

Subsea Wellhead System

Temporary abandonment cap

18 1/4-in. wellhead housing

7-in. casing hanger and seal assembly

9 5/8-in. casing hanger and seal assembly

13 5/8-in. casing hanger and seal assembly

30-in. conductor wellhead

Conductor

20-in. casing

13 1/8-in. casing

9 5/8-in. casing

7-in. casing

Well Head Running Tool

18 1/4" Wellhead Running Tool

Wellhead Running Tool and Casing Hanger Loading Profile

Wellhead Connector Loading Profile

18 1/4" Wellhead

RUNNING TOOL LOCK RING PROFILE

13-5/8" SEATING LOCATION PROFILE

CLAMP BY RETURN JOCKEY

ALIGNMENT SLICES

RUNNING TOOL SEAL AREA

Wellhead Housing

ANTI-ROTATION SLICES

TR-BACK THREADS

SEAL AREA

RUNNING TOOL SEAL AREA

LOAD RING

Casing Hanger

Guide base (template)

Control nozzle

Control outlet

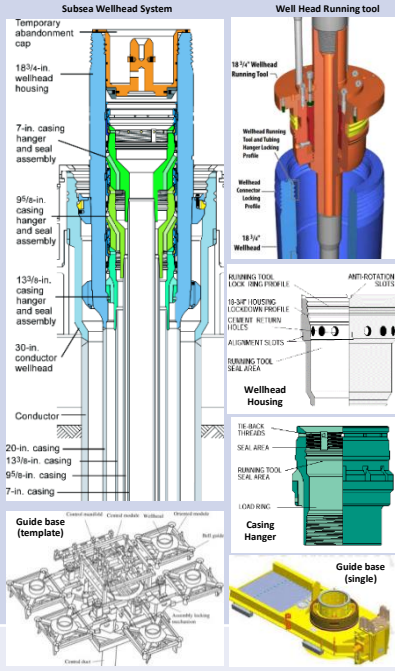
Wellhead

Guide base

Assembly locking mechanism

Control base

Guide base (single)



Horizontal Tree Valves

Vertical Tree Valves

(valves and tubing hanger location)

Advantages

- + Tubing recovery is simplified
- + Large tubing OD
- + All completion work is carried out through BOP stack.
- + The HXT is more tolerant of damaged sealing surfaces in the wellhead system

- + The subsea tree can be recovered without having to recover the tubing hanger
- + The tree is not required to withstand high loads associated with a Drilling BOP stack

Drawbacks

- The tubing must be pulled first before retrieving the tree
- first-line barrier protection to the environment if not a valve but a plug
- The tree must be designed to withstand the loadings associated with a deepwater BOP stack and riser system

- The wellhead bore sets the tubing hanger outside diameter, leaving only a limited area for donwhole access.
- The tree must be recovered in order to perform a tubing work-over.
- The integrity of the wellhead interface is an issue

Vertical XT on Wellhead

Horizontal XT on Wellhead

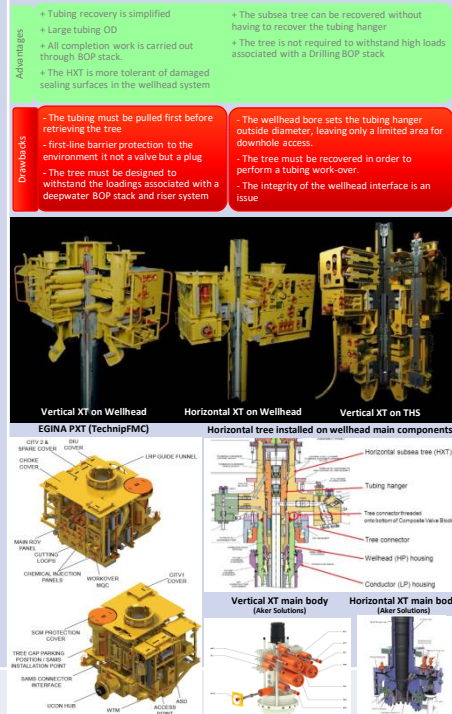
Vertical XT on THS

EQUINA PT (TechnipFMC)

Horizontal tree installed on wellhead main components

Vertical XT main body (Aker Solutions)

Horizontal XT main body (Aker Solutions)



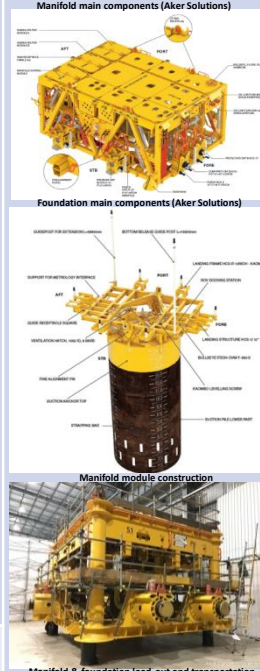
Cluster manifold (BHGE)

Template manifold (BHGE)

Manifold main components (Aker Solutions)

Foundation main components (Aker Solutions)

Manifold module construction

[illegible]