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The Container Ship Size Revolution and South African Port Implications

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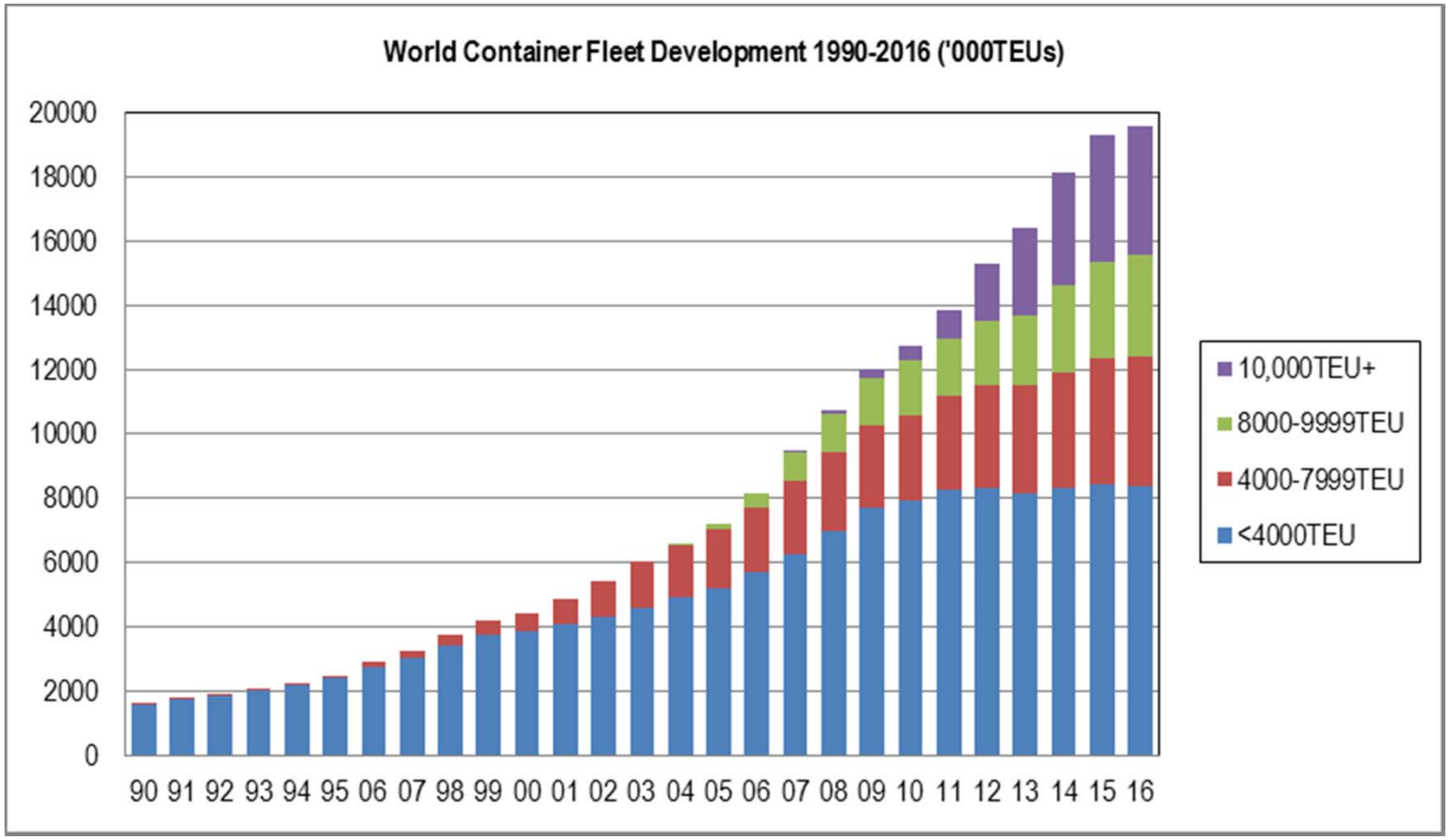
Industry trends - Ship Size Revolution



Industry Trends–Ship Size Revolution

- Fully cellular containership fleet expanded to >16m TEU.
- Focus remains on larger vessels – 8000TEU+ sector up by 10.8%.
- Trend for bigger ships well established since 2004 – 18,000TEU+ ships in service.
- Almost all major lines committed to ULCS.

