

ECHO)))))

SPE Suez University Student Chapter Annual Magazine

Issue 11 | Feb 2019

ACING THE JOB INTERVIEW

Machine Learning for Improved Directional Drilling

Integration of Petrophysical Inputs in an EOR Project



Published By
Society of Petroleum Engineers
Suez University Student Chapter





Growing with Partnership

DEA is an active player and partner in the Egyptian energy sector since 1974. We have so far produced more than 650 million barrels of crude in the Gulf of Suez, via SUCO, our operating joint venture company with EGPC. We are successfully producing gas from the Disouq development project in the Onshore Nile Delta. And, we are proud to be partner in West Nile Delta, one of the currently most important energy projects in Egypt – and there is more to come.



Growing with Energy

DEA

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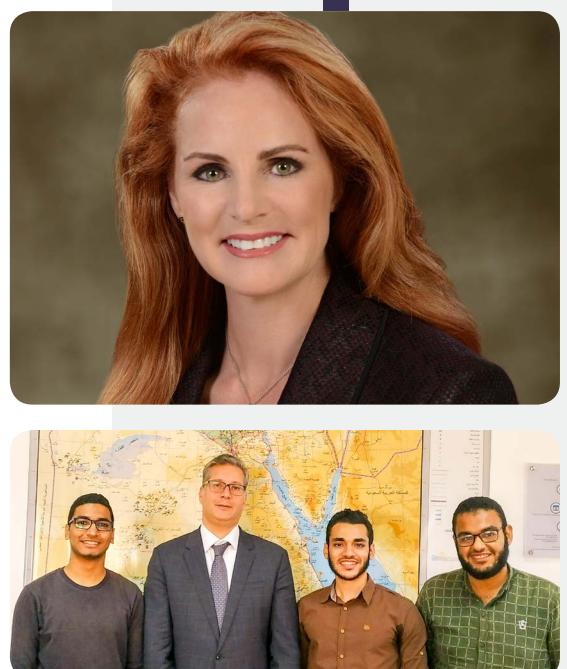
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Foreword



Muhammad A.Tharwat
ECHO Chairperson
Chapter President

Fervency!

That's what actually happens when you are subjected to very tough and harsh conditions, **Fervency!** Just like that Shinny Diamond, it was a chunk of charcoal that did well under pressure, the tough and harsh conditions.

When you pass through excessively hard challenges, and you have an extreme responsibility to cross them peacefully and successfully, as you have the responsibility to lead a whole student chapter of +150 persons to the infinity and beyond, as you promised within your Presidential Elections Speech, you may get frustrated, you may feel defeated, did we really come to an end? No, not this time. You have to get up, unleash your potentials, struggle for your dreams, and achieve your goals. Just reveal your Diamond, just ... **Quash Your Shackles!**

Those were the conditions under which our Slogan for the whole season has generated, Quash Your Shackles. They thought that hard conditions may break us, or crush our spirit. Actually, they didn't know our secret, **hard conditions were our Fuel!**

I have always considered the Volunteering Works **a vehicle you mount to accelerate your life experience.** It pushes you to face many challenges, and with each one you face, a new lesson is learned. The more severe the challenge you face, the deeper the lesson is instilled. As my journey with SPE Suez University Student Chapter is about to come to an end, let me share and memorize some of the most roughly learned lessons in brief.

"It's not Hard to Make Decisions When You Know What Your Values are" Roy E. Disney

A lesson was learned after passing through really hard conditions. Being in charge of several critical decisions required to be determined within short time is severely mind blowing sometimes. Having a clear vision and well set end goals are the key solution!

A Means, Not an End

While facing the storm of life, being too busy with work, business affairs, collecting money, or even volunteering works, may cost your soul a lot, excessive seeking may be harmful sometimes. The core problem is that we often forget that work, money, studying ...etc, are just tools that help us reach our vision. They are just means to reach an end goal. And if you don't have a clear end goal, you are in a real trouble.

It seems that the key solution for most of your problems is having a clearly set end goal for your life. So, by now you have to ask yourself a critical question **what is your end goal?** If you don't have an immediate clear answer, you have to rethink of a lot. You have to retrack!

By the end of ECHO 11 foreword, don't ever forget that hard conditions are the way to **Fervency.** Just continue facing your challenges bravely with a smile.



Mahmoud Morsy
ECHO CEO
Chapter Secretary

Your Dream Determines Your Destiny

What is your dream? What kind of destiny do you target to create for yourself? At a mutual point, we have a clue what it could be. However, it continues changing with the time. We tend to have another dream just because the earlier one seems impossible to achieve.

Why do we keep changing goals in our Life?

We decide something and work on it enthusiastically. Then we face challenges and our passion starts diminishing. Soon we think that we are not capable enough and we quit. We determine another goal and the same follows.

Actually, when we take any decision, we are sure about its success but nature always has plans to test our determination and well.

Do you expect a straight path to your dreams?

You want to pursue your own business or you want to enter into a company, you dreamed. You want to change your profession. You want to become an artist. All these goals lead you to destiny you dreamed for yourself.

How can you go without struggle? If it could be simple to reach those goals, many would have been successful in this world. However, you know that the proportion of these persons is not that high.

"Every worthwhile accomplishment, big or little, has its stages of drudgery and triumph; a beginning, a struggle, and a victory." ~ Ghandi

I have seen many and many times that people go with the flow. We keep going until everything is good. Whenever we found some resistance, our enthusiasm started dying. Therefore, most of our dreams do not live. Do not let that happen to you.

Before you start anything, realize that what challenges you may encounter. If you are well prepared with the rules of the game, your chances to win will increase. We cannot determine all the challenges that we may face. However, we may predict many of them and prepare for them in advance so that they do not come surprisingly to destroy your plans.

Keep Going:

Think twice before pursuing any goal. However, once you decide, give it an action. Do not stop thereafter.

Challenges will come to make you stronger. Keep learning and keep going and you will get it one day.

As Michael Jordon said, "Obstacles don't have to stop you. If you run into a wall, don't turn around and give up. Figure out how to climb it, go through it, or work around it."

Before joining SPE, I wondered how students like us do all these great things like conferences, different events, and this remarkable magazine. When I joined SPE Suez, I dreamt of being one of its great leaders someday. At this time, I was a business development member and participated in SPE Suez Research School Project. Then, I became the Head of International Relations. And now, I realized my goal here and managed to become the International Relations Manager and CEO of this huge project (ECHO Magazine). Small action is enough to keep you on the right track and motivate you to proceed.

In this distinguished issue of ECHO magazine, you will read valuable content with comprehensive coverage for the industry updates by leading pioneers and industry professionals. That is through many interviews with big characters in the oil and gas industry nationally and internationally, and scientific articles. I would like also to show my admiration to ECHO designing team. On the other hand, I am speechless to describe the exerted efforts by the editorial team.

And now, it is time to enjoy ECHO 11....

Shauna Noonan

SPEI President 2020

By Abdallah Sharaf



Shauna Noonan is the chief of artificial lift engineering for Occidental Petroleum Corporation, based in Houston, where she directs the company's efforts in artificial lift system performance globally. Prior to joining Oxy in late 2015, she worked worldwide on artificial lift projects and technology development at ConocoPhillips and Chevron for over 22 years. She has authored or co-authored more than 25 technical publications on the subject of artificial lift and is a frequent speaker at industry events.

She has been an avid SPE volunteer in many roles since first serving as a student section officer. She served on the SPE International Board of Directors as the Technical Director for Production and Operations from 2012–2015. She has driven the development of industry standards and recommended practices for artificial lift systems while serving as chair for ISO and API committees, and has received industry awards for her contributions to the discipline.

Noonan holds a BS degree in petroleum engineering from the University of Alberta. She is the proud mother of two daughters.

1. We are eager to know more about yourself, your studies and your professional career.

I am originally from Canada and got my Bachelor of Science degree in Petroleum Engineering (Co-op) at the University of Alberta. The “Co-op” refers to a 5-year degree program that incorporates five 4-month industry internships, so upon graduating, one has an engineering degree AND twenty months of work experience. For my internships, I worked for Mobil, Hess, Canadian Hunter, and then twice for Chevron.

After graduation, I began working for Chevron out in the field on the rigs. Like many of our SPE members, I was a workover engineer, rig supervisor, field engineer, production engineer, and an artificial lift specialist in the corporate engineering group that had me travelling to Chevron's assets all over the world.

In 2004, after 12 years with Chevron, I was looking to strengthen my artificial lift knowledge so I moved to ConocoPhillips's corporate engineering group, where I started working as an artificial lift specialist. Several years later, I was managing the Completion Technology team, made up of completion, geomechanics, and reservoir engineers focused on developing technology for unconventional shale reservoirs and the Canadian oil sands. In 2015, I was appointed to the position of the Director of Artificial Lift Engineering for the Occidental Petroleum's global operations after a company executive heard my speech at an industry event.

I've worked in field asset teams, technology development, corporate engineering, and executive management. I have worked on miscible floods, extra-heavy oil, steam floods and SAGD, coalbed methane, and unconventional shales. I have worked for multi-national and independent oil and

gas companies on projects all over the world. As a result, I can relate to so many parts of our business.

2. How did you draw up your success story with SPE until you reached this great position as 2020 SPE International President?

I started my SPE involvement as the Vice President of my student chapter. Since that time I have served on all types of SPE committees all over the world, authored over 25 publications, taught an SPE course and webinar, given many panel and keynote presentations, and was also associate editor for the SPE Production and Operations Journal. From 2013 to 2015, I served on the SPE Board of Directors as the Technical Director for Production and Operations and chaired the Training, Programs and Meetings Board Committee.

I have been blessed to be the recipient of several SPE awards: SPE Gulf Coast Section Regional Production and Operations Award (2012), SPE Peer Apart (2011) for technical editors of more than 100 papers, SPE Outstanding Associate Editor: Production and Operations Journal (2010), and outstanding SPE Outstanding Technical Editor (2007). I have experienced the global business and culture of both our industry and SPE, which brings a very positive perspective and strength to my role as SPE President.

3. Every successful manager has many challenges in life, so what are the challenges you faced? How did you overcome them?

This is a great question! The one main challenge that I faced when I first started to manage others was in the area of soft skills development.

Being able to communicate effectively and work well with others in a team environment is crucial in our industry. You could be the most brilliant person in the room technically, but if you are not able to express and explain your ideas, or if you are a poor team player, the doors of opportunity will be closed to you. Working with engineers to improve their soft skills can be difficult, as many won't admit they have poor soft skills, and the steps to improve them may put them outside their comfort zone. I recommend your SPE Student Chapter for having a Soft Skills Club and helping your members develop those needed attributes prior to graduation. The earlier one develops great soft skills, the better it is for one's career progression.

4. How can you see the Middle East support for SPE activities in 2020 and before, especially in Egypt?

In March 2019, the SPEI Board of Directors meeting will be held in Cairo, which is a huge opportunity for the Egyptian section and student chapters. During this time, the Board and local SPE members will be discussing how the Society can best support our Egyptian members, and what events can be planned for 2019 and 2020.

5. What do you expect for the future of the Oil & Gas Industry generally, and Artificial Lift as your career especially?

In the 2018 IEA report titled "Key World Energy Statistics," the outlook for oil and gas consumption into 2040 (see Figure 1) provides great insight into the future of our industry and the continuing need for oil and gas. In terms of artificial lift, most companies have over 50% of their producing wells on some form of artificial lift, which is great. The latest advancements have focused on increasing the electrical efficiency of artificial lift systems and transitioning to electricity generated by renewable sources, such as using solar-powered rod pumping systems as shown in Figure 2.

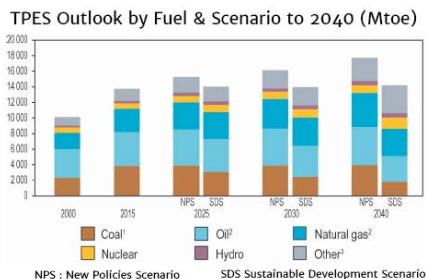


Figure 1—2018 IEA Projections of Future Energy Demand



Figure 2—Solar power array provides electricity to beam pump (photo courtesy of Santos).

