



SPE Suez University Student Chapter Magazine

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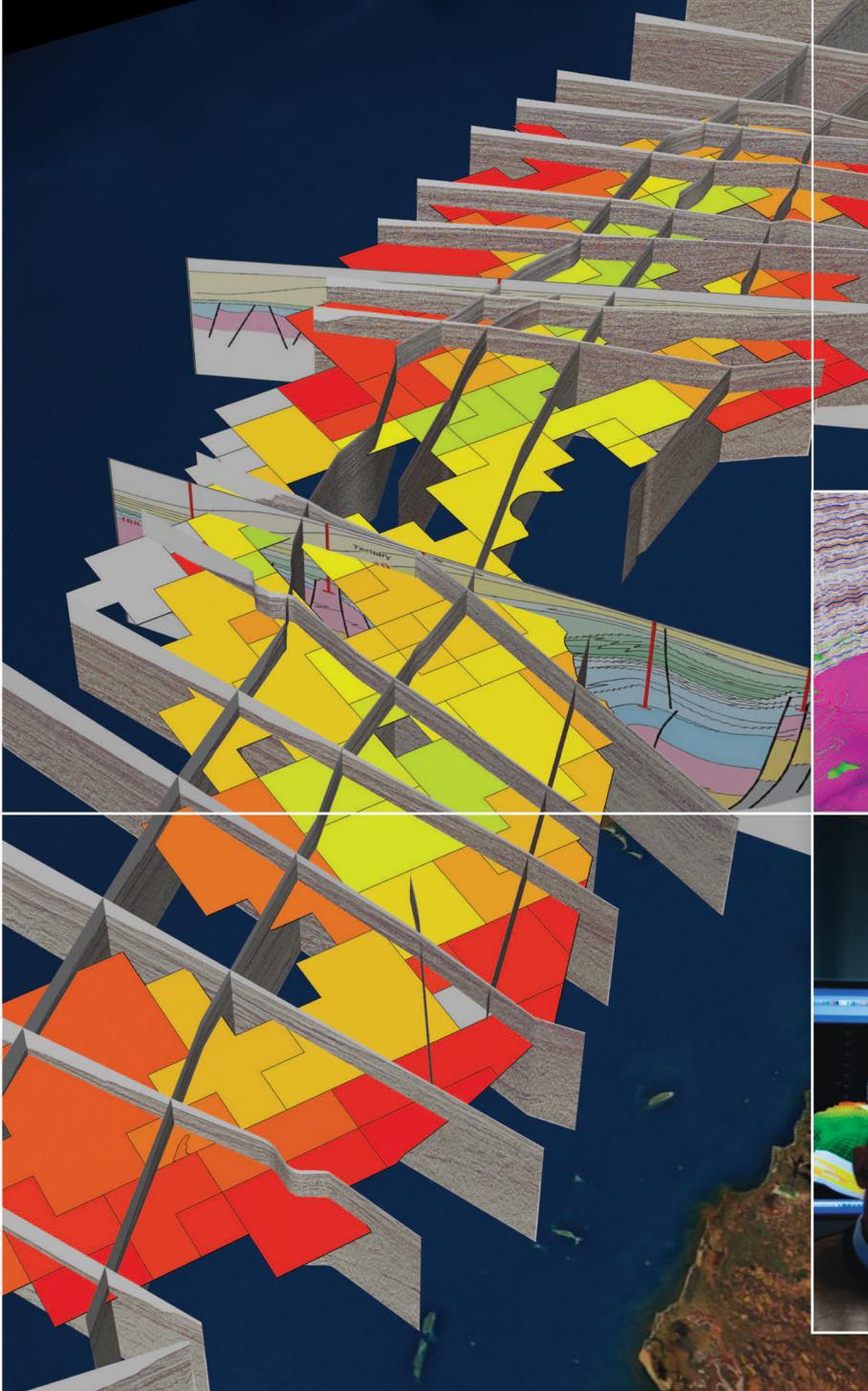
INTERVIEW WITH MR. HELGE HALDORSEN

2015 SPE International President

APPLICATION OF LASER CUTTING IN GAS SHALE FRACTURING

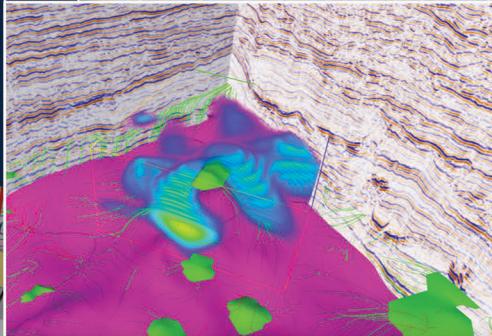
NUCLEAR MAGNETIC RESONANCE (NMR) AND ITS APPLICATIONS

HPHT DRILLING FLUIDS



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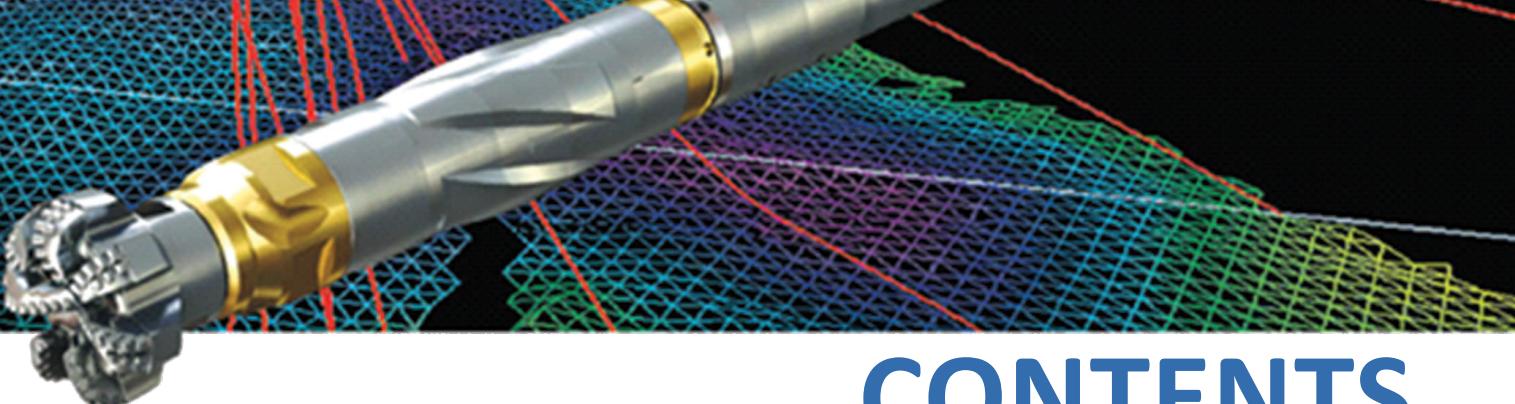
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ANDROID APPLICATION



THE COVER



Burning Oil Shale at Kimmeridge Cliffs

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Innovation Leads

Omar Adel El-Kholy
Chapter President

"Innovation distinguishes between a leader and a follower" Steve Jobs. Nowadays, the world is becoming tougher in all aspects of life; politics, economy, technology, education, etc. We can see the world moving faster than we could ever imagine, this is simply due to the tough competition which made all successful entities support one of the most prestigious reasons of progression; which is innovation.

The future belongs to those who innovate; those who lack innovation will definitely fall behind. If we scrutinize the current competitive economy, we will find the ones who are innovative enough are moving faster towards the future, and eventually they are the ones who will lead. Innovation and leadership are tweedle-dum and tweedledee. Leadership is always concerned with creating a better future, and at the same time, a leader of any organization should always seek enhancing the operations of his committees as well as the mindset of employees, aiming for a better output. When facing competitive situations, a leader always has to come up with innovative solutions to move forward. That is why a successful leader should be innovative and more importantly, he should spread the concept of innovation around.

"If you look at history, innovation does not come just from giving people incentives; it comes from creating environments where their ideas can connect" Steven Johanson. Today's CEOs and leaders do not lack ideas, information, or theories, but the point is how capable they are in creating an atmosphere encouraging everyone to think of and bring about new ideas, how to engage the employees to conduct their ideas and implement them in an innovative way to produce a competitive product.

If you were to look at what confronts a leading organization, you would realize that problems and conditions are getting more complex, not matching the previous problem patterns and experiences. In these situations, ordinary solutions will not be applicable, the solutions we implemented yesterday will not be today's.

I would like to emphasize on an important approach that leaders should utilize in order to produce an innovative product; it is the leadership approach in which the leader should ask himself if he is leading properly, if there are better operational alternatives, what he will do if he faces new problems, and if the organization's members are adaptable to every day's fluctuations. The aim of this approach is that the leader should not keep using the same management method, but rather, he should be flexible as much as he can.

Today in our beloved Egypt, we are facing a lot of challenges, especially economically. From my own point of view, our attempts to find solutions for these challenges should not seek the already implemented. I can see that the innovative youth in Egypt possess brilliant thoughts that should be invested on. This takes us into the importance of entrepreneurship in solving our economic challenges. Imagine that all the innovative ideas are properly utilized to initiate a project; you will find a lot of growing companies, vacancies, and facilities, which will definitely result in solving our problems.

And at this point, I want to send a message for those who have innovative ideas; never underestimate your ideas, do your best to implement them, and you will find plenty of organizations that support innovation. And remember well "we cannot solve our problems with the same thinking we used when we created them" Albert Einstein.

At the end of my article, I cannot find a better chance to thank everyone who made an effort for the sake of our chapter since its initiation, especially ECHO magazine team who gave in all their efforts to come up with this outstanding product; specifically this sixth issue. Hereby, I would also like to mention this season's high board members who were supporting in my rewarding journey with the chapter, and who made appreciable efforts to reach our current proud state of glory; while we are now celebrating a decade of success, a decade of innovation.

And never forget, "The Future Belongs to those who innovate."



Aya M. Ismail
ECHO CEO

The Winner Stands Alone

"The winner stands alone", a title inspired from Paulo Coelho's novel, seems to be a very meaningful phrase precisely describing how I stand now after my five years journey in the faculty. It is not about what we have learnt in lectures, it is about the skills, the values, and the morals we experienced at every single moment we spent in student activities. Student activities gave us – students – the opportunity to live a realistic simulation of how our career lives will be like later in the future, especially that these activities fall under the professional organizations' umbrella.

The personal and individual skills of students working in student activities are enhanced dramatically in aspects like decision making, leadership, crisis management, communication skills, presentation skills, time management, self-confidence, ambition, and having a positive mind-set. After we have noticed the wide gap between the academic and career lives, as well as the difficulty of taking immediate actions to diminish that gap; the one and only solution was to start looking forward to developing ourselves on our own, and working mainly on developing, enhancing, and enriching our soft skills. Fortunately, this is widely introduced now through different student activities and chapters, which are all aiming to contribute positively and add something valuable to the students and to the community as well.

