

A flexible approach to an uncompromising problem.

The refinery facility of one of the world's largest energy companies in Scotland receives crude oil from the Buzzard oil field via the Forties Pipeline System, the pipeline network in the North Sea. The Buzzard crude has high levels of the odorous and potentially poisonous agent mercaptan.

For the storage and distribution site this meant a change in practice. Where previously the Main Oil Line (MOL) open sump system took crude oil from line drain downs during pipe and valve maintenance, the presence of mercaptan required a change in philosophy for the drain system and new equipment.

The starting situation

A Glasgow based engineering consultant acted for the customer on this project. Their brief was to retrofit equipment that ensured containment of the Buzzard crude in a closed to atmosphere system. It was a requirement that the MOL pipe bundle would drain into a closed manifold pipe system, while retaining the traditional open sump function to collect open drains liquid. Any installed equipment would have a dual function; to be able to draw liquid from a tank of 6 m depth and to remove liquid from the MOL drains manifold. A hazard study identified that personnel should not enter the sump area for maintenance purposes, posing a further complication.

The solution

The process conditions resulted in a low NPSHa of just 0.5 m with the possibility of up to 15 % entrained gas in the liquid at times. With dedicated testing to simulate the conditions on our test facility, a suitable pump element was selected that could deal with the process conditions and low NPSHa. A more innovative approach was required to resolve the issue of restricted access to the sump area. A vertical pump, to be mounted in a can or caisson, was proposed. The inlet to the can was as low to the floor as possible. The pump also took suction from the lowest point to optimise NPSHr. The can design allows the vertical pump to be withdrawn from the top, which is located in a personnel friendly area. The can was constructed with a double suction, allowing the open sump or the MOL manifold to be emptied via a valve arrangement.



BEO 240-6C

The benefit

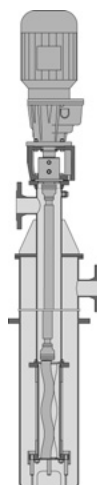
By listening and understanding the issues, a unique solution was found. A caisson/can design was employed to optimise the pump's NPSH requirements. Adopting the can design allowed us to satisfy the maintenance and health & safety requirements, as the pump can be withdrawn from the top of the can without the need to enter the sump area and remove flange/pipe connections. All of the problems presented have been resolved by an extremely flexible equipment design, capable of withstanding the toughest of process applications and design conditions.

Key Facts

- Meets the complex needs of the application
- Low NPSHa: 0.5 m
- Entrained gases
- Vertical caisson/can design
- ATEX zone 1 certified

Significant Cost Savings

- One pump, two services
- Modular design employed uses stock items even on a 'special design'



Installed Pump Type

- Range BEO

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