



W A T E R L I N E

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FROM THE DIRECTOR

This issue of *Waterline* contains our quarterly articles on stevedoring productivity, waterfront reliability and crew to berth ratios.

Our next issue will be published in March 1998. It will include the usual quarterly articles as well as information on port interface costs, port performance (non-financial) and port authority/corporation performance (financial).

I would like to take this opportunity to wish our readers a safe and happy Christmas.

David Luck
Acting Director


IN BRIEF

Stevedoring productivity

The five-port average crane rate was 18.3 containers per hour in the September quarter, the same as the figure for the June quarter.

Crane rates increased at Sydney (18.2 containers per hour) and Adelaide (21.1 containers per hour). There were declines at Brisbane (16.1 containers per hour), Melbourne (18.6 containers per hour) and Fremantle (18.8 containers per hour).


The five-port average net rate increased to 24.3 containers per hour in the September quarter (from 23.6 containers per hour). Net rates rose at all ports except Melbourne.

The five-port average elapsed rate was 20.4 containers per hour in the September quarter (up from 19.0 containers per hour). Elapsed rates increased at all ports. 

Waterfront reliability


Data for a new *Waterline* series indicate that there is significant inter-port variation in the accuracy of ship arrival advice provided at the mainland capital city ports. Other information suggests significant variation in the accuracy of stevedoring completion time estimates.

The BTCE survey of container ship calls indicates that berth availability within four hours of the scheduled time was 89 per cent in the September quarter. Availability of pilots and tugs within one hour of the confirmed time was 99-100 per cent.

Around 40 per cent of the ship calls in the BTCE survey were affected by other waiting time in the September quarter. 

Crew to berth ratios

The crew to berth ratio for merchant shipping increased to an estimated level of 2.152 in the September quarter. This was above the initial ratio of 2.133 that was recorded at the beginning of the monitoring process in 1993.

The crew to berth ratio for offshore shipping was 2.366 in the September quarter, down from the peak figure of 2.379 in the June quarter. The decline mainly reflected falls in the ship time and study leave ratios, which more than offset a rise in the compensation leave ratio. The September quarter crew to berth ratio was higher than the initial ratio of 2.327 that was recorded in 1995. 

STEVEDORING PRODUCTIVITY

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

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 the five-port average *crane rate* (productivity per crane while the ship is worked) was 18.3 containers per hour in the September quarter, the same as the figure for the June quarter.

The five-port average *net rate* (total productivity while the ship is worked) increased to 24.3 containers per hour in the September quarter from 23.6 containers per hour in the June quarter. The increase reflected a slight rise in overall crane intensity (the average number of cranes used to work the ship) over the period.

The five-port average *elapsed rate* (total productivity based on the time labour is aboard the ship) was 20.4 containers per hour in the September quarter, up from 19.0 containers per hour in the June quarter. A reduction in the overall proportion of non-working time at the five ports contributed to the increase in the elapsed rate.

Brisbane

Brisbane's crane rate declined in the September quarter but there were increases in the net rate and the elapsed rate.

The crane rate was 16.1 containers per hour in the September quarter, down from 16.4 containers per hour in the June quarter.

The net rate increased to 19.1 containers per hour, from 18.7 containers per hour in the previous quarter. The increase in the net rate reflected a rise in average crane intensity over the period.

Brisbane's elapsed rate was 16.8 containers per hour in the September quarter, up from 16.6 containers per hour in the June quarter.

The average proportion of elapsed time not worked was 11.7 per cent at Brisbane in the September quarter. This was similar to the June quarter figure of 11.5 per cent.

Sydney

Sydney's stevedoring productivity improved in the September quarter.

The crane rate was 18.2 containers per hour, up from 17.7 containers per hour in the previous quarter.

The net rate increased to 27.9 containers per hour in the September quarter from 25.5 containers per hour in the June quarter. The increase in the net rate partly reflected a rise in average crane intensity following the introduction of new crane working arrangements.

Sydney's elapsed rate was 21.7 containers per hour in the September quarter, up from 18.5 containers per hour in the June quarter. The increase in the elapsed rate partly reflected a reduction in the proportion of non-working time. The average proportion of elapsed time not worked was 22.4 per cent in the September quarter compared with 27.6 per cent in the June quarter.

As noted in *Waterline 12*, an updated information system has become operational at one of the Sydney terminals during 1997. Following a review of sample data for 1996, the terminal operator has supplied information which indicates that the new system is providing more accurate information on non-working time than the previous reporting arrangements. Data from the new system are available back to the March quarter 1997.

Melbourne

Melbourne's crane rate and net rate declined in the September quarter, but there was an increase in the elapsed rate.

The crane rate was 18.6 containers per hour in the September quarter, down from 19.0 containers per hour in the June quarter.

The net rate declined to 23.5 containers per hour, from 24.0 containers per hour in the previous quarter. As crane intensity was virtually unchanged, the reduction in the net rate was attributable to the decline in the crane rate.

Melbourne's elapsed rate was 20.5 containers per hour in the September quarter, up from 20.3 containers per hour in the June quarter. The increase in the elapsed rate reflected a reduction in the proportion of non-working time. The average proportion of elapsed time not worked was 13.0 per cent in the September quarter compared with 15.4 per cent in the June quarter.

Adelaide

Adelaide's stevedoring productivity increased marginally in the September quarter.

