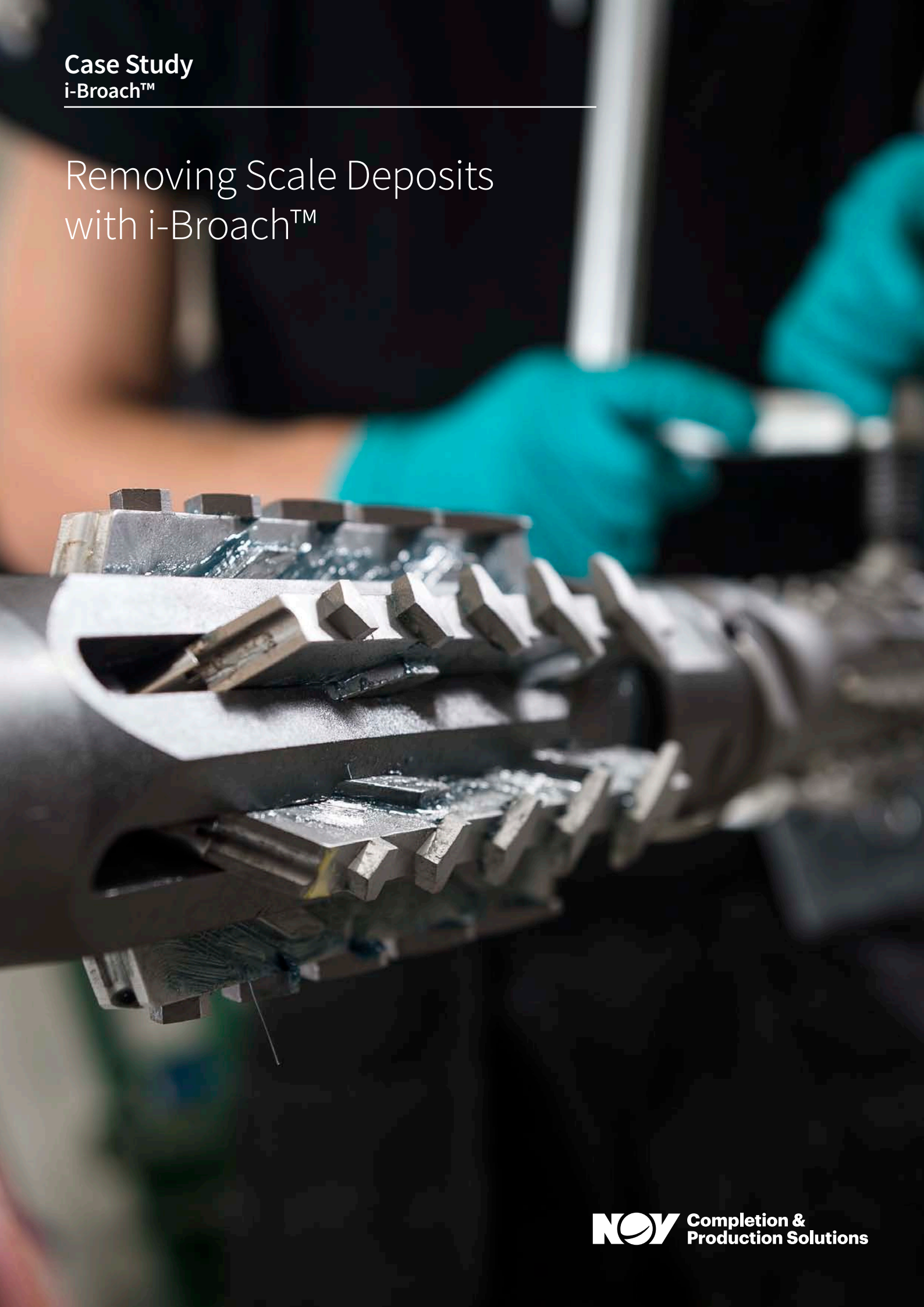
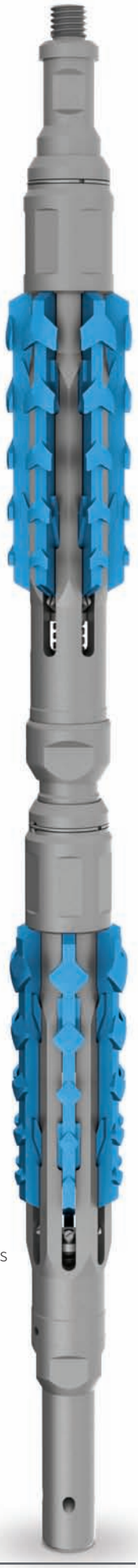
**Case Study**
**i-Broach™**

# Removing Scale Deposits with i-Broach™



NOV Completion & Production Solutions

# Using our i-Broach™, a rigid and effective mechanical scale removal tool, our customer's scale deposits were removed after 4 days, restoring the well to its full ID.



### Business Need

During a slick line operation for a client in the North Sea, restrictions were discovered in 5.5 in. tubing with a 4.548 in. nominal ID. The restrictions were the result of scale deposits from produced water. These scale deposits reduced the well ID, limiting intervention. A caliper run revealed the ID of the well in the restricted section was 3.11 in., creating difficulty getting past the scale with slick line. A scale removal operation was performed using fixed pineapple broaches with 0.25 in. steps. Running a 2.75 in. broach was unsuccessful and our i-Broach was mobilized.

### Solution

The i-Broach is a rigid and effective mechanical scale removal tool with adjustable cutter rails. The i-Broach assembly consists of two broach units covering 360° of the wellbore. When jarring downwards, the broach-rails are forced into the scale, effectively removing deposits and scale buildup on the tubing wall. Upon retrieval, the rails are allowed to collapse and no over-pull is needed, ensuring a safe and efficient scale removal operation. The i-Broach comes in 5 different sizes ranging from 2.1 in.- 6.5 in.

For the operation, the i-Broach Mini was first used to start removing scale, and was then adjusted to 2.85 in., passing the obstruction without any resistance. The i-Broach was then adjusted to 3.2 in., passing the scale, but with some resistance. The operation continued with 0.1 in. steps until the nominal ID was restored. When retrieving the i-Broach between each run, no over-pull was necessary, due to the collapsible rails.

The scale was removed after four days with 600 – 700 jar actions, restoring the full well ID. After the scale removal operation was complete, the scale was examined and found to consist of barite, quartz, hydrocalumite, thaumasite and other calcite. Despite the hard scale, the i-Broach exhibited no wear or problems. The customer now uses the i-Broach as their primary mechanical scale removal option.

## Case Study Snapshot

### Challenges:

- During a slick line operation in the North Sea, scale deposits were restricting the well ID, limiting intervention

### Solution:

- i-Broach, a rigid and effective mechanical scale removal tool with adjustable cutter rails was used to remove the scale deposits

### Result:

- The i-Broach successfully removed the scale without tool wear or issues
- Scale was removed after 4 days with 600 - 700 jar actions
- The well was returned to its full ID
- The customer has established the i-Broach as their primary mechanical scale removal option