

Lloyd's Register – Group Technology

# Singapore Group Technology Centre (GTC)





# Achieving Synergies for the Benefit of Clients

# 250+ Years of Service 7 Years of Acquisitions in Energy Sector

## Technology

2012.04 WEST ENGINEERING SERVICES

2009.01 SCANDPOWER Risk Management

2008.07 CELERITY3 ENGINEERING

2008.02 MARTEC™

2008.01 ModuSpec

2008.01 LIFE MATTERS

2005.11 ØDS

2005.09 CAPSTONE The RBI Experts

Boeing 747-400 (73m long)

# An event that changed the Energy Industry



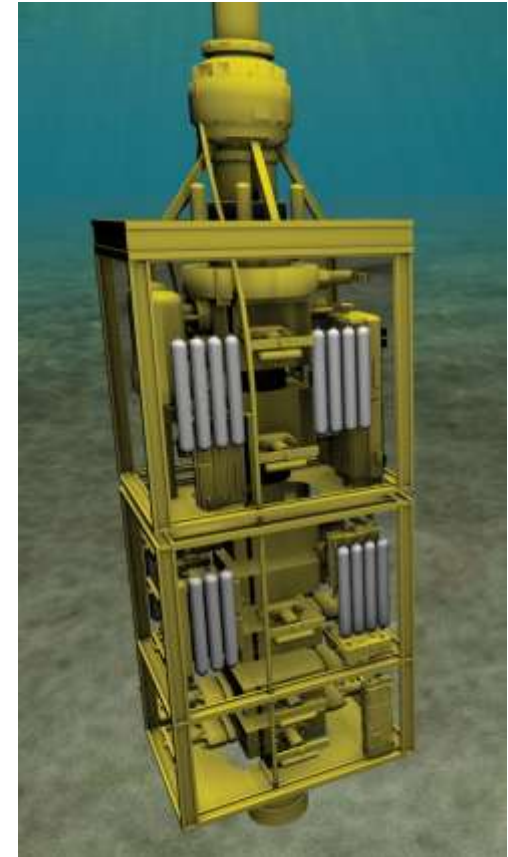
Deepwater Horizon, Gulf of Mexico April 20th 2010  
Explosion and oil spill, 11 deaths, 4.9 million bbls,  
equivalent to 2 **Ultra Large Crude Carriers (ULCCs)**

Although the Lloyds Group have a vast amount of experience and knowledge in Energy, we recognized that we were not doing enough to utilize or co-ordinate our resources and skills for the benefit of the industry.

# One example of how three sections of our group combined to create a highly desirable product for drilling

The screenshot displays the RiskSpectrum RiskWatcher software interface. The main window is titled 'Defence-in-Depth' and shows a hierarchical tree of systems and sub-systems with associated risk levels. A legend indicates risk levels: Unacceptable Risk (Red), High Risk (Orange), Moderate Risk (Yellow), and Low Risk (Green). An 'Equipment out of Service' table lists components like 'Control System B Yellow POD' and 'Control System A Blue POD'. An 'Event History Log' table at the bottom shows events such as 'Take OUT' and 'RESTORE' with timestamps and descriptions.

Note	Calculated	Event time point	Event	Description	Last Edit	E...
	<input type="checkbox"/>	2011-06-14 13:06:45	Take OUT	Valve position indicator failure Control System B Yellow POD	2011-06-14 13:06:53	sa
	<input checked="" type="checkbox"/>	2011-06-14 13:03:22	Take OUT	Component X failure Control System B Yellow POD	2011-06-14 13:03:28	sa
	<input type="checkbox"/>	2011-06-14 13:02:42	Take OUT	Component X failure Control System A Blue POD	2011-06-14 13:02:56	sa
	<input type="checkbox"/>	2004-06-14 12:47:17	RESTORE	Emergency Core Cooling System pump 2	2011-06-14 12:47:27	sa





# Singapore GTC Objectives and R&D Themes

- Contribute to the development of technical solutions relevant to safety challenges the energy industry faces
- Engagement with clients and government via collaborative projects
- Providing training
- Integration of knowledge and skills from acquisitions
- Strong local university content
- Leverage Singapore technology/skills base
- Complementary to Southampton GTC
- Ensure technology readiness
- Provide a catalyst for accelerating growth in Asia