The crane rate was 21.1 containers per hour, up from 21.0 containers per hour in the previous quarter.

The net rate rose to 29.2 containers per hour in the September quarter from 29.1 containers per hour in the June quarter.

Adelaide's elapsed rate was 28.4 containers per hour in the September quarter, up from 28.3 containers per hour in the June quarter.

The average proportion of elapsed time not worked was unchanged at 2.7 per cent in the September quarter.

Fremantle

Fremantle's crane rate declined in the September quarter but there were increases in the net rate and the elapsed rate.

The crane rate was 18.8 containers per hour in the September quarter, down from 19.0 containers per hour in the June quarter.

The net rate increased to 20.6 containers per hour, from 19.8 containers per hour in the previous quarter. The increase in the net rate reflected a rise in average crane intensity.

Fremantle's elapsed rate was 17.0 containers per hour in the September quarter, up from 15.9 containers per hour in the June quarter. The increase in the elapsed rate partly reflected a reduction in the proportion of non-working time. The average proportion of elapsed time not worked was 17.6 per cent in the September quarter compared with 19.5 per cent in the June quarter.

Teus per hour

Figures 1 to 6 and table 6 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. Indicators based on *teus* per hour may be affected by changes over time in the mix of 20 foot and 40 foot containers.

The *teu*-based and container-based data generally indicate similar trends in productivity in the September quarter. The major exceptions involve Melbourne (crane rate and net rate) and Fremantle (crane rate) where there were significant changes in the mix of 20 foot and 40 foot containers over the period.

WATERFRONT RELIABILITY

The *Waterline* reliability indicators provide partial measures of the variability and predictability of waterfront performance for container traffic. This article provides data up to the September quarter 1997.

Ship arrival

Accurate forecasts of ship arrival times facilitate the provision of port services at the times required by shipping lines. Table 2 presents data for two indicators of the accuracy of ship arrival advice at four Australian ports.

The first indicator 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 individual ports varied between 53 per cent and 80 per cent in the September quarter. The major changes from the previous quarter were significant increases at Adelaide and Fremantle.

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 proportions at Brisbane, Sydney and Fremantle ranged from 53 per cent to 92 per cent in the September quarter. This was similar to the range in the June quarter.

Table 2 indicates that there is significant inter-port variation in the accuracy of ship arrival advice at individual ports. The variation potentially reflects a range of operational factors such as differences in weather conditions and the position of each port in the coastal cycle.

Berth availability, pilotage, towage

Table 3 presents information on berth availability, pilotage and towage for container ships at the five mainland capital city ports in the September quarter. The sample covers 263 ship calls, equivalent to 29 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 22 per cent at Brisbane and Sydney to 50 per cent at Adelaide.

Berth availability indicates the proportion of ship arrivals where the berth is available within 4 hours of the scheduled berthing time. The overall proportion for the ships in the BTCE sample was 89 per cent in the September quarter, similar to the figure of 90 per cent in the June quarter. Shipping lines indicated that the major factor contributing to delays in the September quarter was berth congestion.

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 proportion was 100 per cent in the September quarter compared with 99.6 per cent in the June quarter.

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 overall proportion for ships in the BTCE sample was 98.9 per cent in the September quarter, similar to the June quarter figure of 99.2 per cent.

Stevedoring

Table 2 presents information on three aspects of stevedoring reliability at the major container terminals—cargo receipt, stevedoring completion and stevedoring rate.

Cargo receipt is the proportion of receipts (exports) completed by the stevedore's cut-off. Cargo receipt at Brisbane, Sydney and Melbourne averaged 93–94 per cent in the September quarter. This was similar to the range in the June quarter. Data for Fremantle are not available as one terminal operator was upgrading its computer system during the period covered by table 2.

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.

Waterline 12 reported figures of 72 per cent at Brisbane and 27 per cent at Sydney in the March quarter. Information on stevedoring completion is not included in table 2 because the most recent data provided to the BTCE cover only single terminals at Brisbane, Sydney, Melbourne and Fremantle. However, the June and September quarter data for these terminals also suggest significant inter-port variation in stevedoring completion. It is expected that data on stevedoring completion will be published in future issues of *Waterline*.

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. The figures for Brisbane, Sydney and Melbourne increased slightly to 61–62 per cent in the September quarter. Data for Fremantle are not available due to the upgrading of one terminal operator's computer system during the period.

Other waiting time

The nine shipping lines which supplied data on berth availability, pilotage and towage for table 3 also provided information on other waiting time. The data indicate that 106 ship calls (40 per cent of all calls in the sample) were affected by other waiting time (excluding ship schedule adjustments) in the September

quarter. There were 106 ship calls (42 per cent of calls) affected by other waiting time in the previous quarter.

Specific information on the sources of other waiting time was provided for 86 ship calls in the September quarter. Some ship calls were affected by two or three incidents. The average waiting time attributed to each incident was 6 hours. Five factors accounted for 64 per cent of the waiting time incidents for which specific information was available in the September quarter:

- early completion of stevedoring—18 ship calls (including 8 at Melbourne and 5 at Adelaide), with waiting time ranging from 1 hour to 9 hours;
- early ship arrival—15 ship calls (including 9 at Melbourne and 5 at Adelaide), with waiting time ranging from 1 hour to 33 hours;
- awaiting labour—14 ship calls (including 6 at Melbourne and 5 at Sydney), with waiting time ranging from 3 hours to 12 hours;
- crane breakdown—13 ship calls (including 6 at Melbourne and 5 at Brisbane), with waiting time ranging from 1 hour to 8 hours; and
- industrial action—8 ship calls (including 4 at Melbourne and 2 at Sydney), with waiting time ranging from 2 hours to 14 hours.

