2017 Offshore Energy Workshop Review

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LOC Group Ltd

LILLEHAMMER ENERGY CLAIMS CONFERENCE

IUMI 2017 TOKYO September 17-20

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- Introduction to the Committee
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- 2017 Workshop Review and Key Takeaways
- IUMI 2018 (Capetown)

Introduction To The Offshore Energy Committee

Introduction to the OEC

IUMI Vision
To be the influential and trusted voice of global marine insurance.

Mission
Consistently raising professional standards in marine insurance through:

- Timely and topical information, statistics and risk expertise
- Education, insight and guidance
- Networking opportunities
- Effective lobbying

Introduction to the OEC

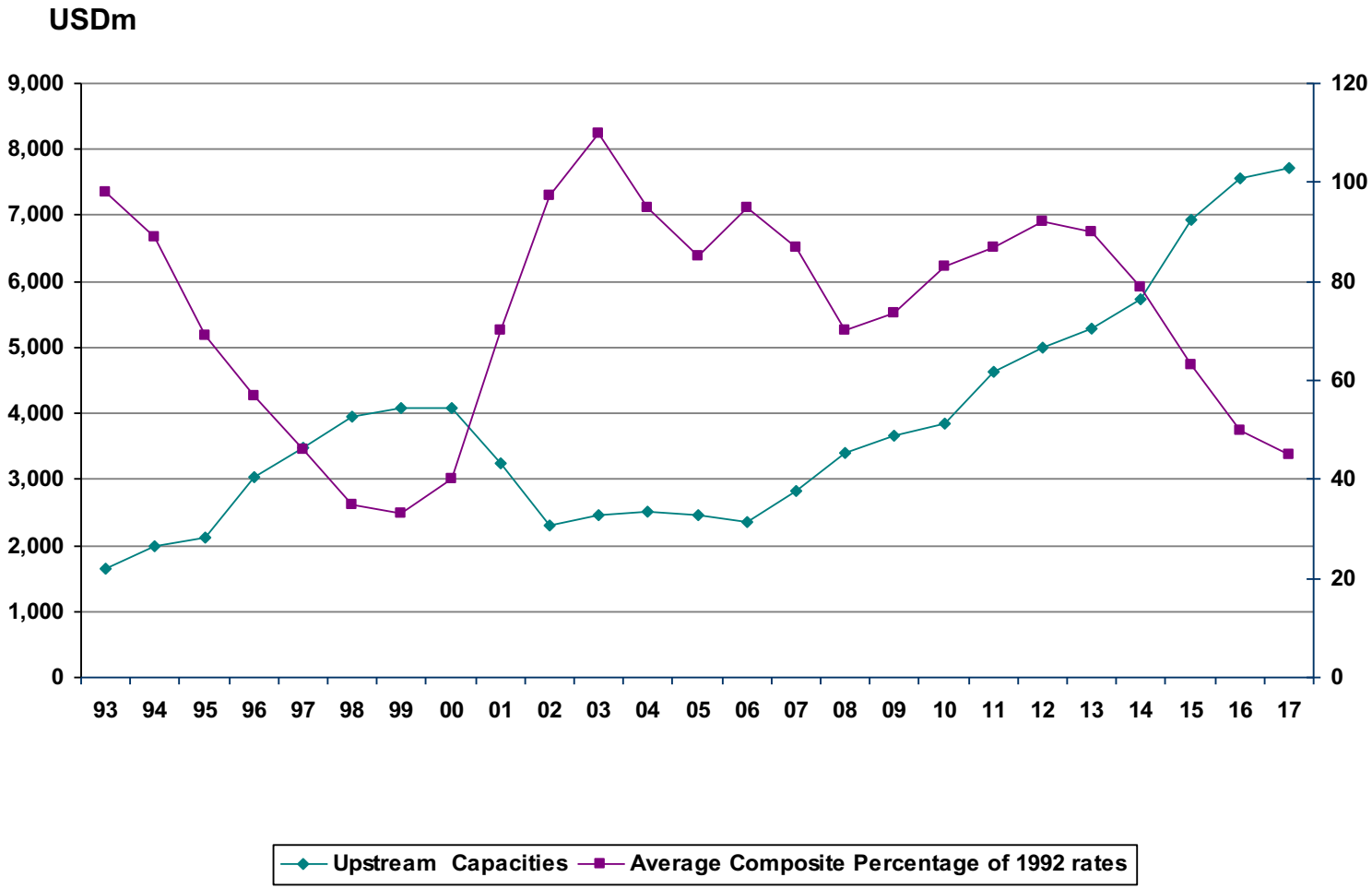
- Executive Committee
- Political Forum
- **Offshore Energy Committee**
- Cargo Committee
- Facts & Figures Committee
- Inland Hull, Fishing Vessels & Yachts Committee
- Legal & Liability Committee
- Loss Prevention Committee
- Nominating Committee
- Ocean Hull Committee
- Education Forum
- Salvage Forum

OEC Membership

Michele Cibrario	Swiss Re, Italy
Helle Hammer **(Political Forum Liaison)**	CEFOR, Norway
Caroline Haquet	Scor, France
Alex Harrison (IPP)	LOC, Australia
Jan Hugo Marthinsen	Gard, Norway
James McDonald **(Chairman)**	Talbot, UK
Colin Sprott **(Executive Committee Liaison)**	Navigators, UK
James Straker–Nesbit **(Secretary)**	LMA, UK
Frank Streidl **(Deputy Chairman)**	Zurich, UK
Toshi Suzuki	MSI, Japan
Axel Ufermann	Hannover Re
Sameh Yousif	Misr, Egypt

