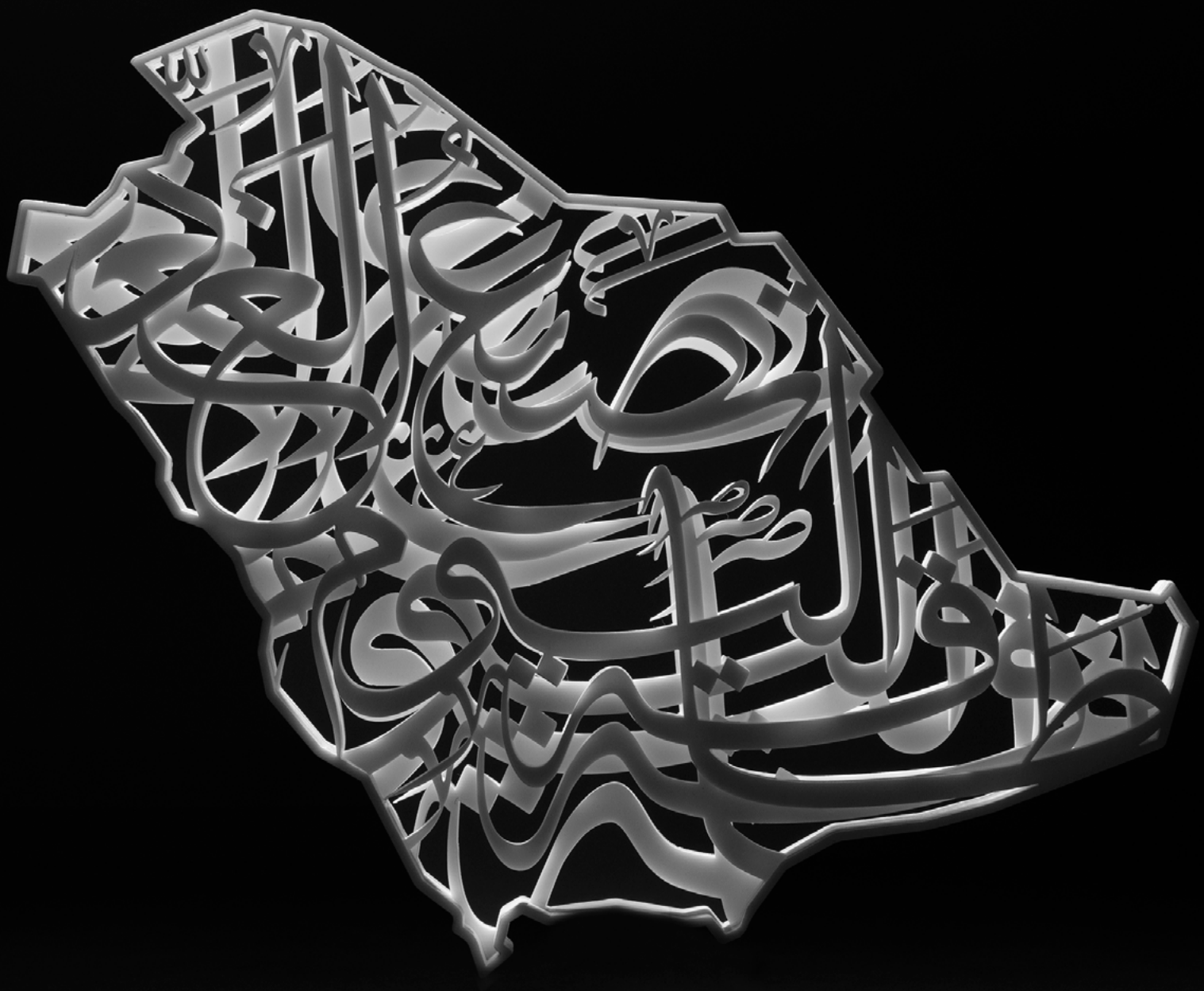
November 2021

SandRose Magazine



SPE International

Kingdom of Saudi Arabia Section

TODAY'S ENERGY

SHAPES OUR TOMORROW

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NOVEMBER 2021 ISSUE

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SandRose Magazine

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We want to hear from you.
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Nasir K. Al-Naimi
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Letters from THE EDITOR-IN-CHIEF

Dear reader,

It gives me great pleasure to welcome you to our first edition of SandRose Magazine for the 2021-2023 term. The theme of this issue is "Today's energy shapes our tomorrow," paying tribute to the energy industry's role in advancing our world by powering our lives and creating a better and brighter future for all. When we refer to "today's energy," we also celebrate the energy industry's greatest asset: its people. This idea is corroborated by a milestone that the SPE-KSA section achieved in July 2021 when we became the largest SPE section in the world. We proudly commemorate this occasion with messages from the SPE-KSA Board of Directors and SPE International leaders.

In this issue, we introduce an editorial celebrating the Kingdom's energy journey from 1930 to 2030, exploring the evolution and transformation of the energy industry from its inception in 1930 to the present day as well as the road ahead to achieving Vision 2030 ambitions. In this issue Mr. Fuad Al-Therman pens a poignant article reflecting on the importance of aiming to achieve our personal best by challenging ourselves. The SandRose editorial team also interviewed Saudi climber, Abdulrahman Al-Abdu about the sport and the life lessons it provides. Much like Mr. Al-Therman's sentiments and ambitions, the drive to climbing the greatest peaks always originates from a deep-rooted desire to defy our limits. In this issue, we also introduce the "SPE-KSA Members Spotlight" to celebrate the people behind the success of SPE-KSA. We are delighted to inaugurate this feature with SPE MENA Regional Director, Mr. Faisal Al-Nughaimish. Towards the goal of honoring SPE's mission to promote knowledge dissemination, we feature hand-picked technical papers covering the latest innovations from the industry. Furthermore, we are proud to introduce the SandRose Technical Paper digest, summarizing paper recommendations from subject matter experts (SMEs). With the commencement of this new SPE term, SPE-KSA has already organized a host of activities that we are proud to highlight in this issue—starting with the newly established D&I Committee's "Importance of Diversity and Inclusion in the Workplace" panel and the Student Outreach Team's Energy4me and school visits programs.

I would like to thank Schlumberger for sponsoring this issue. Your support and partnership is instrumental to the success of this magazine. I would also like to thank SandRose contributors and the editorial team for their dedication and enthusiasm. Finally, I would like to thank former editors-in-chief Hala Al-Hashmi, Salma Al-Hashmi, Hind Al-Rayes, and Rawan Al-Nasser. Thank you for your support and guidance with this first issue.

As always, we are looking for talented writers and artists to feature in future issues. To provide feedback or contributions, please don't hesitate to contact us at ***sandrose@spe-ksa.org***. SR

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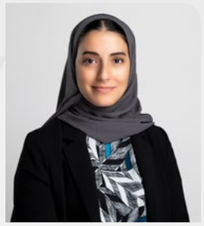

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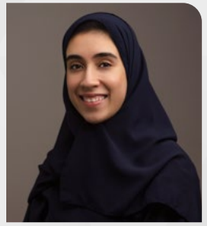

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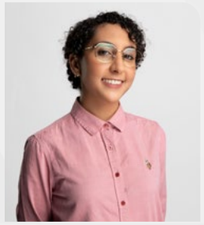

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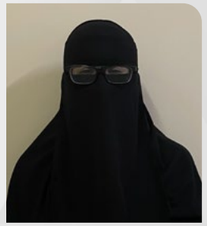

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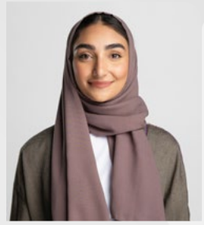

RAWAN ALDOSSARY
Marketing Liaison

Letters from SPE-KSA CHAIRMAN

Dear reader,

As chairman of the SPE-KSA section, I am delighted to welcome you to this new term and the first edition of SandRose Magazine. The mission of SPE has always been to promote knowledge dissemination and to promote the technical and professional competencies of SPE members. Since the establishment of SPE-KSA in 1959, the section has continued to uphold this mission and expanded our role to social responsibilities and stewardship towards our community.

In 2021 we started this term on a high note, officially becoming the largest SPE section in the world. I want to acknowledge the outgoing 2019-2021 committee and all proceeding terms for paving the way towards achieving this remarkable milestone. Additionally, I would like to thank SPE-KSA beneficiaries, members, and volunteers for their support, allowing us to continue to thrive to reach the success and renown we have today. In this special edition of SandRose, we commemorate this landmark accomplishment with quotes from the SPE-KSA Board of Directors and SPE International Leaders.

In the 2021-2023 term, we are also excited to introduce a host of exciting programs and initiatives revolving around three key themes: Energy, Sustainability, and Digital Transformation. The inspiration behind these three areas is centred around the unique times we live in. The role of the energy industry has continuously evolved. In our current time, in addition to extracting and producing energy, oil and gas companies are also now focused on doing so efficiently and more sustainably, making them leaders in energy and stewards of sustainability.

This term, we look forward to bringing back some flagship SPE-KSA events and programs in addition to introducing a host of new programs by capitalizing on the synergy between the physical and digital worlds and in service to our industry and our society.

True to the mission of SPE, in this edition of SandRose, we introduce an array of technical articles, and we also highlight some key SPE-KSA events from the newly established Diversity and Inclusion Committee and the Student Outreach Team. Finally, I would like to thank the SandRose team and contributors for their hard work and dedication in creating this issue, and I look forward to the future instalments of the magazine. SR

DR. AHMED BUBSHAIT
SPE-KSA Chairman

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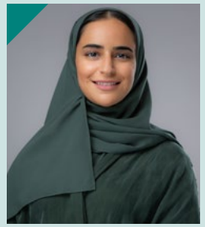
Introducing the
SPE-KSA 2021-2023 EXECUTIVE BOARD

DR. AHMAD BUBSHAIT

SPE-KSA Chairman

Ahmed Bubshait is Unit Head of Safaniya Reservoir Management Team and PE&D CoP leader. He holds a Ph.D. in Petroleum Engineering from the University of Southern California (USC), a Master's degree in project management as well as a Master's degree in petroleum engineering and artificial intelligence that he earned in 2012. His specialties include petroleum engineering, project management and digital transformation. His experience spans the development of reservoir management techniques to enhance reservoir production and sweep efficiency. He is a digital transformation champion for subsurface development and intelligent completion technologies. During his tenure at USC, He was an active member of Reservoir Monitoring Consortium (RMC), Geosystems Engineering and Mutliphysics (GEM) lab and Global Energy Network (GEN). He has also authored several technical papers on topics related to reservoir management, well completion and reservoir characterization/modeling.



SEBA ALMAGHLOUTH

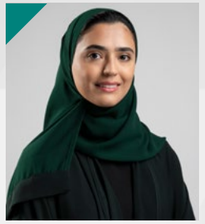
Technical & Professional Programs

Seba is the current Technical & Professional Programs Chairperson for the SPE-KSA 2021-2023 term. She works as a Systems Analyst with the Upstream Digital Transformation Department at Saudi Aramco with nine years of experience in the disciplines of digital upstream and 4IR. She holds a BSc degree in information technology from Prince Mohammed bin Fahad University and an MSc degree in software engineering from Pennsylvania State University. She has also served as the SPE-KSA Student Outreach Chairperson for the 2019–2021 term after volunteering in numerous roles within the section. This term, the Technical and Professional Programs will introduce many programs in a virtual and in-person setting to reach the Kingdom's technical and professional audience.

ABDULLAH AL-THUWAINI

Public Relations

Abdullah Al-Thuwaini is a Supervisor in the Gas Reservoir Management Department in Saudi Aramco and the recently appointed SPE-KSA Public Relation Chairperson. His job focuses on managing and developing gas reservoir fields through strategic development and optimization strategies to maximize production with the utmost economical approaches. He has been an active SPE-KSA member since 2012, in which he was involved in several teams and held different positions as a team lead and Vice Chair. As part of his PR role, his aim is to uplift SPE-KSA's public print to reach all attainable platforms through creative promotion and marketing strategies. Abdullah has a BSc in petroleum engineering from the University of Tulsa and MSc from the University of New South Wales.



FATIMAH AL-BALAWI

Young Professionals

Fatimah Al-Balawi is a Petroleum Engineer at the Gas Reservoir Management Department at Saudi Aramco, and the Young Professionals Chairperson at SPE-KSA. She received her BSc in petroleum and natural gas engineering from the Pennsylvania State University. Fatimah's experience covers reservoir and simulation engineering, focusing on gas fields. Her expertise involve handling drilling and production operations, along with reservoir engineering tasks. Fatimah contributed in many critical projects as a simulation engineer, allowing her to gain the fundamentals of reservoir simulation. Fatimah's started with SPE-KSA in 2018, where she participated and lead many SPE teams since joining. She was also a core member of the SPE-KSA Young Professionals, Student Outreach, as well as the Technical and Professional Programs teams. This term, the Young Professionals committee aims to continue its innovative approach to developing the 7,000+ young professionals of SPE-KSA by introducing a host of new and exciting initiatives and enhancing the existing ones. To develop the technical knowledge and professional competency of the leaders of tomorrow all around the kingdom.

MAHER RAHAYYEM

Conference Management

Maher Rahayyem is a Petroleum Engineer working in the Production & Facilities Development Department (P&FDD) at Saudi Aramco. He is currently a Supervisor of the South Ghawar gas facilities unit. He obtained his Master's degree in petroleum engineering from the University of New South Wales (UNSW). He was the recipient of the UNSW Outstanding Postgraduate Award in 2018. Maher has led many teams within SPE-KSA since 2014 including the most notably Young Professionals Technical Symposium Co-Chairperson for two terms in a row (2014-2016). He also directed numerous T&SA events as the Event Management Chairperson (2015-2016) and as a member of the MEOS Organizing Committee (2019). Recently, Maher headed the registration team as part of the 2020 IPTC Guest Relations Team, in addition to the Public Relations team in Saudi Aramco Booth. Maher is passionate about empowering and positively impacting people through his professional career and volunteering through SPE-KSA. His current role in SPE-KSA is to lead a newly formed committee for conference management, whereby the team will support various SPE conferences and symposia in the region.

DR. YARA ALZAHID

Diversity and Inclusion

Yara Alzahid is a Petroleum Scientist working in EXPEC Advanced Research Center at Saudi Aramco. She obtained her Master's degree from King Abdullah University of Science and Technology (KAUST) and Ph.D. in petroleum engineering from the University of New South Wales (UNSW). She was the recipient of the UNSW Dean's Award for outstanding Ph.D. thesis. Since starting her research career in 2014, she published 12 technical papers, 6 of which are peer-reviewed journal publications. She has 1 granted patent from the US patent office and disclosed 4 more patents. Her research interests include chemical enhanced oil recovery and fluid flow and transport in porous media. Yara has led many research project collaborations and initiatives within her department. She is extremely passionate about diversity and inclusion, particularly encouraging women to pursue careers in STEM majors. She is establishing the Diversity and Inclusion committee, a newly added committee within SPE-KSA. Additionally, she recently established a local section of the Society of Women Engineers (SWE) here in Dhahran.

MESHAL ALSHALAN

Student Outreach

Meshal Alshalan is a Petroleum Engineer with Production & Facilities Development Department in Saudi Aramco and is currently working with the Southern Area Reservoir Management Department. He earned a BSc in chemical engineering from West Virginia University in 2018 and worked as a Research Assistant for one year. He has been active with SPE-KSA since joining Saudi Aramco in 2019, as he was the Team Leader of the University Outreach Program within Student Outreach. He has led several initiatives for university students including multiple virtual learning opportunities, workshops, and programs that connect students with professionals in the energy sector. In the current term of 2021-2023, the Student Outreach vision will be to enable a transparent relationship between academia and the professionals in the industry in order to facilitate and cultivate students' growth toward the professional world. The aim is to support students of all ages with a variety of learning opportunities aiding to develop the technical, interpersonal, and leadership skills of our young leaders. Meshal is keen on comprehensively lifting student participation with the industry. By cultivating this environment, he is confident of our young leaders' potential and that their positive impact on society will be evident.

NAHID ALDOSSARY

Trips and Social Activities

Nahid Aldossary is the current TS&A Chairperson for 2021-2023. She began her career as a member of the Human Resources personnel working at Dhahran Academy. Since 2019, Nahid has worked with Schlumberger as a Field Deployment Lead. Nahid has started her journey with SPE back in 2011 when she was the SPE representative for her company. Her enthusiasm and desire to help are what attracted her to join SPE and to be an active member in its communities. In her spare time, she enjoys running and traveling. Earlier this year, she participated in Spartan World Championship in Greece, where she was the only female participating in the race winning her first Trifecta this year. She also participated in the Spartan race in Muscat, Oman, where she won her second Trifecta for the year.

