

CASE STUDY

HPSR offers cost-saving opportunities for offshore wells and FPSOs



SITUATION

An offshore oil well operator operates an FPSO that processes crude. Seawater is treated and pumped into the well at high pressure (205 barg/2,973 psig) to increase reservoir pressure. To provide overpressure protection, the operator is using a forward acting, cross-scored rupture disc with an operating ratio of 90% and a burst tolerance of +/-10%.

However, this disc is prone to cycle failure due to the forward acting (tensile loaded) design. The 90% operating ratio limits the pump's operating pressure, which impacts the reservoir pressure. There have also been reports that the rupture disc is difficult to install and prone to damage during installation. This affects the disc's product life and reliability. In addition, every rupture disc failure reportedly results in eight hours of non-productive time.

The customer tasked OsecoElfab to provide an effective pressure relief device that would:

1. Allow the seawater line to increase its operating pressure;
2. Be resistant to fatigue and withstand very high pressure/thermal cycles;
3. Be easy to install and maintain.

ACTION

We selected the HPSR as a suitable solution. The HPSR is a single-piece, welded rupture disc assembly designed for use in ANSI RTJ connections. It is easy to install and offers the most robust rupture disc assembly on the market, being specifically designed for high burst pressures, high pressure/thermal cycle rates and high operating ratios.

RESULT

1. The HPSR's 95% operating ratio enables a 5% increase in operating pressure for seawater injection and pumping.
2. The reverse buckling design provides extended service life and limited occurrences of fatigue at high pressures. This eliminates the risk of premature or unplanned failure.
3. The single-piece design is simple to install with minimal training and experience, and it protects the disc from damage.

INVESTMENT COST COMPARISON

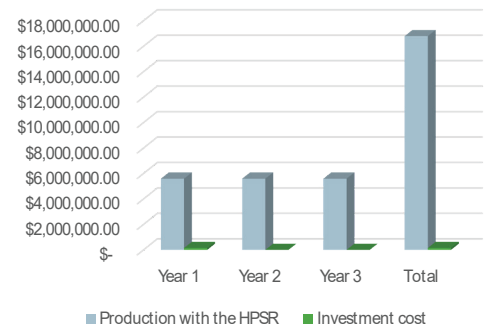
The 5% increase in operating pressure leads to an additional 200 barrels produced daily: \$5.6 MM annual increase.

*Assumed 350 days annually of production with an average price of \$80/barrel.

Proposed HPSR three-year investment: \$120,000.

*Assumed annual PM of equipment.

3-Year Production Increase



ESTIMATED GAIN OVER

A 3-YEAR PERIOD:

\$8.91MM