



25th world gas conference  
"Gas: Sustaining Future Global Growth"



# LNG Supply Chain Design and Optimisation at Qatargas

A Showcase of Industry Leading Collaboration

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Venue: Plenary Theatre, KLCC



Patron



Host



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- Background
- Collaboration Activities & Timelines
- Technologies Employed
- Representative Results
- Realised Benefits
- Key Success Factors

- “Joint Qatargas-Shell LNG Logistics Research Collaboration”
- A partnership based Qatargas’ operational experience and Shell’s technological expertise
- Memorandum of Understanding signed on March 15, 2009
- Research hosted by Qatar Shell Research and Technology Centre, Qatar Science and Technology Park



**“...develop new ways to optimise supply chains for delivering LNG to global markets.”**

QATAR SCIENCE & TECHNOLOGY PARK  
*Member of Qatar Foundation*



# Collaboration Activities & Timelines

## Development

- Create a state-of-the-art LNG logistics planning & optimisation model
  - Based on Qatargas LNG value chain

## Implementation

- Model deployed within Qatargas as a decision support tool

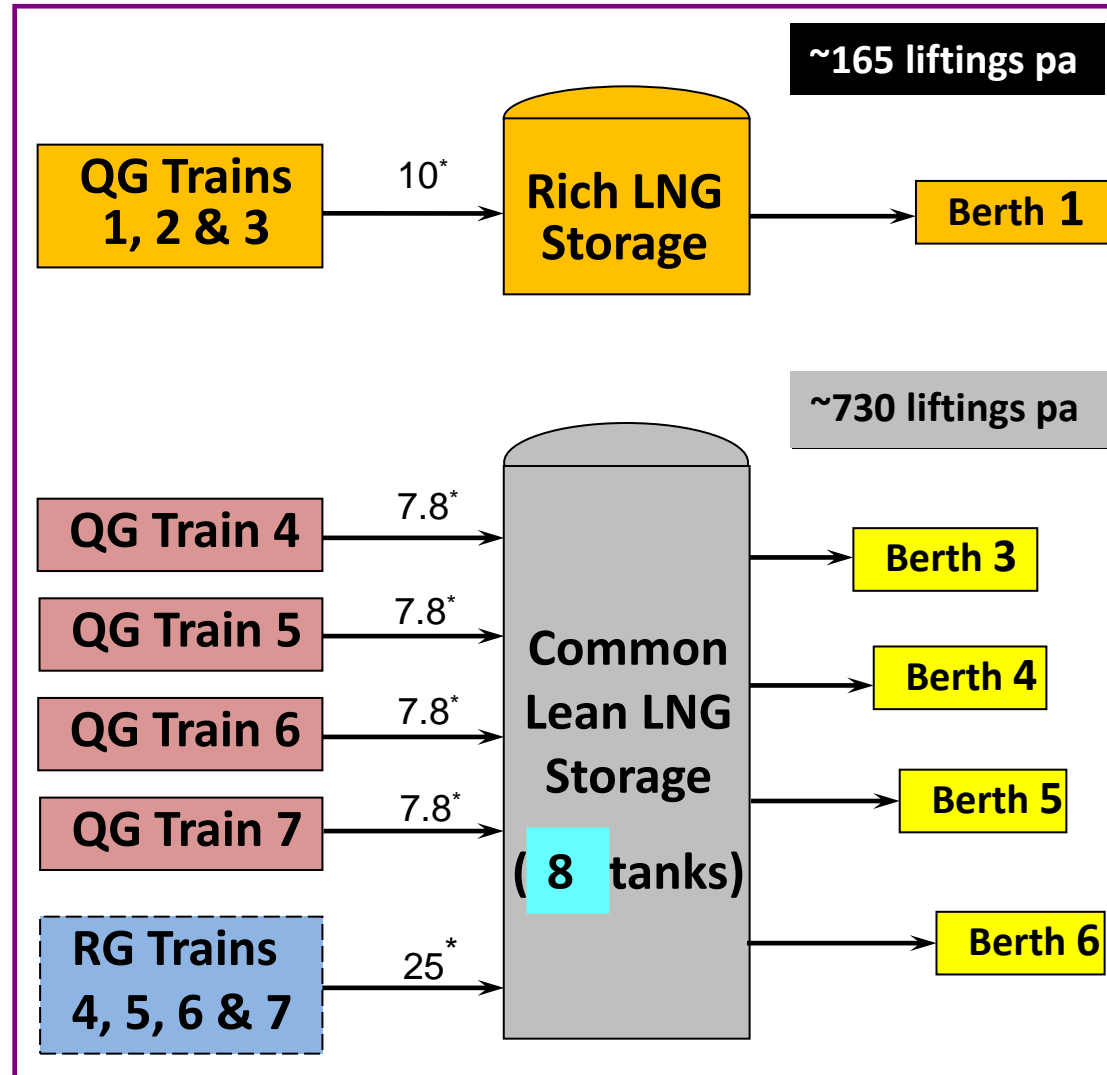
## Resources

- Qatargas: 2 lead LNG Planners
- Shell: LNG Logistics Engineer
- Guidance via Joint Steering Committee

	2009			2010				2011			
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
<b>Project Development</b>											
Kick-off meeting	◆										
Data collection	■										
Building and testing models		■									
Conducting ad-hoc analyses			■								
Identifying model extensions		■	■								
Migrate models to SALSA			■								
Project closed							◆				
<b>Project Implementation</b>											
Drydock planning tool					■						
Fleet balance study						■			■		
Evaluation of opportunities								■	■	■	

# Qatargas LNG Value Chain

- Established 1984
- World's largest LNG producing company
- 42 MTA of LNG production with
  - 17 import terminals
  - 14 Conventional LNG carriers
  - 19 Q-Flex and 13 Q-Max vessels
- Well on its way towards becoming the Premier LNG company by 2015
- Committed to safety, reliability, innovation and operational excellence

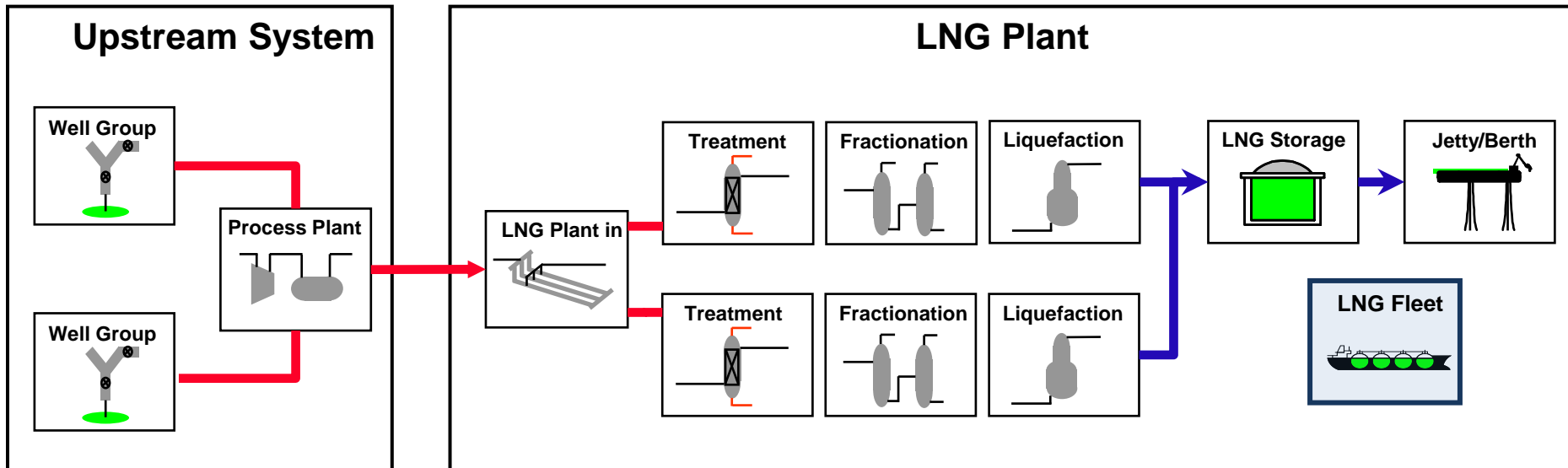


\* FOB Quantity (MTA)

