Taking a good look: Visual data for improved pipeline integrity management decisions

Author: Michael Bruns, Sales Manager Field Products & Services, ROSEN Europe

A visual inspection using an in-line inspection (ILI) tool equipped with a camera allows for an actual look inside a pipeline. The use of a visual ILI inspection is broad, and by adding this feature to regular pigging operations or an ILI tool creates an additional source of data for future integrity decisions, without the need for a tethered camera inspection. This type of inspection can be used to:

- identify damages and the status of the inspected pipeline network
- visually check of pipeline repairs
- assess the general condition of a pipeline
- assess the condition of installations (i.e. status of valves, guide bars, branches)

In addition, this type of look into the pipe allows for the success of other integrity work, as it can quantify the success of a cleaning campaign and whether an internal pipeline coating is intact or whether there are any liquid accumulations such as water in the pipeline and at what location.

To make this kind of data collection possible, the **ROSEN Group** has developed a modular device that can be attached to tailored cleaning tools ranging from 12” to 56” or an intelligent inspection (ILI) tool (see Figure 1). Developments ensured the camera inspection device could meet the high demands on the quality of the recordings and at the same time withstand the rough conditions in a high-pressure gas pipeline. This article briefly focuses on recent case studies rather than technical specifications of the camera device to show how the reported visual data, gathered during regular pigging operations, benefits pipeline operators.

Figure 1: RoVisual modular service device is mounted to the front of a ROSEN Ultimate cleaning tool

Case Study 1:
One specific application of the visual inspection device was to prove a potential restriction/obstacle in an over 50-year-old pipeline, as the sensor arms of a high-resolution geometry tool had been heavily damaged during an in-line inspection, and the gauging discs showed an unexplainable deformation (see Figure 2).

Figure 2: Gauge plates with unexplainable deformation

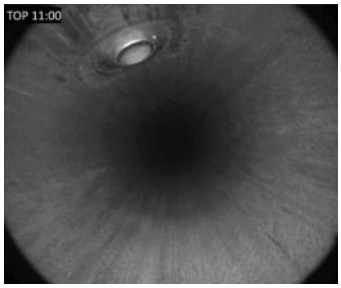

Figure 3: Protruding offtake in an over 50-year-old pipeline

The recorded RoVisual data gave a fast and clear answer - an unknown approximately 50 mm protruding offtake was the reason for these damages (see Figure 3). As a result, the operator removed these offtakes to ensure a safe and successful in-line inspection followed.

Case Study 2:
In a different case, recorded RoVisual data provided a pipeline operator with evidence and certainty on the question whether a present tee of an older asset was barred or unbarred (see Figure 4). Additionally, the data allowed assessing the condition of an older hot tap and related guide bars that actually were recessed (see Figure 5). Unbarred tees and recessed pig bars could potentially result in tool deviation into the offtake, or leaded to a stalled tool due to increased bypass. Therefore, the status of such installations is important to know in order to modify future cleaning and / or inspection tools for safe passage of such installations. It is however remarkable that all this data footage has been recorded at pig velocities of around 2 to 2.5 m/s.

Figure 4: Verification of an unbarred tee

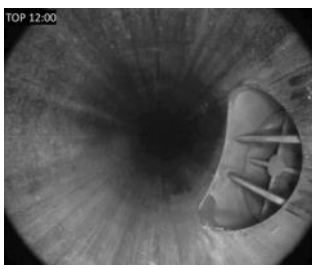

Figure 5: Hot tap with recessed pig bars