REEM ALSADOUN

SandRose Magazine

Reem Alsadoun is a Reservoir Engineer working for Unconventional Reservoir Management Division in the Unconventional Reservoir Engineering Department (URED) at Saudi Aramco. Her previous work experience includes working with the Event Solution Center at the Reservoir Description and Simulation Department and the Unconventional Reserves and Development Strategy Division. Prior to joining Saudi Aramco, Reem completed her bachelor's degree in petroleum of engineering at the University of New South Wales in 2018. During her time at university, she was also on the SPE student chapter executive committee for which she was awarded the school's Outstanding Leadership Award in 2017. As an undergraduate, Reem Also finished first in the SPE International Student Paper Contest in 2018. In 2021, Reem and her team participated in the SPE-KSA Endogenous program, Circular Carbon Economy Challenge winning the top prize. In addition to volunteering in numerous roles within the section, Reem has also been a Senior Editor with the SandRose Magazine team since 2018. She is currently Editor-in-Chief of SandRose Magazine, the official publication of SPE-KSA.

MOHAMMED AL SOMALI

Information Technology

Mohammed Al Somali is a Petroleum Engineering Systems Analyst at Saudi Aramco's EXPEC Computer Center providing technology solutions and services to the Unconventional Resources (UR) organization. He has contributed to the deployment of software solutions that span multiple domains from emerging unconventional exploration to drilling, production engineering, and reservoir management. Mohammed has also led numerous efforts, notably the establishment of business continuity, application virtualization, and industry-standard development practice to enhance the performance, security, and overall reliability of UR in-house systems. As Information Technology Chairperson, Mohammed will continue to uphold and reinforce the section's excellence by adopting key strategies, such as digital transformation to ultimately widen reach, enhance members' experience and automate processes. Mohammed holds a BSc in computer science from the Queen Mary University of London.

MOHAMMED ALMUSELM

Event Management

Mohammed Almuslem is a Petroleum Engineer currently leading the Advanced Data Integration & Analytics team under the Reservoir Description & Simulation Department at Saudi Aramco. He holds a BSc degree in petroleum engineering from the University of Manchester, and an MSc in petroleum engineering with smart oilfield technologies certification from the University of Southern California. Mohammed has been actively involved with SPE-KSA since he joined Saudi Aramco in 2012, and has volunteered in numerous roles within the section, leading up to his current role as the Event Management Chairperson. In this role, his team is tasked with providing and supporting all SPE-KSA teams to deliver high-quality events and activities.

AKRAM AL-BARGHOUTI

Memberships

Akram Al-Barghouti is an SPE-certified Petroleum Engineer and the 2021-2023 SPE-KSA Membership Chairperson. He graduated in 2013 with a BSc in petroleum engineering and two minors in business administration and technical sales from Louisiana State University. Since then, he has been working in Saudi Aramco for eight years, where he spent the first seven years within the production engineering discipline, working on different oil fields within the southern area, including the unique Empty Quarter field Shaybah, and then he assumed the role of a reservoir engineer for a year. Within these eight years, he attended multiple technical and non-technical training programs and assignments, with multiple technical publications and patents to his name. Since joining Saudi Aramco, Akram has been thoroughly active with the SPE-KSA section. He was the Planning and Coordination Chairperson for the PE-KSA 2017-2018 Executive Board and has also led and volunteered in various teams within the section.

TALAL SAGER

Treasurer

Talal Sager is an SPE Certified Petroleum Engineer and the current SPE-KSA Treasurer for the 2021-2023 term. He holds a BSc and an MSc in petroleum engineering from the University of Oklahoma and the University of Texas at Austin, respectively. Talal joined Saudi Aramco in 2013. Since then, he has held various roles and responsibilities in different disciplines, namely reservoir, and production engineering. His work involved technical and leadership roles and he is now part of the PE 4.0 Digital Transformation Team. He has also co-authored several technical publications and patents. Talal has been contributing to the SPE-KSA section since he joined Saudi Aramco including while leading the Ambassador Lecturer Program. Talal also served as the Planning & Coordination Chairperson for the 2016-2017 term.

HEBA ALNASSAR

Planning and Coordination

Heba AlNassar works as a Petroleum Engineer in the Reservoir Management Department at Saudi Aramco and is the Chairperson of Planning and Coordination of SPE-KSA for the 2021-2023 term. Heba received her BSc in petroleum and natural gas engineering at Pennsylvania State University. Throughout her career, Heba has been involved in numerous transformative initiatives, a prime example of which is PE4.0. Guided by this passion, she is currently pursuing her Master's degree in Data Science. Through her involvement with SPE-KSA, Heba served as a member of the Diversity and Inclusion team at the 2020 International Petroleum Technology Conference (IPTC). She was part of the team receiving the best Young Professionals Project Award at the 2020 SPE-KSA Young Professional's Technical Symposium (Endogenous). She was also part of the CEO-recognized winning team of the 2021 YLAB Sustainability Hackathon. SR

SPE-KSA Becomes the
LARGEST SPE SECTION IN THE WORLD

In July of 2021, the SPE-KSA became the largest section in the world with over 11,000 members. The SPE-KSA Board of Directors and SPE International leaders shared some congratulatory messages to commemorate the occasion.

MR. NASIR AL-NAIMI
Senior Vice President, Upstream, Saudi Aramco
Honorary Chairman of the Board of Directors, SPE-KSA

"As Honorary Chairman of the SPE-KSA Board of Directors, I am proud to announce that SPE-KSA is the largest section worldwide, leading in both membership enrollment and retention. This outstanding accomplishment reflects SPE-KSA commitment to SPE's mission of promoting knowledge dissemination, enhancing members' technical and professional competencies. In addition, I would like to thank SPE-KSA members and volunteers for helping us reach this milestone. I trust that SPE-KSA will continue to provide diverse opportunities not only to the oil and gas industry and beyond."

MR. WALEED AL-MULHIM
Vice President of Petroleum Engineering & Development, Saudi Aramco
Chairman of the Board of Directors SPE-KSA

"SPE-KSA prides itself on having a rich legacy of excellence since its inception back in 1959. Last term, our section was faced with the Covid-19 pandemic, an unprecedented challenge that was unique in nature and brought a majority of the world to a halt. In spite of that, not only have the SPE-KSA team managed to survive the pandemic, but we actually strived and grew to achieve a long-awaited milestone. We are now the largest SPE section in the world! This tenacious spirit is evidence that SPE-KSA will continue to excel for generations to come."

DR. ALI AL-MESHARI
Chief Petroleum Engineer, Petroleum Engineering, Saudi Aramco
Vice-Chairman of the Board of Directors, SPE-KSA

"In 2021, the SPE-KSA section achieved a long-awaited ambition of becoming the largest SPE section in the world. This milestone comes at an unprecedented time for the industry. In the face of the challenges presented by the pandemic, the SPE-KSA section has triumphed, increasing memberships to an all-time high and it will be sustained. This growth is a true testament to the dedication of the SPE-KSA teams, the full support from Saudi Aramco, and the resilience of the oil and gas industry."

MR. KHALED AL-BURAIK
Vice President of Southern Area Oil Operations, Saudi Aramco
Director, SPE-KSA

"SPE-KSA has a longstanding history of delivering a rich array of technical, professional, and social programs for the betterment of our industry and our society, I am proud to celebrate the occasion of SPE-KSA becoming the largest section in the world. This accomplishment comes at a unique time for the industry and is proof of its resiliency and the dedication of SPE-KSA members. I am confident that the SPE-KSA section will sustain this accomplishment and will continue to soar to greater heights."

MR. DAWOOD AL-DAWOOD
Vice President of Northern Area Oil Operations, Saudi Aramco
Director, SPE-KSA

"SPE-KSA Chapter is a living example of where solid execution meets strategy expectations. Being the largest section in the world did not happen overnight and surely did not happen haphazardly. This accomplishment came about as a result of a clear vision by the founders, their belief in the capabilities of the section members, and super execution by all of its members throughout the years. This recognition is for all of those who have contributed to this milestone we are enjoying today. However, with such global leadership comes huge responsibility. I am as confident as ever that our current and future young members will take us to higher heights and accomplishments."

MR. ABDUL HAMEED AL-RUSHAID
Vice President of Drilling & Workover, Saudi Aramco
Director, SPE-KSA

"It is fitting that Aramco, as the largest oil and gas operator in the world, has stamped its leadership within the industry by having the largest SPE membership globally. Saudi Aramco and SPE share a symbiotic relationship that focuses on excellence, the sharing of industry developments and technology advancements. This allows Aramco to provide opportunities to their Upstream professionals to enhance their technical and professional competence and achieve their full potential within their field of expertise with the ultimate goal of delivering best-in-class safety, performance and efficiency. Finally, we have been working hard over the past few years to achieve this milestone and it is what we deserve."

DR. ABDULAZIZ AL-KAABI

Dean of College of Petroleum Engineering & Geosciences, KFUPM
Director, SPE-KSA

"SPE-KSA has always aspired to achieve the highest quality work in all its activities and initiatives. Such historical achievement clearly reflects the hard work, dedication and remarkable leadership for many years; it is very gratifying and well-deserved milestone. Special recognition for the unwavering support to the local SPE Students Chapters; our future talent!"

MR. ZIAD JEHA

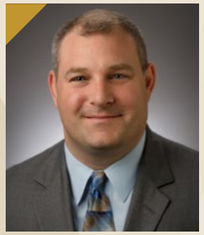
Vice President and General Manager, Saudi Arabia and Bahrain, Schlumberger
Director, SPE-KSA

"Schlumberger is a proud partner of technology innovation through the past 80 years it has been present in this Kingdom, we are in alignment with SPE-KSA chapter in the aim to power this industry with means to progress through shared expertise and technical advancements. As a member of SPE-KSA chapter board of directors, I congratulate the section on being the largest globally and I wish them continuous success for many terms to come."

MR. ABDERREHMANE BELOUCIF

Vice President of Bahrain and Saudi Arabia, Baker Hughes
Director, SPE-KSA

"We are proud and honored that SPE-KSA become the largest SPE section globally despite the unprecedented challenges presented by the pandemic. This significant milestone reflects the dedication of SPE members and the value that SPE brings to the Kingdom. Through our partnership with SPE, we are confident that we will achieve more in the future as we collaborate to take energy forward and continue to play a role in driving Saudi Arabia's economic growth to become a global hub serving the world. We are looking forward to further contribute to our industry and serve our local community and economy as a leading energy technology company."



MR. SCOTT REGIMBALD

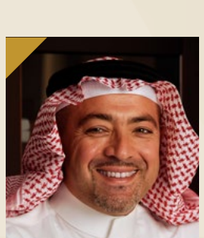
Vice President of Bahrain and Saudi Arabia, Haliburton
Director, SPE-KSA

"Congratulations to the Society of Petroleum Engineers-Kingdom of Saudi Arabia on becoming the largest global SPE section. Halliburton is honored to be a key contributor to and longtime supporter of this outstanding SPE geographical section. We look forward to many more years of collaborating on valuable initiatives to promote oil and gas technology, student and young professional development, and the local economy and communities.""

MR. HANI ALMAIMANI

Vice President of Saudi Arabia and Bahrain, Weatherford
Director, SPE-KSA

"Congratulations to the SPE-KSA section on becoming the largest section of the Society of Petroleum Engineers globally and in the history of SPE. This monumental achievement shows the importance and position of Saudi Arabia to the Oil and Gas industry across the world. As our industry evolves, the SPE-KSA section remains of great significance to continue sharing and learning from our best practices, industry achievements, technical excellence, and professional development. I am proud to be part of the SPE community and the Oil and Gas industry in the Kingdom of Saudi Arabia.



MR. KHALID NOUH

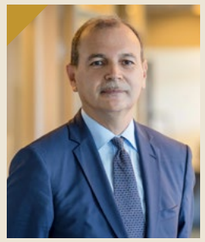
Chief Executive Officer, TAQA
Director, SPE-KSA

"Through its mission to collect, and exchange technologies and technical knowledge concerning the exploration, development, and production of oil and gas resources, SPE-KSA became the leading section of the history of SPE globally. As we celebrate this significant achievement, I would like to stress that this organization garnered this respected position because of the value it offers for the advancement of the energy industry and for ensuring opportunities for Saudi professionals to enhance their technical and professional competencies are widely recognized. I have collaborated with SPE-KSA in many ways, I believe that SPE-KSA is on the road to becoming one of the most well-known organizations in the world's energy industry."

DR. TOM BLASINGAME

2021 SPE President

"On behalf of the Society of Petroleum Engineers (SPE), I would like to congratulate the KSA SPE section on its achievement of becoming the largest single SPE section in 2021. While size is important, commitment to purpose and service are what really matters. I continue to be amazed and inspired by the commitment and achievements of the KSA SPE section — development of ambitious and progressive energy events, participation by Young and Senior Professionals in both event programs and service, and its continuous efforts to grow and extend the influence of the SPE in its region. I wish the KSA SPE section many, many years of continuous growth and service to the SPE; and I thank the KSA SPE section for its commitment to service and its energy and ambitions to achieve great things in our industry.""



MR. KAMEL BEN-NACEUR

2022 SPE President

"Thank you for the volunteers of the SPE KSA Section for their commitment to serving our Society, and doing it with such a level of excellence. It will be my pleasure to work with the Section during and after my tenure as SPE President. I hope the world is now on a sustainable path of recovery from the impact of the pandemic, and that we can go back to a working and living mode, that captures the lessons learned over the last 2 years. From the SPE, we are gradually returning to in-person events, and we were pleased to see many colleagues from KSA during the ATCE in Dubai. We look forward to a very successful 2022 IPTC in Riyadh. Finally, I would like to congratulate all the SPE International and Regional Award winners from the KSA Section this year "

MR. FAISAL AL-NUGHAIMISH

Chief Drilling Engineer, Saudi Aramco

SPE Middle East and North Africa Regional Director

"I am delighted on this occasion to celebrate SPE-KSA becoming the largest section globally. I am both privileged and extremely proud to be part of this section, I am excited about the future, and, to see our young engineers in oil and gas play their part in advancing and evolving the energy industry both within the Kingdom and throughout the world."

MR. ABDULAZIZ ALSUFAYAN

Assistant to Vice President Petroleum Engineering & Development, Saudi Aramco

Director, SPE-KSA

"We have successfully accomplished a major milestone in SPE-KSA, a goal that has been a constant mission of our section. In 2021 we are proudly the largest section in the world leading all sections with the highest renewals, retentions and registration of new members. This is a true testimonial of the tremendous efforts and outstanding coordination from our membership team who maintained annual growth despite the global drop in membership across all sections."

DR. AHMAD BUBSHAIT

General Supervisor, Saudi Aramco

Chairman of SPE-KSA section

"With a legacy of excellence, SPE-KSA has consistently delivered a series of impressive feats through its myriad of technical, professional, and social programs and initiatives, living up to the SPE mission of promoting knowledge dissemination and professional development. The efforts and dedication of SPE-KSA members, past and present, however, have collectively culminated in the remarkable milestone of becoming the largest section globally. To our SPE-KSA members, volunteers and partners, I would like to thank you and congratulate you on this achievement. As we enter this term, we are excited to uphold this legacy and continue to grow SPE-KSA's renown and recognition across the kingdom and beyond, developing minds and inspiring the next generation of leaders." SR

Kingdom of Saudi Arabia Section

Who Are We?

By Akram Al-Barghouti, SPE-KSA Memberships Chairperson

History & Background

SPE is the Society for Petroleum Engineers, the largest non-profit association serving professionals working in the oil and gas industry in over **147** countries. The society was officially founded in 1957, with its predecessor organization dating back to the birth of the oil industry in the late 1880s. Since its founding, the mission of SPE has been to collect, disseminate, and exchange technical knowledge concerning the exploration, development, and production of oil and gas resources and related technologies for the public benefit; and to provide opportunities for professionals to enhance their technical and professional competence.

SPE-KSA Membership Growth

SPE-KSA is the largest section worldwide, serving over 11,000 members. It is one of the 203 sections worldwide. Figure 1 demonstrates the growth in SPE-KSA's membership in the past ten years. The section has experienced continuous growth since 2009. Members have grown more than five times from **2,034** to **11,220** during that period.

Membership Benefits

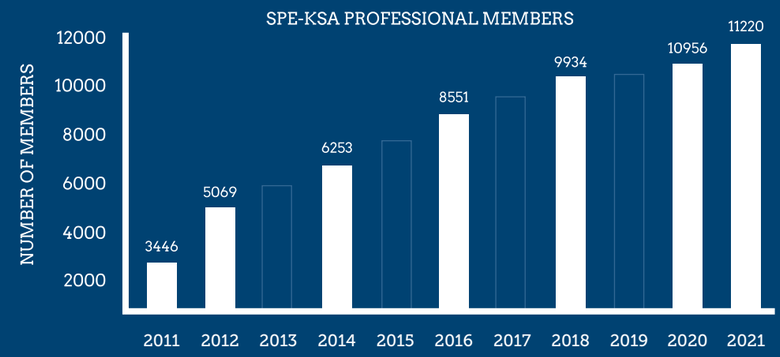
Members enjoy access and exclusive discounts on SPE-sponsored conferences, exhibitions, forums, and workshops. In addition to journals, reference books, and tools. Moreover, members get the chance to expand their professional network through SPE-KSA local events, meetings, and activities.

