniform across Australia. However, the way in which the Australian container transport system adapted to a significant disruption in capacity during the June quarter raises some doubt regarding the strength of the argument for further container terminal investment in Australia based on the grounds of capacity shortages. Future labour productivity improvements would weaken that argument even further.



STEVEDORING PRODUCTIVITY

Table 1 presents the September 1996 to June 1998 indicators of stevedoring productivity for the major Australian container terminals, expressed in *container moves per hour*. Figures 1 to 6 present these data over the December 1995 to June 1998 period. 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 Sea-Land terminal.

Please note that:

- the June quarter 1998 data cover the 8 April to 7 May 1998 period of industrial disputation involving Patrick and the MUA. Patrick was unable to provide any performance data for this period.
- Fremantle elapsed rate data from one operator are not available and therefore only a four-port average indicator could be calculated. However, given that the five-port average is dominated by Melbourne and Sydney, the four-port figure calculated is a reasonable approximation of the five-port average.

Overall national stevedoring productivity, as measured by the five-port average, changed little in the June quarter compared with the March quarter:

- the five-port average *crane rate* (productivity *per crane* while the ship is worked) was 18.7 containers per hour for the June quarter compared with 18.8 in the March quarter;
- the four-port (Fremantle data not available) average *elapsed rate* (productivity *per ship* based on the time labour is aboard the ship) was 20.7 containers per hour compared with 20.0 in the March quarter; and
- the five-port average net rate (productivity *per ship* while the ship is worked) was 24.7 containers per hour compared with 23.4 containers (revised) in the March quarter.

Brisbane average crane rates were 17.3 containers per hour in the June quarter, down from 18.0 in the March quarter. The average elapsed rate was 17.1 containers per hour compared with 16.4 in the March quarter. The net rate of 20.2 containers per hour was up from 19.1 containers per hour (revised) for the March quarter. The average proportion of elapsed time not worked increased to 15.4 per cent.

Sydney average crane rates were 16.9 containers per hour in the June quarter, down from 17.5 in the March quarter. The June quarter elapsed and net rates increased to 20.2 containers per hour and 26.2 containers per hour respectively. The average proportion of elapsed time not worked increased to 22.9 per cent.

Melbourne average crane rates were 19.2 containers per hour in the June quarter, down marginally from 19.5 in the March quarter. The elapsed rate of 21.0 containers per hour and the net rate of 24.2 containers per hour were up on the previous quarter's figures. Elapsed time not worked increased to 13.3 per cent.

Adelaide average crane rates continued their upward trend, achieving 23.1 containers per hour in the June quarter, compared with 22.5 in the March quarter. The Adelaide elapsed rate of 30.4 containers per hour and the net rate of 31.5 containers per hour were both up on the March quarter rates. The



average proportion of elapsed time not worked remained almost constant at 3.5 per cent.

Fremantle average crane rates were 21.5 containers per hour in the June quarter, up from 19.6 containers per hour in the March quarter. The elapsed data for March are not available from one operator and therefore the elapsed rate for Fremantle has not been produced for this quarter. The net rate of 23.9 containers per hour was up on the March quarter rate.

Teus per hour

Table 11 presents 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 because indicators based on teus per hour may be affected by changes in the mix of 20-foot and 40-foot containers from one period to the next.

Container port activity

Table 1 also provides information on container ship visits and container throughput at each of the five mainland capital city ports. The June quarter 1998 five-port average showed a 7.0 per cent decrease in ship visits and a 3.5 per cent decrease in container throughput when compared with the previous quarter. Compared with the June quarter of the previous year the five-port average for container ship visits fell by 5.2 per cent while the five-port average for container throughput rose by 5.1 per cent.

On a port by port basis, the June quarter 1998 container exchange at:

- Brisbane was up 19.8 per cent on the March quarter figure, and up 12.0 per cent compared with the June quarter 1997;
- Sydney was down 5.2 per cent on the March quarter figure, and down 0.4 per cent compared with the June quarter 1997;
- Melbourne was down 11.5 per cent on the March quarter figure, but up 2.4 per cent compared with the June quarter 1997;
- Adelaide was up 28.2 per cent on the March quarter 1998 figure and up 38.0 per cent compared with the June quarter 1997. The large increase in container exchange at Adelaide resulted predominantly from the industrial dispute during April and May. The impact of the dispute on the container ports at Sydney and Melbourne resulted in a number of vessels exchanging their Sydney and Melbourne containers at Adelaide instead; and
- Fremantle was down 6.8 per cent on the March quarter figure, but up 9.3 per cent compared with the June quarter 1997.



**TABLE I CONTAINER TERMINAL PERFORMANCE INDICATORS—PRODUCTIVITY IN CONTAINERS PER HOUR**

Port/indicator	Quarter							
	Sep-96	Dec-96	Mar-97	Jun-97	Sep-97	Dec-97	Mar-98	Jun-98
Five ports								
Ships handled	871	907	865	891	907	963	909	845
Total containers	400201	416977	357848	387277	431853	467122	421769	406938
Crane rate	18.0	17.1	18.4	18.3	18.3	18.5	18.8	18.7
Elapsed rate	19.0	na	18.6	19.0	20.4	20.5	20.0 ^a	20.7 ^a
Net rate	23.5	21.8	23.4	23.6	24.3	24.3	23.4 ^r	24.7
Elapsed time not worked (per cent)	19.1	na	20.3	19.2	16.2	15.7	15.5 ^a	16.2 ^a
Brisbane								
Ships handled	140	141	156	164	162	177	170	168
Total containers	53690	51815	40696	52610	58424	58014	49197	58939
Crane rate	16.5	16.9	17.3	16.4	16.1	16.8	18.0	17.3
Elapsed rate	17.2	17.4	17.3	16.6	16.8	16.8	16.4	17.1
Net rate	20.4	20.4	19.4	18.7	19.1	19.6	19.1 ^r	20.2
Elapsed time not worked (per cent)	15.7	15.0	10.8	11.5	11.7	14.6	13.9 ^r	15.4
Sydney								
Ships handled	228	249	251	249	243	266	238	219
Total containers	123390	137542	126265	131004	142659	157430	137600	130513
Crane rate	16.1	15.4	17.7	17.7	18.2	18.4	17.5	16.9
Elapsed rate	18.2	na	18.2	18.5	21.7	21.9	19.9	20.2
Net rate	23.3	22.7	25.7	25.5	27.9	27.7	25.7	26.2
Elapsed time not worked (per cent)	21.9	na	29.4	27.6	22.4	20.7	22.5	22.9
Melbourne								
Ships handled	274	282	230	249	268	281	276	234
Total containers	163297	161865	130459	143708	162591	178302	166284	147122
Crane rate	19.6	17.8	19.0	19.0	18.6	18.8	19.5	19.2
Elapsed rate	21.1	17.9	19.5	20.3	20.5	19.9	20.1	21.0
Net rate	25.6	21.7	23.0	24.0	23.5	22.6	22.7 ^r	24.2
Elapsed time not worked (per cent)	17.6	17.8	15.3	15.4	13.0	11.9	11.8	13.3
Adelaide								
Ships handled	70	74	69	65	68	66	60	66
Total containers	17415	19047	17486	16874	20974	20773	18163	23293
Crane rate	19.3	19.6	19.6	21.0	21.1	21.4	22.5	23.1
Elapsed rate	22.2	22.6	24.0	28.3	28.4	29.2	29.6	30.4
Net rate	22.8	23.1	24.6	29.1	29.2	30.1	30.7	31.5
Elapsed time not worked (per cent)	2.6	2.2	2.4	2.7	2.7	3.0	3.6	3.5
Fremantle								
Ships handled	159	161	159	164	166	173	165	158
Total containers	42409	46707	42942	43081	47205	52603	50525	47071
Crane rate	17.8	18.2	19.4	19.0	18.8	18.9	19.6	21.5
Elapsed rate	13.4	15.6	16.2	15.9	17.0	18.9	na	na
Net rate	19.4	20.5	20.6	19.8	20.6	23.2	21.1 ^r	23.9
Elapsed time not worked (per cent)	30.9	23.9	21.5	19.5	17.6	18.4	na	na

na not available

r revised

a. Four-port average only as Fremantle elapsed rate data are not available.

