Production Boosting Case Study
Perenco, Wytch Farm, Dorset, UK
Background

Wytch Farm in Dorset, UK, is the largest onshore oil field in Western Europe. Operated by BP for 27 years, Perenco purchased the majority stake in 2011 and later applied to extend the end-date of the oil fields from 2016 to 2037. An innovative solution to boost production from the slowly declining wells was required to maximise production from the mature field.

Solution

Perenco identified an opportunity to increase production / recovery rates from a number of wells by reducing the pressure within oil production separators. Reducing separator pressure in this way reduces resistant back-pressure on any upstream manifolds & wells - in essence the wells have less work to do, to flow. Perenco approached Transvac to design and manufacture an Ejector to perform this duty as they could see the benefits of the technology; no moving parts, minimal maintenance and using existing ‘compressor recycle’ gas to run, for free.

Transvac’s Technical Sales Engineer, Lilly Smith, supported Perenco throughout the project. She commented, “It was clear early in our process modelling that we could offer a significant production gain from a relatively small 3 bar drop in separator pressure by installing the Ejector. It was fantastic to hear from the Perenco engineers that once in operation, this gain was passed on to the performance of the individual wells, some of which enjoyed a 2.7 bar reduction in well head pressure.”
Using Otherwise-Wasted Energy

Compressors are designed to operate within a specific flow-rate range. As a result, when gas flow into the compressor naturally reduces (as a result of declining well production, for example), additional ‘make up’ gas is required to ensure that the compressor has the required flow to maintain operation.

A technique commonly employed in these circumstances is to recycle some of the gas from the discharge/downstream side of the compressor back in to the suction/upstream side. The high pressure gas from the compressor outlet has its pressure reduced to feed the suction side. Although this method overcomes the problem, it is inefficient and wastes energy.

At Wytch Farm, Transvac was able to make use of this recycle gas to drive the Ejector, without affecting compressor performance. The gas was not lost, just ‘borrowed’, to allow the Ejector to perform the duty of lowering the separator pressure and increase recovery from upstream wells and equipment. In simplest terms, the Ejector can be used to perform a production-boosting duty, for free, using no ‘new’ energy.

Equipment

Transvac supplied a custom designed Size 8 Gas Ejector in Carbon Steel (8” NB, 300lb rated). To meet noise restrictions on site, suction and discharge Silencers were provided and acoustic lagging was added for the Ejector, Silencers and interconnecting pipework during installation.