Other sources of waiting time reported by shipping lines included booking times later than preferred times, ship repairs and maintenance, weather and tides.

Concluding comments

There appears to be significant inter-port variation in the accuracy of ship arrival advice provided at the mainland capital city ports. The available data also suggest significant variation in the accuracy of stevedoring completion time estimates.

The availability of berths, pilots and tugs at the scheduled time was virtually unchanged in the September quarter. A sample of container ship calls indicates that around 40 per cent of calls at the mainland capital city ports were affected by other waiting time.

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.

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

Merchant shipping

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

Following discussions with the BTCE, two major ship operators have revised their data for the March and June quarters. The revisions mainly involve study leave, and there have also been some changes to the figures for berth days. The revised crew to berth ratio for the June quarter is 2.145 (previously 2.130). Some components of the March quarter figures have also been revised but the overall ratio for that quarter is unchanged. As the BTCE is still auditing the processes used by one major ship operator, the September quarter merchant shipping data in this issue of *Waterline* are classified as preliminary.

The *crew to berth ratio* for merchant shipping was 2.152 (preliminary) in the September quarter, up from the revised June quarter figure of 2.145. The September quarter figure was higher than the initial crew to berth ratio recorded at the beginning of the monitoring process (2.133 in the September quarter 1993).

Ship time is the largest component of the crew to berth ratio for merchant shipping. The ship time ratio was 1.035 in the September quarter, up from 1.031 (revised) in the June quarter (initial level 1.025).

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 0.967 in the September quarter compared with 0.965 (revised) in the June 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 increased to 0.066 in the September quarter from 0.062 (revised) in the June quarter (initial level 0.073).

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

The *study leave* ratio fell to 0.041 in the September quarter from the peak of 0.046 (revised) in the June quarter (initial level 0.024).

The *training and other paid leave* ratio was 0.008 in the September quarter compared with 0.006 in the June quarter (initial level 0.006).

Table 4 shows the individual components of the crew to berth ratio for merchant shipping, by crew classification, in the September quarter. Deck officers had the highest ratio (2.218) followed by engineers (2.202), integrated ratings (2.104) and catering crew (2.102).

Offshore shipping

Figure 8 presents information on the crew to berth ratio, and its components, for Australian offshore shipping over the period to the September quarter 1997.

The *crew to berth ratio* for offshore shipping was 2.366 in the September quarter, down from the peak figure of 2.379 recorded in the June quarter. The decline mainly reflected falls in the ship time and study leave ratios, which more than offset a rise in the compensation ratio. The September quarter figure was higher than the initial crew to berth ratio at the beginning of the monitoring process (2.327 in the March quarter 1995).

Accrued leave 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 September quarter (initial level 1.151).

Ship time reflects days paid for ship duty (which may include travelling time and days signing on and off). The ship time ratio was 1.010 in the September quarter, down from 1.019 in the June 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 increased to 0.121 in the September quarter from 0.113 in the June quarter. The September quarter figure was the highest compensation leave ratio for offshore shipping since the beginning of the monitoring process (initial level 0.100).

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

The *study leave* ratio declined to 0.042 in the September quarter from the peak of 0.055 recorded in the June quarter (initial level 0.013).

The *training and other paid leave* ratio was 0.002 in the September quarter compared with 0.000 in the June quarter (initial level 0.003).

Table 5 shows the individual components of the crew to berth ratio for offshore shipping, by crew classification, in the September quarter. Catering crew had the highest ratio (2.435) followed by integrated ratings (2.388), engineers (2.342) and deck officers (2.334).

Concluding comments

Preliminary data indicate that the crew to berth ratio for merchant shipping increased to 2.152 in the September quarter. This was above the initial figure of 2.133 that was recorded at the beginning of the monitoring process in 1993.

The crew to berth ratio for offshore shipping was 2.366 in the September quarter, down from the peak figure of 2.379 in the June quarter. The September quarter figure was higher than the initial crew to berth ratio of 2.327 that was recorded 1995.

