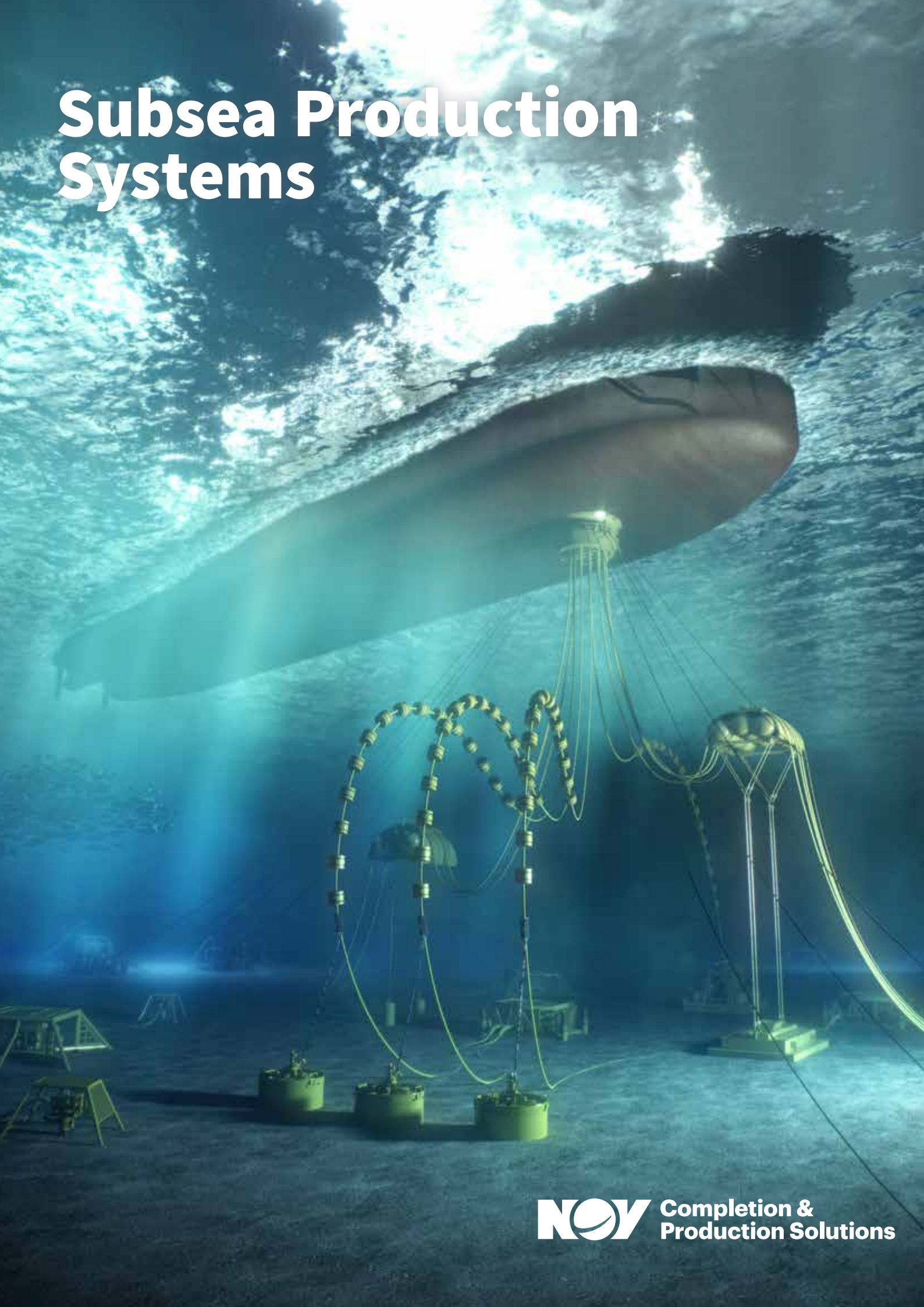


# Subsea Production Systems



## Improving subsea infrastructure

NOV improves subsea infrastructure across the globe. Through technical innovation and a strong partnering approach, we develop solutions based on decades of experience that add flexibility, improve productivity and reduce cost. We provide integrated solutions with dedicated support throughout your entire project – anytime, anywhere – and in an open and honest partnership with our clients we continue to expand the operational envelope for subsea oil and gas production.

With decades of experience in integrating technologies, NOV is a world leader in supplying standardized solutions. From topside solutions and processes down to just before the Christmas tree, we bring a philosophy of standardization, integration and an unwavering focus on cost-effectiveness to offshore operations. For subsea production, our offerings include flexible pipe solutions; turrets, mooring and loading systems as well as innovative improvements on subsea infrastructure, safety, treatment and storage.

### New acquisition!

As part of NOV's mission to industrialize and standardize subsea oil production, the Flexibles Group of NOV has signed a purchase agreement with Kongsberg Oil & Gas Technologies regarding the purchase of the company's Subsea Products.

The agreement includes Thor Tie-In, Weaklink, Pipeline Structures (typically PLEM, PLETS, Wyes, Tees, Foundations, Spools, Jumper), Adjustable Pipeline Supports, GRP Protection Covers, Hot Tap systems, Installation and Repair Tools, Pig Launchers, Pig Tracking Systems, Subsea Storage Units and Subsea Cooler. Technology and employees of Subsea Products will be transferred to NOV at closing.

Simplification across the board:

### Flexible pipes and turrets

We offer an integrated solution where the most complex and costly interfaces are designed and owned by NOV, saving months of negotiations and potential issues for the client. We can thereby reduce the time to first oil by at least 6 months compared to other contractual and technical options.

An example of this integration is the design process surrounding turrets and risers, where engineers from APL and Flexibles leverage years of close cooperation and partnership to create efficient and optimally integrated solutions. This ensures that there are no reruns on turret and mooring design and allows a decoupling of the SURF and FPSO schedule.

Where it's needed. When it's needed:

### Subsea factory

Take production from surface to seabed and save valuable topside space and manpower – especially valuable in remote or harsh environments. The NOV series of subsea production solutions include active and passive coolers, subsea storage units and a radical new subsea approach to water injection and treatment.

Perfect integration:

### Subsea structures

NOV improves subsea infrastructure by carefully designing all structures to interface seamlessly with the surrounding pipe systems. From our range of manifolds and SSIV's to tailor made accessories such as mid-water arches and anchors, our structures help any system meet all design specifications throughout the duration of its design life. For flexible pipe systems, we take full system responsibility to leverage our decades of expertise and experience to provide an optimal configuration.

Adapting to change:

### Tie-ins

When operational needs change and fields develop and grow, NOV is ready. From the easily installed Thor tie-in to safeguarding pipelines with weak links in case of unforeseen events to retrofit hot-tap tees that enable simplified tie-in of new field, we have the solutions to help operators face the challenges to their subsea infrastructure.

Covering your needs for subsea protection:

### The Cocoon and Shroud™ protection systems

NOV can deliver bespoke subsea infrastructure systems, fitted to your specifications. The Cocoon is an integral part of NOV's total subsea infrastructure solution and while originally designed as a snag free, lightweight and slippery structure to provide protection from fishing net incursions, the concept can be adapted to any system needs.

Keep operations going:

### Flow assurance

In response to industry needs for flow assurance, NOV offers a number of solutions related to pigging as well as a novel way of eliminating wax and hydrate issues in flexible pipes. With a range of pig launchers and pig tracking systems – including the subsea automated pig launcher (SAPL) – operators can work safely even with multiple pigs in their pipe system. And with NOV's novel method for direct heating of flexible pipes, wax and hydrate formation ceases to be an issue at all.

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