Energy Committee Market Review (Sept 17)

Upstream Capacity versus Rating Levels, 1993 – 2017



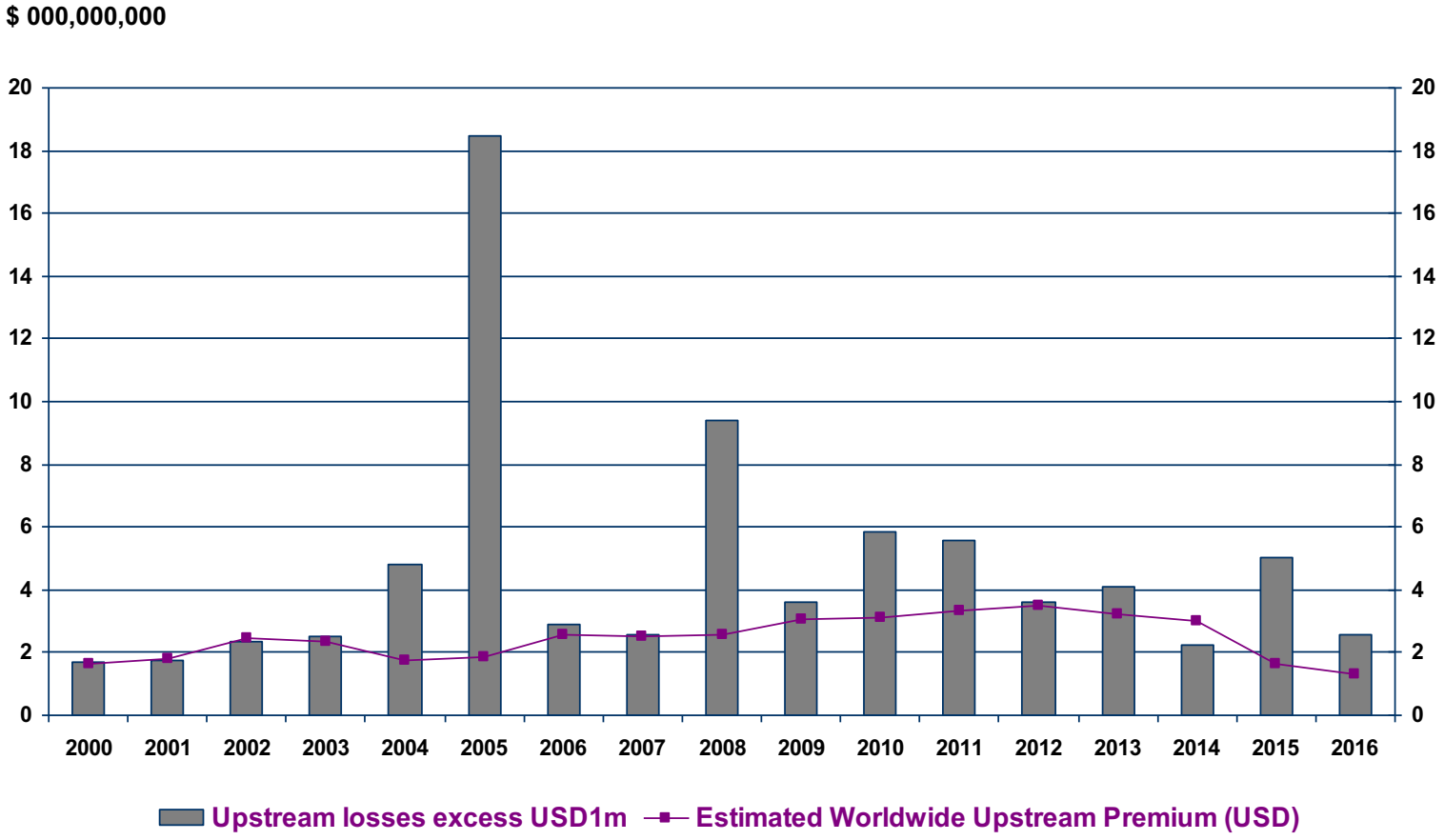
Source: Willis Towers Watson

Upstream Energy losses excess of USD100 million, 2015-16

Type	Cause	Region	Land / Offshore	PD US$	BI US$	Total US$
MOPU	Mechanical failure	Africa	Offshore	350,000,000	950,000,000	1,300,000,000
Platform	Fire + explosion	Latin America	Offshore	780,000,000		650,000,000
Platform	Construction	North America	Offshore	650,000,000		650,000,000
MOPU	Explosion no fire	Latin America	Offshore	382,000,000	112,500,000	494,500,000
Plant	Terrorism	Africa	Land	455,000,000		455,000,000
Rig	Leg punch through	Latin America	Offshore	240,000,000		240,000,000
Platform	Collision	Middle East	Offshore	200,000,000		200,000,000
Pipeline	Ruptured pipeline	Middle East	Land	190,000,000		190,000,000
Rig	Mechanical failure	North America	Offshore	83,500,000	95,000,000	178,500,000
Platform	Fire + explosion	Latin America	Offshore	150,000,000		150,000,000
MOPU	Faulty work	Latin America	Offshore	116,000,000		116,000,000
Pipeline	Anchor/jacking/trawl	Africa	Offshore	100,000,000		100,000,000
MOPU	Corrosion	Latin America	Offshore	100,000,000		100,000,000
						4,824,000,000