FIGURES

FIGURE 1 FIVE MAJOR PORTS STEVEDORING PERFORMANCE—TEUS PER HOUR

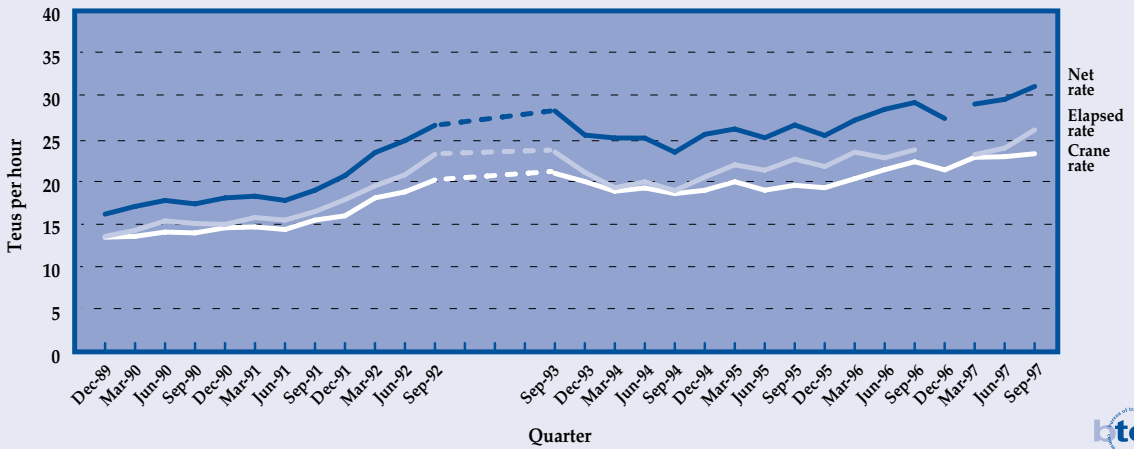
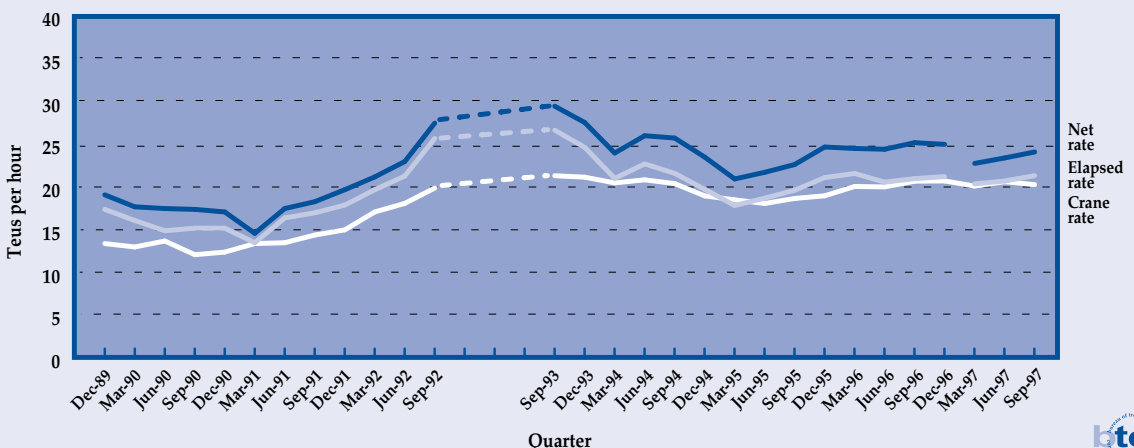


FIGURE 2 BRISBANE CONTAINER TERMINALS PERFORMANCE—TEUS PER HOUR



FIGURES

FIGURE 3 SYDNEY CONTAINER TERMINALS PERFORMANCE—TEUS PER HOUR

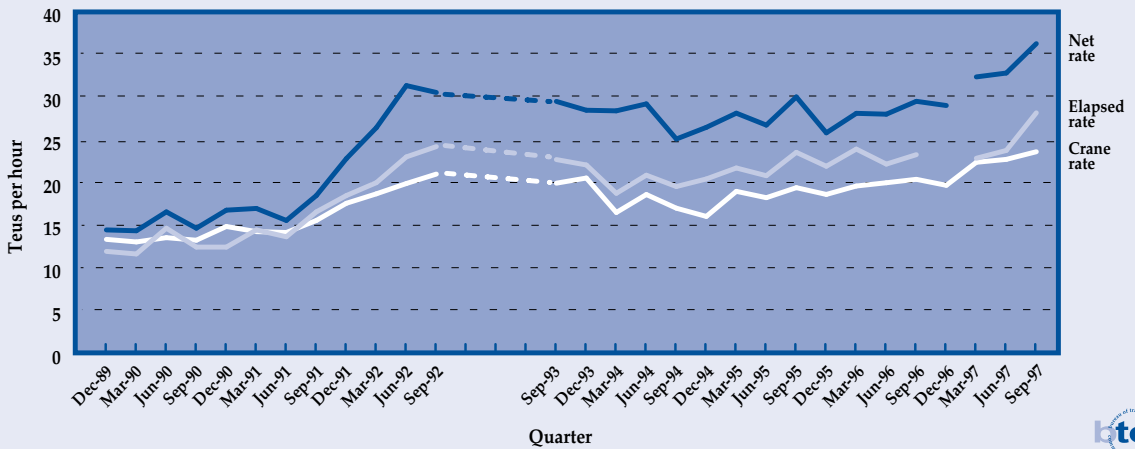
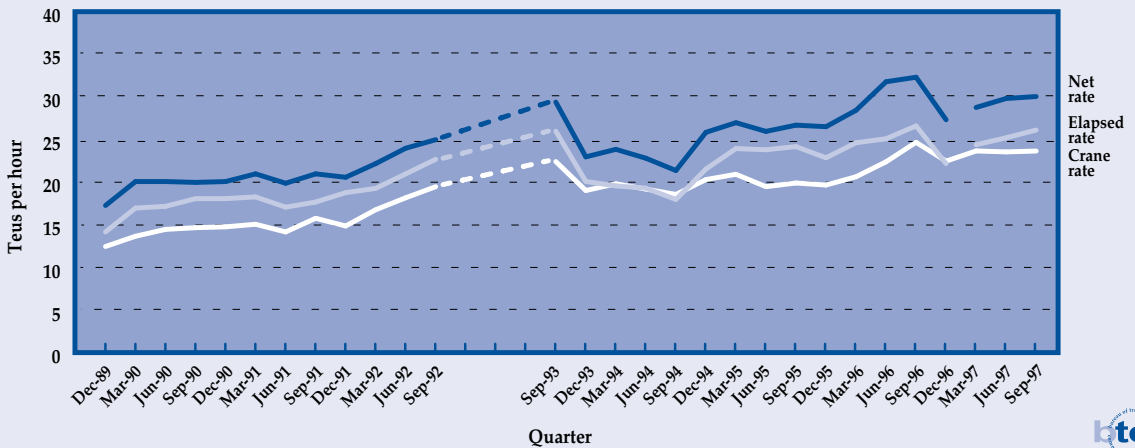