Notes 1. The June quarter 1998 figures do not include data for Patrick covering 8 April to 7 May 1998, during which time the company was involved in a major industrial dispute with the MUA.

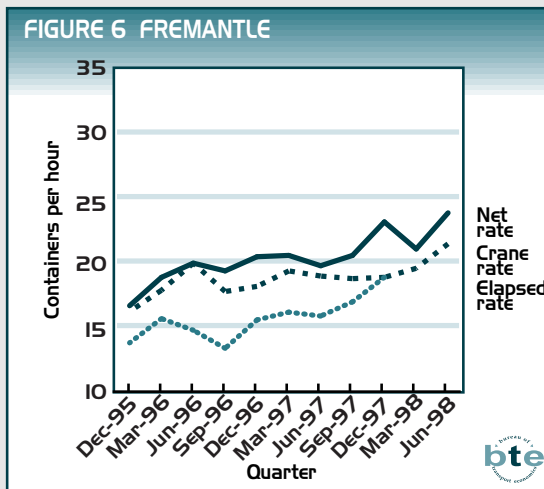
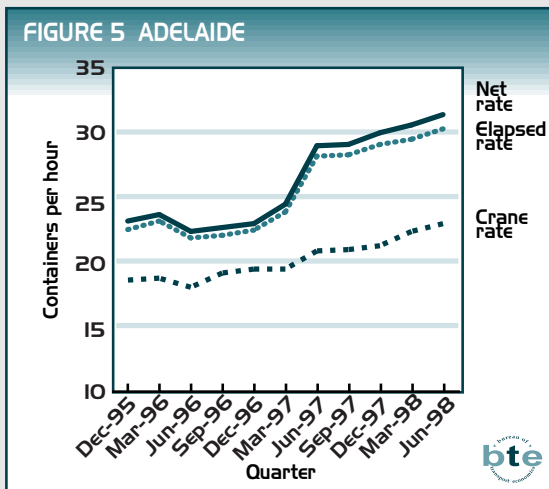
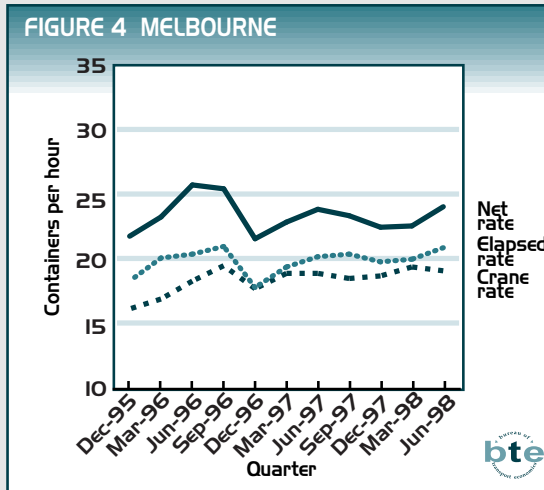
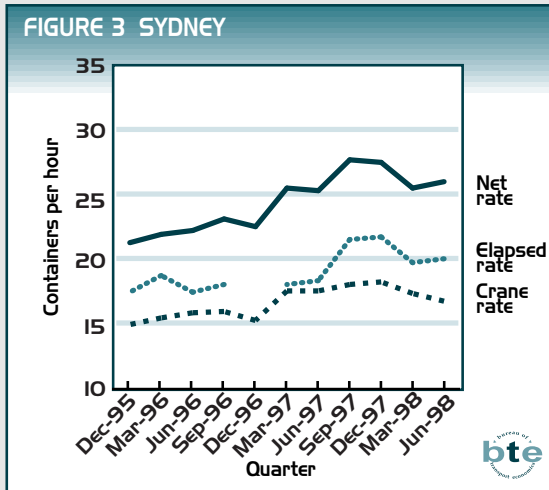
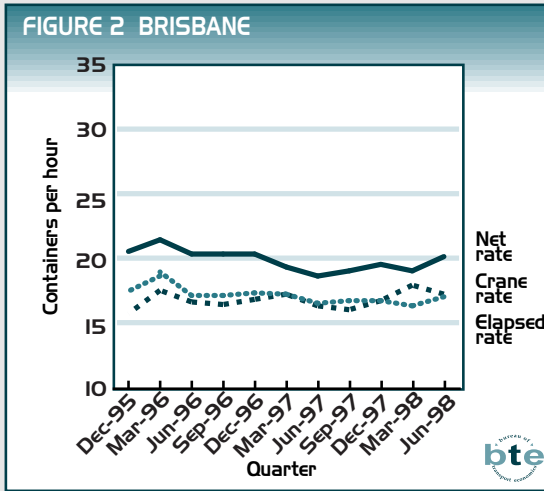
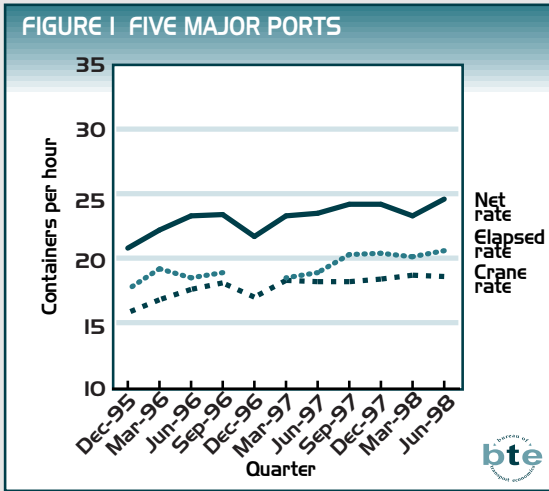
2. Elapsed rates and net rates from March quarter 1997 onwards are not directly comparable with earlier figures (except at Adelaide) due to changes in a terminal operator's information systems.

3. 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 11.

4. Elapsed time not worked is the difference between the net and elapsed rates as a percentage of the net rate.

Sources Patrick, P&O Ports and Sea-Land.





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

Sources Patrick, P&O Ports and Sea-Land.



**WATERFRONT RELIABILITY**

The *Waterline* reliability indicators provide partial measures of the variability of waterfront performance for container traffic at major Australian ports.

Berth availability, pilotage, towage

Table 2 presents information on berth availability, pilotage and towage for a sample of ship calls in the June quarter 1998. It indicates the extent to which selected port services were available at the scheduled or confirmed time.

