

## Case study Chrome Tube Integrity

# Assessing metal loss in corrosion-resistant alloy tubulars helps operator intervention plans



**Location:** Abu Dhabi, UAE  
**Well type:** Sour gas producers  
**Reference:** SPE-192974

### Case benefits

- Demonstrated capability for integrity monitoring of corrosion-resistant alloy tubulars in a high-temperature well in the presence of highly corrosive gases
- Provided a baseline survey of tubular integrity
- Delivered quantitative measurement of metal loss in three barriers and qualitative data for a fourth
- Confirmed depths of casing collars and centralisers
- Enabled successful modification and optimisation of hydraulic fracturing jobs.

**Chrome Tube example well sketch.**

Chrome Tube provides an accurate barrier-by-barrier assessment of tubulars containing chrome or corrosion resistant alloys [CRAs].

Corrosion resistant materials like chrome help protect well completions from highly-corrosive fluids. But high chrome content can cause serious problems for ordinary electromagnetic pipe inspection systems.

Powered by our True Integrity system and Pulse technology, Chrome Tube delivers accurate wall thickness data where other products fall short.

Chrome Tube is used routinely to support your ongoing integrity management programme, or in a targeted fashion to investigate a specific integrity breach.

Its ability to work with CRAs means that the answers are just as reliable as with conventional steel tubulars.

### Challenge

Using corrosion-resistant materials such as high-chromium–nickel alloy for tubulars helps to protect well completions from corrosive fluids. But these alloys present a serious challenge for conventional electromagnetic pipe inspection systems.

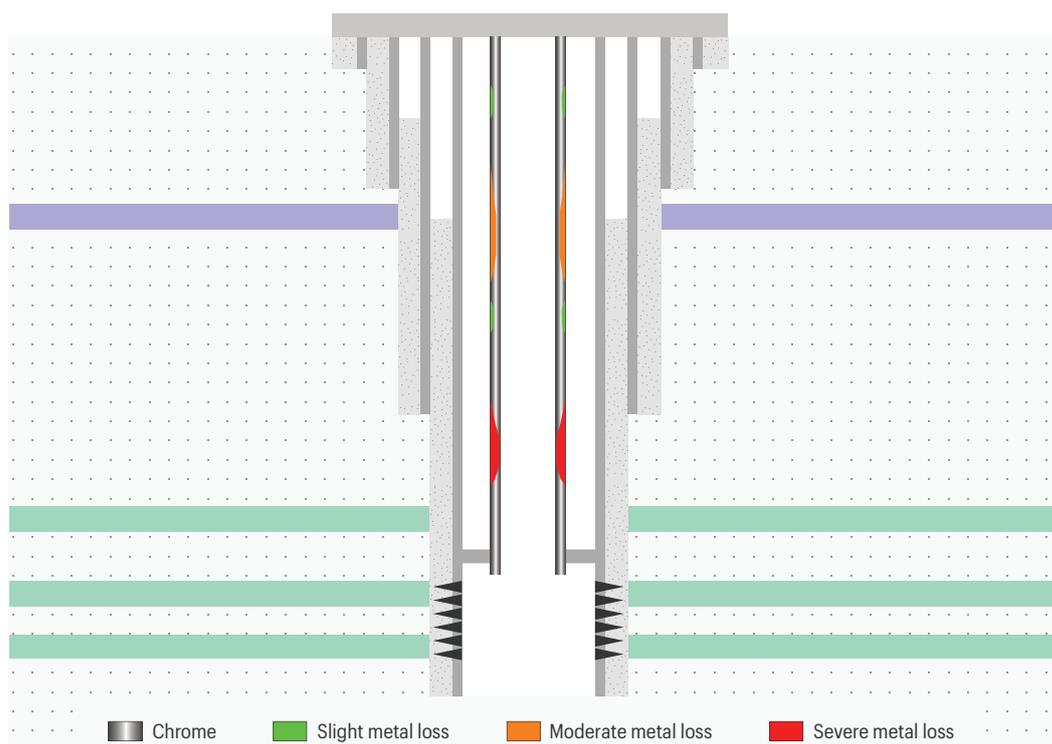
This ADNOC survey took place in a high-temperature sour well. The flow-wetted areas of the well had been completed with chrome-resistant alloy (CRA) tubulars. The diagnostic system, particularly the data acquisition and interpretation process required for the corrosion assessment of CRA tubulars, is much more complex than for conventional steel tubulars. In this case, the corrosion study was a high-temperature environment where

the produced gas contained hydrogen sulphide (30%) and carbon dioxide (10%).

### Solution

The operator, ADNOC Sour Gas, selected TGT's Chrome Tube Integrity product to provide an accurate barrier-by-barrier assessment of the corrosion-resistant alloy tubulars in the well.

Powered by the True Integrity system using the Pulse electromagnetic platform, Chrome Tube Integrity delivers accurate wall thickness data for CRA tubulars and can differentiate between internal and external defects, when complemented with the calliper data. TGT has conducted detailed tests on machined defects to calibrate the



Chrome Tube Integrity product for this purpose. The assessment of low-magnetic tubulars such as CRA is possible without compromising on quality if the fast-response Pulse sensor is used.

The Chrome Tube Integrity measurements were made in memory mode with the sensors being run on slickline. This was an industry first for through-barrier integrity diagnostics in highly corrosive gas wells completed with high-chromium-nickel tubing.

### Result

The survey provided a quantitative assessment of corrosion across three barriers: tubing, production casing and intermediate casing. The survey also updated and confirmed the depths for casing collars and centralisers. A fourth

barrier (surface casing) was identified and qualitative assessment made.

Chrome Tube Integrity showed that all the CRA tubulars complied with the manufacturing standard; no corroded intervals were detected (Figure 1). This new approach provided the operator with an integrity baseline and enabled optimisation of future assessment and intervention plans.

This project confirmed the value of Chrome Tube Integrity as an effective product for a targeted investigation of specific integrity breaches or as routine surveillance support for ongoing integrity management programmes. It also demonstrated the suitability of Chrome Tube Integrity for conducting multi-barrier assessments in wells that contain corrosion-resistant alloy (CRA) tubulars.

Pulse technology showing its capability to differentiate between standard collars and CRA collars.