WTW Energy Loss Database as of March 7 2017

Upstream Energy losses in excess of $1m versus estimated premium income

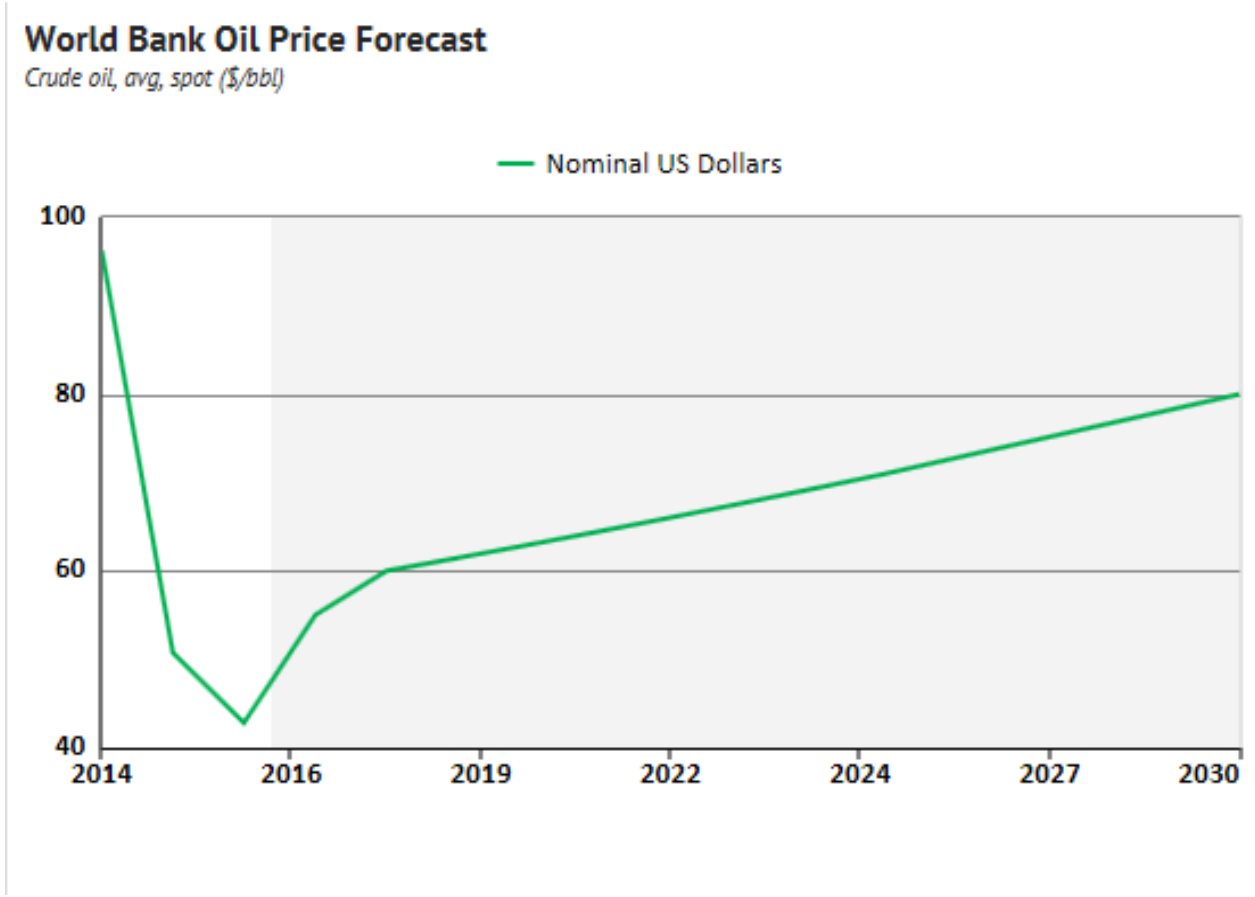


Source: WTW Energy Loss Database as of March 7 2017

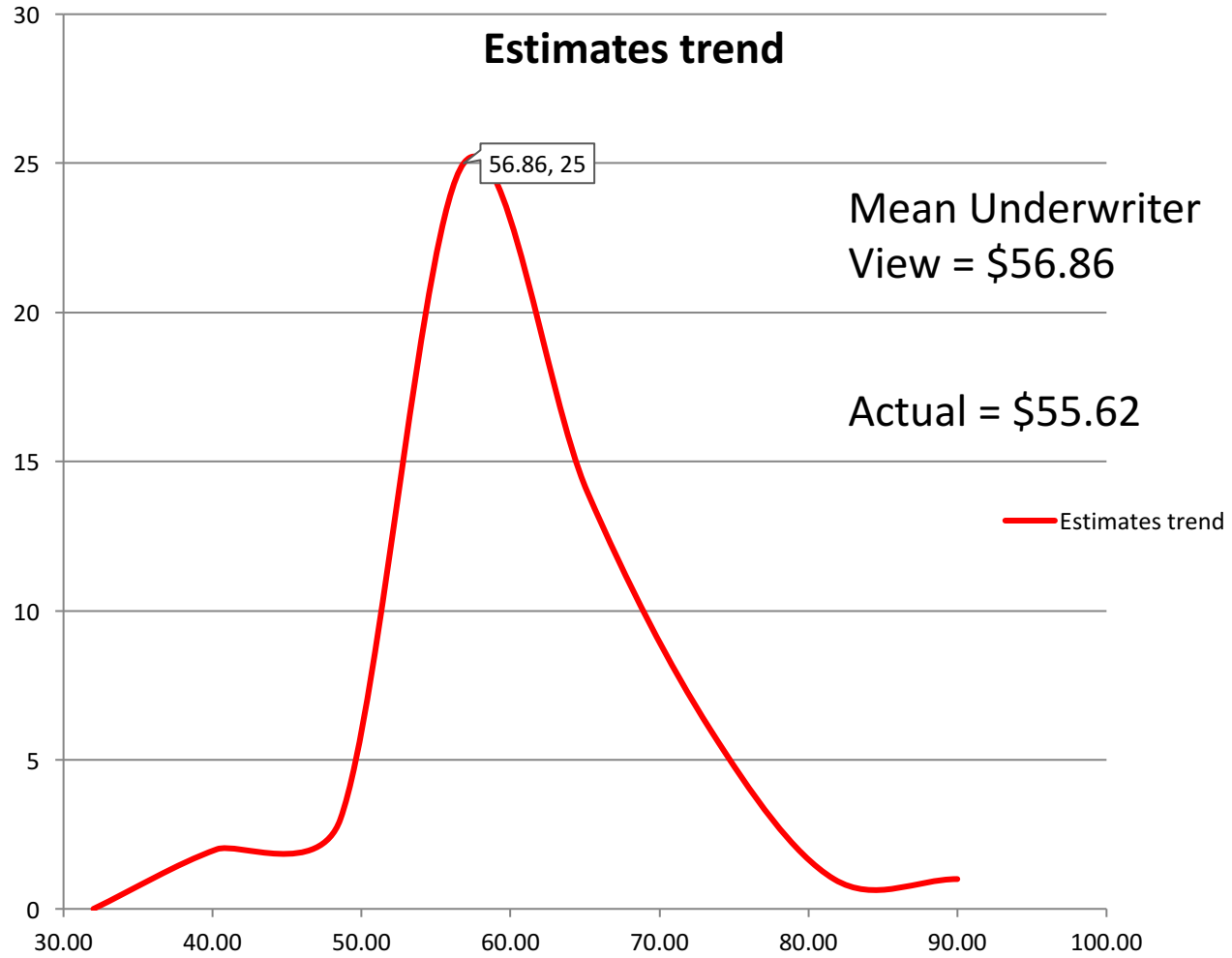
Top 10 Challenges for Energy Underwriters

1. Excess capacity for most risks