TABLE 2 AVAILABILITY OF BERTH, PILOTAGE AND TOWAGE SERVICES AT THE SCHEDULED/CONFIRMED TIME, JUNE QUARTER 1998

Port/operation	(Number of ship calls)								Total no. of ship calls
	Delay (hrs)								
	0	1	2	3	4	5-10	11-20	>20	
Brisbane									
Berth availability	29	0	0	0	0	4	4	2	39
Pilotage	39	0	0	0	0	0	0	0	39
Towage	39	0	0	0	0	0	0	0	39
Sydney									
Berth availability	39	1	1	0	0	5	14	14	74
Pilotage	74	0	0	0	0	0	0	0	74
Towage	74	0	0	0	0	0	0	0	74
Melbourne									
Berth availability	46	0	0	0	0	3	12	20	81
Pilotage	80	1	0	0	0	0	0	0	81
Towage	81	0	0	0	0	0	0	0	81
Adelaide									
Berth availability	20	0	0	0	0	0	4	2	26
Pilotage	26	0	0	0	0	0	0	0	26
Towage	26	0	0	0	0	0	0	0	26
Fremantle									
Berth availability	51	0	1	0	0	1	1	1	55
Pilotage	55	0	0	0	0	0	0	0	55
Towage	55	0	0	0	0	0	0	0	55
Five ports									
Berth availability	185	1	2	0	0	13	35	39	275
Pilotage	274	1	0	0	0	0	0	0	275
Towage	275	0	0	0	0	0	0	0	275

Note Data for individual ports should be interpreted with caution as there is significant inter-port variation in factors such as sample sizes and ship call patterns.

Source Data for a sample of ship calls provided by shipping lines.



The sample for the June quarter covers 275 ship calls, equivalent to 33 per cent of total ship calls at the major container terminals during the period. The proportion of ship calls covered at individual ports ranges from 23 per cent at Brisbane to 39 per cent at Adelaide.

The *berth availability* indicator measures the proportion of ship arrivals where a berth is available within four hours of the scheduled berthing time. Berth availability for the sample of ship calls was 68 per cent in the June quarter 1998, down from 88 per cent in the March quarter 1998. Average waiting time for ships unable to

obtain a berth within four hours of the scheduled berthing time increased to 34 hours, from 18 hours in the previous period.

The June quarter 1998 figure was the lowest level for berth availability since this indicator was first prepared by the BTE in the March quarter 1997. The previous lowest figure was 84 per cent, recorded in the December quarter 1997.

The decline in berth availability in the June quarter 1998 reflects the impact of the dispute involving Patrick and the MUA. The data for the March and June quarters indicate that berth availability fell significantly at most ports. Caution should be used in undertaking inter-port comparisons of berth availability as there is significant variation between ports in sample sizes and ship call patterns.

The *pilotage* and *towage* indicators reported in *Waterline* measure the proportion of ship movements where the service is available to the ship within one hour of the confirmed ship arrival/departure time. The proportions were unchanged at 100 per cent in the June quarter 1998.



Other waiting time

The nine shipping lines that supplied information for table 2 also provided data on other ship waiting time. This category incorporates waiting time that is attributable to factors other than the unavailability of a berth, pilot or towage service at the scheduled/confirmed time. The data on other ship waiting time reported in *Waterline* exclude ship schedule adjustments (for example, instances where the shipping line holds the ship off the port or at the berth in order to maintain the fixed-day schedule).

In the June quarter, 53 per cent of ship calls in the sample were affected by other waiting time incidents that had a duration of at least one hour. This was similar to the proportion of 51 per cent recorded in the March quarter 1998. Both of these figures were significantly higher than the proportions of around 40 per cent that were recorded in the second half of 1997. The average duration of other waiting time incidents was 9.3 hours per incident in the June quarter 1998, up from 7.9 hours per incident in the March quarter 1998.

Table 3 summarises the data on other waiting time incidents in the June quarter 1998. The shipping lines identified a total of 200 incidents (affecting 146 ship calls) for the sample of ship calls over this period. One quarter of the ship calls that incurred other waiting time were affected by two or more incidents.

The total waiting time attributable to particular incident types reflects the number of incidents and the

waiting time associated with individual incidents. In the June quarter 1998, four incident types accounted for around three-quarters of the total hours attributable to other ship waiting time:

- Awaiting labour (22 per cent);
- Stevedoring finished late (21 per cent);
- Industrial action (20 per cent);
- Late ship arrival (11 per cent).

Around 73 per cent of the total hours attributable to other waiting time in the June quarter 1998 directly involved waterfront services (mainly items 1 to 6 in table 3). The corresponding figure for the March quarter 1998 was 51 per cent. Around 16 per cent of other waiting time (32 per cent in the previous quarter) directly involved ship operations (early/late ship arrival and repairs/maintenance).

TABLE 3 OTHER SHIP WAITING TIME INCIDENTS AT THE FIVE MAINLAND CAPITAL CITY PORTS, JUNE QUARTER 1998

Incident type	(Number of incidents)							Total no. of incidents
	Ship waiting time (hrs)							
	1	2	3	4	5-10	11-20	>20	
Awaiting labour	4	6	6	2	13	11	4	46
Stevedoring finished early	7	10	10	5	4	0	0	36
Stevedoring finished late	1	1	4	0	12	11	4	33
Crane breakdown	9	5	1	1	1	0	0	17
Industrial action	1	3	0	0	3	2	6	15
Pilot/tug booking not at preferred time	0	4	2	2	1	1	0	10
Early ship arrival	2	1	1	0	2	1	1	8
Late ship arrival	2	0	0	1	0	3	2	8
Closed port - holidays	0	0	1	0	0	3	2	6
Ship repairs or maintenance	1	1	1	0	1	1	0	5
Weather or tides	0	3	0	0	2	0	0	5
Awaiting cargo or late cargo changes	0	1	1	0	1	1	0	4
Other	2	0	1	0	0	3	1	7
Total incidents	29	35	28	11	40	37	20	200^a

a. These incidents affected 146 of the 275 ship calls covered in table 2.

Source Data for a sample of ship calls provided by shipping lines.





Stevedoring

Table 4 presents the available information on three aspects of stevedoring reliability at the major container terminals – stevedoring completion, stevedoring rate and cargo receipt. Data are not available for Fremantle.

Stevedoring completion provides a partial indicator of the accuracy with which stevedoring time is predicted. Data are not available for the June quarter 1998.

Stevedoring rate provides a partial indicator of the variability of stevedoring productivity at each port. It is defined as the proportion of ship visits where the average crane rate for the ship is within two containers per hour (plus or minus) of the quarterly average crane rate for the terminal. The stevedoring rate indicator ranged from 57 per cent to 60 per cent at the three ports for which data are available in the June quarter 1998. Compared with the March quarter 1998, the indicator increased at Brisbane and declined at Sydney and Melbourne.

Cargo receipt is the proportion of receipts (exports) completed by the stevedore's cut-off time. It provides a partial indicator of one factor that can affect container terminal performance. In the June quarter 1998, cargo receipt ranged between 93 per cent and 97 per cent at the three ports for which data are available.

Ship arrival

Table 4 includes data for two indicators of ship arrival advice. The accuracy of this advice generally improved in the June quarter 1998.

The first indicator of ship arrival advice is the proportion of ship arrivals within one hour (plus or minus) of the most recently advised arrival time available to the port authority/corporation *at 24 hours prior to actual arrival*. The proportion at the four ports for which data are available ranged between 46 per cent and 70 per cent in the June quarter 1998.

The second indicator is the proportion of ship arrivals within one hour (plus or minus) of the last scheduled arrival time *advised inside the 24 hours prior to actual arrival*. The proportion ranged between 90 per cent and 100 per cent in the June quarter 1998.