FIGURE 4 MELBOURNE CONTAINER TERMINALS PERFORMANCE—TEUS PER HOUR



FIGURES

FIGURE 5 ADELAIDE CONTAINER TERMINAL PERFORMANCE—TEUS PER HOUR

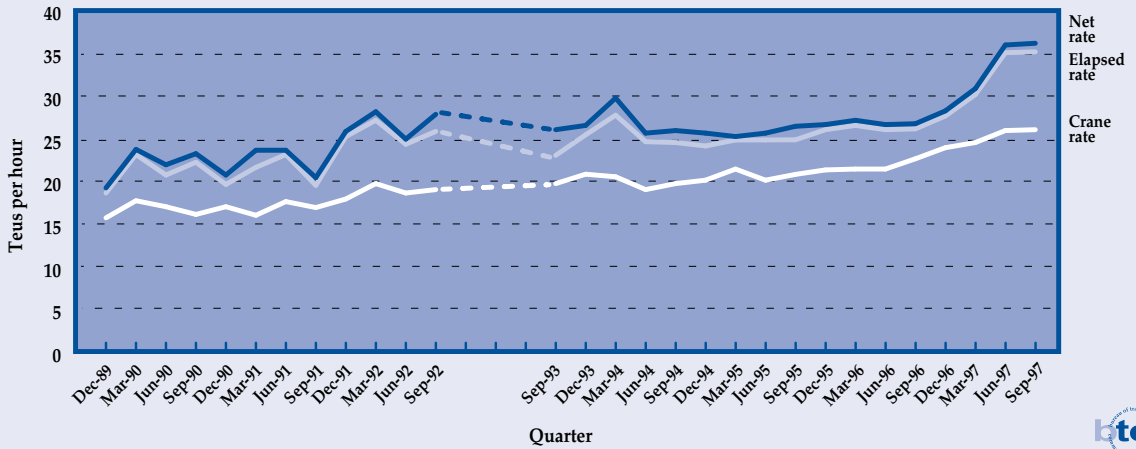
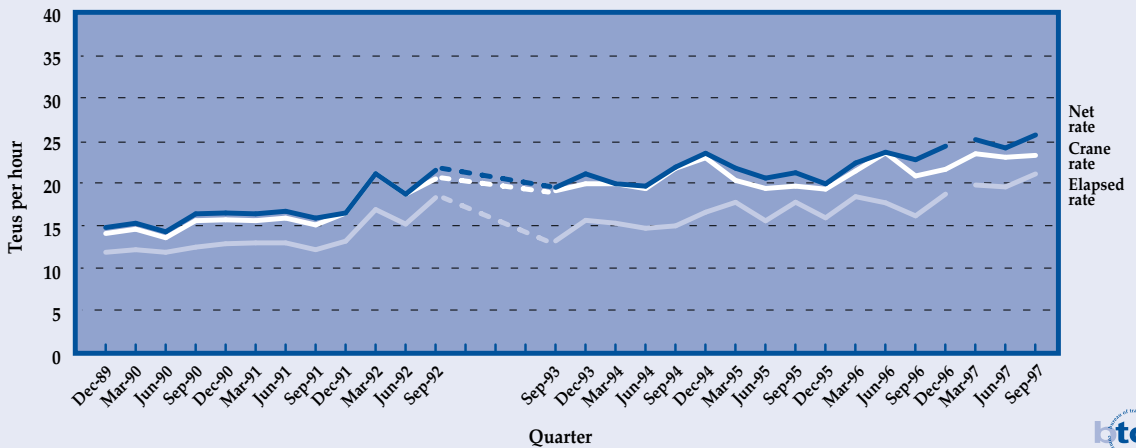
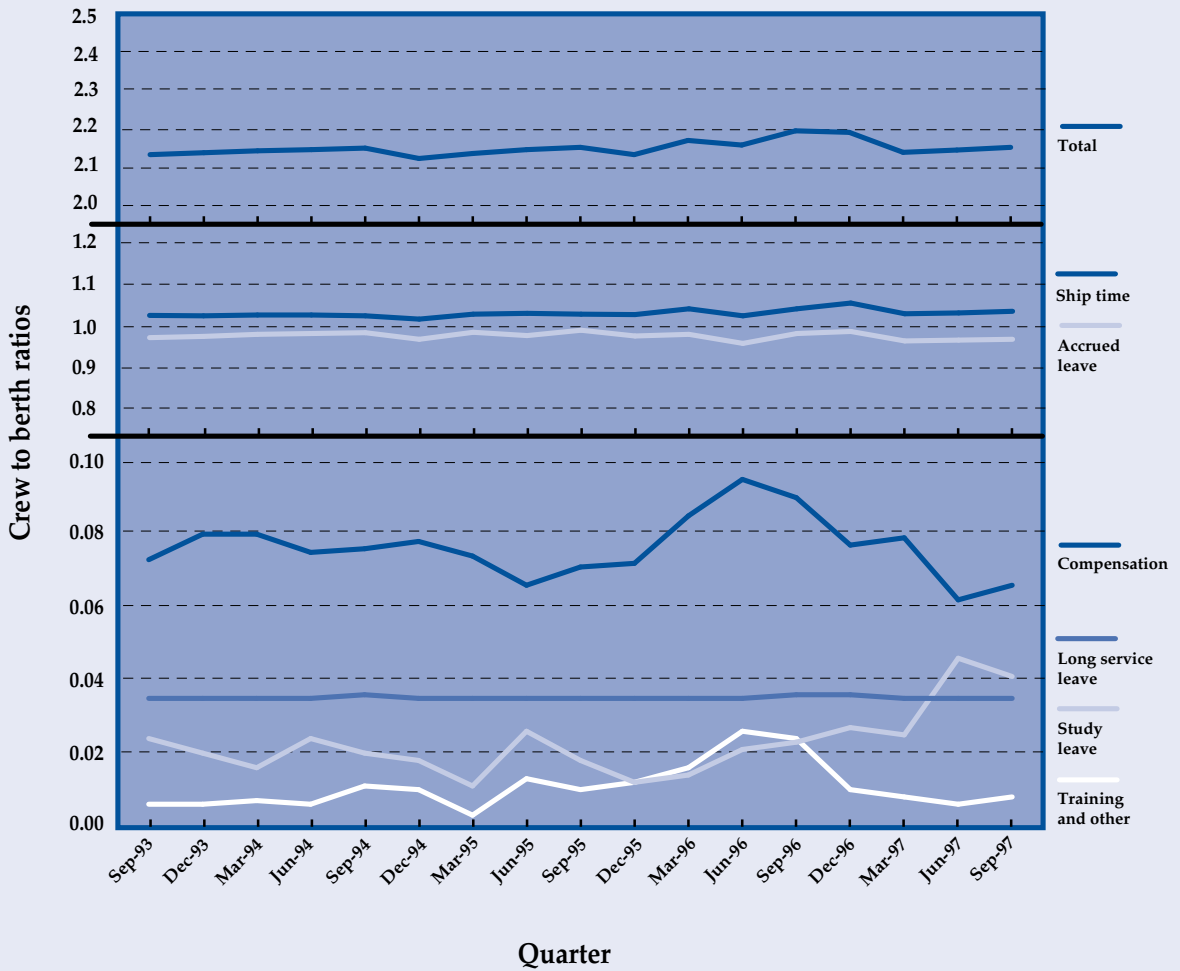