2. Soft market wordings creep
3. Prototypical technology – e.g. FLNG
4. Acquisition costs and expenses
5. Cyber aggregations
6. Lack of activity in oil & gas sector
7. Reactivation risks
8. Inexperienced leadership
9. Delegated underwriting
10. Staying afloat!

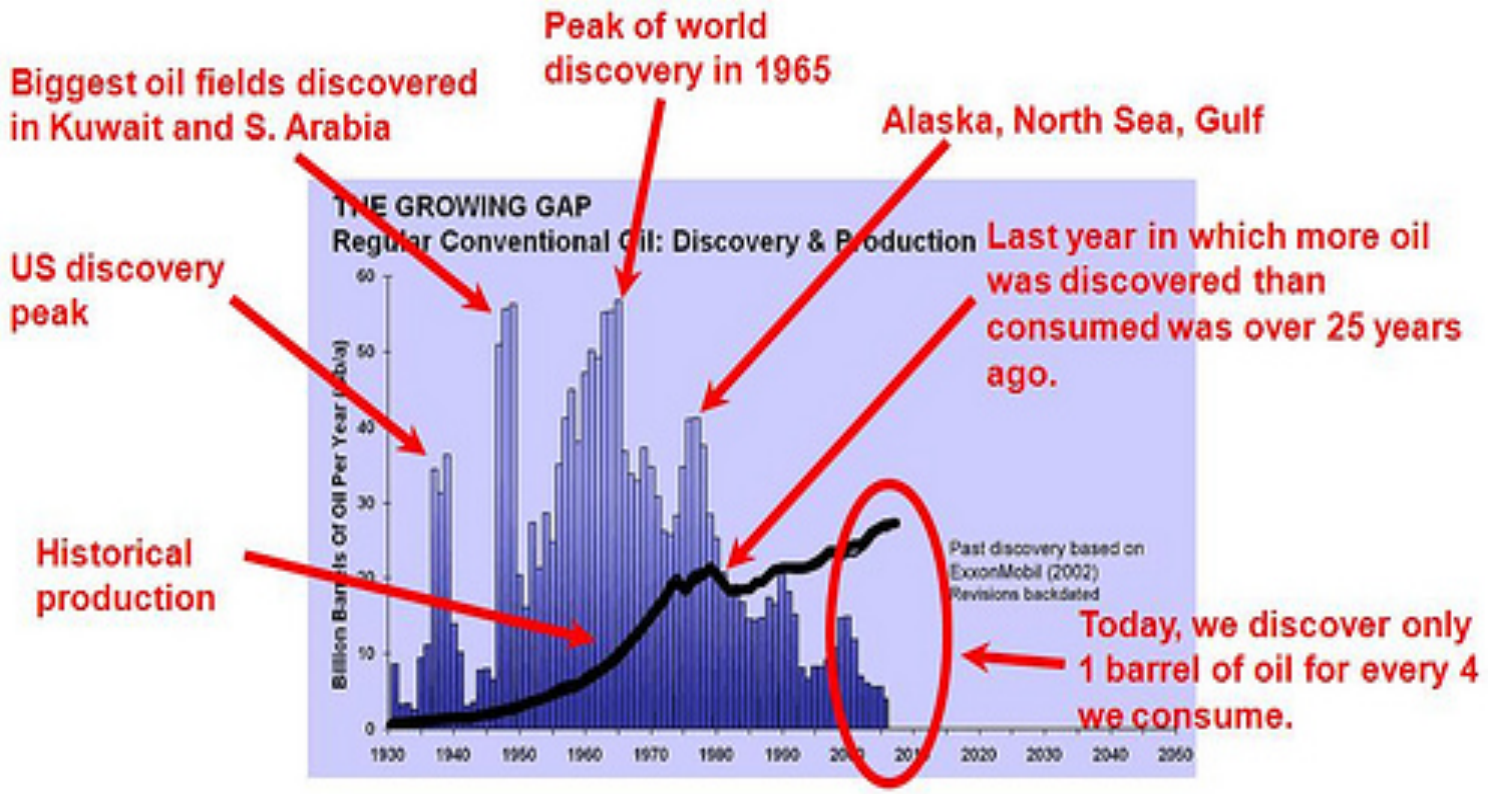
Where is the oil price headed?



