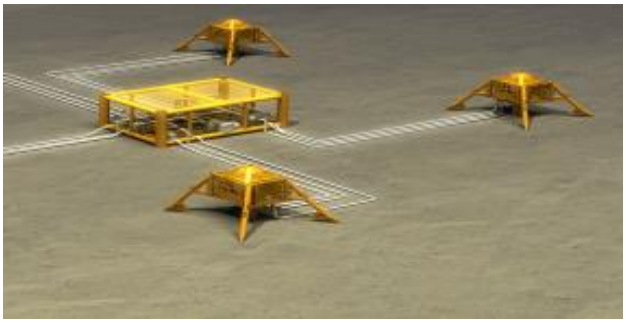
Crondallenergy
Floating Production & Subsea Specialists

Subsea Hardware Consultancy



Hardware decisions

The definition of a subsea system involves multiple decisions on hardware configurations, functionality and required performance.

Tree types (horizontal, vertical), Manifold functionality (active, passive, flow measurement, monitoring), Jumper arrangements (vertical, horizontal, flexible, rigid), Connection arrangements (diverless, single bore, multi-bore, choke bridge), Controls architecture and chemical distribution are just a few.

The challenge

Overall system requirements are often not translated into component requirements and used to drive design, testing, installation and operational integrity management.

Functional requirements and equipment selection

The first step is to develop high-level technical performance requirements from the overall business case and then to use those to extrapolate system wide consistency of component functional specifications (including reliability requirements).

Risk based decision techniques can also be used to select the best through field life comparative value from different hardware options.

Technical assurance

Technical assurance is the systematic approach used to verify that performance requirements can be achieved.

Techniques such as FMECA are valuable in assurance of design but can also be used to improve designs and understand operability issues. Fault tree analysis helps understand the complex interaction of components found in subsea systems.

Where technical performance cannot be assured, qualification tests need to be designed that reflect functional requirements in the intended environment. Assurance of qualification status involves considerable effort, but carries serious risks if not done early enough in the schedule.

Assurance continues into operations where the integrity management schemes capture inspection/intervention requirements developed directly from the understanding of potential failure.

Feedback and lessons learned

Failures indicate an incomplete understanding of requirements and equipment, but offer the opportunity to learn. Investigations that uncover root causes beyond design and drive improvements in organisational processes and capabilities will add most value.

Benefit

Detailed knowledge of hardware design and awareness of the potential for failure is the key to unlocking the value that delivers effective risk mitigation measures and robust execution strategies.

> "Subsea developments are now larger (in size and geographic dispersion), located in deeper water and in more remote locations where interventions are more difficult and expensive"