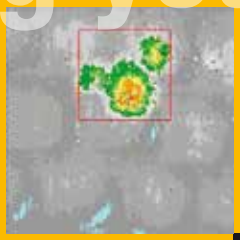
Data Analysis and Reporting

High quality, detailed analysis of your pipeline inspection

Protecting your investment

QUALITY, INTEGRITY, CUSTOMER SATISFACTION

Data is processed in our sophisticated data analysis system by highly trained experts and a report generated based on the anomalies detected during inspection.



a.hak
INDUSTRIAL SERVICES

Multiple services, singular solutions

for the Oil, Gas & Petrochemical Industry

Using our in-house developed inspection tool, in combination with the best qualified personnel and the most sophisticated software, the final report is the deliverable component of your pipeline inspection. The purpose of our data analysis and final report is to accurately inform pipeline owners and operators of their asset's condition.

Our final reporting service is based on a sophisticated data analysis system controlled by our highly trained data analysts. When it comes to reporting, quality and accuracy is essential. All work performed by our data analysts is reviewed and verified by an additional level II or level III data analyst. All final reports are also independently reviewed and verified by a level III data analyst.

THE FINAL REPORT

The body of the final report contains detailed information on field operations, challenges, solutions, inspection statistics, inspection results, dig-up sheets, anomaly C-scans, and more. Our final report package includes:

- A hard copy of the final report
- A DVD with the digital final report, pipe tally and more
- Data analysis according to the POF standards
- Defect assessment according to ASME B.31G or other requested assessment methods
- TubeViewer software to view all pipeline data

DATA ANALYSIS

Data obtained during inspections contains raw ultrasonic signals for highly accurate data analysis and is not useful to clients in this original raw form. Only after data analysis can the inspection results be presented in a meaningful and comprehensive way. Data analysis takes place in three main phases:

1. Automated data analysis and wall thickness measurements using advanced software algorithms.
2. Detailed analysis of features and anomalies.
3. Report compilation.

Detailed analysis utilizes various tools to optimize the reliability of the information extracted from the data, like the A-, B- and C-scans, as well as radial cross-section views. For validation of the wall thickness measurements, both semi-automated algorithms and manual validation measurements are used.

DATA ANALYSIS SOFTWARE

Our data analysis software has been built in-house and is continuously updated and improved. Our inspection tool is equipped with a UT-sensor which measures the ultrasound reflection of the inner and outer pipe wall. Data analysis software translates this signal into five outputs:

1. Wall thickness (C-scan)
2. Distance of center of pipe to inner wall
3. Signal amplitude of the inner wall reflection
4. Signal amplitude of the outer wall reflection
5. Ultrasonic signal (A-scan)

These outputs give a complete picture of the condition of the pipe wall and provide all necessary information to detect and quantify features and anomalies in the pipeline.
All analysis and reporting functionality complies with the specifications and requirements of the Pipeline Operators Forum for intelligent pig inspection of pipelines.

CLIENT SOFTWARE

In addition to the final report, we offer a client version of the data analysis software, called TubeViewer. This allows users to navigate through the pipeline and view a graphical representation of the wall thickness C-scans.

DATA BACKUP

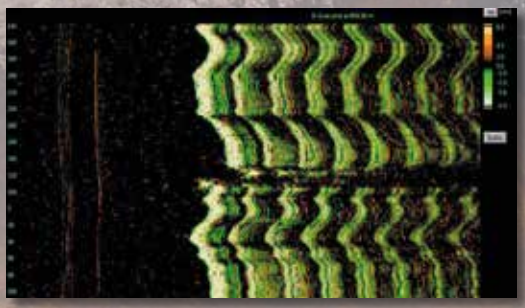
During inspection, the recorded data is safely stored on two separate hard discs. Following analysis and reporting, all data is safely backed-up and archived for future use, e.g. corrosion growth rate comparison.

