



## FSRU Project Development and Operation



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## Course Content:

### Introduction

The course offers a thorough analysis of the FSRU sector, covering many technical, project-specific, and business concerns related to the usage of FSRU regasification units.

### Targeted Groups

- Technical, commercial, and management employees who need an in-depth technical knowledge of the LNG business and FSRU development.
- New technical support personnel entering the sector
- Technical personnel who want to learn more about the sector

### Unit 1: Introduction to LNG - what is LNG:

Some key facts about LNG, including physical properties, rich and lean LNG, composition ranges, safety, and flammability.

### Unit 2: LNG Global Trade and alternative Commercial Models:

- Global Gas and LNG Trade
- Development of LNG Trade
- LNG Importing Countries
- The Global FSRU Fleet
- Gas Market Characteristics
- The LNG Contract Chain
- Sales and Purchase Agreements
- FSRU Chartering

### Unit 3: Technical Fundamentals:

- LNG Properties and conversions
- Heating Values, Wobbe, Interchangeability, and market specifications

### Unit 4: FSRU vs Land Based Import :

- CAPEX Schedule
- Permitting
- Port Restrictions Major

### Unit 5: Major FSRU Technology Choices:

- Regas Technology Selection
- Boil-Off Gas Handling/ Reliquefaction

- LNG Pump Selection
- Topsides Layout Considerations

## **Unit 6: FSRU Cargo Containment Systems:**

Overview of liquefaction systems membrane vs Moss vs SPB vs Type C

## **Unit 7: LNG Transfer**

- Ship to Ship Transfer- side by side vs tandem
- Hard Arms vs Cryogenic Hoses
- HP Gas transfer vs hard arms and HP hoses
- Custody Transfer, Metering and measurement
- Small scale and bunkering

## **Unit 8: FSRU Mooring System Designs:**

- Tower Yoke Systems
- Spread Mooring Offshore Island
- Jetty Mooring
- Gravity Based Regas structures

## **Unit 9: Marine Infrastructure Issues:**

- Breakwater Design
- Port Dredging
- Tugs and Pilots FSRU Designs
- Newbuild vs Conversions
- Shipyard Selection
- Ship Designs AtlanticMax, Q-max, Q-flex
- Floating Storage FSU's
- Floating Regas FRU's
- Floating Gas to Power
- Niche FSRU Applications

## **Unit 10: FSRU Construction & Constructability:**

- Long Lead Item Delivery
- Typical Conversion Schedule
- Typical Newbuild Schedule

## **Unit 11: FSRU CAPEX and OPEX:**

- Factors Influencing CAPEX and OPEX
- Typical OPEX Elements

## **Unit 12: FSRU Site Selection Considerations:**

- Metocean Water Depth
- Water Temperature



- Environmental Regulations

## **Unit 13: Introduction to LNG Safety:**

- Historical Incidents and Lessons learned - material selection, layout, stratification, rapid phase transition, other Safety in Design Safety Code requirements
- Introduction to Permitting and Environmental