Design Development of Large Containerships

	TEUs	Length overall (m)	Beam (m)	Maximum draught* (m)	Required berth depth (m)*
First generation: 1968	1,100				
Second generation: 1970-80	2-3,000	213	27.4	10.8	12.0
Panamax: 1980-90	3-4,500	294	32.0	12.2	12.8-13.0
Post-panamax: 1988-95	4-5,000	280-305	41.1	12.7	13.5-14.0
Fifth generation: 1996-2005	6,400-8,000	300-347	42.9	14.0-14.5	14.8-15.3
Super post-panamax: 1997->	8,000-11,400	320-380	43-47	14.5-15.0	15.3-15.8
Ultra large container ships: 2006->	14,500	380-400	56.4	15.5	16.3
New-panamax: 2010	12,500	366	49.0	15.2	16.0
Maersk EEE Class	18,270	400	59.0	16.0	16.5
China Shipping UASC newbuilds	18,400	400	58.6	16.0	16.3

* Maximum draught is rarely realised, even when vessels are fully laden, so required berth depth is less in practice.

Source: Ocean Shipping Consultants

- China Shipping confirmed current orders to be extended to 19,000TEU.
- Expect other lines to follow – Maersk Line, CMA CGM, UASC all committed to larger tonnage.
- Ship cascading will continue to secondary trade lanes in Africa.

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Industry Trends - Ship Size Revolution

Key factors of note for lines operating larger vessels:

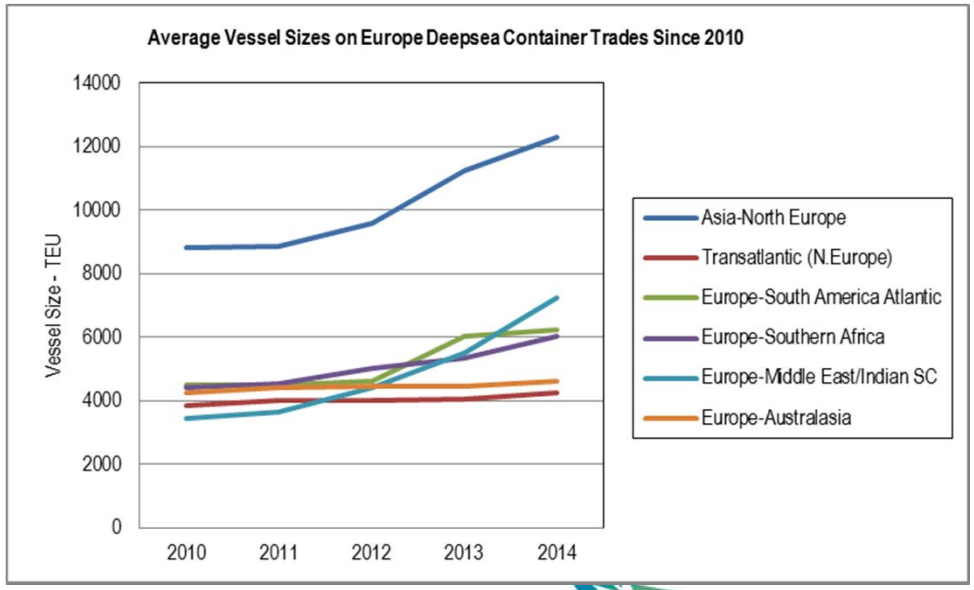
- Port Concentration:
  - Terminals have to meet needs of larger ships.
  - Potential fewer ports of call.
- Transshipment:
  - Intensifying in key locations.
  - Hub & Spoke, Relay/Interlining used.
- Alliances/Consolidation:
  - Individual lines lack overall traffic to successfully utilise bigger ships cost-effectively – hence alliances.
  - G6 Alliance, 2M Alliance, CKYHE and “Ocean Three” grouping will all continue in major trade lanes.
  - Fewer viable alternatives for customers on main trade lanes.

What is Happening to the Container Fleet?