6. What are the events or projects of the Oil & Gas Industry in the Middle East that caught your attention last period, and do you expect great progress in the Middle East's petroleum industry?

There are many great projects in the region that I have been following, but the one that has garnered my attention the most is the Al Hosn Gas Project in the UAE. It is one of the largest natural gas developments in the Middle East that set the bar in terms of construction excellence and production performance.

7. Could you tell us about your upcoming plans for SPE International generally, and SPE YP or student chapters worldwide specifically?

Two of my initiatives that SPE YPs and student members can relate to most is increasing corporate support and improving the methods in which SPE delivers its technical content.

A huge part of my technical and soft skills development was due to the opportunities I pursued within SPE; however, much of this required the support of my employer. During my three years on the SPEI Board as President-Elect, President, and Past President, I plan to educate and engage more companies to support and encourage their employees to participate in SPE programs. I honestly believe that a huge growth opportunity for SPE lies in the geographical areas where there is already an SPE presence, but not full engagement yet by the industry. The engagement of our volunteers and having that corporate support for them is essential for the future of the Society.

In discussions with many SPE student members and even the YPs, I have learned that most do not read the JPT, or access technical papers in OnePetro.org. The feedback I get is that it takes too much time and that knowledge transfer needs to be delivered in methods that can be accessed and consumed in less than 30 minutes. I am currently working with SPE staff on solutions and plan to utilize Podcasts more often for content delivery, such as using them to complement

my President's Monthly Column.

8. As a student chapter, we have achieved many awards as outstanding chapter and golden standard awards more than once. What's your advice for us to continue our march and conserve our success?

Congratulations on all the awards. Your members should be proud of those accomplishments. Forty-five percent of the award criteria is what your chapter has accomplished in Industry Engagement (30%) and Community Involvement (15%). The first two criteria require reaching out and interacting with people outside of your academic institution. Contact other SPE student chapters to see what they have accomplished and share your ideas as well. Reach out to SPE professional members for their feedback. Communication and collaboration leads to innovation.

9. Kindly, give some advice to students and fresh graduates who are about to join the actual industry life.

The very first thing I tell students is to get out to the field, regardless of which petroleum engineering function you want to pursue. You get to really understand how operations work, and you get to learn the "lingo" to better communicate with your field operations staff. You need to "see it and live it" in order to be a better and more effective petroleum engineer.

Find multiple mentors, learn from them and create your own career path. There is no pre-determined career path for you to follow and it is not up to your company to plot your career. Get more than one "success story" and piece together your own plan. Having good mentors can also "open up doors" internally and externally. In addition to getting advice with career planning, there is much you can learn from more experienced engineers and geoscientists, so be like a sponge and soak up everything you can. Don't be afraid to ask questions.

Finally, SPE is there for you. It has endless resources available to help you in all the various roles you will experience. Utilize OnePetro.org, PetroWiki.org, SPE webinars, the Competency Assessment tool and stay current on industry issues through JPT and JPT online. Go to section events and find your way onto a committee where you can expand your industry network.



Interview with Mr. Sameh Sabry

General Manager of DEA Deutsche Erdoel AG in Egypt

By Mahmoud Morsy - Ahmed Mukhtar - Essam Mohamed

1. Firstly, Could you tell us more about your professional career?

In total, I have 18 years of experience in upstream and downstream oil and gas industry. During these years I have been working for a number of multinational companies, starting with ExxonMobil, followed by Chevron and then currently working for DEA (DEA Deutsche Erdoel AG) for the last 10 years. I have an international exposure which is focused on Europe and North Africa. I have been based in DEA HQ (Hamburg, Germany) two times during my career where I worked there for 4 years in total in two different roles. At the beginning of my career I focused on commercial, business analysis as well as business development roles. I have assumed the roles of Commercial Manager for DEA in Europe during 2012–2014 and the role of Commercial and Business development Manager for DEA in Egypt during 2014–2016. Afterwards, I moved to general management roles, where I assumed the role of Deputy General Manager for DEA in Egypt, followed by being assigned as General Manager for DEA business in Algeria during 2017–2018. During my assignment in Algeria. My latest move was coming back to Egypt starting August 2018, as General Manager for DEA Egypt and board member for our JVs with EGPC and EGAS (SUCO and Disouco JVs).

2. How did you draw up your success story to be the general manager of DEA in Egypt?

If I try to summarize the main factors of any career success, I would say that continuous learning and self-development are the key factors. As pointed out, my career was focused on commercial and business related roles. However, exposing myself to new experiences and continuously seeking new tasks and challenges, allowed me to learn fast about all other functions in our industry and increase my experience significantly in very short time. I was always keen to expand my knowledge and enrich my role beyond job boundaries. In particular, by leading cross-functional teams in challenging tasks from all disciplines. This was evident, when I have managed to lead my teams to formulate and agree with partners on development plans and commercial deals, which allowed to unlock the developments of significant resources in Egypt (e.g. West Nile Delta project with our partner BP, Disouq gas asset as well an ambitious investment program in our assets in Gulf of Suez). One of the key factors of success was maintaining good performance, as well as in a consistent mode. Ups and downs are natural, but maintaining a reliable level of performance is key for career success. This was evident, when I was assigned to international roles, for example being the Commercial Manager of DEA in Europe between 2012–2014, many suspected that my level of performance will decline due to stepping out of my comfort zone and being exposed to different business cultures and environments. However, I have managed to maintain my level of good performance and supported DEA senior management and teams to develop number of key projects in UK as well as in Norway. My ambitious and readiness to get out of the comfort zone paved the way for me to advance my career to general management roles. Starting by being assigned as General Manager for DEA in Algeria during 2017–2018. In Algeria, I was proud to achieve (with partners) the completion of the development activities and first gas from our first development project in Algeria (Reggane Nord) as well as establishing an excellent relationship with the Algerian authorities which was reflected in signing of a Memo of understanding with the State Company Sonatrach, opening the door for future cooperation and joint projects in the near future. This career record allowed me to compete and then be selected in an open internal application process for the General Manager position in DEA Egypt.



SPE Suez team with Mr. Sameh Sabry

3. We are eager to know your majors and degrees which you had achieved and your plans when you were a student.

Well, I acquired my Engineering bachelor degree (Civil section) from Ain Shams University in Cairo in 2001 with honours and was ranked as one of top 15 students of this class. In 2006, I acquired my Master of Business Administration, MBA from Arab Academy for Science and Technology & Maritime Transport- Cairo. As a student, I was always keen to monitor closely the potential employers in the Egyptian job market, to better assess what the job market is really needing and accordingly focus my studies on areas of job market interest. I was also keen not only to develop my knowledge but also my set of skills. Remember business is human and not just science, so communications, presentation and analytical skills are also key.

4. What do you expect for the future of the industry?

The future of the oil and gas industry is currently under wide debate. There are some views that predict a decline in the oil and gas market in the mid/ long-term future. Those who believe in this are arguing that the demand for conventional hydrocarbons will quickly decline and will be taken over by the switch to renewables for power generation and the rise in electric vehicles, hybrids and the likes. However, I personally believe that the oil and gas industry has still many years of good business. Most of the reputable institutes predict a continuity in increase in oil and gas demand before seeing some gradual decline by the 2040s. I strongly believe that the oil and gas companies will be able to adapt itself to market developments through re-focusing its energy mix, developing new technologies to reduce cost and improve environmental print. So, I can comfortably argue that altogether the future of oil and gas industry is definitely good for the next decades.

5. The industry is diverse in different ways, how do you see diversity in the oil and gas industry, especially, SPE has established a new committee called Women in Energy?

I am a strong advocate of diversity in oil and gas industry in Egypt. Having said this, diversity in my view extends to not only to its key part of gender diversity, but also extends to diversity in races, colours, nationalities, ethnicities, religions as well as personal believes and identities. On my

very first day in DEA Egypt, as the new general manager, I have gladly signed DEA's Diversity Mission Statement and invited my fellow colleagues in DEA Egypt to sign it as well. In DEA, we are proud to have a female CEO, who's inspiring the whole organization on the necessity and benefits of diversity. I am really glad that SPE has established a new committee for Women in Energy and I think that we need to encourage a higher involvement and equal opportunities of females in the Egyptian oil and gas sector.

6. What is your opinion about ECHO magazine?

I was personally positively surprised with high quality and level of professionalism in editing and publishing ECHO magazine. I enjoy reading it, in particular the interviews with key players in the oil and gas industry in Egypt as well as the Case Study and Advanced Technologies sections. Keep it up!

7. As a student chapter, we have achieved many awards like gold standard and outstanding awards, what do you advise us to do to conserve these great awards?

My advice would be to continuously develop yourselves, stay up-to-date in tracking the industry developments and in expanding your network with key players in the industry.

8. What are your plans to support student activities in Egypt?

DEA Egypt is offering every summer internship opportunities for Egyptian students. Even though those opportunities are not big in number, however we make sure that it is a beneficial experience for everyone who joins us. Personally, I plan to work on strengthening the relationship and interactions between the business sector and students through supporting the activities, attending and addressing keynotes to student events and conferences.

9. Kindly, leave a message for senior students and fresh graduates who are about to join the industry at this time

Be ambitious, never rest for less! Persistence and willingness to continue learning and developing yourselves is key for any career success. Believe in yourselves and be positive, don't get easily demotivated or frustrated when you face a challenge or when you have a failure. Keep trying and never give up!

Interview with Mr. Karim Badawi

| Managing Director - Egypt and East Mediterranean at Schlumberger

By Mahmoud Morsy - Muhammad A.Tharwat - Essam Mohamed



1. Firstly, we are eager to know more about your professional career and how you drew up your success story to be the Managing Director- Egypt and East Mediterranean of Schlumberger?

I started my career almost 22 years ago in Indonesia as a wireline field engineer, then moved to Aberdeen working as a field engineer for 1 year. Then I came back to Egypt as the training center manager for wireline product line. I moved from Egypt to Paris as the operations manager of Schlumberger wireline worldwide for 3 years then, returned to Egypt as a wireline operations manager for 2 years for Egypt, East Mediterranean and, East Africa. After this, I moved to Houston US as a process business system manager for operations, which was actually how to use business system to bring efficiency in the service delivery process to all product lines. Then I moved to Russia, Moscow and, I held many different positions. I was IT manager and after one year, I became the vice president for share services: facilities, IT, HR and, finance. Then I was the vice president for testing services. After this, I became the reservoir group manager for Russia and Central Asia. Finally, I became back to my country as managing director- Egypt and East Mediterranean region.

I am always motivated to work in Schlumberger and, eager to learn new things and, contribute to its achievements. To succeed well in any role it is never about you, it is about your successful and motivated team.

2. What are the innovative services which were applied recently in Egypt by SLB?

Schlumberger actually has been a key part of deployment of new technologies in Egypt. Schlumberger has been in Egypt for 80 years. We started by wireline then introduced some other products. Last October, we launched one of our

new product lines called OneSurface, which is applied in surface facilities. And we are very proud that we are involved in ZOHR field from the discovery to first gas with different product lines like: wireline, simulation modeling and, surface facilities. Also with our new technologies and integrated services approach we managed to partner with BP to deliver Atoll project 8 month ahead of schedule. We are very proud of our new operational base Egypt Center of Efficiency (ECE).

ECE is a great milestone in Schlumberger history.

ECE is a great milestone in Schlumberger history. The learning center inside ECE is considered the first one for Schlumberger in Africa. This new operational base will enable Schlumberger to optimize the performance and increase the efficiency. The following photo is recently captured from Egypt Center of Efficiency in the 6th of October industrial area.



3. What are the efforts behind the scenes of SLB worldwide to deliver a high service quality to the clients?

Schlumberger is the leader of service quality, HSE and new technologies. It always invests in reviewing process to improve the quality and level of the service. In last 3 years, we conducted internal transformational program, which actually helped us to analyze the different processes for the service delivery like: optimum preparation of the equipment.