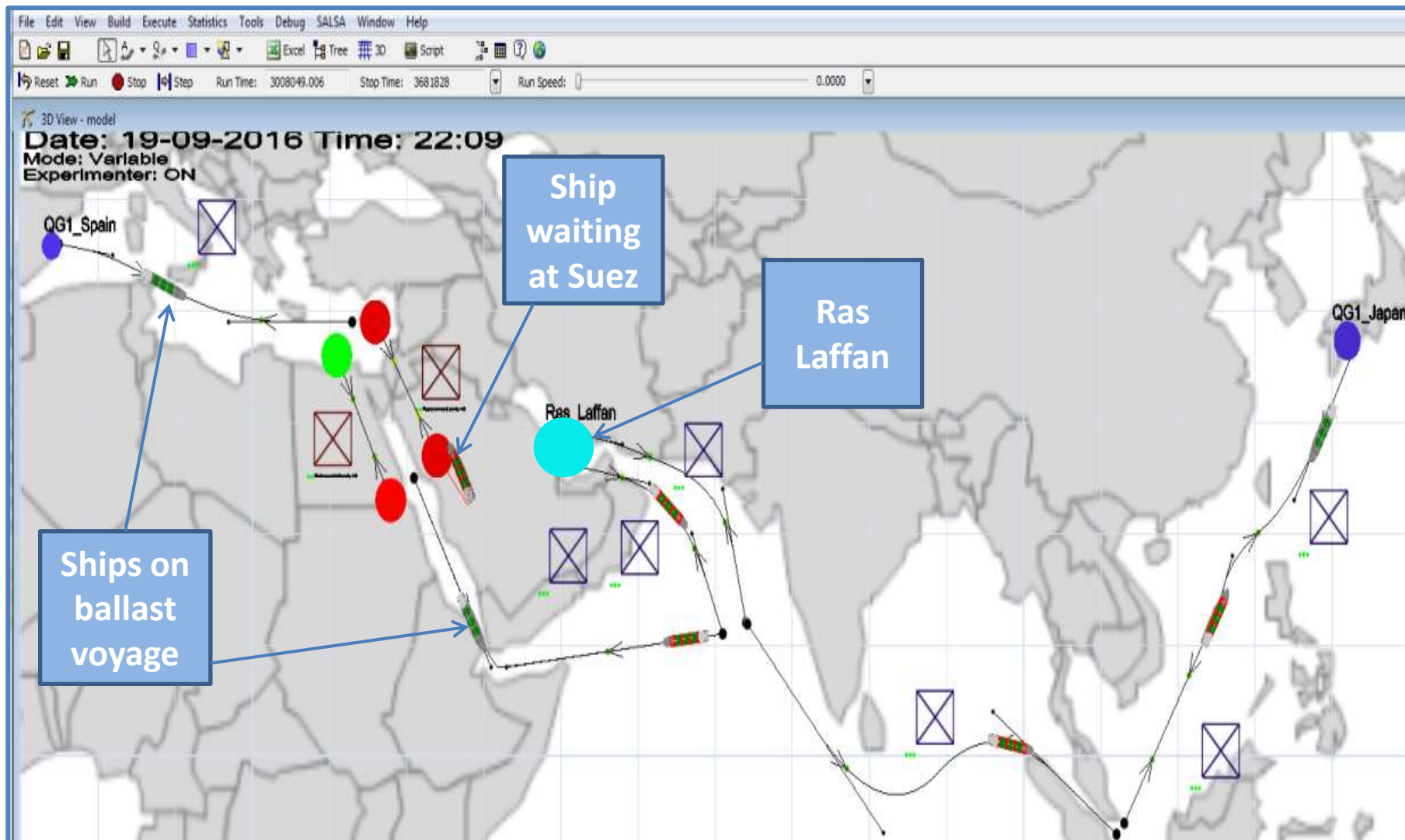
# Technologies Employed

- **ADGENT:** ADP GENERator and Tester
- **SALSA:** Shell Advanced LNG Supply chain Application