For further information, contact the SPE-KSA section membership chairperson, *Mr. Akram Al-Barghouti* at **akram.albarghouti@spe-ksa.org.**

To learn more about SPE-KSA, please visit our website: **https://spe-ksa.org/**

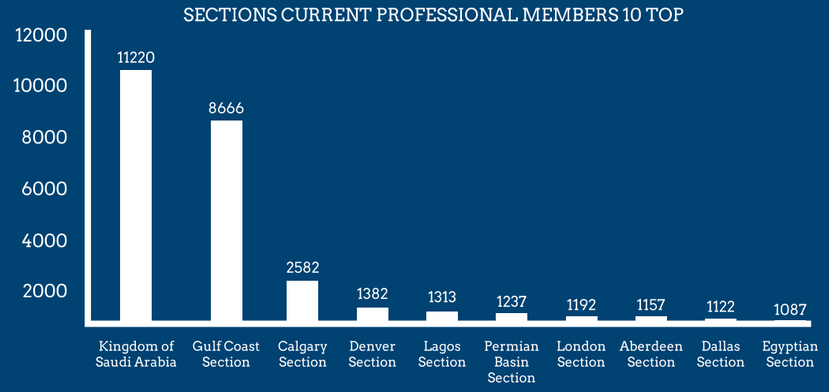
To join SPE-KSA, please scan the QR code

Figure 1. SPE-KSA Professional Members Number from 2011-2021



The SPE-KSA section is the **largest** section outside of the United States with a difference of over 2,800 members from the Gulf Coast section located in the United States. During the past year, KSA's section experienced a **2.41%** increase in growth. SPE-KSA will spare no effort to continue being the largest section worldwide.

Figure 2. SPE Members by Section



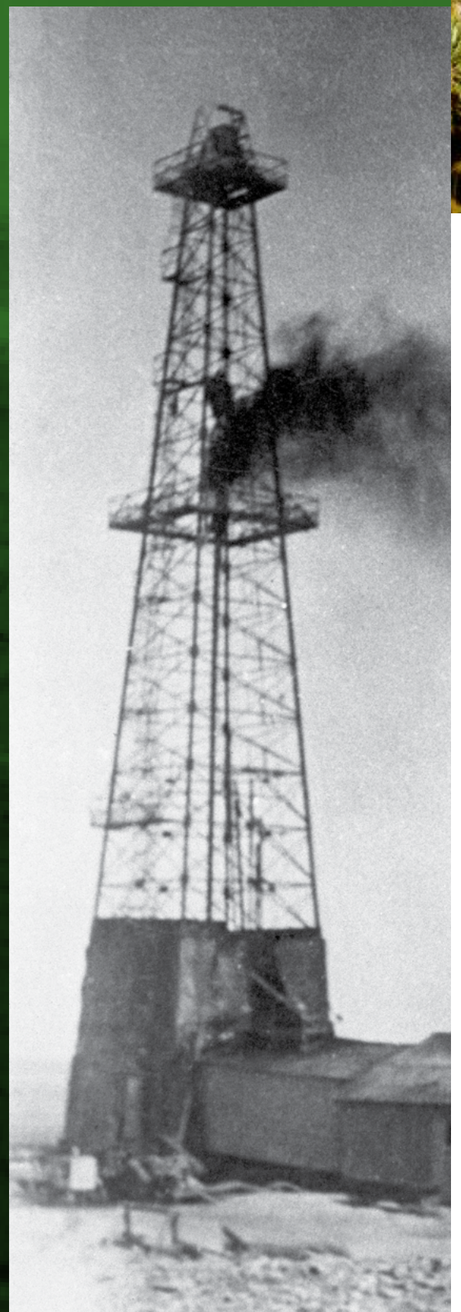
"The Saudi Section of SPE has not only thrived over the last 60 years, in the process, you have become the Number 1 SPE section outside of the United States!"

Amin H. Nasser, Saudi Aramco's President & CEO

Celebrating the Kingdom's Energy Journey

EXPLORING THE ENERGY INDUSTRY'S EVOLUTION FROM 1930-2030

The Kingdom's energy journey has developed hand in hand with that of modern Saudi Arabia. Over the decades, the company has grown and evolved in response to myriad challenges and opportunities and continues to reinvent itself, adapting to a dynamic future. We are now in a time where the energy industry is at a crossroads once more as imminent realities challenge the status quo. As a result, the Kingdom has developed an ambitious plan to diversify the Kingdom's financial portfolio. However, there is still a long way to achieve our goals and fully adapt to the changing world. Still, the Kingdom is more than prepared to rise to the challenge with its boundless resources beyond hydrocarbons, influence in the region, and a proven track record of adaptability and resilience in the face of market challenges. Here we select milestones from the past, current exciting projects, and promising future developments to showcase this remarkable journey.



THE INCEPTION OF THE ENERGY INDUSTRY AND MAJOR FIELD DISCOVERIES

In the 1930s, the Kingdom fielded proposals and offers from other nations to develop its hydrocarbon resources, eventually agreeing with a group of American oil majors, Standard Oil California (SoCal) signed the concession agreement, which later formed the subsidiary the California-Arabian Standard Oil Company (CASOC). The Kingdom was forever transformed with the discovery of Dammam well no. 7 known as the Prosperity well in 1938 and the Ghawar oil field in 1948 as seen in figure 1. In 1944, in light of the growing discovery and development of new fields, CASOC became known as the Arabian American Oil Company (Aramco). The discovery of the major oil fields marked the foundation of modern Saudi Arabia.

The pursuit of hydrocarbon development continues across the Kingdom today. In early 2020, Saudi Aramco announced the development of the Jafurah field, the largest non-associated gas field in the Kingdom of Saudi Arabia to date. Beyond powering the world, the oil and gas industry was the main driver behind the economic and social reform

SOCIAL DEVELOPMENT

With the discovery of major oil fields came many opportunities for social and economic development. One such development was the short-haul rail line connecting the Eastern Province to Riyadh, officially completed in 1951. As Saudis began to join the Saudi Aramco's workforce continuously, the Saudi government rolled out extensive labor relations laws in 1942, giving employees access to basic health care and even rolling out vaccination programs increasing average life expectancy. Aramco also bolstered local business funding to the service sector and vitalized local business, creating a continuously growing middle class. The role of the Saudi energy industry also extended to education. In 1963, by royal decree, the King Fahd University of Petroleum and Minerals (KFUPM) (previously known as the University of Petroleum and Minerals) was established to train the next generation of Saudis leaders as seen in figure 2.

In addition to that Aramco built the first Saudi elementary school for girls in the eastern province in 1964, and that same year Aramco hired its first female employee, Najat Al-Husseini seen in figure 3. Through the 1970s, this social development progressed with an increasing number of Saudis joining the workforce. Shortly after Saudi Aramco became fully Saudi-owned in 1980, in 1984, the company appointed its first Saudi President, H.E. Ali Al-Naimi. Mr. Al-Naimi, a beneficiary of the company's career development and Saudization program, and is widely credited for paving the way for the many Saudis that succeeded him. The pursuit and care for knowledge and educational development continue even today, more recently, in 2009, with the inauguration of the King Abdullah University of Science and Technology (KAUST), a globally recognized center for scientific achievement.

FEMALE EMPOWERMENT

In 1964, Aramco built the first formal girls' schools in Saudi Arabia in Al-Khobar and Rahimah, in addition to training female teachers. By 1967, the company built over 30 schools in the Eastern Province alone, educating 2,400 girls. That same year, the first Saudi woman, Najat Al-Husseini, was also hired. The first generation of women workers worked in the health sector, with time, more women integrated into other professional areas. Na'ilah Mousli is another pioneer, she was the first female petroleum engineer in the company and the first female to assume the role of department manager.

Energy to the World: The Story of Saudi Aramco Vol. 2

Event Timeline

1933

1933, Standard Oil California (SoCal) signed the concession agreement, which later formed the subsidiary the California-Arabian Standard Oil Company (CASOC).

1938

Discovery of Dammam Well no. 7 also known as prosperity well in 1938

1942

In 1942, Saudi government rolled out extensive labor relations laws in response to Saudis joining the workforce

1944

In 1944, CASOC renamed to Arabian American Oil Company (Aramco)

1948

Discovery of Ghawar oil field in 1948

1951

In 1951, the short-haul rail line connecting the eastern province to Riyadh

1963

In 1963, by royal decree, the King Fahd University of Petroleum and Minerals (KFUPM) is established

1964

In 1964, Aramco built the first Saudi elementary school for girls in the eastern province, and hires its first female employee, Najat Al-Husseini.

1975

In 1975, Aramco to develops the Master Gas System

1980

Saudi Aramco became Saudi-owned in 1980

1984

in 1984, the company appointed its first Saudi President, H.E. Ali Al-Naimi

1986

In 1986, the first modified safety flare system was installed in Abqaiq

Figure 3: *Images of the first school's developed in the eastern province*

ECONOMIC PROSPERITY

As oil production increased, the company launched into international renown, partnering with and investing in refineries such as S-Oil in South Korea in **1991** and Petron Corporation in the Philippines in **1994**. However, to fully realize the ambition of becoming an integrated energy company and diversifying the Kingdom's energy portfolio, Saudi Aramco pursued growth opportunities in the downstream sector, forming JVs with major players in the industry to create SATROP, SADARA, and YASREF in **2008, 2010 and 2011**, respectively (figure 4) . Recently, in **2020** Aramco's landmark majority stake acquisition of SABIC was also one of its critical efforts to grow as an integrated energy and chemicals company, catalyzing the commercialization of innovative crude-to-chemicals technologies. These crude-to-chemical technologies will remove or streamline several conventional industrial processes, resulting in the production of less expensive chemicals all while reducing the associated carbon footprint.

For decades, Saudi Aramco aimed to maximize long-term economic growth and diversification through localization of the workforce, technologies, and manufacturing, which is also in agreement with the ambitions of Vision 2030 which was introduced in **2016**. In **2015**, Aramco launched the in-Kingdom Total Value Add (IKTVA) program was launched, realizing this dream to localize 70% of the

workforce by **2021** and in-collaboration with in-Kingdom companies. In 2018, the Kingdom also announced the King Salman Energy Park (SPARK), a 50 km2 energy city in the eastern province that will serve as a hub for the energy sector supporting the mission of IKTVA in creating jobs and maximizing the value-chain. In 2019, the largest Initial Public Offering (IPO) of Aramco the largest of its kind, also represented another critical opportunity to drive economic growth and diversification. Expanding on the industrial investment program, in 2021, the Namaat program was also inaugurated with the signing of 22 new Memoranda of Understanding (MoU's) and one joint venture (JV) agreement focusing on developing the infrastructure and capacity in four key areas: sustainability, technology, industrial and energy services, and advanced materials as seen in figure 5. The Kingdom's strategy to invest locally and internationally, in addition to growing domestic capacity, has allowed the energy sector to continue to thrive. However, sustainable practices are also critical for further growth and development.

Saudi Aramco CEO, Amin Nasser, announcing Namaat project on the 7th of September, 2021.

ENVIRONMENTAL STEWARDSHIP AND SUSTAINABILITY

Saudi Aramco's commitment to the environment has long been a part of its journey. Refineries have been built to deliver high-quality, low-sulfur products to reduce emissions while meeting and exceeding future environmental standards. Through the decades, several projects have highlighted the Kingdom as an industry leader in mitigating environmental impact. In **1975**, the Kingdom asked Aramco to develop the Master Gas System, a gas gathering and processing system to fuel industrial activities and provide domestic electrical power across the Kingdom, dubbed as the "most ambitious energy project" of its time. MGS has undergone several upgrades and expansions since its development. Currently, it has one of the lowest flaring intensities and annually removes 100 million metric tons of CO2 equivalent. In **1986**, the first modified safety flare system was installed in Abqaiq, significantly reducing when compared to its predecessor. The Kingdom of Saudi Arabia was also among the first GCC countries to lead the charge of producing non-leaded gasoline in the **early 2000s**.

The care for the environment also extended to preserving nature and wildlife. **In 2016** the Shaybah Wildlife Sanctuary was inaugurated. The project reintroduced Arabian oryx, Arabian sand gazelles, and

ostriches that had been near extinction for decades figure 6. **In January of 2021**, Saudi Aramco unveiled the Mangrove Eco-Park, a facility dedicated to preserving mangrove forests that protect shorelines from erosion and preserving the local ecosystem and biodiversity

DID YOU KNOW

In 1999, a young Saudi engineer named Mazen M. Mashour invented a smokeless flare system technology won a Gold Award at the International Inventors Conference in Geneva in 2006. Mashour discovered that injecting a relatively small amount of high-pressure air into the flare eliminated smoke from the flares, with significant savings over larger, complex systems. In addition, the invention creates hotter flame burning off the impurities instead of releasing them into the atmosphere, significantly reducing associated emissions. It was deployed at Shaybah in 2000 and Uthmaniyah and Shedgum in 2005.

To find out more, read SPE-138493.

A NEW ERA FOR ENERGY: INTERNATIONAL AGREEMENTS AND NATIONAL TARGETS

In 2015, the Paris Accord was signed by almost 200 countries, with the ambition to limit the global average temperature rise to well below two degrees centigrade above pre-industrial levels. The Kingdom was one of those signatories and supported the Paris Accord, with the nationally determined contribution (NDC) of 130 million tons of CO2e. Taking the proactive approach, in 2015, Saudi Aramco was also a founding member of the Oil and Gas Climate Initiative (OGCI). This CEO-led initiative aims to accelerate the industry response to climate change and recognize the Paris Agreement's ambitions. Reducing emissions to address climate change while meeting the world's energy needs remains the most significant challenge of this century.

Event Timeline

1991

Global partnership in refineries such as S-Oil in South Korea in 1991 and Petron Corporation in the Philippines in 1994.

2009

In 2009, the King Abdullah University of Science and Technology (KAUST) was officially opened.

2008, 2010, 2011

Saudi Aramco pursued growth opportunities in the downstream sector, forming SATROP, SADARA, and YASREF in 2008, 2010 2011.

2015

In 2015, the Paris Agreement was signed

2015

in 2015, Saudi Aramco becomes founding member of the Oil and Gas Climate Initiative (OGCI).

2015

In 2015, the in-Kingdom Total Value Add (IKTVA) program was launched.

2016

In 2016 the Shaybah Wildlife Sanctuary was inaugurated. The project reintroduced Arabian oryx, Arabian sand gazelles, and ostriches that had been near extinction for decades.

2018

In 2018, the Kingdom also announced the King Salman Energy Park (SPARK), creating an energy hub in the eastern province to maximize value-chain

In October 2021, Saudi Aramco announced their ambition to achieve net-zero Scope 1 and Scope 2 greenhouse gas emissions across their wholly owned and operated assets by 2050. This announcement came following the Kingdom's announcement to reach net-zero by 2060. As part of the Saudi Green Initiative (SGI) forum this year, Saudi Arabia effectively doubled its NDC ambition to 278 million tons CO2e removed per year. Under SGI, the Kingdom introduced an afforestation program to plant 10 billion trees, reduce emissions by investing $7 billion USD in low-carbon solutions as part of the OGCI, and increase the proportion of protected areas in both land and sea to 30% of total land.

CIRCULAR CARBON ECONOMY

In recognition of the need to mitigate carbon emissions, Saudi Arabia and Saudi Aramco adopted the Circular Carbon Economy (CCE) framework, a closed-loop system where emissions are reduced, reused, recycled, and removed (4R's). Saudi Aramco's innovative low-carbon practices and technologies already position the company as one of the lowest carbon emitters per barrel in the industry. The company has already pledged to reduce emissions with the World Bank's 'Zero Routine Flaring by 2030' initiative in **2019** through the MGS. Saudi Aramco also removes CO2 by capturing and injecting it into reservoirs and testing the feasibility of enhancing oil recovery for potential future applications in the Kingdom's various oil and gas fields. Efforts to reduce carbon emissions have also extended to the automotive sector using Saudi Aramco's global research network, which includes the development of promising technologies such as gasoline compression ignition (GCI).

THE RISE OF HYDROGEN POWER

Leading the charge on CCE, both Saudi Arabia and Saudi Aramco acknowledged hydrogen's key role in achieving a low-carbon future. Hydrogen can be produced from both renewable resources (green hydrogen) and carbon-abated fossil fuels (blue-hydrogen). Hydrogen's versatility in storage and transport, abundance, and virtually zero carbon emissions make it promising.

In 2019, Aramco and Air products inaugurated Saudi Arabia's first hydrogen fueling station. In 2020, Aramco, the Institute of Energy Economics, Japan, and SABIC successfully shipped 40-tons of blue ammonia to Japan, the first shipment of such a product in the world figure 8. As the Kingdom seeks to reduce its carbon footprint while taking advantage of its natural resources, it is rapidly diversifying its energy portfolio with the development of blue-hydrogen. This demonstrates the Saudi Aramco and the Kingdom's ability to diversify its energy mix and portfolio while continuing to extract value from our natural resources and reducing carbon emissions. Additionally, the Jafurah field, the largest unconventional gas field in Saudi Arabia, is also expected to fuel the development of blue hydrogen, solidifying Aramco's position as Potential hydrogen supplier in a low-carbon future.

Tanker carrying 40-tons of blue ammonia to Japan, the first shipment its kind. When combusted in a thermal power plant to generate energy, it does not emit any CO2

MARKET READINESS FOR RENEWABLES, & ALTERNATIVE ENERGY

While the Kingdom of Saudi Arabia is ambitiously expanding its renewable and alternative energy projects, this growth must be calculated and planned to consider present and projected market needs. Under the Vision 2030 development program, the plan for the Kingdom is to produce 50% of its power needs from renewables.