The Development of Average Vessel Sizes on Key Container Trades 2010-2014
- position at start of year (TEUs)

	2010	2011	2012	2013	2014	Current largest vessel
Asia-North Europe	8822	8880	9600	11250	12300	18270
Transatlantic (N.Europe)	3850	3995	4010	4050	4250	5892
Europe-South America Atlantic	4500	4500	4600	6050	6250	8760
Europe-Southern Africa	4425	4555	5015	5350	6050	10350
Europe-Middle East/Indian SC	3450	3650	4425	5500	7250	11250
Europe-Australasia	4250	4415	4450	4450	4600	5906
Transpacific	5350	5500	5700	6000	6250	14000
Asia-South America Pacific	3100	3750	5100	7300	7450	13100
Asia-Middle East	6050	6150	6950	8000	8100	14100

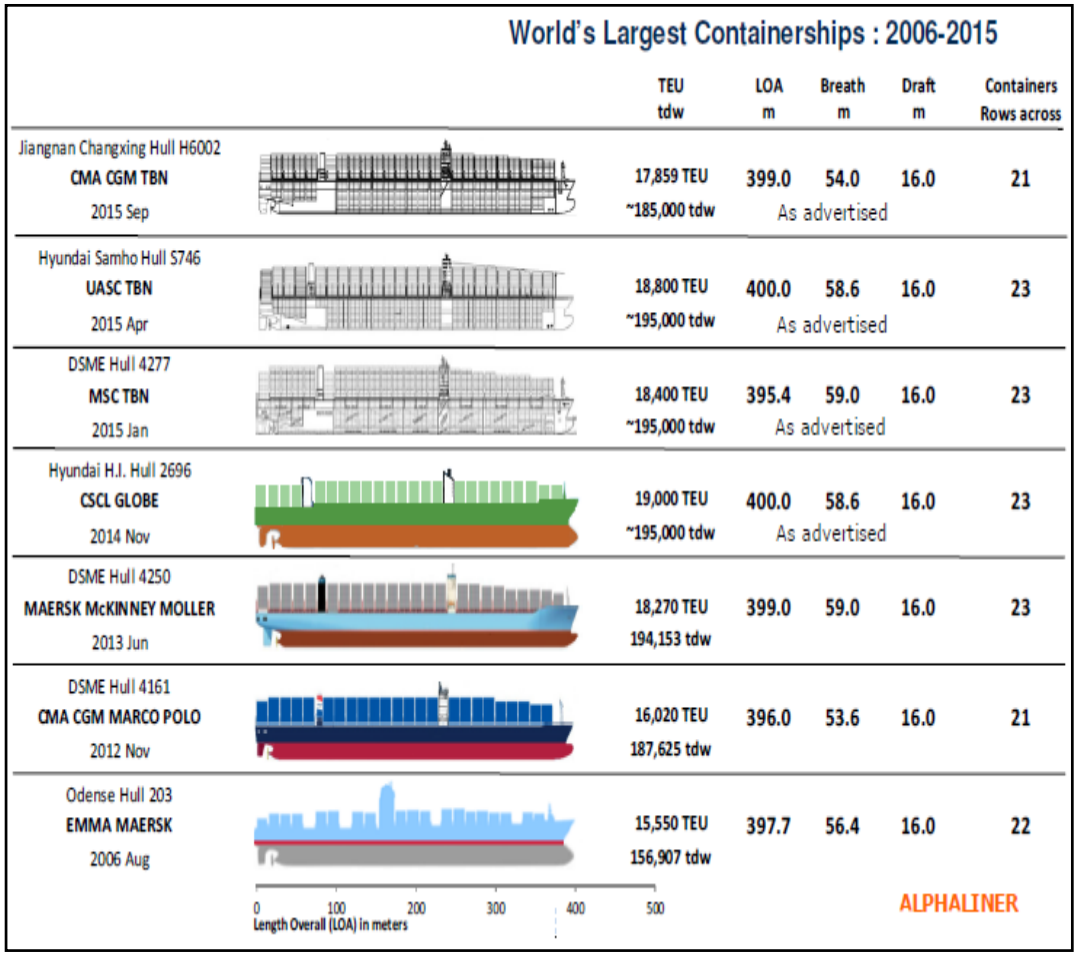
The development of the Panama Canal to allow passage of vessels of up to 12,500TEU (from 2015) will see a sharp increase in Transatlantic vessel sizes and also in other trades involving Canal transit.
Source: Ocean Shipping Consultants



What is Happening to the Container Fleet?

