Subsea 7 offers Mechanically Lined Pipe (MLP) technologies, with more than 150km of BuBi® mechanically lined pipe installed.

The technology is a cost-effective alternative to more expensive options such as solid corrosion-resistant alloys or metallurgically clad pipe. It has been field-proven on the Petrobras Sapinhoá-Lula NE project. This included the reel-lay installation of several BuBi® pipe Steel Catenary Risers in a water depth of 2,100m.

Key benefits:

- Continuing pioneering development, offering clients efficient and economic solutions for MLP
- Unrivalled experience and know-how for the installation and application of MLP
- Unrivalled project experience using reel-lay DNV qualified technology.
Recognition

Subsea 7 and BUTTING have qualified the technology for the reel-lay installation of BuBi® mechanically lined pipe for flowlines and riser applications.

The outstanding potential of this development has already been recognised by the UK’s Pipeline Industries Guild, which presented Subsea 7 with its 2012 Subsea Pipeline Technology Award.

In 2013, Subsea 7 was awarded a contract by Statoil for the construction of the Aasta Hansteen gas field in the northern Norwegian Sea. The project includes the design, coating, fabrication and installation by reel-lay of 19km of 12-inch BuBi® lined pipe flowlines using the Seven Oceans.

Applications

The increased transportation of corrosive media in subsea oil and gas pipelines has generated greater demand for corrosion-resistant materials. Subsea 7 has installed pipes made from solid corrosion-resistant alloys, or metallurgically clad pipe, across a number of Pipelay projects to date.

In recognition of the potential to develop a lower cost solution Subsea 7 undertook development work of Bubi pipe by reel-lay method.

The development work executed has now been qualified by DNV as fit for service in full compliance with the DNV recommended practice RP-A203 related to the qualification of new technology.
Fatigue Testing

Pipe samples have been extensively tested in resonance fatigue, in the post-reeled condition, at The Welding Institute (TWI). A number of fatigue cycles corresponding to the DNV class C have been reached.

Inspection results confirmed that the BuBi® pipe had suffered no detrimental mechanical, or corrosion impact from the reeling and fatigue testing, and therefore demonstrated further that the BuBi® lined pipe can be reliably installed by the reel-lay method and operated under existing practices.

S-N curves showing the number of fatigue cycles reached to date on three test strings (RF1, RF2, RF3). No failure of the pipe or liner seal welds has been recorded at the DNV class C.

Installation

BuBi® pipe can be installed as part of a Bundle, by S-lay, J-lay or reel-lay.

Using the reel-lay vessel, Seven Oceans, Subsea 7 successfully installed around 85 kms of SCRs on the Sapinhoá-Lula NE project in 2014.

In addition, Subsea 7 has installed more than 150km of BuBi® mechanically lined pipe since 1995 in towed bundle and S-lay projects.
Mechanically Lined Pipe

Qualification programme for installation by reel-lay

A comprehensive development programme has been conducted in accordance with DNV RP-A203 to demonstrate the viability of this technology as fit for service.

The DNV Technology Qualification process is a systematic risk-based process which clearly documents the performances of the technology and supports its integration into projects.

The qualification plan included:

- Manufacture of BuBi® test strings
- A detailed laser metrology examination and mapping of the full internal surface of the pipe at the manufacturing stage, and prior to and after reeling simulation
- A conservative cyclic bending test or reeling simulation performed using a purpose-built bending rig at Heriot-Watt University in Edinburgh, Scotland, capable of simulating the strain cycle corresponding to those experienced on Subsea 7 reel-lay vessels
- Finite Element Analysis to model the behaviour of the pipe in several installation and service conditions
- Mechanical and non-destructive tests were conducted post-reeling and fatigue testing.
- Installation methodology includes licence from Statoil Petroleum AS.

For further information contact

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As a result of the qualification of the reelable mechanically lined pipe, Subsea 7 won the Pipeline Industries Guild’s 2012 award for significant contribution to subsea pipeline technology.