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SPECIAL ISSUE - 25 YEARS FROM FOUNDATION

SPE INTERNATIONAL

to reduce drilling time and costs
to improve rig safety
to detect and evaluate reservoirs

Celebrating 30 years of technological leadership and independence

Across 35 countries of operations, GEOLOG's unique focus is on Surface Logging. GEOLOG's leadership in advanced technologies for drilling optimization and formation evaluation is the result of 30 years of field experience and continued active research and development in co-operation with clients.

GEOLOG's advanced surface logging services and technology coupled with highly qualified and experienced personnel, permits clients to improve drilling efficiency and reduce unproductive time, saving costs and improving safety.

GEOLOG is a world leader in gas detection while drilling, thanks to its advanced gas extraction systems and its unique gas analysis system (DualFID™). Through hydrocarbon analysis from Methane to Toluene, drilling parameters measurement (hydraulics, mechanical and engineering) and the ability to manage third party data such as LWD and wireline, GEOLOG provides its clients with timely information, at the rig site and anywhere thanks to its Real-Time data transmission system Wellcoms. GEOLOG also runs a number of complementary services which range from Cutting Volume Monitoring for drilling operations optimization and borehole stability monitoring to formation fracture detection or the geochemical analysis and interpretation of drilling cuttings, which can save budgets and, in certain cases, entire wells.

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PROMINENT NEWS

Geolog - 30 years of innovation in exploration and drilling

by Gionata Ferroni, Geolog Technical Manager

Born on a Volcano

On a sunny day in the summer of 1982 Carlo Bezzola set foot on the island of Vulcano, in the Tirrenian Sea. Unlike most visitors, Carlo was not there for tourism. In fact, Agip was conducting a geothermal wells campaign on the island and, in order to support the logging of its wells, contracted the newly-formed company Geolog SpA for the job. Geolog duly sent out Carlo, one of its young geologists, to carry out the task, along with its first surface logging unit.



Figure 1 In the years Geolog has deployed logging systems in hundreds of locations, but very few could match the beauty of its first wellsite on the Vulcano island.

30 years and countless wells after that Italian geothermal adventure, Geolog has become an international player in the oil and gas exploration and drilling business. Today the company, still headquartered in Milan for its technical and production facilities, has corporate offices in Amsterdam, from where international operations are run. With a presence in over 35 countries distributed over

6 continents, and more than 170 units operating at any given time, Geolog is today one of the only five truly global surface logging companies in the world, and the only independent, privately owned one.



Figure 2 With a global presence, GEOLOG systems have been exposed to all possible conditions. Russia's -50C is as extreme as the +60 recorded in the Algerian desert.

Carlo Bezzola is now one of the company's senior managers and recalls the early days, when the company built their first systems following directly the specifications of Agip, initially the sole client of Geolog.

Carlo, what do you miss of the early days at Geolog?

"I have fond memories of Guido Panci, the founder of Geolog. I will always be grateful to him for the chance he gave me and for his teachings. I joined the company thinking of myself as a pure geologist and I was quickly transformed in an all-round electrician-plumber-mechanic and programmer. A very important practical learning!"

When did you first realize that Geolog had made it in the global arena?

"When I saw a geologist wearing a Geolog cap in a restaurant in Montevideo, Uruguay. It was the sign of having achieved a global status." Amongst the technologies you employed, do you remember any that at the time seemed science fiction and is today totally obsolete?

"The then famous HP 9825. It was the first all-in-one desktop computer. Geolog was amongst the first to introduce it in mudlogging when everyone else was still using electro-mechanical systems. It had an aura of magic. Our engineers were able to write a small 4-lines program and store data on a 250K cassette, to create the first ever offline engineering service on a drilling well. It is now showcased at the HP museum!"



Figure 3 The HP 9825 computer, first introduced on the field by Geolog in the early '80ies. A little-known Geolog primacy.

Are there other technologies that Geolog has introduced in the oilfield?

"Geolog has pioneered flame-ionization gas detectors, which today are an industry standard for gas detection, everybody uses them. But we still have the best ones..."