"The Winner Stands Alone" does not only describe how I stand now, it also describes how SPE SU SC stands right now among all the other chapters, after a decade of being the first student chapter to be founded in our faculty.

I can remember five years ago, when I joined the faculty, SPE SU SC was the only chapter working on ground for the sake of introducing something of value to students. And through years, the impact of what SPE SU SC brought about to students was ascending, something which consequently promoted us last season to win the privilege of being the World's Chapter of The Month. This took the students' expectations for what we can introduce to them and how we can enrich both their technical and soft skills into a higher level, on the other hand, meeting these expectations professionally became our main concern and major challenge.

Nothing of all the aforementioned was going to be achieved without the contributions of every single volunteer who had joined SPE SU SC since 2004. Volunteers are the backbone of any non-profit organization, but when it comes to SPE SU SC volunteers specifically; their imprint and impact are obvious in every single detail in the chapter.

Dear SPE SU SC volunteers, at the end of my five years journey in this chapter, I would like to send my gratitude to each member I have worked with; you have to always believe in what you are doing! My advice to you is to never ever lose your spirit or your enthusiasm during the time you are volunteering in the chapter, as I said before, you are the backbone and the building unit of all the achievements and progress shown. Believe me, the moment when you feel that you have added something valuable to people around you is literally priceless, no need to tell you how to do that, because with the spirit you have, you will always know the best way to make a creative and a valuable contribution.

The last thing I would like to share with you is; to keep enjoying the taste of success years after you graduate and leave the chapter, never fail to find a way to sustain what the chapter had achieved. If you are an old member, transfer and spread your spirit to the new ones, if you are a leader, prepare other leaders for the future, always keep in mind that "*It is not about the success you might want to achieve, it is about sustaining this success even after you leave*".

Finally, for those members who had the honour of founding the chapter ten years ago, you have made history and added something valuable that was and always will contribute positively. You must be proud of what you did, because today, and after a decade of what you have initiated, SPE SU SC and its members are Winners Standing Alone with high standards of professionalism and success.

Mr. Helge Hove Haldorsen

2015 SPE International President

By Omar Adel El-Kholy



Helge Hove Haldorsen serves as vice president strategy & portfolio North America for Statoil in Houston, Texas, USA. He has served on the Society of Petroleum Engineer's board of directors for three years. He also has been an SPE Distinguished Lecturer and Author in JPT. He has authored numerous technical papers and articles. He has also held various engineering positions at British Petroleum, Standard Oil of Ohio (Sohio), and ExxonMobil (Esso).

1. Mr. Helge Haldorsen, first of all I would like to congratulate you for being the 2015 SPE President. Can you tell us how your journey with SPE has started and what you feel about it?

In 1978, as I was working through my MSc in Petroleum Engineering at the Norwegian Institute of Technology in Trondheim, Norway, I had a professor who once said, "You must join SPE, it will be among your smartest moves in your life." How right he was! So the 35 years of professional and personal partnership that I have experienced with SPE has been decisive for my career. In a broader sense, I believe that without SPE and its 110,000+ members, the E&P industry would not be able to provide the world's seven billion people with their energy needs every day.

I had the opportunity to cooperate with many of SPE's key geographical regions; Europe, North America, West Africa, Russia, and the Middle East.

At one point, I had staff in Maadi, Cairo reporting to me and this gave me the opportunity to visit the Pyramids of Giza, the Sphinx, and Tut-Ankh-Amon exhibit at the Egyptian Museum. This had utterly impressed me. These monuments were so technologically advanced. I often use a favorite metaphor to explain sense of purpose; imagine walking towards a man cutting rocks next to one of the Giza Pyramids being built and you ask, "Good morning sir! Are you cutting rocks?" "No sir." replying the man. "I am building a pyramid!" The difference is the sense of purpose. This is how I feel about SPE and our mission; in both SPE and in our jobs, we wake up every morning trying to help seven billion people receive their energy needs every day. What a great and noble cause!

2. Being elected to be 2015 SPE President, can you tell us how you managed to reach this position?

I have gone through SPE's volunteer ranks, ending up with a term on the SPE board, and I have been a Distinguished Lecturer and Author in JPT. I even made the cover page a few times. I have headed up SPE board committees for awards and meetings, and I have given many invited keynote SPE presentations and keynotes around the world. And for how I managed to reach this position, I tried to bring along my proven formula; tenacity, enthusiasm, and a belief in what I am doing and what SPE and the E&P industry are doing. I believe that this formula is a prerequisite for success in any field.

3. As someone who had spent his educational and career life in petroleum industry, to what extent do you see that SPE is positively contributing and serving petroleum industry?

If we use a tree to symbolize an E&P company, and the roots to symbolize the way companies gather their E&P competence and best practices, many of the roots will lead directly to one of SPE's 140,000+ papers or to one of our 140+ conferences held each year.

4. Through all the daily fluctuations in the global economic status, how can you see the impact of this status on petroleum industry?

A nation's development depends on one key factor; Energy. Just look at a plot of gross domestic product per capita vs. energy per capita for the world's nations. You cannot have one high without the other

also being high because they are interdependent. Consequently, it will be a great challenge for the world's petroleum engineers to supply the world with the energy needed to go forward. In 2050, the world population would be 9 billion, and securing the world with the energy needed in a safe and sustainable manner, would be our greatest challenge.

7. How do you see the contribution of SPE to students all over the world? And what message would you like to leave to the chapters' members?

Student chapters are extremely important for the future of SPE and the industry. Recruiting young members into SPE is important. I wish I could tell every PE

9. Now coming to our last question, are there any thoughts you would like to share with our readers especially students on our tenth anniversary?

First of all, I would like to congratulate you on your ten years of achievements. Also, I want to make a very important recommendation; during your professional life,

"I often use a favorite metaphor to explain sense of purpose; imagine walking towards a man cutting rocks next to one of the Giza Pyramids being built and you ask, "Good morning sir! Are you cutting rocks?" "No sir." replying the man. "I am building a pyramid!" The difference is the sense of purpose. This is how I feel about SPE and our mission; in both SPE and in our jobs, we wake up every morning trying to help seven billion people receive their energy needs every day. What a great and noble cause!"

5. As VP Strategy at Statoil Houston, how do you see the future of oil and gas industry? And what message would you give to those who are anxious about their future careers?

On the long term future, energy transformations such as solar, wind, safer nuclear, bio-fuel, and other-invented-yeasts would become on par with fossil fuel in price. I am convinced that we will not stop using oil because we run out of it, rather we will stop using oil because alternatives grow more attractive, cheaper, and environmentally imperative. Therefore we should consider 3 "Es"; Energy, Economics, and Environment (and not just 1E, Energy) as we navigate global energy security moving ahead. The bottom line: Energy careers are safe, and when the energy transformation speeds up, the workforce will speed up too – there is no better starting point.

6. As an SPE president, how can you see the role of SPE in the Middle East generally and Egypt's section particularly?

The Middle East is and has been very important for the world's access to sufficient hydrocarbon resources. Therefore, SPE gains a lot from sharing technology from this region with the rest of the world, and this region gains a lot too, by importing professionalism and project lessons learned from other regions. And for Egypt's section, Egypt is a large and important country in the Middle East with a long and proud hydrocarbon tradition, spanning both onshore and offshore disciplines and projects.

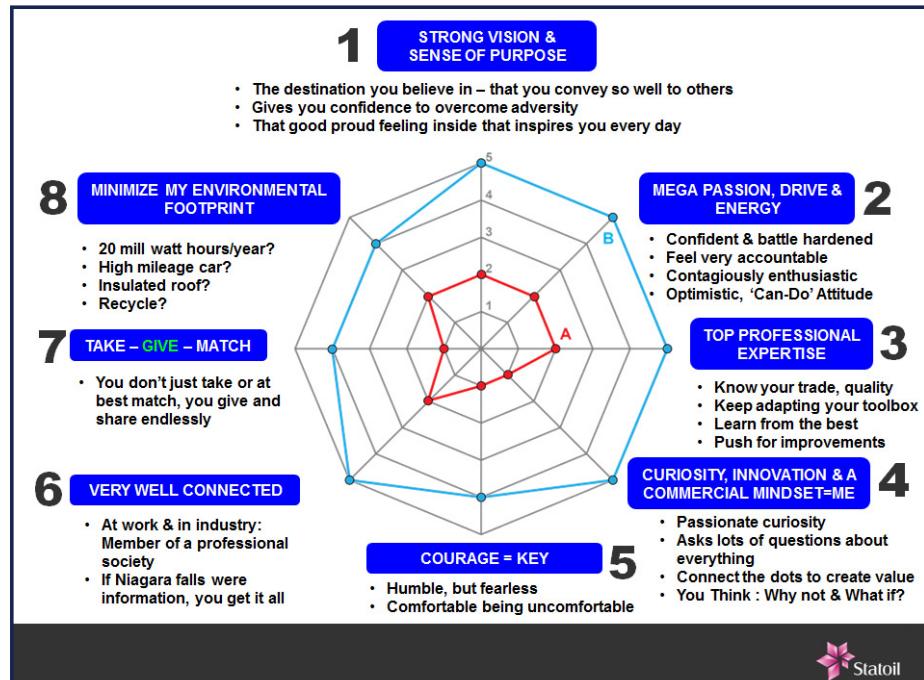
or even STEM student in the Middle East what the SPE membership has done for me. And it would be great to cooperate with all SPE chapters with similar E&P challenges. This could be built out with students and professor exchanges.

8. Back to your life as a student, what were your major interests? Also what recommendations would you give to the students to be on the right track?

My hobbies have always been sports (running, triathlon, and volleyball), reading, history, old civilizations (including that of Egypt), art and music all the time. Based on my 35+ years of experience, as you will see in the figure below these are eight key traits for a professional to succeed:-

you ought to be not only a good engineer, but also a good career manager.

Lord Kelvin, once said that flying was impossible since humans are heavier than air. Of course, the Wright Brothers proved that he was wrong later. Therefore, when someone tells you that something is impossible, just do not believe them. Another thought that gives you great belief in mankind's ability to improve; Imagine a picture of Flint arrow heads from the Clovis culture in New Mexico, USA next to a picture of U.S. astronaut Neil Armstrong stepping onto the moon. Imagine the number of leaps in so many dimensions from one to the other. Mankind can do this again and again but we always have to be mindful of the 3 Es, not just 1E!



