PEOPLE IN COMPUTING

Profiles of personal computer users and their achievements

Oil Well Tests Get Intelligent Computer Help

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Anatesco's Denesha: Determining "downhole" conditions for the profit-squeezed oil industry.

With OPEC falling apart and oil prices tumbling, it's a wonder anyone in the oil patch is still making money. Indeed, for 1985, oil-industry analysts have been predicting more bankruptcies than mergers among oil service companies. But one of those oil service companies—Anatesco, of Bakersfield, Calif.—is expanding.

For the past three years, Anatesco has carved out a computing niche in the competitive oil-well testing business: monitoring efficiency with a Hewlett-Packard system. The software to run these tests was developed by Anatesco founder Doug Denesha. He began his career in the oil fields in 1966 as an engineering assistant for Chevron. "I noticed right off it was tough to do a good job making these oil wells produce because there wasn't a good handle on the sorts of things a person really needed to know to make intelligent decisions. For example, it's hard to tell if a pump is bad. The only way to tell is to watch production going down." But there may be other reasons production drops, such as bad gauges, tubing leaks, perforations, or even the well going dry. "A lot of money was being wasted pulling pumps and putting them back in."

Even with experience it's difficult to determine the "downhole" conditions of an oil well. The pump may be straining at oil that is too thick to flow easily or that is impeded by underground geology. Or the pump may not be working hard enough, losing oil readily available for pumping to the surface. Oil wells are tested with a dynamometer, an electric X-Y plotter. By measuring certain loads, it is possible to make calculations and interpretations so that the pumping system can be adjusted for greater efficiency.

"But we had to figure out the geometry 24 times to go through an entire pump cycle," says Denesha. "It took us a full day, sometimes longer to do one well. Then we'd stay up all night trying to figure out what we had." In contrast—one day recently, 63 wells were tested using Anatesco's computerized system.

It took years of development for the testing procedure to reach this point. "I was the worst hacker you ever saw," Denesha confesses. He started with a Radio Shack Model I and Page 1 of the beginner's manual, where it says, "Hi, I am your computer." Denesha gradually progressed to a Hewlett-Packard 9816 computer with 768k of memory, and a 7470 plotter. The original testing program was written in Radio Shack BASIC, but is now in Hewlett-Packard BASIC and graphics language with some binary extensions.

The computer uses hard-shelled 3.5-inch disks, each of which will hold tests from about 100 wells. A hard disk is out of the question, as the equipment is mounted in a van that goes bouncing over rough oil-field roads in temperatures that range from zero to 110 degrees Fahrenheit. The computer's power comes from golf-cart batteries converted to provide AC electricity.

The basic "vital element" test is performed in about 10 minutes, with a load cell and a position transducer attached to the rod under the "horse's head" bobbing up and down at the front of the oil well. For a power-consumption survey, another couple of devices are used. Data goes by cable to the computer in the van, and results are printed out almost immediately. After well operations are adjusted, the well can be retested on the spot to see if the changes effected an improvement.

Denesha says he knows of one company in Midland, Texas, that is using an Apple personal computer for a similar testing program. There are perhaps a dozen companies in the industry trying to analyze oil wells without the benefit of personal computers.

Denesha says the testing equipment and program are universal tools. "We haven't found an application it wasn't suited for. Anything that goes up and down can be tested. If it's worth producing, it's worth monitoring." And that's especially true in these days of narrowing profit margins in the oil industry.

—Audrey Cochran