

## Case #00016

### EnDura® seals allow Red Spider Hydraulic RED to meet ISO 14310 standard, Validation Grade 1

#### The Problem

As a leading designer, manufacturer and supplier of innovative downhole solutions to the global oil and gas industry, Red Spider Technology's product range is engineered to address a wide range of issues and problems experienced in the upstream production of oil and gas including completion, intervention and drilling equipment.

"Until recently meeting the ISO14310 - V1 standard has been more of an aspiration than a reality for many companies. Our range met the V3 and even V2 standard, however the need to meet V1 has become essential as oil and gas operators continue to drive up health and safety standards," said Gary Smith, marketing manager, Red Spider Technology.

#### The Requirements

According to Norsok Standard D-010 a mechanical tubular plug shall, if used as a well barrier element in production or injection applications, comply with ISO 14310 by meeting Grade V1 for design validation.

The V1 Test is particularly difficult for seals to pass. The seal is pressurised and then heated up and cooled down four times. Red Spider went further and subjected it to seven days of continuous testing. To pass the test the seal must not show any signs of leaking.

The 3.250" Hydraulic RED was tested to 7,500 psi differential pressure and within a temperature interval of 75°C and 4°C. "EnDura® V95X was the first material we had come across to be truly V1 compliant," noted Gary Smith.

#### The Material

EnDura® V95X is a high performance 92 °IRHD hardness fluoroelastomer (FKM). This material exhibits good chemical resistance to a wide range of acids, hydrocarbons, brines, solvents and petroleum fluids and offers outstanding long-term O-ring sealing force retention. The excellent compression set performance, high strength and extrusion resistant properties of V95X make it an ideal material for use in high pressure applications.

#### The Apparatus

The Red Spider Hydraulic RED (Remote Equalisation Device) replaces conventional equalisation devices run as part of a wireline lock or retrievable bridge plug assembly, such as a simple bull nose, shear out sub, prong and sub or cycle plug. In effect it is an 'intelligent' equalisation device which allows the operator the ability to perform any number of pressure tests up to its maximum rating, above or below the plugging assembly.



Hydraulic RED relies on an Annular Tubing Control Valve which is controlled remotely from the surface. The valve is designed to control the gas injection in an oil well. It allows gas to be injected into either both upper and lower zones of a reservoir or just one zone, for example, to control injection preferentially into the top zone over the lower zone.

The Hydraulic RED uses 20 V1 accredited EnDura® V95X O-ring seals in total. The valve relies on the EnDura® seals to prevent gas leaking and going up to the hydraulic head on the surface where it would pose a fire risk.

#### The Solution

EnDura® has been both a technical and commercial success for Red Spider Technology according to Gary Smith. "Since achieving V1 accreditation with Endura® seals, there has been a noticeable upturn in the number of Hydraulic RED operations in the Norwegian sector and the device is fast becoming the tool of choice for workover and tubing change-out operations. So far it has been used on 12 jobs - mainly shallow set isolations where the well is being plugged for workover applications," he said.