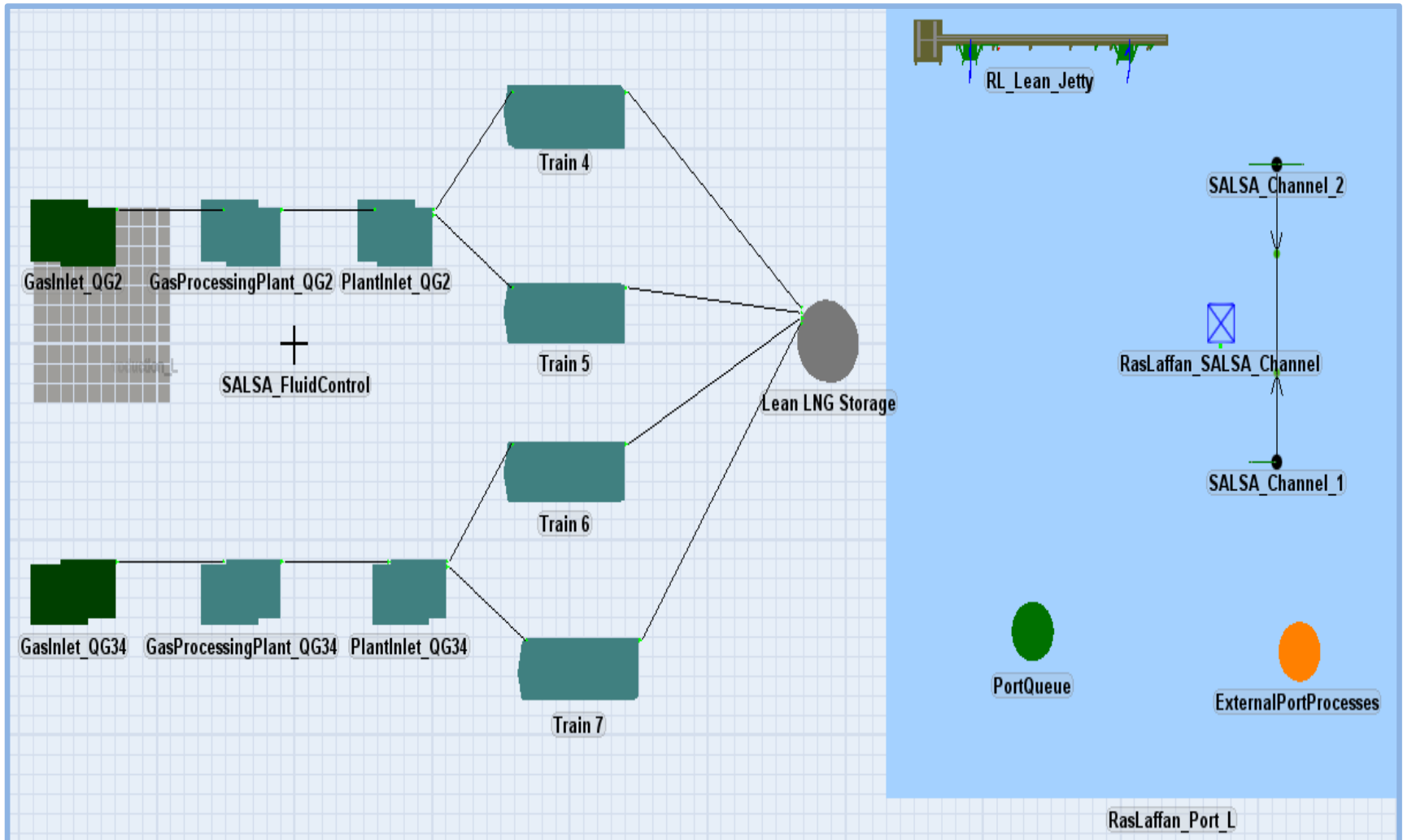
	Previous Technology	ADGENT	SALSA
ADP generation		✓	✓
Inclusion of random events	✓	✓	✓
Long term capacity planning	✓	✓	✓
Gas quality tracking			✓
3D visualization			✓
Plug and play modularity			✓