TABLE 4 STEVEDORING AND SHIP ARRIVAL RELIABILITY INDICATORS, MARCH AND JUNE QUARTERS 1998

Indicator	(per cent)									
	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jan-Mar	Apr-Jun	Jan-Mar	Apr-Jun	Jan-Mar	Apr-Jun	Jan-Mar	Apr-Jun	Jan-Mar	Apr-Jun
Stevedoring										
Stevedoring completion	60	na	28	na	na	na	na	na	na	na
Stevedoring rate	48	60	61	58	63	57	na	na	na	na
Cargo receipt	93	97	82	93	93	94	na	na	na	na
Ship arrival										
Advice at 24 hrs	60	70	51	46	na	na	43 ^a	57	56	57
Advice inside 24 hrs	94	100	91	92	na	na	94	95	93	90
na	not available									
a.	Low figure for Adelaide is reportedly attributable to industrial issues at other ports.									
Sources	AAPMA, Patrick and P&O Ports.									



PORT INTERFACE COST INDEX

The Port Interface Cost Index provides a measure of shore-based shipping costs (charges) for containers moved through the Australian mainland capital city ports. Data for the periods January–June 1998 and July–December 1997 are presented in tables 5 to 7. The Port Interface Cost Index is based on an indicative approach. That is, the index is not an average of all costs, but is based on those costs typically charged by service providers in most instances. The indicative approach was adopted because of the difficulty of obtaining data on the multitude of factors affecting the prices charged by each service provider, particularly for towage and road transport charges, and customs brokers' fees.

Port and related charges

Table 5 provides the cost parameters used to determine the port and related charges in table 6. These cost parameters relate to a representative port call by a containership (Lloyd's ship classification UCC). The representative ship is selected from the ship size range which had the most port calls from UCC type ships during the particular period. The other cost parameters are then determined by taking the mean of all port calls in the range that contains the representative ship. Typically, the ship size range of 15 001 to 20 000 GRT has had the most port calls at each port.

It is important to directly connect the mean number of teus exchanged per port call with the size of the representative ship. This is because most port and related charges, particularly towage and port authority tonnage charges, are dependent upon the size of the ship. However, shipping economics are such that, the larger the ship being used to transport the cargo, the more likely ship operators are to attempt to exchange higher amounts of cargo per port call. As a result, the per unit (teu) cost of exchanging cargo at a particular port remains roughly the same for each port call regardless of the size of the ship. It is for this reason that comparative port charge analyses that keep the cargo exchange constant while varying the ship size are misleading. A discussion of this, in relation to the Port Interface Cost Index, can be found in *Waterline 4*, October 1995, pp. 9–13. That article also demonstrates that the BTE's Port Interface Cost Index is a reasonable

TABLE 5 PARAMETERS USED IN THE PORT INTERFACE COST INDEX, 1997/1998

Indicator	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998
Vessel size										
GRT	17215	17215	17215	17215	17215	17215	17215	17215	17215	17215
NRT	8372	8372	8372	8372	8372	8372	8372	8372	8372	8372
Teus exchanged^a										
Total	402	347	818	719	724	662	239	327	366 ^r	330
Loaded	308	273	680	578	607	553	187	260	302 ^r	265
Empty	94	74	138	141	117	109	52	67	64 ^r	65
Loaded inwards	139	126	419	358	324	290	74	114	163 ^r	139
Loaded outwards	169	147	261	220	283	263	113	146	139 ^r	126
Ship call parameters^a										
Number of port calls	4	3	3	3	3	3	4	3	6	5
Elapsed berth time (hrs)	24.3	24.1	38.6	36.9	36.2	32.8	11.3	14.8	18.7 ^r	16.3

r revised
a. Mean value for ships between 15 000 and 20 000 GRT.

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



approximation of port interface costs for most container movements across the Australian mainland capital city ports.

Table 6 provides the port and related charges at the five mainland capital city ports for the periods July–December 1997 and January–June 1998. Port and related charges comprise ship-based charges and cargo-based charges.

Ship-based charges

On a per teu basis, ship-based port and related charges rose at Brisbane, Sydney, Melbourne and Fremantle but fell at Adelaide in the January–June 1998 period. This outcome is mainly the result of a decrease in the mean number of teus exchanged per port call at Brisbane, Sydney, Melbourne and Fremantle and a substantial increase at Adelaide. However, changes in the average number of port calls made by the indicative vessel during the period and changes in the elapsed berth time also impacted on the charges to a minor extent in some ports.

Only at Brisbane was there any actual change in ship-based charges; a 10 cents per teu (2 per cent) rise in mooring and unmooring charges. However, on a per ship call basis, this resulted in only a marginal increase (0.2 per cent) in total ship-based charges.

At Melbourne, Adelaide and Fremantle, changes in the parameters upon which the ship-based charges are calculated rather than changes to any actual charge resulted in changes in ship-based charges. At Melbourne the cost of berth hire is based on the elapsed berth time which decreased by 9 per cent on average, with the result that total ship-based charges per ship visit decreased by 3 per cent. At Adelaide tonnage costs increase with the time the ship stays at the berth, measured as elapsed berth time, and conservancy costs (navigation

TABLE 6 PORT AND RELATED CHARGES, 1997/1998

Indicator	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998
Ship-based charges (\$/teu)										
Conservancy	5.56	6.45	-	-	-	-	5.03	4.60	1.44 ^r	2.40
Tonnage	-	-	8.21 ^r	9.34	8.44	9.23	14.41	11.34	6.91 ^r	7.68
Pilotage	12.75	14.78	4.16	4.73	7.57	8.29	9.83	7.19	5.71 ^r	6.34
Towage	25.15	29.17	11.95	13.59	10.15	11.10	51.47	37.63	26.88 ^r	29.86
Mooring, unmooring	4.15	4.93	3.85	4.38	1.38	1.51	-	-	3.00 ^r	3.34
Berth hire ^a	-	-	-	-	11.95	11.84	-	-	-	-
Total^b	47.61	55.33	28.17^r	32.03	39.49	41.97	80.75	60.76	43.94^r	49.62
Cargo-based charges (\$/teu)										
Wharfage										
Imports	26.00	26.00	60.00	60.00	34.30	34.30	53.00	53.00	47.30	47.30
Exports	26.00	26.00	45.00	45.00	34.30	34.30	53.00	53.00	47.30	47.30
Harbour dues	42.00	42.00	-	-	-	-	-	-	-	-
Berth charge	-	-	-	-	-	-	-	-	13.90	13.90
Total port and related charges (\$/teu)^b										
Loaded imports	115.61	123.33	88.17 ^r	92.03	73.79	76.27	133.75	113.76	105.14	110.82
Loaded exports	115.61	123.33	73.17 ^r	77.03	73.79	76.27	133.75	113.76	105.14	110.82
Charges per ship visit (\$/visit)										
Total ship-based charges	19157	19197	23036 ^r	23036	28599	27786	19296	19860	16088	16352
Empty teus ^c	1340	1055	1380	1410	1168	1088	0	0	493 ^r	501

- not applicable

r revised

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 5.

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





service charge] decrease with a rise in the number of ship visits within each 6 month period. On average, elapsed berth time at Adelaide rose by 31 per cent in the January–June 1998 period while the number of ship visits fell by 28 per cent. Together these produced a 3 per cent rise in total ship-based charges per ship visit. Finally, at Fremantle the conservancy cost depends upon the number of ship visits within each 2 month period. An average 12 per cent reduction in ship visits produced an increase of 2 per cent in total ship-based charges per ship visit.

While caution should always be used when making port comparisons on a per teu basis, Sydney remains the lowest cost port for ship-based charges. This is significant from a cargo owner's point of view. However, Sydney maintains this position as a direct result of the substantially larger number of teus exchanged per port call. From the point of view of ship operators using ships similar to the representative ship in table 5, Fremantle remains the lowest cost port for ship-based charges on a per ship visit basis.

Cargo-based charges

There were no changes in port and related cargo-based charges at any of the five ports in the January–June 1998 period.