Other notable goals to this end include replacing 30% of vehicles on the road in Riyadh with electric vehicles (EV's) by 2030. With that being said, promising new initiatives such as Saudi Aramco's promising hydrogen business will need to grow alongside customer demand for these products. Neom, a smart city planned in Tabuk, northwest of the Kingdom, will be solely powered by renewables. Neom aims to be the first carbon-free ecosystem of its kind powered by green hydrogen, leading research and development in renewable energy, and a model for the cities of tomorrow as seen in figure 9.

When we explore the evolution of the energy industry and Saudi Aramco throughout the decades, we note that role of the Saudi Aramco is constantly evolving and has a ripple effect that extends to other sectors from social to economic development and beyond. Over the decades, Saudi Aramco has continuously reinvented itself, starting as the Arabian American Oil Company, as created by the initial concession agreement with SoCal, to becoming Saudi in 1980. The company's role also shifted with time from an oil-producing and exporting company to an integrated petroleum enterprise developing enhanced petrochemical products. The current shift takes Aramco to a publicly listed integrated energy and chemicals company that in addition to producing hydrocarbons will play a key role in building a low carbon economy by developing technological solutions and clean fuels. The enduring success of Saudi Aramco and the Saudi energy industry can be attributed to a lifelong legacy of looking beyond the raw value of hydrocarbons, from developing communities, training the leaders of tomorrow, to leveraging our access to solar energy and protecting and reinvigorating the local environment. To sustain this success however, we need to realize the world around us is constantly changing and to continue to anticipate what lies ahead, creating new opportunities wherever they may be. If we succeed, we will have witnessed 100 years of sustainable development in an ever-evolving landscape. SR

Neom's "The Line" city, a 106-mile-long city stretching from the mountains to the Red Sea. The largest carbon-free system in the world, powered by solar power, wind farms, and emerging green hydrogen.

Event Timeline

2019

In 2019, Aramco is publicly listed in the largest Initial Public Offering (IPO) in history

2019

In 2019, Aramco and Air products inaugurated Saudi Arabia's first hydrogen fueling station.

2020

In early 2020, Saudi Aramco announced the development of the Jafurah field, the largest non-associated gas field in the Kingdom of Saudi Arabia to date

2020

In 2020, Saudi Aramco, the Institute of Energy Economics Japan, and SABIC successfully ship 40-tons of blue ammonia to Japan and the first the world has witnessed.

2021

Dammam-7 Supercomputer unveiled in 2021

2021

In January of 2021, Saudi Aramco unveiled the Mangrove Eco-Park, a facility dedicated to preserving mangrove forests

2021

In October 2021, Saudi Green Initiative (SGI) forum Kingdom of Saudi Arabia announces goal to reach net-zero by 2060

2021

In 2021, the Namaat program introduced

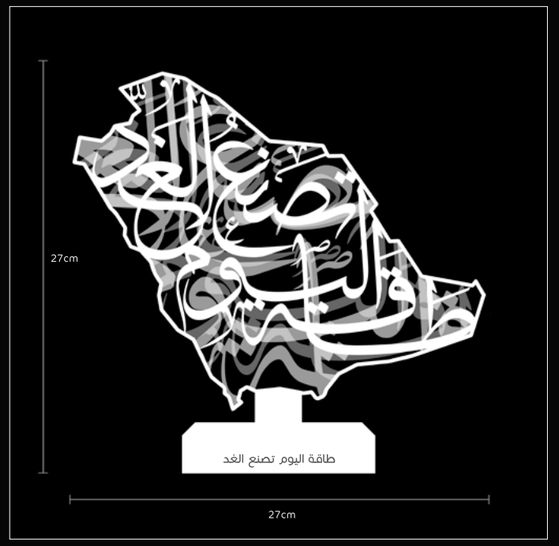
Behind the Cover

Today's Energy Shapes our Tomorrow

طاقة اليوم تصنع الغد

How was it created?

The cover was created using 3D printing technology, combining our heritage and digital tools and celebrating Yousef Al-Hammadi, local talent, and owner of Mishq studio.



The meaning behind the theme of this issue

The theme of this issue is "Today's Energy Shapes our Tomorrow," and on the cover, the phrase is spelled out in Arabic "**طاقة اليوم تصنع الغد**" and is shaped into the Kingdom's map. The theme celebrates the energy we put into today, whether in the form of natural resources or other forms of energy and pays tribute to the role it has played in shaping the Kingdom of Saudi Arabia and our future. The theme also ties into the editorial of this issue, where we explore the evolution of the energy industry from 1930 to 2030, and how it has dramatically transformed the Kingdom into the prosperous nation we are today. Additionally, "today's energy" also pays tribute to our greatest resource, our people, and the role we play in creating our tomorrow.

The cover artist

For this first issue of SandRose, the editorial team worked with **Mishq**, a design company based in Khobar, Saudi Arabia, to produce the first 3D printed cover art. Visit Mishq's website at: **Mishq.co** Follow the artist on Instagram **@ya.calligrapher** and on Twitter **@Mishqsa**

Cover art design mock-up from inception to 3D printed sculpture

80 YEARS YOUNG!

HERE'S TO SCHLUMBERGER'S 80 YEARS OF INNOVATION AND EXCELLENCE

Schlumberger-KSA

Schlumberger's historical and successful presence in the Kingdom is a demonstration of how to bring the best of local culture and international experience. Hard work, a passion for excellence, a constant focus on developing talents, and unparalleled efforts have kept the stalwart in place for decades. By achieving resounding success for over 80 years, Schlumberger is thrilled to celebrate this remarkable anniversary. The Schlumberger brothers invented Wireline logging back in 1927. On Oct 03, 1941, the first log was recorded in Saudi, near Dammam see ***figure 1***. Since then, Schlumberger has been striving to be the partner of choice to invest and unlock the massive potential of the Oil and Gas sector in Saudi and bring its contribution to the success of the Kingdom. Some images of Schlumberger operations in Saudi from the 1970s are seen in ***figure 2***.

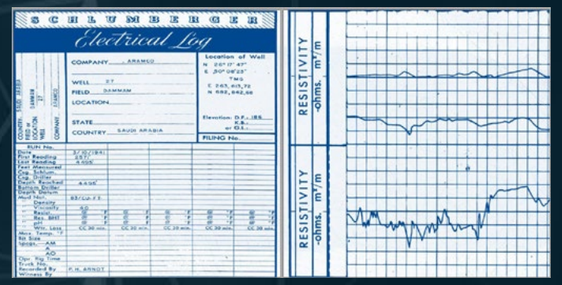


Figure 1: *Image of the first log recorded in 1941, the first log near Dammam, Saudi Arabia.*

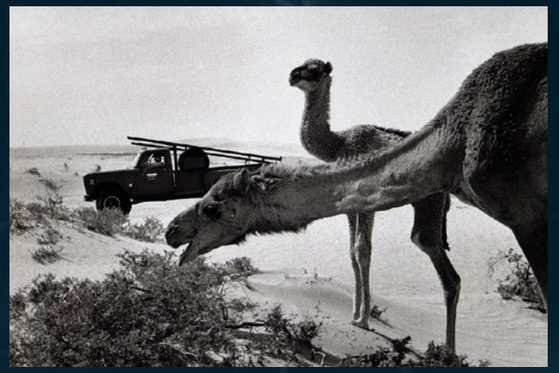


Figure 2: *Some images of Schlumberger operations in Saudi from the 1970s, cementing the company's rich legacy and history in KSA.*

One of the greatest stories in the Kingdom has been the launch of integrated projects under the model of a Lump Sum Turn Key. Piloted in 1996 in the Shaybah field, it was later adopted by Saudi Aramco. Not only has Schlumberger been an industry leader in such performance model projects, but the company has also created the blueprint by which other companies have followed.

Schlumberger was the first company to establish a state-of-the-art oilfield research center in Dhahran Techno Valley. Completed in 2006, this initiative stands as the cornerstone of an exciting collaboration with Saudi Aramco for fit-for-basin technologies. The center has now onboarded digital initiatives that help improve performance in drilling and sustainability.

With such an array of amazing milestones to its credit, Schlumberger also inaugurated The Center for Reliability and Efficiency (CRE) in 2016 as part of its ongoing efforts to strengthen the local supply chain. The CRE is the home for the maintenance of oilfield tools and equipment. The center is the largest maintenance facility owned by Schlumberger worldwide and as a result, it hosts over 1,000 employees, predominantly Saudis see ***figure 4***.

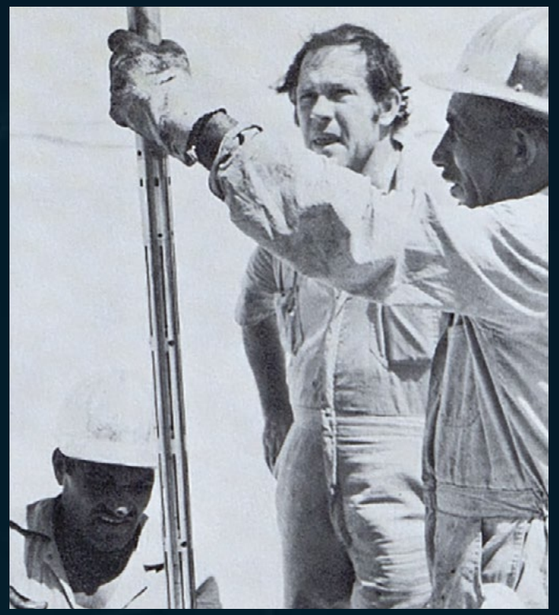


Figure 3: *Image of Schlumberger employees in Abqaiq, Saudi Arabia in 1981.*

Figure 4: *The Center for Reliability and Efficiency (CRE) inaugurated in 2016.*

Figure 5: *in 2020 Schlumberger became the first upstream services company to establish a local manufacturing facility at SPARK*

Over the last decade and despite industry downturns, Schlumberger continued to develop its presence in the Kingdom. Last year, it was the first upstream services company to establish a local manufacturing facility in King Salman Energy Park (SPARK) thus enabling an agile fit-for-basin capability that links research, product development, and now manufacturing to the needs of the Saudi Arabian market. The SPARK center also plans to manufacture other Cameron products very soon as the demand grows seen in figure 5.

Schlumberger also has stood strong at the forefront of acting as a strategic enabler in the Kingdom and a major milestone in relation to its diversity and inclusion is where it became the first company to have a female Saudi engineer in an oilfield. Diversity is a key part of its success which has led to a major focus on gender balance for over 25 years now.

Schlumberger's culture is key to its success. Relying on a tight-knit community of colleagues to challenge and support each other has allowed the company to achieve such ambitious goals. Being global in outlook and local in practice, Schlumberger is united by a shared passion for discovery and a commitment to constantly pushing boundaries. Committed to customers, constantly learning and growing while driven by a strong safety and sustainability culture, Schlumberger thrives when faced with the most complex technical challenges.

Looking forward to 80 more, Schlumberger seeks to always improve its performance and extend the technical limits of the energy industry by pioneering new approaches and harnessing the latest advances in disciplines including Artificial Intelligence (AI), Machine Learning (ML), Industrial Internet of Things (IIoT), and more to create amazing technology that unlocks access to energy for the benefit of all. This is the pulse and spirit of Schlumberger, which stands as an essential aspect of its business strategy.

Continuing with the same passion for excellence and leveraging its expertise in the industrialization of technologies, its ability to create strong partnerships globally with culturally diverse players, and its industry-leading digital capabilities, Schlumberger aims at contributing to revolutionary changes within the energy sector in the region.

The company plans to bring necessary changes within its infrastructure and hire top-notch professionals for maximizing productivity and bringing profitable rewards to the Kingdom. Thinking beyond boundaries when it comes to progression and evolution. And certainly, there's no compromise on that at Schlumberger.

> ***"We are proud of our contribution to the development of the Kingdom's energy sector over the past 80 years. We will continue this journey for many years to come." said Ziad Jeha, Managing Director - Schlumberger Saudi Arabia.***

As they say, the greatest stories are not always told but lived and for sure Schlumberger's 80 years of this relentless commitment to the Kingdom further intensifies with every passing day. Young at 80 and young forever to serve its people.

Figure 6: *Schlumberger's and Saudi's first female maintenance and reliability engineer, Rawan Alabdulhadi*

Unconventional Engineering Toward Efficient Geosteering and Well Placement - Logging-While-Drilling in an Oil-based Mud Environment

By Salaheldeen Almasmoom, Drilling Engineer at Saudi Aramco and Naif Rubaie, Oil and Gas Facilities Supervisor at Saudi Aramco

INTRODUCTION

Designing a horizontal well in an unconventional play always comes with a challenge to adequately balance the geosteering requirements with an optimized drilling engineering design that delivers the best drilling performance while acquiring all the desired data. The main requirement was to acquire high-resolution resistivity images to support geosteering operation, and to interpret fractures, geological features, and events in the formation. This is to be done while drilling with an oil-based mud (OBM) system as the drilling fluid to overcome the drilling challenges. The logging while drilling (LWD) density image has its limitations in terms of geosteering due to its poor vertical resolution. It was the best available option until the recent development of the new generation of LWD imaging tool. This recent development was the answer to enable both acquiring high-resolution images and supporting geosteering in an OBM environment without jeopardizing the well and logging plans. A collar mounted sensor LWD technology, able to deliver both ultrasonic and resistivity images in real-time in an OBM environment, was utilized to achieve the well objectives, ***Figure 1.***

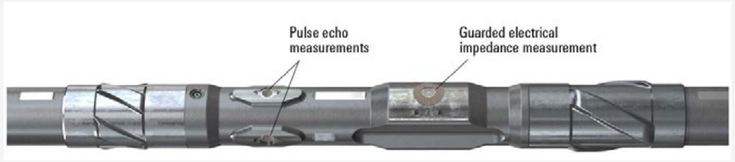


Figure 1: The new-generation dual-image OBM environment LWD imaging tool. The sensors send the pulses through the drilling fluid using the electormagnetic subsystem. These pulses are then sent into the formations at a wide range of frequencies to produce the resistivity images of the subsurface geological structures of the formations. The short ultrasonic pulses taken from the formations affected by the OBM are removed by the acoustic subsystem of the sensors. Combining both features helps make the new LWD imaging tool capable of recording high-resolution resistivity and ultrasonic images. The continuous sensors' sampling of the LWD tool of the ultrasonic and resistivity images improves the resolution of the produced images to surpass the images recorded by wireline tools1.

ENGINEERING PLANNING

Bottomhole Assembly Design: Along with the modeling-based data correction done to the measured acquired logs, reducing the severe logging sensors' motion while drilling by having the best drillstring stabilization is essential to mitigate the lateral motion effects in the logging measurements2. In addition, lowering the borehole tortuosity in the wellbore will result in lower downhole dynamics, such as the phenomenon of stick-slip. Lowering the changes in dogleg severity (DLS) while drilling a directional wellbore will result in having a smoother lateral profile, and therefore lower borehole tortuosity.

The planned lateral drilling BHA included the following LWD sensors; gamma ray (GR), density, neutron, resistivity, sonic, density imager, and the new LWD OBM dual imager to measure ultrasonic and resistivity image logs. The addition of the newly developed tool added three main challenges:

The tool's addition adds approximately 15-ft sub (or short pipe) to the normal LWD BHA run. The total length of the BHA becomes approximately 505 ft.

The tool's addition adds two more stabilizers to the planned drilling BHA. Therefore, the drilling BHA will have six stabilizers, compared to four stabilizers in the normal logging-while-drilling BHA typically run in the field.

The placement of the tool in the planned drilling BHA to preserve both the quality of the recorded logs, and the real-time transmission throughout the run.

The drilling engineering team ran several drilling BHA designs. These designs were mainly simulated for torque and drag (T&D), axial displacement, and stick-slip magnitude to select the best engineered drilling LWD BHA design. Figure 2 shows the selected drilling LWD BHA design configuration.

