■ Algorithms and calculations for reciprocating compressors have been developed through eight years of extensive field trials and detailed analyses of actual operational results. The proprietary calculation engine handles all types and models of reciprocating compressors, and is continually updated to remain current and accurate.

DIAGNOSIS AND OPTIMIZATION PROGRAM ADDS NEW CAPABILITIES

Enalysis Software Now Offers Internet Reporting, Fleet Management Tools and Analysis Tools for Screw Compressors

By Neil Purslow

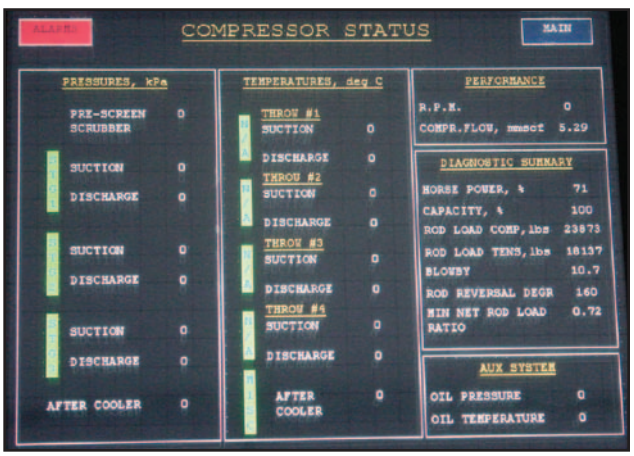
Evolution is necessary for long-term success. Nowhere is this truer than in the world of engineered services based on proprietary software, where the quick and continual evolution of product and service through active customer feedback is not only necessary for success, but also mandatory in ensuring continued customer satisfaction.

In COMPRESSORTechTwo (March-April 2001), an article detailed how Detechtion Technologies' Enalysis software diagnoses and optimizes reciprocating compressors. The service provided by Detechtion allows producers to aggressively address asset utilization to determine a compressor's maximum capability under its current operating conditions, and recommend changes and adjustments to the equipment to get actual throughput closer to its maximum capability. It also identifies underutilized horsepower and where incremental production exists. Users of the software have claimed improved compressor efficiencies and increased cash flow by as much as 5 to 10%.

"Since that first article was published a year ago, we've made three significant changes to the software," said Alan Taylor, president of Detechtion Technologies in Calgary, Alberta. The changes were prompted by requests from clients and required considerable effort, but were essential to make the software more valuable for them."

"Turnaround time for Enalysis reports was quick," explained Brian Taylor, director of engineering, "but not quick enough for some clients." In Canada, the majority of operational information is faxed to Detechtion where it is keyed into the database. After processing, reports are generated and faxed back to the originator. This process takes two days at most. "Many of our clients have requested faster reporting for earlier problem detection," said Brian, "while others have requested the ability to enter the data themselves."

The solution required changing the delivery platform for the program. Detechtion developed an Internet version of Enalysis using a standard Web



■ The majority of operating results used within Enalysis can be obtained from a compressor's control panel similar to this. However, the major difference in Enalysis is that after processing the data, it provides recommended actions to improve the compressor's utilization and volume throughput.

browser, providing 24-hour-a-day, seven-day-a-week access to users. Data entry is now distributed and controlled through encrypted security access by unique user identification and password. Enalysis results are generated instantly upon completion of entering operational information, with reports printed locally. If a report identifies a condition that requires immediate attention, e-mail notifications are automatically sent to selected personnel.

Canadian customers will be converted to the new system by mid-2002.

Dennis Church, a production foreman at Husky Energy in Alberta, is eagerly awaiting the arrival of the new software. "We'll realize operational benefits faster by accessing the

Analysis can assist in the conservation of fuel gas to an engine (or electricity to an electric motor), providing an immediate cost savings to the producer and preventing premature failure of the equipment.

Internet and printing the results ourselves within the area." Since introduced last year, all international and U.S. customers are using the Internet version for their analyses.

"Client emphasis for the program has evolved over the past year," said Scott Robertson, director of business development at Detechtion. "Customers want more than just a diagnostic service; they are looking for something to help them manage their entire fleet of compressors. They require a tool that identifies over- and under-utilized equipment and determines asset performance at a variety of levels (total company, field, foreman, plant), and not just for individual compressors."

Enalysis' fleet management provides summarized data at levels that are useful to each individual client. Fixed and operational data are captured by cylinder for each compressor and, through the use of unique client hierarchies, is summarized to the required reporting levels. For example, an area superintendent can review the results for a field, and then investigate further to find out more about a specific result. This process can continue until a single cylinder has been identified.

