Graduate Certificate in Subsea Engineering

Subsea Installation and Intervention

Subsea Installation and Intervention

Subsea installation and intervention are critical components of subsea engineering, involving the deployment, maintenance, and repair of equipment and structures in underwater environments. This glossary aims to provide a comprehensive overview of key terms and concepts related to subsea installation and intervention for the Graduate Certificate in Subsea Engineering.

Acoustic Positioning System

An acoustic positioning system is a technology used in subsea operations to accurately determine the position of underwater assets, such as ROVs, AUVs, and subsea structures. It relies on sound waves transmitted between transponders and receivers to calculate the location of objects in the water.

Autonomous Underwater Vehicle (AUV)

An autonomous underwater vehicle is a self-propelled, unmanned vehicle designed to operate underwater without direct human control. AUVs are used in subsea installations for tasks such as seabed mapping, pipeline inspection, and surveying.

Christmas Tree

A Christmas tree is a complex arrangement of valves, spools, and fittings installed on a wellhead to control the flow of hydrocarbons during production operations. It is a critical component of subsea installations and is used to regulate the flow of oil and gas from the reservoir to the surface.

Diving Support Vessel (DSV)

A diving support vessel is a specialized ship equipped with diving facilities to support underwater operations, including subsea installations, maintenance, and repair activities. DSVs are essential for providing safe and efficient access to underwater structures and equipment.

Dynamic Positioning System

A dynamic positioning system is a technology used on vessels to automatically maintain their position and heading without the need for anchors. This system is crucial for subsea installation operations, as it allows vessels to remain stationary during delicate procedures such as ROV operations and equipment deployment.

Flexible Flowline

A flexible flowline is a type of pipe used to transport hydrocarbons from subsea wells to production facilities

on the surface. It is designed to withstand the harsh conditions of the seabed, including high pressures, temperatures, and bending loads, making it a vital component of subsea installations.

Hydraulic Workover Unit (HWU)

A hydraulic workover unit is a mobile rig used for well intervention operations in offshore environments. HWUs are equipped with hydraulic systems to perform various tasks, such as well stimulation, plug setting, and equipment installation, making them essential for subsea intervention activities.

Installation Vessel

An installation vessel is a specialized ship used to install subsea equipment, such as pipelines, umbilicals, and structures, on the seabed. These vessels are equipped with cranes, winches, and positioning systems to carry out complex installation operations in offshore environments.

Jumper

A jumper is a short section of pipe used to connect two subsea components, such as flowlines, pipelines, or risers. Jumpers are critical for creating a continuous flow path between different subsea structures and are commonly used in subsea installations to ensure efficient hydrocarbon production.

Kick-off Point

A kick-off point is a specific location on a wellbore where the deviation angle changes from vertical to horizontal or inclined. It is an essential consideration in subsea installations, as the kick-off point determines the trajectory of the wellbore and the placement of subsea equipment.

Light Well Intervention (LWI)

Light well intervention is a technique used to perform maintenance and repair operations on subsea wells without the need for a full drilling rig. LWI vessels are equipped with wireline tools, coiled tubing, and hydraulic systems to carry out interventions such as plug setting, stimulation, and equipment installation.

Manifold

A manifold is a subsea structure used to distribute and control the flow of hydrocarbons between multiple wells and production facilities. Manifolds play a crucial role in subsea installations by connecting flowlines, pipelines, and control systems to optimize production efficiency and facilitate reservoir management.

Non-Destructive Testing (NDT)

Non-destructive testing is a method used to evaluate the integrity of subsea structures and equipment without causing damage. NDT techniques, such as ultrasonic testing, radiography, and magnetic particle inspection, are essential for ensuring the safety and reliability of subsea installations.

Offshore Construction Vessel (OCV)

An offshore construction vessel is a specialized ship equipped with cranes, winches, and dynamic positioning systems to support offshore construction and installation activities. OCVs play a vital role in subsea engineering by providing the necessary infrastructure and equipment for subsea installations.

Pigging

Pigging is a technique used in subsea pipelines to clean, inspect, and maintain the integrity of the pipeline. Pigs are devices inserted into the pipeline and propelled by the flow of fluid to remove debris, inspect for defects, and facilitate the transportation of hydrocarbons in subsea installations.

Quayside Testing

Quayside testing is a procedure conducted on subsea equipment and structures before deployment to ensure their functionality and integrity. This testing is essential for verifying the performance of subsea installations and identifying any potential issues that may arise during offshore operations.

ROV Support Vessel

An ROV support vessel is a ship equipped with launch and recovery systems for remotely operated vehicles (ROVs) used in subsea operations. These vessels provide a stable platform for ROV operations, such as inspection, maintenance, and intervention, making them essential for subsea engineering activities.

Subsea Control Module (SCM)

A subsea control module is a device used to remotely control subsea production systems, such as trees, manifolds, and valves, from the surface. SCMs play a critical role in subsea installations by enabling operators to monitor and regulate subsea equipment without direct intervention.

Tension Leg Platform (TLP)

A tension leg platform is a type of offshore structure used to support production facilities in deepwater environments. TLPs are anchored to the seabed using tensioned tethers, providing stability and flexibility for subsea installations in challenging offshore conditions.

Umbilical

An umbilical is a bundle of cables and hoses used to provide power, communication, and fluid transfer between surface facilities and subsea equipment. Umbilicals are essential for subsea installations, as they supply the necessary resources to control and operate subsea systems effectively.

Vertical Connection System (VCS)

A vertical connection system is a subsea tool used to connect and disconnect hydraulic and electrical lines between subsea equipment and surface facilities. VCSs are essential for subsea installations, as they enable the installation and retrieval of equipment without interrupting production operations.

Wellhead

A wellhead is the component of a subsea well that provides the interface between the surface and the downhole reservoir. Wellheads are used to control the flow of hydrocarbons, support casing strings, and protect the wellbore, making them critical for subsea installations and production operations.

Xmas Tree Installation

Xmas tree installation refers to the process of installing a Christmas tree on a subsea wellhead to control the flow of hydrocarbons during production operations. This procedure is essential for ensuring the safe and efficient operation of subsea wells and is a key component of subsea installations.

Yoke Connector

A yoke connector is a subsea tool used to mechanically connect two components, such as pipelines, flowlines, or risers, in offshore environments. Yoke connectors are designed to withstand high loads and pressures, making them essential for subsea installations where reliable connections are critical.