Subsea Wellhead and Trees

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Lecture 1: Introduction to Subsea Wellheads & Trees

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Introduction

- Subsea wellheads and Xmas trees are one of the most vital pieces of equipment in a subsea production system.

- The subsea wellhead system performs the same general functions as a conventional surface wellhead.

- It supports and seals casing strings and also supports the BOP stack during drilling and the subsea tree after completion.
Introduction

- A subsea Xmas tree is basically a stack of valves installed on a subsea wellhead to provide a controllable interface between the well and production facilities.

- It is also called a Christmas tree, cross tree, X-tree, or tree.

- Subsea Xmas tree contains various valves used for testing, servicing, regulating, or choking the stream of produced oil, gas, and liquids coming up from the well below.
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Introduction

- The various types of subsea Xmas trees are used for either **production or water/gas injection**.

- Configurations of **subsea Xmas trees** can be different according to the demands of the various projects and field developments.

- Subsea wellhead systems and Xmas trees are normally designed according to standards.
Introduction

Some of these standards includes:

- API 6A, Specification for Wellhead and Christmas Trees Equipment;
- API 17D, Specification for Subsea Wellhead and Christmas Tree Equipment;
- API RP 17A, Recommended Practice for Design and Operation of Subsea Production Systems;
- API RP 17H, Remotely Operated Vehicle (ROV) Interfaces on Subsea Production System;
- API RP 17G, Design and Operation of Completion/Workover Risers;
- ASME B31.3, Process Piping;
- API 5L, Specification for Line Pipe;
Introduction

Some of these standards includes:

- ASME B31.8, Gas Transmission and Piping System;
- ASME BPVC VIII, Rules for Construction of Pressure Vessels, Divisions 1 and 2;
- AWS D1.3, Structural Steel Welding Code;
- DNV RP B 401, Cathodic Protection;
- NACE MR-0175, Petroleum and Natural Gas Industries
- Material for Use in H2S-Containing Environments in Oil and Gas Production.

Note:

These standards will be discussed in details as the form the building block of this course.