AIMU MARINE INSURANCE ISSUES SEMINAR

CARGO MODELING UPDATES

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AGENDA

- Background
- Latest Cargo CAT Model developments
- Lessons learned from recent Marine Cargo CAT events
- Discussion
RMS is the world’s leading provider of products and services for the quantification and management of catastrophe risk.

- Work with most major insurance and reinsurance companies in US & Europe
- $2 trillion worth of insurance and capital markets transactions based on RMS Risk Models
- Trusted by regulators and rating agencies for over 25 yrs
- RMS catastrophe risk models used for rated capital market transactions
- First company to develop a Cargo & Specie Cat Model
SCOPE OF THE CARGO CAT MODEL

- **CAT Perils** modeled for Cargo & Specie:
  - EQ: 76 Countries
  - Wind (and surge): 63 Countries
  - Severe Convective Storm: United States & Canada
  - US Flood (new addition in 2019)
  - **Perils Coming Soon:**
    - EU Flood (15 countries)
    - EU SCS (15 countries)

- **Port Exposure Databases:** 51 Hi-resolution, 134 Standard-resolution (representing 80% of global tonnage)

- **Cargo & Specie modeled:** 100% of Cargo bucketed into 18 categories, 12 storage types: over 200 vulnerability curves per peril PLUS secondary modifiers

- Other Marine Lines modeled: Offshore Platforms & Yacht

- **Question for potential future development,** do you have significant interest in any of the following:
  - Terrorism
  - Fire & Explosion
  - Hull: Attritional risk and/or Builders Risk
  - Offshore Platform (other than Gulf)
NATURAL CATASTROPHE RISK IN THE US

Perils modeled shown: HU, EQ, SCS
MARINE CARGO IS HIGHLY DIVERSE

What is being shipped?

Cargo & Specie Risks

Public domain photo

Getty Images

http://www.crowley.com

http://www.nskcontracting.com
SAME PERIL – DIFFERENT DAMAGE

- If a Hurricane causes storm surge of 3’ at the same port

Damage to bottom level container mostly

Some of it may be washed away

Degree of damage depends on storage, packaging and protection

Significant Damage

http://www.crowley.com

http://www.nskcontracting.com

Getty Images

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RELATIVE AAL BY CARGO TYPE AND BY PERIL
MODELING HURRICANE RISKS TO WATERCRAFT

- Boat Length – Small vs. Medium vs. Large
- Motor vs. Sail
- Inside Building vs. Outside
WATERCRAFT DAMAGE IN HURRICANES

- Watercraft losses driven by **Storm Surge** & less so by Wind
- **Anchoring, Tie-downs, Clearance above ground** for boats stacked onshore affect loss potential
- **Haul away** likelihood influenced by Captaincy & Warranty requirements
Offshore Platform Modeling

Andrew (1992) ~$3bn industry loss
- Andrew caused severe damage - triggered design code improvements

Lili (2002) ~$2bn industry loss
- Exposed newly developed deepwater structures and mobile rigs

RMS Offshore Platform Model first released 2003, updated in 2006 and 2011

Ivan (2004) ~$2bn industry loss
- Submarine landslides in Mississippi Delta region drove loss of production losses

Katrina & Rita (2005) ~$15bn industry loss
- Record-breaking activity – affected almost the entire Gulf of Mexico exposure between them with unprecedented damages

Gustav & Ike (2008) ~$9bn industry loss
- Significantly affected almost all GOM exposure once again; Ike brought high waves as well as winds
LESSONS LEARNED FROM RECENT MARINE CATASTROPHES
Lessons Learned from Recent CAT Events:

SUPER TYPHOON JEBI: JAPAN SEPTEMBER 2018

Kobe City

Port Island:
- Flooding reported, no visible damage

Rokko Island:
- Containers damaged due to surge and wind
- Containers washed away by surge (some empty?)
- Severe auto damage
- Nearby Ferrari dealer: 51 autos damaged
In a major CAT event, Marine Cargo losses can be highly correlated with other lines
- Property
- Liability
- Workers Comp
- ........

Marine Cargo losses ($3B) from HU Sandy added over 15% to the Property losses of $18B

Water can cause as much, or more damage than wind in a hurricane

**Marine Cargo Cat risk needs to be managed in conjunction with Property CAT risk and other lines**
Understanding your Cargo exposure is essential to understanding and managing your risk:
- **WHAT** type of Cargo is it
- **HOW** is it stored
- **WHERE** is it Stored
- **VALUE** of Cargo

For some types of Cargo you need to understand some secondary characteristics: eg Fine Art & Specie (protection, sprinklers, packaging….)

**Cargo CAT risk can vary wildly based on what kind of cargo it is, how its stored and where its stored**
NEXT FRONTIER OF CARGO MODELING….

- Cargo in transit remains a “known unknown” for exposure aggregation
  - Ports
  - Free Ports
  - Container ships
  - Warehouses
- Marine industry’s greatest exposure aggregations are often NOT quantified
- Cargo can face a spectrum of risks over the course of shipment

**Sharing of shipping information would improve Cargo Risk Management**
“STUFF” HAPPENS

- Some Major Ports hold over $10B of Cargo on a given day
- Ports are sometimes used for “convenient storage” (eg autos)
- The close proximity of Cargo storage makes it susceptible to CAT events: Quake, Wind, Hail, Flood, Liquefaction, Fire & Explosion……..

Lessons Learned from Recent CAT Events:

Can Cargo handling processes be improved to reduce risk at major ports
CARGO CYBER RISK IS REAL!

- NotPetya Malware Attack
  - Maersk forced to shutdown operations in 76 ports
  - Business interruption loss > $300M

- Drug ring hacked into Antwerp & Rotterdam shipping systems to re-route containers with smuggled drugs
  - Phising and malware attacks aimed at Port employees to gain system access
  - 2 Tonnes of Cocaine & Heroine captured

- RMS model scenario: Hackers re-route valuable cargo could cause up to $5B+ in stolen cargo and perishable goods (delay in delivery)

Marine Cargo is susceptible to Cyber attack resulting in material theft loss and immeasurable Port BI
In areas of high CAT risk (e.g., CA EQ, FL HU), the CAT component of Cargo risk is material and can vary widely across geography.

Applying a uniform CAT load may price you out of certain business and/or cause you to be adversely selected against.

Risk-Specific underwriting will greatly improve risk selection and/or pricing in such areas.

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DISCUSSION