FIGURE 6 FREMANTLE CONTAINER TERMINALS PERFORMANCE—TEUS PER HOUR



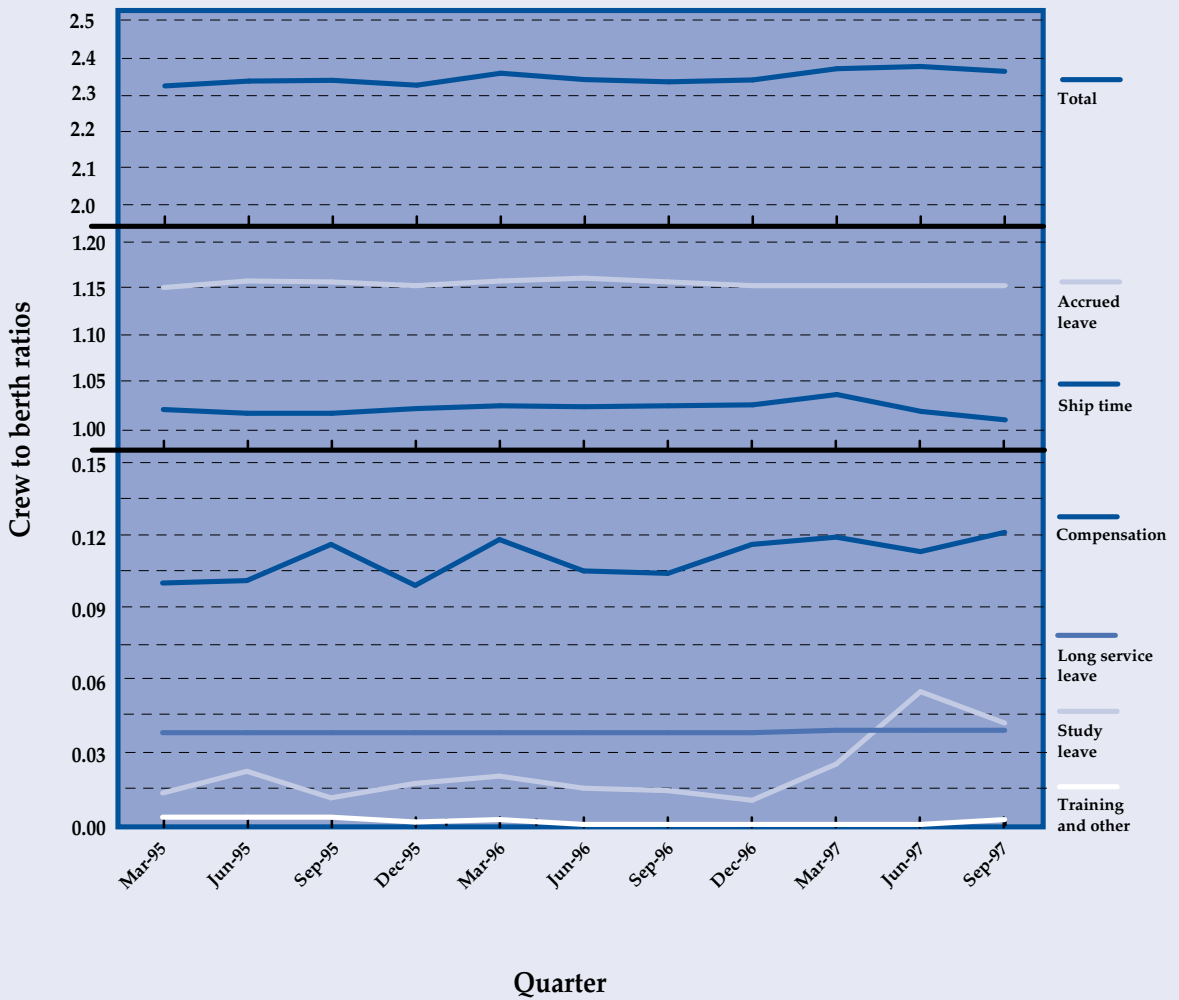
FIGURES

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	Sep-97
Brisbane								
Crane rate	15.8	17.6	16.7	16.5	16.9	17.3	16.4	16.1
Elapsed rate	17.0	19.0	17.2	17.2	17.4	17.3	16.6	16.8
Net rate	20.6	21.5	20.4	20.4	20.4	19.4	18.7	19.1
Sydney								
Crane rate	15.0	15.6	16.0	16.1	15.4	17.7 ^r	17.7	18.2
Elapsed rate	17.6	18.9	17.6	18.2	na	18.2	18.5	21.7
Net rate	21.0	22.1	22.4	23.3	22.7	25.7 ^r	25.5	27.9
Melbourne								
Crane rate	16.3	17.0	18.4	19.6	17.8	19.0	19.0	18.6
Elapsed rate	18.8	20.2	20.5	21.1	17.9	19.5	20.3	20.5
Net rate	21.9	23.4	25.9	25.6	21.7	23.0	24.0	23.5
Adelaide								
Crane rate	18.8	18.9	18.2	19.3	19.6	19.6	21.0	21.1
Elapsed rate	22.8	23.3	22.0	22.2	22.6	24.0	28.3	28.4
Net rate	23.3	23.8	22.5	22.8	23.1	24.6	29.1	29.2
Fremantle								
Crane rate	16.2	17.9	20.0	17.8	18.2	19.4	19.0	18.8
Elapsed rate	13.4	15.7	14.8	13.4	15.6	16.2	15.9	17.0
Net rate	16.7	18.9	20.0	19.4	20.5	20.6	19.8	20.6
Five ports								
Crane rate	15.9	16.9	17.7	18.0	17.1	18.4 ^r	18.3	18.3
Elapsed rate	17.7	19.3	18.6	19.0	na	18.6	19.0	20.4
Net rate	20.9	22.3	23.4	23.5	21.8	23.4 ^r	23.6	24.3

na not available

r Revised to incorporate amended data provided by a Sydney terminal operator which has updated its information systems.

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 6.

Sources Patrick, P&O Ports and SeaLand.



TABLES

TABLE 2 SHIP ARRIVAL AND STEVEDORING RELIABILITY INDICATORS, JUNE AND SEPTEMBER QUARTERS 1997

Indicator	<i>(per cent)</i>									
	Brisbane		Sydney		Melbourne		Adelaide		Fremantle	
	Apr-Jun	Jul-Sep	Apr-Jun	Jul-Sep	Apr-Jun	Jul-Sep	Apr-Jun	Jul-Sep	Apr-Jun	Jul-Sep
Ship arrival										
Advice at 24 hrs	63	63	56	53	na	na	50	80	49	58
Advice inside 24 hrs	56	53	93	92	na	na	na	na	75	81
Stevedoring										
Cargo receipt	93	93	92	93	96	94	na	na	na	na
Stevedoring completion	na	na	na	na	na	na	na	na	na	na
Stevedoring rate	58	61	57	62	59	62	na	na	na	na

na not available

Sources AAPMA, Patrick and P&O Ports.