4. What is your opinion about ECHO magazine?

ECHO is a very good magazine for many reasons. It is made by students, which is very important in your success in the future because you interact with different people and, you know how to edit, how to print, and how to commercialize for it. All these things are keys for your success soon. You share news about different companies, technical articles and, interviews with different profiles, which is an indication of your bright future. I wish you continue this great work and keep it up.

5. As a student chapter, we have achieved many awards like gold standard and outstanding awards, what do you advise us to do to conserve these great awards?

Always think and act that you are not alone. Student activities are very great in integrity and team work. The industry is built on having team work, knowledge and, best practices. You did a great thing so keep your engagement with the industry and try to select good topics for your projects and events and, I think you actually do that. The future is yours, so keep challenging.

6. What are your plans to support student activities in Egypt?

I have many ideas to support all students. One of them is already implemented, which is giving the practical exposure to the students. They know about our different product lines and technologies through filed trip to our bases. Also to make sure our latest software programs are installed in universities labs. We also sponsor selected graduation projects of students at different universities.

7. As one of Egypt oil and gas leaders, we would like to discuss your expectations for the future of the industry in Egypt and the region.

The future of the industry in Egypt is very promising. Egypt now has huge discoveries and projects like: ZOHR field, West Nile Delta and Red sea. I think you will have a fantastic future.

8. Kindly, leave a message for senior students and fresh graduates who are about to join the industry at this time.

My message is to be very positive, do your best and always know that your success depends on your team. Always learn and improve your skills. Take every opportunity to add to your career.

Reservoir-Integrated Production System

The smarter way from oil flow to cash flow

Introducing the reservoir-responsive Schlumberger integrated production system equipped with leading process technologies, connecting subsurface and surface expertise from design through operations.

Multidiscipline remote monitoring

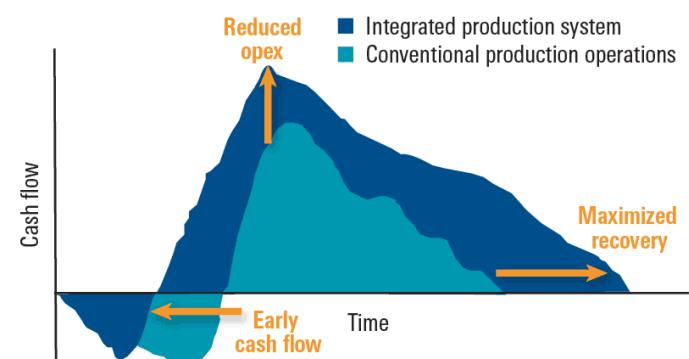
The fully integrated production system globally connects the subsurface with the surface. Changes in production are proactively matched and managed, with the constantly updated reservoir model serving as the vital narrative guiding maximum recovery and optimization for any targeted production rate, effluent condition, or export quality requirement.

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Seamlessly connected, digitally enabled, and software controlled, the production system integrates data analytics, process modeling, and automation of best practices to ensure flow assurance and optimal production.



Our integrated production system provides operators with a global solution that fully connects the subsurface and surface and creates value at every stage in the production life of a field.



Obtain first oil faster, achieve early cash flow, stage investment decisions, reduce risk, and maximize reservoir recovery.



Interview with Mr. Robert Ziegler

**Global SME Managed Pressure
Drilling at Weatherford &
Global Deepwater Advisor**

By Mahmoud Morsy

Firstly, Could you tell us more about your professional career? How did you manage to be the Global SME Managed Pressure Drilling at Weatherford & Global Deep-water Advisor?

Well I studied petroleum engineering at Montan University in Leoben, Austria, Europe. I was lucky with my professor that time because he was one of the well-known engineers in fracturing. I learned a lot from him. Then I was required to take Shell Distant learning Program to be a certified drilling engineer and supervisor. During my time with shell (1991-1996), I worked as a drilling engineer in the Middle East and West Africa. Then I moved to work in Oman as a completion and artificial lift Operations Engineers. The Oil was very heavy there and most of them were using PCP in a slow rate. Then. I worked for Chevron as a Deep-Water Drilling representative in West Africa. After that, I worked as an exploration manager at Public Investment Fund, then I returned to Shell as a regional-wells technology operation manager in Asia pacific region. In August 2009, I moved to work as a head of Deep-Water drilling in Petronas. Also I worked in many places after that like Cairn India Ltd and RZI Deep Water Drillling leaders where my job was a strategic consultant for cutting edge projects, worldwide.

Since Nov 2015, I have moved to work in Weatherford, Huston, Texas area as a Global Director of Well Control Technology. And now, I am the Global SME (Subject Matter Expert) for managed pressure drilling and the global Deep-Water advisor.

2. We are eager to know your plans when you were a student.

I studied at Montan University and chose Petroleum Engineering as I want to work internationally and travel around the world. I came from an engineering family, so I chose to become an engineer too. Specifically, I chose petroleum engineering because it is one of the best professions in Europe and all over the world. At the time, I managed found the first student chapter in Austria which is SPE student chapter. I did a great job with my chapter. Every week there was a company coming to my university to discuss a specific topic, I dealt with many big characters and sponsors. We started recruitment at this time to bring the highly-skilled students. I got my master's degree in Reservoir management from the same University.

3. We need to know more about your volunteering experience.

Volunteering Work is one of the most important things in the life. I have volunteered in many places and the start was with SPE student chapter. With SPE international, I have participated in many events and conferences. I was the program chairman of the Sarawak section. This section was able to double membership during my time. Then, I became a program committee member in SPE/IADC MPD/UBD Conference and the same for the Arctic Technology Conference. I am responsible for setting up the drilling sessions since the beginning of this conference. In 2014, I was the chairman of the program committee of Offshore Technology Conference (OTC) Asia. This was the first time OTC took place in Asia Pacific. We achieved more than 25000 delegates. Also, I am a member of the MPD/UBD committee in the International Association of Drilling Contractors (IADC).

4. What is your opinion about ECHO magazine and how to keep developing?

You really did a great job with your magazine. It's a very nice and professional one. Every year try to keep developing it to copy with others around the world. Anyway, your magazine is a big work.

5. As a student chapter, we have achieved many awards like gold standard and outstanding awards, what do you advise us to do to conserve these great awards?

Very nice to converse these great awards, you should be a reference for other student chapters, and I think with this performance that you are very professional. You should keep developing in both technical and non-technical skills. Egypt is a big country in our industry, and I think that many companies will help you achieve your goals by providing you with presentations and courses.

6. What are your plans to support student activities in all over the world?

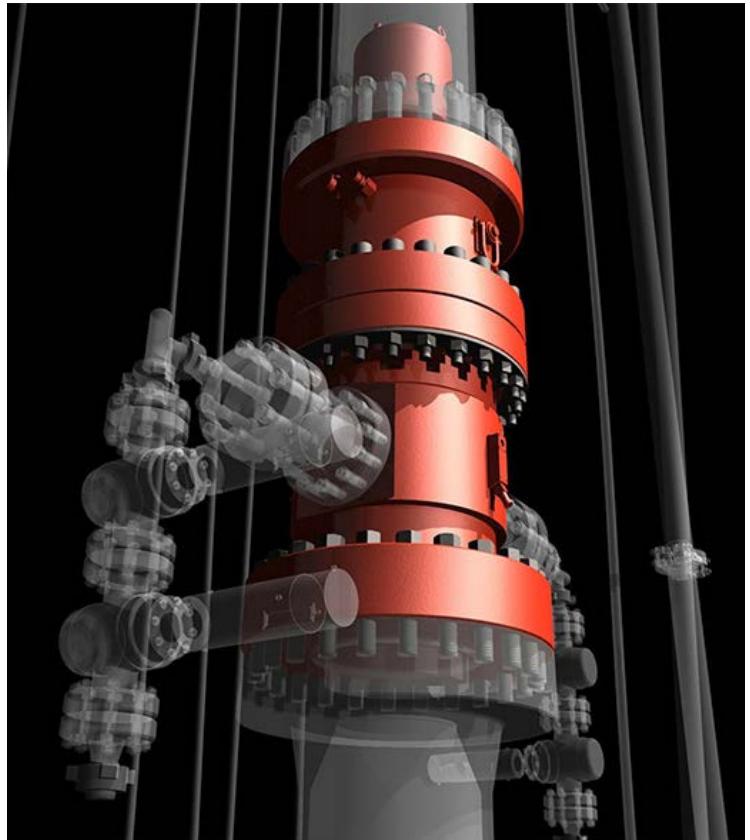
Well, as you know some service companies now are in a bad situation. Thanks to god, Weatherford isn't one of them. We support all of these activities in technical and non-technical aspects, and you can contact our local company in Egypt to get more support. Also, you can apply for internships in Weatherford.

7. What do you expect for the future of the industry?

Very bright future, we still have 65% to 70% of the original oil in place so we will have more and more decades of oil and gas industry. We have excellent researches in different topics like: advanced drilling techniques and EOR. I believe that all these things will lead us to reach our goal so the way is too long for this industry.

8. Kindly, leave a message for senior students and fresh graduates who are about to join the industry at this time.

My message is to see how many graduates like you in many places around the world so why should I hire you? You should stand out of the crowd and do different things. This industry is very competitive so you should cope with its changes. If you like what you study, then you will like what you do. Try to improve your skills and make the best use of them to get a job.



MANAGED PRESSURE DRILLING

Mitigate drilling hazards with precise pressure control

Managed pressure drilling (MPD) provides an active approach to well control. Unlike passive control methods, MPD operations use a closed-loop system that helps to determine the downhole pressure limits and manage the annular pressure profile accordingly. As a result, you can enhance primary well control, verify downhole barriers in real time, and even automatically react to influxes and losses.





Machine Learning for Improved Directional Drilling

Hani Elshahawi

Digitalization Lead – Deepwater Technologies at Shell International Exploration and Production Inc.

Abstract

Directional drilling is a complex process involving the remote control of tool alignment and force application to a very long drill string subject to variable external forces. Controlling bit tool face orientation while ensuring adequate rate of penetration (ROP) is quite challenging.

An artificial intelligence system was developed to learn from the actions of expert directional drillers and the mechanics of drilling simulations. Machine learning algorithms were employed to improve the efficiency of directional drilling: optimized ROP, less tortuous borehole, less personnel on board (POB), and consistency across operations.

To create a system for controlling tool face angle and guiding drill bit sliding during directional drilling, relevant historical data from directional drilling operations was gathered. Much of this data was recorded in the drilling logs, which the drilling operator traditionally uses to control drilling parameters. The collected data was then filtered and used to structure and train artificial neural networks and select appropriate hyperparameters.

The neural network developed could replicate the decisions of expert directional drillers within a small error (<3%). Reinforcement learning was then successfully used to improve network performance, particularly for conditions not previously considered.

Methods, Procedures, and Process
We have engaged in the development of a deep learning, artificial intelligence system to learn from the actions

of expert directional drillers and drilling simulations (Figure 1) and generate predictions or decision-making based on complex patterns in previously collected data.

operation as well as the resulting effects on the drilling tool and wellbore. Much of this information is recorded in the drilling logs and includes differential pressure, rotary torque, hook

Proposal: AI = Reinforcement Learning + Deep Learning

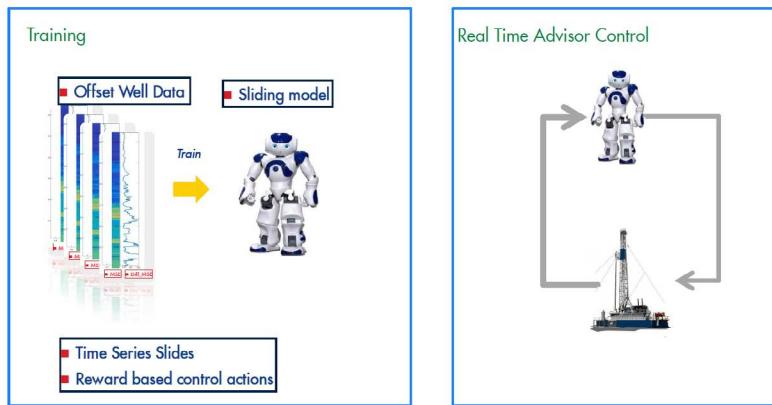


Figure 1: Paradigm for directional drilling guidance system including training using supervised historical learning and unsupervised reinforcement learning (left) and integrated real-time advisor control.

