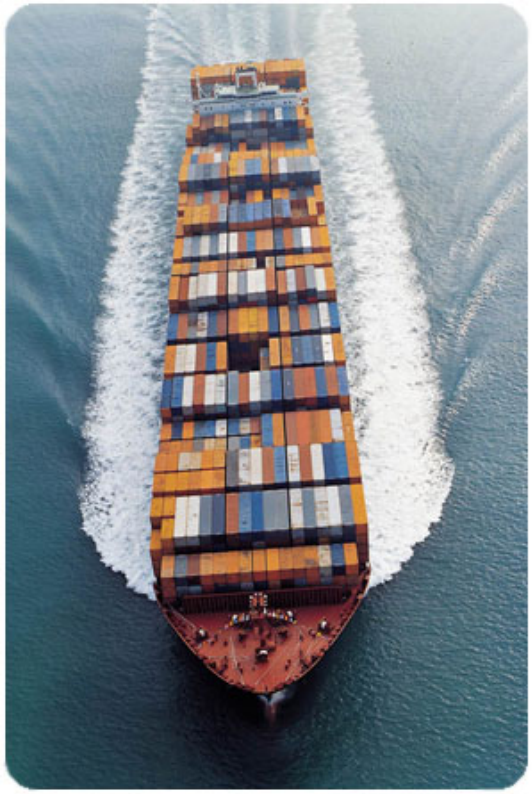
Cargo Accumulation



Anthony Cowie
Swiss Re
September 28, 2007
AIMU/IMUA Seminar
New York, NY

Cargo Accumulation

- Agenda
  - Why are we more concerned today?
  - Accumulation Examples
  - Estimating cargo accumulations – How much is a TEU worth?
  - Accumulation Methodologies
    - Top Down vs. Bottom Up
  - Conclusions

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Why are we more concerned today?

- Issues
  1. Underwriters do not have access to timely shipment information for risks covered under their policies, therefore underwriters do not know their actual aggregate exposure on any single vessel or in any port

  2. This lack of knowledge is causing serious high-level concern with regard to sustainability and solvency. How can you manage an accumulation if you don't realistically know what it is?

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Why are we more concerned today?

- Technological Advances and Increased Trade Leads to Higher Accumulations
  - Higher values of goods shipped
  - Higher number of container vessels
  - Increased size of container vessels
  - Shrinking number of major hub transshipment points
    - Increases cat accumulation

