

## **Heidrun - Injection with continuous pressure surveillance below cap rock**

Per E Svella, Øystein Brandal, Tonje A G Aaring, Øyvind Gustavsen

Voidage on Heidrun is mainly achieved from down flank water injection where the injectors are placed in the water zone. Most injectors are perforated liner solution perforated in several reservoir zones. Commingled injection has shown to be challenging based on the low formation strength, leading to severe sanding issues during shut-in from water crossflows between zones. A solution including gravel packed sand screens has proven robust and is widely used subsea where interventions opportunities are less. Skin and plugging of the near wellbore is a challenging task in gravel packed completions and high injection pressures may be needed to establish fractures for injection, but also for maintaining the desired rate.

To meet the demand for safe injection at elevated pressure a new completion design has been established. The design is based on experience from a smart well (DIACS) injector drilled in 2011, which enables continuous pressure surveillance in a reservoir zone just below the caprock. The pressure gauge communicates with the shallow reservoir zone through a screen, isolated from the main injection interval. This makes it possible to monitor potential reservoir contact between the injection interval and observation zone.

This presentation describes the concept and experience from several Heidrun injectors.