

“U. L. C. S.”

Cargo Workshop Presentation

20 September 2006



Münchener Rück
Munich Re Group

Matthew O'Sullivan
Munich Reinsurance



U. L. C. S.

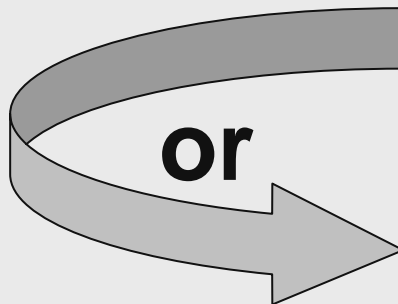


Münchener Rück
Munich Re Group

Ultra Large Container Ship?



Ultra Large Claim Scenario?



Agenda



Münchener Rück
Munich Re Group

Setting the Scene – What is the environment we are in?

The outlook for the shipping and insurance industries.

What is the worst case scenario for cargo?

What risk factors could lead to this worst case scenario?

Lets consider the ship...

... and the cargo.

What is the result of the combination of these risks?

A reinsurers opinion...

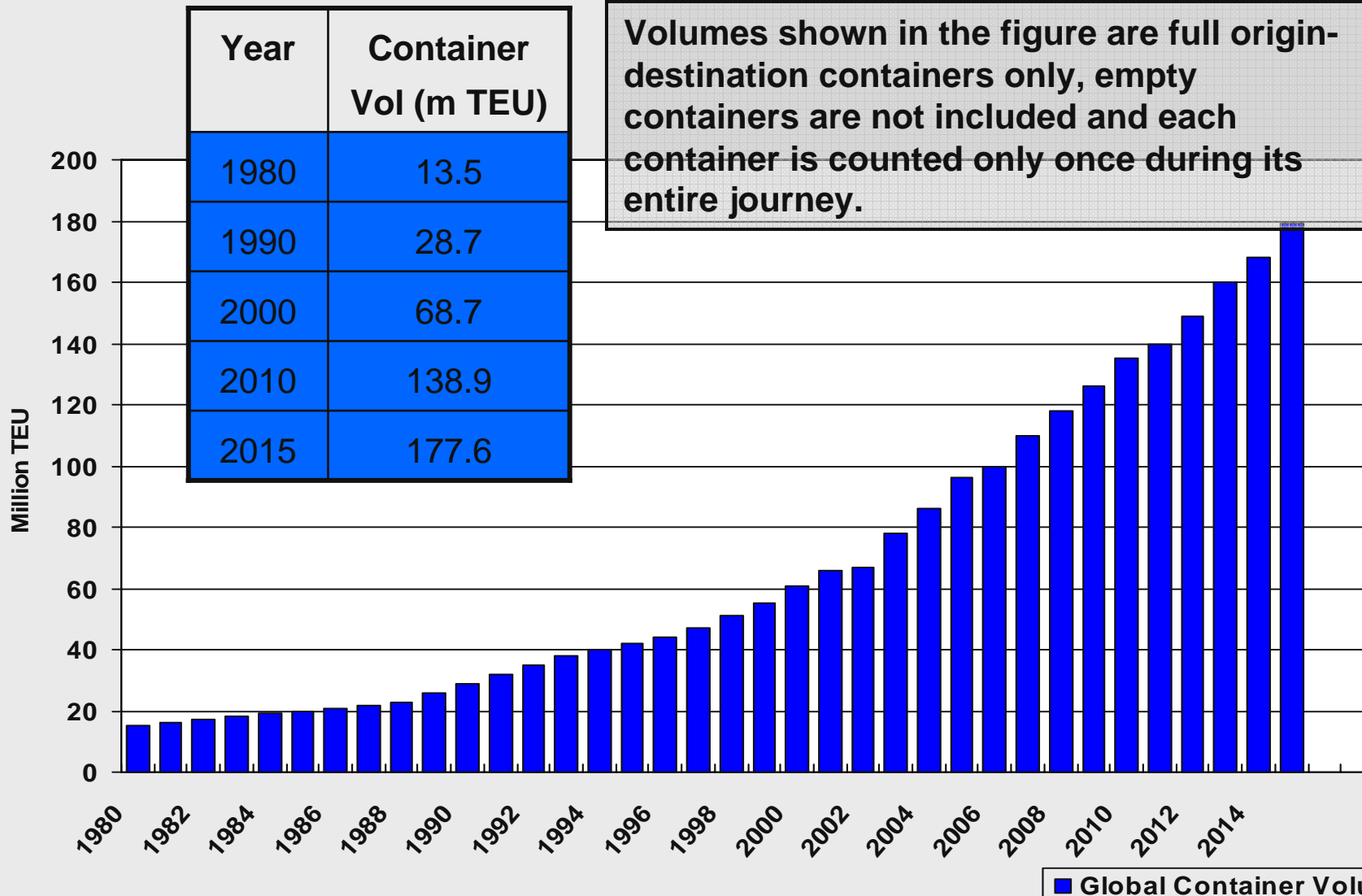
Setting the Scene

Past and Forecast Global Container Volumes (1980-2015)