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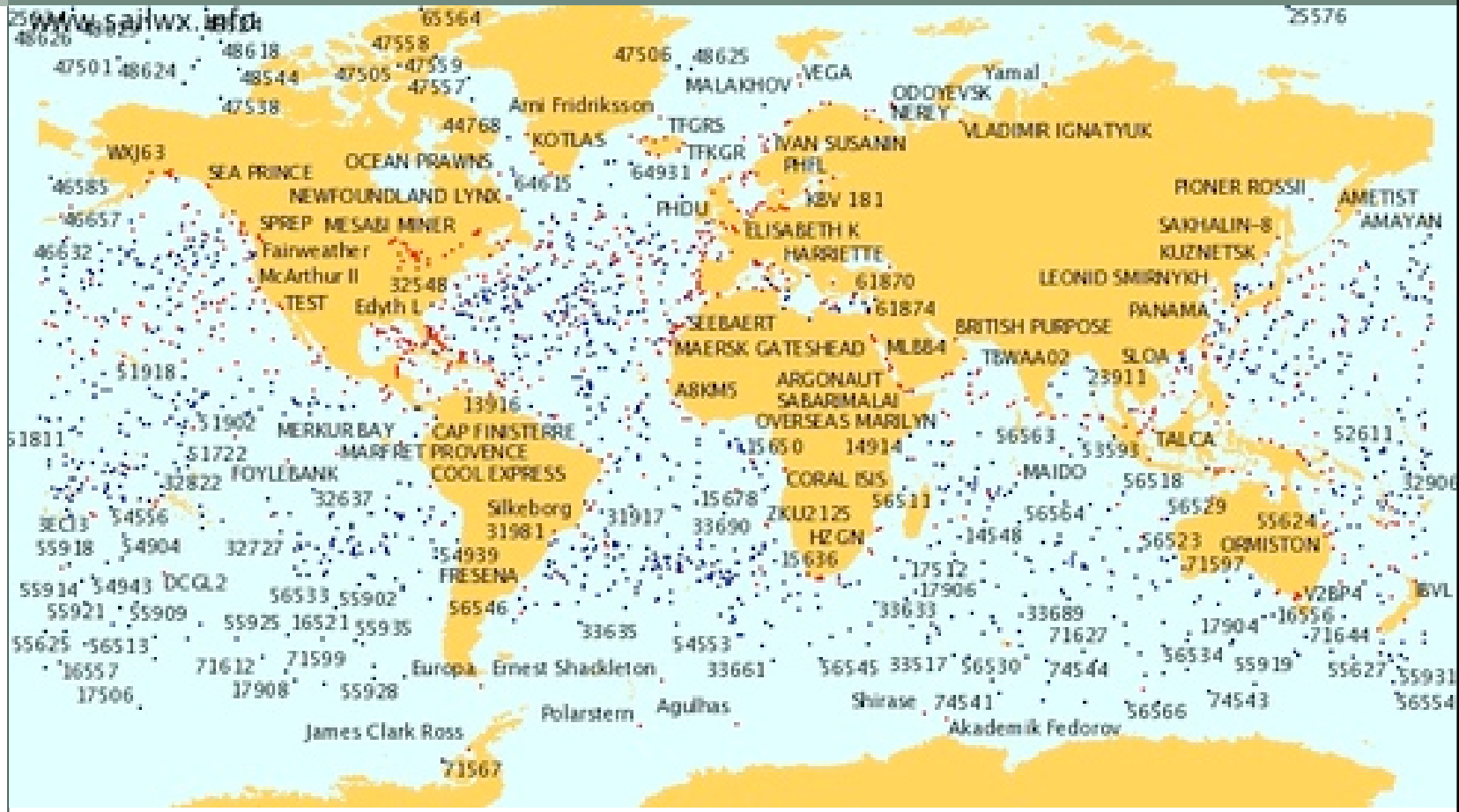
Why are we more concerned today?



Ship Traffic http://www.sailwx.info/

Bigger Ships = Bigger Risks

- Current generation of large container vessels =10,000 TEU Capacity

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Bigger Ships = Bigger Risks

- Next generation of container vessels
  - 12,000 - 18,000 TEU Capacity
  - 22-24 containers across
  - 60m across, 15-21m depth
- Vessel operation limited to small number of deep water ports – increased concentration of risk