ADDITIONAL SERVICES

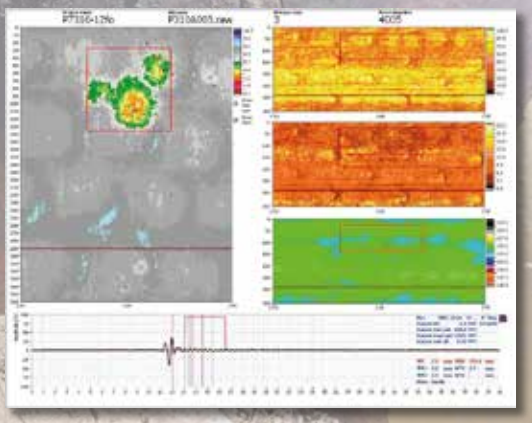
During data analysis and final reporting we carry out a defect assessment as standard, and can also offer fitness-for-purpose reporting if required. We also offer:

- Immediate notification: any feature with a depth ≥ 80% or a Failure Pressure ≤ MAOP is reported immediately to the client.
- Integrity Management through PIMS software
- Defect Assessment: ASME B31.G, Modified B31.G, RSTRENG, SHELL92, DNV, etc.
- Corrosion Growth Rate Analysis: Back to back or historical.

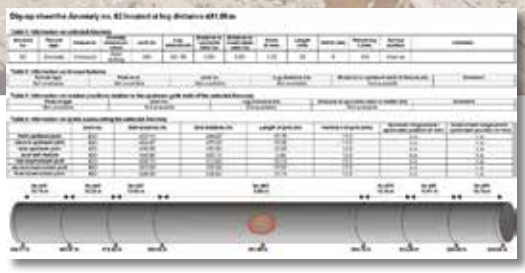
Protecting your investment



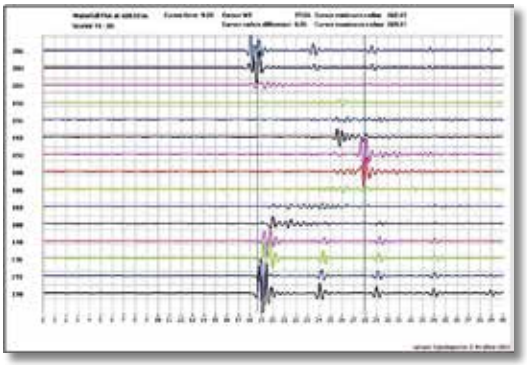
B-scan



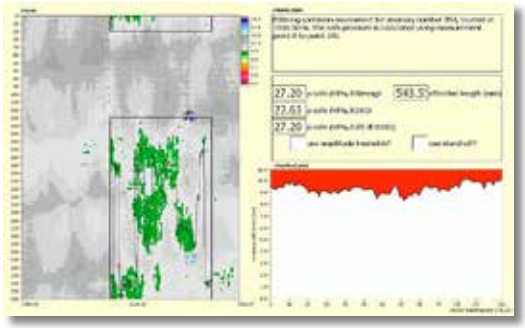
C-scan



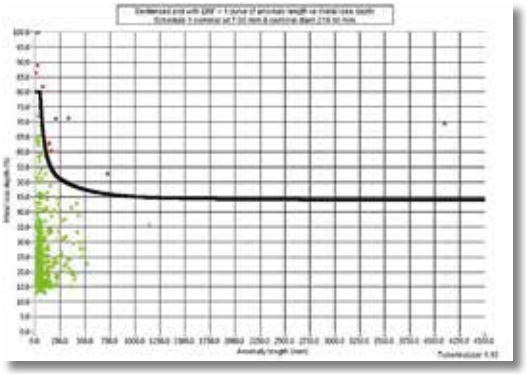
Dig up sheet



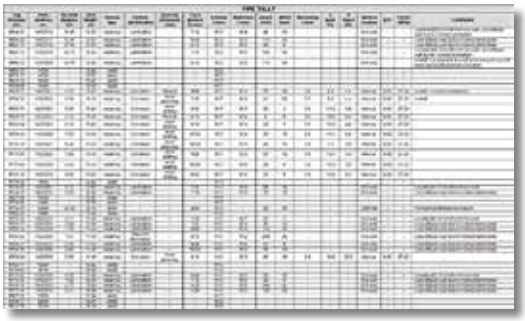
Waterfall Plot Internal Corrosion



RSTRENG River Bottom Profile



ERF Curve



Pipe Tally

SUMMARY OF METAL LOSS ANOMALIES	
Total number of metal loss anomalies	152
Number of internal anomalies	127
Number of external anomalies	19
Number of non applicable anomalies (general wall thinning due to the manufacturing process)	6
Number of general anomalies	16
Number of pits	6
Number of pinholes	3
Number of axial and circumferential grooves	43
Number of axial and circumferential slottings	84
Number of anomalies with depth 0 - < 10 % t	51
Number of anomalies with depth 10 - < 20 % t	88
Number of anomalies with depth 20 - < 30 % t	9
Number of anomalies with depth 30 - < 40 % t	4
Number of anomalies with depth 40 - < 50 % t	0
Number of anomalies with depth 50 - < 60 % t	0
Number of anomalies with depth 60 - < 70 % t	0
Number of anomalies with depth 70 - < 80 % t	0
Number of anomalies with depth 80 - < 90 % t	0
Number of anomalies with depth 90 - < 100 % t	0