With Enalysis' in-depth database, using the program's trending and data manipulation tools ensures quick data analysis. Place the cursor over a single operating condition or performance indicator (pressure, temperature, volumetric efficiency, or rod load) and with a click of the mouse, historical charts and graphs are displayed. Detailed user-designed spreadsheets showing setup data, operating results, key performance indicators and performance flags are also easily created. As well, users can design printable charts for displaying specific results for easier analysis of specific compressor components and rationalizing performance data for a fleet.

All data fields displayed on Enalysis reports are available for fleet management reporting. Asset effectiveness, rod loads, pocket adjustments, blowby created by cylinder slippage and lost production are some of the variables closely watched. Different levels of management easily access their information using predetermined hot buttons. Dean Halewich, manager of facilities engineering from CNRL explained that their field personnel have fully-endorsing Enalysis. "They've realized the benefits of the program through minimizing maintenance costs and achieving incremental production gains."

"As with every Enalysis report, fleet management summarizes lost productivity as a dollar value for cash flow at risk," said Robertson. "By stating the results in dollars, we bring focus to those assets that require attention first."

"As we researched the fleet management function, clients would ask, 'How can I manage my entire fleet if only reciprocating compressors are included?'" said Alan. "This question led to our third change — the addition of screw compression into Enalysis (trademarked as Ro-tek in Canada)."

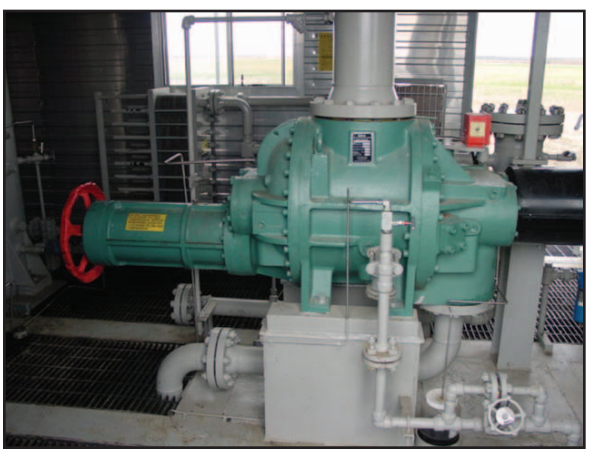
The setup and algorithms for screw compressors were developed in the same manner as for reciprocating equipment. Data collection remains non-invasive, without the need to shut down and retrofit compressors with new equipment. Each machine is set up in the database with information from the manufacturers' data books, coupled with specific site conditions and if necessary, supplemented from Detechtion's comprehensive library of OEM design information. Operational data are collected through normal reporting processes without additional effort or equipment.

Screw compressors have their own set of unique operating conditions. Setting slide valves, adjusting Vi, and monitoring oil systems for rotor lubrication are just a few unique items handled by Enalysis. Operating conditions can change rapidly in low-pressure boosting applications, quickly changing compression ratios. These and other conditions are predicted and included in the algorithms used in the calculation engine. All results and recommendations are displayed on the Enalysis report.

"We worked closely with Jiro Compression, a screw compressor packager in Alberta to acquire performance information," said Brian. "Since very little data has been published on screw compression performance, we needed to do complete detailed testing on new equipment to obtain the results needed in our algorithms. We used Jiro's facilities and monitored eight screw compressors under a variety of operating conditions, collecting extensive data and verifying predictions of how these machines would respond under these conditions."

Jiro Compression decided to use Enalysis' diagnostic ability on its lease fleet and on all new screw compressor packages sold. This provides a three-fold benefit — it enables Jiro to determine how well the equipment is running, provides data for possible warranty support and provides Jiro's customers with real-time diagnostic service. Producers have been receptive to collecting the operational data, since it enables them to optimize their equipment faster.

As well as a diagnostic tool, Enalysis has proven to be an effective optimization tool for debottlenecking — especially when screw compressors are used to feed gas to reciprocating compressors. The program looks at more than just the compressor. For instance, a compressor may be set up correctly, but if the driver is generating too low an output the compressor cannot be efficient. Enalysis will identify this condition and recommend



Enalysis helps producers understand all aspects of their screw compressor. For example, a compressor may be unable to process incremental gas even though the slide valve is properly adjusted. Through Enalysis, it may be determined that the Vi is set too high, resulting in over-compression. The recommended action would be to adjust the Vi, enabling the compressor to process the incremental gas while saving horsepower.

Through a better understanding of horsepower utilization, large compression units can be relocated and utilized where they provide the most benefit and be replaced by smaller units, which assist in minimizing capital investment. Enalysis can effectively handle all compressors 25 hp (19 kW) and up.

corrective action.

Detechtion has experienced increasing demand for Enalysis. Existing customers are extending the program's use as they discover how Enalysis can increase the efficiency of their compressor fleets. Plans for completing the next significant change are well underway, allowing SCADA systems to automatically load real-time operational data directly into Enalysis. With sustained cash flow increases between 5 and 10% per compressor, producers are anxious to get their fleets on-line. ■