High Pressure-High Temperature Drilling Fluids

Mohamad Attia
Egypt Technical Manager
Halliburton Fluids



Drilling fluids consist of two phases, a continuous ‘liquid’ phase and a discontinuous ‘solid’ phase. The fraction of each phase in the fluid mixture affects the behavior of the fluid under downhole conditions. In high pressure-high temperature (HPHT) environments, drilling fluids exhibit different physical behavior based on two factors; the type of the continuous phase used to formulate the fluid, and the solids’ characteristics like size, number, and distribution. For instance, oil is a preferred continuous phase component in HPHT fluids as it better resists temperature degradation and provides a higher lubricity coefficient than water-based fluids. Regardless of the components used, the relationship between the continuous phase and the solid phase in a particular drilling fluid is 70-80% predictable, leaving 20-30% uncertainty to be explained by different theories or scientific models.

The first step in formulating the right HPHT drilling fluid is to identify the wellbore conditions, pressures, temperatures, formation rock mechanics, formation water chemistry, and potential risks. From an engineering standpoint, we have to consider two to three candidate fluids for testing. The next steps are, selecting a fit-for-purpose fluid formulation, designing a testing program that includes fluid optimization to resist certain contaminants, and work on optimizing the cost per barrel for the best value added.

Predicting fluid behavior downhole is subjected to many elements. They include temperature gradient, sea bed temperature, riser length, mud coolers, dynamic (circulation) and static time, Equivalent Circulation Density (ECD), Equivalent Static Density (ESD), overbalance pressure, fracture simulation, Wellbore Strengthening application (WellSET) to increase the hoop stress around the wellbore, hole cleaning and annulus cuttings’ load, solids’ slip velocity and buoyancy effect, pipe rotation, cuttings’ size and distribution, and hole geometry.

Other Challenges Include:

- Specifying the important wellbore stability parameters; mud density, differential pressure, WellSET, shale chemistry, gas pockets, influxes, drilling direction, number of trips, and exposure time.
- Calculating accurate rock mechanics; horizontal stress, Poisson’s ratio and Young’s modulus, and preparing a mud density collapse graph.
- Identifying any risk of severe losses.
- Clearly identifying issues related to drilling fluids independently and separating them from issues caused by tool failure and/or improper drilling practices.
- The final challenge is cementing the casing. Many experts believe that the pressure required for breaking fluid gels, having an annulus free of cuttings, and filter-cake removal are the most critical elements for good cementing. Others included the need to load the drilling fluid or the cement slurry with certain Lost Circulation Treatment Materials (LCM) to ensure that the cement reaches the desired depth behind the casing. In addition, it is necessary to spot thermally stable fluids behind the casing to maintain adequate pressure above the cemented section.

In conclusion, designing and managing HPHT fluids is about identifying all the challenges and looking at them from the right perspective, designing customized solutions according to the specific well needs, and finally implementing a realistic plan that touches all aspects and concerns.

History Matching Process

Basic Concept and Real Value

Mo'men Ramadan
Senior Reservoir Engineer
SIS - ARM - Schlumberger



History Matching process “HM” is the most challenging and time consuming task for reservoir simulation domain. It starts by establishing a discrete 3D geological model which more or less resembles the real reservoir topography and geological features; e.g. reservoir top, aquifer strength, porosity, and permeability distributions. HM comes as an iterative methodology to tune these geological features in order to match the field performance attributes; i.e. well rates and pressures.

This iterative process is performed by generating multiple geological model realizations which are solved using advanced computational techniques. The flow equations are then solved using finite difference simulator, and the simulation’s results are compared with the actual well production/injection data.

At the end of the day, the evaluation criteria of getting a representative HM model relies on how all the available data (e.g. seismic acquisition, well logs, well test interpretations, field surveillance data, etc.) is integrated with our reservoir engineering understanding of the drive mechanism.

It is really important to keep our eyes open for the uncertainties that may exist in the reservoir. This will guide us to not rely on only one HM solution. So, it is highly recommended to propose multiple HM scenarios honoring the range of the uncertainties aligned with our reservoir engineering understanding.

A traditional question would be; which is better? Achieving a high quality HM (i.e. minimum difference between the simulation and observed data.)? Or investing more efforts to capture the reservoir driving mechanism? It is a very critical decision that has to be made at the early stages of any HM process. This

decision will drive the whole subject to achieve a representative simulation model that captures the drive mechanism with an acceptable HM quality. The following figures show two HM simulation cases which used conceptual model designed for researches and academic training purposes using Petrel and Eclipse.

Case 1 in figure (1): it only targets HM quality that has been achieved using unrealistic local modifications of the facies distribution around the wells.

Case 2 in figure (2): it has lower HM quality but it is still honoring our understanding of the facies distribution. Defiantly, Case 2 has more credible and reliable prediction results compared to Case 1.

Eventually, the real value of getting calibrated simulation models honoring the reservoir’s uncertainties; is to have a trusted foundation for evaluating the forecast of different development strategies, in order to optimize field recovery techniques such as water injection, gas lift, enhanced oil recovery, and so on.

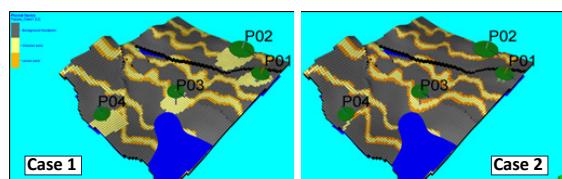
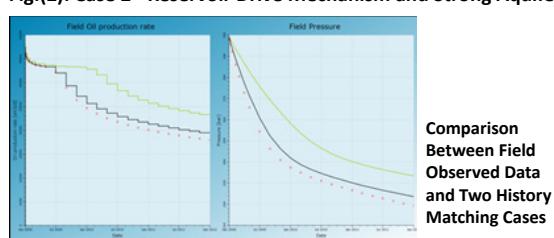


Fig.(1): Case 1 - Local Modifications and Weak Aquifer
Fig.(2): Case 2 - Reservoir Drive Mechanism and Strong Aquifer



Nuclear Magnetic Resonance (NMR) and Its Applications

Dr. Tharwat Fawzy Hassane
Senior Petrophysicist - Reservoir Engineer
BP Egypt



The Combinable Magnetic Resonance (CMR) tool enhances the precision of Nuclear Magnetic Resonance (NMR) measurements that respond to the hydrogen nuclei contained in pore fluids. These measurements contain information related to both pore volume and pore size. This information has been most easily used as a stand-alone NMR interpretation or as overlays of NMR data on other log data. However, attempts of using NMR data quantitatively with traditional porosity measurements have been more difficult. The difficulty originates from the need to combine measurements that are insensitive to pore structure and pore fluid with NMR measurements that are sensitive to those formation properties. For example, even in perfectly clean freshwater sand, an NMR tool may produce porosity that is different from density and neutron porosities. The differences have been attributed to either the lack of early-time signal from small pores associated with silt and clay size grains or incomplete fluid polarization. The NMR has many applications which will be explained later in this article.

NMR Applications:

- 1- Lithology-independent Porosity.
- 2- Irreducible Water Saturation.
- 3- Tar Identification.
- 4- Determining Clay, Silt, and Sand Volumes.
- 5- Determining Fluid Types (Gas, Oil, and Water).
- 6- Two Permeability Estimation Equations (Timur-Coates and SDR Equation).

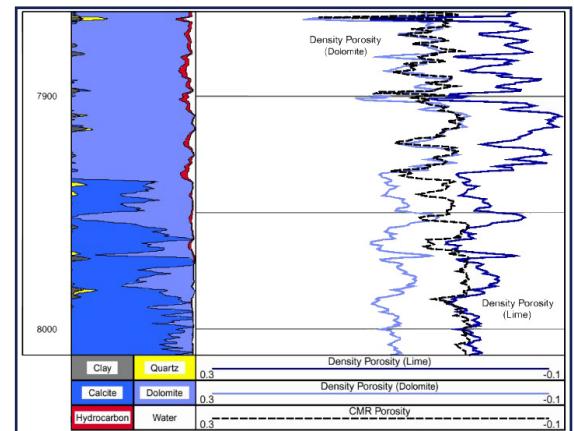


Fig.(1): Lithology-independent Porosity

1- Lithology-independent Porosity

We understand that the porosity measured from both neutron and density logs is matrix influenced. In neutron logs, neutrons are calibrated to water and limestone matrix so any lithology rather than that will sway the neutron reading. The same case happens with density log since there is one component in the formula which is called matrix density. But, the NMR porosity is matrix-independent since it targets only the hydrogen index in the fluid that loads up the porous medium. Thus, NMR is a precise method where we can measure the accurate porosity without any effect of the lithology on the tool. There is an example explaining that in figure (1) while the Total Combinable Magnetic Resonance (TCMR) porosity matches the density porosity at the base part and top parts where the matrix is limestone and dolomite respectively, and record different readings in between, where the lithology is mixed.

2- Irreducible Water Saturation

Irreducible water saturation is estimated from the ratio between Bulk Volume Irreducible (BVI) – fraction

of rock bulk volume that is occupied by water – and the TCMR Porosity as indicated by the equation and the figure below;

$$S_{WIRR} = \frac{BVI}{TCMR}$$

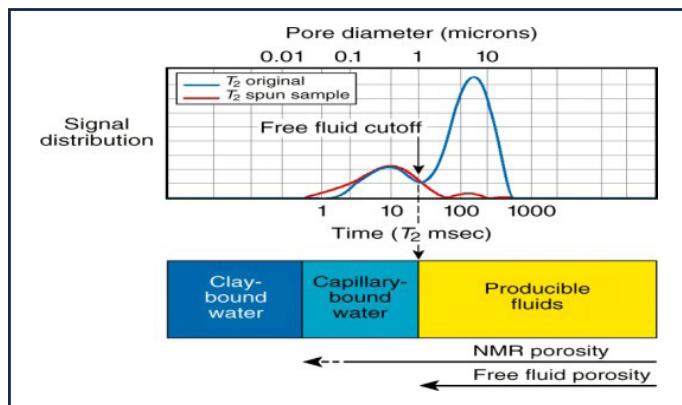


Fig.(2): S_{WIRR} from NMR

3- Tar Identification

Tar can be easily identified in the water zones using the resistivity response. In the oil zone, it is difficult to separate tar and hydrocarbon using exclusively resistivity logs. NMR transverse relaxation T_2 contains useful petrophysical and geological information. The T_2 histogram is a function of both fluid properties and pore size distribution. Tar is almost solid and the hydrogen it contains relaxes very fast because it has strong binding forces. The shortage of T_2 in presence of tar results in lower NMR porosity compared to the conventional density or neutron porosity. Figure (3) indicates Tar volume between density-neutron and TC MR porosity where the lower TC MR represents Tar volume.