**Subsea**

**Drilling & Well Control**

**Asset Performance  
Management**

**Risk**

**Deepwater/FOI**

**Renewables**

**Enabling/Emerging Technology**

# What the Singapore GTC will do

- Research portfolio to improve business sustainability through cycles in energy prices:
  - Efficiency at energy supply
  - Efficiency at energy use
  - Diversification of energy mix
  - Enable life extension projects
  - Less labour intensive solutions
- Focus on harsh environment issues:
  - Trim safety factors to reduce CAPEX
  - Technology qualification to minimize project delays
  - Enable market entry of smaller innovative businesses
- Mechanisms to improve organisational integrity and staff competency
- Management systems to verify / improve HSE performance

# Success Criteria

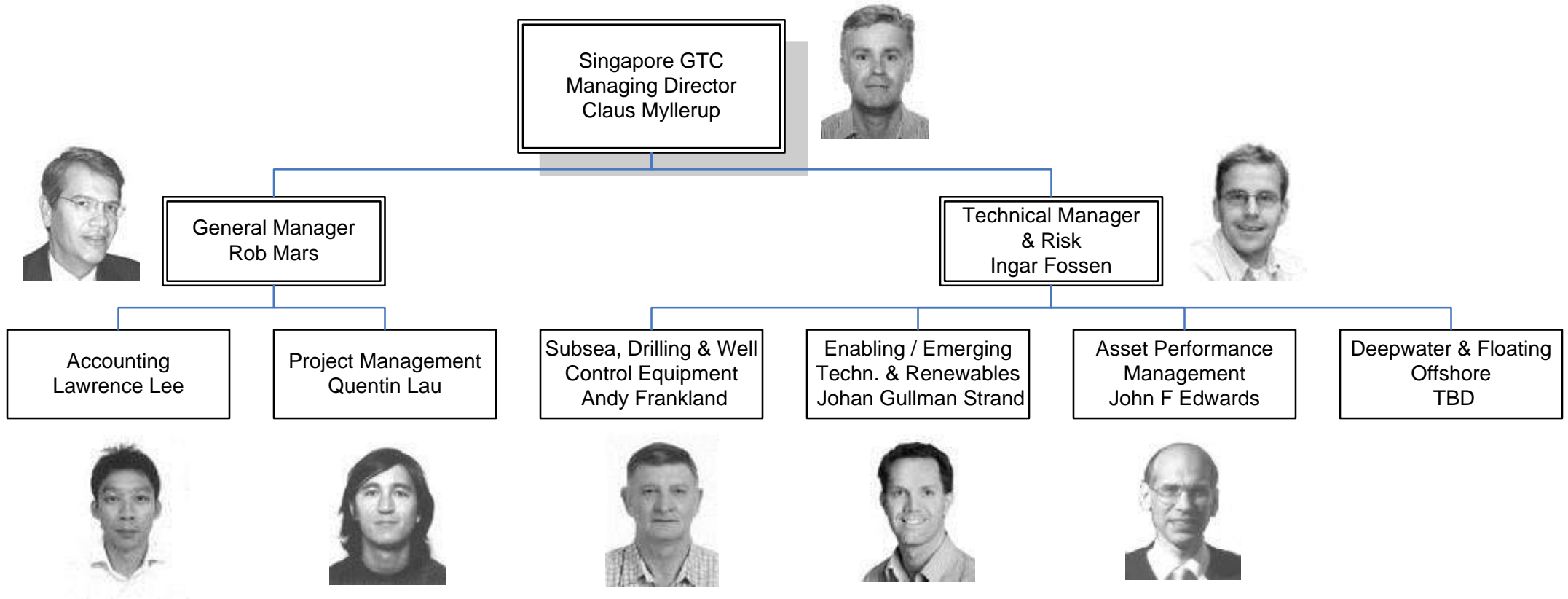
- The solutions we develop in collaboration with partners and clients improve their performance and reputation
- The Singapore GTC contributes to developing the next generation of technical leaders for the energy business by giving them
  - Versatile skills to face cycles in energy job market
  - Humility towards the technical challenges the industry faces
  - A strong industry network through joint industry projects
  - Pride in providing the world with solutions to its energy needs