Changes in total port and related charges per teu

At Brisbane, on a per teu basis, total port and related charges rose 7 per cent for both loaded imports and loaded exports for the period January–June 1998. As the change in the mooring and unmooring charge effected only an insignificant increase in cost, the 7 per cent rise is almost entirely the result of the 14 per cent drop in the mean teu exchange for the period.

At Sydney, on a per teu basis, total port and related charges rose about 5 per cent for loaded imports and loaded exports in the January–June 1998 period. As there were no changes in any of the port and related costs at Sydney during this period, this increase demonstrates the impact a 12 per cent decrease in the mean teu exchange can have upon the per unit charge.

At Melbourne, on a per teu basis, total port and related charges rose 3 per cent for loaded imports and loaded exports for the period January–June 1998. This increase was the result of a decrease (9 per cent) in the mean teu exchange per port call, outweighing the effect of a decrease in the time the vessel remained alongside the berth.

At Adelaide, on a per teu basis, total port and related charges fell 15 per cent for loaded imports and loaded exports in the January–June 1998 period. This decrease was the result of a substantial increase (37 per cent) in the mean teu exchange.

At Fremantle, on a per teu basis, total port and related charges rose 5 per cent for loaded imports and loaded exports in the January–June 1998 period. This increase was the result of a decrease (10 per cent) in the mean teu exchange per port call, together with a decrease in the average number of port calls per ship during the period.

Stevedoring charges per teu

The last ACCC survey of container terminal operations provided a provisional estimate of stevedoring charges of \$203 per teu in 1995. For the January–June 1997 period, the BTE contacted a range of shipping lines and terminal operators in an interim attempt to obtain more recent estimates for container stevedoring charges. As a result, it was estimated that average revenue for container



stevedoring was 7.5 per cent, or \$15 per teu lower than the ACCC's provisional 1995 estimate. This led to a provisional stevedoring charge of \$188 being used for the Port Interface Cost Index.

The BTE is still working to obtain detailed data to provide a more robust estimate of stevedoring charges. In the meantime, based on the opinions of reliable shipping industry sources that suggest stevedoring charges have remained reasonably static over the past 12 months, the previous estimate of \$188 has been used again as the provisional estimate for the January–June 1998 period.

Land-based charges per teu

The average charges for customs brokers' fees and road transport charges for the July–December 1997 and January–June 1998 Port Interface Cost Index are included in table 7. These charges are based on data provided by approximately 40 customs brokers and 50 road transport operators. Customs brokers' fees for imports are higher than the fee for exports, reflecting the more complex clearance procedures for import containers.

The January–June 1998 period indicated little movement in customs brokers' fees in the five ports. A two per cent decrease in the fee for imports at Fremantle and a two per cent decrease in the fee for exports at Brisbane were the only changes exceeding one per cent.

Similarly, there was little movement in average road transport charges in the January–June 1998 period, with a 3 per cent increase at Brisbane being the only change in excess of one per cent. One of the parameters used to estimate road transport charges is the time taken to move containers from (to) the wharf to (from) the customer's warehouse. Both distance and traffic congestion impact upon this parameter and help explain, to some extent, the significant difference

TABLE 7 PORT INTERFACE COSTS, 1997/1998

Indicator	(\$/teu)									
	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998
Imports										
Ship-based charges	48	55	28 ^f	32	39	42	81	61	44 ^r	50
Cargo-based charges	68	68	60	60	34	34	53	53	61	61
Stevedoring ^p	188	188	188	188	188	188	188	188	188	188
Customs brokers' fees	123	123	154	152	138	138	131	131	145	143
Road transport charges	179	185	288	288	252	251	157	158	194	195
Total imports^a	606	620	718	719	651	653	610	591	632	637
Exports										
Ship-based charges	48	55	28 ^f	32	39	42	81	61	44 ^r	50
Cargo-based charges	68	68	45	45	34	34	53	53	61	61
Stevedoring ^p	188	188	188	188	188	188	188	188	188	188
Customs brokers' fees	78	77	110	111	89	89	71	71	70	70
Road transport charges	179	185	288	288	252	251	157	158	194	195
Total exports^a	561	574	659	663	602	604	551	532	557^r	564
<i>p</i>	provisional pending updating of stevedoring charge using detailed survey data									
<i>r</i>	revised									
<i>a.</i>	Components may not sum to totals due to rounding.									
Notes	<ol style="list-style-type: none"> Based on parameters described in table 5. 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. 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	BTE estimates based on: ship call data supplied by relevant port authorities/corporations; price schedules of relevant 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.									





between road transport charges at Melbourne and Sydney compared with Brisbane, Adelaide and Fremantle.

Indices for individual ports

Table 7 indicates that, with the exception of Adelaide, port interface costs increased marginally at all Australian mainland capital city ports between July–December 1997 and January–June 1998. Port interface costs rose by 2 per cent at Brisbane, by less than 1 per cent at Sydney and Melbourne, and by 1 per cent at Fremantle. In Adelaide port interface costs fell by 3 per cent.

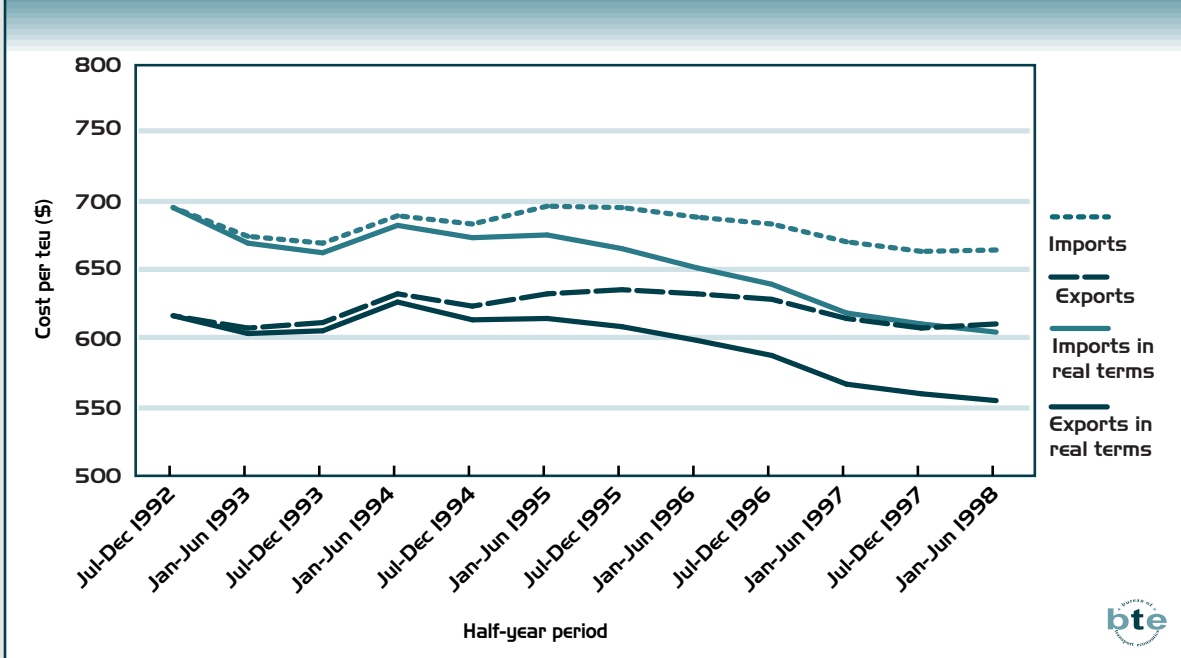
However, the changes in the port interface cost indices should be interpreted with caution given the provisional nature of the reported stevedoring charges. Even if stevedoring charges did not change during the January–June 1998 period, care should also be taken in making inter-port comparisons of port interface costs. The use of a single stevedoring charge for all ports reflects the scope of the available information which is not disaggregated on an individual port basis. In practice, container stevedoring charges tend to vary between ports.