Münchener Rück
Munich Re Group

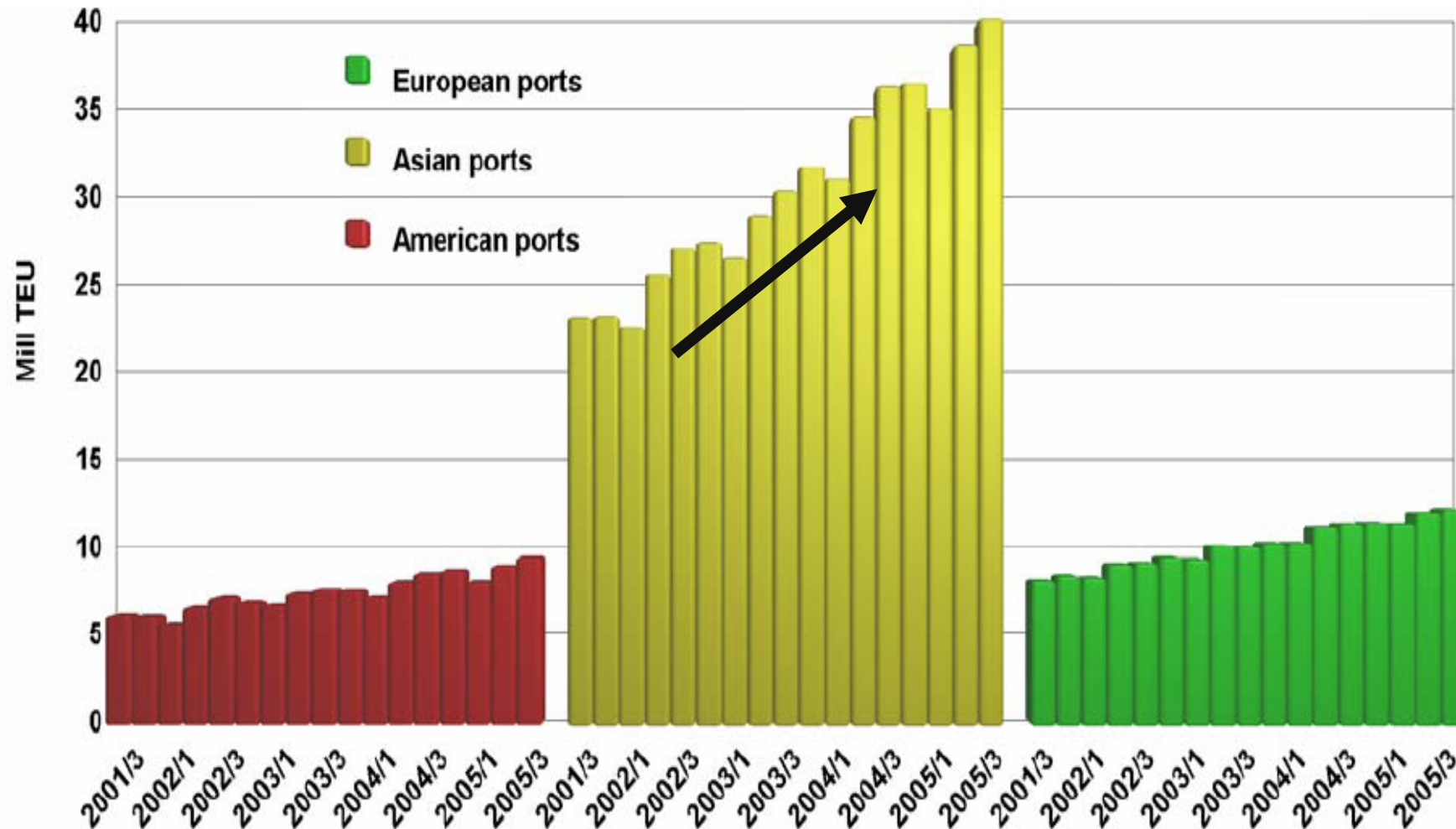
Source: United Nations Economic and Social Commission for Asia and Pacific (UNESCAP)



Setting the Scene



Quarterly container port traffic by continent September 2001 – September 2005

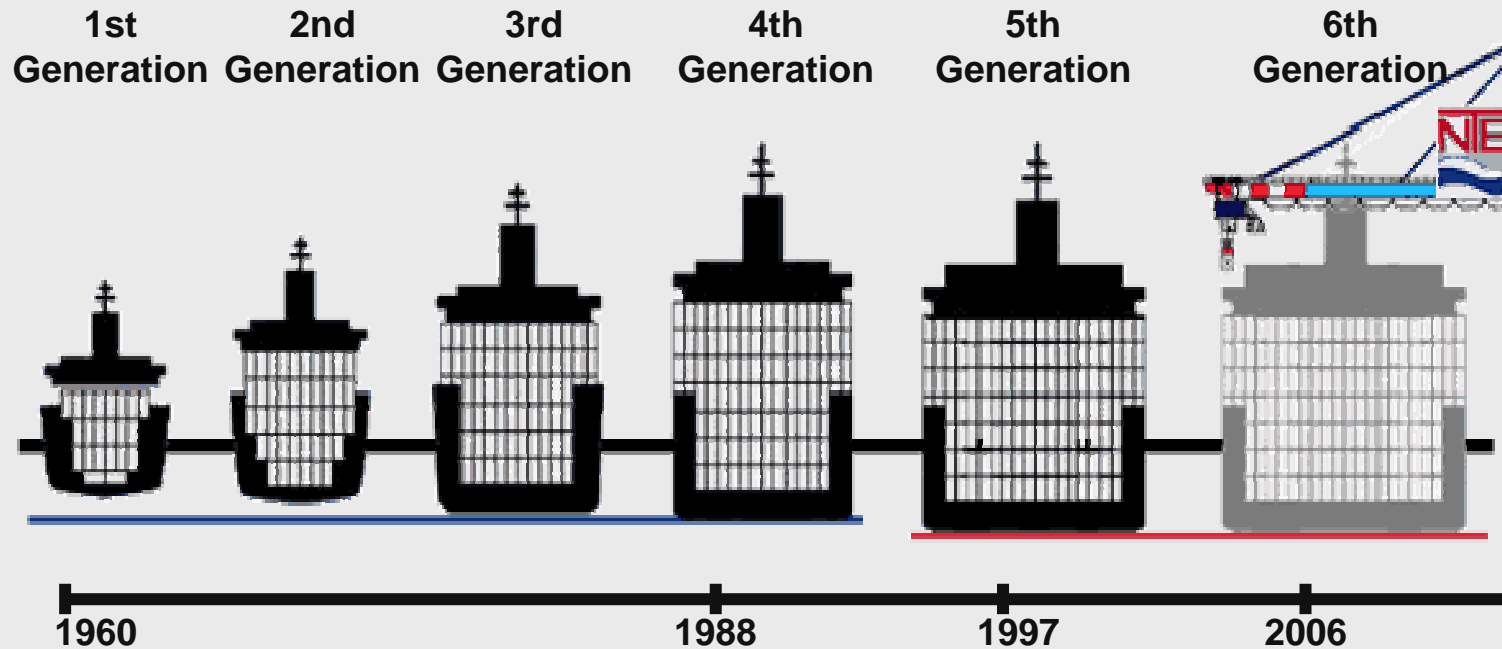


Source: ISL Monthly Container Port Monitor December 2005, www.isl.org

Setting the Scene - Ship Development



Münchener Rück
Munich Re Group



Source: Propulsion Trends in Container Vessels; MAN B&W Diesel A/S, www.manbw.com

