

PUSHING AHEAD WITH SEABED PROCESSING AND CONTROL

The growing need to develop fields with longer tiebacks in deeper water means the existing approach to field development is no longer appropriate. Lateral thinking is now demanded so that the challenge of seabed processing can be approached from a better direction.

New developments have made electrical power safe and reliable for seabed applications and installations can now be powered and controlled with great efficiency. Their reliability is, however, likely to be in inverse proportion to the number of wet mateable interfaces required, particularly if they are electrical. Any worthwhile system will require periodic maintenance and must, therefore, be readily retrievable. However, whenever a component on a seabed installation is removed or replaced under water, the process creates a potential source of failure.

When the founders of Alpha Thames built the first seabed processing system offshore Abu Dhabi in the late 1960s it was realised that constructing installations in modular form could dramatically reduce the number of wet-mateable interfaces. Rather than using component modularisation, sub-system modularity was considered initially. However, the AlphaPRIME system that subsequently evolved uses conventional manifolds, valves and components in a modular format that can, if required, also contain all of the well's pumping, flow control and processing requirements.

AlphaPRIME System-Modules weigh 25 to 50 tons depending on field requirements and are capable of producing 20,000 bboepd. If appropriate, a System-Module can begin life by operating as a straightforward manifold centre and be upgraded

later. This might include the addition of further production capabilities such as the gas and/or water separation that may become necessary as the characteristics of the field change during its life cycle. It is ideal for deep-water applications but can operate at any depth and may increase well production by up to 75 per cent.

Because a field will usually operate with two modules in place, production can be maintained by one should it be necessary to recover the other for maintenance or modification. This ability to perform routine preventative maintenance is a further benefit as the difficulty of servicing conventional installations can result in their being used until a failure occurs. This is now recognised as a worrying practice that can result in prolonged and costly well shut-ins.

A number of other seabed processing concepts are known to be struggling to leave the drawing board yet an AlphaPRIME system can be seen at the workshops of Kockums Engineering in Sweden. This demonstrates how an installation can be operated remotely and shows visitors how an entire System-Module is quickly and easily removed and transported to a workshop whenever maintenance or upgrading is necessary. The work can then be carried-out safely without the pressures encountered during in-field maintenance and the System-Module can be fully tested before it is re-installed.

The availability of seabed control and processing is further streamlined through Alpha Thames' willingness to licence its extensively patented design to companies faced with development programmes that might be measured in years. Alpha Thames can put the concept to use on fields ready for development now, working with other engineering departments and contributing the specialised subsea engineering expertise that would make such projects prohibitively expensive for companies proposing to start them from scratch.