Flexible Solution For FLNG Offloading
By: CAHAY Marc, Technip
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Content

1. Ideal Solution
2. Technologies
3. Configurations
4. Conclusion
Ideal Solution
What is the Ideal Offloading Solution?

- Safe
- Available
- Standard LNGC Fleet

Does it exist?
Safety

- Collision risk
  - Distance
  - Approach & mooring procedure

- Escalation risk
  - Distance

- Leak risk
  - Number leak sources / interface
  - Flange & Swivel
Availability

Environmental Conditions

System

LNGC Requirements

Design Envelop

UKOOA e.g. for tandem envelop
Technologies
Amplitude LNG Loading System - ALLS

- Cryogenic Flexible Pipe
- Multifunction connecting system

Cryogenic flexible pipe
Quick Connector and ERS
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LNG Flexible Pipe Mark 1 & 2

Mark 1
Aerial

Aerial Environment
Catenary Deployment
Short Lengths (< 170 m)

Mark 2
Floating & Aerial

External Water Tightness
High Fatigue Strength
Harsh Operations
Long Lengths (>300 m)

MAWP = 12 barg

MAWP = 18 barg
Predictability and Pressure Drop

- **Predictable behavior**
  - Use of well known material in elastic domain.

- **Complex CFD study**
  - Completion of a LES-VMS study to confirm level of friction coefficient and explain it.
  - Creation of a predictive model.

- **Optimized Transfer Loop**
  - From offloading pumps to LNGC tanks.
Configurations
FLNG Offloading Configurations

Side by Side

Tandem
Side-by-Side Configuration: Flexarm

- Counter weight
- Swinging arm axis and damping
- Flexible Pipe 2
- Rigid arm
- Winch
- Rotating mechanism
- Pedestal

Swinging arm

Wire

Gooseneck

Flexible Pipe 1

Connecting system

Flexible Pipe 2

Swinging arm axis

Connecting system
Aerial Stern-to-Bow Configuration: ALLS
Aerial Stern-to-Bow Configuration: ALLS
Floating Stern-to-Bow Configuration: ALLS
Floating Stern-to-Midship Configuration: ALLS
Conclusion
Conclusion

- Cryogenic flexible Mark 1 & 2\(^{(soon)}\) ready for market
- Flexible systems to answer the client needs

Environmental Conditions

System
- Flexarm
- Aerial StB
- Floating StB
- Floating StM

LNGC Requirements
- Spot market or dedicated
- Size
- DP or not
- ...

Design Envelop
Large or Restricted
Thank you

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