	Desc.	OD (in) / ID (in)	Max OD (in)	Bot Type / Top Type	Bot Gender / Top Gender	Length (ft)
1	8 1/2" PDC Bit (6X15 nozzles)	5.750 / 2.250	8.500	/ 4-1/2 REG	/ Pin	0.8
2	**Rotaty Steerable System (RSS)**	6.750 / 5.160	**8.375**	4-1/2 REG / 4-1/2 F	Box / Box	14.0
3	Float Sub	6.810 / 2.875	6.810	NC50 / NC50	Pin / Box	3.0
4	Link Sub for RSS	6.875 / 2.250	7.438	4-1/2 F / 5-1/2 FH	Pin / Box	7.3
5	Saver Sub	6.750 / 3.250	6.750	5-1/2 FH / 5-1/2 FH	Pin / Pin	1.2
6	**New LWD Dual Imager Tool**	6.750 / 2.000	**8.375**	5-1/2 FH / 5-1/2 FH	Box / Box	15.1
7	Saver Sub for MWD Tool	6.890 / 3.250	6.890	5-1/2 FH / 5-1/2 FH	Pin / Pin	1.2
8	**Measurement While Drilling (MWD) Tool**	6.890 / 5.109	6.890	5-1/2 FH / 5-1/2 FH	Box / Box	24.9
9	Saver Sub for MWD Tool	6.770 / 3.875	6.770	5-1/2 FH / 5-1/2 FH	Pin / Box	1.5
10	Saver Sub for GR/Resistivity Tool	6.890 / 3.188	6.890	5-1/2 FH / 5-1/2 FH	Pin / Box	1.2
11	**Gamma Ray (GR)/Resistivity / Annular Pressure while Drilling**	6.750 / 2.810	7.500	5-1/2 FH / 5-1/2 FH	Pin / Box	17.9
12	Saver Sub for Sonic Tool	6.930 / 3.875	6.930	5-1/2 FH / 5-1/2 FH	Pin / Box	1.2
13	**Sonic Tool**	6.960 / 5.157	**8.250**	5-1/2 FH / 5-1/2 FH	Box / Box	31.6
14	Saver Sub for Neutron Density Imager	6.900 / 3.875	6.900	5-1/2 FH / 5-1/2 FH	Pin / Pin	1.2
15	**Neutron Density Imager Tool**	6.900 / 2.250	**8.250**	5-1/2 FH / 5-1/2 FH	Box / Box	17.2
16	Saver Sub for Neutron Density Imager	6.790 / 3.250	6.790	5-1/2 FH / NC50	Pin / Box	2.1
17	6 x 5" HWDP (6 joints)	5.000 / 3.000	6.500	NC50 / NC50	Pin / Box	184.0
18	Hydraulic Jar	6.500 / 2.250	6.500	NC50 / NC50	Pin / Box	29.1
19	5 x 5" HWDP (5 joints)	5.000 / 3.000	6.500	NC50 / NC50	Pin / Box	150.9
20	5" DP	4.855 / 4.276	6.625	NC50 / NC50	Pin / Box	To surface

Figure 2: *The LWD BHA configuration, including the new LWD OBM dual imager, while drilling with OBM in the wellbore.*

WELL EXECUTION

Well Placement & Geosteering: The real-time transmitted density image log is normally the tool used for well placement, along with the GR log if an OBM system is used. The resistivity image log could not previously be provided. With OBM, the mud-cake behaves similar to electrical insulators which obstructs the current flow, so using the same LWD tools to acquire data in a water-based mud (WBM) environment is not feasible to use in an OBM system4. Furthermore, existing and drilling-induced fractures filled with OBM misrepresent the image by scaling fewer sedimentary features.

The real-time density image log is used for well placement through identifying the bedding planes while drilling through the lateral section. From the shape of the bedding layers recorded real-time, the well path can be guided to keep the bit inside the target zone. Despite that, the bedding planes shown in the resistivity image log recorded real-time from the new

dual LWD imager tool show higher resolutions when compared to the density image. Therefore, providing more data to improve goesteering.

Figure 3 shows the better image resolution of the resistivity image compared to the density image log. For the first time ever in this field, the real-time transmitted resistivity image was used for well placement along with the density image log. In addition, it was the first time ever to transmit in real-time all three image logs.

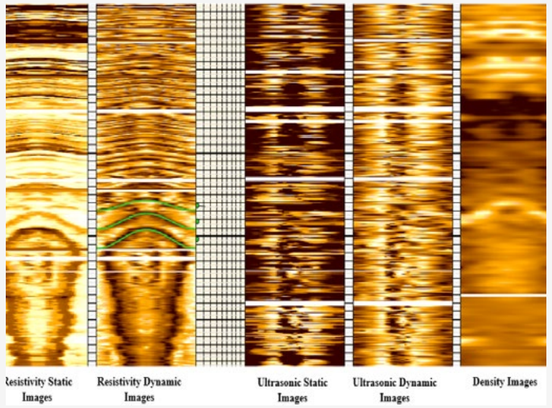


Figure 3: *All three image logs (resistivity images on the left side in two different modes, ultrasonic images the next two in the middle in two different modes, and the density image on the right side) were transmitted real-time together when drilling commenced. The gap in some logs is due to excessive ROP and some noise in MWD telemetry. This real-time transmission was done for the first time in the world.*

Prior to drilling the well, the expectation from the offset horizontal wells was to have the target formation almost flat. Therefore, the initial directional plan was designed to maintain the well inclination after landing in the range of 89.7 to 90° while drilling through the lateral section. The resistivity image log transmitted real-time from the new dual LWD imager tool obtained while drilling through 96 to 98 lb/ft3 OBM, combined with the density image log helped to identify the dipping behavior of target formation. The formation starts flat for a short interval, then it dips downwards for most of the lateral section. Then, toward the end of the lateral section, the downwards trend decreases until it is almost flattened out, ***Figure 4.***

The resistivity image log helped correct the well path back to the target zone. Figure 4 shows that the actual well path was out of the target zone for a small portion of the lateral, then was corrected back to the target zone. Then, the well path was maintained inside the target zone throughout the lateral section of the well by using the real-time resistivity image log.

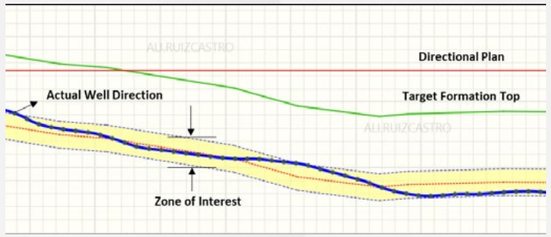


Figure 4: *The actual well path relative to the zone of interest. The target formation is dipping down initially, then flattens out at end of the lateral.*

IMAGES VERTICAL RESOLUTION AND QUALITY ASSESSMENT

LWD Images vis-à-vis Wireline Images: One of the main concerns while acquiring LWD imaging logs in an OBM environment was always the vertical resolution when compared to wireline imaging tools. This additional acquisition of wireline logs significantly increases the budget of not only the logging program, but also of the drilling part of the project as it adds additional rig time. Unfortunately, acquisition of wireline image logs in horizontal wells does not always provide image data with a suitable quality for the tasks they are acquired. This is due to the challenging nature of the acquisition in such environments e.g. hole condition, solids in mud, and so on.

The OBM LWD resistivity and ultrasonic images acquired in this well while drilling were compared with wireline images, and with the LWD density image. The results were promising; the image quality and image resolution of the OBM LWD resistivity and ultrasonic images were excellent, and permitted the users of the data to identify more geological events than with the wireline images, Figures 5 and 6. Several natural fractures and faults were clearly identified, many of which could not be observed with the wireline image logs.

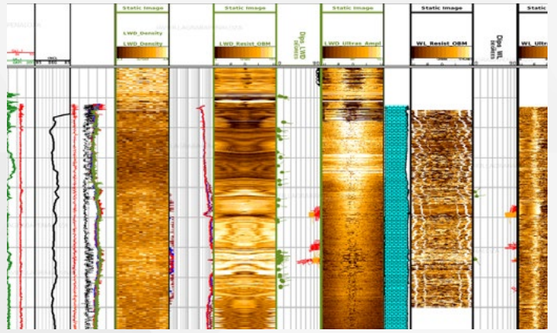


Figure 5: *Compressed plot over the entire curve and lateral sections of a carbonate interval. Static image with LWD (density, oil-based resistivity and ultrasonic) and wireline (oil-based resistivity and ultrasonic) images. Note that at this compressed vertical scale dip planes are clearly more evident on the LWD oil-based resistivity image if compared with the rest of the image logs. Also note that without the image data, the low porosity zones of this section will be considered with low flow potential, when in fact they will be the major contributors to the hydrocarbon flow due to the presence of the natural fractures (red tadpoles).*

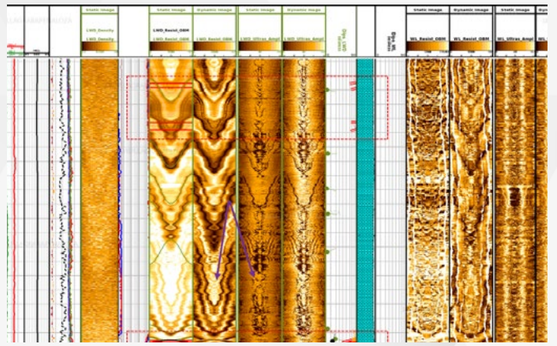


Figure 6: *(Expanded scale plot). On the LWD OBM resistivity and ultrasonic images several natural fractures are observed (red tadpoles). Some of these events are hardly or none observed on the wireline images.*

CONCLUSIONS

The overall process summarized in this paper strived to optimize the well construction operation in unconventional drilling. The engineering design and fit for purpose LWD dual imager in OBM enabled a faster delivery in completing the horizontal well. The ability to make fast decisions in real-time based on full information and borehole images improved the geosteering operation. The process from the pre-job phase and well engineering design toward the execution phase reflects a success story delivering such a challenging well.

The LWD oil-based dual imager (dual physics) provided resistivity and image logs that were better than the wireline resistivity and ultrasonic image logs in many sections in terms of quality and resolution. It allowed for real-time decision making to adjust the well path and thus improved well placement.

ACKNOWLEDGMENT

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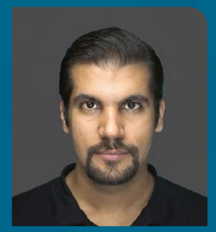
Visual Analytics: What Tesla and an oilfield have in common!



By Saad Hamid, Production Engineer at Saudi Aramco
Abdullah AlDraihem, Technical Advisor at EV Offshore

In a recent interview with Electrek, Elon Musk said:

"When radar and vision disagree, which one do you believe? Vision has much more precision, so better to double down on vision than do sensor fusion.... As vision processing gets better, it just leaves radar far behind."

Advanced imaging technology has become an indispensable part of the modern world. It is prevalent in the latest generation of automotive vehicles. Tesla, among several car manufacturers, uses computer vision and advanced image processing techniques to support safer driving. In industries involving high levels of security, advanced imaging plays a critical role in delivering the data and accuracy required for critical decision-making processes, such as facial recognition. The quality and precision of the image data acquired are decisive factors for these applications.

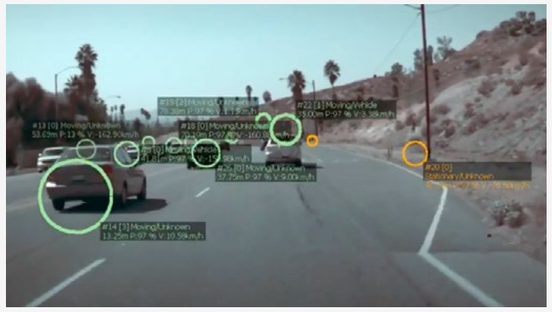


Figure 1: *Tesla Computer Vision (Courtesy Electrek.co)*

The oilfield is no stranger to imaging and cameras either. Downhole video cameras have operated in oil and gas wells since the 1980's, but it is only in recent years that the technology has advanced sufficiently to reliably capture, store and process the large volumes of high quality images and high frame-rate videos. This information is required for computational analysis and as input for machine learning models for deriving meaningful outcomes through Artificial Intelligence (AI).

Advances in computer vision techniques and image processing have led to the ability to make detailed and accurate measurements from images – known as visual analytics. This new data analytics source, combined with state-of-the-art acquisition technology has significantly improved the understanding of complex well issues while reducing operational time, risk, and cost. Examples of its applications include hydraulic fracturing, well integrity, erosion, restrictions, and leaks.

To exploit the information value from what is now a suitably rich visual dataset, bespoke software applications have been developed to analyz e and quantify the captured video data. With this software system, the user can measure the dimensions of captured objects within the field of vision of the camera system by placing markers, shapes or freeform drawings directly onto the image. The system defines these sub-pixels dimensions highlighted by the operator and converts to calibrated real-world measurements of distance, thereby returning quantification of lengths, areas, arcs and azimuth in any plane in all three dimensions.

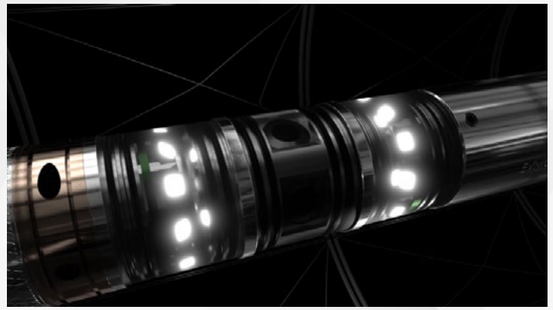


Figure 2: *Optis Infinity Multi-array Sideview Camera (Courtesy EV)*

MULTI-ARRAY SIDE VIEW CAMERA SYSTEM

The developments in video acquisition systems and computer vision technology discussed above provide a step-change in the value and number of applications for downhole video. This latest camera system incorporates the innovative arrangement of four axially aligned image sensors contained within a novel and unique lens system. The system operates by capturing all four side-viewing camera feeds simultaneously at 25 frames per second. A hybrid system of real-time and memory functionality is now possible through the integration of high-capacity memory modules and telemetry systems. This unique technology allows all four array cameras to record simultaneously and save the recordings memory storage while delivering high-quality live video at the surface. This quantum shift in information offers an unparalleled understanding to support real-time decision-making and enable effective well management.

IMAGE STITCHING PROCESS

To extend the application of array technology, significant advances have been made in image processing to deliver a single, continuous 360-degree image derived from the integration of images from each of the four individual cameras. This process, known as image stitching or ' mosaicking'. Stitching takes full advantage of the overlap in the circumferential direction between adjacent cameras and high frame rate video captured by each camera. These two features in combination ensure that features of interest are captured by at least one camera and over successive depth/ time points, ensuring that recorded datasets capture a complete & quantifiable image of the wellbore.

An example of the input video and the resulting output images from this image stitching process is shown below in Figure 3 for a perforated area of a well. With current array camera technologies this process analyzes in excess of 5x109 input pixels (> 5 Gigapixels) to produce an image of 10m (approximately 33ft), with resulting file sizes > 20 MB/ m (> 6.5 MB/ft). The resulting images quickly becomes very large in size, the mosaic images are therefore stored in short, depth indexed sections as the database and accessed by the playback software in sequence to produce images over any required interval with the minimal image processing and file handling.

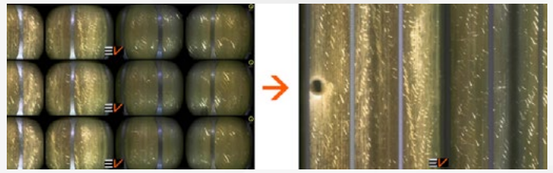


Figure 3: *Example mosaic image over perforated area of well based on input sequence (Courtesy EV)*

Another advantage of the image stitching process is that the technique is purely driven by the properties of the images and does not rely on external sources of information regarding tool speed or the centralization/ offset of the tool within the wellbore. The benefit of this is that the algorithm is able to compensate for changes in downhole speed, centralization and tool orientation, providing a measure of each effect as an output.

This in itself provides significant opportunities for downhole depth and speed correction which may assist greatly in improving the location/deployment of mechanical services, such as cutters and perforating systems, deployed in combination with the array video technology. Similarly, time-lapse analysis of well integrity or cased hole petrophysical logs may be significantly improved by enabling more accurate depth correlation and motion compensation of successive datasets.

LOG DATA INTEGRATION AND 3D VIEWING

Having successfully created seamless, continuous images of the wellbore environment, it is now possible to integrate the data with other sources of data on a time or depth-matched basis. By integrating this well or structural integrity logs, it is now possible to visualize the combined data in both 2-dimension and 3-dimensions through the development of a combined video/log data analysis suite, as illustrated in figure 4. By viewing and analysing multiple datasets with the mosaicked image, it is possible to gain a greater understanding of the well condition and behaviour as well as quantifying the changes that may have occurred. Through this technique, it is also possible to identify root cause and assess the impact and severity of the issue for improved decision making with regards to remedial actions with the added benefit of simplified and visually intuitive information.

Figure 4: *Simultaneous 2D presentation of quantitative multi-finger calliper data and qualitative 360-degree mosaic image (Courtesy EV)*

For further enhancement, the mosaic images can be superimposed onto 3-Dimensional CAD models and technical drawings of components and assemblies as supplied by the original manufacturer. This allows the image to be seen in its intended geometry, and from any viewing angle or perspective, enabling identification of variation between original specifications and 'as measured' geometries.

CASE STUDY

The Challenge

The following example comes from an operation in Saudi Arabia, where the well in question was completed as a single lateral, horizontal gas well, with a 5 ½" pre-drilled liner in 8 3/8" open hole. Workover operations were completed previously to replace the corroded carbon steel with 4 ½" S13% Cr tubing.

During a drift run, a restriction was encountered near the upper R-Nipple at 2,425 feet. A 2.75in lead impression block was run, however the investigative efforts were inconclusive. With the well shut in, the operator needed to characterize and quantify any identified restrictions in the production tubing.

The Solution

A high-resolution camera combined with a multi-finger calliper string was deployed on E-Line. The combination of both visual and quantitative data delivers a more complete answer to well integrity challenges. This leads to enhanced interpretation and provides invaluable 360° pipe coverage to compliment the limited radial coverage available from a standalone mechanical calliper. Deployment on electric line means that multi-finger calliper measurements and high definition down-view and side-view images can be acquired real-time, at surface.

