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SUCCESSFUL GRAVEL PACKING OF A HORIZONTAL WELL WITH LIMITED CLEARANCE

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Abstract

In August 1999, BP Amoco Energy Company of Trinidad & Tobago successfully gravel packed a 600 ft. horizontal well with limited clearance (0.39") between screens and liner.

The Teak B-8 offshore well was completed as a 600 ft gravel packed horizontal completion across a 5" pre-perforated liner (4.276"ID). What was unusual about this wellbore configuration was that 2-7/8" Excluder screens (3.89"OD) were run instead of the popular 2-3/8" Excluder size. The 5" liner was a contingency plan to the original 6" open hole in the event of shale activity, however no contingency was placed on screen size due to equipment logistics. The Horizontal gravel pack design simulation indicated that even with limited clearance it was possible to gravel pack the lateral section, even though global experience was to exclusively use 2-3/8" screens in any 5" liner. The work was done with a 460K Snubbing Unit. See Fig.1 for wellbore sketch. Production rates have exceeded expectations, from 1100 BOPD to 2000 BOPD to 2500 BOPD at 28/64" to 32/64" to 36/64" adjustable choke settings, FTP dropped from 600 psig to 590 psig to 580 psig for the above rates. This indicates an extremely high productivity index. No sand is produced.

With careful planning and execution , risks associated with limited clearance can be reduced in gravel packing horizontal sections. For successfully gravel packing a 6" hole with a 5" pre-perforated liner and 2 7/8" screens, the most salient control parameter is the dune height selection which dictates the successful progression of the alpha waves from the heel to the toe. Thereafter, the successful progression of the beta waves is indifferent to the existence of the 5" pre-perforated liner.
Completion objectives were achieved by effective co-ordination within a multi-disciplinary team framework.

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