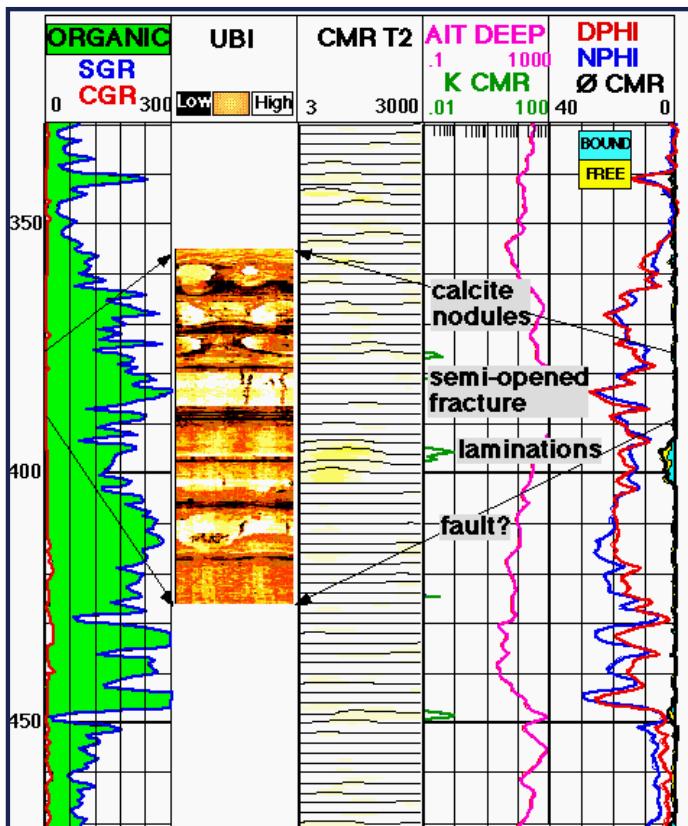


Fig.(3): Tar Volume from NMR

4- Clay, Silt, and Sand Volumes Determination

The volume of clay, silt, and sand can be calculated from the NMR

as follows:-

The clay porosity can be conveyed from Clay Bound Fluid (CBF1) from T_2 distribution ranged from (0.3 to 2.0 ms) whereas the silt can articulate from T_2 ranged from (2.0 to 33.0 ms). This can be expressed as $(\Phi_{BFV} - \Phi_{CLAY})$. Further, the sand volume can be expressed as Free Fluid Volume (FFV) as illustrated in figure (4).

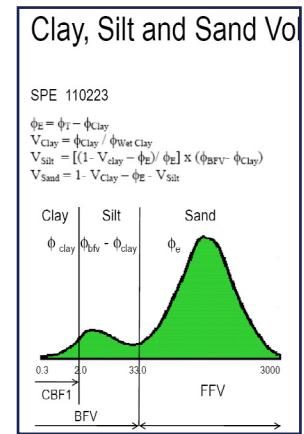


Fig.(4): Clay, Silt, and Sand Volumes from NMR

5- Fluid Typing from NMR

The Magnetic Resonance Fluid (MRF) method is based on two key ingredients – a new microscopic Constituent Viscosity Model (CVM) and a new Multifluid Relaxation Model. The CVM provides a link between NMR relaxation times and molecular diffusion coefficients in hydrocarbon mixtures such as crude oils. The Multifluid Relaxation Model accounts for the T_2 decay of spin-echo signals that arises from intrinsic spin-spin interactions, surface relaxation, and attenuation due to molecular diffusion of fluid molecules in a magnetic field gradient. The MRF method exploits the fact that molecular diffusion coefficients of brine, oil and gas molecules typically have values that are well separated from one another. Thus, the diffusion attenuation of a suite of measured NMR signals contains sufficient information to allow differentiation of brine, oil, and gas. The MRF method involves the simultaneous inversion of a suite of spin-echo measurements with the new MRF multiplied relaxation model. Figure (5) indicates the MRF station in to identify oil and water – Example from Abu Dhabi, SPE 2001 Journal.

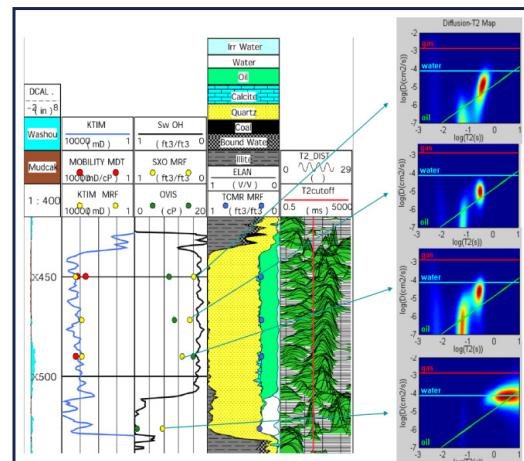


Fig.(5): Fluid Typing from NMR

6- Permeability Estimation

There are two equations that can be derived from NMR logging to calculate permeability. The first one is called Timur-Coates and the second one is called SDR Equation. These equations can be written as follows:-

$$K_{SDR} = b * \Phi^{4*} (T_{2LM})^2 \quad (mD)$$

Whereas a , b , are calibration factors to the core.

ϕ = NMR Porosity (ν/ν_0)

BEV= Bound Fluid Volume (v/v)

$T_m = T$ Logarithmic Mean (ms)

PowerDrive Archer:

High Build Rate RSS for Increased Reservoir Exposure

Khaled Al-Halawani
Drilling Engineering Manager
Schlumberger East Africa and East Mediterranean (EEG)



The PowerDrive system is a rotary steerable system (RSS) that provides you with optimized directional drilling. It acts as a full rotating tool which reduces drag, improves ROP, decreases the risk of sticking, and achieves superior hole cleaning. In this article, I want to go deeper through PowerDrive Archer RSS, the new version of PowerDrive series introduced by Schlumberger, and also some differences or additions in PowerDrive Archer compared to previous versions of RSS based tools.

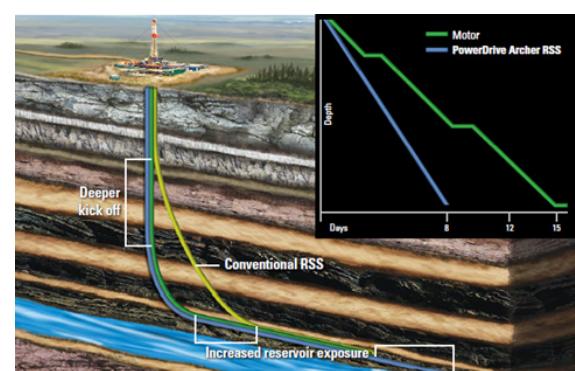
PowerDrive Archer RSS Does More than Executing Complex 3D Wells in One run

PowerDrive Archer RSS delivers to well profiles that were previously only accessible by motors, with ROP and wellbore quality of a fully rotating RSS. This revolutionary system repeatedly and consistently delivers high build rates from any inclination (in field trials more than $17^\circ/100\text{ ft}$). All the PowerDrive Archer external parts rotate, which reduces the risk of mechanical or differential sticking and improves wellbore quality for easier well completion. The system can drill complex 3D wells from shoe to shoe and openhole sidetrack at any point. Built on the proven and reliable technologies of PowerDrive X6 RSS, the PowerDrive Archer RSS with a unique hybrid steering unit maximizes reservoir exposure and reduces risk.

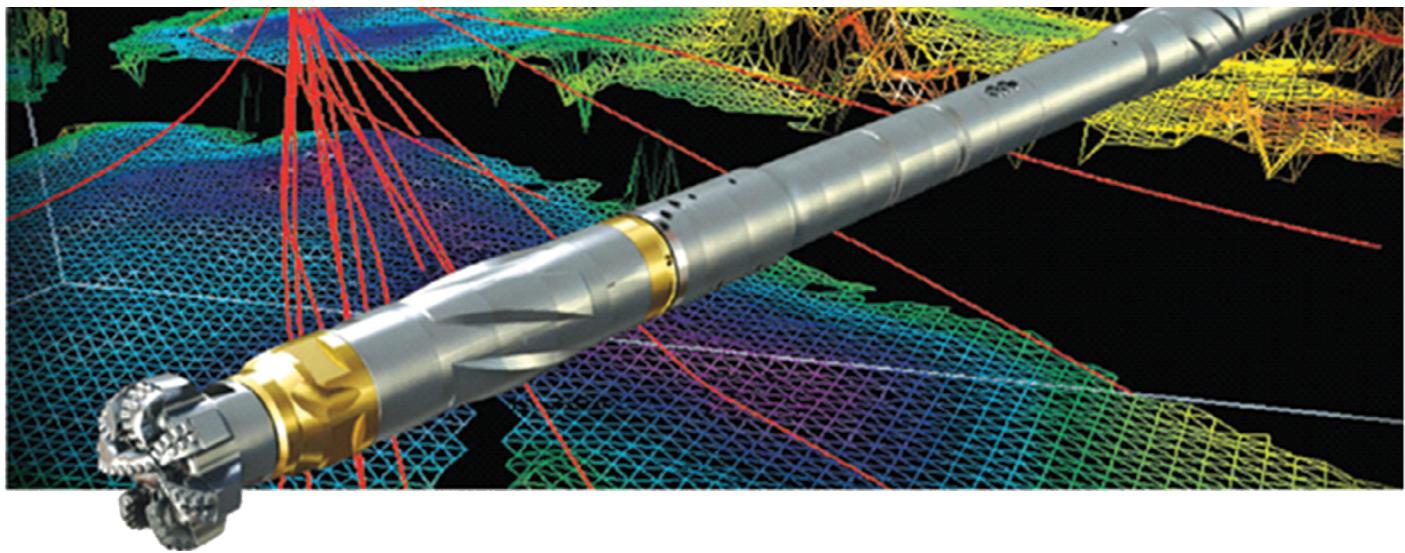
the reservoir's sweet spot and can even extend the horizontal section to TD.

A New Tool for the Drilling Engineers

The PowerDrive Archer RSS provides the extra assurance that well profiles can be drilled as planned. The increased dogleg capability gives control in unconsolidated formations and punches through hard stringers. Fast, reliable, and directional openhole sidetracks can be completed to reduce time on multilateral wells and allow wells to be placed exactly where required. Pushing the kickoff deeper enables the drilling engineer to mitigate risk and cost by reducing the inclination in unstable formations and the footage to the reservoir.