National index

Figure 7 provides the national Port Interface Cost Index since it was first produced for the July–December 1992 period. The figure also shows the Port Interface Cost Index in real terms. Again the reader is reminded that care should be taken in interpreting the data for the more recent periods.

In overall terms, the index increased by less than half a per cent for both imports (\$665 per teu) and exports (\$611 per teu) in the January–June 1998 period. In real terms, this represents a decrease of just under 1 per cent. Since the initial development of the Port Interface Cost Index, national port interface costs have fallen, in real terms, by approximately 13 per cent for imports and 10 per cent for exports.

FIGURE 7 THE NATIONAL PORT INTERFACE COST INDEX



Sources BTE 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; stevedoring charges data supplied by the ACCC and industry sources; and ABS gross non-farm product deflator data (cat. no. 5206.0).



**PORT PERFORMANCE - NON-FINANCIAL**

Non-financial indicators for the five mainland capital city ports in 1997/98 are presented in table 8. The January–June 1998 indicators include the period of the major industrial dispute between Patrick and the MUA and therefore do not necessarily represent a typical comparison with previously published indicators for the individual ports.

Cargo throughput

Total cargo throughput at the five ports increased to 45.2 million tonnes in the January–June 1998 period, compared with 43.6 million tonnes in the July–December 1997 period. There were increases in throughput at Brisbane (9.9 per cent), Adelaide (28.8 per cent), and Fremantle (5.0 per cent), and decreases at Sydney (3.7 per cent) and Melbourne (1.1 per cent).

Overall this was a rise of 3.8 per cent in total throughput for the five ports compared with the previous half year, but a fall of 0.3 per cent when compared with the January–June 1997 period.

The tonnage of *non-containerised general cargo* handled at the five ports fell by 6 per cent to 2.4 million tonnes in the January–June 1998 period (2.5 million tonnes in the July–December 1997 period). All five ports contributed to this fall, with Adelaide recording the largest decrease (21.5 per cent) and Fremantle the smallest (3.0 per cent). However, the non-containerised general cargo throughput for the five ports in the January–June 1998 period represents a 5.8 per cent increase compared with the same period in 1997.

TABLE 8 NON-FINANCIAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORTS, 1997/98

Indicator	Brisbane		Sydney		Melbourne		Adelaide		Fremantle		Five ports ^d	
	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998	Jul-Dec 1997	Jan-Jun 1998
Total cargo throughput ('000 tonnes)	9733	10700	11390	10969	9434	9334	2387	3075	10612	11142	43557	45220
Non-containerised general cargo ('000 tonnes)^a	540	517	404	385	1057	991	150	118	377	366	2527	2376
Containerised cargo (teus exchanged)												
Full import	55283	57082	214301	189423	243319	217602	16261	19454	54848 ^f	53984	584012	537545
Empty import	26982	22450	8165	7504	39124	30878	8461	7855	10474	11134	93206	79821
Full export	67356	66838	133463	116244	213186	197025	24630	24730	46483 ^f	48819	485118	453656
Empty export	10165	11412	62252	66857	49080	50596	2939	3582	10962 ^f	14098	135398	146545
Total teus	159786	157782	418181	380028	544709	496101	52291	55621	122767 ^f	128035	1297734	1217567
Average total employment^b	180	152	202	200	70	70	170	167	189	184	811	773
Turnaround time (hrs)^c												
Median result	32	36	38	36	41	44	18	20	24	24	-	-
95th percentile	54	97	67	73	73	132	37	57	61	58	-	-
-	not applicable											
a.	Excludes bulk cargoes.											
b.	Comparisons between ports are not appropriate since each port authority/corporation has a different structure.											
c.	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.											
d.	Components may not sum to totals due to rounding.											
Source	AAPMA.											



Measured in teus, *container traffic* for the five ports fell by 6.2 per cent to 1.2 million teus in the January–June 1998 period (1.3 million teus in July–December 1997). Throughput of loaded teus decreased by 7.3 per cent, with loaded imports decreasing by 8.0 per cent and loaded exports decreasing by 6.5 per cent.

During the January–June 1998 period throughput of loaded containers increased at Brisbane (1.0 per cent), Adelaide (8.1 per cent) and Fremantle (1.5 per cent), and decreased at Sydney (12.1 per cent) and Melbourne (9.2 per cent) in comparison with the previous half-year.

The five-port total container traffic increased by 10.1 per cent in the July 1997 to July 1998 year compared with the previous 12 month period, with full container throughput increasing by 8.7 per cent over the same period.

Employment

Table 8 indicates that *average total employment* at the five mainland capital city port authorities/corporations fell by 4.7 per cent in the January–June 1998 period. This follows a 10.6 per cent fall between January–June 1997 and July–December 1997 and represents a 19.2 per cent fall in average total employment since mid-year 1996.

CREW TO BERTH RATIOS

The BTE monitors crew to berth ratios for Australian merchant and offshore shipping on a quarterly basis. 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 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 carry out the work of the ship(s) in a safe and efficient manner.

Merchant shipping

Figure 8 presents information on the crew to berth ratio, and its components, for Australian merchant shipping. As the BTE is still auditing the data, the June quarter 1998 merchant shipping data in this issue of *Waterline* are classified as preliminary. The crew to berth ratio for merchant shipping totalled 2.102 in the June quarter, compared with 2.104 in the March quarter, and below the initial level of 2.133 in the September quarter 1993.

Table 9 shows the individual components of the crew to berth ratio for merchant shipping, by crew classification, for the June quarter. Ship time is the largest component of the crew to berth ratio for merchant shipping, and reflects days paid for ship duty (which may include travelling time and days signing on and off). The ship time ratio fell to 1.020 in the March quarter, compared with 1.032 in the previous quarter.

Accrued leave 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 0.951 in the June quarter, compared with 0.958 in the March quarter.



