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# Economic analysis for selecting sand control methods

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**Abstract:** More than 15 sand control methods are available to oil industries, including down hole sand exclusion methods and surface sand management methods. Several selection guidelines have been proposed by industries comparing expected productivity, failure risks, installation complexity, and cost. However, all of them are ambiguous since the comparisons are based on these specific features.

When oil industries decide whether to develop oil and gas fields, one of the most frequently used economic analysis is to calculate NPV, the net present value of the field. This index is used in this paper since we believe it is the best index available for oil industries to judge whether certain sand control methods are more effective than others. In this paper, NPV is calculated for the seven most frequently used sand control methods for three typical gas and oil reservoirs in the North Sea. The selected typical North Sea reservoirs (Depth = 7,500 ft TVDSS) are

(A) A medium gas reservoir which has 30 wells with an initial flow rate of 30 MMscfD/well.
(B) A large gas reservoir which has 30 wells with an initial flow rate of 150 MMscfD/well.
(C) A medium oil reservoir which has 30 wells with 8,000 STB/D/well with 35° API.

The NPV is calculated based on CAPEX, OPEX, productivity, sand management cost and risk of failure. A comparison of seven methods adapted by several companies experienced with various sand problems in the North Sea shows that the sand rate control method is one of the most effective methods to manage sand problems if formation is strong enough not to induce catastrophic failure. However, this method requires careful sand management based on long experience. Cased Hole Frac & Pack method also generates a high NPV for weak formations because of the small failure rate and low skin after several years of production.

**Key words:** sand production, sand control, failure risks, economic analysis, NPV



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