

Introductory FPSO Course Online Training

Commences 19th January 2021

Tuesday 19th January 2021 Module 1 – Introduction to FPSOs

- 08:30 – 09:00 **Registration and Attendee Introductions**
- 09:00 – 09:45 **Course Introduction/FPSO Market Overview & Key Regional Differences**
- Course objectives, summary, and overall course content and FPSO market overview
 - Basic characteristics of FPSOs – advantages and disadvantages compared to other technologies
 - Overview of how regional differences influence FPSO size, configuration and project delivery considering environmental drivers, regulatory compliance, and local content
- Brendan Robertson**, Manager – Facilities Engineering, **Cron dall Energy**
- 10:00 – 10:45 **FPSO Design & Technology (including Recap of the Pre-Reading Material)**
- This session will provide an outline of key design and technology elements of FPSOs including differences in FPSO design, technology, and project execution.
- Terminology
 - Technical building blocks: hull, mooring & station-keeping, topsides, ship to subsea interface, storage and offloading
 - Major design considerations and decisions for overall FPSO configuration
 - Typical examples: a review of FPSOs from different regions of the world
 - New technology developments
- Brendan Robertson**, Manager – Facilities Engineering, **Cron dall Energy**
- 11:00 – 11:45 **FPSO Procurement Strategy and Commercial Considerations (part 1)**
- In this first session we examine the options available to the project team, in the development of a suitable contracting strategy for FPSO projects. It will consider key commercial considerations, expected field life, risk mitigation strategies and regional and market considerations
- Developing a project strategy – the importance of creating good project definition
 - Contracting options
 - Lease vs. purchase
 - Commercial considerations and options
 - Redeployment – the potential for re-use and realising value
- Tony Hodgkins**, Manager – London Office, **Cron dall Energy**

Thursday 21st January 2021 Module 2 – Introduction to FPSOs

- 09:00 – 09:45 **FPSO Procurement Strategy and Commercial Considerations (Part 2)**
- Cost and schedule expectations and drivers
 - Capital costs and lease rates
 - Evaluating and managing project risks
 - Risk management tools during project execution
 - Key lessons learned and examples of different execution methodologies
- Tony Hodgkins**, Manager – London Office, **Cron dall Energy**

10:00 – 11:00 **Introduction to Case Studies and Workshop**
Tony Hodgkins, Manager – London Office, **Crandall Energy**

Strategy Workshop

Working in teams and using the knowledge gained so far, delegates will start developing a FPSO strategy for their own individual case study.

11:00 – 11:30 Workshop Feedback Session

Tuesday 26th January 2021
Module 3 – FPSO Layout and Design

09:00 – 09:45 **Hull Design, Layout and Structures**
 In this session we explore the differences in hull layout and structure, providing examples of the key factors driving hull layout and selection

- Newbuild and conversions – examples of both
- Strengths and weaknesses of layout options
- Global hull loading
- (Other) site-specific loads
- Structural assessment
- Structural fatigue

Luciano Musumeci, Senior Naval Architect, **Crandall Energy**

10:00 – 10:45 **Topsides Design Considerations**
 This session identifies and examines the design issues specific to FPSO topsides. Relevant FPSO topsides processes and technologies will be overviewed.

Brendan Robertson, Manager – Facilities Engineering, **Crandall Energy**

11:00 – 12:00 **FPSO Offloading and Turret Mooring Systems**
 This session covers the various means of offloading produced crude oil from an FPSO and the likely project specific drivers resulting in different approaches being selected, and turret and swivel technologies.

- Tandem offloading
- CALM buoys
- Submerged loading systems
- Different turret and swivel technologies available and their strengths and weaknesses
- Key features of turrets
- Key features of swivels

Luciano Musumeci, Senior Naval Architect, **Crandall Energy**

Thursday 28th January 2021
Module 4 – FPSO Layout and Design

09:00 – 10:00 **FPSO Topsides Layout, Fuel, Heat and Power**
 This session discusses key layout drivers for the FPSO topsides facility and session introduces fuel, heat and power strategies to cope with varying project scenarios.