	<i>Small Feeder</i>	<i>Feeder</i>	<i>Panamax</i>	<i>Post-Panamax</i>	<i>Suezmax</i>	<i>Post-Suezmax (Malaccamax)</i>
Draught	<9m	10m	max.12m	12-13m	max.16.4/14.4m	max.21m
Breadth	<23m	23-30m	max.32.25m	>32.25m	max.50/57m	max.60m
TEU	<1,000	<2,500	2,500-5,000	5,000-10,000	10,000-12,000	12,000-18,000

Setting the Scene – “Emma Maersk”



Münchener Rück
Munich Re Group

Emma Maersk

Length:	397m
Draft:	15m
Width:	56m
Height:	63m
Capacity:	11,000 container
Cost:	\$145m
Crew size:	13 people
Speed:	27 knots
Route:	Asia-to-Europe Service (63 days)
Start Service:	Sept 2006

**Longer than the
Tokyo Tower is
tall**

**Wider than the
width of a football
field**

**Hold 11,000
20-foot-long
containers or
even more**

... and it floats!

Source: www.hamptonroads.com (Aug/2006)

Outlook: Industry vs (Re-)Insurance



Münchener Rück
Munich Re Group

These dynamic developments for the shipping and trade industry present a very positive outlook.

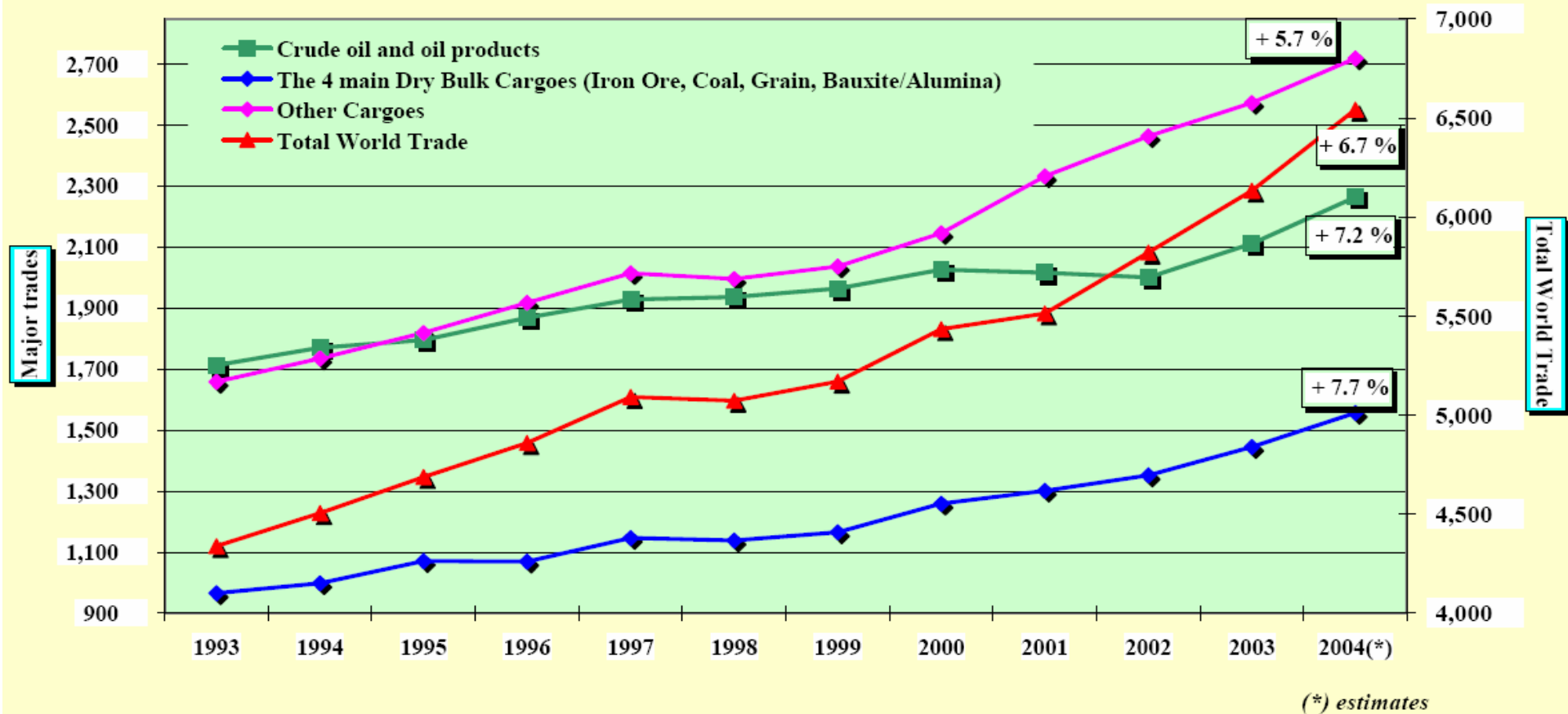
What about the outlook for the (re-)insurance industry?

Global Market Development – World Seaborne Trade Volume



Münchener Rück
Munich Re Group

Development 1993-2004 (in million tonnes) - Growth rate in 2004



Source: Indicators issued from various sources such as ISL Bremen for World fleet and trading figures (as at June 2005) and Clarkson Research Studies for shipbuilding and scrapped vessels (as at June 2005).

