
Graduate Certificate in Subsea Engineering

Subsea Installation and Intervention

Subsea Installation and Intervention Key Terms and Vocabulary

Subsea engineering is a specialized field that deals with the design, construction, installation, and maintenance of underwater structures and equipment. In this course, we will focus on Subsea Installation and Intervention, which are critical aspects of subsea engineering. To fully understand these concepts, it is essential to familiarize yourself with key terms and vocabulary used in this field. Below are some of the most important terms you need to know:

1. Subsea Installation:

Subsea installation refers to the process of installing subsea equipment, structures, or pipelines on the seabed. This can include subsea trees, manifolds, umbilicals, risers, flowlines, and other components that are essential for the operation of subsea oil and gas fields.

2. Intervention:

Intervention in the subsea context involves activities aimed at maintaining, repairing, or enhancing the performance of subsea equipment. This can include tasks such as well intervention, subsea maintenance, and subsea repair.

3. ROV (Remotely Operated Vehicle):

An ROV is an unmanned submersible device used for various underwater tasks, including subsea installation and intervention. ROVs are equipped with cameras, sensors, manipulators, and other tools to perform complex operations in the subsea environment.

4. Diver:

A diver is a trained professional who performs underwater tasks, such as inspections, repairs, and installations. While the use of divers has decreased with the advancement of ROV technology, they are still utilized in certain subsea operations.

5. Pipeline:

A pipeline is a long tubular structure used to transport fluids, such as oil, gas, or water, from one location to another. Subsea pipelines are laid on the seabed and play a crucial role in the transportation of hydrocarbons from offshore fields to onshore facilities.

6. Subsea Tree:

A subsea tree is a complex assembly of valves, sensors, and control systems used to control the flow of oil or gas from a subsea well. Subsea trees are installed on the seabed and connected to the wellhead to regulate production.

7. Manifold:

A manifold is a structure used to distribute or collect fluids from multiple subsea wells. Subsea manifolds

are essential components of subsea production systems, allowing for the efficient management of hydrocarbons from different wells.

8. Umbilical:

An umbilical is a bundle of cables and hoses used to provide power, communication, and fluids to subsea equipment. Subsea umbilicals are essential for the operation of subsea installations, as they enable the transmission of vital signals and resources.

9. Riser:

A riser is a vertical pipe that connects a subsea well to a floating production platform or a vessel on the surface. Risers transport oil, gas, or other fluids from the seabed to the surface and play a crucial role in offshore oil and gas production.

10. Installation Vessel:

An installation vessel is a specialized ship equipped with cranes, winches, and other tools for the installation of subsea equipment. These vessels are used to deploy subsea structures, pipelines, and other components in offshore environments.

11. Subsea Tieback:

A subsea tieback is a method of connecting a new subsea well to an existing production facility. This technique allows for the development of new fields without the need for a standalone platform, reducing costs and increasing efficiency.

12. Subsea Intervention System:

A subsea intervention system is a set of equipment and tools used to perform maintenance, repair, and other interventions on subsea installations. These systems may include ROVs, intervention modules, and other specialized equipment.

13. Subsea Control System:

A subsea control system is a network of valves, actuators, sensors, and control modules used to operate subsea equipment remotely. These systems allow operators to monitor and control subsea installations from a central control room onshore or on a vessel.

14. Subsea Inspection:

Subsea inspection involves the visual or remote assessment of subsea structures, pipelines, and equipment to identify defects, corrosion, or other issues. Inspection activities are crucial for ensuring the integrity and safety of subsea installations.

15. Subsea Repair:

Subsea repair refers to the process of fixing or replacing damaged or malfunctioning components of subsea installations. Repair operations may involve the use of ROVs, divers, or specialized tools to restore the functionality of subsea equipment.

16. Subsea Decommissioning:

Subsea decommissioning is the process of permanently abandoning and removing subsea installations at

the end of their operational life. Decommissioning activities involve the plugging of wells, removal of pipelines, and disposal of subsea structures in an environmentally friendly manner.

17. Hydrostatic Pressure:

Hydrostatic pressure is the pressure exerted by a fluid at rest due to the weight of the overlying water column. In subsea installations, hydrostatic pressure plays a crucial role in the design and operation of equipment, as it can affect the integrity and performance of subsea structures.

18. Hydrocarbon Production:

Hydrocarbon production refers to the extraction of oil and gas from subsea wells for commercial purposes. Subsea installations are designed to facilitate the production of hydrocarbons and ensure their safe transportation to onshore facilities.

19. Subsea Engineering:

Subsea engineering is a multidisciplinary field that encompasses the design, construction, installation, and maintenance of subsea installations. Subsea engineers are responsible for developing innovative solutions to challenges in the offshore environment.

20. Subsea Environment:

The subsea environment refers to the conditions and challenges present in underwater locations, such as high pressure, low temperatures, corrosive seawater, and limited visibility. Subsea installations are designed to withstand these harsh conditions and operate reliably in offshore settings.

21. Subsea Infrastructure:

Subsea infrastructure includes all the components and systems required for the operation of subsea installations, such as pipelines, manifolds, control systems, and umbilicals. This infrastructure forms the backbone of offshore oil and gas production.

22. Subsea Installation Challenges:

Subsea installations face various challenges, including complex logistics, harsh environmental conditions, equipment reliability, and safety considerations. Overcoming these challenges requires careful planning, innovative technology, and skilled personnel.

23. Subsea Installation Methods:

There are several methods for installing subsea equipment, such as diver-assisted installation, ROV installation, pipeline laying, and subsea lifting operations. Each method has its advantages and limitations, depending on the specific requirements of the project.

24. Subsea Intervention Techniques:

Subsea intervention techniques include well intervention, pipeline repair, subsea maintenance, and other activities aimed at ensuring the efficient operation of subsea installations. These techniques require specialized equipment and expertise to execute successfully.

25. Subsea Installation Standards:

Subsea installations must adhere to industry standards and regulations to ensure safety, reliability, and

environmental protection. Standards such as API, ISO, and DNV GL provide guidelines for the design, construction, and operation of subsea equipment.

26. Subsea Installation Projects:

Subsea installation projects involve the planning, execution, and commissioning of subsea equipment in offshore environments. These projects require coordination between various stakeholders, including operators, contractors, and regulatory bodies.

27. Subsea Installation Risks:

Subsea installations are exposed to risks such as equipment failure, human error, natural disasters, and environmental damage. Mitigating these risks involves implementing robust safety measures, contingency plans, and risk management strategies.

28. Subsea Installation Innovation:

Innovation plays a vital role in the development of subsea installations, with advancements in technology, materials, and design driving improvements in efficiency, safety, and performance. Innovations such as digitalization, automation, and remote monitoring are transforming the subsea industry.

29. Subsea Installation Future Trends:

The future of subsea installations is likely to be shaped by trends such as deeper water exploration, subsea processing, renewable energy integration, and digitalization. These trends will drive the evolution of subsea engineering and open up new opportunities for the industry.

30. Subsea Installation Training:

Training in subsea installation and intervention is essential for engineers, technicians, and operators working in the offshore sector. Training programs cover topics such as subsea systems, safety procedures, equipment operation, and emergency response to ensure personnel are prepared for the challenges of subsea work.

In conclusion, understanding key terms and vocabulary related to subsea installation and intervention is crucial for anyone working in the field of subsea engineering. By familiarizing yourself with these concepts, you will be better equipped to tackle the challenges and opportunities presented by offshore installations and contribute to the advancement of the subsea industry.