

Subsea Wellhead and Trees

Presented by

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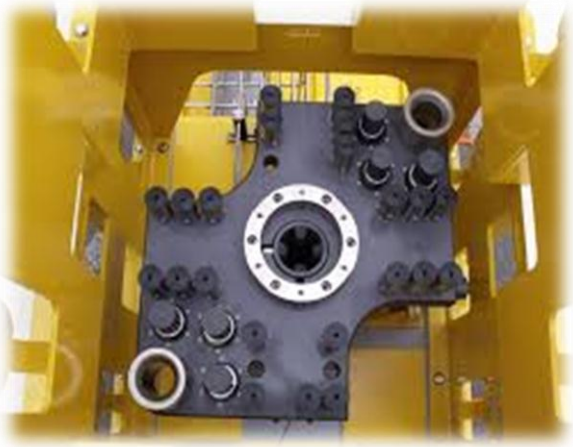
Outline

Lecture 4: Subsea XMAS Trees

- Function Requirements
- Types and Configurations of Trees
- Selection Criteria
- Design Process
- Service Conditions
- Main Components of Tree



Lecture 5: Tree Mounted Controls

Lecture 6: Tree Running Tools

Lecture 7: Subsea Xmas Tree Design & Analysis

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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

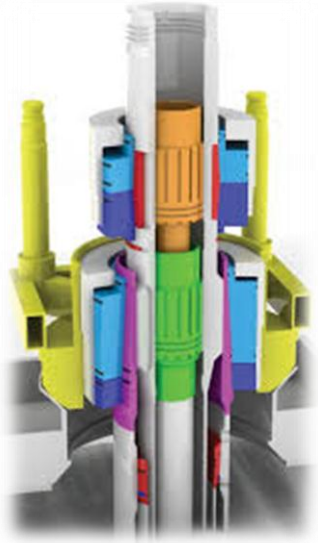
- It supports and seals casing strings and also supports the BOP stack during drilling and the subsea tree after completion.

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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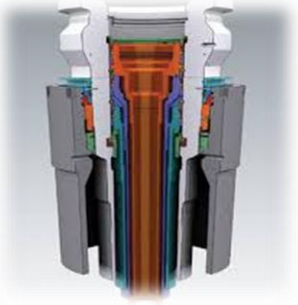
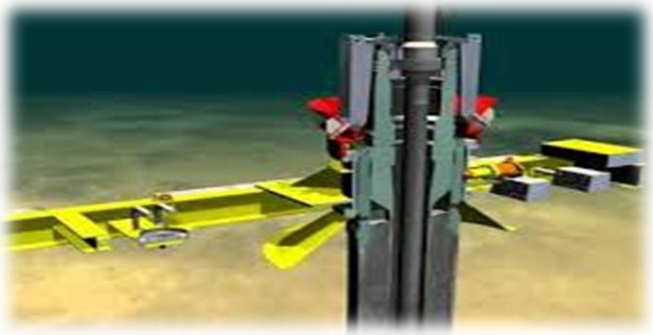


Introduction

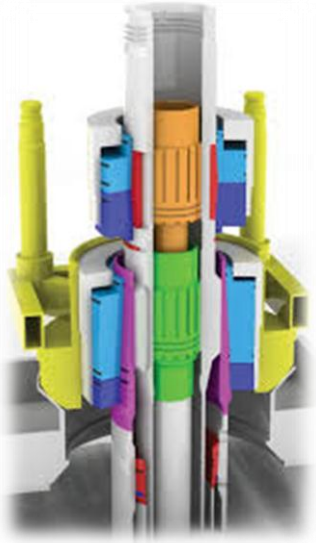
- The various types of subsea Xmas trees are used for either **production or water/gas injection**.
- Configurations of **subsea Xmas trees** can be different according to the demands of the various projects and field developments.
- Subsea wellhead systems and Xmas trees are normally designed according 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 Comlpetion/Workover Risers;
- ✓ ASME B31.3,Process Piping;
- ✓ API 5L,Specification for Line Pipe;



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Some of these standards includes:

- ✓ ASME B31.8,Gas Transmission and Piping System;
- ✓ ASME BPVC VIII, Rules for Construction of Pressure Vessels, Divisions 1and 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.

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