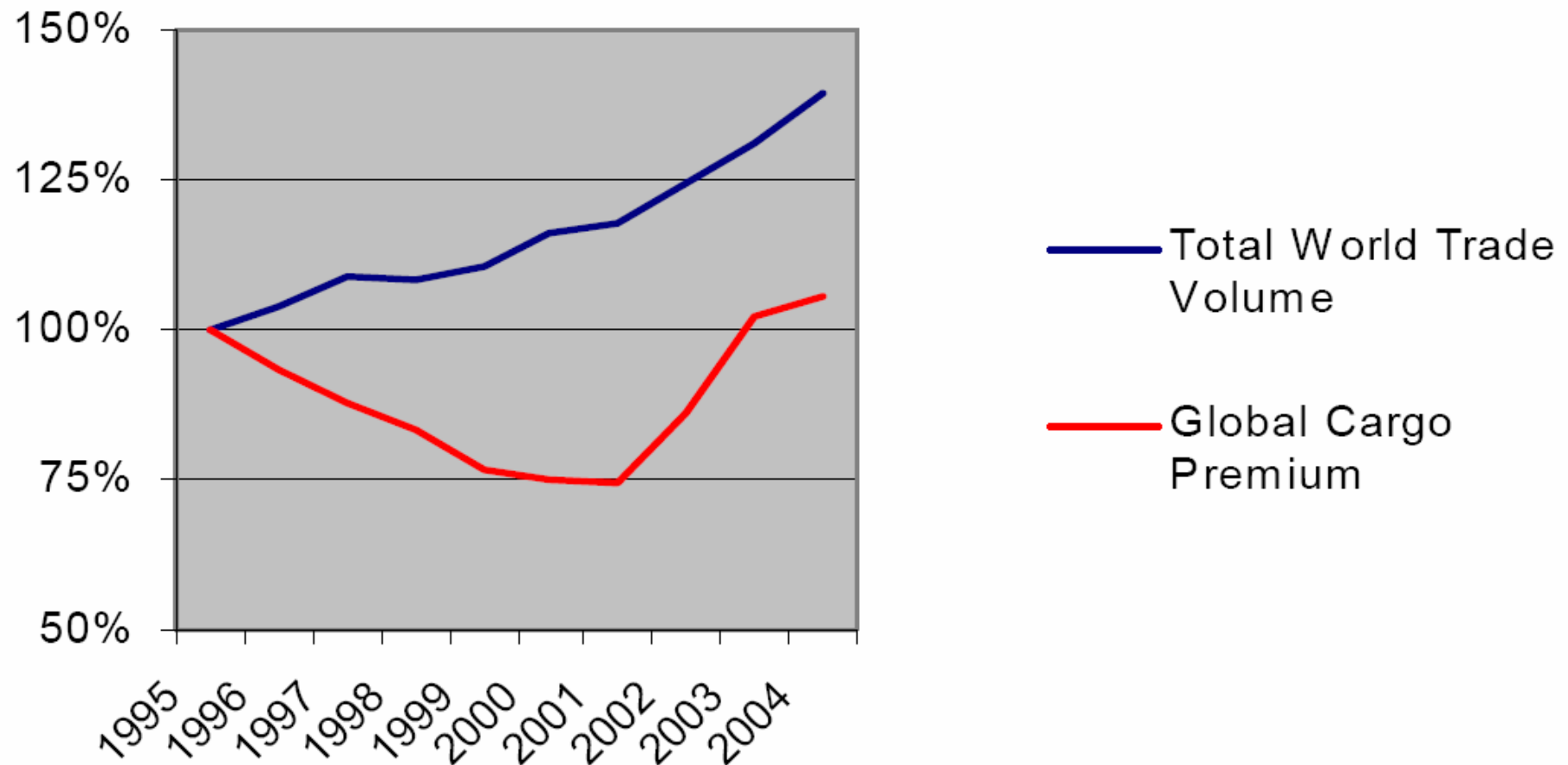
Global Market Development –

World Seaborne Trade Volume and Global Cargo Premium



Münchener Rück
Munich Re Group

Index of evolution, 1995 = 100%

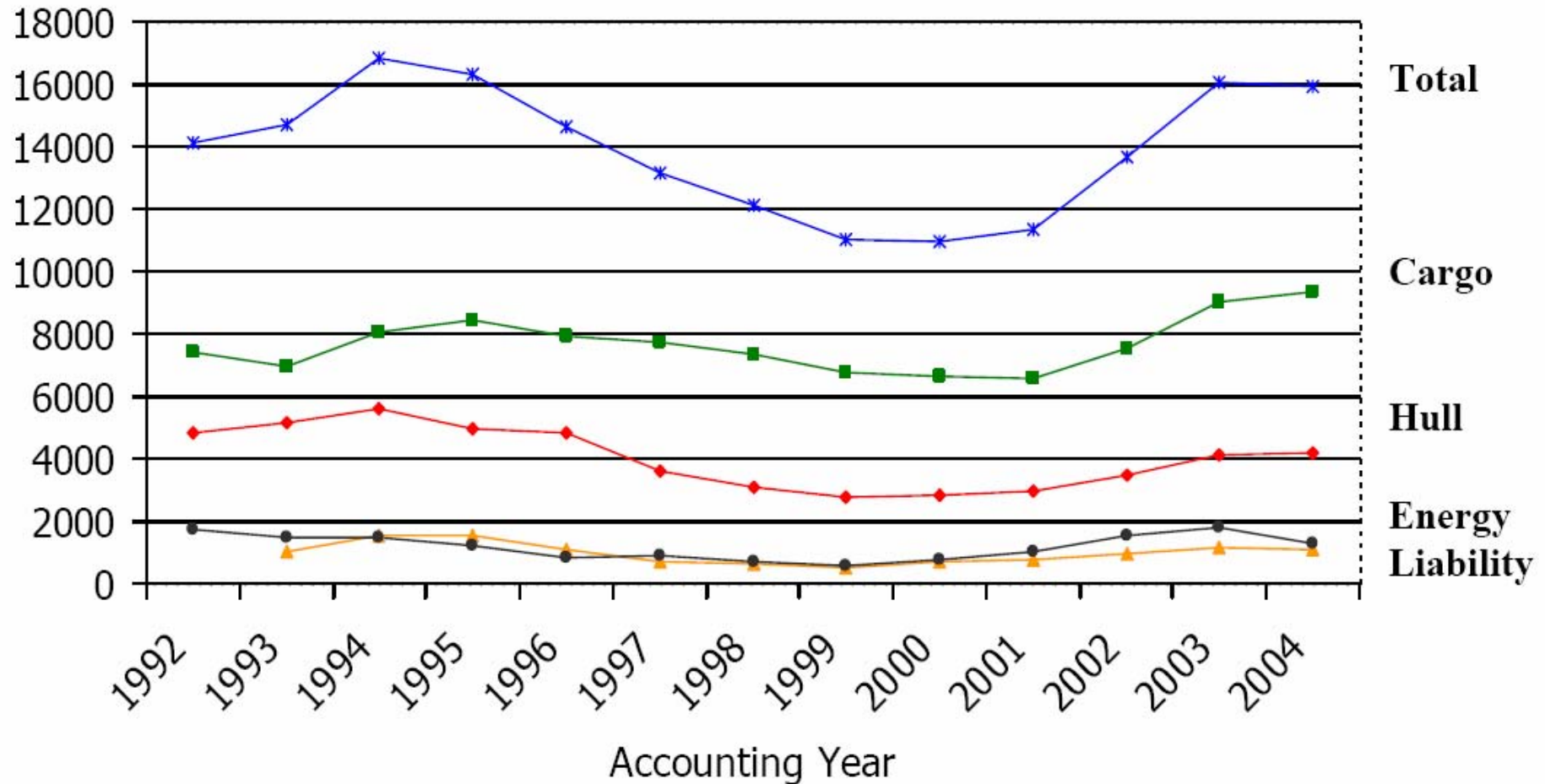


Source: Indicators for World Trade Volume from ISL Bremen

Global Market Development – Premium Volume Marine Worldwide (US \$ mio.)



Münchener Rück
Munich Re Group



A substantial part of the volume increase since 2001 is due to a weakening of the US\$ against other currencies.

Worst Case Scenario



Münchener Rück
Munich Re Group

The maximum loss that might be expected, at a cautious estimate, to occur as a single loss event, taking into consideration all the circumstances of the risk.

Our Assumption:

The worst case scenario we need to consider as marine cargo Underwriters is the total loss of an ultra large container carrier...

What could cause such an event?

Vessel

Cargo

External

Risk Factors for Large Container Vessels



Münchener Rück
Munich Re Group

The new generation of ULCS requires several economic and operational considerations:

Source: ABS Publication, "Giants in the Container Industry; www.eagle.org

Economic Risks	<ul style="list-style-type: none">→ Service Speed→ Maintenance→ Draft Restrictions→ Container Configurations
