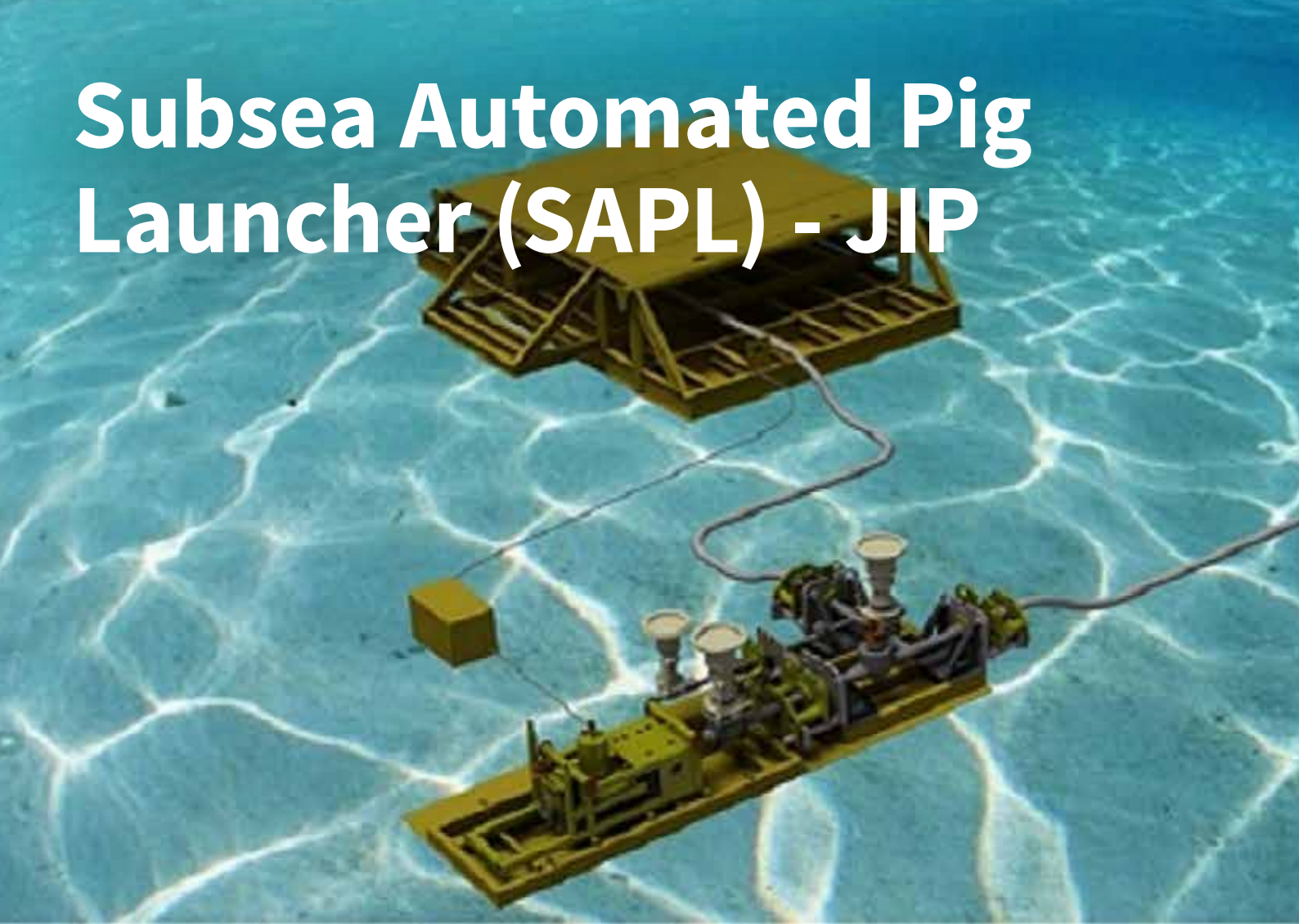


Subsea Automated Pig Launcher (SAPL) - JIP



With rising number of deepwater developments and increasing tiebacks, pigging has become an important element for ensuring flow assurance and integrity.

The high OPEX associated with pigging operations often deter operators from using the technology, leading to failures, production losses, and expensive repair operation. NOV has developed a first of its kind subsea pigging system, capable of automated operation, applicable for pre-commissioning, inspection and liquids and solids management.

Business case

Lowering production temperature

- Optimum and predictable cooling performance.

Cost reduction

- Enable low cost, on-demand pigging operation by deferring high mobilisation costs of using ROV/ OSV
- Lower CAPEX by using single flowlines

Enhanced integrity

- Lower cost allows frequent pigging operations, thus enhancing integrity

Availability

- Pig any time and on-demand
- Reduction in lead time in preparing for pigging operation

HSE

- Improved safety/ minimum vessel activity above launcher

Broader applicability

- Applicable for pre-commissioning, inspection, liquids and solids management and in brownfield retrofit applications

Faster operation vs. conventional topside pigging

- Shorter time to complete pigging operation
- Pig at higher operating pressure

Subsea Automated Pig Launcher (SAPL) - JIP

Scope

The scope of the JIP will be to build and test a prototype of the SAPL system for qualifying the system to subsea standards. The test matrix will include testing of the mechanical components (pig feeder, cassette, kicker, etc), as well as system integration and functionality of the system at operational conditions.

