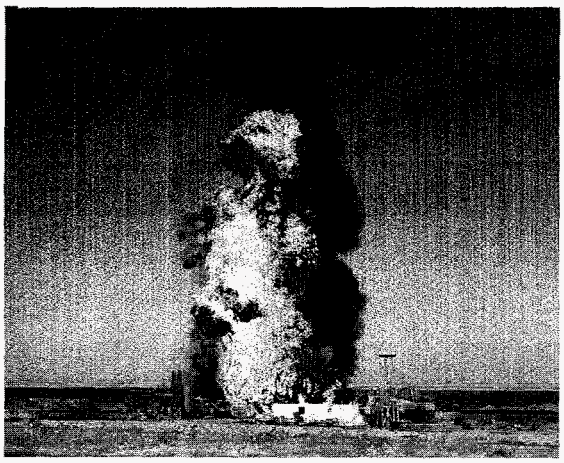
SAN099-1061J

Sandia's Geothermal Advanced Drill Rig Instrumentation Assists Critical Oil & Gas Drilling Operation

On November 23, 1998, an 18,000-foot-deep wild-cat natural gas well being drilled near Bakersfield, CA blew out and caught fire. All attempts to kill this well failed, and the well continues to flow under limited control, producing large volumes of natural gas, salt water, and some oil. The oil and some of the water is being separated and trucked off site, and the remaining gas and water is being burned at the well head. A relief well is being drilled approximately one-quarter mile away in an attempt to intercept the first well. If the relief well is successful, it will be used to cement in and kill the first well.

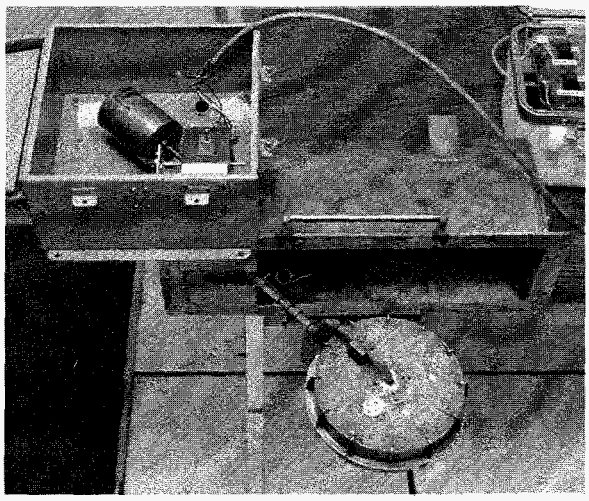


A blow out gas well burns near Bakersfield, CA. Photograph taken by Epoch Wellsite Services, Inc.

Epoch Wellsite Services, Inc., the mud-logging company for the initial well and the relief well, requested Sandia's rolling float meter (RFM) for these critical drilling operations. The RFM is being used to measure the mud outflow rate and detect kicks while drilling the relief well, which will undoubtedly encounter reservoir conditions similar to those responsible for the blow out. *Based on its prior experience with the RFM, Epoch believes that it is the only instrument capable of providing the level of accuracy and response to mud flow needed to quickly detect kicks and minimize the risk of a blowout on this second critical well.*

In response to the urgent request from industry, Sandia and Epoch technicians installed the RFM on the relief well return line, and completed its initial calibration. The data from the RFM is displayed in real-time for the driller, the companyman, and the toolpusher via Epoch's RIGWATCH Drilling Instrumentation System. The RFM has already detected several small kicks while drilling toward the annulus of the blown out well. A conventional paddle meter is located downstream of the RFM to provide redundancy and the opportunity to compare the two meters in an actual drilling operation. The relief well is nearing 14,000 feet deep, targeting an intercept of the first well near 17,600 feet. The relief well is expected to be completed in about 30 days. Several other Sandia instruments being developed for geothermal drilling are also being evaluated during this operation. Successful performance of these instruments on this important drilling job will reinforce our efforts to commercialize this technology for the geothermal and oil and gas drilling industries.

Sandia's Rolling Float Meter was developed through the Lost Circulation Technology Program sponsored by the U. S. Department of Energy, Office of Geothermal Technologies. It monitors drilling fluid returns to rapidly detect loss of circulation during geothermal drilling. Lost circulation is particularly prevalent in geothermal wells, and can add as much as 10% to the total cost of drilling the well. Consequently, rapid detection and treatment of lost circulation is necessary for cost-effective geothermal drilling. Sandia has been evaluating and demonstrating the capabilities of the RFM to the geothermal industry for several years. In addition to lost circulation, the RFM is also useful for accurately detecting well kicks. Contacts have been made with mud logging companies that are involved with both geothermal and oil and gas drilling operations.



Sandia's rolling float meter is mounted on top of the rig's outflow line and measures the flowrate of drilling fluids leaving the well. The meter is unique in its ability to accurately quantify flowrate in a partially filled pipe.

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