The Results

High resolution video was logged from surface to the depth of interest, where the live footage instantly revealed parted tubing below the pup joints. The camera identified the lower portion of tubing had dropped about 18 feet. The side view footage revealed the extent of the damage on the upper parted tubing in more detail (Fig.5)

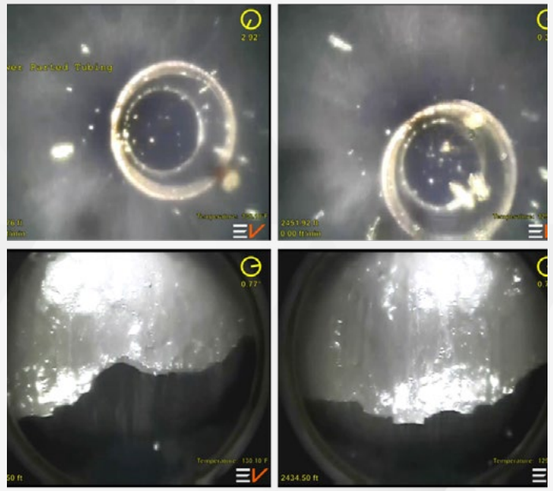


Figure 5: *Parted tubing identified by downview camera. Extent of damage revealed by side-view images. (Courtesy Aramco/EV)*

A 360 degree "mosaic" image was generated from the side-view footage to help visualise the extent of the damage in more detail (Fig. 6) .

Figure 6: *360 degree 'mosaic' image of parted tubing damage. (Courtesy Aramco/EV)*

The multi-finger calliper revealed strong evidence of galvanic corrosion and severe pitting within both pup joints (Fig. 7). The associated f low c ouplings showed little sign of corrosive damage, suggesting concentrated galvanic corrosion in the pup joints associated with mixed metallurgy.

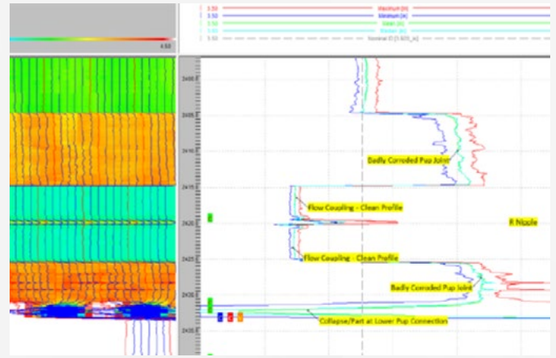


Figure 7: *Calliper pass over pup joints revealing severe corrosion and confirming parted tubing damage. (Courtesy Aramco/EV)*

The combination of qualitative and quantitative data provided a holistic view of the situation downhole and allowed the operator to move ahead safely with a workover operation.

CONCLUSIONS

Modern downhole video provides high-definition images, and high frame rates to identify and diagnose wellbore features that are otherwise unobtainable by other technologies. The quantification of these images, and the ability to combine with other quantitative log datasets, provide a more intuitive visualization of complex information and greater accuracy of interpretation.

The continuous 360-degree images of wellbore conditions, enabled by advances in computer vision, image processing techniques, and downhole video technologies, deliver a level of wellbore evaluation that far exceeds the limits of conventional logging technologies. The application of visual analytic techniques to the images from these latest generation technologies has enabled the development of new diagnostic methods. These methods provide an improvement in information provided which empowers decision-making, leading to better economics and reduced operational risks. SR

SandRose Technical Paper Digest

Curated by Nora Hamidaddin, Associate Editor SandRose Magazine

In this section, we curate a number of recommendations for technical papers from subject matter experts on topics relating to their respective disciplines.

Petrophysics

PORE SURFACES OF RESERVOIR ROCKS: SMOOTH OR ROUGH? AND WHY SHOULD WE CARE?

Proposed by Shouxiang Mark Ma, Sr Petroleum Engineering Consultant, Saudi Aramco

Paper: SPE-201689-PA Objective-Driven Solid-Surface-Roughness Characterization for Enhanced Nuclear-Magnetic-Resonance Petrophysics from SPE Journal 26 (05): 2860–2879

All rock pore geometry models used in the oil and gas industry assume that pore surfaces are smooth. In reality, however, rock surfaces are intuitively rough. How to characterize surface roughness and evaluate its impacts on derived petrophysical properties are the main objectives of this paper, where pore surfaces are characterized by using an extra high-resolution laser scanner confocal microscope. Results indicate that grainy limestones have relatively higher surface roughness compared to muddy limestones and dolostones. There are many applications to the proposed study, and in the paper, the example used illustrates how NMR pore characterization can be enhanced by considering pore surface roughness.

Unconventional Resources

THERMAL MATURITY ESTIMATION BY RAMAN SPECTROSCOPY FOR UNCONVENTIONAL RESERVOIRS

Proposed by Wael Abdallah, SDCR Center Manager, Schlumberger Middle East

Paper: Fast and accurate shale maturity determination by Raman spectroscopy measurement with minimal sample preparation from the International Journal of Coal Geology 173 (PP150-PP157)

Production of petroleum from unconventional reservoirs (UR) is key to meeting future global energy demands. However, it still requires better characterization for profitable exploitation. Accurate knowledge of organic matter thermal maturity allows prediction of the petroleum type in the reservoirs. The paper introduces a robust correlation between Raman signal and thermal maturity for a variety of source rocks with a wide range of maturity developed at Schlumberger Carbonate Research Center. The resulting correlation enables the estimation of thermal maturity expressed as vitrinite reflectance equivalent to being estimated in unknown formation samples. The proposed framework is also applicable on rock samples at the well site with minimum preparation.

Machine Learning/ Petrophysics

MACHINE LEARNING STRATEGIES FOR ACCURATE WELL LOGS PREDICTION

Proposed by Ahmed Abouzaid, Formation Evaluation SME, Baker Hughes

Presented at SPE/IATMI Asia Pacific Oil & Gas Conference and Exhibition Virtual, October 2021

Artificial Intelligence (AI) or Machine Learning (ML) allows for building automated processes with minimal human intervention and improving the efficiency of well log prediction. The paper compares two different approaches to ML modeling: 1) the self-calibrating model, and 2) the domain-knowledge ML model. The results from the first approach could not achieve satisfactory accuracy because of the complex relationship between petrophysical parameters. The second approach, however, showcased better results, where the input well logs used are the standard logs GR, resistivity, and density-neutron. The proposed framework achieved a prediction accuracy of R2 (regression model R-squared) score of 87% and CC (correlation coefficient) of 96%.

Carbon Management

CARBON CAPTURE & STORAGE

Proposed by Ammar Alshehri, General Supervisor at Upstream Carbon and Circularity Division, Saudi Aramco

Paper: Carbon Capture – North America: Reassessing the Opportunity by Morgan Stanley Research

Morgan Stanley recently published a report on carbon capture in North America. The report highlights several aspects of Carbon Capture & Storage (CCS) including major planned projects, existing CO2 infrastructure, and incentive schemes. It also highlights the anticipated CCS cost, where the capture cost has a higher and wider range of $21-$171 per ton of CO2 based on the source of the CO2, while the storage cost has a lower and narrower range of $7-$11 per ton of CO2. The paper provides useful information for benchmarking a topic that is gaining huge interest nationally and worldwide. SR

Be the New Version OF YOURSELF

By: Fuad F. Al Therman
General Manager at Saudi Aramco

It is said that the journey of a thousand miles begins with a single step. In fact, as I write this article, I expect to reach my millionth step today (amounting to around 500 miles) since I started tracking my steps on my phone about five months ago. As I near my mid-fifties, I am embarking on a program to restructure my life to make it more efficient and effective.

When we think of bettering ourselves, we naturally begin comparing ourselves to others. While some competitiveness may enhance performance, too much of it can have adverse effects on our psyche -- especially when we are outperformed. On the other hand, competing with ourselves is an idea worth adopting because it pushes us to do better regardless of the circumstances.

Seeking comfort is human. But pursuing efficiency, strength, and resilience requires effort, determination, and the courage to step outside one's comfort-zone. As it has been said in a verse attributed to ***Imam Ali:***

> ***If you guard your soul and work towards its betterment You will live in peace and have a favorable reputation***

A balanced life should allow for both comfort and growth. Personally, the idea of competing with myself and achieving my "personal best" first came to mind 15 years ago, back when my two daughters, Deema and Dana, shy of 10 years of age, were participating in swimming competitions in Saudi Aramco's Dhahran residential community . At these swimming meets, I noticed that coaches recorded each swimmer's best times. While swimmers raced against each other, they also strived to exceed their personal best times. That idea stayed with me, but it did not bloom into a behavior-changing commitment.

It wasn't until last year, during a management development program at Aramco where the idea began to truly manifest. As part of an executive coaching program, I was asked to think about the goals I'd like to achieve in my personal and professional life. I realized that I could apply the notion of "personal best" to all facets of my life. I could be the best version of myself. I could be the "new edition," upgraded, rebooted and customized, much like mobile phones, software, and robots. Making development an integral part of our lifestyle creates a continual cycle of improvement, keeping us sharp, relevant and adaptable.

I began a program to challenge myself in five key areas, which I believe are essential for anyone to enhance their abilities, improve their performance, and outdo themselves:

MENTAL	**Developed through reading, learning, and enhancing work and life skills**
PHYSICAL	**Enhanced with exercise, diet, and healthy habits.**
SPIRITUAL	**Deepened through acts of worship, meditation, closeness to God, and working towards the hereafter.**
EMOTIONAL	**Strengthened by emotions of love, healthy relationships, and staying in touch with family, friends, and coworkers.**
FINANCIAL	**Improved with savings and investment.**

It is no secret that self-development in pursuit of becoming the best version of ourselves calls for determination, tenacity, and discipline to push us into accomplishing goals that can only materialize through conscious effort. It's as Thomas Edison once said, "Genius is 1% inspiration and 99% perspiration." It also takes time for change to occur. Results don't happen overnight, they grow gradually over months and years. This reminds me of an Arabic proverb: A little bit of continuous effort is far better than doing a lot inconsistently. I believe that it is our moral obligation to aim for self-actualization and not to settle for being at the bottom or to stop mid-way when success or excellence is within reach, or as the well-known Saudi poet ***Abu Al-Tayyib Al-Mutanabbi*** once said:

> ***Among all human flaws lay no greater flaw as the deficiency of those to whom excellence can be attained***

It is important to note that your success in becoming the best version of yourself does not mean pressuring yourself to become exceptional or to change the world as we know it. Rather, it is to realize that growth only comes with effort, and that's a fact of life. Over the past 30 years, management and self-help literature has grown exponentially because they are selling this idea that we must all be exceptional. The way I see it, every person who works hard and perseveres will no doubt be accomplished. They may not be exceptional or leave a lasting mark, but they will definitely be balanced in their own life and influential in their own circles. And that in itself is a virtue not to be missed. SR

Bridging the Generation Gap

A FOCUS ON THE MULTIGENERATIONAL WORKFORCE

By Danna Khattab, Abdulrahman Albukhari, Mustafa Kidawi, Maram Ejaimi, SPE-KSA Diversity & Inclusion Committee

Multigenerational human factors substantially affect the cultural environment of organizations within the workplace. As the workforce environments shift towards a multigenerational space, organizations must be prepared to take advantage of the benefits and ensure the optimization of this diversity as a valuable asset. Additionally, multigenerational inclusion in corporations provides a healthy variance in work habits, expectations, and communication styles. Implementation of the age diversity strategy can be a solid bolster to achieving business goals; the collaboration of new innovative ideas with wisdom from long experiences brings increased productivity. Young employees can add value with their flexibility to rapidly developing technology and adaptability to the changes. Concurrently, more mature employees can provide knowledge from their experience that can guide the decision-making processes.

Significant benefits of including a range of ages in the staff can be noticed in various areas while performing workplace duties such as:

Multiple perspectives; different generations can have distinctive ways of viewing job responsibilities, leading to a broader range of abilities that support innovation.

Problem-solving expertise; teams with age diversity can offer a wider variety of ways to address problems.

Learning and mentoring opportunities; reverse/cross-generational mentoring can be applied to provide a mutually beneficial mentoring environment.

Knowledge retention; focusing more on the in-house promotion of the young talent and reducing recruitment from outside ensures that the knowledge passes on within the company through the generations.

Unique and meaningful relationships with coworkers; various age groups within the corporation mirror a family structure that offers potential for personal connections with those outside one's generation.

Along with the apparent benefits, corporations will face the challenges of managing a multigenerational workforce. There are four different generations within working ages: Baby Boomers, Generation X, Millennials, and Generation Z. With each generation raised in different periods, managers must be aware of the characteristics of the various workspace generations and act accordingly. As a byproduct of being born in different eras, each generation was exposed to unique circumstances shaping their outlook. For example, an employee born between 1946-1964 (baby boomer) will likely be focused on financial stability/retirement and has a live-to-work mentality. On the other hand, an employee born between 1980-1995 (millennial) will focus on career growth and integrating a work-life balance. Accordingly, conflict is unfortunately bound to arise due to the differences in values. Thus, proper communication is the key to solving conflict through an open, honest, and transparent environment where people feel included and respected. In addition, employees should be discouraged from taking firm stands against either view in a conflict as a compromise can be better reached when each party is willing to see the value of how others feel.

However, these defining generational characteristics might not be possessed by all its members as everyone is unique. Therefore, employees with a similar generational background should be perceived as individuals rather than entire demographic groups. Ergo, the best strategies for managing a multigenerational workforce match those used for overseeing people with additional characteristics. The three main strategies to managing people are: identifying the ideal management style, using specialized coaching to help employees grow, and setting stretch goals. When these strategies are applied and personalized to individual employees, the corporation can expect significant enhancements in performance. Overall, identifying the different perspectives, attitudes, and behaviors will assist managers in communicating better with their employees.

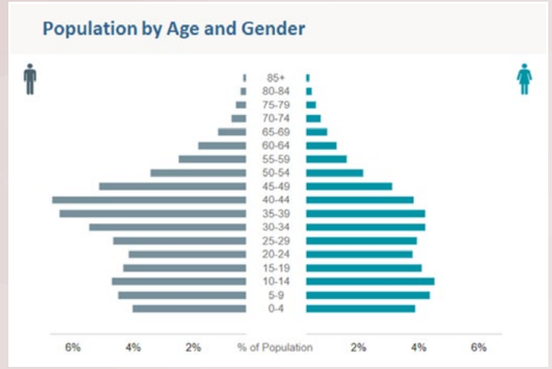


Figure 1: *2020 Saudi Arabian Census shows the population distribution in terms of age group and gender (Population Clock: World, 2020).*

Multigenerational workforces are not limited to specific regions and are present worldwide, including Saudi Arabia. This is best exemplified by a 2020 Saudi Arabian census which shows that the Saudi population has prevalent diversity in terms of the distribution of generations. The Census Bureau outlines the makeup of each demographic, as seen in Figure 1.

The Census shows a disparity in the prevalence of the generations, and it can be assumed that such diversity is present in the workforce as well. Furthermore, the impact of generational diversity is anticipated to extend beyond the workplace; it is expected to affect public policies, governmental bodies, and local government workforces. Early recognition of generational diversity's rise is crucial to ensuring that its potential benefits are optimized.

Additionally, addressing the shift in perceptions of public policy and organizational performance effectively is necessary to recognize the substantial influence of generational differences.

The term generation gap, three decades ago, was primarily used to describe conflicts between parents and children. Nowadays, these differences are affecting various aspects of an individual's daily life. Thereby, generational gaps need to be bridged across divides, and managers must publicize the positive aspects of intergenerational relationships in the workplace. The best way to accomplish this would be to create an open communications channel; allowing the different generations to openly express and discuss their unique points of view will undoubtedly lead to a more positive understanding between them. SR

Interview with

Abdulrahman Al-Abdu climbing life

PICTURES BY
Faris Alsharif &
Will S. Lawrence

Abdu climbing in Hariq

After a long night drive through the sleepy towns of Asir, we found ourselves in Tanoumah, a city in the southwest of Saudi Arabia, 120 Km north of Abha, nestled in the Sarawat mountain range. Upon arrival, we were greeted by Abdulrahman (Abdu) Al-Abdu, a Asiri local climbing enthusiast and the owner of the newly established Gamba Climbing platform.

In typical Abdu fashion, he greeted us with his enthusiasm and signature can-do attitude preparing us for our ascent into what the night had hidden. As the sun rose, we walked a short distance from the camping site, taking in the cold mountain breeze, making our way through clearings shrouded by juniper trees, the magnificent mountains of Tanoumah, and the songs of mountain birds wandering in its expanse.

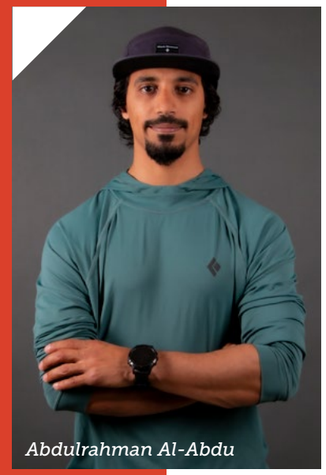
When we arrived at the base of our climbing route, Abdu enthusiastically talked us through the process of outdoor sports climbing, teaching us about the tools required, the different knots, and climbing techniques. We were all excited to take on the challenge, with a hint of fear of tackling this vertical maze. However, by the end of the weekend, that fear was replaced with an appreciation and excitement for even more outdoor climbing, an intrigue over Abdu's passion for it, and a fascination with the budding Saudi climbing community. To investigate this, the editorial team sat with Abdu for a SandRose exclusive.