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Bigger Ships = Bigger Risks

5,500 TEU
Hyundai Fortune

871 Containers

$200-$300M Loss

Bigger Ships = Bigger Risks

4038 TEU

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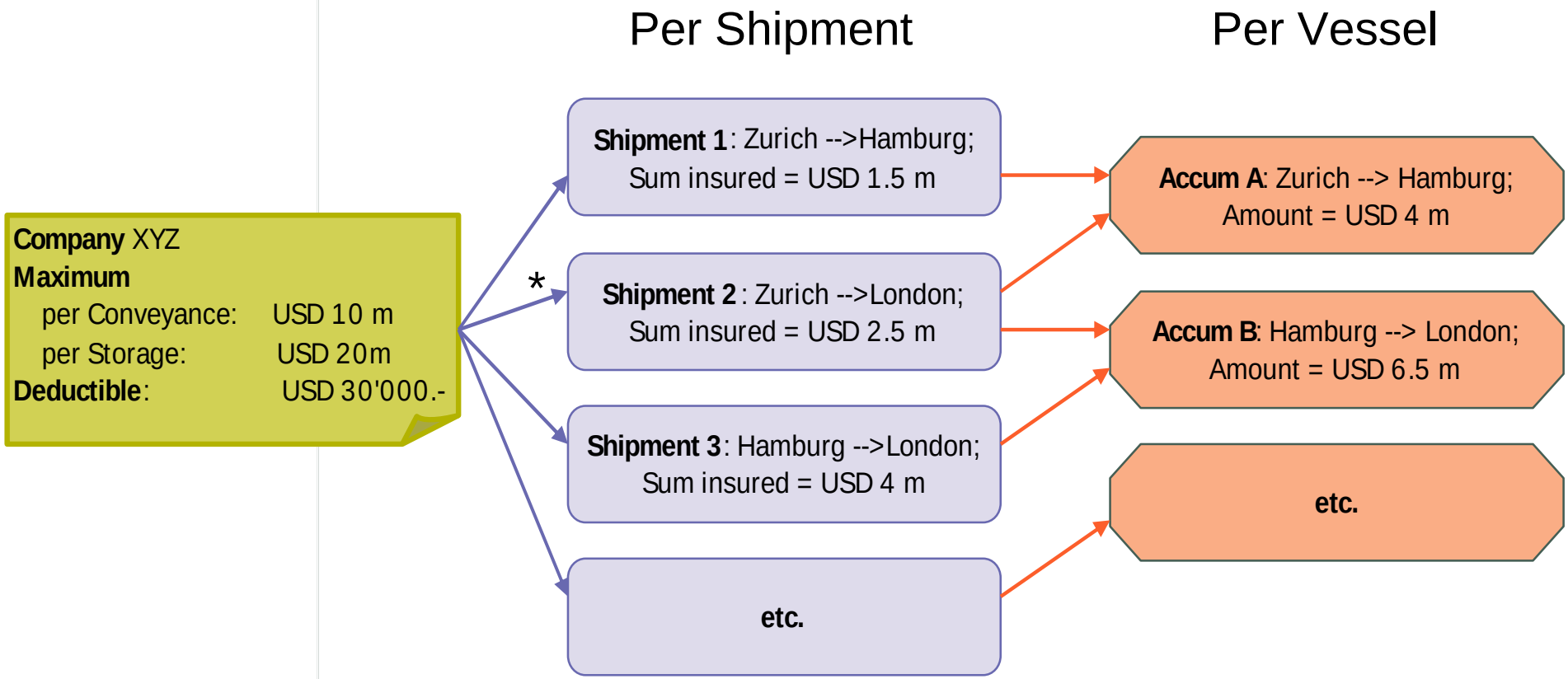
Accumulation Examples

Cargo Accumulation: Transit Routes



* Shipment 2 is Zurich → London via Hamburg

Cargo Accumulation Example: Single Vessel

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Example: One large container vessel, 2 shipments, total loss, max policy limit = $10M

Company A:

- Average value per 20 ft container: $20,000
- Number of containers: 500
- Total Cargo Value: $10,000,000

Company B:

- Average Value per 20 ft container: $50,000
- Number of Containers: 200
- Total Cargo Value: $10,000,000

=> Cargo Claim for Each Insured = $10,000,000
=> Cargo Claim for Combined Insureds = $20,000,000

A company that purchases only $10M of excess of loss reinsurance based on their maximum individual policy limit will be underinsured for an occurrence.

Potential of $200M to $850M total exposure for largest vessels.

Cargo Accumulation Example: Multiple Vessels

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Example: Two large container vessels collide, multiple insureds, total loss, max policy limit = $10M

Vessel A:

- Average value per 20 ft container: $25,000
- Number of containers: 800
- Total Cargo Value: $20,000,000

Vessel B:

- Average Value per 20 ft container: $25,000
- Number of Containers: 800
- Total Cargo Value: $20,000,000

=> Cargo Claim for Each Insured = $10,000,000
=> Cargo Claim for Combined Insureds = $40,000,000

A company that purchases only $10M of excess of loss reinsurance based on their maximum individual policy limit will be underinsured by $30M in this case.

Potential of $400M to 1.7B+exposure for collision of 2 large

Port Accumulations

- In addition to amounts in transit, insurers also need to consider the accumulation at a particular port.
  - Warehouse Exposure: Goods sitting in port
  - Container Traffic: Goods passing through port
- Main exposure is catastrophe, similar to a Property Contents exposure
- Insurers will sometimes overlook this exposure in their rating
- Here too, open type policies do not provide sufficient detail to calculate port accumulations (e.g. principle ports)

Port Accumulations: Top Down Method for Estimation

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- Container Volumes – Annual and daily throughput figures available on the Web and from industry sources
- Container Values – Average value of goods, same considerations as for Cargo accumulations above
- Average Time in Port – Assume some value, typically several days
- Need to consider seasonality
- Transshipment ports accumulate goods at higher values than direct import ports