1 Year Oil price predictions (IUMI Delgates 2016)



But is there cause for optimism?



Gas Market also likely to improve in comming years once locked in production capacity is taken up.

Committee Conclusions (Sept 2017)

- Claims remain larger than premiums.
- The oil price recovery and increased gas demand will come but is unlikely to assist in the near term.
- In the meantime, we are in danger of sinking and not staying afloat! We better get bailing!

2017 Workshop Review and Key Takeaways

Disruptive Times: Sinking or Staying Afloat?

What is the state of the Energy Market?

1. Still plenty of margin in it
2. Only margin without a CAT event
3. Little to no margin left
4. Margin disappeared some time ago
5. Time to close the account down

2017 OEC Workshop Content

- **IPP - Faulty Design – Have You Read the Wording?**
  Paul Lowrie, Partner Clyde & Co, UK
- **FPSO Turret Design and Operational Integrity**
  Dr Andrew Newport, Technology Director, SBM Offshore
- **FLNG Technical Challenges**
  Spencer Clark, Lloyd Warwick International, UK
- **Expert Panel Q&A**
  Paul Lowrie
  Dr Andrew Newport
  Spencer Clark
  Alex Harrison
  Jan-Hugo Marthinsen

Faulty Design – Have You Read the Wording?

Paul Lowrie, Partner Clyde & Co, UK

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Case Study

- A claim for flakey coating on an FPSO topsides due to coating being incorrectly specified.
- The problem was discovered 18 months into the maintenance period.
- Covered under Builders Risks.
- Coating in question had been certified for an offshore environment. It was only some years later that the certification was found to be incorrect.
- **Claim – US$100m for removal and re-coating, and repair of corroded metal.**

Paul used the chosen case study to highlight the wildly different treatment of defects between jurisdictions using 3 tests.

Q - Is this faulty design?

Australia – Yes Canada - No

Q – Are the costs of replacing the 'merely' defective paint covered?

Spain – YES England - No

Q – Is the corrosion to the parent metal covered?

Denmark – No England - Yes

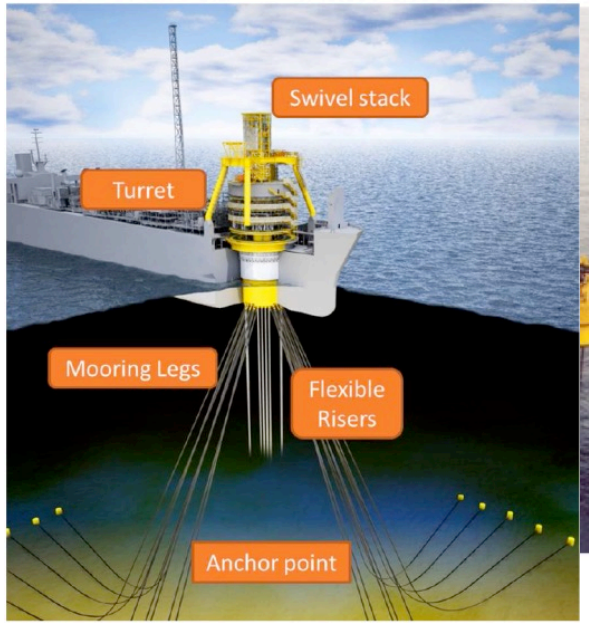
Key Take Aways

- Do you know the law and jurisdiction of your primary policy?
- Do you know the approach that legal system takes to these issues regarding defects?
- There can be significant difference between what the insurer may intend and what the court interprets.