The exact scope of the JIP will be based on the overall requirements of the participating operators. The output of the JIP will be a qualified SAPL system with license to JIP partners to use the technology.

SYSTEM PARAMETER	SPECIFICATION
MAX PRESSURE RATING:	25 years
PIPELINE Ø:	12"
DEPTH RATING:	3,000 m
DIMENSIONS (LXWXH):	15 m x 2 m x 2 m
WEIGHT:	~15,000 kg
NUMBER OF PIGS PER CASSETTE:	4-10
PIG KICKER MEDIUM:	Well stream / injection fluids

Prototype testing

The testing and qualification procedures will include the following:

- Pig Feeder System
- Installation and Retrieval of Cassette
- Pig Detection
- Pig Kicker Functionality
- Operation of loading mechanism

Functional characteristics

Operational modes include the following:

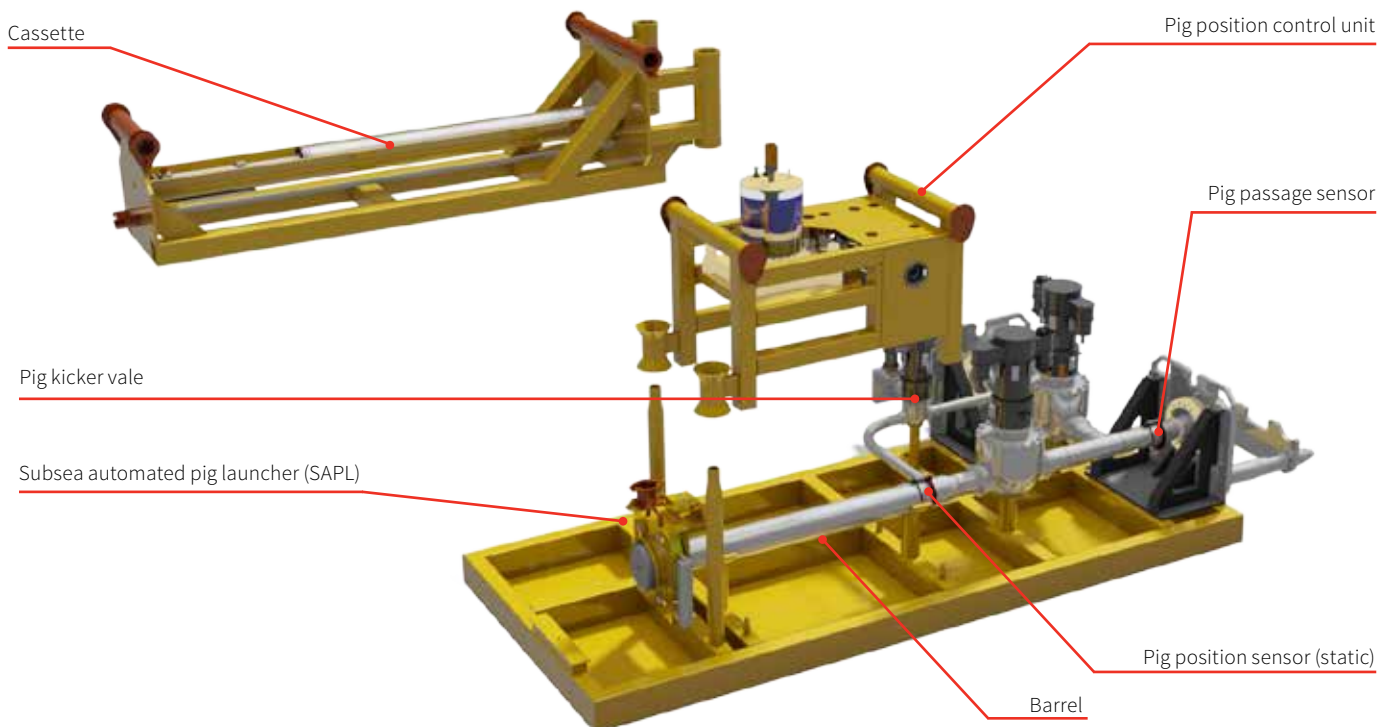
- Pre-commissioning
- Commissioning
- Inspection
- Deposition removal

Suitable for all kind of pigs with a maximum of 5% bypass. Cassette can be adjusted to different pig lengths.

Project funding pr. Q3 2016

Oil Companies (Shell and Total)	60 %
Norwegian Research Council	25 %
NOV	15 %
Total project	100 %

Contract value per Q3 2016 23 MNOK



Subsea Production Systems develops, produces and markets some of the strongest and most advanced subsea systems. Subsea Production Systems is a Business Unit in National Oilwell Varco (NYSE:NOV) which supplies customer-focused solutions that best meet the quality, productivity, and environmental requirements of the energy industry.

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