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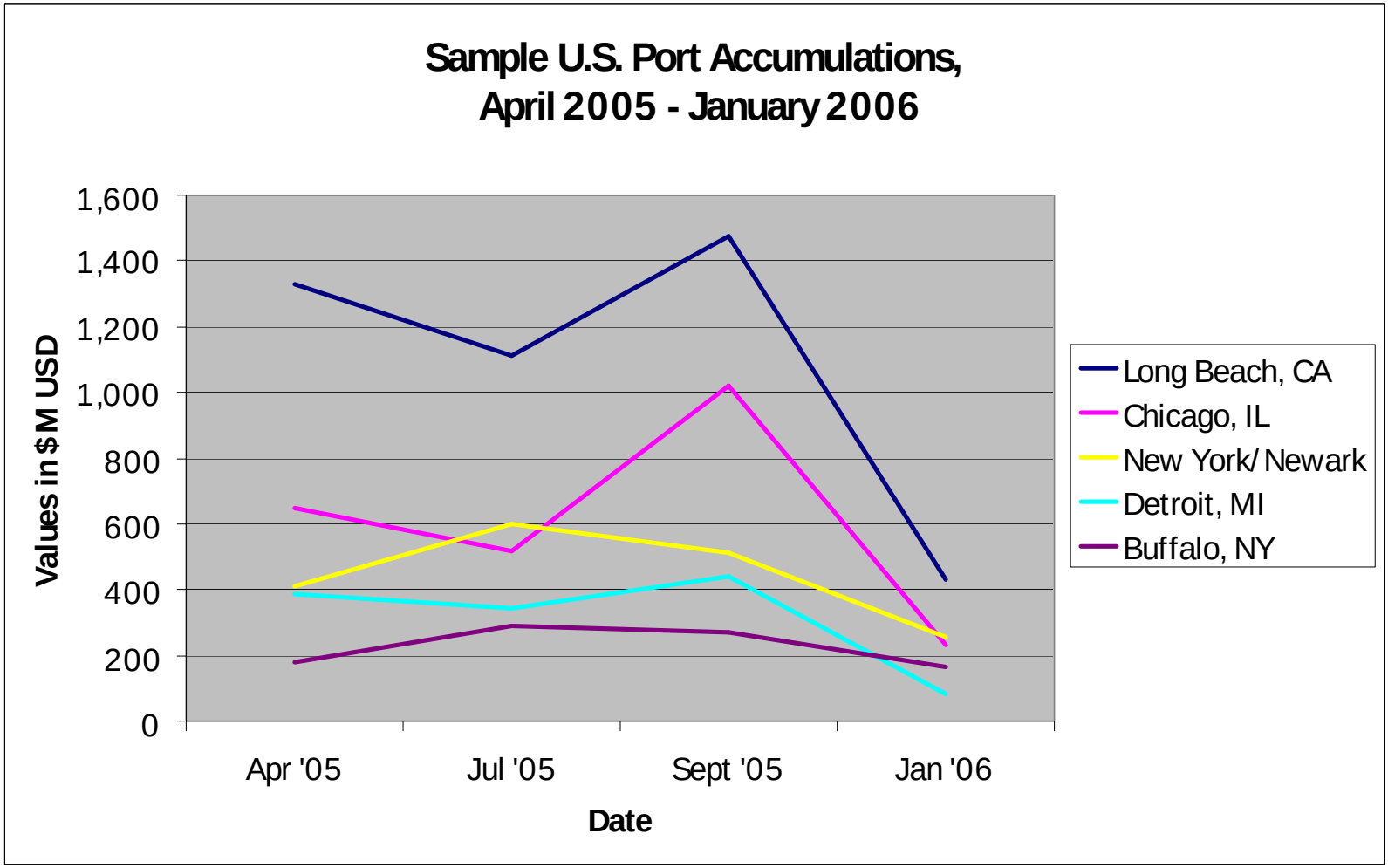
U.S. Port Accumulations – Average Daily



Source: U.S. Customs Data

Cargo Accumulations: Estimation Difficulties

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- Open policies with a rate on annual turnover
  - No declaration of shipments in advance
- Can limit the exposure per vessel for each policy/client, but cannot limit the aggregation of clients per any one vessel
- Currently impossible to monitor the accumulation on board a vessel due to unavailable or difficult to retrieve information:
  - Which clients have shipments on vessel
  - The total value of those shipments

Estimating cargo accumulations – How much is a TEU worth?