FPSO Turret Design and Operational Integrity

Dr Andrew Newport, SBM Offshore, Monaco

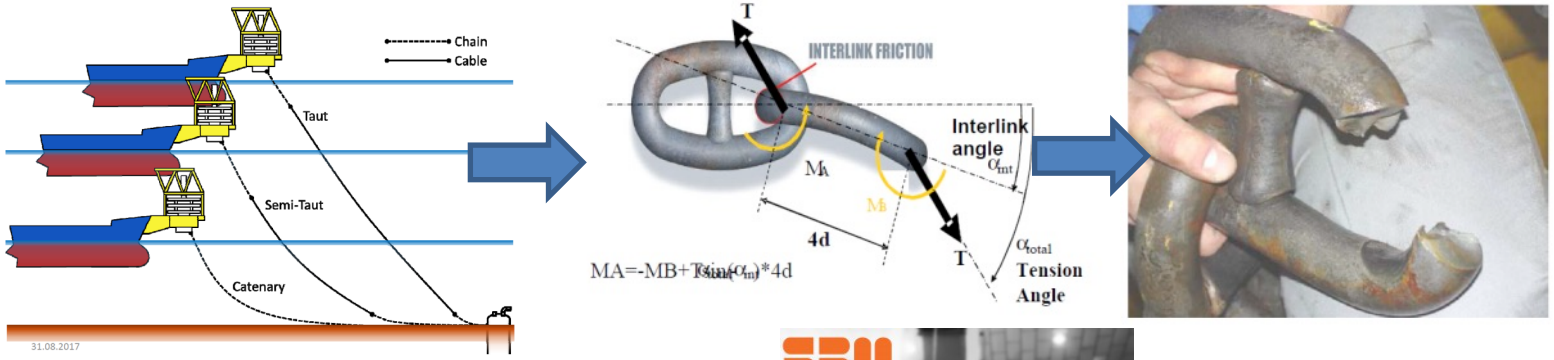
Andrew provided a detailed overview on the various FPSO Turret design concepts, Their operational limitations and the developments in design.

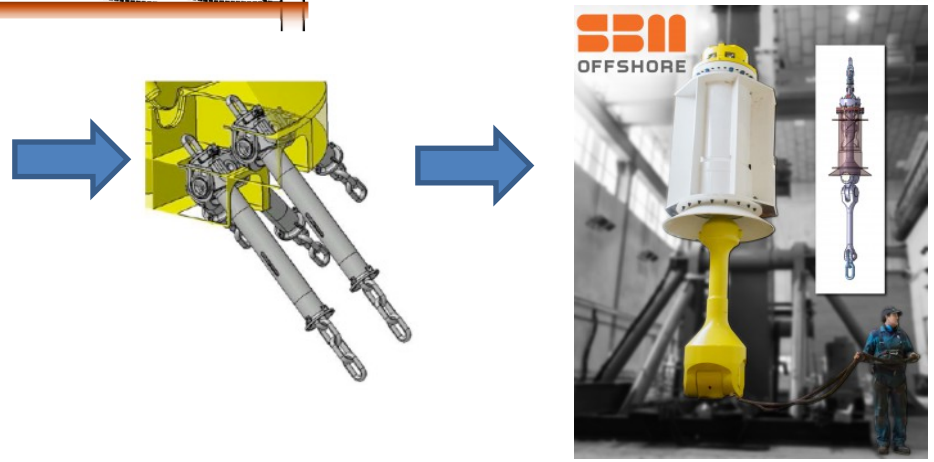


FPSO Turret Design and Operational Integrity

The 3 primary focuses of the presentation were;

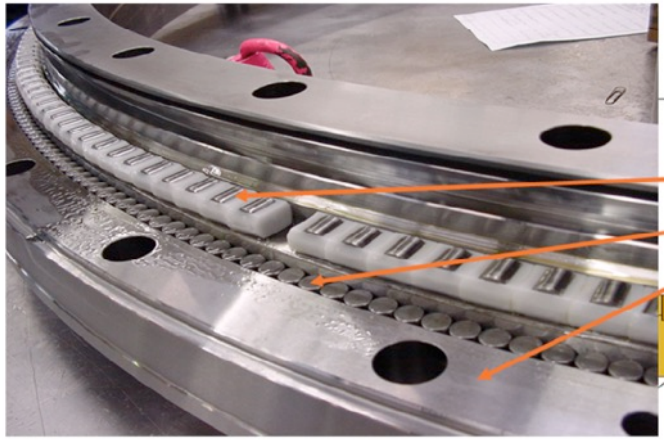
1) Change in mooring leg connection design due to out-of-plane bending failures and the need to go to deeper water.