- Project drivers
- Safety considerations
- Alternative topsides construction approaches

Brendan Robertson, Manager – Facilities Engineering, **Crandall Energy**

10:15 – 11:15 **Case Study Introduction and Workshop**

Brendan Robertson, Manager – Facilities Engineering, **Crandall Energy**

FPSO Design and Layout Workshop - Working in your teams you will define the hull, mooring and topsides layout appropriate to your own projects technical and strategic drivers.

11:15 – 11:45 **Workshop Feedback Session**

Tuesday 2nd February 2021
Module 5 – Project Considerations

09:00 – 09:45 FPSO Mooring System Design

This session introduces the key design drivers for the mooring system

- Overview of mooring system types
- Environmental drivers
- Regulations
- Riser and mooring system design interactions

Luciano Musumeci, Senior Naval Architect, **Crandall Training**

10:00 – 10:45 FPSO Conversions and Redeployments

This session provides more detail regarding how conversion and redeployment projects are managed, highlights the key activities for a conversion/redeployment project, risk areas and their mitigations.

Tony Hodgkins, General Manager - London, **Crandall Energy**

11:00 – 11:45 Regulatory Considerations for FPSO Projects

FPSOs are challenging governed by a combination of maritime and offshore regulatory regimes, technologies, and practices. This session considers:

- Relevant technical and regulatory issues in floating production
- Relationship between coastal state authorities, maritime flag authorities and class societies
- A description of the class approach to FPSO quality assurance and compliance management

Luciano Musumeci, Senior Naval Architect, **Crandall Energy**

Thursday 4th February 2021
Module 6 – Project Considerations

09:00 – 09:45 Riser Design Considerations

This session introduces the various key riser technologies employed on FPSO projects and their relative selection drivers.

Ian Frazer, Principal Consultant, **Crandall Energy Subsea**

10:00 – 10:45 Subsea Systems for FPSOs

This session introduces the key interfaces between the subsea and FPSO projects covering the following topics:

- Subsea system overview
- Key interfaces between subsea and FPSO
- FPSO and subsea project timing and structure – managing interfaces

Ian Frazer, Principal Consultant, **Crandall Energy Subsea**

11:00 – 12:00 FPSO Commissioning and operations

This session covers the commissioning and operations phase of the FPSO

- Key activities required
- Onshore vs. offshore commissioning
- Risks associated with offshore commissioning
- Contract approaches for effective commissioning
- Lease operate – company and operator relationship

- Success drivers

Brendan Robertson, Facilities Manager, **Cron dall Energy**

Tuesday 9th February 2021

Module 7 – Project Legal, Financing and Environmental Considerations

- 09:00 – 09:45 **Legal Considerations for FPSOs**
- Contract structures and financing considerations
 - Design and construction risks
 - Country and operational risks
- David Gardner**, Partner, **Schjødt**
- 10:00 – 10:45 **Sustainable Finance Trends and the Green Recovery**
- During this session, we will explore current global trends in sustainability and how these affect project financing requirements, specifically regarding FPSO projects
- Global trends on sustainability policy and carbon
 - Sustainability finance standards and voluntary agreements
 - What this means for FPSO Projects
- Sarah Murfitt** and **Steve McIlwaine**, **SMC Limited**
- 11:00 – 11:45 **FPSO Project Financing Considerations**
- During this session we introduce the key finance models for FPSO projects, the scenarios in which they are employed and their strengths and weaknesses.
- Simon Davies**, Natural Resources, Structured Finance Office for EMEA, **MUFG Bank**

Thursday 11th February 2021
Module 8 – Project Considerations

- 09:00 – 09:45 **FPSO and SURF Installation**
- This session covers key activities associated with the installation and associated SURF equipment
- Installation activities and equipment
 - Schedule
 - Risks
- Ian Frazer**, Principal Consultant, **Crandall Energy Subsea**
- 10:00 – 11:00 **Case Study Introduction and Workshop**
- Tony Hodgkins**, General Manager - London, **Crandall Energy**
- Project Risk Assessment Workshop**
- Apply your understanding of the technical and project risks association with your project by applying robust strategies to mitigate them.
- 11:00 – 11:30 **Workshop Feedback Session**
- 11:30 – 12:00 **Course Recap and Close**