As Carlo mentions, the geographical distribution of the company was initially dictated by the

ventures of Agip around the world. So the all-Italian Geolog expanded into Venezuela, Tunisia, and Congo during the early nineties, starting up operations that last to date.



Figure 4 Personal Protective Equipment on the rig floor, 30 years ago. The new millennium – Geolog in the world.

The new millennium actually started in the worst possible way for Geolog: company founder Guido Panci passed away prematurely in the year 2000. However, his legacy was brought forward by the new company management which, to date, has grown Geolog into one of the most successful and respected service companies in the business. Antonio Calleri has been at the helm of the company for a decade now. What did he find when he first arrived?

"I was impressed. I found a series of systems and technologies which were innovative and

unique. The competition did not have them! The chromatography system was more advanced than anything I had seen in the business. They had developed systems to measure rock mechanics, still unique today. And all their engineering software was built in-house, from scratch, instead of adapting existing products as most would do. I stuck to those core competences because they were a clear technological advantage in a competitive market. My first task was that of industrializing these solutions and introducing them to international clients, to expand the company on the global arena."

So what is the key to the company's success, today?

"I believe there are three main aspects to our success" states Mr. Calleri: "First is people. The Geolog family is now over 1,000 people. Most of them we have picked straight from university; we have trained them and developed as much as we could their natural skills. Most of our top managers and senior technical figures have come that way. Second, we believe innovation is the key. Especially today, since we work with our clients in frontier drilling operations. And finally, we have decided to "stay in the box". We do one job, which is mud logging service. We do it well. We are entirely focused on it. We want to be the best in the world at it"

And what is left of the Italian roots of the company?

"Italian creativity is in the foundations of our industrial culture. We believe that in the competency and ingenuity of some of our suppliers lies the legacy of the Italian geniuses of the Renaissance. A small Leonardo, Michelangelo, or a modern Marconi or Natta is present in the technology solutions we build together with our Italian partners."

All about technology

From its birth, Geolog has been involved in developing new applications and tools

destined to the three main areas of the company's activity:

Sensors to improve drilling efficiency: a good example is the **GeoCVM**: cutting volume monitoring service for real-time detection and monitoring of borehole stability and cleaning. Furthermore, Geolog's experience in the utilization of advanced flow detectors has enabled the development of the **Flow-Guardian** package, which provides accurate and advanced monitoring of the well fluid balance, and early kick detection.



Figure 5 The Cutting Volume Machine (CVM)

Gas detection and gas analysis: Geolog's Constant Volume Degasser (CVD) coupled with the fast and high resolution chromatograph **DualFid[™]** provides the most accurate gas detection system available on the market. Geolog is at the forefront of gas detection and is constantly developing systems to investigate the gas composition in real time and infer the formation fluid type on-site.

Acquisition, processing and visualization software: Geolog has developed a very flexible and fully configurable well data management software, and since 2007 it has become a provider of real-time data transmission services with its proprietary system **Wellcoms**, aware of the increasing need for taking informed decision at central level within clients operations.

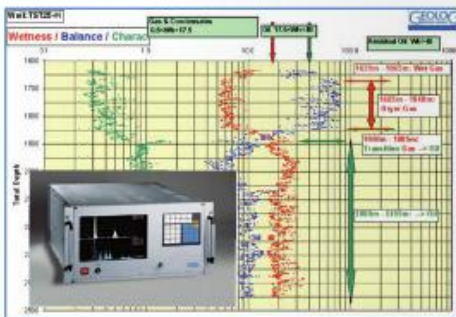


Figure 6 Gas detection system and log

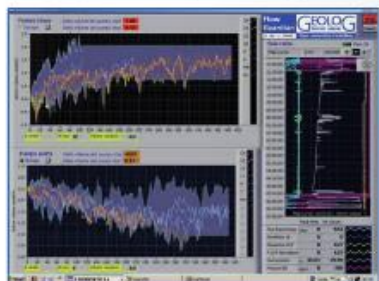


Figure 7 Early kick detection software

Geolog's history has been marked by a series of technology milestones. The company prides itself with technological leadership in a field where staying ahead of the competition is the key to survival and success.