The project was broken down into the following tasks to achieve the stated objectives: information formulation including Operator engagement and data preparation, immersion and analysis including artificial neural network construction, evaluation, drilling simulation, and reinforcement learning.

Before machine learning can commence, it is essential to gather and understand the relevant data. Data scientists engaged with Operator subject matter experts to transfer data that was used to structure and train the neural network. In the case of a directional drilling system, the network requires any available information a driller used when making decisions about slides in a drilling

load, tool face angle, and ROP as well as planned and estimated actual wellbore trajectory. The drilling operator in turn controls weight on bit (WOB), flow rate (GPM), rotary speed (RPM), and top drive center position and torque. Knowledge-sharing meetings between directional drilling domain experts and artificial intelligence data scientists enabled determination of viable learning goals and informed the design of the artificial neural network. Raw data from directional drilling logs was processed, filtered, and parsed to feed it into the custom machine learning system.

The gathered datasets were divided into three separate sets to train and validate the results; training, validation, and testing. Training data is used

in the training of the network itself and will generally comprise the bulk of the collected data. Validation data is used for active analysis of the network during training to prevent training that diverges from a generalized solution. Finally, testing data is kept separate and used only for final evaluation of a trained network.

For each dataset, the collected historical data was separated into input data (the information a driller uses to make decisions) and target data (the actions the driller took). The network ingests input data and compares its own output actions against those taken by the experts to determine whether it has made errors and what those errors are. Over time small corrections improve the calculated output for many separate historical examples and merge into a more general solution to the problem. A network was considered successful if it made similar choices as the experts.

Results and Observations

Historical directional drilling data, including that from measurement while drilling (MWD), were compiled from fourteen horizontal wells in Appalachia and the Permian Basin. In addition to time/date stamps, the data included bit depth, hole depth, hook load, weight on bit, differential pressure, gravity tool face, magnetic tool face, tool face angle, ROP, rotary RPM, rotary torque, standpipe pressure, total pump output, and other, more extraneous categories. The datasets were then unified for use in training and validation (Figure 2). Telemetry data was used to estimate wellbore trajectory and plotted against the planned trajectory.

The neural network predicts future

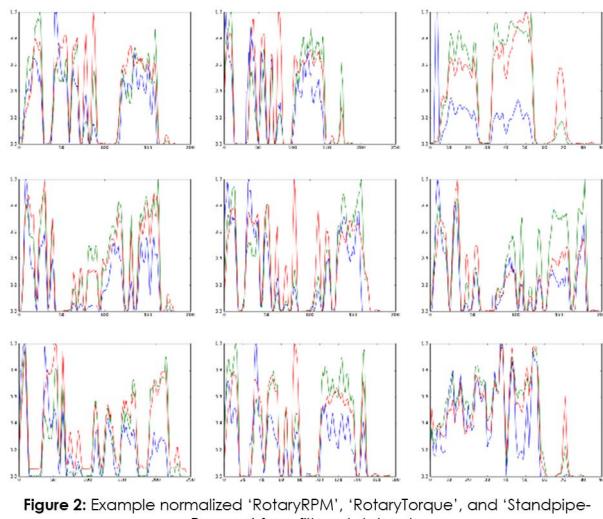


Figure 2: Example normalized 'RotaryRPM', 'RotaryTorque', and 'StandpipePressure' from filtered datasets.

differential pressure and rotary torque based on current tool face, weight on bit, total pump output, rate of penetration, current rotary torque and current differential pressure. In this way, it follows the historical choices of experts. After removing data errors, the directional drilling logs were filtered down to on-bottom sliding events based on a 21-point sliding standard deviation. The data was then split for training and validation, with 377,000 timepoints used for training and testing and 214,000 timepoints for network validation. After 1,800,000 training steps, normalized percentage error for differential pressure prediction was down to 0.21% and that for rotary torque prediction was at 2.72% when tested against directional drilling not included in training or validation processes (Figure 3).

Collaboration with directional drilling experts allowed expedient collection, compiling, and filtering of directional drilling data from multiple rigs in different regions in preparation for machine learning. Unsupervised learning in the form of hierarchical clustering and adversarial neural networks was used to confirm the physical situation, subject matter expert guidance, and inputs and outputs of the drilling guidance system. Training based on these inputs and outputs resulted in an artificial neural network that predicted the choices of expert directional drillers within 3% error.

Future directions for machine learning for improved directional drilling include integrating the system with geosteering information and guidance to improve wellbore trajectory targeting.

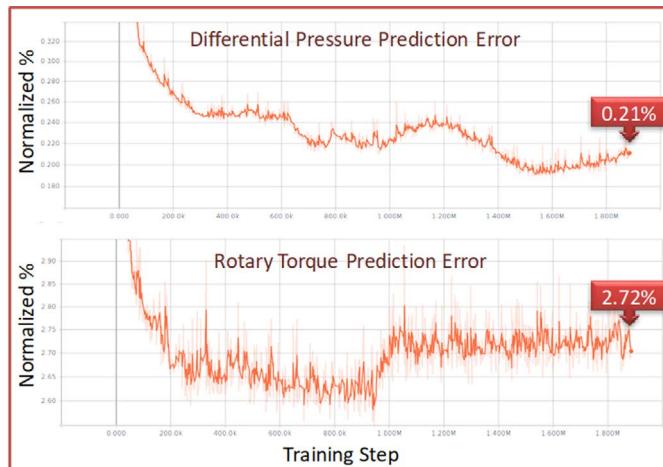


Figure 3: Training results on simple convolutional neural network (CNN) from historical directional drilling data.

Conclusions and Future Directions

The machine learning approaches outlined in this article show great potential for developing an advisory system for directional drillers and ultimately an automated directional drilling rig.

This may involve collecting the information from drilling logs or deriving it from video footage on the drill rig. Additional efforts will focus on integrating the trained machine learning system with a supervisory mode for advising a human expert and testing the system in a real-world drilling environment with the goal of improving the overall economics of directional drilling operations.

This article is based on the full length paper OTC-28633-MS - Machine Learning for Improved Directional Drilling.



Are You Getting the Results You Want?

WE CAN ACHIEVE THEM, TOGETHER

Whether your focus is deep water, mature fields, or unconventional, Halliburton experts will work with you every step of the way to help maximize recovery, increase operational efficiency, and lower your cost per BOE. That's not an empty promise. That's our commitment to you.

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Halliburton Conquering Unconventionals through Collaboration and Technology

As the world's energy needs continue to rise and more countries pursue greater degrees of energy independence, the new frontier of unconventionals will continue to expand. The success of unconventionals across North America will find greater footing in the Middle East and North Africa.

The exploration, development and production of unconventional resources are highly variable and require a collaborative, holistic understanding of the subsurface and the reservoir. Enhanced recovery techniques, such as hydraulic fracturing, combined with innovative technologies can optimize well placement and well design, identify sweet spots and improve fracture treatment and spacing to get more production at the lowest cost.

Halliburton's expertise in unconventionals spans decades as it collaborates with customers to engineer solutions that maximize asset value and lower the cost per barrel of oil equivalent. This objective is realized by accelerating reservoir understanding and reducing uncertainty through subsurface insight, developing fluids to increase drilling efficiency and well productivity through customized chemistry and delivering reliably and efficiently at the wellsite while reducing the environmental footprint.

FracInsight® analysis, a workflow that leverages the best available horizontal well data to select perforation clusters and stage locations, is one of the technologies that play a significant role in developing high performing wells. It is designed to create a more consistent fracturing operation by eliminating the fracturing of nonproductive rock and predicting how the reservoir will respond to stimulation.

The service is especially valuable in new and undeveloped unconventional assets that often require operators prove reserves without the expense of drilling dozens of wells to establish a learning curve. Technologies like FracInsight that draw on basin specific data are critical to driving better producing wells at lower costs.

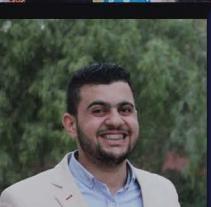
Accurate well placement is another challenge in unconventional reservoirs. Halliburton developed the Radian™ Azimuthal Gamma Ray and Inclination Service, a geosteering solution that provides real-time, high-quality borehole images and continuous inclination measurements, to help operators accurately place the wellbore in the sweet spot for increased production and lower costs per BOE.

Radian recently helped an operator identify previously unseen differences between formation layers to provide a much clearer understanding of the geological structure and position of the well. This resulted in cost savings by avoiding more expensive logging while drilling technology on the job.

Companies expanding their unconventionals presence across the Middle East and North Africa must also overcome the unique challenges they face. Due to the need for long horizontal drilling in the region, and the challenges this presents, Halliburton designed the Geo-Pilot Duro Rotary Steerable System to increase drilling efficiency with a higher rate of penetration. New drilling motor technology has also enhanced reliability so operators can drill longer runs while reducing costly non-productive time resulting from motor failure.

As demonstrated in North America, unconventionals hold great promise and technologies that help reduce uncertainty and increase production are critical to their success.

HALLIBURTON





Industry Threshold



Mike Cherry CEO of Matterhorn Energy

Refracs

practices

you have drilled

and seeing results that equal or exceed the well's initial performance and hold up as if

(matrix and fractures) that were not adequately stimulated, the first time.

Plays that are over-pressured, suffer from an additional deficit, in that, how the well was allowed to flow back after stimulation is as critical as the completion design itself. It is very clear using analytic software, operators that pulled their wells harder in attempt to get higher IPs have indeed permanently damaged the performance of their wells. Thus, one can conclude that conservative choke management is absolutely mandatory to maximize the performance and long-term recovery from over-pressured reservoirs, such as the Eagleford and Haynesville, to name a few of the big ones, with significant data to analyze.

The bottom line is to achieve the best performing wells that greatly exceed their offsets in similar geologic

environments, one must ensure that all productive pay is adequately stimulated and connected with the natural fracture systems that exist in addition to the matrix itself. Bi-wing conventional fracs that are pumped with cross linked gels do not adequately connect the matrix and the fracture system to maximize the stimulated volume. To accomplish a well-designed stimulation, one has to ensure that all pay within a stage is of "like-rock" to prevent the stimulation preferring to go more to the area of greatest permeability, than to the rock with lesser permeability that truly benefits the most from the frac stimulation. This can be accomplished by combining like-rock within stages and utilizing a limited entry approach

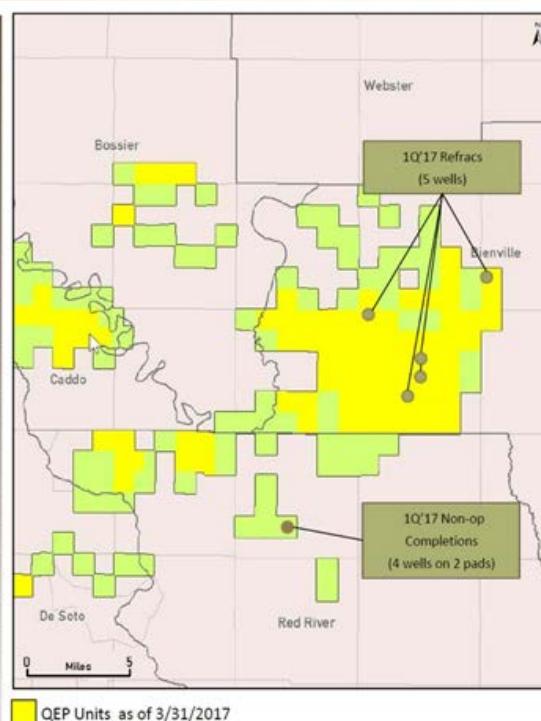
to perforating.

