

Pre-engineered Subsea Solutions Incite Oil, Gas Industry Change

Standardization effectively addresses project feasibility.

Wayne Hand, OneSubsea, a Schlumberger company

Amid the disconcerting economic news of the past several years, a quiet revolution has been taking place. Pre-engineered, capital-efficient solutions are carving a niche in the industry product roster. This is in direct response to operators' need for qualified, field-proven, flexible solutions at lower cost than bespoke solutions that leverage the lessons learned of the past to ensure future reliability.

Major operators and independents are embracing these capital-efficient designs as a project viability enabler. In the words of one major subsea operator, standardization is the new innovation.

During the most recent period of high oil prices that occurred before the downturn, the industry required engineered solutions to bespoke customer specifications as a means to reduce perceived operational risk. But over time these bespoke specifications have taken on a boomerang effect, with inefficient and complex project-specific solutions becoming a contributor to operational risk, high cost, and long lead times. Now operators are becoming open to consider capital-efficient solutions with flexible functionality rather than bespoke equipment and systems. Supplier-led innovation is paving the way to new solutions options.

Pre-engineered Solution Advantages

Suppliers have been working on innovative ways to help operators address viability challenges. By collaborating



A subsea tree comprised of cost-efficient equipment components. (Source: Schlumberger)

with operators early in the project life cycle, suppliers are learning that while cost is the current major barrier to project progression, other critical objectives such as safety, reliability and operational efficiency are still top of the agenda. Companies such as OneSubsea, a Schlumberger company, are leveraging wider capabilities to address these objectives.

Pre-engineered solutions configured to meet true project needs offer a cost-effective, reliable way to meet unique project challenges and vastly improve cycle time. Optimization is achieved by standardizing processes, documentation, manufacturing and design across projects, enabling the most efficient use of engineering, project management and plant resources. At the heart of capital-efficient equipment is a suite of preauthored material specifications, weld specifications, coating specifications and quality plans that leverage standardized execution processes from engineering, procurement, manufacturing, inspection, assembly and testing.

Pre-engineered common core components combined with repeatable processes help to reduce risk. Through ever closer customer engagement, lessons learned are being incorporated into standard designs and maintained as part of a standard offering; this allows a repeatable manufacturing process, further increasing reliability and quality. Once the process is repeatable, it can then be optimized.

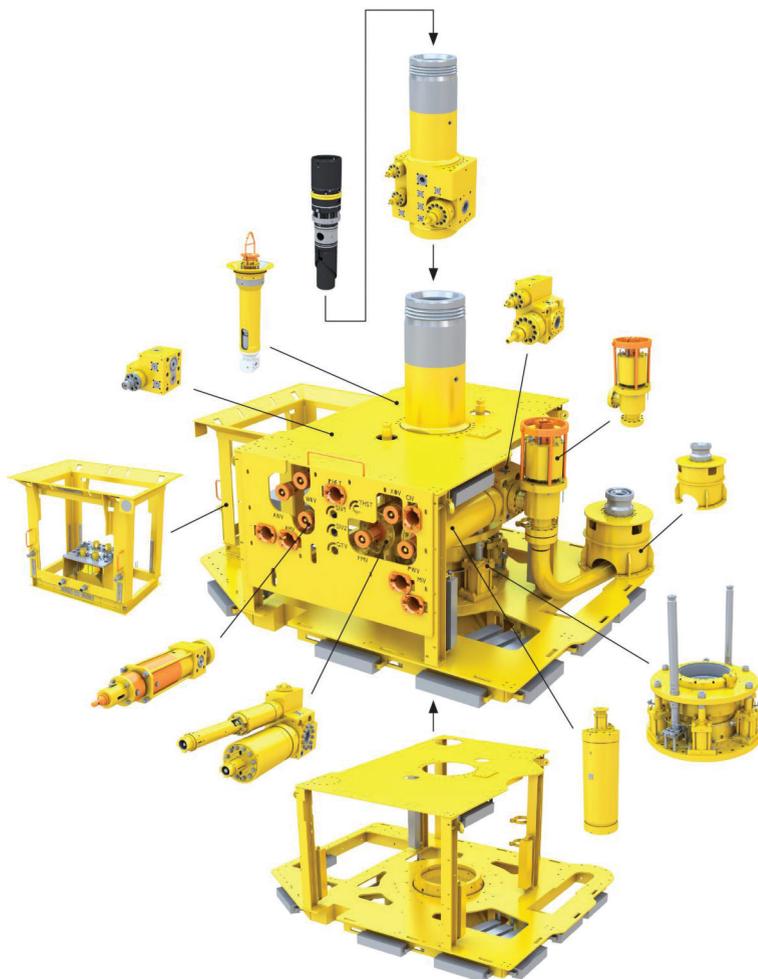
When considering functional requirements, suppliers are coming up with innovative solutions and flexible functionality. For subsea trees, functional requirements can be met by utilizing common core components from efficient modular layouts and designs, allowing the operator to choose functionality from a menu of standard options.

Today, standardization does not mean less functionality; in fact, the opposite is true.

Standardization allows operators to have the functionality they really need, delivered by utilizing repeatable, common core components from existing, qualified and field-proven technology. A modular platform allows functional flexibility while avoiding bespoke redesign for every new piece of equipment. Utilization of those common core components can offer significant lead time benefits. Recent examples include subsea production trees that have been configured, manufactured and delivered within 12 months to multiple global locations.

Standardization Helps Project Viability

An operator of an Australian brownfield had been trying to develop the field as a standalone project, but it had



Pre-engineered components designed for subsea application reduce costs while retaining reliability. (Source: Schlumberger)

been determined that the project was not financially viable based on the field architecture despite oil prices being significantly higher. In search of a solution, the operator engaged OneSubsea to explore potential opportunities to make the field viable.

Part of this discussion included the use of capital-efficient equipment, such as a standard horizontal tree configuration and connectors using standard components where possible. Twelve subsea trees' sub-assemblies were configured with standard spool bodies and wing valves. Subsequently, the solution was refined over time to remove subsea transformers that were part of the original development scenario and to include capital-efficient equipment, simplifying the subsea architecture. It was estimated that project costs were cut in half and the project was proven to be technically and economically viable. **ESP**