Operational Risks	<ul style="list-style-type: none">→ Green Water→ Lashing Arrangement→ Vessel Motions (Parametric Roll)→ Vibration→ Machinery→ Human Error
Combination of Risk Factors that will result in total loss of vessel	

Can these vessels sink?
YES!

Example from our Colleagues in the Space Dpt



Münchener Rück
Munich Re Group



Loss History of Container Ships



Münchener Rück
Munich Re Group

Date	Ship	Cause
Nov 1998	APL China	Weather conditions (typhoon)
July 1999	CMA Djakarta	Fire/Explosion due to hazardous cargo
Aug 1999	Ever Decent	Collision
July 2001	Torm Alexandra	Incorrect ballast / lifting a heavy container
Oct 2002	Alva Star	Operating/Navigational error
Nov 2002	Hanjin Pennsylvania	Fire/Explosion due to dangerous + undeclared cargo (CaHypoCl)
Sept 2005	Fowairet	Grounding for unknown reasons
Dec 2005	APL Panama	Human Error – Grounding
Mar 2006	Hyundai Fortune	Explosion (source unknown)
June 2006	Emma Maersk	Fire during welding works
Aug 2006	YM Green	Fire due to containerized Cargo

Source: www.containershipping.nl/casualties.html

Have we been lucky so far?

Cargo – the Risks



Münchener Rück
Munich Re Group

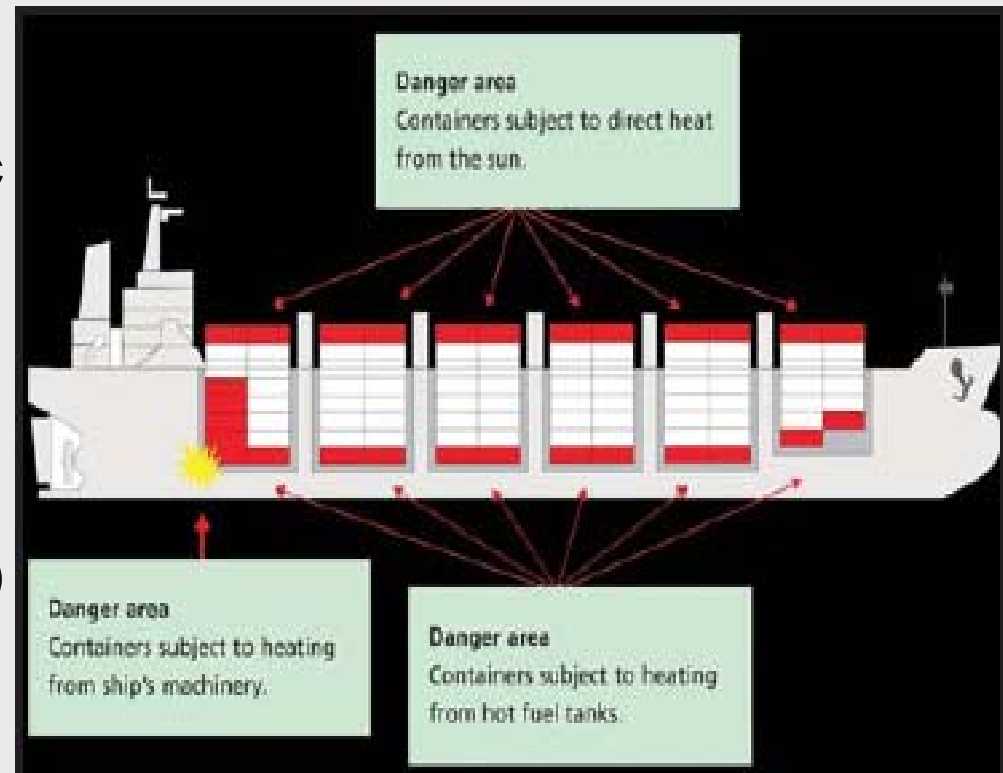
Fire – the largest risk

Carriage of Dangerous goods remains as our biggest threat

Only 57% of fireworks met basic quality standards, with banned chemicals and poor packaging

Factors, such as ..