FIGURE 8 CREW TO BERTH RATIOS—AUSTRALIAN MERCHANT SHIPPING

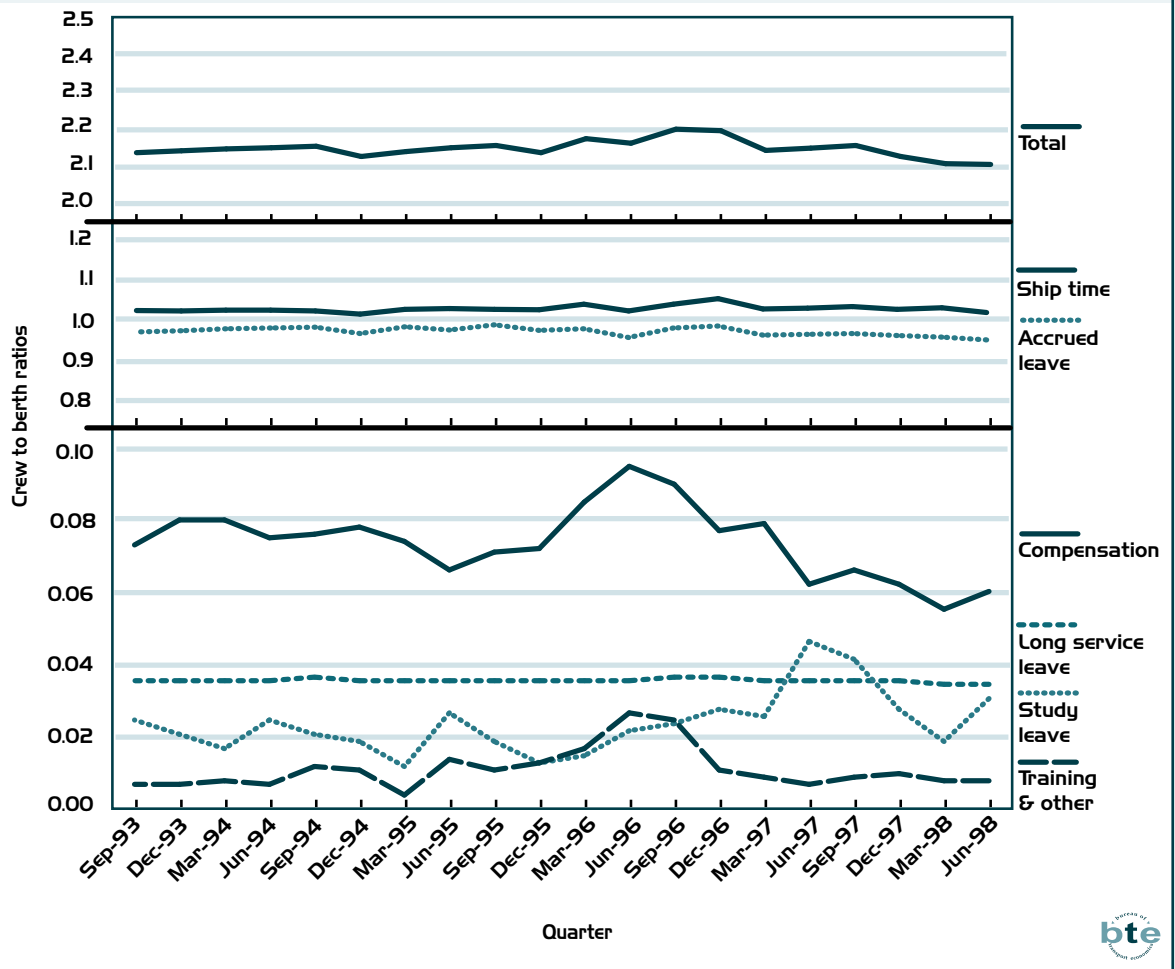


TABLE 9 MERCHANT SHIPPING CREW TO BERTH RATIOS BY ACTIVITY AND CREW CLASSIFICATION, JUNE QUARTER 1998^P

Crew type	Ship time	Accrued leave	Compensation	Long service leave	Study leave	Training & other	Total ^a
Deck officers	1.043	0.974	0.019	0.035	0.037	0.019	2.127
Engineers	1.025	0.957	0.048	0.035	0.094	0.008	2.167
All officers	1.033	0.965	0.034	0.035	0.066	0.013	2.148
Integrated ratings	1.007	0.937	0.085	0.034	0.001	0.001	2.064
Catering crew	1.012	0.942	0.073	0.034	0.000	0.001	2.061
All ratings	1.008	0.939	0.081	0.034	0.000	0.001	2.063
All crew	1.020	0.951	0.060	0.034	0.031	0.007	2.102
Previous quarter	1.032	0.958	0.055	0.034	0.018	0.007	2.104
Initial level ^b	1.025	0.971	0.073	0.035	0.024	0.006	2.133

p preliminary
a. Components may not sum to totals due to rounding.
b. Initial level for September quarter 1993.

Source Data provided by ship operators.





Other components of the merchant shipping crew to berth ratio were:

- Compensation leave rose to 0.060 compared with 0.055 in the March quarter;
- Long service leave remained constant at 0.034;
- Study leave rose to 0.031 compared with 0.018 in the March quarter; and
- Training and other paid leave remained constant at 0.007

Offshore shipping

Figure 9 presents information on the crew to berth ratio, and its components, for Australian offshore shipping. As the BTE is still auditing the data, the June quarter 1998 offshore shipping data in this issue of *Waterline* are classified as preliminary.

The crew to berth ratio for offshore shipping was 2.322 in the June quarter, compared with 2.337 in the March quarter 1998, and the initial March quarter 1995 level of 2.327.

Table 10 shows the individual components of the crew to berth ratio for offshore shipping, by crew classification, for the June quarter. Accrued leave is the largest component of the crew to berth ratio for offshore shipping, and 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 for the June quarter remained unchanged at 1.153.

Ship time also represents a significant part of the offshore crew to berth ratio and reflects days paid for ship duty (which may include travelling time and days signing on and off). The ship time ratio for the June quarter was 1.017, compared with 1.022 in the previous quarter.

Other components of the offshore crew to berth ratio were:

- Compensation leave fell to 0.092 compared with 0.109 in the March quarter;
- Long service leave remained constant at 0.038;
- Study leave rose to 0.022 compared with 0.011 in the previous quarter; and
- Training and other paid leave fell to 0.000 from the previous quarter's 0.004.

TABLE 10 OFFSHORE SHIPPING CREW TO BERTH RATIOS BY ACTIVITY AND CREW CLASSIFICATION, JUNE QUARTER 1998^p

Crew type	Ship time	Accrued leave	Compensation	Long service leave	Study leave	Training & other	Total ^a
Deck officers	1.016	1.153	0.032	0.037	0.045	0.000	2.283
Engineers	1.018	1.153	0.018	0.037	0.048	0.000	2.274
All officers	1.017	1.153	0.025	0.037	0.047	0.000	2.279
Integrated ratings	1.015	1.153	0.137	0.038	0.000	0.000	2.344
Catering crew	1.027	1.153	0.236	0.040	0.000	0.000	2.456
All ratings	1.017	1.153	0.153	0.039	0.000	0.000	2.362
All crew	1.017	1.153	0.092	0.038	0.022	0.000	2.322
Previous quarter	1.022 ^r	1.153 ^r	0.109 ^r	0.038	0.011	0.004	2.337
Initial level ^b	1.021	1.151	0.100	0.038	0.013	0.003	2.327