Thus, when best practices have not been adhered to, the resultant wells have been found to be excellent refrac candidates that will truly result in performance equal to or greater than the original completions. Thus, utilizing big data analytics, operators can determine how their well performance stacks up to the competition and at the same time discerning what are the best completion designs that have resulted in the best performance in the plays you are involved. This also provides a tool to analyze who might be the best take over wherein frac designs were not optimized and resulted in wells grossly under-stimulated.

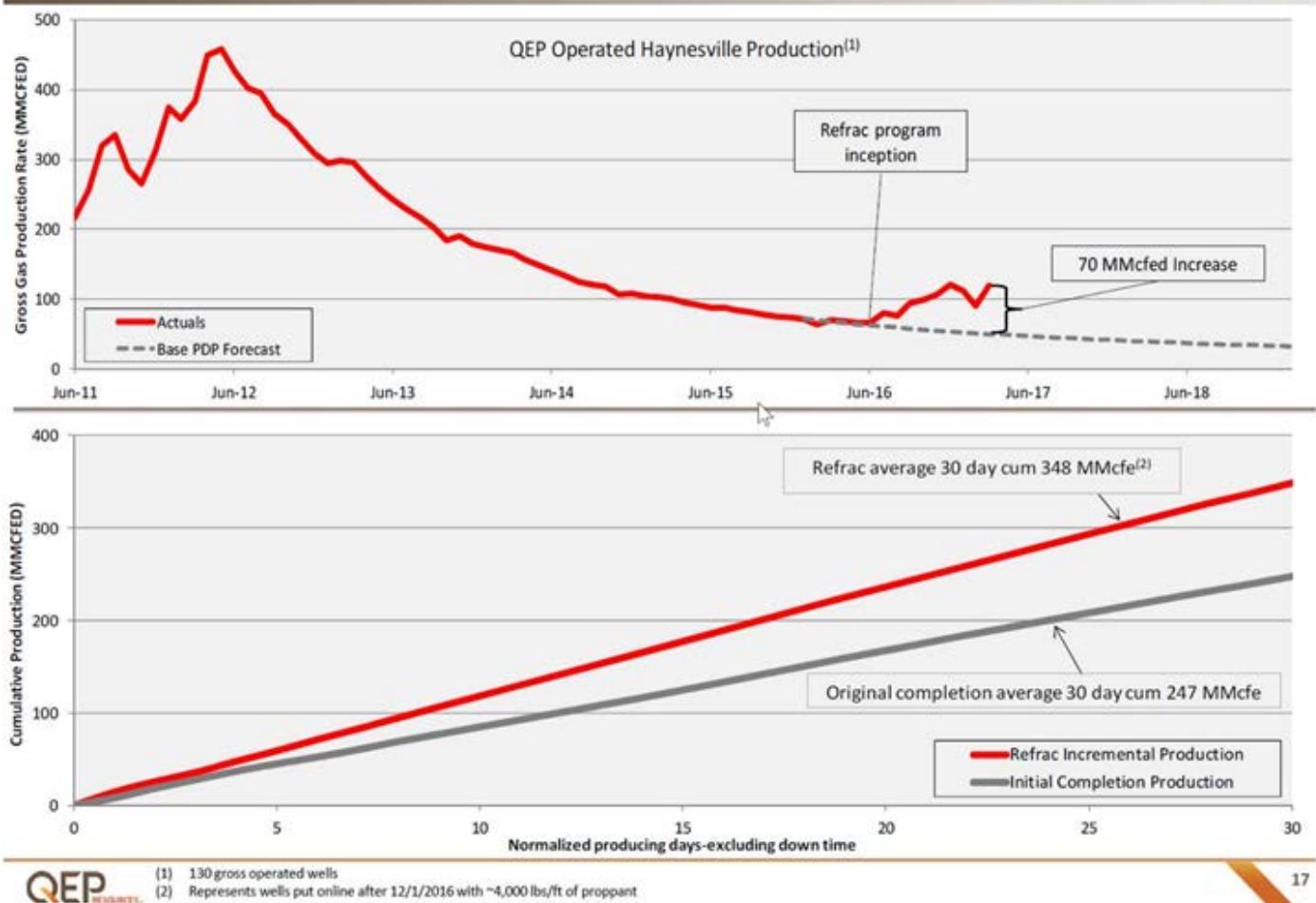
- Completed five refracs
 - Average incremental 24-hour rate increase of 11.5 MMcfed
- Eight new non-op wells brought online in 1Q'17
- Refrac program has increased Haynesville gross production by ~70.0 MMcfed since inception

Well Name	Pre Refrac (MMcfed)			Post Refrac (MMcfed)		
	Restimulated Lateral Length (ft)	Proppant (lbs/ft)	Last 10-day	30-day Cum	90-day Cum	180-day Cum
WAERSTAD 003	2,243	2,386	0.22	197.9	494.3	777.9
B HARPER 23-15-9 H 001	4,352	2,532	0.34	257.7	687.9	1,166.5
BILLY R HARPER 14 H 001	4,323	2,508	0.44	277.6	747.3	1,271.3
MOSLEY 5-15-9 H 001	4,269	2,596	0.46	276.9	743.7	1,191.0
J WOODARD 27-15-9H 001	1,451	3,441	0.47	175.1	446.3	719.9
J WOODARD 34-15-9 H 001	4,211	2,481	0.33	241.5	650.7	1,150.9
SANDERS 8-15-9 H 001	4,560	4,048	0.53	274.8	766.2	
J SALTER H 001	2,971	2,861	0.45	271.9	736.5	
RADZIKOWSKI 17-15-9 H 001	4,440	3,976	0.53	339.0	953.7	
L PARKER 10-15-9 H 001	4,371	5,092	0.28	312.5	906.4	
THOMAS 6-15-9 H 001 ⁽¹⁾	4,533	3,925	0.34	392.1		
MARAK 15-15-9 H 001-ALT ⁽¹⁾	1,534	3,912	0.54			
MARAK 22-15-9 H 001 ⁽¹⁾	4,472	4,076	0.28			
BECKETT 28-15-9 H 001 ⁽¹⁾	3,289	4,048	0.44			
THRASH 30-16-8H 001 ⁽¹⁾	4,388	3,977	0.26			

Haynesville – 1Q 2017 Activity



Haynesville – Well Refrac Performance



Most horizontal refracs have been done on 4000–5000 ft laterals. The two most common methods have been 1) biovert diversion and 2) running 3.5" casing/liners inside wells with 5-1/2" production casing strings. Biovert diversion has not been as effective but the only choice in existing wells with production casing smaller than 5-1/2" and has mostly been done using more conventional, hybrid style of fracs. The best alternative with the best results have been running the 3.5" string and enabling the operator to completely do a limited entry perforating method with a more effective frac design as I described herein to better connect the matrix and natural fracture system.

I recognize there is limited public data on refracs but there have been operators that have been very successful in re-stimulating horizontal wells such as QEP and there are numerous others we are familiar with that have been equally or more successful than even this article displays, that have chosen to not share their data. I can assure you the new refracs have shown to add new reserves and greatly outperform the original wells, as exhibited by QEP.

I have not spoken with anyone from QEP and my comments in this article are not from any information I have received from the company or its employees, but merely observations based upon new refracs with which I am familiar. Congratulations to QEP for great work and your willingness to share your results with the industry! You are to be commended for going beyond what the industry deems an acceptable, industry-standard approach to completion design.

Advanced Technology

Piyush Pankaj

Principal Reservoir Engineer—Team Leader,
Software Integrated Solutions (SIS), Schlumberger



Decoding Positives or Negatives of Fracture-Hits: A Geomechanical Investigation of Fracture-Hits and its Implications for Well Productivity

Introduction

One of the most commonly discussed topics in the context of unconventional reservoirs is the fracture-hits occurring in horizontal wells. The discussion groups are divided into arguments against claiming either positive or negative, and sometimes neutral, consequences of these fracture-hits to productivity of the wellbore. The effect can be as minimal as observing a temporary pressure spike in a well while hydraulically fracturing the nearby well to as drastic as observing proppants flowback, wellbore collapse.

In general, a fracture hit can be defined as any perturbation observed in the wellbore immediately due to a fracturing operation in the offset well. The perturbation may be in the form of change in production, change in pressures, or change in wellbore (cased or open hole) conditions. We classify fracture hits into near-wellbore fracture hits (NWB fracture hits) and producing rock volume fracture hits (PRV fracture hits) (Fig. 1).

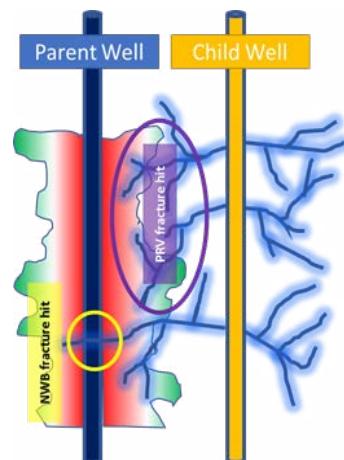


Fig. 1—Defining NWB and PRV fracture hits.

The fracture-hit can further be subdivided into multiple forms of fracture hits:

- A **fluid fracture hit** is a fracture hit that has been caused by clean fracturing fluid only influencing the offset wellbore and no proppants traversed in the fracture face. This may have long-term impact on wellbore productivity; the impact is generally negative.
- A **propped fracture hit** is a fracture hit that has been caused by the proppant-laden fracturing fluid influencing the offset wellbore. This may have long-term impact on wellbore productivity; the impact is generally positive.

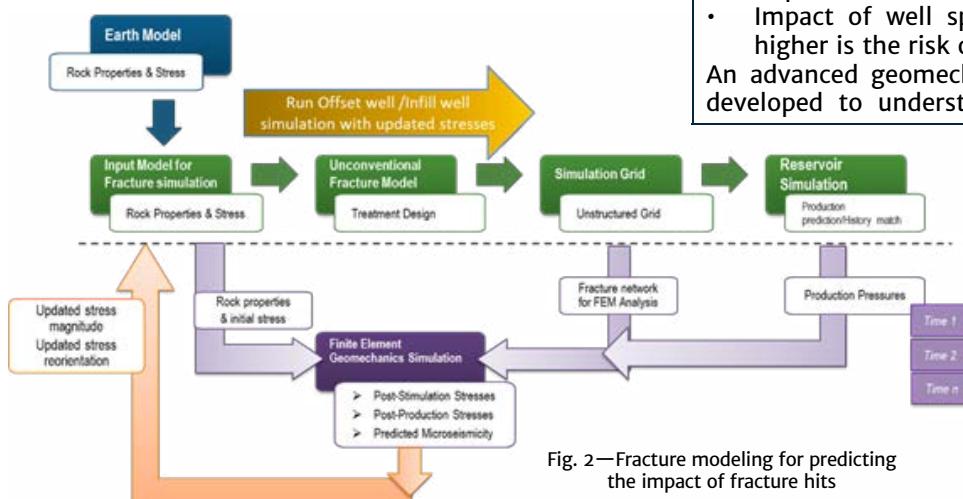
- A **pressurized fracture hit** is a fracture hit that is due to pressure transmission and includes aggravated forms of fluid and proppant fracture hits. However, this does not have a sustained long-term impact on well productivity.

Methodology

The fracture hits may be caused by various conditions of well completion, reservoir properties, or the combination of both. The following conditions are evaluated for estimating the degree of fracture hits:

- Depletion around the parent wellbore and stress change
- Impact of perforation efficiency and open clusters in the child wellbore.
- Impact of treatment design on the child wellbore
- Impact of well spacing. The closer the wellbore, the higher is the risk of a fracture hit.

An advanced geomechanical modeling workflow has been developed to understand fracture hits and their impact.



The modeling workflow includes a series of steps as shown in Fig. 2. The workflow is derived from the workflow presented by Pankaj et al. (2016).