- Temperature
- Packaging (how and when)
- Contamination
- Manufacture Process
- Labeling

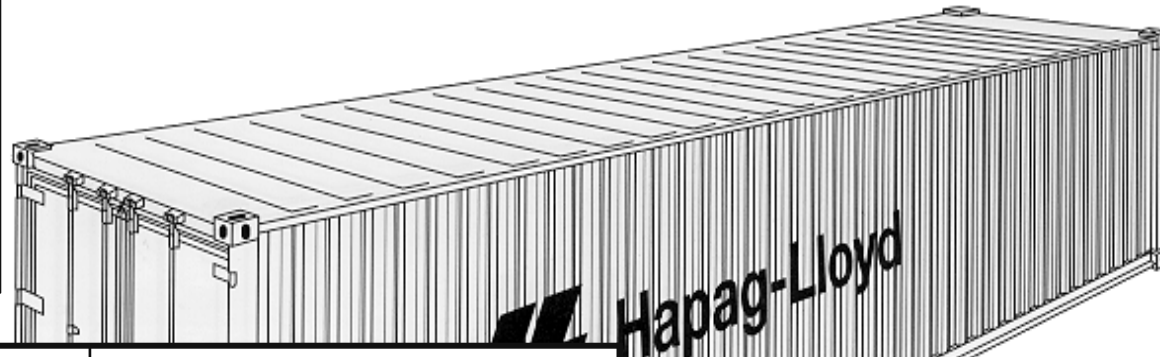


Need to imbed a concept of professionalism that recognizes that mistakes in loading on dry land can lead to explosions on the high seas!

Cargo – Voices of Average Values Estimated



Münchener Rück
Munich Re Group



European Insurer	117 000
Claims Adjusters	80 000 – 85 000
Container Conference Rotterdam	210 000
Press Release “Directions Magazine”	185 000
Recent Loss Consignment	92 000
MR Assumption	80 000 – 100 000

The Result – Total Loss Scenario



Münchener Rück
Munich Re Group

Cargo = 11 000 TEU x USD 80 000 = USD 880 000 000

Hull = USD 145 000 000

Total Potential Loss = USD 1,025bn





The Result – Worst Case Scenario

Cargo = 14 500 TEU x USD 100 000 = USD 1,450bn

Hull = USD 145 000 000

P&I = USD 500 000 000 (or even more)

Total Potential loss = USD 2,095bn



100 Largest Container Ships in the world



Münchener Rück
Munich Re Group

Largest ships

Biggest Ships in the World, listed by TEU capacity

Built	Name	Length o.a.	Beam	TEU	GT	Owners/Flag
2006	Emma Mærsk	393.0 m	56.4 m	14.500 (maximum TEU)	151.687	Maersk Line/Denmark
2006	Georg Mærsk	367.28 m	42.8 m	10.150	97.933	Maersk Line/Denmark
2006	Gerd Mærsk	367.3 m	42.8 m	10.150	97.933	Maersk Line/Denmark
2005	Gjertrud Mærsk	367.3 m	42.8 m	10.150	97.933	Maersk Line/Denmark
2005	Grete Mærsk	367.3 m	42.8 m	10.150	97.933	Maersk Line/Denmark
2005	Gudrun Mærsk	367.3 m	42.8 m	10.150	97.933	Maersk Line/Denmark
2005	Gunvor Mærsk	367.3 m	42.8 m	10.150	97.933	Maersk Line/Denmark
2006	Xin Los Angeles	336.7 m	45.6 m	9.580	107.200	China Shipping Container Lines (CSCL)/Hong Kong
2006	Cosco Beijing	350.0 m	42.8 m	9.469	99.833	Costamare Shipping/Greece
2006	Cosco Hellas	350.0 m	42.8 m	9.469	99.833	Costamare Shipping/Greece
2006	Cosco Guangzhou	350.56 m	42.8 m	9.469	99.833	Costamare Shipping/Greece
2006	Cosco Ningbo	350.0 m	42.8 m	9.469	99.833	Costamare Shipping/Greece
2006	Cosco Yantian	350.0 m	42.8 m	9.469	99.833	Costamare Shipping/Greece
2006	CMA CGM Fidelio	350.0 m	42.8 m	9.415	99.500	CMA CGM/France
2006	CMA CGM Medea	350.6 m	42.8 m	9.415	95.000	CMA CGM/France
2003	Arnold Mærsk	350.5 m	42.8 m	9.310	93.496	Maersk Line/Denmark
2003	Anna Mærsk	342.6 m	42.8 m	9.310	93.496	Maersk Line/Denmark
2004	Albert Mærsk	342.6 m	42.8 m	9.310	93.496	Maersk Line/Denmark
2004	Adrian Mærsk	342.6 m	42.8 m	9.310	93.496	Maersk Line/Denmark
2003	Arthur Mærsk	342.6 m	42.8 m	9.310	93.496	Maersk Line/Denmark
2003	Axel Mærsk	342.6 m	42.8 m	9.310	93.496	Maersk Line/Denmark
2006	MSC Esthi	335.0 m	45.8 m	9.200	99.500	MSC/Liberia
2005	MSC Pamela	336.7 m	45.6 m	9.200	90.449	MSC/Liberia
2005	MSC Susanna	321.0 m	45.6 m	9.200	90.449	MSC/Liberia
2005	MSC Chicago	321.0 m	45.6 m	9.200	90.449	Offen Claus-Peter/Liberia
2005	MSC Bruxelles	321.0 m	45.6 m	9.200	90.449	Offen Claus-Peter/Liberia
2006	MSC Madeleine	348.50 m	42.8 m	9.100	107.551	MSC/Liberia
2006	MSC Ines	348.50 m	42.8 m	9.100	107.551	MSC/Liberia
2002	Charlotte Mærsk	347.0 m	42.8 m	8.890	91.690	Maersk Line/Denmark
2002	Clementine Mærsk	347.0 m	42.8 m	8.890	91.690	Maersk Line/Denmark
2002	Columbine Mærsk	347.0 m	42.8 m	8.890	91.690	Maersk Line/Denmark
2002	Cornelia Mærsk	347.0 m	42.8 m	8.890	91.690	Maersk Line/Denmark
2005	Colombo Express	335.5 m	42.8 m	8.749	93.750	Hapag-Lloyd/Germany
2006	Chicago Express	335.5 m	42.8 m	8.749	93.750	Hapag-Lloyd/Germany
2005	Kyoto Express	335.5 m	42.8 m	8.749	93.750	Hapag-Lloyd/Germany
1999	Clifford Mærsk	347.0 m	42.8 m	8.680	91.690	Maersk Line/Denmark
1998	Sally Mærsk	347.0 m	42.8 m	8.680	91.690	Maersk Line/Denmark
1998	Sine Mærsk	347.0 m	42.8 m	8.680	91.690	Maersk Line/Denmark
1999	Skagen Mærsk	347.0 m	42.8 m	8.680	91.690	Maersk Line/Denmark
1998	Sofie Mærsk	347.0 m	42.8 m	8.680	91.690	Maersk Line/Denmark
1999	Sorø Mærsk	347.0 m	42.8 m	8.680	91.690	Maersk Line/Denmark
1997	Sovereign Mærsk	347.0 m	42.8 m	8.680	91.690	Maersk Line/Denmark
1997	Susan Mærsk	347.0 m	42.8 m	8.680	91.690	Maersk Line/Denmark