- Unique hybrid steering unit
- All external components rotate
- PowerDrive X6 control unit for wider operating envelope and increased reliability



Fully Rotating Rotary Steerable

All external parts on the PowerDrive Archer RSS rotate, which improves hole cleaning and reduces the risk of stuck pipe. This rotation also increases ROP by eliminating the sliding intervals and trips required when using a positive displacement motor. Wellbores drilled by the PowerDrive Archer RSS are smooth and consistent even when build rates are high. These smooth wellbores reduce torque and drag, allowing good weight transfer to the bit to maximize ROP, and extending the length of the horizontal sections.

Smooth Wellbores to Ease Completions

The high-quality, smooth wellbores produced by a fully rotating RSS make it easier to run casing and wireline logs. And with reduced friction and tortuosity, wells drilled with PowerDrive Archer RSS also enable completions engineers to run intelligent completions with a larger OD, as rugosity is reduced.

Drilling Engineering with the Reliability of a True Hybrid

The PowerDrive Archer hybrid steering system has demonstrated good reliability as its moving components are internal and do not make contact with harsh environments. This true hybrid system has internal pads that push against an articulated sleeve pivoted on a universal joint to point the bit in the desired direction. It also enables openhole side-tracking at any point in the well because of reduced dependence on wellbore contact.

Control Unit Provides Wider Operating Envelope

The precision steering that high build rates require is managed by a control system based on the proven, reliable system used in the PowerDrive X6 RSS. The radical new design of this control unit allows drilling with heavier muds and a much wider flow range. The PowerDrive Archer RSS also features a closed loop inclination hold mode that ensures pinpoint accuracy at any drilling speed.

Fatigue management prediction

When subjected to rotation through aggressive build rates, the BHA experiences high bending moments. As build rate increases, fatigue life reduces exponentially, shortening the life of BHA

components to hours. Schlumberger performed finite element analysis (FEA) and a detailed strain-based fatigue study on all components of the PowerDrive Archer BHA to understand the effects of high build rates. These tests produced a predicted fatigue life for the BHA components with rpm, ROP, and dogleg severity (DLS) all being factors. In figure (1), the PERFORM Toolkit data analysis service automatically performs this complex fatigue management and enables real-time monitoring in the field. It provides real-time tracking of steering and fatigue management in a time-depth log, combined with a precise graphic representation of the BHA. This intelligent rig-state-detection engine enables accurate analysis of drilling performance and continuous assessment of torque-and-drag models.



Steerability Assurance

Steerability is paramount in achieving aggressive build rate curves. With modeling and rigorous testing of BHA behavior at a Schlumberger drilling technology center and in the field, PowerDrive Archer RSS brings with it advanced techniques to design the ideal bit for performance and steerability, as well as stringent controls for BHA and bit design.

Application-specific Bit and BHA Design

Forces from the bit, the PowerDrive Archer steering unit, and various contact points downhole influence the steerability of the PowerDrive Archer BHA. For this reason, dedicated design engineers use: the IDEAS integrated drillbit design platform from Smith Bits, Schlumberger company finite element analysis (FEA) modeling of the bit, BHA, drillstring, the well profile and the geology to analyze how the drilling system as a whole will perform. Every PDC drillbit designed for use with the PowerDrive Archer RSS is validated for stability, steerability, ROP, and durability.

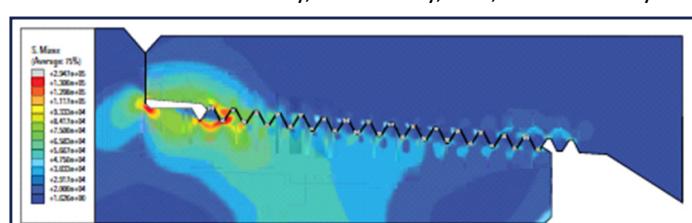


Fig.(1): Bending Moment Analysis and FE.4 Modeling in the PERFORM Toolkit Service



This is not at all a one-way relationship in which SPE gets labor free of charge, it is actually more of a win-win situation. The fact that so many people are willing to contribute once they get going is a testament, not only to their dedication to the oil & gas industry as a whole, but also to the benefits they see themselves gaining from being volunteers. I have nothing but great things to say about SPE, because it is a world-class organization where smart, hardworking, and devoted people make use of their knowledge and abilities to create something tangible that they share with others as well.

**Mohamed El-Seba'ee
2008 Chapter President**

CELEBRATING A DECADE OF SUCCESS

**BEST CHAPTER IN THE FACULTY FOR SEASON 2011/ 2012
GOLD STANDARD AWARD IN 2010, 2011, 2012, AND 2013
EGYPT BEST CHAPTER IN 2011 AND 2012
WORLD CHAPTER OF THE MONTH IN FEBRUARY 2009 AND**



ND MARCH 2013

AND NOW IT IS OUR TIME TO
“IMPRESS THE GLOBE”



AMAPETCO Optimizes Subsea Flow Assurance with PIPESIM Modeling

Hatem Darwish

Production Engineering Team Leader
Schlumberger - EEG



PIPESIM Steady-State Multiphase Flow Simulator

PIPESIM software is a steady state, multiphase flow simulator. PIPESIM models multiphase flow from the reservoir to the wellhead. Flowline and surface facility performance can be calculated to generate comprehensive production system analysis. PIPESIM software can be integrated with the Avocet production operations software platform, and the Petrel E&P software platform to deliver a singular solution spanning reservoir simulation to production.

Optimizing Production

Once a production system is brought on stream, the ability to ensure optimal production is critical to achieving maximum economic potential. Here again, PIPESIM software provides a comprehensive set of workflows – from well candidate selection for workovers, to the identification and mitigation of flow assurance challenges, to online optimization of the complete system.

PIPESIM Network Simulation/Optimization

It is necessary to understand the thermohydraulics of your production system, both for pipeline and facility design, and for coping with flow assurance challenges. The PIPESIM Network Simulator shares a common software environment with PIPESIM well, pipeline, and flow assurance modelling, delivering the most rigorous field-wide solution available on the market. The network solver is suitable for networks of any size and topology, including complex loop structures and crossovers. By modeling the entire production or injection system as a network, the interdependency of wells and surface equipment can be accounted for and the deliverability of the system can be determined.

The Case

The Amal Petro Company (AMAPETCO) planned to optimize its network flow to overcome a number

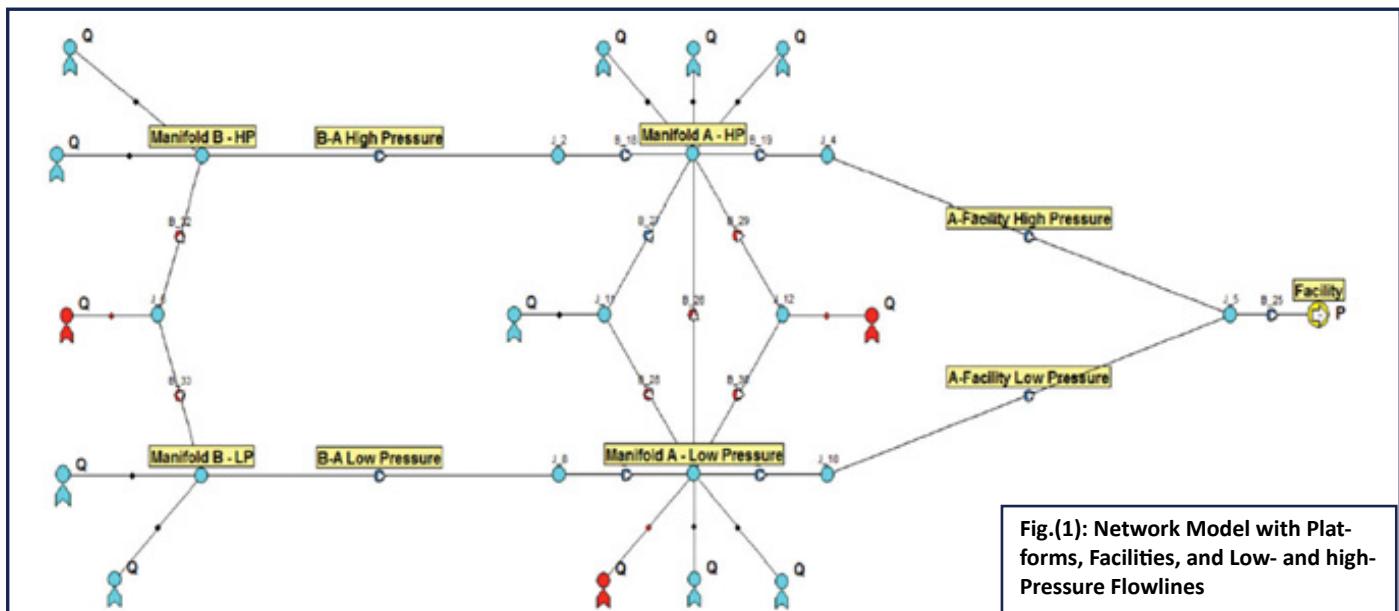
of issues that were preventing it from producing at its reservoirs' full potential. Its existing capacity was challenged by varying reservoir pressures, while flow assurance was often compromised by hydrates, slugs, erosion, and bottleneck problems. AMAPETCO wanted to define an ideal network and facility design, and isolate associated flow assurance issues. AMAPETCO discussed the creation of a new network model with Schlumberger to help in this process.

Building the Model

The first task was to gather data from all areas of the network, including flowlines, riser properties, PVT data, and observed wells data. This information was then used to create a comprehensive network model in the PIPESIM steady state multiphase simulator. History matching was then undertaken, and applicable horizontal and vertical flow correlations were evaluated. The best combinations were then selected to show the smallest difference between simulated and actual pressure measurements at the surface. The model was then fine-tuned by adjusting holdup and friction factors to improve matching accuracy. To test various flow situations, simulation scenarios were run. Just-gas, just-oil, and gas-oil flow scenarios were simulated with a number of different flow assurance simulation variations, including hydrates, slugs, erosion, and bottlenecks.

Optimized flow – Optimal Production

The new history-matched PIPESIM network model allows AMAPETCO to run multiple flow assurance scenarios to select an optimal pipeline design, as well as increase its network capacity to better realize the production potential of its reservoirs. In addition, efficient engineering and design enabled by the new system saves capital and operating expenditure through: reducing pipe costs and determining ideal coating type, thickness, and application selections.



Challenges Faced

- Optimize network flow to realize reservoir production potential.
- Increase network capacity.
- Overcome flow assurance issues and bottlenecks.

Solutions Proposed

- Gather varied network data.
- Create model using PIPESIM simulator and undertake history matching.
- Simulate and test different flow assurance scenarios.

Results Obtained

- New PIPESIM network model allows AMAPETCO to:
- Run multiple scenarios to select optimum pipeline design.
 - Mitigate and plan for optimum flow assurance
 - Increase network capacity to better realize production potential.
 - Reduce capital and operating expenditure.