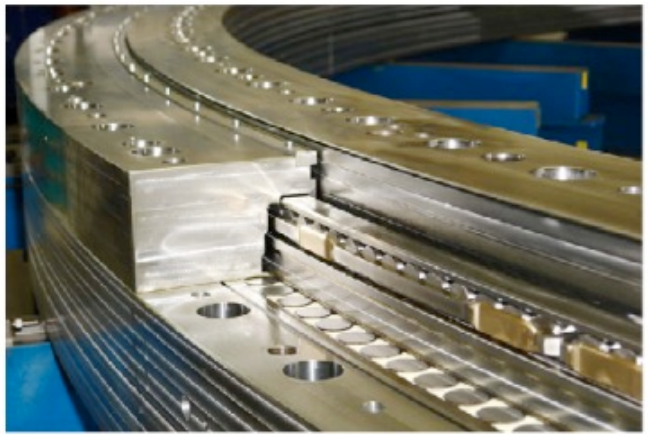


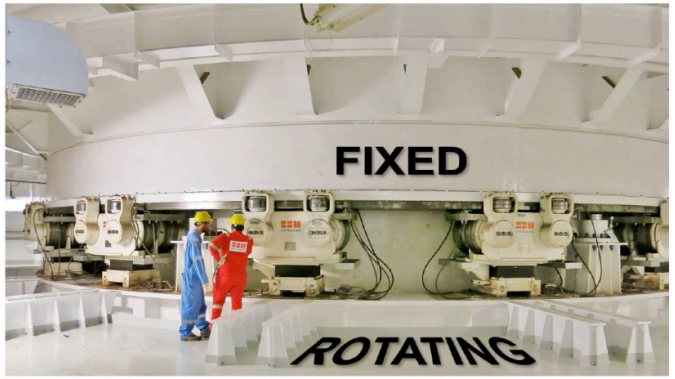


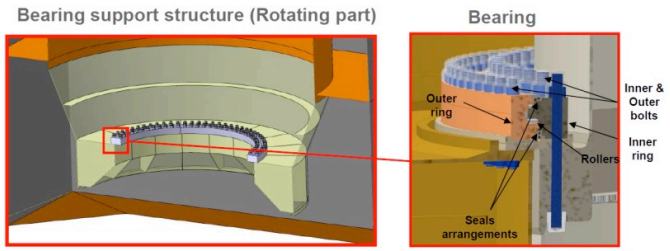
FPSO Turret Design and Operational Integrity

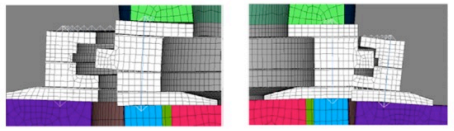
2) Primary bearing design progression to support redundancy, access for maintenance and considerations for design of supporting structures





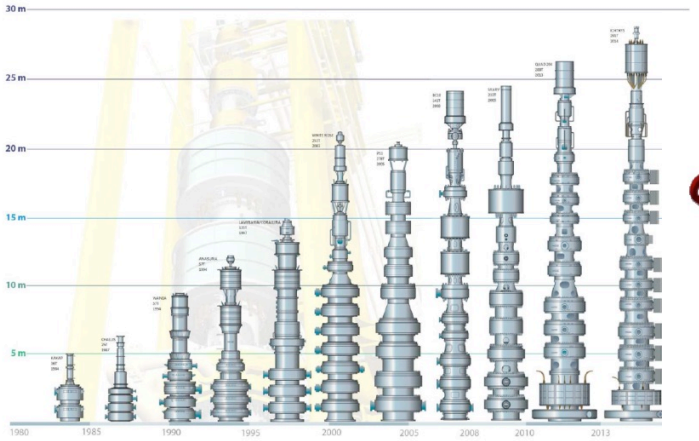


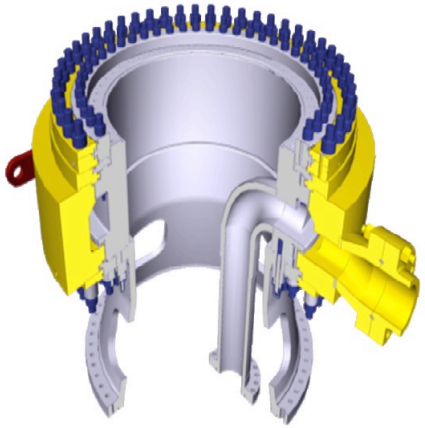




FPSO Turret Design and Operational Integrity

3) Swivel Design & operational maintenance restrictions



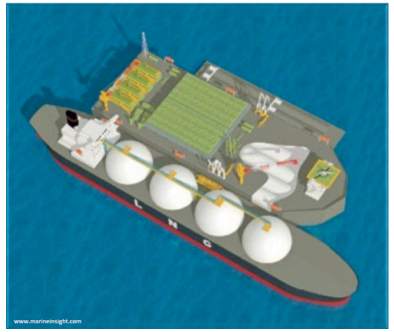


Key Take Aways

- Operational integrity is highly dependant upon the system design, particularly at component level.
- You can‘t maintain your way out of poor design.
- Design has developed considerably through learnings from earlier failiures but also to meet the changing demands as we go deeper and install bigger units.
- Redundancy in design and ability to effect repair is a lot more prevelent now. <u>But what of the older assets?.</u>

FLNG Technical Challenges

Spencer Clark, Lloyd Warwick International, UK



Spencer provided an overview presentation of FLNG and FSRU Floating systems. The presentation included the following;

- A Recap on existing floating production facilites and the reasons for their use.
- A look at the known operational risks with Floating production.
- A brief introduction as to what LNG is and the reasons for the expected continued growth in the LNG market.
- The new emerging technical challenges for FLNG units and their operation.
- The new risks associated with FLNG production units.