Estimating cargo accumulations – How much is a TEU worth?

- TEU average value estimates
- Top down accumulation analysis
- Bottom up accumulation analysis
- Where do we go from here?

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Average TEU Value Estimates

Source	Average Value
Matthew O'Sullivan – IUMI 2006	$80,000 - $210,000
Munich Re: Estimate	$80,000 - $100,000
XL Re Studies	$35,000 - $120,000
Hyundai Fortune (Multiple sources)	$204,000 - $300,000
MSC Carla (AIMU RI Committee Survey)	$74,000
APL China (AIMU RI Committee Survey)	$211,000
Guy Carpenter: Japan – LA	$90,000
Guy Carpenter: LA – Japan	$30,000
AIMU Reinsurance Committee	$95,000

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Average TEU Value Estimates

Route	*Average Value*	*Standard Deviation*
North America – Asia	$17,795	$102,163
North America - Europe	$28,480	$76,081
Europe - Asia	$21,663	$89,863
Europe – North America	$26,424	$55,020
Asia – North America	$30,477	$41,517
USA – China	$10,840	$64,077
USA – Japan	$77,144	$301,929
USA - Australia	$22,065	$51,267

Oceanwide Actual Container Values

Vessel Accumulations

Top Down Vessel Accumulation

- Select TEU Estimate
- Multiply X worst case maximum TEU per vessel
- Multiply X 2 for collision
- Multiply by insurer market share
- $100,000/TEU * 12,000 TEU * 2 * 2% = $48,000,000

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Port Accumulations

Hong Kong container terminal at Kwai Chung

Top Down Port Accumulation

- Select TEU Estimate
- Port turnover / 300 days * 3 days avg stay
  - 200-250K TEU – Asian ports
  - 150K TEU – LA/Long Beach
  - 50-100K TEU – European ports
- Multiply by insurer market share
- 100,000 *150,000* 2% = $300,000,000

Note: Port turnover estimates from Oceanwide

Concerns with Top Down Vessel / Port Accumulation

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- Average TEU Value Estimates
  - Big variances in estimates
  - No weight given to commodity & route differences
- Market share assumptions
  - Can vary widely by port, route and commodity
- Vessel Worst Case assumes a collision with 2 totals – can you get a realistic PML for this?
- Seasonal fluctuations

Bottom Up Vessel Accumulation – "Back to the Future"

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- Eliminate the current Open Cargo Policy on a turnover basis.
- Design web based cargo policy requiring the declaration in advance of all shipments.
- Real time data will then be available for an insurer to track vessel / port accumulations and develop aggregates across a portfolio.
- Could be coupled with Radio Frequency (RF) or GPS identification systems to track static accumulations and entire transit through multi-modal transport systems.

Bottom Up Vessel Accumulation – "Back to the Future"

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- With today's IT systems it should be possible
  - Clients use EDP systems for the administration of the purchase and distribution of their goods
  - The forwarders use EDP systems for the administration of their orders
  - Effectively the entire supply chain use some kind of EDP tracking system.
- Assuming it is possible to match all such data, single declarations of shipments should be feasible
- Side benefit: Client "Stickiness"

Concerns with Bottom Up Vessel Accumulation

- Will my clients / brokers agree to change the way they do business?
- Who will pick up the IT costs?
- If my companies insist in moving in this direction and my competitors don't, will I lose business?
- Do the benefits outweigh the costs and risks?

Cargo Accumulation: Practical Impact of Bottom Up Solutions

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- Cargo insurers will have better knowledge of actual shipments and there values and will realize revenue for exposure covered
- Policies should generate increased premium volume (unless the technical rates are reduced correspondingly)
- By aggregating the per shipment data, insurers will gain a greater understanding of the accumulation exposure
- This data should enable insurers to model and forecast expected catastrophic loss scenarios
- Better information to guide portfolio balance and protection

Cargo Accumulations: Conclusions

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- Cargo accumulations are difficult to calculate
- Accumulation methods and models are in their infancy
- Greater transparency is needed to understand and control the exposure
- Potential for catastrophic loss is very real
- New ideas and methods are needed to keep cargo underwriters profitable
- Reinsurance can play a major role in protecting cargo portfolios
- Potential benefits of Bottom Up outweigh the downside
- Solvency II

Cargo Accumulations: Any Questions?