WELL LOGGING

A history of well logging in Canada

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Early History
The history of well logging in Canada begins in 1937, a mere 10 years after the very first electric log was run in the Pechelbronn oilfield in France on September 5th 1927. A quote from the official Schlumberger history tells the story: "In another part of the country, a young engineer named Bill Gillingham was attempting to raise some interest in electric logging in the Bradford, Pennsylvania area. The response was not immediately tremendous. A trainee under Gillingham, R.R. Rieke, was told to head west by northwest, to Mt. Pleasant, Michigan, embarking on one of the strangest Schlumberger journeys you’ve heard of."

“You see, they ended up in Canada, not looking for oil, but for gold. The preliminary work had been conducted by André Allegret and, as a result of surface exploration, a contract had been let. ‘When we arrived,’ Rieke said, ‘trouble was afoot. They had found gold alright, but not where the survey had said. When they drilled there — nothing. We left rather quickly.’"

Two years later, “electric logs” were introduced to the Canadian oil patch in 1959 by the forerunner of today’s Halliburton Services Ltd. The first Halliburton unit was operated out of Black Diamond, Alberta, by Jack Pettinger, who remained active until 1979. Jack and another pioneer, Stan Nehor, currently with Halliburton in London, England, recalls that trips of hundreds of miles to such far-flung wildcat sites as Resascal, Saskatchewan, Pouce Coupe, B.C., and Lloydminster were not uncommon.

During the war years, equipment was also stationed at Norman Wells on the Canol Project and at Vermilion, Alberta. The logger of those days had to be versatile because he was often called upon to operate cementing and acidizing equipment, or to run drill-stem tests, in addition to the standard electrical survey (ES). With increased demands after Leduc, more modern survey equipment was added. Also, the “FM” (frequency modulated) system of transmitting subsurface data from a single conductor cable was adopted by Halliburton. This technique has remained a unique feature of the Halliburton-WELEX wireline equipment.

The approximate dates of first availability of modern logging methods, as recalled by Gerry Obermeyer, current manager of operations for Halliburton, were Focus resistivity 1952, Radiactive 1954, Induction 1954 and Acoustic 1958. A shift in the development of Canadian operations also occurred in 1957 when the parent company purchased WELEX Inc. A combined WELEX-Halliburton Electrical Well Section operated in Canada as a separate company for some time. The perforating service, which had also been introduced to Canada by Halliburton in 1940, was expanded. Later, that group was absorbed as an operating division of Halliburton Services Ltd.

Schlumberger arrived permanently in Canada in 1946 by opening a location at Lloydminster, manned by such notables as Ed Burge, Hugh Gough and Arne Thorson. Truck numbers were in the 200 series. One of the older units in Canada about that time required that the crew jack up the rear end and install a chain from the rear axle to the winch drive. Services offered were ES, six-shot sidewall core guns and bullet perforating.

By 1949, there were offices in Calgary and Edmonton, and Neil Collins was at the helm in booming Redwater. Barry McVicar had joined the forces as well. By 1951, tools available were ES, gamma ray, dipmeter, directional, cores, microlog, laterolog, limestone device, temperature, perforating and caliper. The year 1951 also saw the introduction of revolutionary armoured cable to replace the 1-in-diameter fabric-covered line known as the “ragline”.

A job report of that year mentions a trip to a well near Port Vermilion that commenced the 26th of April and ended June 29th, with most of the intervening time spent attempting to get to the well by building bridges and barges, waiting for ferries and sinking into mud. Ten

Schlumberger Unit No. 273, just off the assembly line, similar to the first Schlumberger units in Canada, with the roll-down canvas sides and un-insulated metal recording shack.

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years later (1961) saw the first logs to be run in Canada's Arctic Islands at Winter Harbour on Melville Island. Since that epic event, operations have taken place in all the frontier areas from the misty Queen Charlotte to Hudson's Bay, the East Coast and the Beaufort Sea.

Laurel Wells established their first office in Edmonton on the Cooking Lake Trail in 1947, offering the usual GR log. They quickly opened stations in Stettler, Virden, Swift Current, Estevan, Drayton Valley, Red Deer, Swan Hills and Fort St. John, the hot spots of the time. The early managers, who responded to the needs of the times, were Bill Ludwig, Lee Lobdell and Glenn Robinson.

Perforating guns of Canada Limited opened their first office in Edmonton on Calgary Trail in 1949. Walt Minor and Bill McKay were the people in charge. In the early 1950s, radiation logging for cased and open hole was one of the primary services available, out of the usual towns such as Lloydminster, Kindersley, Stettler, Estevan and Drayton Valley. In 1965, the company's name was changed to Pan Geo Atlas Canada Limited and open-hole logging services were introduced in the following year.

In July of 1966, PGAC and Laurel Wells merged into one large operation under the auspices of Dresser Atlas Inc. The combined companies offered a full line of services from various Canadian locations thereafter.

McCullough Wireline Services were around in the early 1950s, and offered services mainly in the cased hole field. Mart Kershahan, one of the early managers, became better known for his contributions to the early days of computed log analysis at Computrex Computer Services Limited in the early 60s. Mart recognized the potential of the scintillator, developed at the University of Manitoba, and offered it in place of the less efficient Geiger-Muller GR counter—now nearly all GR logs are run with scintillation counters.

