THE DOWNHOLE VISUAL ANALYTICS COMPANY

Powered by Epidote

MULTI-FINGER CALIPER ANALYSIS AND REPORTING

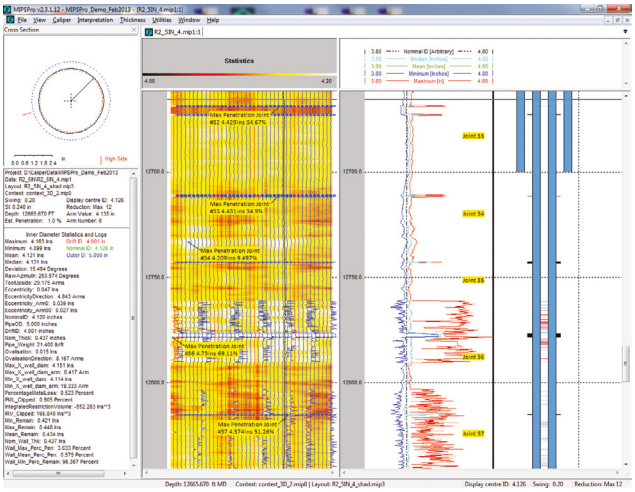
MIPS (Multi-Finger Imager Processing Software) is the industry's leading software package for multi-finger caliper data processing and interpretation

OVERVIEW

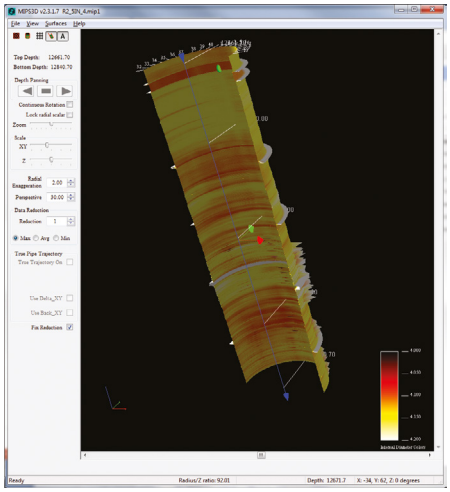
MIPSPro

MIPSPro is sophisticated analysis and visualisation software that enhances the interpretation of caliper and pipe thickness log data. Used globally by leading operating and service companies, MIPSPro maximizes data value by efficiently identifying and diagnosing well integrity issues.

MIPSPro runs independently of the instrument used to acquire the log data, reading field data in LAS, DLIS and other industry standard formats.



MIPSPro main viewer window showing dynamic 2D cross section, calculated statistics, coloured 'VDL' presentation of multi-curve data set with editable annotations, auxiliary maximum, minimum, mean and median data curves referenced to nominal diameter, and a well schematic.



MIPS3D window synchronised with main viewer is fully interactive and customisable allowing rotation, fly down, cut away or full 3D views, image capture and video recording

Key Features and Benefits

Interactive processing algorithms prepare caliper and thickness data for analysis. Workflows calculate multiple penetration and restriction statistics - readily identifying typical corrosion, scale build-up, drilling wear and other deformation anomalies. MIPSPro uses synchronised 2D and 3D views to visualise and communicate results.

Multiple output options allow results to be presented to end-users in their chosen format. An integral reporting module delivers customised Word, Excel and PDF documents. Scaled log plots can be produced in TIFF or PDF format and processed curve data can be output in LAS format. MIPS3D can produce 3D movie clips and 2D and 3D scenes can be saved and communicated to the end user with the license free MIPSView package, exactly as the analyst viewed them.

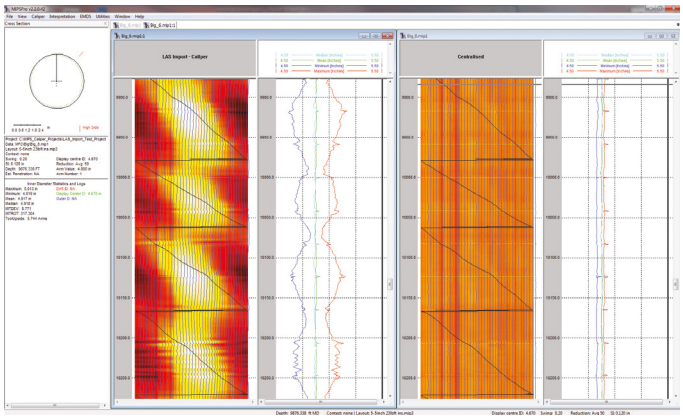
THE DOWNHOLE VISUAL ANALYTICS COMPANY

Powered by Epidote

PROCESSING MODULES

MIPSPro gives the analyst a comprehensive set of processing options to prepare the data for interpretation. These include:

- Centralising field data – almost always required for accurate analysis of pit depths
- Depth Correction
- Merging and Splicing of multiple runs
- Orientation to top of hole
- Editing of poor data
- Recalibration to known IDs

