

The Lease Pumper's Handbook

Chapter 14 Well Testing

Section C

SPECIAL TESTS

C-1. Well Logs and Surveys.

As a well is drilled, many special logs are run to determine information concerning the commercial viability of a well. These include both open hole and cased logs, cement bond logs, directional surveys, and tracer surveys. It would consume too much space to review each of these in this manual.

Special production tests and surveys, however, are run on flowing wells to gather specific information. Two of the most common tests performed on flowing wells are pressure and temperature surveys. There can be many special reasons for running these tests, but this manual will discuss the procedures and general purposes only.

C-2. Pressure Surveys.

Pressure surveys are run for several reasons. One purpose is to project the producing life of the field. As the test instrument (Figure 1) is lowered into the hole, the altitude above sea level is a factor in locating at what depths below the surface the pressures must be taken.



Figure 1. A quartz pressure gauge.
(courtesy of GRC Amerada Gauges)

To obtain the needed pressures, the instrument is mounted on the wellhead in a short lubricator, similar in appearance to a swabbing lubricator, and the instrument is run into the hole on a solid wire line (slickline) or by a logging truck. The master gate is opened and the instrument is lowered into the well according to the instructions from the production company office.

As the pressure recording instrument is lowered into the hole, it is stopped at specific points for a few minutes in order to obtain a straight reference line.

Pressure surveys are run on most flowing wells every six to twelve months. The pumper is notified as to when the well is to be shut in for this test and when it will be run. This will allow the pumper to be present at the test and to place the well back into service at the conclusion of the test. In preparation for this test the well is shut in long enough to record the maximum bottom hole pressure.

C-3. Temperature Surveys.

Temperature surveys are an excellent tool to help determine if there are casing leaks. A temperature recording instrument is lowered slowly on a small solid wire line to the bottom of the hole. The procedures for running this test are identical to the procedures for obtaining well pressures. At specific depths, the instrument is stopped for a short interval to give a series of reference

points. At most casing leaks, gas will expand as it leaves the casing to enter a lower pressure area. This expansion creates a drop in temperature, indicating a possible leak.

C-4. Other Well Tests.

Several other procedures may be performed to check well conditions. A couple of the more common include:

Caliper surveys. A caliper survey tool is run on an electric line. After it reaches the desired depth, steel fingers are released to drag on the inside surface of the casing as it is slowly retrieved. Each finger draws a line on the chart, and every time a pitted spot is encountered, the arm goes farther out, resulting in a spike on the chart.

As the survey tool goes through a collar, all of the fingers or bows go out to provide reference marks to identify which joints are pitted and how deep each pit is. Caliper surveys are run in wells where the tubing may be damaged by corrosion. They give a good reference as to when the tubing is reaching the limit of its dependable life and of the condition of each joint of tubing.

Running scrapers. When a packer or other large tool is planned to be run in the casing with a diameter that is only slightly smaller than the casing, a tool is run that will scrape the inside of the casing to avoid the risk of sticking the tool in the hole. By running a scraper into the hole and retrieving it before running the packer, the pumper can reduce the possibility of problems.

There are many other testing tools that are utilized in production operations that the pumper will encounter over time.

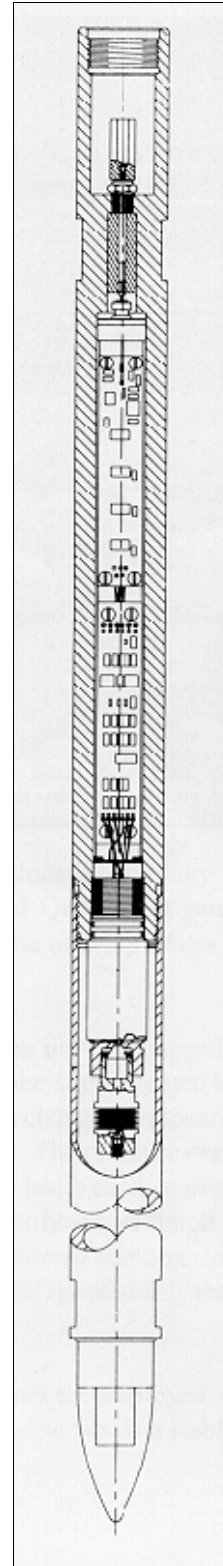


Figure 2. Cross-section of the quartz crystal pressure gauge.
(courtesy of GRC Amerada Gauges)