Tanoumah from above

First Climbing Experience

Back in 2013, while studying in Toronto, Abdu started climbing by chance when his friend invited him to an indoor climbing gym. He has been hooked ever since. Time and time again, he kept coming back and progressing through the climbing levels. While many can be dissuaded by how daunting climbing may be when attempting it for the first time or negotiating a new route, Abdu embraced the mental and physical challenge of working through climbing problems he didn't initially believe he could solve, defying his expectations.

Abdu: What I liked about it was that I couldn't attempt the climbing route at first. It was impossible! That's what made it challenging and rewarding. No one walked me through it. It was only through observing and attempting a route I realized and developed the technique to defy my limits."



Abdulrahman Al-Abdu

Why Rock Climbing

Many people answer the call to climb for different reasons. For some, it's the adrenaline rush, while others may be driven by the mental challenge or the desire to improve their fitness. For Abdu, it was the nuances of testing, developing, and executing a sequence of physical techniques and the success of completing a move in the most efficient way possible. Abdu also attributes his love for climbing to enjoying the state of "flow".

Abdu: You get in the zone where nothing else exists. You are simply flowing through it. You can feel challenged, but you're still flowing through it. If you get in that head-space, then you are a climber, and you're doing it.

Climbing as a Lifestyle

Before his first visit to the climbing gym back in Canada back in 2013, Abdu worked out actively and consistently at the gym. He attributes his ability to rapidly take up and progress through climbing to his strict workout regimen. However, when pursuing his graduate studies in Australia, climbing began to take precedence above all. Seven years after that fateful visit, his fitness regime solely became individually dominated by climbing.

After graduating from university, Abdu returned to the Kingdom to work with a reputable international consulting firm in the heart of Riyadh. Despite landing a highly coveted job, climbing was always on Abdu's mind.

Abdu: Climbing gave my life a focus. I structured my travels around it. Climbing to me changed from a hobby to a lifestyle. It took priority over everything. For instance, while working a corporate job, I told my manager that I would only give you 50% because the other half is climbing.

The Landscape of Climbing in Saudi Arabia

Upon returning from Canada in 2013, Abdu tells us there weren't many well-established climbing areas in the Kingdom. However, a chance introduction in 2015 led to a visit to Wadi Hanfia, where a few climbers went at the time. He visited a small indoor climbing gym in a school and a few outdoor climbing spots south of the Kingdom during that same period. Unfortunately, none had the established or certified routes that he had seen in his travels. Determined to find climbing spots within the Kingdom, he drove to Tanoumah; to his surprise, he found three well-established yet worn-out fixtures installed by climbers who have been frequenting this hidden gem for decades. This all changed in 2018 when the General Sports Authority started federations to introduce and support several sports, one of which was the Saudi Climbing and Hiking Federation (SCHF). Since then, SCHF has championed numerous projects to develop climbing spots across the Kingdom. The projects led to the mass development of many routes, designated climbing areas, in addition to climbing competitions and national memberships.

With all of the developments introduced by SCHF, Abdu saw a gap in the market for climbing instructors to build the climbing community. Determined, he quit his job, got his instructor certification in the US, and joined SCHF, determined to build a base of climbers within the Kingdom. Abdu eventually became the climbing affairs manager within SCHF. While SCHF gave him the access and the opportunity to pursue his passion, he found himself in a similar predicament once again, an administrative job.

Abdu: I found myself yearning to be in the field and with unfettered access to climbing. It was then that when I decided to go into business for myself and start my own climbing school here in Saudi Arabia.

Going Solo with Gamba Climbing

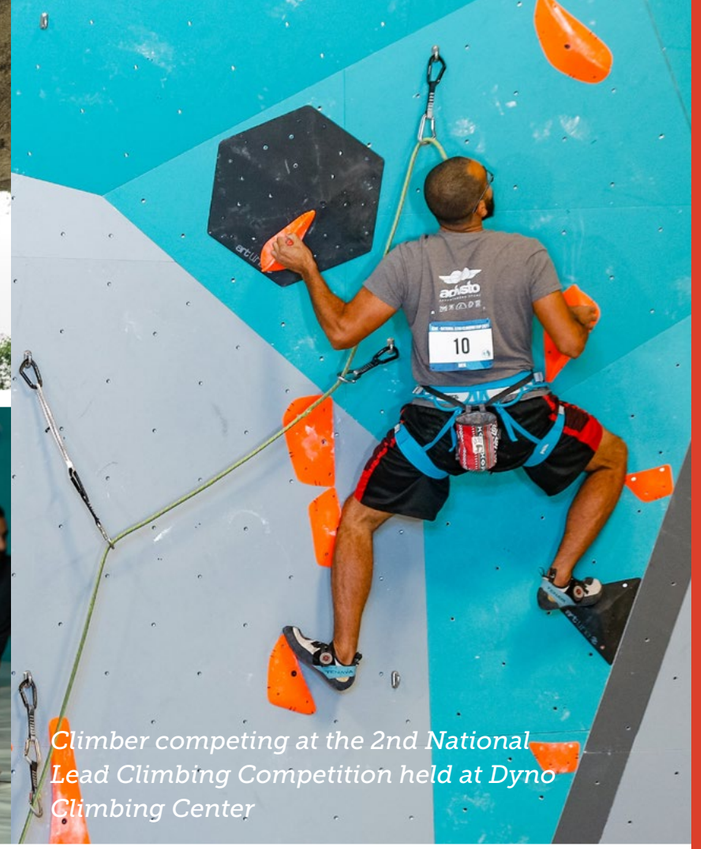
In July 2021, Abdu started his own climbing business to teach people how to climb outdoors. Inspired by the comradery he observed in his climbing travels, Abdu chose the name "Gamba", short for the Japanese word "ganbaru" meaning "do your best" or "to work with perseverance", a name which fits the encouraging and friendly attitude he radiates in every class he teaches. The transition to leading and teaching climbing courses proved to be a natural fit for Abdu and in line with his mission to build the climbing community in the Kingdom. Since launching Gamba, he has led diverse groups of learners across all age groups.

Abdu: Helping people push themselves to do something they never thought they'd be able to do—it's a satisfying feeling. I had a person climbing who couldn't finish the route with some words of encouragement. The student finished it and shed some tears of joy. The barrier most of the time is mental, or they need to improve their technique. So it is very satisfying to help someone through that.

Climber on an overhang

Abdu climbing a crack in Tanoumah

Climbers at Dyno Climbing Center



Climber competing at the 2nd National Lead Climbing Competition held at Dyno Climbing Center

Abdu drilling climbing bolts to anchor from

Hariq

Life Lessons from Climbing

When attempting my first outdoor climb, I couldn't help but reflect on the life lessons to learn from climbing, whether persistence, problem-solving or patience. In our interview, Abdu also reflected on the life lessons he has learned from climbing.

Abdu: Fear is very tangible. Most people are stuck because they fear losing money or getting abandoned or failing; fears stop them. In climbing, people are often trapped by the fear of getting injured. In climbing, fear is tangible; they're afraid of heights or falling. Once you figure out the source of the fear, you can kill it instantly. Some people are fearful of falling. Therefore, they will practice that in a safe environment experiencing the fall with a secured rope, ultimately realizing they are safe. To compare that to life, you need to face your fears by pinning down the root of them and confronting them head on. Take that approach to life, pinpoint the problem and be honest about it; only then can you overcome it.

Tips for New Climbers

When asked about the future of climbing, Abdu expressed his excitement about the potential to teach across the Kingdom and to continue developing the still-nascent climbing community. Currently, the Ministry of Tourism has constructed climbing walls in Medina. There are also established routes in Hariq, Riyadh, Shafa, Taif, and most recently in Neom. Looking at the Eastern Province, the first indoor climbing gym in Saudi Arabia, DYNO, has already transformed the climbing scene in the Kingdom. DYNO has already hosted the second national lead climbing competition, offering a new platform to an ambitious and explorative new generation of climbers in the Kingdom.

Abdu: The most challenging thing in climbing is starting. The moment you make that commitment, it gets easier.

Visit your local indoor climbing gym and learn the proper skills and techniques that you can take anywhere. In the Eastern Province, you may visit DYNO indoor climbing gym.

Try outdoor climbing, travel to Riyadh or and other climbing spots in the Kingdom and explore local outdoor climbing class offerings, or internationally. Ask yourself "where can I go climbing?"

Get familiar with the equipment and invest in some of your own (shoes, harnesses, ropes, etc.).

Join a climbing group or learn with a partner. Climbing is a group sport, and development is easier when you can assist or be assisted by others.

Enjoy the process. Climbing is an invitation to be present. Be mindful, respect and embrace the fear and push through it. Enjoy the flow and relish in the accomplishment. SR

KFUPM CELEBRATES FIRST BATCH OF FEMALE STUDENTS

By: Fayrouz Alessa
Geophysicist at Saudi Aramco and MBA Student at KFUPM

October 7th, 2021, was a historic day for both King Fahad University of Petroleum & Minerals (KFUPM) and Saudi females, as the inauguration of female education took place under the patronage of HRH Prince Abdulaziz Bin Salman, the minister of energy and the Chairman of the Board of Trustees of the University. As a part of the first batch of female graduates, I was honored to attend the ceremony to celebrate the opening of the university's program for females and celebrate the university's 60th anniversary. The ceremony attendees consisted of some of the most inspiring leaders, including the Chief Executive Officer of Saudi Aramco, Amin H. Nasser, and distinguished KFUPM alumni. Additionally, some of the country's brightest women leaders expressed their enthusiasm for this milestone and delivered inspiring messages to the students.

During the ceremony, his Highness Prince Abdulaziz Bin Salman, the current Saudi Minister of Energy and KFUPM Alumnus, gave a speech marking the occasion. During his address, he inspired us by saying,

As KFUPM students, many of us always felt connected with the university long before entering the institution since many of our role models, fathers, brothers, and cousins were alumni and given the university's rich legacy. Therefore, we are grateful for the opportunity to take our rightful place to study at this prestigious institution and to serve our community and our country. SR

> ***"A vision is not created to remain on paper nor to become just a symbol, but rather its goal is you, and you are the source of its energy. If these walls spoke, they would commend and thank you and your ancestors for the work and passion you've put in for the future of your country. You are the university's purpose so that you have a permanent lead, an unbeatable bet, and a horse that always perseveres"***


Nadhmi Al-Nasr
CEO of Neom


Amin Nasser
President and CEO of Saudi Aramco


H.E. Mohammed Khalifa Al Khalifa
Bahrani Minister of Oil and Gas


H.E. Abdullah Al-Swaha
Saudi Minister of Communications and Information Technology


H.E. Ahmed Al-Rajhi
Saudi Minister of Labor and Social Development


Rania Nashar
Head of Compliance & Governance at the Public Investment Fund (PIF)


Nabilah Al-Tunisi
Former Chief Engineer at Saudi Aramco

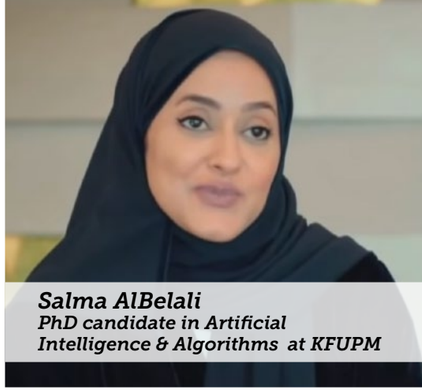

Dr. Moudhi AlJamea
Vice President of Saudi Telecom Company

H.E Prince Abdulaziz bin Salman Al Saud
Saudi Minister of Energy

H.E Dr. Mohammed Al-Suwaiyel
Former Saudi Minister of Communications and Information Technology

Fai Aldossary
Operation Foreman at Saudi Aramco

Saeed Al-Ghamdi
Managing director and CEO of Saudi National Bank (SNB)



Salma AlBelali
PhD candidate in Artificial Intelligence & Algorithms at KFUPM

KFUPM students at the ceremony

Sandrose Reviews

By Basmah Alotaibi and Dana Dabbousi, Associate Editors SandRose Magazine

This is SandRose Reviews. Building on our "Book Recommendations" section, we'll be adding documentaries and podcasts for our readers with a diversified media palette. For our visual learners, our on-the-go learners, and our traditional book-and-a-cup-of-tea learners, we want to help you on your growth journey. We will compile our editions favorites from self-development to scientific chronicles and inspirational memoirs, so you don't have to.

For future editions, we will be taking 'Recs from our Readers' so if you want to submit your reviews, send them to SandRose for a chance to be included.

Recs from our Readers

Saudi Aramco's Young Leadership Advisory Board (YLAB)

In honor of YLAB's 10th anniversary, we've asked the talented youth of Saudi Aramco to share their personal favorites.

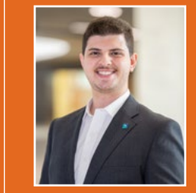
Books

Abdulaziz Al-Suwailem,
Upstream

The Intelligent Investor

The book by Benjamin Graham and Jason Zweig teaches retail investors the philosophy of value investing and helps them reach their long-term goals. First published in 1949, market conditions over the years have proven the viability of the book's techniques. This book inspired legendary investor Warren Buffet as he built his first portfolio and is "by far the best book on investing ever written," according to him.

Documentaries



Abdullah Kurdi,
Downstream

Deepwater Horizon in their Own Words (2021)

Beyond the fascinating film production, the movie provides endless lessons learned from safety to business management. You will learn something new every time you watch it.

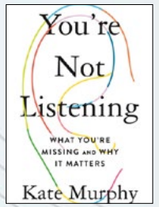
Podcasts

Hamad Al-Shehab

Cup of Coffee with Abdulrahman Abu Maleh
فنجان مع عبدالرحمن أبو مالح

If you enjoy a warm drink and an interesting discussion, this podcast is your best pick! Abdulrahman, podcast host, meets interesting figures across the Kingdom and creates a dialog that hocks you to the last minute.

Books



You're not listening

Kate Murphy

"Listening is about the experience of being experienced." – Kate Murphy

Do you remember the last time you listened to someone without mentally planning the rest of your day or the last time someone really listened to you? In a digital age where a conversation is mere clicks away, our discussions lack emotional resonance, purpose, and direction. Kate Murphy is a journalist and a professional listener by trade. In her first book, "You're Not Listening: What You're Missing and Why It Matters," Murphy delves into why we're not listening, the consequences, and how to alter the rapid trend of apathetic exchange. From a top furniture salesman to a CIA agent, Murphy introduces some of the finest listeners while making the psychology, neuroscience, and sociology of listening approachable. Before reading Murphy's book, I'd speak from personal experience when those around me discussed their hardships, thinking I would lessen their discomfort. However, after reading her book, I discovered I'm shifting the conversation instead of supporting it as my way of coping with someone else's pain rather than genuinely listening to them. In times of dividedness, you'll be more inclined to use your left ear after reading Kate Murphy's spectacular book.

If you enjoyed "You're not listening" by Kate Murphy, you'll definitely enjoy "Talking to Strangers" by Malcolm Gladwell.

Documentaries

Particle Fever (2014)

"Jumping from failure to failure with undiminished enthusiasm is the big secret to success." - Savas Dimopoulos

Particle Fever is an award-winning documentary film following the first trial run of the Large Hadron Collider (LHC), a massive particle accelerator built by 10,000 scientists and engineers near Geneva, Switzerland. The film follows an experiment run at the European Organization for Nuclear Research (CERN) by experimental physicists and theoretical physicists who tried to conceptualize a framework for the LHC's results—beginning from 2008, the initial trial of the LHC, and ending in 2012 when the final elementary particle, Higgs Boson, was identified. Film director Mark Levinson, formerly a theoretical physicist, took a highly intricate topic and made it not only accessible to laypeople but also emotionally investing. Particle Fever is a must-watch to reignite the passion and curiosity in anyone.

If you enjoyed Particle Fever, check out Cosmos: A Spacetime Odyssey documentary series!

(Award: Stephen Hawking Medal for Science Communication in 2016)

Podcasts

Hidden Brain

Group Think

Hidden Brain analyzes the psychological phenomena that influence common human behaviors, a series that any astute leader will want to follow. From breaking down our fight, flight, or freeze instincts to the role regret plays in our lives, host Shankar Veydantham invites leading psychologists to interpret interesting stories and speak to the psychology behind our shared human experience. Hidden Brain reveals the lessons we can all take through each episode from a thorough understanding of ourselves and others. In a recent episode on Hidden Brain titled Group Think, Shankar sits down with Psychologist Jay Van Bavel to dive deep into the impacts of 'groupthink' on our society and the responsibility of leaders to use this power wisely. Groupthink is a psychological phenomenon where group members can come to conclusions based on what their group thinks regardless of any reason or apparent consequences, often known as a herd mentality. The episode highlights how the majority can often dictate our thinking, going as far as subconsciously influencing our sense perceptions and behaviors. Shankar's greatest strength as a host is tying together a multitude of psychological studies while keeping their relevance apparent to a broad audience. After tuning into this podcast, you may find yourself referencing these studies at events, both professional and personal, as they reveal the roots of very common yet difficult to fathom behaviors that are worth reflecting on with others.