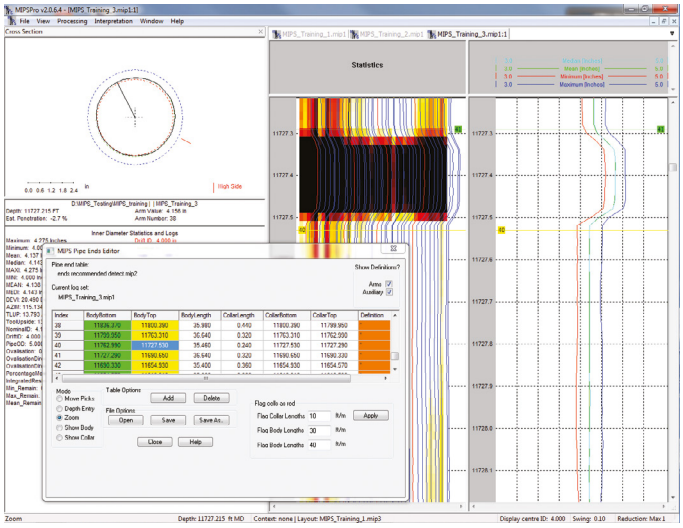


Uncentralised field data, on the left, produces inaccurate corrosion and scale analysis. Centralised caliper data shown on the right after processing is now optimised for further interpretation.

WORKFLOWS

MIPSPro assists in efficient interpretation of log data through:

- Automation of time consuming processes
- Quick access to commonly used commands
- Pre-population of default options for workflows
- Semi-automated collar identification allowing joints to be quickly identified and interactively edited prior to further analysis

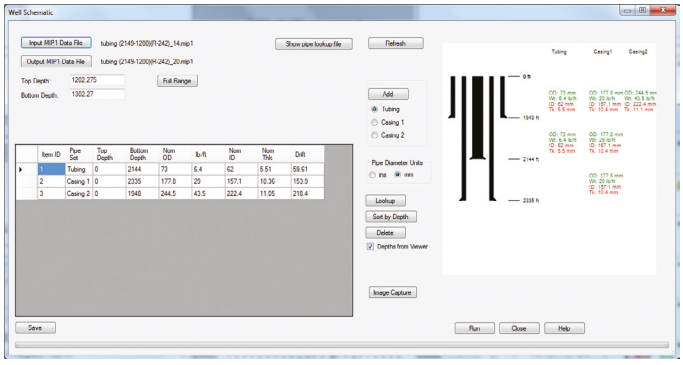


The joint detection processor provides automated picking and QC of tubing and casing collars. Joint-by-joint statistical analysis can then be performed. MIPSPro allows many parameters and user preferences to be saved and reused in future projects.

STATISTICAL ANALYSIS

An extensive statistical analysis of penetration and restriction data provides the basis for quantitative interpretation.

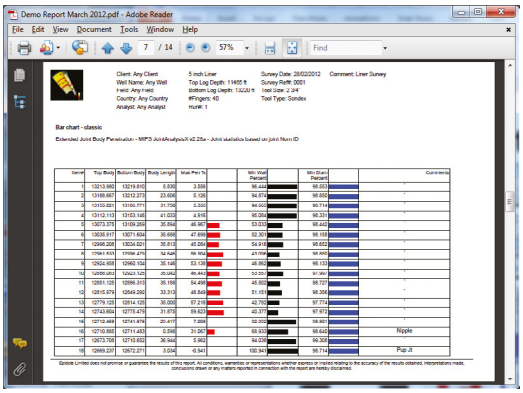
With more than 30 statistical results available for each joint, the analyst has full flexibility in the reporting of pipe integrity.



Tubular details are entered in a well schematic style interface, producing a graphical well sketch and auto-populated tubular dimensions.

REPORTING

The integrated reporting module in MIPSPro allows the analyst to produce structured, custom built reports in Word, PDF or TIFF format. Features of the statistical reporting include histograms, bar charts, joint analysis tables and pipe grading. Log sections, 2D cross sections and 3D views are all easily captured and added to the written report. Pre-prepared introductory and concluding text sections complete the written report. MIPSPro reports are supported with API style log plots, LAS output and presentation of data in MIPSView.

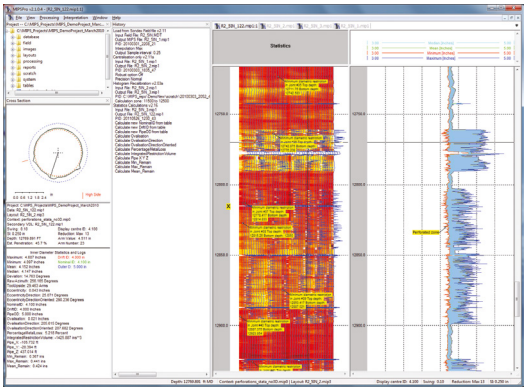


Example Joint statistics table from MIPSReport.

