



RED | BARON

**SUSTAINED
CASING PRESSURE
REMEDICATION
SOLUTIONS**

Solutions for Sustained Casing Pressure (SCP) Remediation

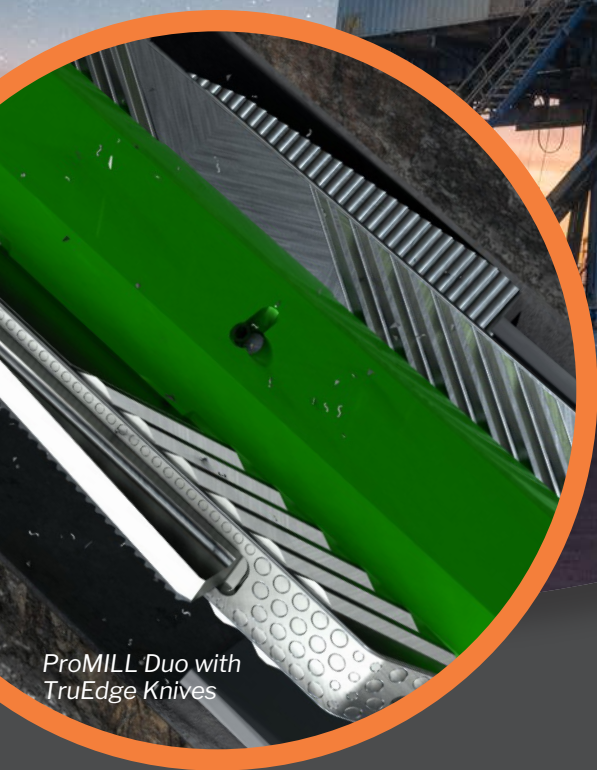
Sustained Casing Pressure (SCP), exhibited in many wells, is defined as measurable casing pressure in any well annulus that rebuilds after being bled down, attributable to causes other than artificially applied pressures or temperature fluctuations in the well.

SCP in any well means that well integrity has been compromised. The effective remediation of SCP is a recognized industry challenge that requires practical and reliable solutions.

Wellbore Integrity Solutions' Red Baron product line and our technology partners offer comprehensive solutions to remediate **Sustained Casing Pressure (SCP)** in the wellbore. Our technologies, when combined, can provide a single solution for this known industry challenge.

Comprehensive SCP Remediation Solutions

- Intervention and Fishing Services
- Specialized Milling Systems
- Debris Management
- Fibre Optic (FLI) distributed temperature and acoustic leak detection
- Alternative Barrier Materials



ProMILL Duo with TruEdge Knives

**Highly Productive Tools.
Restoring Wellbore Integrity.**



Wellbore Integrity Solutions is ready for all your **well integrity** requirements.