Member Spotlight

In this section, we select a distinguished member of the SPE-KSA community to highlight in each issue

FAST FACTS

Name: Faisal Al- Nughaimish
Job title: Chief Drilling Engineer at Saudi Aramco
SPE involvement: SPE Middle East Regional Director

What event, person, or life experience has had the most influence on the direction of your life?

My late father has been the greatest influence in my life, he devoted himself to provide a better future for his family and built a very successful career for himself. I try my best to follow in his footsteps each and every day.

How do you define success?

Success is what you make it yourself, it's the journey, not the destination. We are all on our own journey, let's just make sure we enjoy it.

When you're not working, how do you enjoy spending your time?

When I am not working, I am enjoying my time with my family and friends. I enjoy all sports. In my spare time, I dive and I find life underwater both spectacular and very relaxing.

Which achievement or contribution of are you most proud? Why?

I feel very fortunate to have been involved in many leading projects in the Kingdom of Saudi Arabia from very early on in my career. If I had to pick one project that is closest to my heart it is definitely Manifa, which was the largest extended reach drilling project of its time with very challenging targets. Delivering a project that you can almost recognize from outer space, presenting many world's firsts, and driving engineering to its limits, I proudly consider this one as a star on my shoulder.

What's one thing — either industry/work-related or not — you learned recently?

I never stop learning every single day. At this point in my career, I am most interested in learning about people and the teams I manage in order to develop their talents further. We should take advantage of every failure and turn it into a learning opportunity.

What are you looking forward to in the future?

I am excited to see new developments in Artificial Intelligence, Machine Learning, and also Blockchain Technologies and how they can contribute to the energy industry and our environmental climate change challenges. I look forward to seeing our young professionals in oil and gas play their part in advancing and evolving the energy industry.

What does SPE mean to you?

To be a part of SPE brings me from my home in Saudi Arabia closer to the 144 countries with its members where we have a platform to engage in oil and gas exploration and production. Here we can only gain opportunities to exchange information with the wealth of events, courses, and publications on offer. As we enter into IR4.0, SPE is an even more exciting organization to be a part of. A place where we can all as professionals innovate and enhance the energy industry with an aligned mission and vision. SPE is a meeting of some of the world's brightest minds who are committed to advancing the oil and gas community's ability to meet energy demands in a safe and environmentally responsible sustainable manner.

Quote or motto you live by?

In the words of one of the greatest sportsmen of all time Muhammad Ali,

> **"Float like a butterfly, sting like a bee. The hands can't hit what the eyes can't see."**

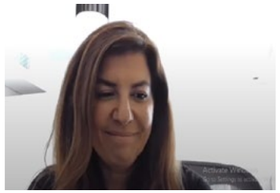
Panel Discussion on the Importance of Diversity & Inclusion in the Workplace

By By Mustafa Kidwai, SPE-KSA D&I Publications Team Editor

PANELISTS

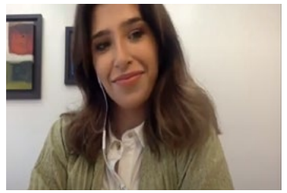
MR. YOUSIF ALTAHAN
Manager
Upstream Business
Support Department
Saudi Aramco

MR. RIYADH ALNAJJAR
KSA Country Leader
Transformation Management
PwC Middle East



MS. NORMA TAKI
D&I Leader
PwC Middle East

MODERATOR



MS. HALA ALHASHMI
Young Leaders Advisory Board
(YLAB) Coordinator
Saudi Aramco

SPE-KSA successfully held an informative panel about the Importance of Diversity & Inclusion and its evolution in the workplace.

The aim of this panel discussion was to highlight the positive strides Diversity and Inclusion has taken in Saudi Arabia recently. The panelists were asked questions to highlight the importance of D&I and how to implement it effectively in the workplace.

When asked about the difference between diversity and inclusion, Mr. AlTahan said, "Diversity is attracting all types of talents globally; all genders, age, background, ethnicity, and education. Everyone will come with their own skillset and unique experience. Inclusion is where you harness all these and make them feel welcomed, engaged, and above all - respected." Mr. AlNajjar added, "If we all had the same experiences, the same mindset, the same thinking, there would be no innovation going on." Highlighting the importance of bringing different cultures and age groups to the workplace, Mr. AlNajjar went on to say, "combination is our strength."

Outlining steps emerging organizations should consider to better implement D&I strategies, Ms. Taki said, "The tone needs to be set at the top; select someone who is client-facing and understands what happens on the ground. Leverage data; Look at exit interviews, modeling, and predictive analysis."Emphasizing the impact of D&I, Ms. Taki also added, "If we look at gender, you did not tap into 50% of your talent."

The panelists' insights were valuable and successfully showed Saudi Arabia's positive developments towards fostering more inclusive environments. SR

SPE-KSA D&I Committee Hosts

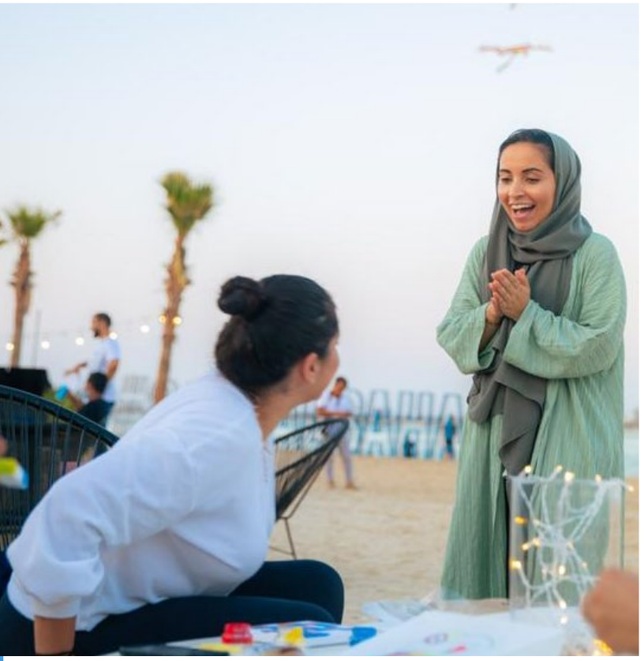
A MENTAL HEALTH AWARENESS EVENT BY THE BEACH

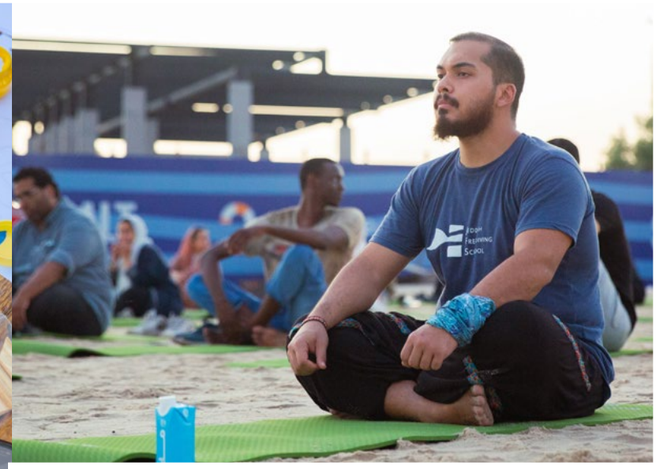
By Mustafa Kidwai, SPE-KSA D&I Publications Team Editor

SPE-KSA's Diversity and Inclusion committee held a mental health awareness event on October 17th at Salt AlBahar, Khobar. It was the first in-person event held by the SPE-KSA 2021-2023 term. The main goal of this event was to present the attendees with various methods to unwind after experiencing stressful days. The event also aimed to highlight the importance of mental health and raise awareness towards it.

The event activities included board games, painting activities, photo booths, and a meditation session. The board games allowed the attendees to socialize and meet new people. The painting activity, led by Bara AlArfaj, was centered around expressing emotions onto the painting canvas. The artist explained that he draws inspiration from his own feelings and encouraged all the participants to do the same. After introducing the attendees to what he called "art therapy", the artist gave a few examples of drawing techniques he currently uses. This activity was well received by the partakers, who allowed their creativity to take over. As the sun was setting, the attendees were called over to attend a guided yoga session led by Muneerah AlArdhi, Founder of Mantra Studio. The session began with the instructor explaining her background and what led her to discover a passion for meditation and yoga. The instructor then informed the participants that the meditative yoga session they will partake in will be "Yoga Nidra". The focus of this type of yoga would be meditation by allowing the body and mind to relax completely. The attendees responded well and were fully engaged in this activity. The event's activities concluded with a photo booth where everyone took memorable pictures to remember the successful event. The SPE-KSA D&I committee received great feedback from the participants and is looking forward to holding more in-person events in the future. SR

To watch a video of the event scan the QR Code





SPE-KSA Student Outreach Activities

School Outreach Program: Student Outreach Visits Dhahran Ahliyya Schools

By Mishal Alsana, SPE-KSA Student Outreach

On September 29th, 2021 SPE-KSA's representative and Student Outreach member, Mishal Alsana, held a workshop at the Dhahran Ahliyya Schools. The workshop was organized as a part of the Student Outreach team's efforts to spread awareness of the energy industry and to provide an opportunity for young students to interact with professionals from the oil and gas industry. The workshop included a presentation titled "Energy and Petroleum Engineering and How to be Part of it". Mishal engaged with over 80 high school students, explaining the importance of energy in our lives and the future of the oil and gas industry. He also shared his experience working as a professional engineer and his journey as a university student.

The workshop was one of several sessions and workshops the Student Outreach team organized as part of its efforts to engage the young students and to promote knowledge dissemination. SR

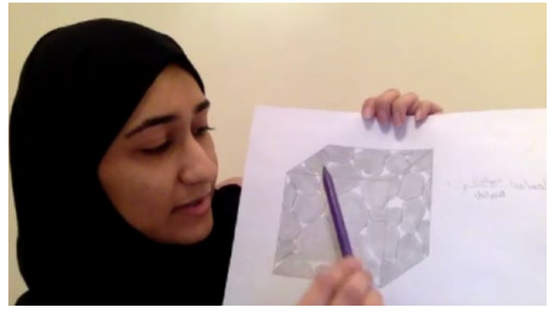
SPE-KSA Student Outreach member, Mishal Alsana, presenting workshop at the Dhahran Ahliyya Schools to spread awareness of the energy industry

Student Outreach High School Webinar with Energy4Me

By Heba Alsoqair, SPE-KSA Student Outreach

SPE Student Outreach initiated the Energy4Me program consisting of a series of webinars hosted by SPE-KSA's Student Outreach during and after school hours to deliver our energy ambassador program. The program aims to educate students on the value of energy in our lives and to broaden their understanding of the energy industry as a whole. The first installment of the webinar series was done in collaboration with officials from the Office of Education Supervisory in Dammam who were also in attendance.

The webinar consisted of presentations on topics ranging from energy, sustainability, and petroleum engineering. In addition, the Energy4Me team presented three science experiments pertaining to petroleum engineering practices on concepts such as porosity, fluid density, and formation coring operations. The webinar was well-received by students and academic officials. SR



SPE KSA Volunteers conduct experiments to students virtually

University Outreach Program: Student Outreach Participation at KFUPM TEDx Event

By Ibrahim Almulhim, SPE-KSA Student Outreach Member

After a 7 year absence, the TEDx event was relaunched at King Fahad University of Petroleum and Minerals (KFUPM) on September 17, 2021. TEDx KFUPM hosted eight speakers who spoke on a wide array of exciting ideas revolving around the theme of the importance of strategic disruption in any organization. One of these speakers was Dr. Sami Alnuaim, SPE 2019 President, who spoke about how the paradigm shift the energy industry is focusing with carbon mitigation coming to the forefront. SPE-KSA's Student Outreach team in collaboration with SPE KFUPM chapter also engaged with the audience members at the SPE booth to promote the society, its role and activities. As a result of the promotional activities, over 50 students signed up for SPE membership and expressed interest in participating in SPE activities. SR

SPE-KSA Student Outreach Team at KFUPM TEDx Event

University Outreach Program: Student Outreach Team Visits Al Asala Colleges

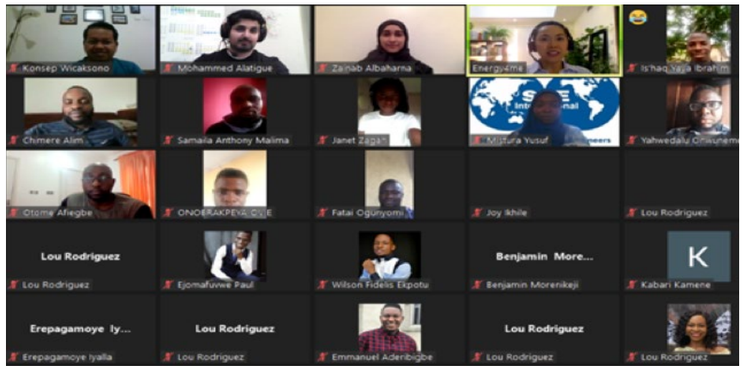
By Raneem Al Luhaidan, SPE-KSA Student Outreach Member

Student Outreach members visited Al Asala Colleges to deliver an awareness session on SPE-KSA's role within the Kingdom and the energy industry, and the many benefits of an SPE membership. The session was well attended with more than 70 students and faculty members, including the Dean of the college of Engineering. The attendees showed an interest in becoming members of the SPE family and in potentially joining the oil and gas industry. The event kicked-off the establishment of an SPE student chapter within Al Asala Colleges to bridge the gap between academia and industry. SR

SPE-KSA Student Outreach Team with students and faculty members at Al Asala Colleges

West Africa Energy4Me Training Session

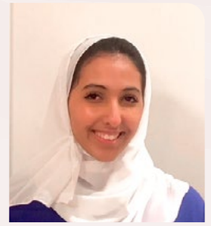
By Zainab Albaharna, Energy4Me Ambassador



On September 25, 2021, the Energy4Me program held a virtual training session for the West African region aimed at middle and high school teachers. Nearly 70 teachers registered for the session to learn more about the oil and gas industry. The session started with introducing teachers to society and the benefits of an SPE membership, including access to educational resources. Energy4Me ambassadors also conducted three exciting science experiments that touched on fundamental engineering concepts. The teachers found the training session rewarding and were excited to perform the experiments alongside their students. SR

Meditation: THE ART OF STAYING STILL

Written by Noor Aljandan, Student at Dhahran Ahliyya Schools
Edited by Deem Aldossary, Junior Editor



One of the most frequent misconceptions people have about meditation is that it makes you feel a specific emotion. When, it is about staying still, clearing the mind, and accepting unwanted thoughts as they are, and unlocking new insight. Most of us are bothered by an endless stream of negative thoughts, and it is a rarity to go longer than a few moments without any. To achieve a sense of calm, many turn to meditation, the art of staying still.

If you feel nothing when you meditate, you would be surprised to know you are doing it well! The absence of our inner self-talk creates an even greater opportunity to notice the body, feelings, and emotions. There is no unique sensation that is supposed to turn up when meditating. Meditation, when properly understood, is about training the mind to be aware of our thoughts and observing thoughts without judgment with the ultimate goal of understanding them. Initially, the practice can be uncomfortable, but it is a skill that we can hone with consistent practice. It can also be incredibly calming when done correctly, improving our concentration and reducing stress.

I have been meditating for a year now and can finally say that I have reached a state I can sit with my thoughts without judgments and accept them as they come. Afterward, I feel at peace. However, I sometimes still struggle with intrusive thoughts and emotions when I meditate, which is normal. Meditation, after all, is a practice.

When it comes to meditation, many people make the mistake of always trying to abruptly stop any thoughts to try to enter a peaceful state and strive to stay there. Unfortunately, these attempts cause stress, tension, and frustration and become the number one cause for people to stop practicing. Thus, leading beginners to believe they are doing it incorrectly or that it is too difficult, but it does not have to be that way! The trick is not to end any unpleasant thoughts entirely but to observe and allow them to pass.

So, in the end, meditation is not about making you feel something profound but observing your thoughts without judgment and with openness and curiosity. It may not eliminate negative self-talk,but it will help us find a new perspective to let go of our inner-critic. SR

Sandrose Readers Lens

IN THIS SECTION WE SHARE PHOTO SUBMISSIONS FROM OUR READERS, SHARING THEIR UNIQUE ABILITY TO CAPTURE IMAGES THAT SPEAK TO THEM

"I like taking photos; especially travel photos and those who know me well, know that I like to reveal the hidden beauty in the places that I document in my photography. When I visited the Prophet's Mosque (Al-Masjid Al-Nabawi), I could not stop admiring the great architecture around me and I took many photos of those great arches that show the marvelous Islamic architecture at its best. Sometimes, abstracting gives a clearer view!"

Firas A. Abussaud , *P.E. System Analyst, Saudi Aramco*
Follow Firas on Insta **@myhamasat**

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