Fig. 2—Fracture modeling for predicting the impact of fracture hits

Effect of Fracture Hits on Well Productivity

As NWB fracture hits occur, the hydraulic fracture carrying fluid at high pressure and proppants would not only touch the parent wellbore but also bears the risk of carrying sand into the wellbore by connecting through the pre-existing hydraulic fractures (Fig. 3). This would necessitate wellbore cleanout and coiled tubing well intervention in the parent wellbore. Additionally, the hydraulic washout of a parent well's near-wellbore proppants poses the threat of losing connected surface area that was contributing to the productive volume for the parent wellbore. This would theoretically cause a drop in the parent well productivity and hence would constitute a "negative" fracture hit from the production perspective. However, if the proppants from the child well's hydraulic fracture imitates connection to the unpropped sections of the hydraulic fracture system, the parent well may suddenly see an incremental productive surface area coming in from the new child well's fracture system. This condition may result in increasing the production from the parent wellbore, which would cause this well to be put in the "positive" fracture-hit category (Fig. 4).

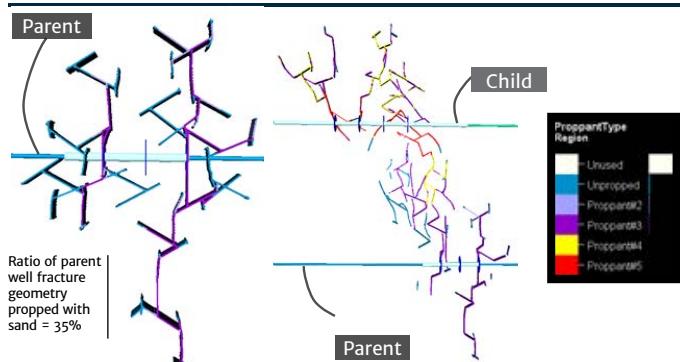


Fig. 5: Left, parent well fracture geometry with proppant distribution. Right, parent and child well fracture grid with proppant distribution.

Conclusions

Fracture hits can have positive, neutral, or negative impacts on productivity of the parent wellbore. The nature of the production result depends largely on the factors such as increase in effective drainage volume as fractures overlap, type of overlap (fluid or propped), and degree of interference between the wells as they compete to produce from the same rock. Fracture hits have been typically considered as a problem when planning the well completion of wells in unconventional reservoirs. Operators have been aggressive in extracting the maximum oil and gas out of the reservoir and wells are placed close together, resulting in continuous fracture hits being observed in multiple reservoir basins. However, predictions of production response to fracture hits have been unreliable. The study presented provides a streamlined methodology to consistently describe the cause and effect relationship of fracture hits. Applying this methodology, operators can improve their well planning by accounting for the positive or negative impacts of the fracture hits.

Case 2: Negative Fracture Hit: In this case, the parent well has more than half of the fracture geometry propped with sand (~56%), and the fracture hit from the child well improves the surface area, when the child well is included in the simulation, the production drops by 17%. Therefore, considering production potential, the Parent fracture hit that had allowed bigger drainage for the parent wellbore did not help to improve production because the child well competed with the existing production drainage volume of the parent wellbore. As a result of the added productive fracture surface area with proppant, the resulting fracture hit would seem intuitively to have positive impact on production. However, because both child well and parent wells are producing, the positive effect of added surface area is not realized fully in the production response because both the wells start to compete for the same rock volume. Therefore, the net effect of production for the parent well due to the fracture hit becomes a negative impact in this scenario. Hence, in this case, the fracture hit can be considered to have a negative fracture hit.

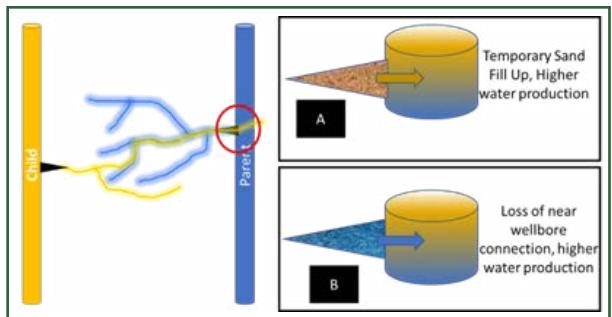


Fig. 3—NWB fracture hit

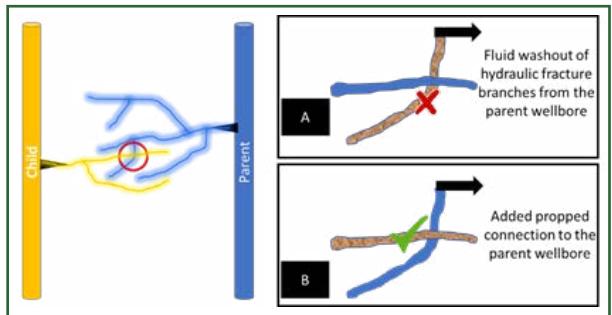


Fig. 4—PRV fracture hit

Case: Positive Fracture Hit:

In this case considered with a different treatment design on the parent wellbore, the hydraulic fracture generated had only over one third of the geometry propped with sand (~35%) and the fracture-hit from the child well improves the propped surface area.

When the child well is not considered in production, the parent well shows an increase in production of over 100% (Fig. 7), but when the child well is included in the simulation, the production of the parent well is around 11% higher than the parent well's production without the fracture hit. Therefore, considering production potential, the fracture hit can be seen as to create a positive impact in production. Positive fracture hit can also occur when existing non-productive cluster from the parent well is intercepted by a proppant laden fracture front from the child well. This would make the non-producing perforation cluster access the nearby reservoir rock through the supplemental hydraulic fractures from the child well.

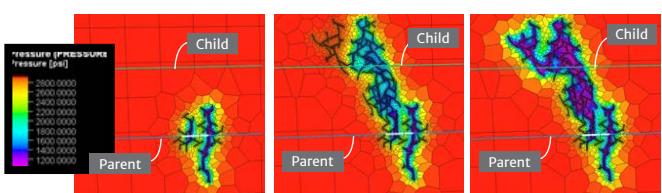


Fig. 6—Pressure depletion at 1 year with the three scenarios.

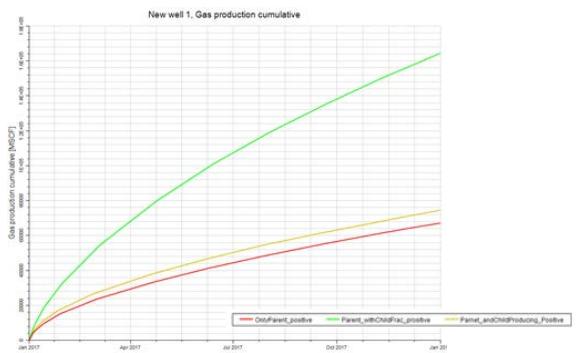


Fig. 7—Production performance with the three scenarios.

PICS 2

Petroleum Industry and Career Summit (PICS) 2 is a mega event organized by SPE Suez University Student Chapter in collaboration with The American University in Cairo SPE Student Chapter in 21, 22 December, 2018. HALLIBURTON, BGS ENERGY SERVICES and, CHEIRON were the main sponsors of the event. Baker Hughes and Weatherford were the other technical sponsors. This outstanding summit included many technical sessions about new challenges in oil and gas industry, non-technical sessions, and motivational talks about idols in the industry. Moreover, industry pioneers talked about current crisis and needed skills to get through it. HALLIBURTON Egypt offered a technical competition between students. Also, BGS ENERGY SERVICES and Baker Hughes provided us with more than seven job shadowing opportunities.



Orphans' Week

What can be crueler than being deprived of your parents and without someone caring about you? Our team wanted to make some young children happy, inspired, and educated. They went to many charities and played with them as well as teaching them some things. The children were so delighted, hopeful, and passionate. The activities were drawing, competitions, reading some stories, and playing soccer. Each day was a different story to tell about how the human can change someone's life easily. Simple things are enough to make someone happy.



Khalda Winter Training

Khalda Petroleum Company provided Suez University students with a highly effective winter training.

The program was to visit different rigs and introduce them to the drilling work environment in addition to giving students an overview about the operations and other departments in the field of the western desert, Egypt.



SPE Suez Developmental Project: Skills Club

Believing in the critical role that business skills play in today's professional world, SPE Suez University Student Chapter launches its first comprehensive developmental project (Skills Club). The goal of the project is to provide Suez University's students with the needed soft skills to perform better in their future professional careers.

The project consisted of several programs discussing various skills such as Successful Interviewing, CV Writing, Public Speaking, LinkedIn, E-mail Writing, Persuasion, Freelancing and Negotiation. The project also included long-term programs for Professional English and Graphic Designing. It is also worth mentioning that the sessions and workshops provided during the project were presented by a talented group of the chapter's current student leaders.

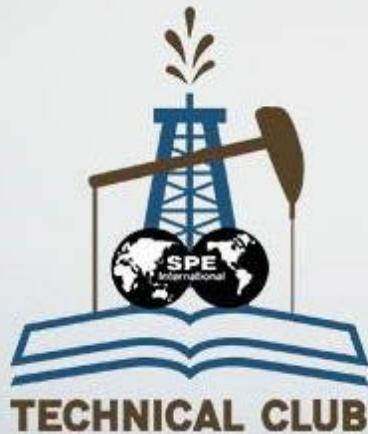
PACE

Great student chapters as SPE Suez, AUC and Cairo, have proven to be the most respectable student chapters in Egypt, may be in the whole world; one of the ways they chose to change the students' mentality, is to organize great conferences, aiming at bridging the gap between the students and the practical field. Petroleum Arab Conference and Exhibition (PACE), is a whole new cooperation between the three student chapters; one that is technically and financially supported by the most reputable oilfield companies ever; one that includes fierce competitions; one that is honored by various keynote speeches about the current status; and for the first time, one that includes a live exhibition from several respectable companies. The conference was held at the AUC from 15 to 17 March '18.



SPE Suez Technical Club

As in SPE Suez we always try to quash the shackles and reach our goals by the most effective and successful ways. We launched the Technical Club for the first time. It is a great project organized by our technical segment. It consists of giving sessions about different topics in our industry like: (FDP) Field Development Plan, Well Intervention, Well Logging, Fishing, Hydraulic Fracturing, and Well Control. We end every day with a competition with remarkable rewards.



EDCTC Leadership Program

SPE SU SC in cooperation with EDCTC provided the students with the opportunity to learn more about the leadership skills with many effective workshops. EDCTC provides a variety of courses as well as needs-based training interventions to their clients. Their work is driven by their team's passion for education, training and development and their complete commitment to offering pioneer services.



STC Course

SPE SU SC in cooperation with Soleman Oil & Gas Training Center (STC) managed to provide students with an excellent course about Well Intervention. It was three days in the center. The students learnt about different techniques and methods. We had a good feedback from all the students.

Case Study

Moustafa Hagag

Geology (Petrophysics) Consultant,
SPE Certified Petroleum Professional (SPEC)



Integration of Petrophysical Inputs in an EOR Project.

A Case Study in a Carbonate Reservoir offshore UAE

Introduction

The field is on production since 1967, it is a carbonate elongated anticline with 160 ft. thickness. With well-developed porosity, but low to moderate permeability, sometimes, intercalated with high permeability streaks. Dense carbonate layers separate the porous intervals. The reservoir is highly faulted. Pressure maintenance is supported by peripheral water injection and central gas injection pattern scheme. As part of the field development, a peripheral water injection scheme is in place, and two EOR gas injection pilots were commissioned in 1998 to investigate the benefits of gas injection above MMP (Minimum Miscibility Pressure) in the low and high permeability reservoirs.

The purposes of this work are to;

- Present an overview on log monitoring strategy for the EOR gas injection pilots.
- Summarize specific actions were taken to gather log data.
- Discuss and evaluate the results.

The Gas Injection Pilots Configuration:

- Central GI Patterns (A, B, C) are 3 inverted 5-spot patterns, each was 1.4 Km² and consists of 1 gas injector (horizontal or vertical) and 1 vertical observation well (100 m distance) and 4 vertical oil producers were used as observation wells.
- North GI Pattern, is a single inverted 5-spot pattern, 1Km², consists of; 1 horizontal gas injector at the center of the pattern, with 1 observation well (100 m distance), and 4 horizontal oil producers, single completion. Figure 1

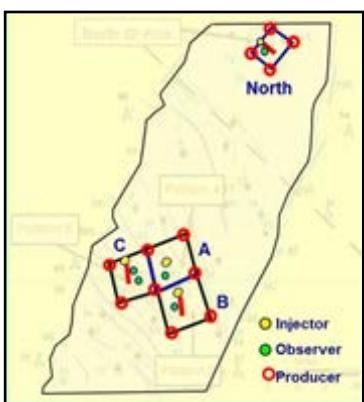


Figure 1: GI Pilot Configuration

The Pilot Objectives:

- Assess the applicability of miscible gas injection as a mean to maximize recovery.
- Identify the incremental benefits of gas injection over water injection.
- Determine the most effective method of long term field development.
- Ensure sustainable production capacity from all reservoir layers.