Number of anomalies with ERF 0.6 - < 0.8	0
Number of anomalies with ERF 0.8 - < 0.9	145
Number of anomalies with ERF 0.9 - < 1	0
Number of anomalies with ERF ≥ 1	0

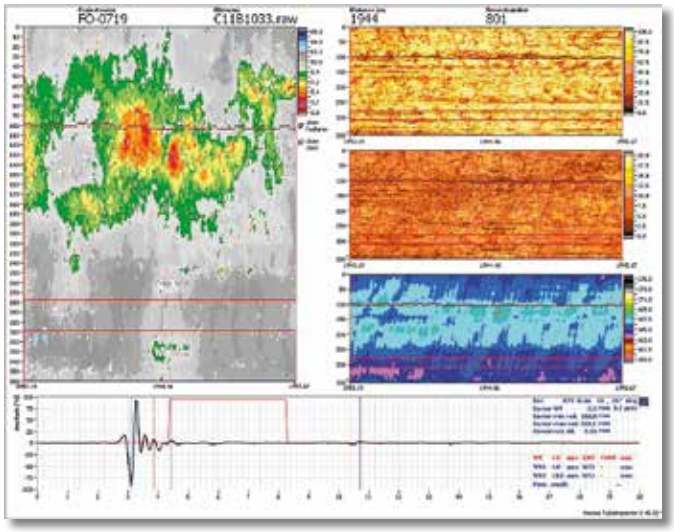
Summary of Metal Loss Anomalies

CORRISION GROWTH ANALISYS

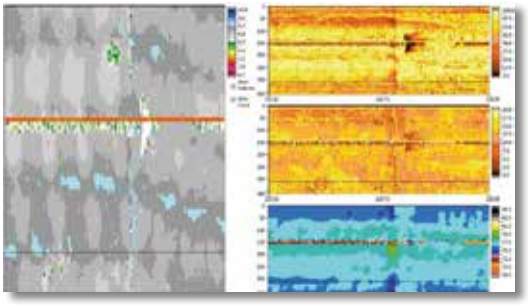
A.Hak is capable of performing Corrosion Growth Rate (CGR) Analysis; either historical (whereby only one inspection is required) or back to back (whereby two inspections are used). This service grants pipeline owner/operators additional insight into the behavior of corrosion on their assets. Many clients use CGR analysis as an additional layer of risk management by looking closely at features that do not meet their excavation criteria at the time of inspection, but are calculated to by the time of their next planned inspection. Conversely, A.Hak's CGR Analysis can also be used as input for deciding when to plan the next inspection.

A.Hak has an internal policy whereby we notify clients immediately upon identifying an unrepaired anomaly deeper than 80%, or that has a calculated burst pressure less than the MAOP of the pipeline.
Some clients have their own immediate notification criteria and in these instances we adopt the more conservative of the two. Notifying clients immediately ensures these severe features receive an appropriate level of attention and also allows pipeline owner/operators to act quickly on features that may leak or rupture in the near future.

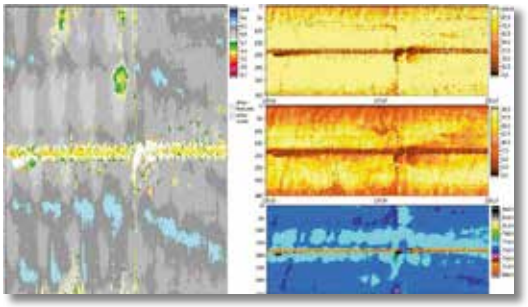
Every year we notify several clients of such features and every year we have clients grateful for the advanced warning and their partnership with A.Hak.



Immediate Feature C-scan



Previous inspection



Most recent inspection

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