# Rich LNG (QG1) Model – Global View

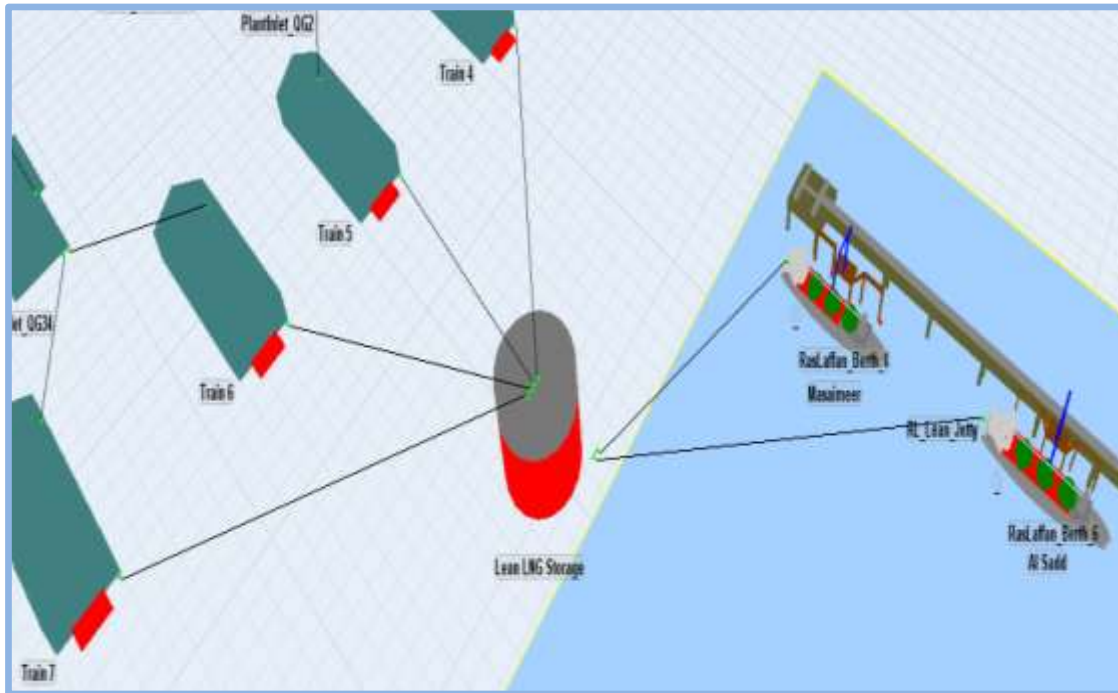


# Lean LNG (QG2, QG3, & QG4) Model – Ras Laffan

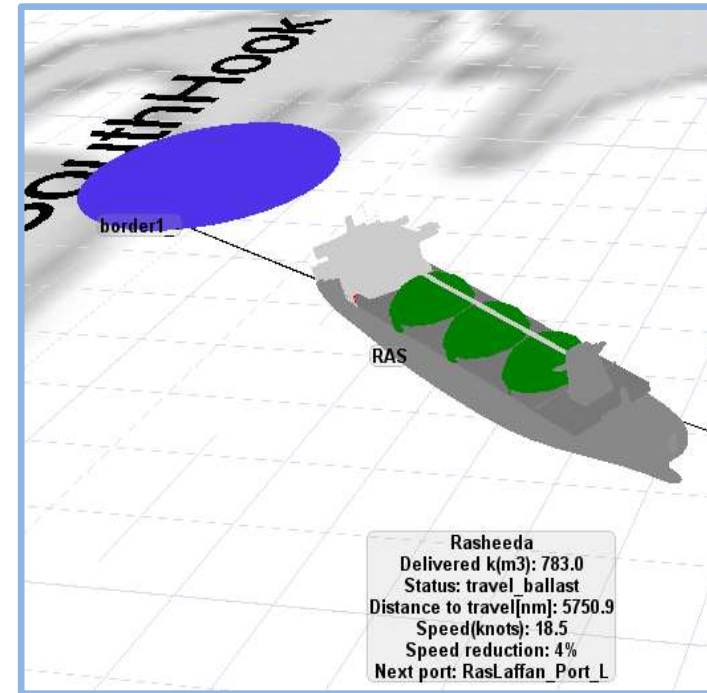




# Lean LNG (QG2, QG3, & QG4) Model



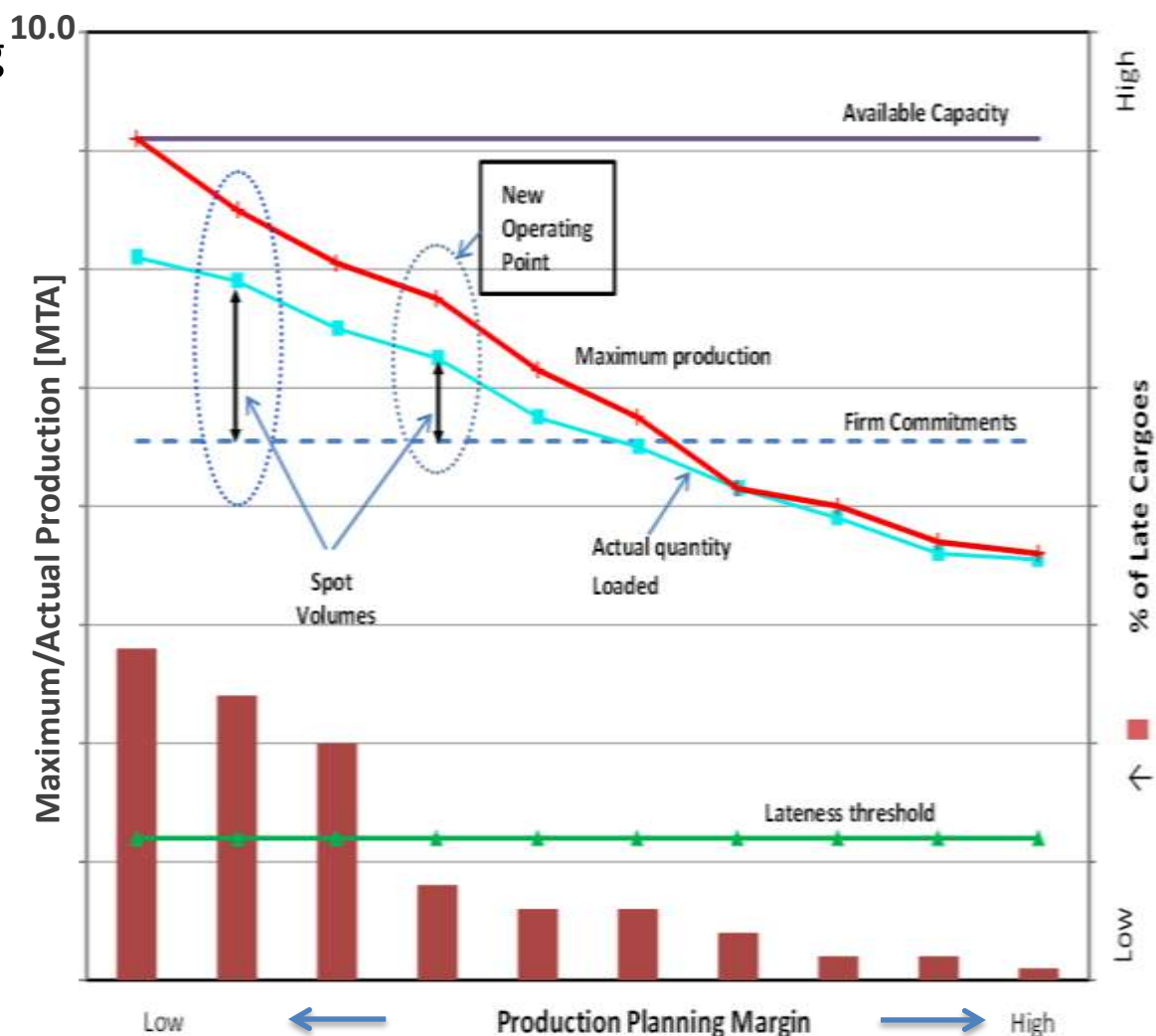
a) Simultaneous Loading at Ras Laffan



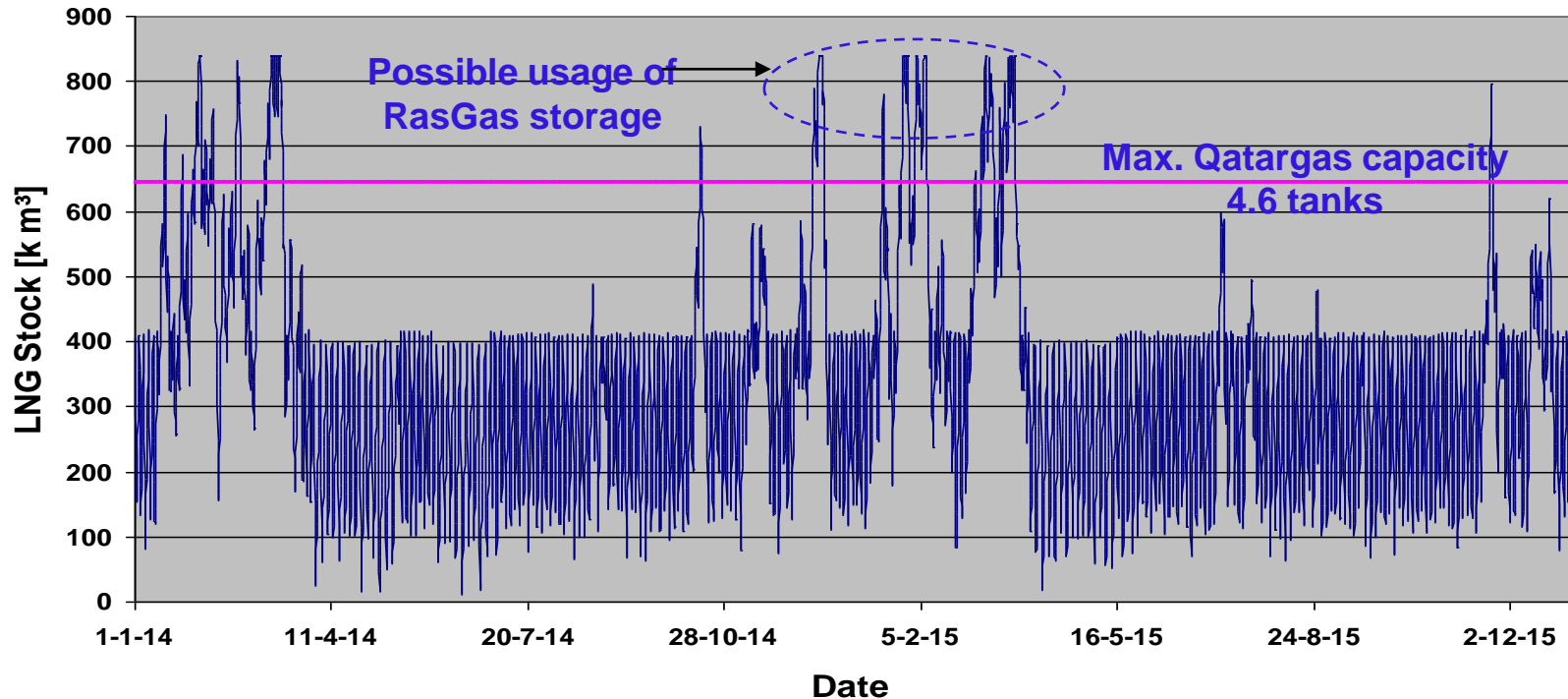
b) Vessel voyage info

# Representative Results – Rich LNG (QG1)

- Model validation and testing based on historical data (1996 - present)
- Production Planning Margin vs. ADP robustness
- All firm commitments can reliably be produced and delivered
- New supply chain operating point
- Quantification and timing of spot cargoes



