

WELLCOM Pressure Boosting System

BHR develops novel system that utilises energy from high pressure wells to boost production from low pressure wells

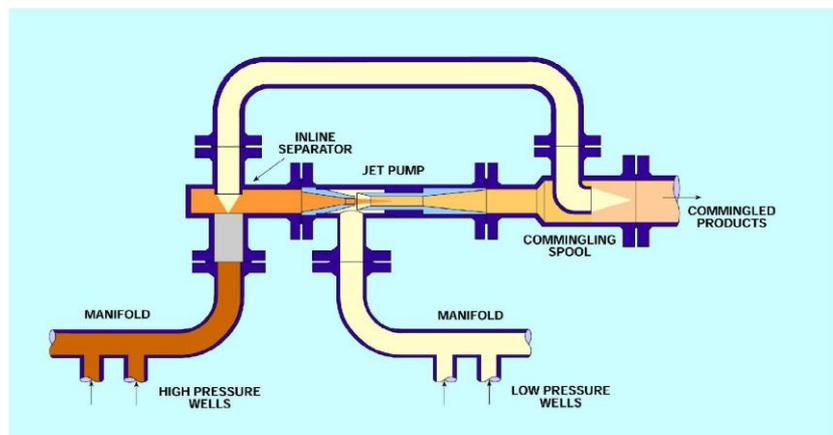
The Challenge

Production and total recovery from many fields is restricted by low reservoir pressure. This can apply to many depleted fields or new fields where production pressure is insufficient for transport of fluids by pipeline or to meet downstream process requirements.

BHR Group developed WELLCOM as a cost effective boosting system designed to meet production pressure requirements whilst allowing wellhead production pressure to be reduced, thus increasing production and recovery. At the heart of WELLCOM is a jet pump which utilises energy from a high pressure (HP) source to boost the production pressure of low pressure (LP) wells. The high pressure source can be a high pressure well or an existing boosting system such as a compressor or booster pump.

Project Goal and Approach

To design and supply to Eni SpA a multiphase boosting system for a low pressure oil well with up to 70% associated gas content. Flow could be varied from 744 bbl/d at 45 barg to 6048 bbl/d at 56 barg). The system was to utilise motive energy from a higher pressure well producing 4992 bbl/d at 78 barg.



To meet this challenge the WELLCOM system was designed with:

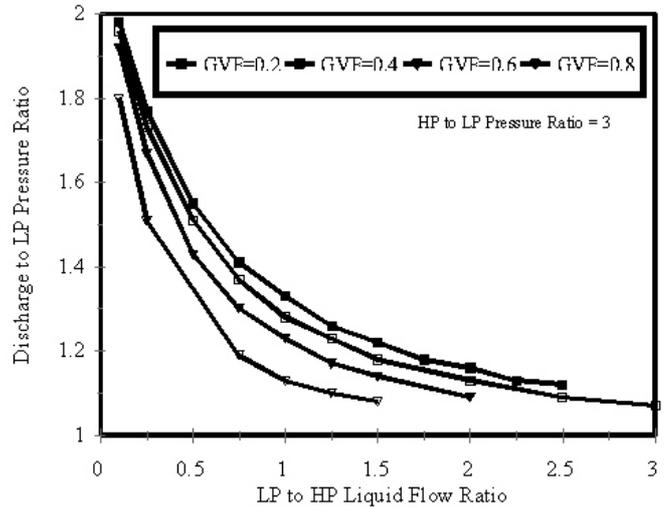
- A compact separator
- A specially designed jet pump
- A commingling spool



BHR's compact separator, separates the gas from the liquid of the HP flow. The separated liquid is fed into the nozzle of the jet pump as the motive flow. The total LP flow enters the suction line of the jet pump and combines with the HP flow, passing through the mixing tube and diffuser where transfer of energy takes place. The separated HP gas is combined with the fluid mixture from the outlet of the jet pump using a commingling spool.

Key factors affecting the performance of a WELLCOM Oil system are:

- HP/LP pressure ratio and liquid flow ratio
- The gas volume fraction (GVF) of the LP flow.
- The graph across shows examples of the system performance under different HP/LP pressures and GVF values.
- BHR used its jet pump design software to optimise the design for a range of production condition.



The Results and Benefits

A WELLCOM Oil system was supplied comprising a WELLSEP compact inline separator (to separate gas from the motive fluid), a custom designed jet pump and a dedicated commingler (to remix the separated gas with the driven fluids).

The complete system was mounted in a skid frame.



Results taken from the system instrumentation confirmed an impressive boost to the low pressure produced fluids. At the discharge of the system, measurements showed that the low pressure fluids had been boosted to a new range of pressures of 56 barg (744 bbl/d) to 58 barg (6048 bbl/d) representing a gain in pressure of up to 25%.

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