# Master Research Collaboration Agreement with Singapore Agency for Science Technology and Research





# Singapore GTC Management

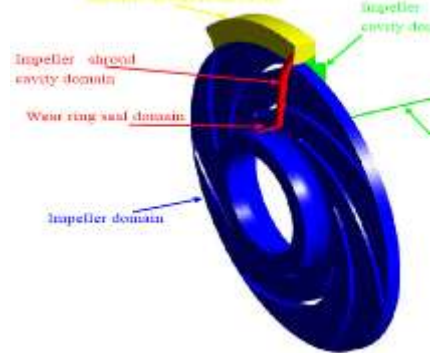


# Next Steps

Theme	Phase 1 Project
Subsea, Drilling and Well Control Equipment	BOP Risk Model capability extension
	BOP maintenance best practices from ModuSpec/WEST inspection data mining
	Account for external water pressure on design limits of equipment and quantify sealing performance in Constant Online Real-time Monitoring System
	Interactive training and competency testing software
	LR Technology Qualification scheme
	LR Internal: DROPS standard
	LR Internal: MODU Rules
Asset Performance Management/Life Extension	Review of existing RBMI Modules
	Pipeline Risk Based Integrity Management Systems
	Steel structures Risk Based Integrity management Systems
	Corrosion eBook
	Microbiological Influenced Corrosion
Risk	Source term modelling in risk analysis
	Spray leak modelling
	Comparison of consequence modelling tools
	Next generation quantitative risk assessment
	Development of CFD models using "open source" solutions

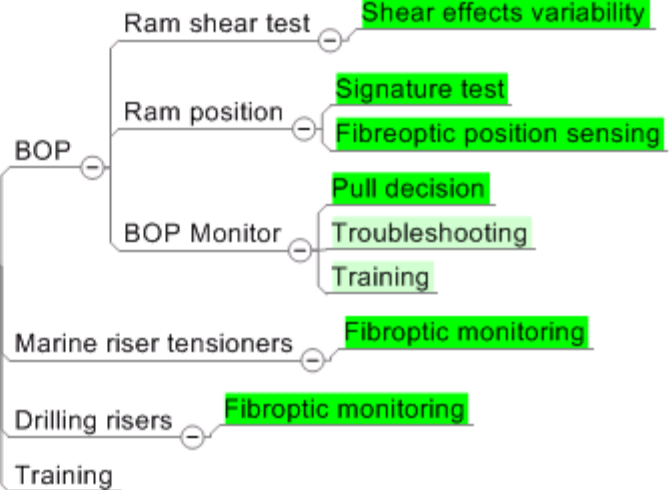
- Establish Master Research Collaboration Agreements with NUS and NTU
- Fast track recruitment and training of local workforce to work with lead subject matter experts
- Finalise phase 1 JIP agreements and initiate work
- Develop phase 2 JIP portfolio and identify partners
- Knowledge transfer

# Current Subsea Technology Projects

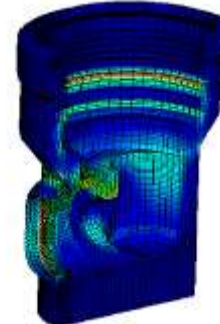
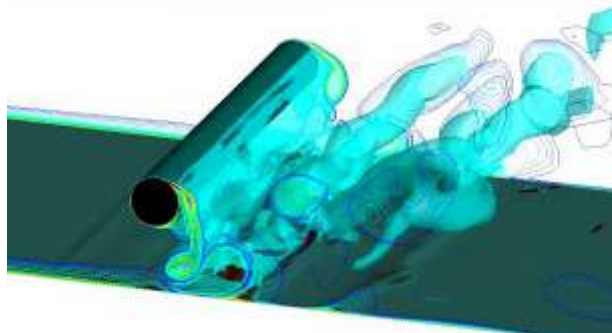
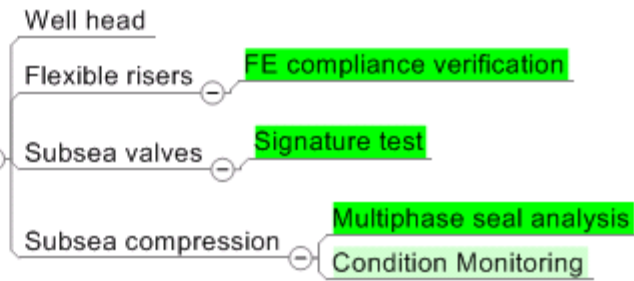


Subsea

Drilling






Production





# Thank you for your attention

- Interested in making a difference for the industry as well as for Singapore together with us?
- Visit [www.lr.org/SingaporeGTC](http://www.lr.org/SingaporeGTC)

<b>Why we are doing it</b> Our CEO and Group Energy Director share their thoughts on why the Singapore GTC is so important to Lloyd's Register. <a href="#">Why we are doing it</a>		<b>A collaborative approach</b> Central to the success of the GTC is the collaboration between our experts and business, academia, and R&D agencies. <a href="#">Our collaborative approach</a>	
<b>Research topics</b> We are focusing on four research areas critical to our public-service mandate. <a href="#">Read about our research topics</a>		<b>How to join in</b> There is still room for the industry to come forward with research projects. <a href="#">How to join in</a>	

Bookmark with:



Enhancing the safety of life and property for the benefit of the public and the environment.

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