INTETECH WELL INTEGRITY TOOLKIT

This web-based software has been designed by Liane Smith and Dragan Milanovic of Intetech Ltd., established experts with extensive operating company experience in the field of downhole engineering and operations. It is a unique approach to well integrity management. The software combines the functions of:

- A comprehensive database drawing together reservoir information, well design, completion condition, operating data, inspection results, workover operations etc.
- Quantitative data analysis
- Immediate engineering and management feedback.
- Further functions are available to provide guidance in planning and implementing workover operations.

The business benefits include:
- Streamlining of data collection activities.
- Improved in-company networking between departments (reservoir engineering, drilling, operations, inspection, corrosion engineering etc.)
- Consistency of approach to well integrity problems.
- Fast identification of potentially dangerous situations.
- Ease of technical evaluation of problem wells and design of remedial action.
- Prioritisation of workover schedule.
- Instant feedback to management in accessible format.
The web-based software opens with a field view which can be zoomed and panned to focus on particular areas. Field relief features can be removed. Wells are indicated by type and well-integrity status using a colour coding system so that there is immediate indication of the status. A small selection of the many data views are shown here.

Clicking on an individual well reveals its' status according to criteria relevant to the field and the company. In this example the estimated tubing life is indicated to exceed the design life, the wellhead seals have been successfully tested at the last check but there is evidence of annulus pressure problems exceeding set criteria so the well is identified for shut-in for diagnostic testing. Users who log on with administrator status have access to adjust “rules” or to post a note indicating waiver of normal rules for a specific well or other explanatory comments.

Well data is entered in categories as “Design data” (all information, design, test results etc. prior to handover to operations) and “operational data”. Data entry interfaces are set up so that there is direct downloading from existing data sources (such as Excel sheets or continuous reading monitoring data). Where specific data is entered infrequently, such as the well design, or annual test results, then it may be entered directly by typing into forms, but the majority of regularly entered data is by direct loading to avoid duplication of data collection effort.

Any data can be viewed directly in tabular format, or graphed within user defined ranges (e.g. within certain date periods). Any view of the screen can be exported to other programs such as Excel or Word, or emailed directly.
Production data is combined with well design data and well deviation survey data to calculate the maximum corrosion rate in the tubing and use that information to estimate the remaining life of the tubing, giving advanced warning of possible leaks or indicating potential sources of annulus pressure.
Comparison of annulus pressure data graphs with tubing head pressure data gives an immediate indication of excursions above MAASP values and highlights wells requiring diagnostic testing to evaluate the source of SAP.

SAP diagnostic test data is mathematically analysed to evaluate the pressure build-up pattern, assisting in diagnosing potential causes.

Further calculations are available to assist in planning well workover operations.

In total the integrity of 50 critical well components has been considered in the software, which can be tailored to meet individual company policies and experience.