Postgraduate Certificate in Advanced Subsea Engineering for Oil and Gas

Subsea Intervention and Remote Operations

Subsea Intervention and Remote Operations are crucial aspects of advanced subsea engineering for the oil and gas industry. This explanation will cover key terms and vocabulary related to these topics.

1. Subsea Intervention: Any activity that involves altering or interacting with subsea equipment or infrastructure is considered a subsea intervention. This can include installation, maintenance, repair, or recovery of subsea equipment.

2. Remote Operations: Remote operations refer to the control and monitoring of subsea equipment from a remote location, often from a surface vessel or onshore control room. This allows for greater efficiency, safety, and cost-effectiveness compared to traditional manual interventions.

3. ROVs (Remotely Operated Vehicles): ROVs are unmanned underwater vehicles that are remotely operated from a surface vessel. They are equipped with cameras, lights, and manipulator arms to perform various tasks, including inspection, maintenance, and repair of subsea equipment.

4. AUVs (Autonomous Underwater Vehicles): AUVs are similar to ROVs but operate autonomously without real-time human intervention. They are programmed to follow a predetermined path and can perform tasks such as data collection, inspection, and surveillance.

5. Subsea Tree: A subsea tree is a key component of subsea production systems. It is a tree-like structure that controls the flow of oil or gas from a well to a production facility. Subsea trees are typically installed on the seabed and can be operated remotely.

6. Umbilical: An umbilical is a cable that connects a subsea system to a surface vessel or platform. It provides power, communication, and fluid transfer between the surface and subsea systems.

7. Sonar (Sound Navigation and Ranging): Sonar is a technique used to navigate, communicate, or detect objects underwater using sound waves. It can be used for various applications, including subsea inspection, mapping, and object detection.

8. Hydraulic System: A hydraulic system is a type of power transmission system that uses fluid pressure to perform work. In subsea operations, hydraulic systems are often used to control valves, manipulator arms, and other equipment.

9. Fiber-Optic Cable: A fiber-optic cable is a type of cable that uses light to transmit data over long distances. In subsea operations, fiber-optic cables are often used for communication and data transfer between subsea systems and surface vessels or platforms.

10. Electrical Power Distribution: Electrical power distribution refers to the delivery of electrical power from a source to subsea equipment. This can include transformers, switchgears, and other electrical components.

11. Subsea Control System: A subsea control system is a system that controls and monitors subsea equipment. This can include sensors, valves, and other components that are used to control the flow of oil or gas.

12. Subsea Manifold: A subsea manifold is a structure that distributes fluid from multiple wells to a production facility. It is typically installed on the seabed and can be operated remotely.

13. Wellhead: A wellhead is a component that sits on top of a subsea well and controls the flow of oil or gas. It is typically installed on the seabed and can be operated remotely.

14. Intervention Workover Control System (IWOC): An IWOC is a system that controls subsea well intervention activities. It allows operators to control well intervention operations from a surface vessel or platform.

15. Well Intervention: Well intervention refers to any activity that involves altering or interacting with a subsea well. This can include installation, maintenance, repair, or recovery of subsea well equipment.

16. Riser: A riser is a pipe that connects a subsea system to a surface vessel or platform. It is used to transfer fluids between the surface and subsea systems.

17. Blowout Preventer (BOP): A BOP is a safety device that is used to prevent uncontrolled release of oil or gas from a well. It is typically installed on the seabed and can be operated remotely.

18. Christmas Tree: A Christmas tree is another name for a subsea tree.

19. Moon Pool: A moon pool is an opening in the floor of a surface vessel or platform that allows subsea equipment to be deployed

20. Launch and Recovery System (LARS): A LARS is a system that is used to deploy and recover subsea equipment, such as ROVs or AUVs.

21. Electric Line (EL): An EL is a cable that is used to transmit electrical power and data between a surface vessel and subsea equipment.

22. Workclass ROV: A workclass ROV is a type of ROV that is designed for heavy-duty tasks, such as construction, maintenance, and repair of subsea equipment.

23. Observation Class ROV: An observation class ROV is a type of ROV that is designed for light-duty tasks, such as inspection and surveillance of subsea equipment.

24. Motion Compensation: Motion compensation is a technique that is used to stabilize subsea equipment in rough seas. It involves compensating for the movement of the surface vessel or platform to keep the subsea equipment steady.

25. Dynamic Positioning (DP): DP is a system that is used to maintain the position of a surface vessel or platform in rough seas. It involves using thrusters to keep the vessel or platform in a fixed position relative to a subsea target.

In summary, Subsea Intervention and Remote Operations are critical aspects of advanced subsea engineering for the oil and gas industry. Key terms and vocabulary related to these topics include ROVs, AUVs, subsea trees, umbilicals, sonar, hydraulic systems, fiber-optic cables, electrical power distribution, subsea control systems, subsea manifolds, wellheads, IWOCs, well intervention, risers, BOPs, Christmas trees, moon pools, LARS, ELs, workclass ROVs, observation class ROVs, motion compensation, and DP. Understanding these terms and concepts is essential for anyone working in the field of advanced subsea engineering for oil and gas.