1999	Svend Mærsk	347.0 m	42.8 m	8.680	91.690	Maersk Line/Denmark
1998	Svendborg Mærsk	347.0 m	42.8 m	8.680	91.690	Maersk Line/Denmark
2000	A.P. Møller	347.0 m	42.8 m	8.660	91.690	Maersk Line/Denmark
2000	Caroline Mærsk	347.0 m	42.8 m	8.660	91.690	Maersk Line/Denmark
2000	Carsten Mærsk	347.0 m	42.8 m	8.660	91.690	Maersk Line/Denmark
2001	Chastine Mærsk	347.0 m	42.8 m	8.660	91.690	Maersk Line/Denmark
2001	Cornelius Mærsk	347.0 m	42.8 m	8.660	91.690	Maersk Line/Denmark
2001	Laura Mærsk	266.0 m	37.0 m	8.660	50.721	Maersk Line/Denmark
2004	CSCL Europe	334.00 m	42.80 m	8.498	90.645	Allocean Maritime/Cyprus
2005	CSCL Africa	334.00 m	42.9 m	8.468	90.645	Seaspan Container Line/Cyprus
2004	CSCL America	334.00 m	42.9 m	8.468	90.645	Allocean Maritime/Cyprus
2004	CSCL Asia	334.00 m	42.9 m	8.468	90.645	Seaspan Container Line/Hong Kong
2004	CSCL Oceania	334.00 m	42.9 m	8.468	90.645	Seaspan Container Line/Hong Kong
2006	Mærsk Seville	335.0 m	42.8 m	8.452	94.724	Blue Star GmbH/Liberia
2005	Mærsk Santana	335.0 m	42.8 m	8.452	94.724	Blue Star GmbH/Liberia
2006	Mærsk Sheerness	335.0 m	42.8 m	8.452	94.724	Blue Star GmbH/Liberia
2005	Mærsk Samia	335.0 m	42.8 m	8.452	94.724	Blue Star GmbH/Liberia
2005	Mærsk Sydney	335.0 m	42.8 m	8.452	94.724	Blue Star GmbH/Liberia
2005	MSC Rania	332.4 m	43.2 m	8.400	95.000	MSC/Panama
2006	MSC Silvana	332.4 m	43.2 m	8.400	95.000	MSC/Panama
2005	Houston Express	332.4 m	43.2 m	8.400	95.000	Norddeutsche Reederei/Germany
2005	Savannah Express	332.4 m	43.2 m	8.400	95.000	Norddeutsche Reederei/Germany
2006	Mærsk Stralsund	332.4 m	43.2 m	8.400	95.000	Blue Star GmbH/Liberia
2006	Mærsk Saigon	332.4 m	43.2 m	8.400	95.000	Blue Star GmbH/Liberia
2004	CMA CGM Hugo	334.1 m	42.8 m	8.238	90.745	NSB Niederelbe/Germany
2004	CMA CGM Vivado	334.1 m	42.8 m	8.238	90.745	CMA CGM/France
2004	MSC Rachala	334.1 m	42.8 m	8.238	90.745	NSB Niederelbe/Germany
2004	MSC Rialto	334.1 m	42.8 m	8.238	90.745	NSB Niederelbe/Germany
2006	CMA CGM Otello	335.0 m	42.8 m	8.204	89.800	CMA CGM/France
2005	CMA CGM Otello	335.0 m	42.8 m	8.204	89.800	CMA CGM/France
2006	CMA CGM Don Carlos	335.0 m	42.8 m	8.204	89.800	ER Schiffahrt/Liberia
2006	CMA CGM Don Giovanni	335.0 m	42.8 m	8.204	89.800	ER Schiffahrt/Liberia
2006	CMA CGM Parsifal	335.0 m	42.8 m	8.204	89.800	ER Schiffahrt/Liberia
2005	Cosco China	335.0 m	42.8 m	8.204	91.649	ER Schiffahrt/Liberia
2006	Cosco Germany	335.0 m	42.8 m	8.204	89.800	ER Schiffahrt/Liberia
2006	Cosco Napoli	335.0 m	42.8 m	8.204	89.800	ER Schiffahrt/Liberia
2005	MSC Lucy	324.8 m	42.80 m	8.089	89.954	MSC/Panama
2005	MSC Maeva	324.8 m	42.80 m	8.089	89.954	MSC/Panama
2005	MSC Rita	324.8 m	42.80 m	8.089	89.954	MSC/Panama
2005	MSC Busan	324.8 m	42.80 m	8.089	89.954	Offen Claus-Peter/Panama
2005	MSC Beijing	324.8 m	42.80 m	8.089	89.954	Offen Claus-Peter/Panama
2006	MSC Toronto	324.8 m	42.80 m	8.089	89.954	Offen Claus-Peter/Panama
2006	MSC Charleston	324.8 m	42.80 m	8.089	89.954	Offen Claus-Peter/Panama
2005	Ever Champion	339.9 m	42.80 m	8.073	90.449	NSB Niederelbe/Marshall Islands
2005	Ever Charming	339.9 m	42.80 m	8.073	90.449	NSB Niederelbe/Marshall Islands
2006	Ever Chivalry	339.9 m	42.80 m	8.073	90.449	NSB Niederelbe/Marshall Islands
2006	Ever Conquest	339.9 m	42.80 m	8.073	90.449	NSB Niederelbe/Marshall Islands
2006	Ital Contessa	339.9 m	42.80 m	8.073	90.449	NSB Niederelbe/Marshall Islands
2005	Lt Cortesia	339.9 m	42.80 m	8.073	90.449	NSB Niederelbe/Marshall Islands
2006	OOCL Asia	323.0 m	42.80 m	8.063	89.097	OOCL/Hongkong
2005	OOCL Atlanta	323.0 m	42.80 m	8.063	89.000	OOCL/Hongkong
2004	OOCL Hamburg	323.0 m	42.80 m	8.063	89.097	OOCL/Marshall Islands
2003	OOCL Long Beach	323.0 m	42.80 m	8.063	89.097	OOCL/Marshall Islands
2004	OOCL Ningbo	323.0 m	42.80 m	8.063	89.097	OOCL/Marshall Islands
2003	OOCL Shenzhen	322.97 m	42.80 m	8.063	89.097	OOCL/Hongkong
2005	OOCL Tianjin	323.0 m	42.80 m	8.063	89.097	OOCL/Marshall Islands

