

SmarTest™ System

A Cost Effective, Total Solution for Gathering Dynamic Reservoir Data

SmarTest™ (*) is a state-of-the-art telemetry operated testing assembly that improves well evaluation by integrating existing drillstem testing (DST) technology with recent developments in DST tools and sampling technologies. The system is designed for openhole applications but can be modified to run in cased hole applications. SmarTest provides operators with the ability to collect reservoir data and fluid samples in a lower risk environment than traditional open-hole testing. The result is a total solution for dynamic, production well testing that makes exploration activities more cost beneficial and environmentally friendly.

Using the SmarTest system allows:

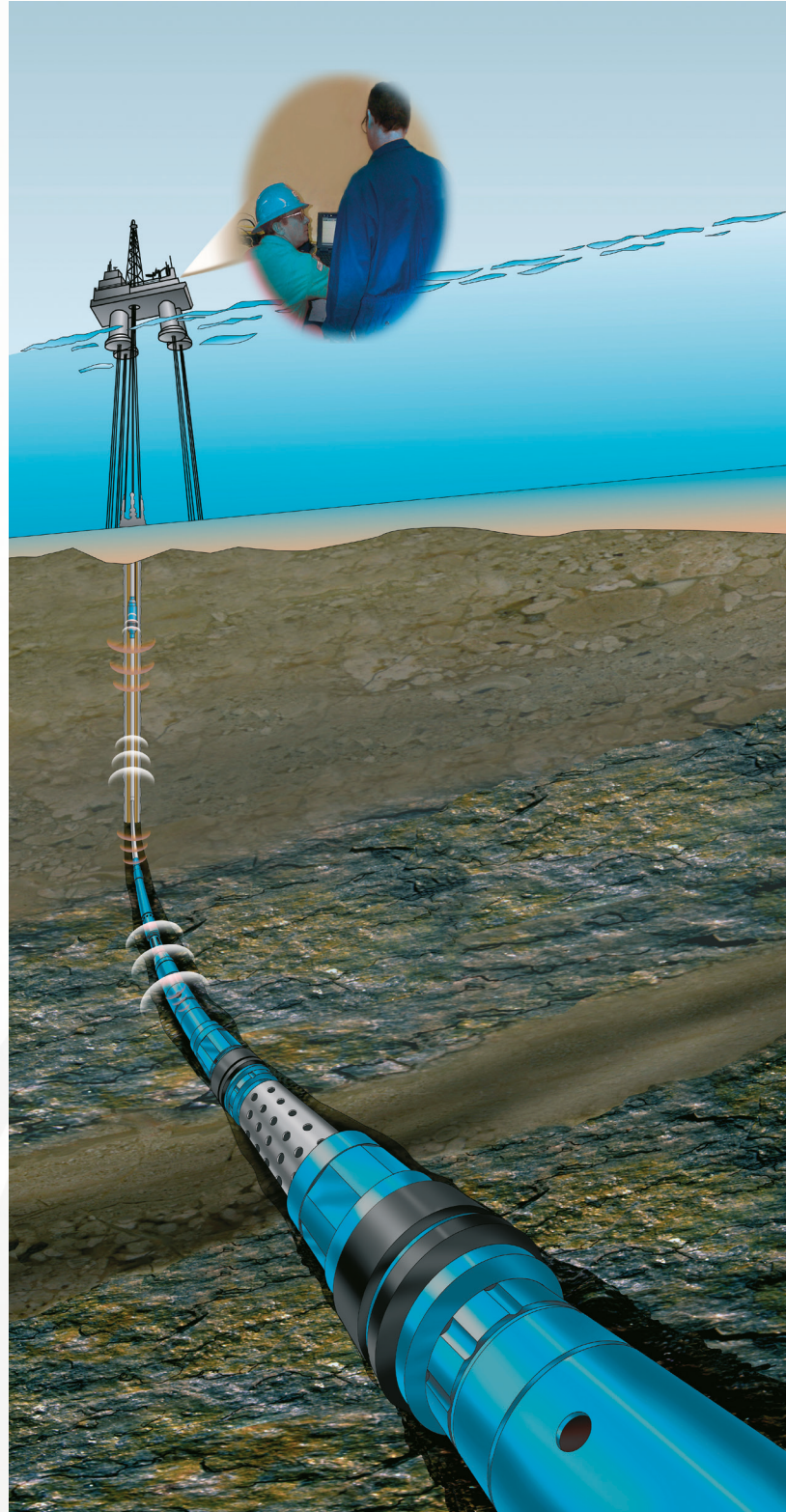
- Testing reservoirs using conventional and/or closed

chamber techniques to calculate:

- » permeability
- » skin
- » productivity index
- » reservoir pressure
- Recording real-time pressure and temperature
- Measuring fluid flow rates
- Identifying fluids in place
- Retrieving high-quality PVT samples from wells
- Availability of testing multiple zones in one run

Benefits

- Reduces well costs by providing the value and results of conventional DST at significantly reduced cost
- Minimizes surface equipment
- Provides greater value and results than available with Wireline Formation Testing (WFT)
- Requires no flaring
- Reduces risk of operational downtime by using wireless, two-way data transmission.
- Captures bulk samples as large as the ID volume of the workstring
- Gathers better dynamic reservoir information than WFT



Features

- For openhole or cased hole applications
- Real-time acoustic two-way data transmission
- Pressure compensated single-phase samplers
- Telemetry downhole tools
- Tool position feedback
- Downhole fluid identification by conductivity, permittivity, density, viscosity, and pH
- Large volume bulk fluid sample
- Closed flow chamber with fluid interface device (PIG)
- Savings on well cost

All the Value and Results of Conventional Drillstem Testing (DST) at a Fraction of the Cost

The verification of hydrocarbon reserves and fluid properties and behavior from conventional drillstem testing gives an accurate estimate of the parameters required in designing an optimum oil and gas field development. However, the total operational cost for DST is high. The SmarTest system delivers those same accurate results but at a total cost that is considerably lower.

A Major Advantage over Wireline Formation Testing (WFT)

The results possible with WFT are limited in both amount and quality since those results only reflect near wellbore data. Because the SmarTest system allows operators to flow greater volumes of reservoir fluids, they are able to capture a more representative fluid sample. This, in turn, enables the gathering of more information about the well than is possible with wireline formation testers.

For more information on how the SmarTest system can provide a cost-effective, total solution for gathering dynamic reservoir data, contact your Petrotech representative or email smartest@smartest.no

SmarTest™ Specifications

Open Hole Size	8 ½" - 12 ¼"
Min. Casing	7" - 9 5/8"
Max. Pressure	15,000 psi
Max. Temperature	302°F / 150°C
Produced Volume	18bbl /3m3
Flow Chamber	5" or 7"
Ideal Height of Pay Zone	3 ft
Pressure/Temperature gauges	no limit

Fluid Samples:

4 x PVT Quality	4 x 540 cc
Large Volume Bulk Sample	50 l

Fluid ID measurements:

Density	0.3 - 1.35 g/cc
Viscosity	0.2-100 cP
Permittivity	1-10
Conductivity	0.01 - 20 S/m
pH	3 - 11 pH
Pressure	0 - 1034 barg
Temperature	0 - 175°C

Comparison of Testing Methods

Objectives	WFT	SmarTest	DST
Initial Reservoir Pressure	√	√	√
Permeability	√1	√	√
Representative Single-Phase Samples	√1	√	√
Skin Factor		√	√
Productivity Index		√	√
Atmospheric Bulk Samples		√	√
Radius Of Investigation Past Damaged Zone			√ √
Reservoir Limits Test			√
Typical No. of Rig Days, 1 Zone	2	3	7
Typical No. of Rig Days, 2 Zones		5	17

1) Although WFT is capable of meeting these objectives, under some circumstances these results are not always guaranteed.

- SmarTest is a Joint Industry Project (JIP) executed in cooperation with Petrotech, Norske Shell and Norsk Hydro.
- * SmarTest is in its testing phase and will commercialize in 2007