PIPESIM Project:

- Figure (2): scenario results showing phase envelope with main flowline conditions.
- Figure (3): erosion scenario results in a 16 km pipeline, in which the maximum erosional velocity ratio is 0.75.

"The new PIPESIM network model has helped us mitigate flow assurance issues, while increasing our production system capacity. Improved engineering and planning is now possible, and we have already made financial savings through optimal design." – Abdel Fattah Fayad, Reservoir Department Head, AMAPETCO

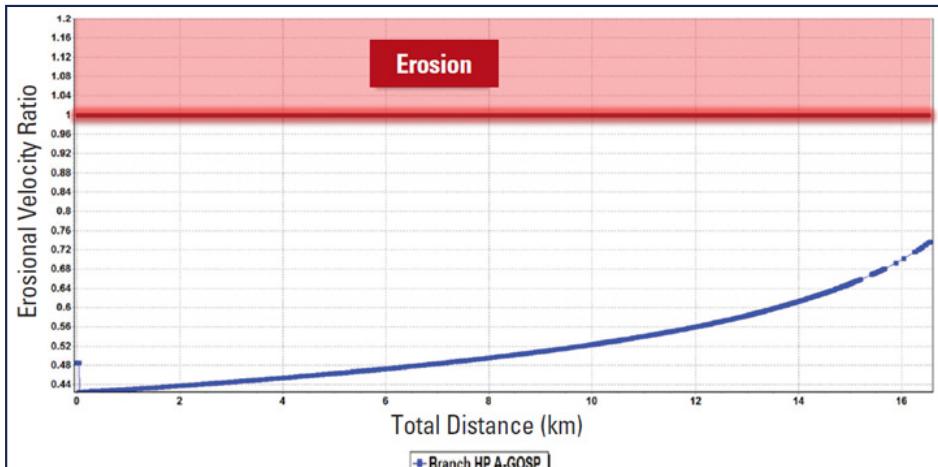


Fig.(2): Scenario Results Showing Phase Envelope with Main Flowline Conditions

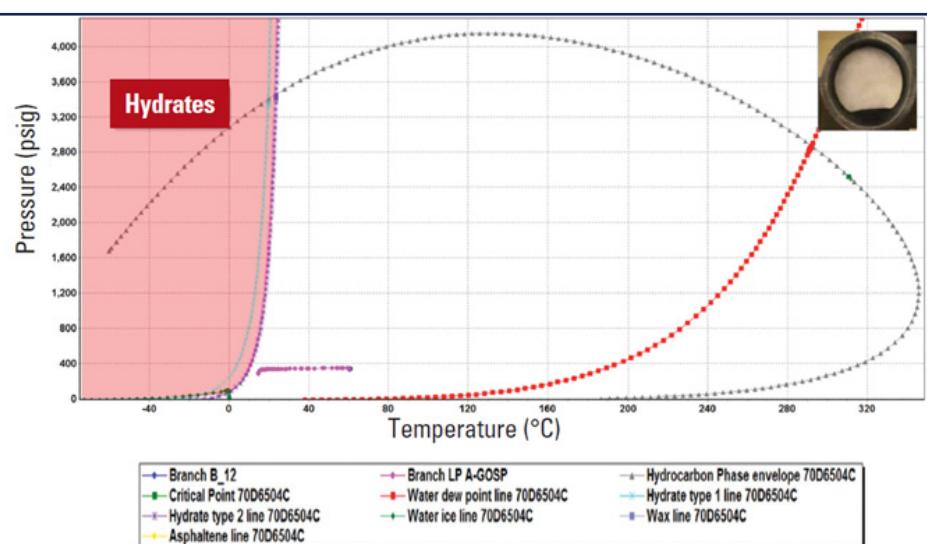


Fig.(3): Erosion Scenario Results in a 16 km Pipeline

Application of Laser Cutting in Gas Shale Fracturing

Khaled Ismail El-Nagar

Senior Student, Faculty of Petroleum & Mining Engineering
Suez University



Neither of the earliest significant commercial production operations for natural gas (shale gas, New York State, 1821) or oil (retorted oil shale, Scotland, 1851) came from what we today consider to be conventional hydrocarbon accumulations. Despite these unusual beginnings, oil and gas from conventional hydrocarbon accumulations has dominated production for the past 150 years. However, organic-rich shale would be a potential reserve for oil and gas to be produced if endowed with the right characteristics, evaluation, and production operations.

Gas in Shale Rock

Some of the methane that is formed from the organic matter buried with the sediments escaped into sandy rock layers adjacent to the shale formations, forming conventional accumulations of natural gas which were relatively easy to extract. However, some remained locked in the tight, low permeability shale layers in three different ways as shown in figure (1):

- Into the natural fractures and the fracture-connected pore spaces.
- Adsorbed to mineral surfaces within pore spaces or natural fractures.
- Absorbed to the organic and mineral surfaces of matrix rock.

Hydraulic fracture stimulation was the first technology to unlock the gas trapped in shale. This practice creates permeability in rocks, which was naturally very few. Fracturing shale from vertical wells produced high initial production flow rates, followed by rapid falloff. Operators realized that more contact with the reservoir was needed to avoid these rapid declines. Thus, along with hydraulic fracturing, drilling extended-reach horizontal wells allowed contact with significantly more reservoir rock than is possible from vertical wellbores. As a result, the combination of horizontal drilling and hydraulic fracturing has allowed access to larger volumes of shale gas that were previously unreachable. So, the key appears to lie in understanding and applying the best combination of drilling and fracturing processes.

Production Techniques

• Horizontal Drains

The only way to expose more of the source rock pay zone to the well is to drill horizontally. The horizontal drain is kicked off at the base of a vertical hole at a depth of 1,500 to 3,000 meters and extended over a distance between 1,000 and 2,000 meters. Additionally, multi-lateral horizontal drilling is the best practice to maximize reservoir exposure and Stimulated Reservoir Volume (SRV).

• Hydraulic Fracturing: Shale Shock!

Once drilling is complete, the casing is perforated,

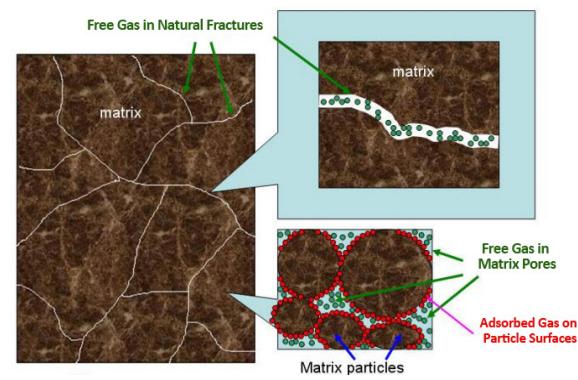


Fig.(1): Gas inside Shale

and water is pumped under high pressure, cracking the shale and creating a network of fractures as shown below in the picture, extended along the shale layer and from the wellbore to both sides up and down. The fracture is only a fraction of an inch wide and held open by the proppant sand grains. Shale wells have as many as 25 fracture stages, each of them can involve as much as 420,000 gallons of water with a pound per gallon of sand. It means that more than 10 million gallons of fresh water may be pumped into a single well during the completion process.

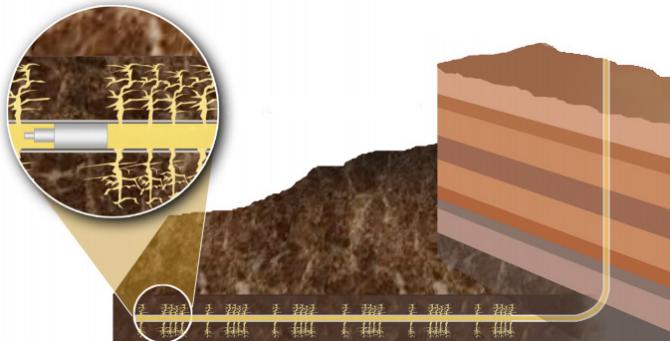


Fig.(2): Shale Network Fracture

Environmental Challenges

Water Issues

Depending on the reservoir's type, 20 to 80% of the water injected flows back in the early years of production. This flowback water picks up hydrocarbon molecules, salts, and radioactive materials as it flows through the source rock – which makes it critical to be treated, reused, or even disposed of. Water used in the fracturing fluid contains chemicals that may leak and pollute ground water aquifers if the well is not securely designed. Further, the huge volumes of water needed during the process reflect its availability for essential uses negatively. For instance, San Antonio consumes 40 million gallons per year while Marcellus shale play production consumes half of this amount.

New Laser Application; a Technique under Investigation

Since 1997, Gas Technology Institute (GTI) and its associated partners have paved the way for applying high power lasers in drilling and completion of oil and gas wells. Consequently, these recent advances in high power lasers technology are hoped to provide new tools and also replace the current traditional methods. This article is likely to be the first kick-off to present the idea of laser cutting in rock fracturing for shale gas.

Definition

Laser cutting is a technology that uses a laser beam to cut materials, and is typically used for industrial manufacturing applications, but is also on its way to be used by oil and gas industry operators. Laser cutting works by directing the output of a high power laser, by computer, to the material to be cut. Afterwards, the material either vaporizes away, or melts, and then the residual material is blown away by a jet of gas, leaving an edge with a high quality finished surface.

Methods

- Vaporization cutting.
- Melt and blow.
- Thermal stress cracking.

From the aforementioned methods, thermal stress cracking is the one concerned in Gas Shale fracturing, because it has been shown with experimental tests that rock cracking precedes melting occurrence without any kind of destruction.

Brittle materials are particularly sensitive to thermal fracture; a feature exploited in thermal stress cracking. A beam is focused on the surface causing localized heating and thermal expansion. This results in a crack which propagates further by the aid of the laser beam subjected, taking into consideration the type of this laser beam.

“Because shale gas is unconventional source of petroleum, the solutions for its challenges must be ‘unconventional’ and more importantly ‘innovative’. In my opinion, the future should be directed towards hydraulic fracturing-free operations, which will be environmental friendly and pave the way for more innovative solutions in oil and gas industry.”

Air Quality

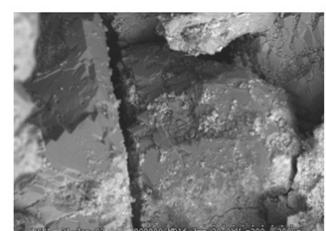
Extraction of shale gas causes greater emissions of carbon dioxide (CO₂) than conventional gas production. The actual amount depends on the number of drillings and the energy required for fracturing, transportation of water and wastewater, and the huge amount of equipment used during development. Carbon dioxide emissions for the operation of a shale gas well are estimated at 348–438 tons added to the greenhouse effect.