Sustained Casing Pressure Remediation Solutions

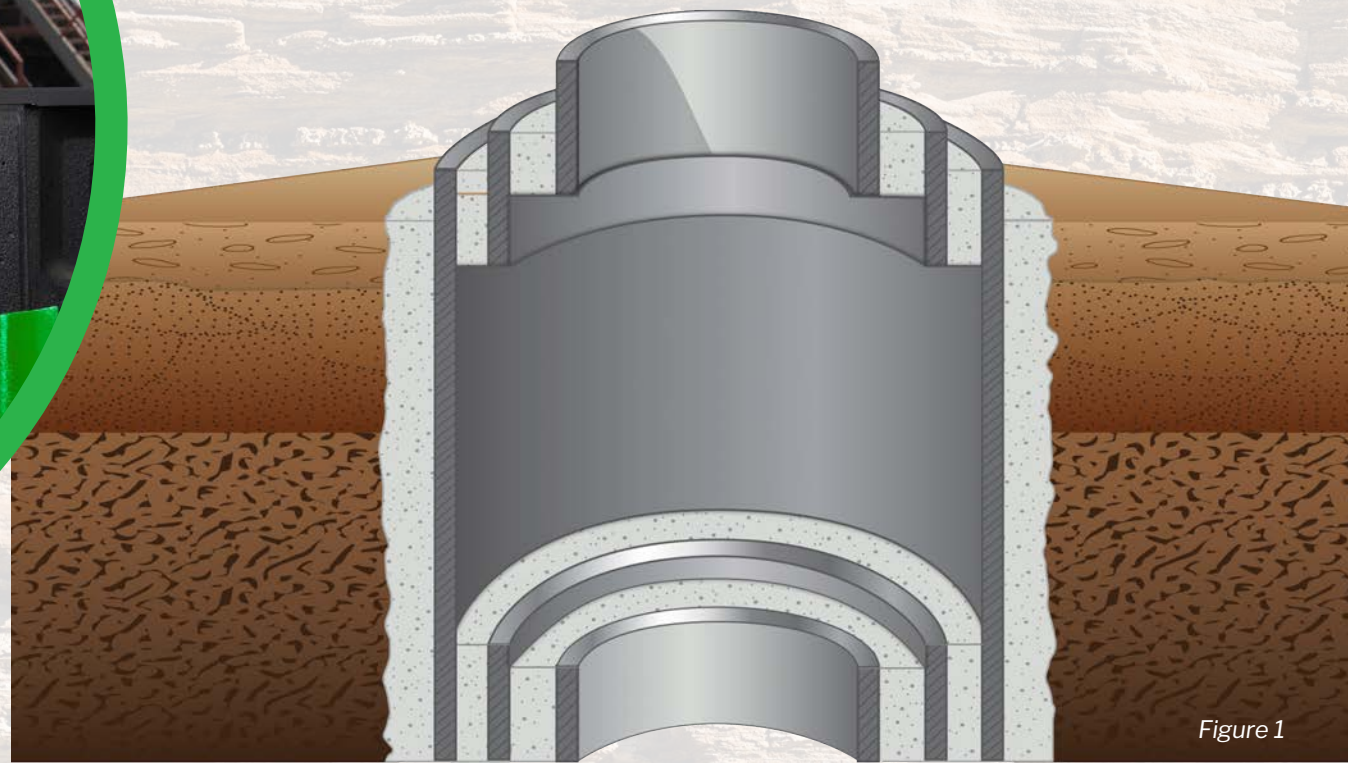


Figure 1

Figure 1: Preparation of zone prior to barrier installation.

Red Baron Well Intervention and Fishing Services

Conventional cased hole Intervention and Fishing Services is often required to enable wellbore access, including operations such as completion recovery, retrieval of a fish, removal of obstructions, or general cleaning of junk and debris. Wellbore Integrity Solutions offers a **comprehensive portfolio** of equipment and draws on more than 60 years of operational experience to **safely and efficiently** workover wells with wellbore integrity issues. A global footprint of support bases and experienced personnel deliver **customer-focused services**.

Specialized Milling Systems

WIS's Red Baron proprietary portfolio of milling systems ensures that the appropriate casing sections are removed effectively and in a single trip.

ProMILL Trip-saving milling and casing scraping system

The ProMILL system enables single-string section milling and casing scraping in one trip as part of the SCP remediation process. A combined section mill and **underreamer with custom casing scraper arms** allows access to the annulus and removes residual cement in the next casing ID. (Figure 1)

All ProMILL systems include next generation cutting structures such as **TruEdge** or **WavEdge**, that offer durability, high ROP, and superior hole cleaning.

The hydraulically activated high-ratio casing scraper remains closed during milling. It is then activated to remove residual cement and provide a clean surface preparation before the introduction of a new barrier material.



ProMILL Duo

ProMILL Duo Dual casing section milling and scraping system

To remediate SCP across two annuli, the ProMILL Duo is used. Equipped with both TruEdge and WavEdge cutting structures its high expansion ratio enables it to drift through the inner casing in the retracted state and, upon actuation, open to a larger diameter to mill the outer casing.

The system is equipped with active stabilization that optimizes the dynamic behavior of the BHA.

The removal of the residual cement sheath on the outer casing ID is done using the underreamer with custom casing scraper arms. (Figure 1)

SCP Access Mill

After deployment of the new barrier material, a SCP Access Mill, with an optimized cutting structure is used to mill through the barrier material and regain full wellbore access. (Figure 2)



Heli-Mag

Debris Management

CHIMERA Comprehensive Wellbore Cleanout Solutions

An established best practice is thoroughly cleaning the wellbore before Barrier Material deployment. String magnets such as the **Heli-Mag, Uni-Mag, or NR-Mag** should be used in the BHA to capture the steel cuttings. The Heli-Mag is the preferred choice as it offers the highest load-carrying capacity. The Heli-Mag is equipped with "rare earth" magnets that provide strong resistance to de-magnetization and have a proven track record in milling-related applications. Jetting and circulating tools are also utilized to hydraulically wash the desired wellbore zones.

Well-SENSE

Fibre Optic Distributed Temperature and Acoustic Profiles

With our technology partner, **Well-SENSE, FiberLine Intervention (FLI)** services are used for SCP remedial applications. FLI is an efficient wellbore surveying solution that rapidly delivers

high-quality insights. In comparison to other forms of well surveillance, time and costs are reduced. The equipment is compact and lightweight, requiring a small wellsite footprint.