Log monitoring program was designed to provide log data acquisition, analysis and interpretation to evaluate the gas injection pilot's performance.

Log Monitoring Activities

- The monitoring program was set to accommodate the activities before gas injection phase and while gas injection phase.

Activities before gas injection (planning phase):

1. Designed the vertical observation wells

The well trajectory has been designed to be deviated by 7° across the reservoir section away from the injection well, Figure 2. This deviation assured that the tool "sees" the same side of the hole, decreasing the logs uncertainty.

2. Ensured the integrity of the pilot wells
The isolation between zones of interest had been reviewed by evaluating the available cement bond logs and the shoe bond tests.

3. Selected the logs suitable for gas capturing and monitoring and optimized the running frequency
 - a. The logs had been selected to capture the completely miscible gas in oil and the immiscible gas.
 - b. The full set of the selected logs had been run as base (reference) log, then follow up logs (time lapse).

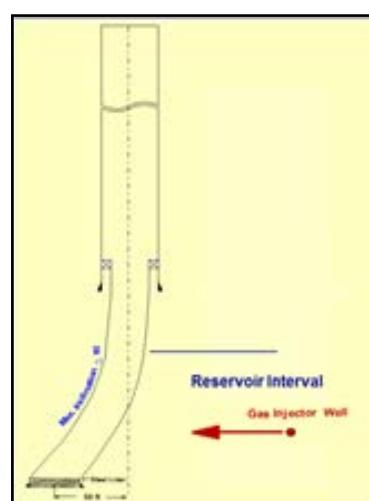


Figure 2: Observation Well

c. The selected logs were:

► **Pulsed Neutron Tool (Σ)**

- Both Σ and Φ are decreased compared base curves.
- Near and far count rates are scaled to overlay in water bearing zones with little or no separation. In case of gas, far will strongly move to the left of near, Figure 3

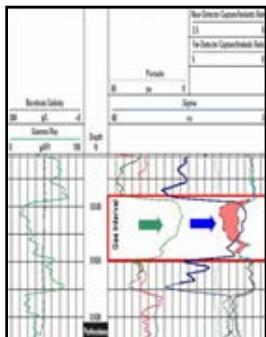


Figure 3: Pulsed Neutron Log (Σ) and NPHI Response in Gas

► **Dual-energy detectors neutron (Φ)**

- Gas has low hydrogen content, i.e., fewer neutrons are absorbed and more reach the detector, the porosity is low.
- The dual energy detectors tool has been selected to differentiate between the effects of gas on neutron from the effect of salinity.
- Three runs have been performed to record the raw data, correction for steel casing and cement are applied
- The tool can't differentiate between the free gas or gas in solution, it responds only to hydrogen index (HI).

► **Array Sonic (DT)**

- It is effective even in marginally cemented wells and can be used to detect gas zones that are not easily recognized.
- Slowness-Time-Coherence (STC) processing is conducted on the raw data to get corrected Dt-compression (DTCO) and DT-shear (DTSM), from which V_p (velocity of compression), and V_s (velocity of shear) are calculated.
- In case of gas, arrival will affect the readings of V_p/V_s ratio, DTCO and DTSM.

► **Temperature (T)**

- Temperature log is used in the detection of gas via the cooling effect of expanding gas in or behind casing.

4. The Selection of Base and Time lapse logs

- Ran pulsed neutron as a base and time laps logs in production wells which were used for observation because of completion diameter restriction.
- In vertical observation wells (no completion restriction);
 - Ran base (Neutron/ Pulsed Neutron/ Sonic and Temperature) as reference logs.
 - Ran neutron Φ log as follow up (time lapse) because it is more sensitive to gas more than sigma Σ based on a SNUPAR simulation study made by Schlumberger.

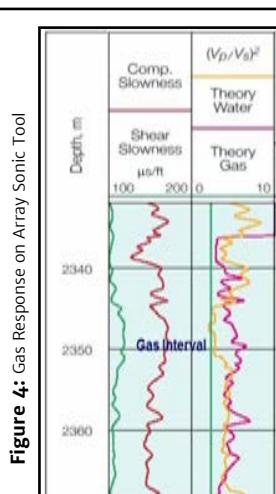


Figure 4: Gas Response on Array Sonic Tool

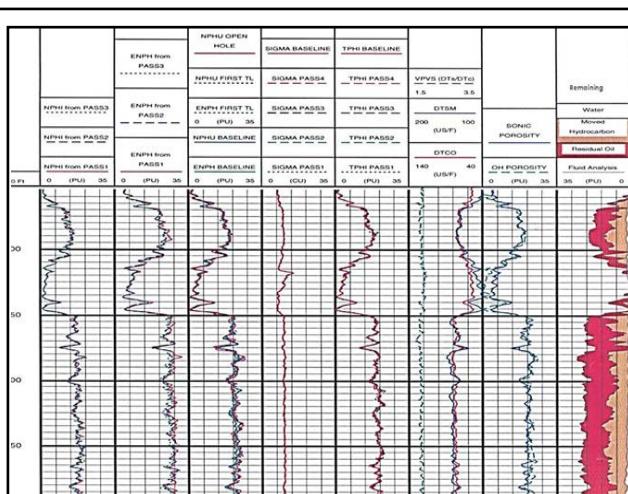


Figure 5: Example of Base Log (Reference) in a Vertical Observation Well

- **Figure 5 shows an example of base logs (Reference) were run before injection in a vertical observation well.**

While Gas Injection

► **Ran Base and Time Lapse Logs**

The gas injection started in 1998 after running base (reference) log in all observation wells and because of the completion size restriction; only RST-A (OD 1^{11/16}) was run in the producers as base/ reference logs.

► **Time Lapse Logs**

The CNT-G (Dual Energy tool of Schlumberger) tool was run as follow up logs in vertical observers, and the RST-A tool (Pulsed Neutron toll of Schlumberger) was run as time lapse logs in production wells.

► **Ensure Uniform Gas Intake over the Injection Intervals**

To ensure the successfulness of the gas injection process; the production logging tool (PLT) was run in all gas injection wells. The log interpretation showed uniform gas injection intake across the injection interval and no gas leakage behind casing.

► **Injected unique chemical tracers in the injectors**

To understand the geological complexity of the reservoir and to review the preferential path of the injected gas, four unique chemical tracers were injected in the gas injection wells. The tracer analysis showed that the injected gas distributed among the reservoir in different ways.

► **Evaluated the Results**

The miscible gas injection for the rest of the field was approved as a mean to maximize the field recovery.

Summary and Conclusions

An EOR gas miscible project was conducted to enhance the productivity of a carbonate reservoir. The Petrophysical log data played a big role to the success of the project. The log monitoring activities had been started even before gas injection by designing the observation well and reviewed the integrity of the pilot wells. The proper reference logs and time lapse logs were properly selected, optimized, and interpreted to capture the gas response across the reservoir on time. The gas injection intake across the reservoir was reviewed to ensure homogeneous distribution. The conducted tracer analysis revealed that the reservoir is more complex than expected. Due to well log monitoring management and control; the gas miscible gas injection was approved as a mean to maximize the field recovery.

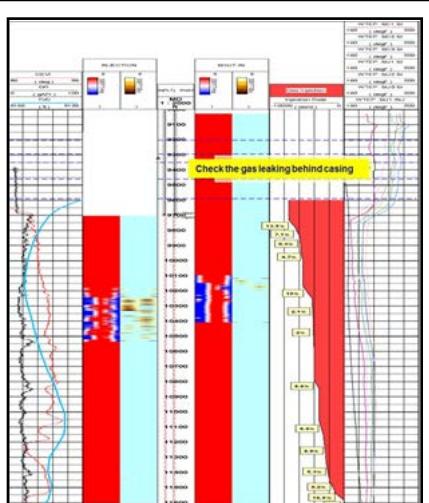


Figure 6: PLT Display of Horizontal gas Injection



ESPtoy: Educational Simulation Software about Oilfield ESPs

Burney Waring

Former Principal Technical Expert at Shell and Director of Retirement Testing at Waring Retirement Laboratory

I made a work-toy! I hope you have fun with it.

ESPtoy is an instructional simulator that I built to help teach Engineers and Operators about the dynamic performance of Electric Submersible Pump (ESP) systems. It's free for non-commercial use. I was lucky to have 50+ LinkedIn friends help me test ESPtoy, catching many bugs, problems and providing so many great ideas.

Instructional Simulations

Decades of teaching Engineers and Operators inside oil and gas companies around the world have required me to learn various instructional techniques. I struggled with teaching certain topics where dynamic behaviors were involved and where there were multiple interacting variables so I started using simulations. Simulations have definitely helped my students to learn difficult topics.

Gamification

The gamification of learning is a huge area of R&D and practice.

My own most 'pure' form of gamification: I ran an exercise for experienced engineers called "Production Technology Quiz Bowl".

Back to ESPtoy, it is very easy to create 'games' for the learner around simulations. ESPtoy can be used in multiple game-like ways, including: The Base Case, which is the default mode, provides the user with a wide-variety of changes that they can make.

In this mode, the user changes to pre-defined scenarios to see some typical things that can go wrong with ESPs, and then must come up with ways to mitigate these problems.

In this mode, the user changes to pre-defined scenarios with a short backstory and must try to find the best solution.

Although ESPtoy comes with 15 cases built-in, it doesn't preclude anyone from inventing additional cases with their own descriptions and settings.

Note to Instructors: If you teach any sort of software, consider adding game elements to your exercises.

Realism vs. Veracity

It isn't necessary to create a highly-rigorous simulation. For teaching purposes, the results only need to reflect a realistic behavior to give a student an intuitive sense for how a dynamic system behaves, how

multiple changes interact. So, ESPtoy has the right equations and the right behaviors for increasing viscosity, specific gravity, and pump wear, but doesn't have rigorous multiphase flow, PVT, enthalpy balance, pump catalog, hundreds of inputs, etc. that are needed in a rigorous design and analysis software.

Building ESPtoy

I've been programming on and off for 42 years on various systems and in various languages.

I chose Python for this project. Python is amazing for many reasons, but I will pick two of them:

- There are multiple ways to write software, and Python can handle any of them.
- I knew I wanted to build a very visual simulation and did not want to be restricted to standard Windows motif. I wanted to make what is basically a game. The Python community has a library called Pygame.

If you are going to use Python, you might have a look at Anaconda to help get everything in place.

Why is ESPtoy Free?

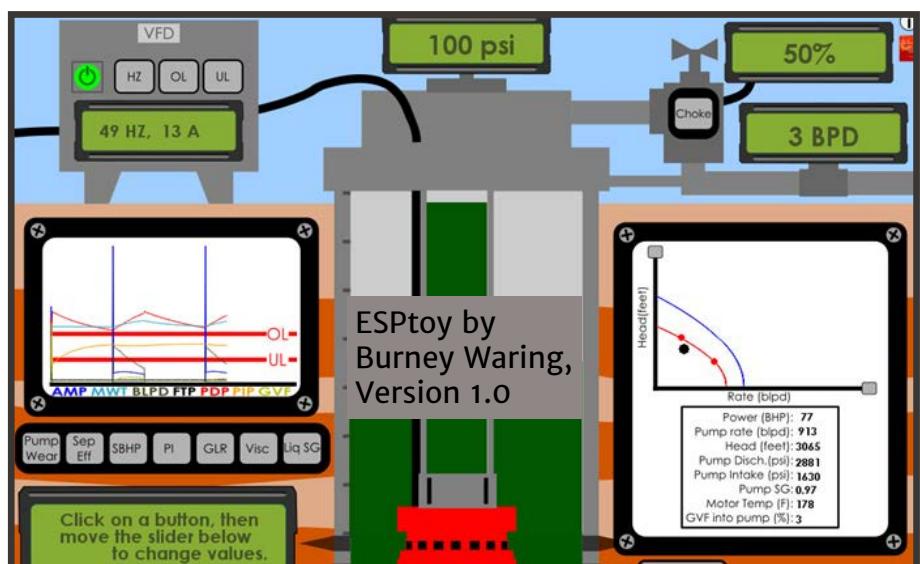
After a long debate, I decided that my primary happiness in projects like this comes from the joy of creating new things and from the feedback I get when I help people. So, to optimize my own happiness generation, I decided ESPtoy should be in the maximum number of hands possible.