In 2004 Geolog developed a gas chromatograph which, duly updated with time, is still today a benchmark for gas detection while drilling. Then, in recent years, the R&D efforts of the company have yielded advances in all its main products and services:

2007 Geolog's real-time transmission service Wellcoms is launched. It is today transmitting well information in Real-Time from dozens of wells simultaneously.

2009 Geolog's heavy gas analyzer DualFid Star is field deployed (Romania), a tool dedicated to fluid contacts identification and fluid characterization while drilling, one of Geolog's most original contributions to the advancement in surface logging technology.

2010 Geolog, already present in the offshore business, installs its first systems on drillships, some of the largest and newest in the world. Dedicated systems and sensors have been developed by Geolog for advanced gas detection and drilling safety in the expanding deepwater operations business. Geolog is at this time one of the only 2-3 surface logging companies fully qualified to operate in deepwater environments.

2011 Geolog pioneers Geochemical analysis services at rigsite, bringing to the field analytical instruments which were before only used in remote laboratories.



Figure 8 Yesterday and Today: an '80ies cabin (note a typewriter on the desk) and an advanced modern system.



We asked a final question to Mr. Calleri: what will Geolog be in 30 years?

"It will remain a global reality. And it will continue in the direction of integrating rock and fluid characterization. It's a bold objective, but that's what being a service company is all about."



Shale Gas: New Opportunities for the International Growth of Italian Goods and Services Providers Fields



Report by Gionata Ferroni, October 14th 2011, S. Donato Milanese, Sala Barbara, eni headquarter

Assomineraria organized a well-attended workshop in October, presenting one of the hot topics of this period. Shale Gas, with the scope of highlighting the opportunities for Italian companies in the international market related to this unconventional hydrocarbon source.

The workshop was chaired by Andrea Ketoff, the organization's General Director.

Sergio Polito, President of the branch organizing the workshop, clarified that Shale Gas in Italy remains beyond the horizon, due to environmental concerns and efficiency issues affecting a cost-sensitive project like Shale Gas.

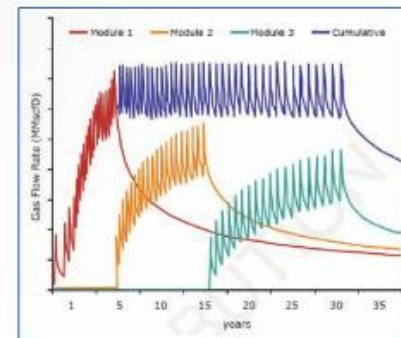
He was followed by Roberto Nava (Bain & Company) who explained how a dedicated business model, different from standard E&P processes, is needed. The suggestion is to look at more industrialized processes, for what is appropriately called "factory drilling". Or, in alternative, to acquire the knowledge from those who already have the know-how, as several majors have done, partnering with smaller US shale gas firms.

ENI's Satyavan Reymond clarified for the audience the main differences between

traditional hydrocarbon reservoirs and Shale Gas in different aspects: the geology, the production and cost profile, the approach, which, for shale gas, shows many similarities with the mining industry.

ENI's L. Aleotti, starting from his present experience at the company's Poland project, highlighted the process, which reverses established E&P procedures. In particular, it was pointed out how in unconventional shale reservoirs it is necessary to produce first, in order to both finance and plan the continuation of the campaign; an approach totally alien, so far, to conventional field development.

Figure 2 Field development curve



Due to its business structure, Shale Gas production requires the definition of quantifiable key performance indicators (KPIs) to optimize every aspect of the process.

An insight in the geomechanical issues involved with Shale Gas drilling was brought by Schlumberger's Vincenzo De Gennaro. Debunking

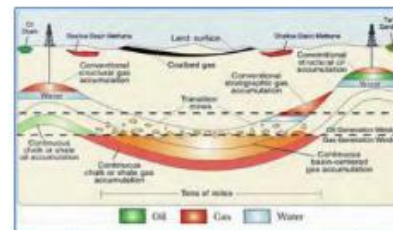


Figure 1 A shale gas basin compared with other hydrocarbon sources