FLI disposable fibre-optic technology captures distributed temperature and acoustic profiles along the complete length of the well in real time. It pinpoints areas of interest and simultaneously monitors changing conditions,

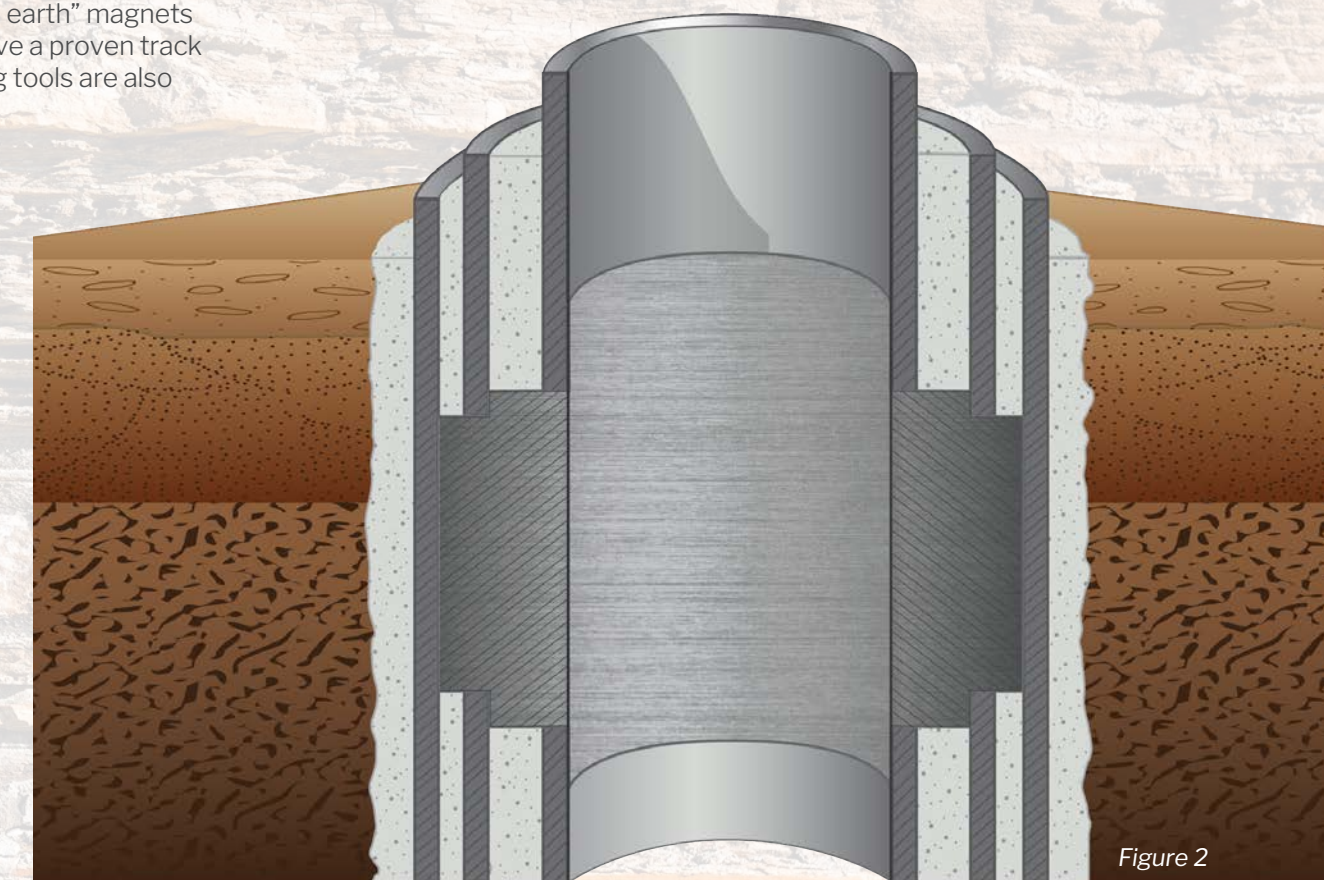


Figure 2

Figure 2: Barrier in place and wellbore access re-established.

irregularities, or anomalies. Leaks behind casing and cement can also be pinpointed while running inside the tubing.

After establishing the leak source, the distributed measurements also allow the identification of the well's flow path. Having this understanding enables a targeted and precise intervention to be carried out.

When required, surveys can be completed rigless and offline. A surface acquisition system immediately records and processes the data gathered by the sensors.

Alternative Barrier Materials

Alternative barrier materials such as metals and resins have gained significant market acceptance. They offer high-quality sealing materials for extreme applications such as in oil and gas wells.

Through our technology partners we are able to offer these alternative barriers. These high-quality barriers complete the SCP remediation process, sealing off the source of the pressure.

With short, targeted window lengths, we are able to reduce the volumes of these materials required and so significantly reduce the costs of the remediation. (Figure 2)

Sustained Casing Pressure Remediation Solutions



For more information, contact
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RED BARON

DRILCO

**THOMAS
TOOLS**