I'm retaining the right to negotiate the commercial uses of ESPtoy.

What's next?

Gas Lift was my second completed work toy. Working on other toys on other topics? Almost certainly, yes. For example, topics related to Production System Optimization, one of my other favorite areas of study.

More information about ESPtoy:
www.waringworld.com/esptoy/README.html



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Acing the Job Interview

Who is interviewing whom?

Rowena Moraes

Curated Learning, Communication, Content TEDx Speaker,
Editor, Writer and LinkedIn Profile Writer

**Recruiting done right is not about filling seats,
it's about building the future of a business.**

**Edith Cooper,
Goldman Sachs**

This is a powerful statement which, at first glance, seems pretty ordinary. Yes, we know that recruiting is about getting people on board. When you have many roles to fill, however, it can feel a little like a race to fill seats.

As a potential recruit, you want to see any role you are interested in as part of something much bigger. It helps you approach your role and contribution within a wider context, enabling you to see more opportunities, threats and risks. Acing the job interview is a tough thing to do. There is no finite set of things you should do to get through an interview successfully. There are a myriad number of factors that can affect the interview.

1. An interview is a two way street.

This means that the interview is not just about the organisation. They may have called for the interview and may appear to control many aspects of the recruitment process but this is also your interview. It is your opportunity to ask questions about the organisation. It is incumbent on you to do as good a job as you can to find out all you need to know about who you want to work for.

2. Do your research on the organisation and who will be conducting the interview.

Preparation is key. The better prepared you are, the better you can cope with any changes that come your way. There is more opportunity to get background information on an organisation today than there was before. It's not information for the sake of information. It's pulling together the right information which together presents a picture of the organisation.

3. The interview itself – scare tactics, psychometric tests, stress, format (phone, video, out of office, group interview).

Large organisations typically have a range of tools and techniques to help them make an accurate assessment of candidates. Some interviewers use scare tactics for one simple reason. When you put a person through a stressful situation, a candidate's real nature will show up from under all the polish and preparation. Stress in any interview can come from many aspects. The best way to prepare for these situations is to stay as true to yourself as you can and remain as calm as possible.

4. How will you deal with the salary question?

You can either get this question very early in the process or at the end. You cannot control this but you can spend time to prepare for this in advance so you know what to say. They may believe they can ask but you also have a choice as to what you want to say, how much information you want to divulge as well as the timing of delivery. Frankly, the older you get, the better you get at handling these sensitive questions, in my opinion. When you're young or inexperienced, you may feel not in control of the situation and so, cave in at these points. Over time, you realise that salary is really the last of the big issues. Sure, money and the reward package are relevant factors but so is the timing of these issues. If they have the wrong person for the role or the interviewee is not interested in what's on the table, salary is irrelevant.

5. Have questions for the interviewer.

How can you not? They are considering having you come on board and you need to do the same. You will be curious, you will have many questions. Your job is to figure out which are the most important questions to ask during the interview and which should be follow up questions.



6. The absolute basics.

The absolute essentials appear very sensible and yet, reality will show you that different people have different ideas of what it means to get the basics in place. The absolute basics are the things you cannot afford to avoid or forget. These include things like the way you dress, punctuality, your body language and more. Dress should be more comfortable than stylish but still exude the personality you want to convey. Be mindful of every aspect of your body.

Go through possible interview scenarios beforehand and think through your possible responses. It is less about memorising what you're going to say and more of having a purposeful approach to every question so that you're not off guard with new situations.

In many ways, you cannot fully prepare yourself because the interview is a dynamic environment with both visible and invisible agendas. The best you can do is prepare yourself as best you can and allow yourself to be truly authentic. This means that if there is no fit, you're happy to let it go. This means that if they don't necessarily respond well to your answers or you didn't like the way things progressed, you're happy to move on to something else.

7. Prepare your stories.

Interviews are stressful enough without the added discomfort of dealing with really tough questions. You want to review your career history, concentrating on particular challenges faced, significant milestones, promotions and censures and make notes for yourself on these situations. Review how you'd like to describe these situations and in effect, prepare your stories. When you do this in advance, you can pull up your memories and answer any questions with ease.

8. Find other employees (past and present) and get connected.

A network like LinkedIn enables you to see the people who have either worked at or are still based at specific organisations. Feel free to reach out to connections to get their feedback on the organisation or culture.

Feel free to ask connections to introduce you to their connections who are currently there, so you can ask them questions. You won't know until you ask. In many ways, the more information you have, the more you will feel that you can make an informed decision.

9. Arrive early

This deserves its own dedicated space because this in itself, is worthy of much. Arriving early helps to get you into a good place mentally. It also signifies to the other party that you have a healthy respect for their time. Arriving early is a good first impression to make.

10. Tell me about yourself.

This is a good thing to figure out early in your career. While it is very useful in an interview setting, it is as useful in a casual environment with friends as well as at networking events. This is easier said than done because the aim of this exercise is not to present yourself as a role or set of attributes. It is also not to describe yourself in terms of what you're not. So then, who are you really? It's a coming together of all of your work history, interests, passion and motivations. It's both the professional and the personal amalgamated. The easiest way I can see you attempting this is to think of how best to describe yourself in two sentences. If you can describe yourself in two sentences, you can easily transition to a much longer description effectively but this does not necessarily work the other way around. It's also useful to regard this as a periodic exercise, in which case, you're not beholden to a particular description for all time. As circumstances, jobs and interests come and go, the way in which you describe yourself should also be allowed a degree of flexibility.

11. Solid exit strategy

A good first impression would do well accompanied by a great exit. This involves being very aware of both verbal and non verbal cues and addressing this where you can. Take charge by identifying what you see as the next steps or propose them for added clarity.

In closing, you would do well to remember that all the work is done in preparation for the interview. If you had to panic, you don't do so at the interview but well before. Do your research, think of good questions you can use to guide your research forward and prepare yourself in all the ways possible to get into that situation well-armed. Once you're in, let it go. Roll with the punches, put it all out there and let the cards fall where they may. This is how I believe you can ace that job interview.

Are You Using All the Power of Personal Branding in Your Life and Your Career?



| Elisabeth Casaposa

Personal Branding Coach

What's my message for you today? Create and start developing your personal and professional brand, so you can start creating and taking advantage of the many opportunities. Today, I will consider myself a winner if you finish this article. In the next lines, I will share with you my very own Transformational 5 Rings Methodology. You can apply my methodology start reaching for your dreams. Branding, it's a step-by-step process where your total image changes, a transformation that will change your life forever. In less than just a few pages I will share with you the secrets of how to build a stronger total brand.

The 5 Rings upon which our lives circle about today, must grow simultaneously in parallel to present a well balanced and multidimensional symmetric view of yourself. But before I share with you about my transformational 5 rings methodology, which I have named "the let go effect".

The importance to choose the "Let go Effect"

Have you ever felt the freedom of quitting a job you really hated? I have. What happens next is extraordinary, You find yourself having lots of time and energy, which of course must be redirected.

Make sure you start right away by cleaning up your schedule of all of those things that have been making you a busy, but not a productive person. Work with a coach, someone capable of pointing and guiding you in the right direction. The "Let go Effect" it's about your mindset too. Negative and wrong messages can get a hold of our brain and could be trying to very easily drive our lives. Stop chasing

dreams...and Start owning them! Now let me share with you briefly, my 5 rings methodology

Ring 1 your Lifestyle and Health.

You need to become a total match for the dream you are wanting to own. We all have the same 24h/day, it's how we use those hours that defines and separates us from the crowd. Take control of your life and own your schedule.

If you want to change something around you, please make sure you start changing the way you treat yourself.

Ring 2 your Professional Career.

Decide what you want to do. Break your goals down into actionables steps. Your goals need to be specific and measurable. Build a professional business map. Write down exactly where you want to go and design a solid plan on how to get there. Get the benefits and results you deserve.

Ring 3 Entertainment, Time and Money Freedom.

Stay optimistic and increase your confidence. Do you think I was born as an optimistic and confident person? Absolutely not! that was literally stopping me from growing. Don't do that to yourself! Read, watch youtube videos and learn how to be confident, whatever it takes, do it now. Everyone wants time for entertainment and freedom. Learning how to attract that. Define yourself, your passions, your strengths.

Ring 4 Relationships.

Did you know that the 5 people you are expending the most time with in your life, are earning similar money

than what you make?. Stay focus on what and who you love. Be selective and make an impact within your community.

Ring 5 Digital Presence.

Today, all life coaches really need to include motivation in their speeches and conversations. Thus the reason I feel that I need to share with you my love for coaching to help you reach your goals, and combine it with my digital marketing experience to help you know the benefits of My Transformational 5 Rings Methodology. The 4 first areas are building our own brand. Now it's time to develop your image online. Build your profile online using the power of videos and professional photos. Build your own website with your own domain and start blogging. Start managing your social media profiles in the right way.

My advice to you is, build your brand if:

1. *You are looking for the next step in your career.*

You will have the ability and the power to get the results you want if you start taking control of your own brand.

2. *If you are an entrepreneur or a business owner that has a blog or wants to be a blogger.*

Start building your own brand because people will buy your book when they have already developed a link of trust with you. you need to share your story and build levels of trust between you and your clients.

3. *If you want to learn the secrets and rules of the online game.*

Building your own brand is a non-negotiable step. Now make the right decision.

You can change yourself. You have inside of you the power to do that. You can not change the situation around you.
Change your mindset.

5 Rings Methodology

My Transformational

When I wake up every morning, I feel happy to start a new day with the opportunity to transform lives. When you finish putting together your own brand, and even during the process, you will see your coworkers, your friends and your family treating you differently. Don't be surprised, it's natural, and a great part of my dream is to be with you during this transformation; coaching you step by step and introducing you to all of the digital marketing tools.

We are capable to do, learn, and build incredible things. but We have only one lifetime to do it, not more not less. we need to decide to do it, the earlier the better. God built me with a set of fantastic tools included. I just needed to start using them. Whether you believe in God or another powerful force, you know that inside you is more than what you are sharing with this world today. I made the decision to be free, to be happy, to be in love with my life. I didn't come here by simple jumping. I planned a way, I learned new skills, and I discovered and applied the "Let go Effect" fully upon my life. I started from scratch, like good bakers bake great cakes. I changed my old mindset and started to build and own my dream. And this journey it's been exciting and continues to be, as it continues to remind me who I can fully be, the best version of my own brand.

Errors that a lot of us have done and you should avoid:

Is your brand making the impact you expected?
Are your social media profiles giving you the results you want?
If the answer is no, it is because your 5th ring has not been built yet.

Have you ever seen a woman put on bad makeup? what happens if the same amazing woman cleans her beautiful face and uses some top of the line make-up, well? She's improved her image, right? Something very similar is what happens when I'm coaching one of my clients and we start developing their unique brand with them. You may want to apply the new "make-up" yourself, but the hand and expertise of the make-up professional really makes a difference. So I advice you to find yourself a coach like me, who can fully support you, it is extremely essential.

Write in a notebook the 3 areas that you are most interested. These are your true passions.Then you need to write in your notebook the 5 jobs you are good at doing . You will define your vision and mission and focus on what you have the ability to develop. Define your goals, and start transforming your ideas into actions.

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