- The role of 10,000TEU+ vessels has increased dramatically, driven by scale economies and competitive pressures.
- Massive ordering for ULCS and New Panamax vessels.
- Transpacific and Asia-Europe trades cannot absorb all of this tonnage - 'cascade' effect on other routes now felt.
- Development of new 'broad beam' 8,000-10,000TEU vessels for North-South trading, particularly in Africa and South America.
- At the same time, fuel is much more expensive – there are pressures to slower steaming and dropping port calls.
- The overall effect will be further concentration and greater transshipment activity.
- New generation container feeder vessels – 1,800-2,000TEU (and larger) will be typical.
- Co-operation also possible on feeder services – Grand Alliance 'model'

What is Happening to the Container Fleet?



- Lines previously understated capacity – Emma Maersk in 2006 declared at 11,000TEU but later believed to be 15,550TEU
- CSCL upgraded 5 newbuilds from 18,400TEU to 19,000TEU
- 3 x CMA newbuilds have been upgraded from 16,000TEU to 17,859TEU
- Inflated capacity seem to be purely notional – based on additional deck stowage
- Means that usable capacity growth of the fleet in teu terms is more modest than nominal capacity – 5.7% in 2013 vs 4.9% in dwt terms in 2013
- Change in dwt:teu ratio from 16tons/teu in 1970's to c.12tons/teu now and 10-11 tons on bigger vessels