Dr. Charles Groat, University of Texas, said “Drilling for natural gas in itself does not pose a threat to air and water quality, if it is done properly”. The problem is, hydraulic fracturing technology has a strong environmental track record and is employed under close supervision by state, local and federal regulators.

Because shale gas is unconventional source of petroleum, the solutions for its challenges must be “unconventional” and more importantly “innovative”. In my opinion, the future should be directed towards hydraulic fracturing-free operations, which will be environmental friendly and pave the way for more innovative solutions in oil and gas industry.

Theory of Application

Development of micro-cracks is a function of the quartz content and void space present in a rock. As thermal energy accumulates in a quartz grain, it will expand then contraction with low void space leads to development of micro-cracks within it as seen on the right in the case of Berea Sandstone. High temperatures induced by laser beams weaken the rock, because the development of micro-cracks and clay dehydration lead to an increase in void space resulting in increase in permeability.



SEM Image of Lased Quartz Grain

Conclusion

It has been shown that the key in gas shale rock is to identify quartz, calcite, types of clay and other heavy minerals. The matrix of shale may be clay-rich or quartz-rich in other cases, and it has been reported that the initiation of micro-cracks is more effective in the shale which, has lower clay content and a high quartz content, i.e., high brittleness.

Underground Coal Gasification (UCG) in India

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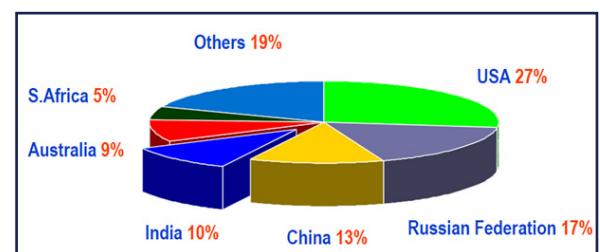


Underground coal gasification (UCG) converts coal in-situ into a gaseous product, commonly known as synthesis gas or syngas through the same chemical reactions that occur in surface gasifiers. Gasification converts hydrocarbons into a synthesis gas (syngas) at elevated pressures and temperatures. It can be used to produce many products like electric power, chemical feedstock, liquid fuels, hydrogen, and synthetic gas. Gasification provides numerous opportunities for pollution control, especially with respect to emissions of sulphur, nitrous oxides, and mercury.

India has the 4th largest coal reserves in the world and ranks 3rd in coal production. The total recoverable reserves of coal are only about 15.6 % (41.28 billion tons), leaving a large quantity, nearly 223.26 billion tons of “un-mineable” coal reserve. The Lignite reserves in India are estimated at around 38.93 billion tons, of which 87.5% occur in the southern State of Tamil Nadu.

The reason behind considering UCG resources, is that the world market is increasingly looking to its coal reserves as a solution for its dependence on imports to fuel its economy. The US especially is estimated to have about 27% of the world's supply, about 1000 billion tons of recoverable coal resources (U.S. Energy Information Administration, 2006). UCG has numerous advantages over conventional underground or strip mining and surface gasification, including:

- Reducing costs, surface damage, and eliminating mine safety issues eg.(mine collapse, asphyxiation, etc).
- Coals that are un-mineable (too deep, low grade, thin seams) are exploitable by UCG.
- No surface gasification systems are needed; hence, capital costs are substantially reduced.



Total Proved World Coal Resources (Coal and Lignite), BP statistical review of world energy

Injection Processes (CRIP, UCG):

1) CRIP stands for Continuous Retraction Injection Point; one of the most important considerations in UCG is the method used to establish a channel between the injection well and the production wells. Coal has high permeability, where channels might exist naturally. In some cases, coal may have a number of fractures and fissures, which also lead to natural channels. However, in many cases, the coal may have low permeability, and other means of establishing a connection between the wells are necessary. In the CRIP process, the production well is drilled vertically, and the injection well is drilled using directional drilling techniques so as to connect to the production well, as shown in figure (1). Once the channel is established, a gasification cavity is initiated at the end of the injection well in the horizontal section of the coal seam. Once the coal near the cavity is used up, the injection point is retracted (preferably by burning a section of the liner) and a new gasification cav-

ity is initiated. In this manner, a precise control over the progress of gasification is obtained.

The CRIP process retracts the combined steam and oxygen injection point to control the location of the combustion front. The syngas, which was more than a third hydrogen in many of the early UCG pilots, (remainder is CO₂, CO, CH₄, and higher hydrocarbons) is brought to the surface and processed to remove particulates, CO₂, and H₂S and to convert the CO, CH₄ and higher hydrocarbons to more hydrogen.

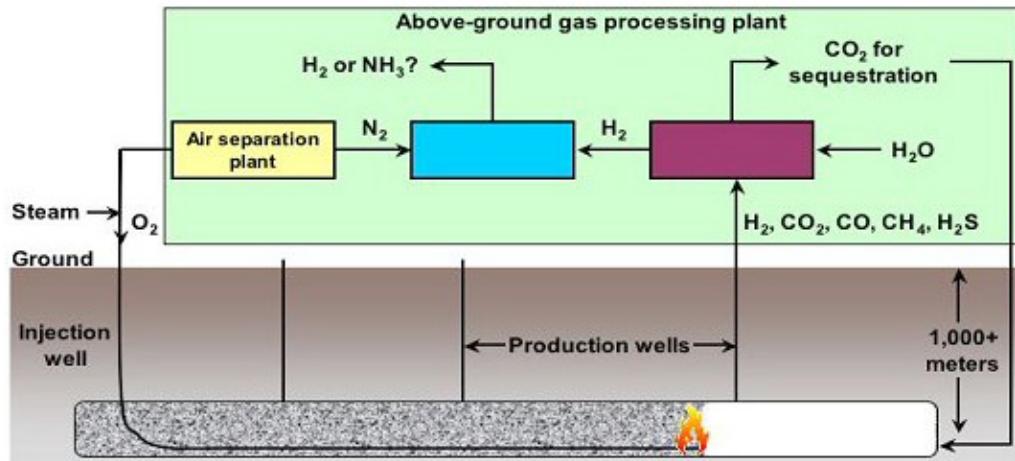


Fig.(1): Schematic Illustrations of the CRIP Process

2) UCG, a proprietary process employed by the Ergo Exergy. It relies on making use of the natural pathways that already exist in the coal seam and enhancing them further if necessary, to create a link between the injection well and the production wells. The UCG technology was successfully demonstrated for the Chinchilla Project in Australia, wherein an estimated 35,000 tons of coal were used up to produce 80,000,000 Nm³ of syngas at 5MJ/Nm³. The UCG technology is also under consideration for the proposed Powder River Basin UCG project, and for a joint venture between Gas Authority India, Ltd. (GAIL) and Ergo Exergy.

UCG research and some results

One of the problems of UCG research is that "we do not see" the process happening under the ground and the ability of measuring temperature and performing continuous gases analysis are not possible in practice. From the stand point of the methods used, one can characterize the research by two approaches: mathematical modelling (including stimulation studies), and experiments in UCG laboratory.

Mathematical Modelling

Syngas is a product of some complicated reactions between solid and gas phases (O₂, CO, CO₂, H₂O, CH₄, and H₂). At first, the thermodynamics model (Kostúr 2007) was built to obtain fundamental results regarding syngas composition. That considered 12 well-known relevant chemical reactions. The considered system of chemical reactions is in equilibrium if total Gibson's energy is minimum.

$$G = \sum_{j=1}^N n_j \mu_j \quad (a) \quad \mu_j = \mu_j^0 + RT \ln \frac{n_j}{\sum_{j=0}^N n_j} \cdot \frac{p}{p_0} \quad (b)$$

Where μ_j – is the standard Gibson's energy (kJ), R – is the universal gas constant, T – is the temperature (K), P is the pressure in system (Pa), P₀ is the standard pressure (Pa). Stimulations (Iaciak et al. 2008) using the thermodynamic model (a) – (b) for the composition of lignite, were demonstrated for the chemical reactions with air under the condition that the oxygen concentration would be close to zero in syngas. The processed results of thermodynamic stimulations in terms of concentrations of individual components depending upon the syngas temperature shows that the concentrations of utility syngas components CO, H₂ arise with increasing temperature, but on the other hand, increasing temperature reduces the concentration of CO₂ and H₂O. Maximum methane concentrations are achieved at lower temperatures.

I would like to emphasize that this stimulation offers an image of the maximum concentration of utility syngas components depending on temperature. The actual temperature during gasification in this system will be set by the energetic balance including heat loss, but thermodynamic model does not handle this and does not reflect the kinetics of process (heterogeneous reactions are significantly slower than the homogeneous).

Experimental Research

Experimental model is built on the basis of respecting the fundamental knowledge of the similarity theory. In particular, it is a geometric similarity of coal model to potential coal seam for gasification.

$$\text{Constant} = X_{\text{model}} / X_{\text{coalseam}} \quad (d)$$

$$\beta_{\text{model}} / \beta_{\text{coalseam}} = 1 \quad (e)$$

Where X are the dimensions (length, width) and β is the relevant slope of a coal bed with a horizontal plane. Coal is cut into blocks before insertion into the generator, they are stuck together to adhere similarity criteria (d) and (e). However, it is impossible to apply geometric criteria for the thickness of the coal bed in the laboratory because of practical reasons. Therefore, instead of this criterion we apply another one to test the equality of heat flow in coal-rock interface (f) in the model and the real in-situ experiments.

Q=idem (f)

In other words, the same heat flow from coal into the surrounding rocks is the assumption of identical processes, more accurately the in-situ and model temperature. This criterion is reached by surrounding the rock masses and coal by insulating materials. Insulation thickness is determined by simulation studies for coal model and potential coal bed. We used thermal simulation model based on the solution of Fourier's partial differential equations in the simulation studies with the same initial and boundary conditions.

Conclusion

Currently, UCG is the only feasible technology to harness energy from deep un-mineable coal seams in an eco-friendly method. It has the potential to convert coal resources to coal reserves. However, major challenges in gas processing for a successful trial include identification of end usage of low CV syngas, separation of sticky condensates from gas, and handling of CO₂; ultimately turning it into an economical proposition.

BP Gas Discovery in Egypt's East Nile Delta

BP has confirmed the Salamat discovery offshore in East Nile Delta as one of the deepest exploration wells ever drilled in the country; it reached nearly 7 km in a water depth of 649 m. Salamat well is considered the first drilling project in North Damietta offshore concession which has been granted to BP and partners in early 2010. BP has all of the equity in the Salamat discovery.