The late 1950 and most of the 1960s saw a number of independent wireline operators appear on the scene. This trend continues today, with one of the notable successes being the acquisition of an interest in Wireline Electronics (1976) Limited by Perico Services Limited in 1976. Later in the year, the management of Perico and Wireline joined with Geahart-Owen Inc. of Fort Worth, Texas, to offer the Geahart direct digital logging system in Canada for open-hole logging under the name of Computalog Services Limited. Perico, Wireline and Computalog operated somewhat independently until 1979, when they were amalgamated to form Computalog-Geahart Limited.

While the logging tools got better and more expensive, and the number of services grew, the interpretation of well logs remained at a relatively primitive state until 1951, when the first technical paper directly relating to interpretation of logs in Canada was published in The Canadian Mining and Metallurgical Bulletin. The paper dealt with the application of electrical logging in Canada, by M.P. Tixier and R.L. Forsythe. It was presented at the Annual General Meeting of CIM in Quebec City in April 1951. The paper dealt with the presence of oil and the resistivity of the formation, and the potential for the detection of oil and gas in the formation.

The Combined Canadian Well Logging Society

The Canadian Well Logging Society was formed in 1955 after a group of people in the major oil companies and service companies perceived the need for the exchange of ideas and technical information. The pioneers of the Well Logging Society were A.J. Brown, Ed Burge, Nick Ediger, Barry Mecwicar and Gerry Shaw. Barry claims to have provided the beer and Gerry the sandwiches at the organizational meeting in the 400 Club cardroom. At least we know from this list, what their priorities were.

Other important names involved in the early years of the CWLS were A.G.T. Weaver, A.A. Perebinossos, Leo Vladicca, Ted Connolly, Trev Cutmore, Don Tough, Bob LABELLE, Percy Cole, Doug Morrison and Mart Kershahan. Some important names may have been left from this list, and I hope that response from readers will generate a more complete history of the early years of the society. The society was well organized and the first chapter was formed in Regina, which was active between 1957 and 1961. Don Tough was one of the prime movers in this area.

Although lunch and evening meetings were held for a number of years, there is no formal printed record of the topics or papers presented until 1968, with the appearance of the CWLS Journal, Volume 1, and almost simultaneously the Transactions of the 2nd Formation Evaluation Symposium. Symposia had been held roughly every second year (now in the odd-numbered years). The Journal ceased publication with Volume 10 in 1977. Primarily because the technical papers were being submitted for the symposia rather than for publication. Papers are now also published in the Journal of Canadian Petroleum Technology by mutual agreement between the CWLS and JCPTE. An important function of the Society is the maintenance of the Water Resistivity Catalogue of Canada, with the most recent revision occurring in 1978.

The Society membership has grown from the initial complement of about 12 to something approaching 500 members. In addition, approximately 80 corporate members assist in financing the operations of the Society. Although this history is concerned mainly with well logging in Canada, it is important to note that the Well Society has a large list...
Course on multiphase flow in pipes and its application to production and transportation of oil and gas

A three-day short course on "Multiphase Flow in Pipes and its Application to Production and Transportation of Oil and Gas" will be held at The University of Calgary, April 27 to April 29, 1982.

The course is designed for engineers and other professionals in the oil and gas industry who are engaged in the design of production, gathering and transportation facilities.

It will present a detailed treatment of the available methods for:

- prediction of fluid properties for oil, gas, oil-gas, condensate-gas and dense phase systems;
- single-phase (gas, oil, dense phase) and multiphase (gas-oil, gas-condensate) flow calculations in pipelines;
- gathering system design;
- well tubing design for single-phase (gas, oil, dense phase) and multiphase (gas-oil, gas-condensate) flow;
- generation and use of gradient curves;
- metering of multiphase flows;
- production batching in pipelines.

The applications of the computer programs:

1. INPROP (fluid properties calculation),
2. PIPEPOL (pipeline design and analysis calculation),
3. WELCO (wellbore design and analysis calculation) and
4. FLOMAP (generation of flow pattern maps)

will be discussed in detail. Problemsolving sessions are included in the course to actual field situations, both with hand calculations and with the use of the above programs. No previous knowledge of computers or computer programming is required. It will be assumed, however, that all registrants have a knowledge of basic fluid mechanics.

All registrants will be provided with a set of comprehensive course notes and user guides for each of the above computer programs. Instructors for the course will be: Dr. K. Aziz, Dr. G.A. Gregory and Mrs. M. Fosurgi from the Department of Chemical and Petroleum Engineering, The University of Calgary.

Information regarding course fee and registration procedures can be obtained from: The Faculty of Continuing Education, The University of Calgary, Calgary, Alberta, T2N 1N4. Telephone — (403) 284-3411.

International conference on pipeline inspection

The Physical Metallurgy Research Laboratories, Ottawa, is organizing, in cooperation with the Canadian Council of the American Society for Metals and the Canadian Society for Nondestructive Testing, an International Conference on Pipeline Inspection, to be held in Edmonton, Alberta, June 13-16, 1983.

The purpose of the conference is to discuss and assess the state-of-the-art of technologies for transmission pipeline inspection, with emphasis on recent developments in engineering and in research. Topics to be discussed include mill inspection of pipe, field inspection with respect to welding and integrity of pipe, in-service inspection and regulatory aspects. A proceedings volume is planned.

Inquiries should be addressed to: Dr. R.W. Revie, Chairman, International Conference on Pipeline Inspection, Physical Metallurgy Research Laboratories, Canada Centre for Mineral and Energy Technology, 548 Booth Street, Ottawa, Ontario, K1A 0G1.

Telephone inquiries may be directed either to Dr. R.W. Revie (613-588-4500) or to Dr. B.M. Patchett, conference co-chairman University of Alberta, Edmonton (403-422-2604).