^p preliminary

^r revised

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

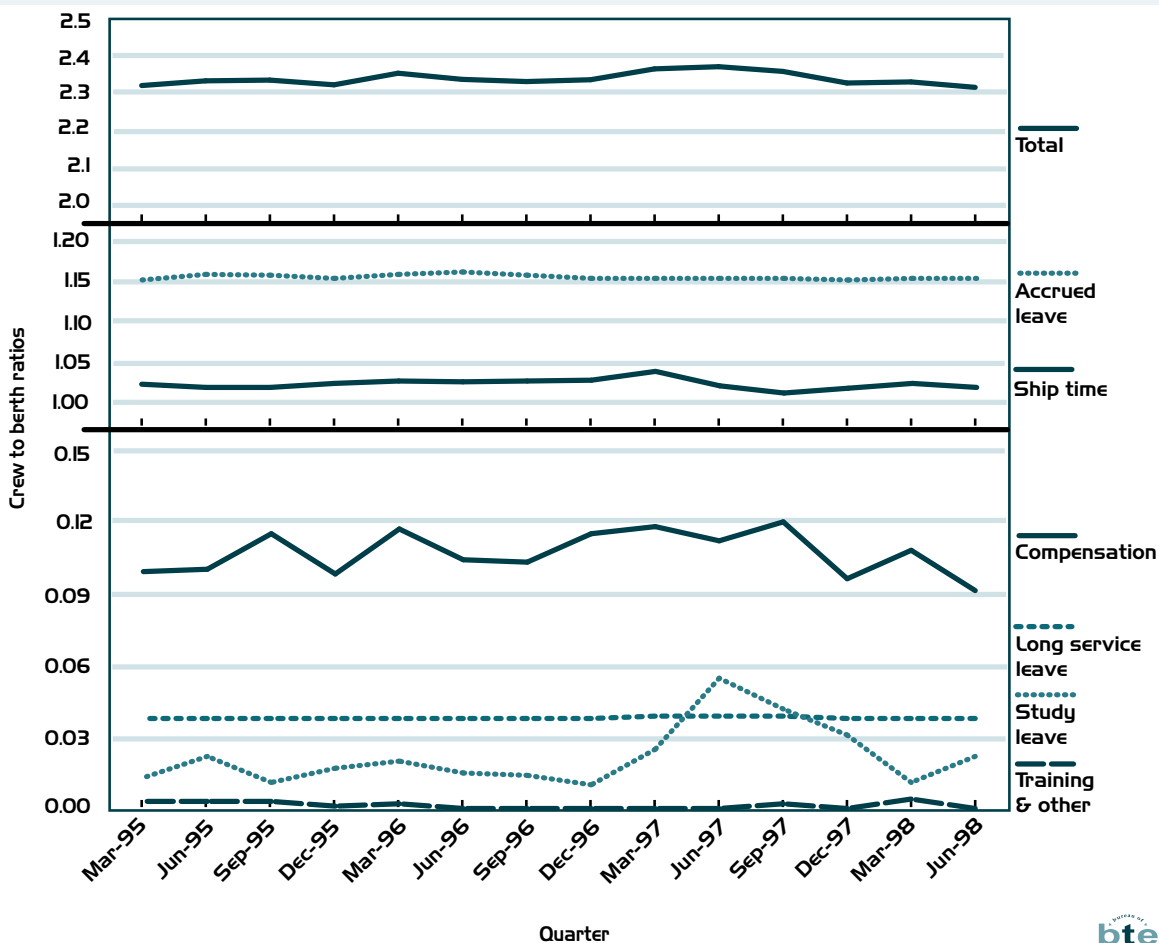
^b Initial level for March quarter 1995.

Source Data provided by ship operators.





FIGURE 9 CREW TO BERTH RATIOS—AUSTRALIAN OFFSHORE SHIPPING



ABBREVIATIONS

AAPMA	Association of Australian Ports and Marine Authorities
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
BTE	Bureau of Transport Economics
GRT	Gross Registered Tonnage
MUA	Maritime Union of Australia
NRT	Net Registered Tonnage
teu	Twenty-foot equivalent unit
WIRA	Waterfront Industry Reform Authority

DEFINITIONS

Elapsed time—the total time over which the ship is worked, measured from labour aboard to 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 net crane hour.

TABLE II CONTAINER TERMINAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORTS—PRODUCTIVITY IN TEUS PER HOUR

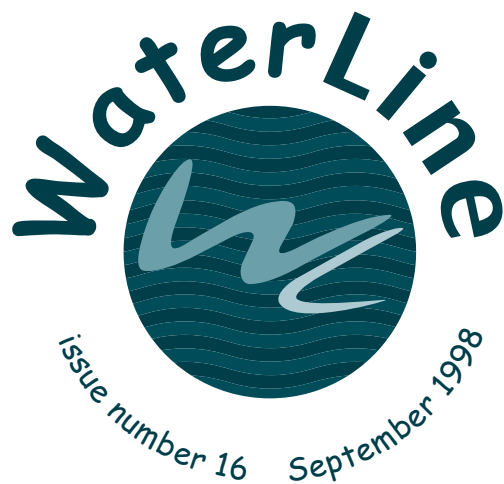
	Sep-95	Dec-95	Mar-96	Jun-96	Sep-96	Dec-96	Mar-97	Jun-97	Sep-97	Dec-97	Mar-98	Jun-98
Five ports												
Ships handled	721	728	748	827	871	907	865	891	907	963	909	845
Total teus	433594	425731	411538	440098	497140	519206	441697	483372	549247	585474	527881	514409
Crane rate	19.5	19.2	20.3	21.3	22.3	21.2	22.8	22.8	23.2	23.3	23.5	23.6
Elapsed rate	22.5	21.7	23.2	22.6	23.6	na	23.1	23.8	26.0	25.8	na	na
Net rate	26.5	25.3	27.1	28.5	29.1	27.2	29.0	29.5	31.0	30.8	29.6 ^r	31.3
Brisbane												
Ships handled	135	132	124	133	140	141	156	164	162	177	170	168
Total teus	58851	46439	39037	51008	66115	62904	47471	65572	73184	71043	58857	74023
Crane rate	18.6	18.9	20.0	19.9	20.6	20.6	20.0	20.5	20.2	20.5	21.6	21.6
Elapsed rate	19.5	21.0	21.5	20.5	20.9	21.1	20.3	20.6	21.2	20.8	19.9	21.5
Net rate	22.5	24.6	24.4	24.3	25.1	24.9	22.7	23.3	24.0	24.2	23.0 ^r	25.4
Sydney												
Ships handled	192	203	206	216	228	249	251	249	243	266	238	219
Total teus	148431	143746	146038	148290	156344	174982	158323	167705	183978	201535	176496	168234
Crane rate	19.3	18.5	19.5	19.9	20.3	19.6	22.3	22.6	23.5	23.5	22.5	21.8
Elapsed rate	23.4	21.8	23.8	22.1	23.1	na	22.7	23.6	28.0	28.2	25.6	26.1
Net rate	29.9	25.7	28.0	27.9	29.5	28.9	32.2	32.7	36.1	35.5	33.1 ^r	33.9
Melbourne												
Ships handled	221	227	228	262	274	282	230	249	268	281	276	234
Total teus	161943	173566	162911	170884	203371	202376	162156	177070	208200	223465	207346	185803
Crane rate	19.8	19.6	20.5	22.3	24.5	22.4	23.6	23.5	23.6	23.6	24.3	24.3
Elapsed rate	24.1	22.8	24.4	25.0	26.5	22.1	24.3	25.1	26.0	25.2	25.3	26.8
Net rate	26.6	26.4	28.3	31.7	32.2	27.2	28.7	29.7	29.9	28.7	28.6 ^r	30.7
Adelaide												
Ships handled	34	42	47	63	70	74	69	65	68	66	60	66
Total teus	14319	17318	15955	18803	20519	23351	21963	20933	25982	25188	22260	27975
Crane rate	20.9	21.4	21.5	21.5	22.7	24.0	24.6	26.0	26.1	26.0	27.5	27.7
Elapsed rate	24.9	26.1	26.6	26.1	26.2	27.7	30.2	35.1	35.2	35.4	36.3	36.5
Net rate	26.5	26.7	27.2	26.7	26.8	28.3	30.9	36.0	36.2	36.5	37.6	37.8
Fremantle												
Ships handled	139	124	143	153	159	161	159	164	166	173	165	158
Total teus	50050	44662	47597	51113	50791	55593	51784	52092	57903	64243	62922	58374
Crane rate	19.5	19.2	21.2	23.4	20.8	21.5	23.3	22.9	23.1	23.6	24.5	26.7
Elapsed rate	17.7	15.8	18.3	17.6	16.0	18.6	19.7	19.5	21.0	22.2	na	na
Net rate	21.1	19.8	22.2	23.5	22.6	24.2	25.0	24.0	25.5	28.8	26.4 ^r	29.8

na not available

r revised

- Notes 1. The June quarter 1998 figures do not include data for Patrick covering the 8 April to 7 May 1998 period, during which time the company was involved in a major industrial dispute with the MUA.
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 15.

Sources Patrick, P&O Ports and Sea-Land.



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