This discovery indicates that Egypt's energy industry has a bright future and offer renewed confidence in the potential of East Nile Delta's geology. Pressure data and fluid samples confirmed the presence of hydrocarbons but further appraisal is still required to better define the field resources and to determine the best options for developing this discovery.

According to regional president for Egypt,



Hesham Mekawi, "This was a very complex well to drill, with the operations taking more than a year to complete, and I believe the operation reflects our long-term commitment to the country during this period of change and challenges. We

take great pride in our presence here and in our partnership with the country." Mekawi added, "We believe that partners work together, and although we are passing through a more testing period, we are always working with a view to the future."

USA World's Number One Oil Producer



"The U.S. will surpass Russia and Saudi Arabia as the world's top oil producer by 2015, and be close to energy self-sufficiency in the next two decades, amid booming output from shale formations", the International Energy Agency said in its annual report. Although it remains a controversial technique, shale fracking is about to raise the United States' oil production to go beyond number one oil producer, Saudi Arabia. The technique, which involves the injection of water into the formation in order to develop fractures and allow fluids to escape, promotes United States to displace Saudi Arabia as the world's largest oil producer by 2015. And by 2020, it is estimated that United States will produce 11.6 million barrels per day, while Saudi Arabia's output is expected to fall from 11.7 to 10.6 million BPD.

But on the other side, this technique has been criticized to be associated with earthquakes and pollution, something which redirected the social attention to the environmental concerns and consequences of this technique.

Total Takes Over Shell



On one of the greatest turns in the market of fuel stations in Egypt, Total the French oil and Gas Company acquired shell's fuel retail network in the country which is about 85 fuel stations. Total which already owned 70 fuel stations in Egypt will double its market share after this take over.

A total Spokesman said "Through this acquisition, we reaffirm our ambition to increase our development in Africa and in the Middle East in retail business."

Saudi Arabia is Going Nuclear

Saudi Arabia is typically associated with oil, it was the world's largest oil producer in 2012. But Saudi Arabia, along with other Middle Eastern countries, has to contend with the rising domestic energy consumption, much of which is currently generated by oil and gas. Using oil resources to satisfy electricity demand comes at the expense of oil export revenues. Commenting on this, Saudi Aramco's CEO Khalid Al-Falih, warned that rising domestic energy consumption could result in the loss of 3 million barrels per day of crude oil exports by the end of the decade if no alterations were made to the current trends.

In order to diversify its energy sources, the country has taken another step towards building up its nuclear power generation, providing a key tool in managing a mismatch between the rising in-country energy consumption and the heavy dependence on oil exports to meet the domestic funding needs.

The need for diversification has driven the country to set ambitious targets for construction of nuclear generating plants to help in confronting the ascending electricity needs. Saudi Arabia plans to spend over \$80 billion to build 16 reactors over the next 20 years, forecasting that by 2032, 17 gigawatts of nuclear power capacity will generate 15% of its electricity needs, according to the World Nuclear Association.



IPR New Discoveries in Egypt

The Improved Petroleum Recovery (IPR) Group of Companies announced the discovery of a new oil well in the field of Yidma in Western Desert. The well is expected to produce 12,000 barrels of light oil and 14 million cubic feet of natural gas per day. On the other hand IPR scored an off-shore discovery in Gulf of Suez. It is the first drilled well in its Southwest Gebel El Zeit concession with natural-

ly flowing oil and gas of 3,611 BOPD and 2.9 MMcf/D.

IPR's Chief Operating Officer, Sam Dabbous, stated "We are very pleased with the results of these new discoveries and the great efforts of our technical teams. We look to replicate this successful effort in our ambitious expansion plans in 2014 to exceed internal expectations and contribute to the fulfillment of the country's mandate to increase production."

As part of this integrated investment plan, IPR remains on pace to invest in 57 wells to increase production, and add new reserves in 2014 between its Western Desert and Gulf of Suez assets portfolio.



Kuwait Petroleum

Kuwait Petroleum CEO Hashem Hashem, reported that the studies made according to the company's reservoir management policy usually reveal an increase in the current petroleum resources indicating that the recent studies revealed huge resources in all of the company's areas.

Looking inside, the Burgan field – which is considered one of the largest oil fields in the world – has huge reserve and sufficient energy that allow production for many upcoming years according to the economical oil price.

The Burgan field will play an important role to satisfy the company's goal of a 4 million barrels of oil production per day by 2020. For this goal, the company has set a strategic plan of using the best production techniques which maintain reservoir potential and to sustain the company's strategic target.

And for Kuwait's status in oil and gas industry, Moody's Credit Rating agency has evaluated the country's resources as enough for more 89 years.

Israeli Natural Gas Partners Announce New Drilling Plans

Tamar and Leviathan are two fields that were recently-discovered by the partners – which include Houston-based Noble Energy Inc. (NBL) and other Israeli companies. The Tamar field, which began production in March, contains about 9 trillion cubic feet of gas, and Leviathan has about 19 trillion cubic feet of gas; which might give an expectation for Israel to meet all of its natural gas needs for at least three decades, as well as promote Israel to become an exporter of gas. The partners in two large Israeli offshore natural gas fields said that they are willing to begin drilling in another nearby field with a budget of \$122 million. The new field, Eran, which is located off Israel's northern coast is estimated to contain about 684 billion cubic feet of gas, a much smaller amount than the partners' nearby Tamar and Leviathan fields.



CHAPTER NEWS

Schlumberger Training Courses

Through SLB "EEG University Relations Manager", our chapter successfully made a deal with SLB Egypt along the academic year 2013/2014, to provide a package of training courses for Suez University Students in SLB Training Center, including the following courses:

- 1- Introduction to SLB Simulators.
- 2- History Matching and Conditioning Reservoir Models to Dynamic Data.
- 3- ECLIPSE.
- 4- Petrel Reservoir Engineering (customized) + Petrel Drilling (introduction).
- 5- Artificial Lift.
- 6- PIPESIM.
- 7- OFM.
- 8- Introduction to Drilling.
- 9- Directional, Horizontal, and Multilateral Drilling.
- 10- Well Placement Fundamentals.
- 11- Coiled Tubing and its Applications.
- 12- Hydraulic Fracturing.

The first four training courses were covered by the end of February

2014, and the rest of the package will be completed throughout the academic year. Each course is attended by 8 students and certificates for the attendees were provided by SLB.



North Africa Technical Conference

SPE SU SC officers had participated in SCOW (Student Chapter Officers Workshop) held along with NATC. The workshop was a great opportunity for our chapter officers to engage with SPE international representatives, and officers from different SPE chapters of MENA region. Also, our chapter members were able to attend different technical sessions and E-posters throughout the conference, in addition to meeting different representatives from oil and gas companies. SPE Regional Paper Contest was also held during NATC, and one of our chapter members participated and won the second place.



ECHO and YoungPetro are now Partners

Seeking the international exposure and the vision of leading internationally, SPE SU SC proudly announced the partnership of its official magazine ECHO with YoungPetro Magazine.

YoungPetro is an International Student Petroleum Magazine, whose mission is to inspire active participation in the petroleum world through fresh-thinking coverage of people, technology discoveries, environmental issues, events, and career stories.



As our mission is to become a chapter of professional excellence, providing the highest quality services to Suez University students, SPE SU SC has released SPE Voice package. This package guarantees the fast, up-to-date communication between us and our targeted audience. The package includes SPE Windows/Windows Phone 8 applications together with SPE Android application. The package has many features. Firstly, the fast access for all our social networks and website. Secondly, lists of useful websites related to the O&G industry and some of the top global petroleum companies. Thirdly, push-notification service to keep you informed with relevant and up-to-date events.

BG Day

Working on reducing the gap between the theoretical and practical knowledge of Suez University students, and on a trial to link students with the biggest IOCs, SPE SU SC organized a full day for British Gas Company (BG Egypt) at the faculty campus. The day started with a "Safety Moment" by Eng. Sherif El-Sayed Abdelrahman - Petroleum Engineer and former Vice President of SPE SU SC, and then Mrs. Yasmina Abd El-Latif - Social Performance Advisor, introduced a session about Practical Tips for Effective CV Writing and Interviewing Skills. Finally, a session about Forecasting and Decline Curve was conducted by Eng. Ali Sanad - Lead Reservoir Engineer.



S3 Reservoir Simulation Suite License

Through our international relations activities within SPE Reservoir Characterization and Simulation Conference and Exhibition (RCSC) held in Abu Dhabi, UAE, September 2013, SPE Suez University Student Chapter has managed to make a deal between Sciencesoft Ltd. UK and our university, in terms of providing 32 licenses for (S3GRAF, S3GRAF3D, S3GRAF-HPG, and S3control) which are part of S3 Reservoir Simulation Suite. These licences are valid until Dec. 2019, with the availability of renewal. <http://sciencesoft.com/>

Steer Your Career Program

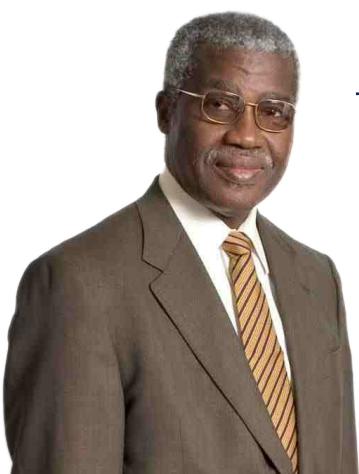
The development of not only our team, but all the student-organizations has always been what we seek. We have successfully partnered with one of the most prestigious, famous educational organizations, Injaz, to deliver a three-day workshop. Accordingly, invitations were sent to all the student-organizations in Suez University. The workshop tackled the most important skills that all students look forward to, such as leadership, time management, communication, problem solving, and presentation skills. More than 120 students have attended the workshop and showed great admiration of the new skills they have learnt.

Apache Reservoir School

SPE SU SC provided 20 opportunities for Petroleum Engineering Department senior students at Apache Corporation. The students are offered an intensive school in Reservoir Engineering which will end by their graduation. Moreover, the students who attended this school will be entitled as fresh Reservoir Engineer candidates for hiring.

NAPESCO Fishing Yard Visit

SPE SU SC had organized a workshop for 15 students to NAPESCO Fishing Yard. The students were introduced to all fishing tools in the workshop, and got the opportunity to experience some practical work by themselves. The workshop visit was followed by a technical session about fishing jobs, and the challenges which engineers might meet during their work.



SPE President 2013 Mr. Igbert Imomoh Appreciation Letter

As a result of the outstanding performance of SPE SU SC, Mr. Igbert Imomoh, 2013 SPE International President sent our Chapter President, Omar Elkholy, an appreciation letter for the contribution of SPE SU SC as a chapter serving Suez University students. This letter was a great motivation for the chapter members and a push for a real promising success.

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