The Schoonebeek Oil field – past, present, and future

Joris Steenbrink on behalf of Martin de Keijzer and Schoonebeek Redevelopment Team

The 1 billion bbls Schoonebeek Oil field is located onshore Netherlands. It has produced 250 mln bbls in the period 1943-1996 from nearly 600 vertical wells. The unconsolidated Lower Cretaceous Bentheim Sandstone reservoir (0-40 m thick, 30% porosity, 0.5-8 Darcy permeability) contains viscous oil (25°API, 160 cP in situ). The reservoir forms a complexly faulted anticline. Primary recovery in the “Main Water Drive Area” was characterised by early water breakthrough. In the “Solution Gas Drive Area” (SGDA) low GOR and lack of aquifer support caused rapid pressure decline. Various small-scale EOR projects were initiated. In 1996 exploitation was no longer economical; all wells were abandoned and the surface infrastructure was removed.

Today, redevelopment of the SGDA is attractive again. The new Field Development Plan makes optimum use of up-to-date subsurface technologies and close integration between new and existing surface facilities. Detailed reservoir modelling identified steam flooding with closely spaced horizontal oil producers and steam injectors in the bottom part of the reservoir as optimal ("Gravity Assisted Steam Flooding"). The gas-fired steam-generation plant will also deliver electricity to the national power grid. Produced water will be disposed into depleted gas fields using existing pipelines.

High-resolution 3D seismic of the SGDA, acquired in 2005, has significantly improved reservoir and fault definition, allowing (i) improved placement of the 70+ planned wells, (ii) expansion of the redevelopment area, and (iii) reduction of expected drilling costs by minimising the number of sidetracks. Drilling is expected to commence early 2009, with first oil production in 2010. Additional oil recovery is estimated to be around 120 mln bbls.

The presentation will focus on technological aspects with special emphasis on the detailed well planning, which is critical to successful redevelopment.