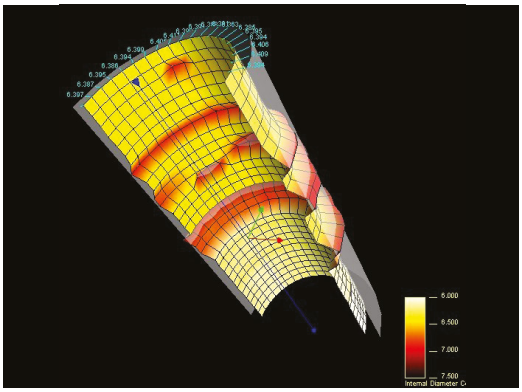
Global analysis allows the user to find the largest wall penetrations, cluster neighbouring penetrations, and show the relative size of the clusters in a summary graph. Overlays can be used to compare passes and for time lapse analysis.

LICENSE-FREE VIEWER

MIPSView is provided as a license free version of the 2D and 3D viewers for distribution to the client, allowing interaction with images exactly as the analyst viewed them. Visualising data in this way aids communication and understanding of the results. The analyst can define scenes in MIPSPro and the client can open these again in MIPSView.



MIPSView shares the same viewer as MIPSPro, allowing the analyst to communicate important data features to the client.



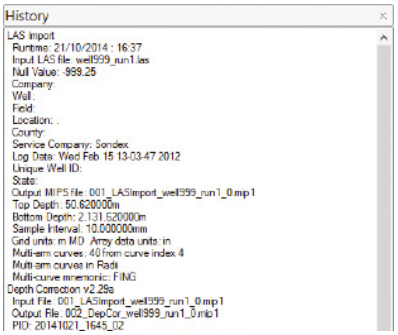
MIPSView has the same 3D viewer as MIPSPro. The analyst can define a 3D display which will be directly opened by the client.

AUDIT AND QC

Processing History within MIPS captures details of all parameters and processes allowing QC, audit or reconstruction of the analysis.

History details can be embedded in LAS files or displayed in the MIPS Viewer.

Right: MIPS captures the processing history in the header of the data files.
This can be displayed alongside the viewers and output to the header of a LAS data file.

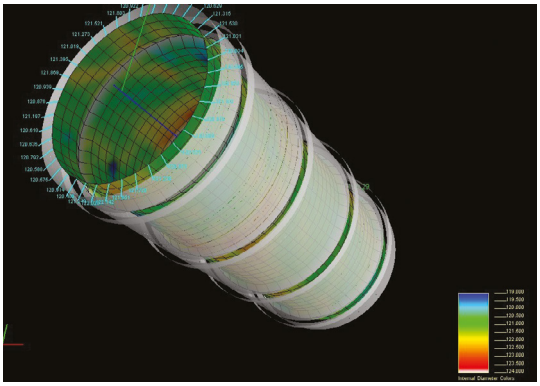


THE DOWNHOLE VISUAL ANALYTICS COMPANY

Powered by EVEpidote

SOFTWARE UPDATES AND SUPPORT

- MIPSPro is regularly updated with improvements and new features
- MIPSPro can analyse data from an array or average thickness sensor with or without accompanying multi-finger caliper data. Measured ID and OD, and thickness data imported and combined for analysis and visualisation
- MIPSPro contains a comprehensive help web, documentation and workflows complemented by training and email based support



Combined Caliper and Thickness data displayed in the 3D Viewer

MIPSPRO 2.5 SUMMARY OF FEATURES

A Windows based package for the import, processing, analysis and display of multi-finger caliper (MFC) and pipe thickness data

Data import	• Import of field data from Sondex, GOWell, Probe, Hotwell and other MFC tools via LAS 2.0 or 3.0 ASCII files • Import of native Sondex/GE SRO and MDT files • DLIS format import • Generalised Depth or Time domain ASCII data
Caliper data processing	• Shift, stretch & squeeze depth correction • Array curve editing • Robust least squares centralization • Data derived re-calibration - 3 methods • Spice / merge of runs and additional logs • Multi-arm statistics • Azimuth driven orientation to upside • Calculate and optionally remove best fit cross section ellipse
Utilities	• Channel and depth re-sampling • Curve editing / filtering • Curve maths utilities
Thickness data processing	• MTT Phase to Thickness conversion • Artefact editor • Data derived re-calibration • Calculation of OD
Joint analysis	• Automatic pipe end detection & interactive edit • Pipe-by-pipe statistical analysis • Pipe grading • Global penetration and pit cluster analysis

Reporting	• Built-in flexible reporting of text, graphs, tables, bookmarked displays & cross sections, imported images • Colour coded grading in tables • Output in Word, PDF or TIFF format • Archiving system to re-use tables, layouts and reporting templates curve lists & grade tables • Export of body/collar flag curve • Pit depth Rank Analysis
2D and 3D Display	• Intelligent reduction of data for display • Configurable display of curves with various line types, colour, weighting and shading • Tabbed multi-window displays • Dynamic cross section displays • Display of additional imported curves (e.g. GR, CCL) • Processing history display • Synchronization with MIPS3D • Co-rendering of thickness / time-lapse logs • Overlay of automatic or user defined text annotation layers • Well schematic display • Storage and retrieval of Viewer scenes
Help	• Links from all UI forms and full manual
Data export	• Customisable LAS 2.0 ASCII and DLIS output of data • MIPS projects for delivery with license free MIPSView • Automatic build of MIPSView batch scripts