A Reinsurers Opinion



Münchener Rück
Munich Re Group

- The accumulation aspect in cargo insurance has long been overlooked...
- We can no longer use our old excuses like: “can’t assess the risk”; “cargo is always moving”; “we are not the same as property” and “it will never happen”.
- As the exposure increases so does the focus on marine increase for the capital providers.
- Are we looking in the right area? Is the loss of a ULCS really the worst case scenario for the cargo market?
- **What about onshore Cargo Accumulation?**

Munich Re – Port Exposure Project

In Conjunction with Munich Re Geo Risks Research Dep.



Münchener Rück
Munich Re Group

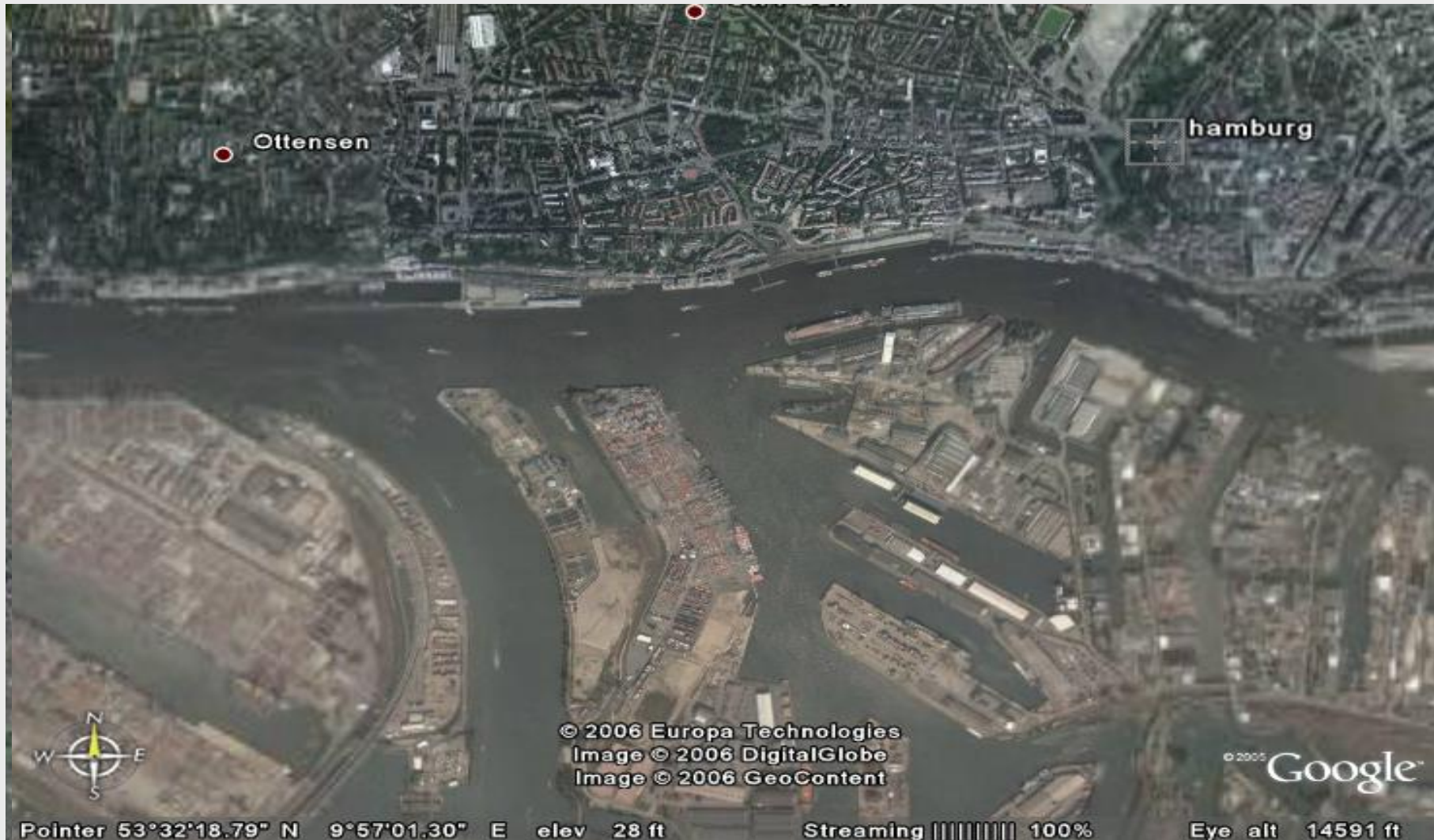


PML Study on Major Ports

Hamburg & Tokyo



Münchener Rück
Munich Re Group



Thank you for your attention.

**Matthew O'Sullivan
Munich Re**