FLNG Technical Challenges

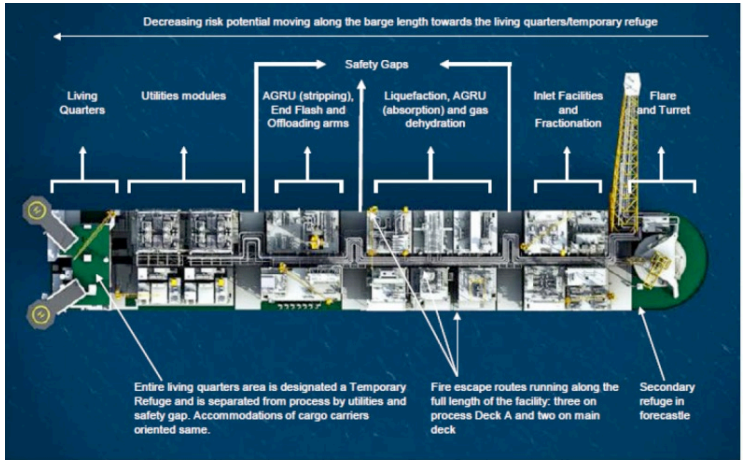
Focus was placed on the new operational challenges and the safety considerations and mitigations required;

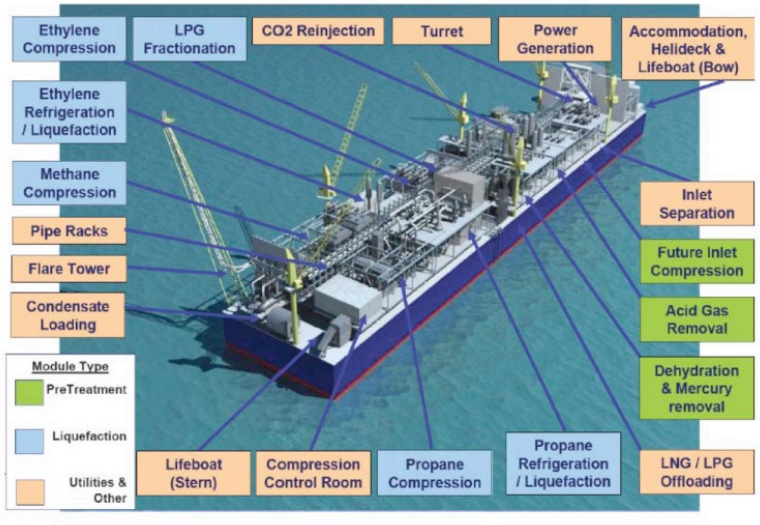
FLNG Operational Constraints

- Topside physical space
- Maintenance challenges
- Refrigeration / compression systems
- Machinery reliability
- Shutdown procedures
- Reduce restart times
- Avoid unplanned liquefaction unit shutdown

Safety and Mitigation

- Selection of liquefaction technology
- Complexity of design & operations vs FPSOs
- Cryogenic liquid spill prevention
- Vapour dispersion
- Storage & handling of refrigerants
- Operations during LNG offloading





Key Take Aways

- Many of the risks associated with FLNG/FSRU units are already well known from FPSO/FSO units already operating.
- However, certain aspects of FLNG and FLNG unit operation cause operational challenges which may prove to be claims value escalators;
  - The nature of LNG, its low boiling point and the cryogenic storage and handling challenges this creates.
  - Complexity and compact/stacked nature of topsides making removal/replacement or repair in situ difficult.
  - Limited offloading options due to need for cryogenic transfer leading to new offloading risks.

	Boiling Point ^{0}C
Nitrogen	-196
Oxygen	-183
Methane	**-162**
Ethane	-88

Pannel Session Topics

- Potential Claims value escalators related to FLNG Units
  - Remote location and limited suitable repair facilities
  - Complexity of Topsides equipment
  - Compact/Stacked nature of topsides making removal/replacement or repair in situ difficult.
- Berthing for Cargo transfer could pose significant risks for claim due to vessel impact. Thus, review of these marine operations important.
- Terror exposure for FLNG/FSRU.
  - Considered low for remote offshore FLNG
  - More likely a concern for FSRU‘s near shore and close to population centres or other infrastructure.
- Timescales for disconnection and reconnection of disconnectable FPSO‘s such as Stones for wind storm events.
  - 2-3 Days for preperations for disconnection
  - Minutes for the disconnection itself due to quick release design
  - 24 hrs for reconnection subject to favourable weather conditions

Pannel Session Topics

- Can offshore contractors further reduce their costs
  - It was felt they are already rock bottom.
  - However, some additional efficiencies may be possible if supported by Oil companies in reducing/removing their internal specifications and relying on Industry norms to allow standardisation.

- Currency of skill base in industry for FLNG/FSRU era
  - Challanging due to prevailing market conditions leading to loss of technical headcount from industry
  - Requires active participation in JIP, Committees and internal knowledge sharing sessions.
  - Needs more projects in order to allow a wider base to gain the relevant expereince.

“Managing Emerging Risk and Exposure – Think the Unthinkable”

Potential Energy Workshop Presentation Topics

- The technical challenges of deep water construction projects – 3 recent losses on deep water projects - Big Foot, Moho Nord and Egina – 2 of which are African
- Economic/oil price outlook - future supply/demand, price, impact of OPEC cuts and future for offshore and shale.
- The interaction between Hull and P&I policies for floating production
- General African Energy Market review
- Infrastructure and logistics challenges for emerging African regions/projects
- Geothermal wells - An increasing power source in the Rift

Please let Jan-Hugo or I know your thoughts on other topics of interest that may relate to emerging risks particularly from an African perspective.