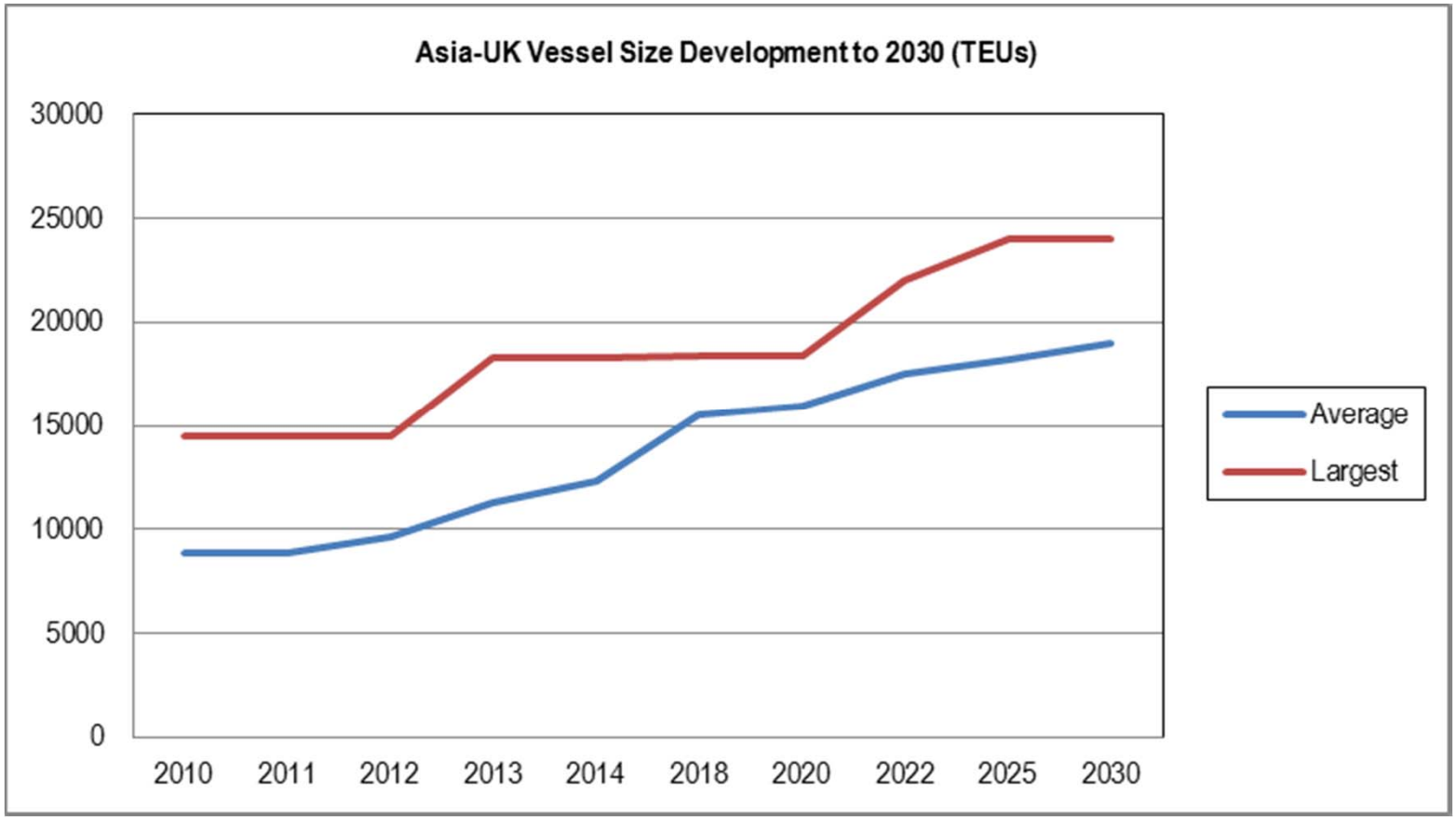
Recently Ordered ULCS's

Ultra Large Container Ship Deliveries to 2016

	In service 6/14		Due by end 2014		Due by end 2015		Due by end 2016		Total		
	no.	000TEU	no.	000TEU	no.	000TEU	no.	000TEU	no.	000TEU	%
10,000-12,999	72	793.30	9	97.68	17	178.36	11	112.02	37	388.06	48.9%
13,000-15,999	145	1965.30	8	108.00	23	325.85	25	352.50	56	786.35	40.0%
16,000TEU+	12	212.50	9	160.68	31	556.91	1	18.80	41	736.39	346.5%
Total	229	2971.10	26	366.36	71	1061.12	37	483.32	134	1910.8	64.3%

Source: Lloyd's Register/Ocean Shipping Consultants

The Future Size Expectations ex Asia-Eur



Deepsea Shipping Costs ex Asia

Deep-Sea Containership Capital and Operating Costs 2014

	2000TEU	3500TEU	4500TEU	6800TEU	8500TEU	10800TEU	12500TEU	14500TEU	18270TEU	22000TEU	24000TEU
Capacity - TEUs	2000	3500	4500	6800	8500	10800	12500	14500	18270	22000	24000
Capital Costs											
Newbuild Price - mUS$	25.0	35.5	40.0	57.5	76.5	90.0	112.0	130.0	162.0	178.0	190.0
Daily Capital Charge - $	*10,307*	*14,636*	*16,491*	*23,706*	*31,539*	*37,104*	*46,174*	*53,595*	*66,788*	*73,384*	*78,331*
Operating Costs											
Manning - US$/day	3,200	3,650	3,650	3,650	3,650	3,650	3,650	3,800	4,100	3,650	3,650
Repair & Maintenance - US$/day	1,096	1,568	1,734	2,456	2,903	3,238	3,573	3,948	4,353	6,284	6,635
Insurance - US$/day	655	936	1,035	1,466	1,733	1,933	2,133	2,350	3,100	3,751	3,961
Admin/Other Charges* - US$/day	1,000	1,100	1,100	1,200	1,200	1,200	1,300	1,475	1,650	1,300	1,300
Total	*5,951*	*7,253*	*7,519*	*8,773*	*9,486*	*10,021*	*10,656*	*11,573*	*13,203*	*14,986*	*15,546*
TOTAL	16,258	21,889	24,010	32,478	41,025	47,125	56,830	65,168	79,991	88,370	93,877
$/TEU	8.13	6.25	5.34	4.78	4.83	4.36	4.55	4.49	4.38	4.02	3.91

Source: Ocean Shipping Consultants

Other Container Fleet Developments

- **The shipping lines desire to maximise the size of vessels, whilst minimising the slot costs looks set to continue with designs for 22,000TEU and 24,000TEU vessels already under discussion.**
- **New vessel designs offer either an increase in LOA (from 400m to 430-450m) or an increase in beam from 59.0m to 61.5m.**
- **In all new design option, draught required remains the same as EEE-Class vessels.**
- **WAFMAX/SAMMAX vessels specifically designed to maximise capacity for use in shallower waters such as in Africa and South America.**