# Representative Results – Lean LNG (QG2, QG3, & QG4)



- Qatargas “standalone” storage requirement is 6 to 7 @ 140,000 m<sup>3</sup> tanks
- With the current nomination (4.6 tanks), usage of RasGas’ storage capacity for relatively short periods
- Significant potential savings achievable by coordinating the vessel dry dock programme with scheduled LNG train maintenance

# Realised Benefits of Collaboration

- Improve Qatargas' in-house modelling capabilities
  - Coherent and integrated view
  - Harmonisation of inputs from various disciplines (Operations, Engineering, Shipping, etc.)
  
- Maximise operational excellence by combining Shell's LNG logistics expertise with Qatargas' operational know-how
  - Production
  - Market flexibility
  - Asset utilisation
  - Reliability of supply
  
- Enhancement of SALSA by testing it in a real-time operational environment
  - Enhanced modelling functionality
  - Optimised scheduling rules

- Clear vision and guidance from Qatargas Management to access selected and proven technologies from its partners
- A clearly defined business need for collaboration, with appointed champions to drive it forward
- Satisfying legal requirements – confidentiality agreements, bespoke legal training, etc. – prior to commencing project
- A well defined post-project and user-deployment plan to maximise value
- Ensuring the final product meets usability criteria and the needs of the intended audience

## Thank You

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