TABLE 3 AVAILABILITY OF BERTH, PILOTAGE AND TOWAGE SERVICES AT SCHEDULED/CONFIRMED TIME, SEPTEMBER QUARTER 1997

Port/operation	<i>(Number of ship calls)</i>								Total no. of ship calls
	Delay (hrs)								
	0	1	2	3	4	5-10	11-20	>20	
Brisbane									
Berth availability	32	0	0	0	0	1	1	1	35
Pilotage	35	0	0	0	0	0	0	0	35
Towage	34	0	1	0	0	0	0	0	35
Sydney									
Berth availability	42	1	0	0	1	5	3	2	54
Pilotage	54	0	0	0	0	0	0	0	54
Towage	53	0	0	0	0	0	1	0	54
Melbourne									
Berth availability	70	0	2	1	2	2	3	3	83
Pilotage	83	0	0	0	0	0	0	0	83
Towage	83	0	0	0	0	0	0	0	83
Adelaide									
Berth availability	30	0	0	0	0	2	0	2	34
Pilotage	34	0	0	0	0	0	0	0	34
Towage	33	0	0	0	0	1	0	0	34
Fremantle									
Berth availability	51	0	0	1	0	2	2	1	57
Pilotage	57	0	0	0	0	0	0	0	57
Towage	57	0	0	0	0	0	0	0	57
Five ports									
Berth availability	225	1	2	2	3	12	9	9	263
Pilotage	263	0	0	0	0	0	0	0	263
Towage	260	0	1	0	0	1	1	0	263

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 4 MERCHANT SHIPPING CREW TO BERTH RATIOS BY ACTIVITY AND CREW CLASSIFICATION, SEPTEMBER QUARTER 1997^p

Crew type	Ship time	Accrued leave	Compensation	Long service leave	Study leave	Training & other	Total ^a
Deck officers	1.057	0.977	0.036	0.036	0.090	0.021	2.218
Engineers	1.046	0.978	0.040	0.036	0.087	0.013	2.202
All officers	1.052	0.978	0.038	0.036	0.089	0.017	2.210
Integrated ratings	1.021	0.961	0.087	0.034	0.000	0.001	2.104
Catering crew	1.023	0.948	0.096	0.034	0.000	0.001	2.102
All ratings	1.022	0.957	0.090	0.034	0.000	0.001	2.104
All crew	1.035	0.967	0.066	0.035	0.041	0.008	2.152

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

p. Preliminary.

Source Data provided by ship operators.



TABLE 5 OFFSHORE SHIPPING CREW TO BERTH RATIOS BY ACTIVITY AND CREW CLASSIFICATION, SEPTEMBER QUARTER 1997

Crew type	Ship time	Accrued leave	Compensation	Long service leave	Study leave	Training & other	Total ^a
Deck officers	1.008	1.153	0.046	0.038	0.086	0.004	2.334
Engineers	1.009	1.153	0.058	0.038	0.081	0.002	2.342
All officers	1.008	1.153	0.052	0.038	0.084	0.003	2.338
Integrated ratings	1.010	1.153	0.187	0.039	0.000	0.000	2.388
Catering crew	1.024	1.153	0.218	0.040	0.000	0.000	2.435
All ratings	1.011	1.153	0.190	0.039	0.000	0.000	2.394
All crew	1.010	1.153	0.121	0.039	0.042	0.002	2.366

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

Source Data provided by ship operators.



TABLE 6 CONTAINER TERMINAL PERFORMANCE INDICATORS, SELECTED AUSTRALIAN PORTS—TEUS PER HOUR

	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	Sep-97	
Brisbane																		
Ships handled	106	111	112	140	140	187	136	123	135	132	124	133	140	141	156	164	162	
Total teus	49622	46529	37820	52983	51596	50574	41723	47065	58851	46439	39037	51008	66115	62904	47471	65572	73184	
Crane rate	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	20.2	
Elapsed rate	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	21.2	
Net rate	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	24.0	
Sydney																		
Ships handled	205	238	177	240	223	221	218	202	192	203	206	216	228	249	251	249	243	
Total teus	124028	139321	116914	129586	142659	152326	144868	140113	148431	143746	146038	148290	156344	174982	158323	167705	183978	
Crane rate	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	22.3 ^r	22.6	23.5	
Elapsed rate	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	na	22.7	23.6	28.0	
Net rate	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	32.2 ^r	32.7	36.1	
Melbourne																		
Ships handled	235	306	211	265	267	244	265	228	221	227	228	262	274	282	230	249	268	
Total teus	129687	143350	153420	158849	159039	180134	173338	152983	161943	173566	162911	170884	203371	202376	162156	177070	208200	
Crane rate	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	23.6	
Elapsed rate	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	26.0	
Net rate	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	29.9	
Adelaide																		
Ships handled	21	26	28	34	31	33	35	50	34	42	47	63	70	74	69	65	68	
Total teus	9650	12616	13243	12461	13167	15038	16832	21676	14319	17318	15955	18803	20519	23351	21963	20933	25982	
Crane rate	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	26.1	
Elapsed rate	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	35.2	
Net rate	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	36.2	
Fremantle																		
Ships handled	116	115	127	135	121	124	128	136	139	124	143	153	159	161	159	164	166	
Total teus	37566	40910	40587	40986	36635	46969	44388	45308	50050	44662	47597	51113	50791	55593	51784	52092	57903	
Crane rate	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	23.1	
Elapsed rate	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	21.0	
Net rate	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	25.5	
Five ports																		
Ships handled	683	796	655	814	782	809	782	739	721	728	748	827	871	907	865	891	907	
Total teus	350553	382726	361984	394865	403096	445041	421149	407145	433594	425731	411538	440098	497140	519206	441697	483372	549247	
Crane rate	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	22.8 ^r	22.8	23.2	
Elapsed rate	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	na	23.1	23.8	26.0	
Net rate	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	29.0 ^r	29.5	31.0	

na not available

r Revised to incorporate amended data provided by a Sydney terminal operator which has updated its information systems.

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 (see earlier issues of Waterline), and are 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

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.

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