Container Vessel Sizes and Rows Across

Type	TEU range	No.of rows
Panamax	4,500-4,900	13
Post Panamax	5,000-6,000	16
	6,000-9,000	17
	9,000-10,000+	18
New Panamax	12,500-13,000	20
Post New Panamax	14,500	23
EEE-Class	18,270	23
New generation	22,000	24
WAFMAX/SAMMAX	7,450-8,700	18

Source: Ocean Shipping Consultants

Consolidation and Consortia - I

- Container shipping is a dynamic and cyclical industry, which continually shows various trends that impact on the business sector.
- The – already globalized - container shipping sector has shown various rounds of mergers and acquisitions, and there are still a few to come.
- Consolidation materialise in two major ways, by means of **mergers** and acquisitions and by means of the forming of **consortia** of shipping lines, or alliances.
- This is not a new process – earlier signs of cooperation designed to reduce costs have been in operation since 1994 if not sooner.

Consolidation and Consortia - II

Consortia

- The pooling of vessel capacity by two or more carriers.
- Exchanging slot capacity (slot swaps) or by pooling vessels.
- Consortia have vessel sharing agreements on certain trades and usually also jointly procure port and terminal services.
- Consortia serve to maximize efficiency of resources and optimize service levels (i.e. frequency, transit times).
- Due to strategic or commercial changes and to mergers and acquisitions, consortia tend to change on a regular basis.

Consolidation - Recent

- Grand Alliance and New World Alliance form G6 (2011)
- CKYH Alliance formed (2002) – Evergreen added in 2014 (CKYHE)?
- Hapag Lloyd and CSAV merge (2014)
- UASC and China Shipping increase cooperation (2012-13) on certain trades, but no official consolidation
- Evergreen, China Shipping and UASC all looking to cooperate on various services on an ad hoc basis with other lines (2012-13)
- Following failure of P3 Alliance to be ratified, Maersk and MSC try again with 2M Alliance (2014)
- CMA CGM counter with new “Ocean Three” Alliance with CSCL and UASC (2014)
- Hamburg Sud acquires CCNI (2014)
- Consolidation is the key strategy, but ‘operational arrangements’ rather than full alliances will be problematic.

Existing S.African C.Terminal Facilities

South African Container Terminals

Terminal	Length (m)	Max.Depth (m)	STS
Durban - Pier 1	1900	16.0	17
- Pier 2	650	12.5	6
Cape Town	1137	15.5	9
Port Elisabeth	925	14.5	5
Ngqura	1310	16.5	6
East London	2512	10.4	MHC
Richards Bay	644	13.5	MHC

Source: Ocean Shipping Consultants

Maximum Size of Vessel Accommodatable

Design Development of Large Containerships

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CSCL 18,400 Class	18,400	400	58.6	15.5	16.4

* Maximum draught is rarely realised, even when vessels are fully laden, so required berth depth is less in practice.
Source: Ocean Shipping Consultants

Maximum Vessels Accomodated When Full

Terminal	Max.Depth (m)	Max.Vessel Cap.
Durban - Pier 1	16.0	12-14,500
- Pier 2	12.5	4,500
Cape Town	15.5	11,400
Port Elisabeth	14.5	6,400
Ngqura	16.5	18,400
East London	10.4	1,500
Richards Bay	13.5	5,000

Source: Ocean Shipping Consultants

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Implications for Container Terminals

- Terminals must expand and make better use of existing facilities to handle larger vessels and consignment sizes
- Terminal productivity has improved, but there remain a need for further improvements
- Terminals which do not lift productivity will see market share decline
- Need for dredging – approach channels and berths. Clear planning needed for all terminal developments. Depth alongside is critical to 'future-proof' terminals. Channel and approach dredging can follow later.
- Longer berths ; larger terminal area; increased gate pressure
- Larger/Havier Quay Cranes - Longer reach; Taller clearance; Twin/Tandem Lifts
- Increase in load on quay structures and increase in electrical loads and electrical infrastructure

Conclusions

- **Major Alliances gives access to markets ahead of notional demand for individual shipping lines**
- **Greater cooperation expected between lines to be able to compete with Big 3**
- **Increased number of t/s hub options**
- **Pressure on gateway ports**
- **Terminals have to become increasingly efficient and look to offer 'something different' to be able to attract calls**

Thank You

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