Technological Innovation and Infrastructure in the LNG Industry

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Industry Change

Re-Export

Baseload, Long-Term Markets

Land-Based Liquefaction

LNG Carrier

Land-Based Regasification

Offshore (GBS, FSRU)

GasPort (Dockside) Regas

Gateway (Buoy) Regas

Floating Liquefaction

LNG Regas Vessel

Ship-to-Ship LNG Transfer

Seasonal

Peaking

Short-Term

Long-Term
Technological Advances

• Floating LNG is seeing advances in:
  – Regas vessel flexibility and performance
  – Regas terminal configurations
  – Cargo transfer solutions
  – Distributed / smaller load servicing
  – Offshore LNG production

• All of these help to more efficiently meet market demands and open new markets
Vessel Flexibility and Performance

• Flexibility
  – Ability to operate as FSRU or LNGC
  – Combination with land-based infrastructure
  – Operability in a multitude of environments

• Performance
  – Regas range from <100 to >1,200 mmcf/d
  – Storage capacity of 265,000 m³
  – Increased uptime and reliability
Terminal Configurations

• Fast-track solutions in varying situations
• Key success factors
  – Reduced design time
  – Quick realization of long lead items
  – Rapid identification of key project risks
STTS - Summary as of: 03/18/13

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<th>Operation</th>
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<th>Operator</th>
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<th>Total (CuM)</th>
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<td><strong>Total</strong></td>
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Ship-to-ship LNG transfer has become an accepted solution
Distributed / Small Loads

• Opening up smaller markets
  – STS from LNGC to small scale LNG carriers/barges
  – Small vessels deliver LNG to land-based satellite facilities in constrained areas
  – Land-based facilities provide storage and access to gas grid and/or power plants
Offshore LNG Production

FLSO™ - Floating Liquefaction Storage & Offloading Vessel

Lavaca Bay LNG Project
Point Comfort, Texas
Offshore LNG Production

**Completed FEED Results:**
Cost: <$600/tpa of production
Capacity: 4.4 MTPA

4 MTPA Liquefaction Vessel (250,000 m³ Storage)
Length: 338 meters
Beam: 62 meters

4 x 1 MTPA Liquefaction Modules
Power Generation and Controls
Final Dehydration and Fractionation Module
LNG Transfer
What’s Next?

- Excelerate’s goal is to recognize a full floating value chain – from production to consumption

- Many other opportunities for efficiency and optimization exist in the industry - the trick is to recognize them and act