



February 2024

# SandRose

## Magazine



THE FUTURE  
OF MOBILITY

# CONTRIBUTORS

## FEB 2024 ISSUE

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## Magazine

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# Letter from

## THE EDITOR-IN-CHIEF

*Dear reader,*

As we embark on a new term in SPE-KSA, I am thrilled to share the culmination of months of diligent work by our dedicated editors, diverse contributors, esteemed industry leaders, and highly-regarded subject matter experts. It is this unique and rigorously curated blend of technical insights, community stories, and bold ideas that defines SandRose Magazine.

In this edition, we are excited to explore the theme of 'The Future of Mobility'. This concept not only encompasses the core end products of our industry, but also resonates with the intrinsic human desire to be free, explore, and discover. Looking ahead, we asked ourselves and our contributors: what does the future of mobility hold?

In our quest to satiate our curiosity, we interviewed Mr. Yasser Mufti, Executive Vice President of Products & Customers at Saudi Aramco, to glean insights into the landscape of the industry as well as the global and domestic outlook of mobility in its many forms. The SandRose team also connected with Dr. Nihal Al Sabbagh on the fascinating and highly pertinent topic of enabling pedestrian mobility in cities with hot climates, such as ours.

Beyond that, we are also delighted to feature a multitude of technical articles and personal perspectives from our community and beyond, along with some highlights from the exciting first few months of SPE-KSA's sections. As the

largest SPE section globally, our membership volume is only outmatched by our ambitions to go above and beyond in enriching our members' experiences, creating a lasting positive impact to our community, and broadening our horizons in the context of an ever-evolving energy landscape.

I extend my deep and sincere gratitude to each and every one of our varied contributors, who span a vast range of backgrounds both professionally and in virtually every demographic facet. Our work would not be possible without you, and it is first and foremost for you. To our valued sponsors, editors, and readers: thank you for being part of our undeterred drive to develop our members' technical and business acumen, share knowledge and experiences, and connect our community. You are the engine of our progress and motivation.

I hope you thoroughly enjoy perusing our inaugural issue, and I encourage you to reach out to our team to offer your unique perspectives, feedback, and contributions. 

Kindest regards,

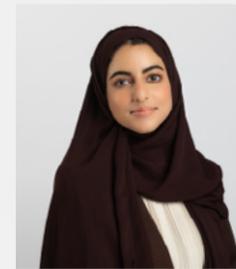
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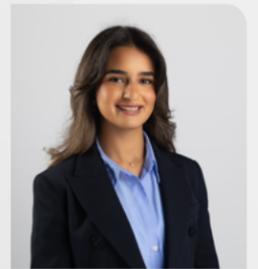
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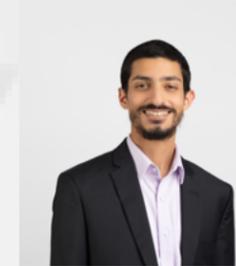
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# Letter from

## SPE-KSA EXECUTIVE BOARD CHAIRMAN

Dear valued reader,

This year marks the 65th anniversary of the SPE-KSA section. As we celebrate this milestone, let us reflect on the remarkable journey that has led us to this point. Established in January 1959 as the first section outside of the United States, SPE-KSA has demonstrated unwavering dedication to its mission, advancing the technical and professional competency of its esteemed members and reaching out to the broader community.

Throughout the decades, we have witnessed momentous achievements, groundbreaking discoveries, and transformative advancements in the energy sector. Our primary goal in SPE-KSA is to establish ourselves as pioneers within the energy sector, setting a precedent for sustainability and actively driving the digital shift. By creating a vibrant community that encourages knowledge sharing, social responsibility, and collaboration, we nurture an environment where ideas flourish, and excellence is sustained.

Looking ahead, our commitment remains steadfast in fostering professional growth, promoting innovation, and supporting our members in their pursuit of excellence. We continuously strive to equip our members with the necessary tools, insights, and platforms to navigate the future with confidence and success. The plans for 2023-2025 encompass a diverse range of programs and

activities for knowledge exchange and networking opportunities.

In commemorating these decades of service to our industry and community, we extend our heartfelt appreciation to everyone who has been part of our journey, past and present. We thank SPE-KSA sponsors, beneficiaries, members, and volunteers for their support, passion, and invaluable contributions that have propelled us forward and made a lasting impact on the energy industry. Together, we will shape the future, inspire generations to come, and uphold the legacy of excellence that defines the SPE-KSA section.

In this edition of SandRose, we are pleased to present diverse articles, highlighting key events and introducing new and revamped flagships that align with our mission, such as NMO, Growth Quest, and Spectrum. In addition to that, we are pleased to re-introduce the Human Capital Management Committee, previously known as Diversity & Inclusion (D&I), and introduce two newly established support groups: Admin Coordination and Logistics.

On behalf of the Executive Board members, I extend a heartfelt welcome to you for the commencement of this new term and the exciting launch of SandRose Magazine's first edition for this term. I express my deepest appreciation to the SandRose team and contributors for their dedication in writing and curating this edition. I eagerly anticipate the forthcoming magazine releases as we continue to embark on this exciting journey together. 

**MAHER RAHAYEM, CHAIRMAN**  
SPE-KSA EXECUTIVE BOARD (2023-2025)

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# SPE AWARDS

Join us in celebrating the recipients of the 2023 SPE International Awards, which recognize our members' substantial technical and professional contributions to the field of petroleum engineering and the global oil and gas industry.



**Visionary Leadership Award**

**KHALED AL-BURAIK**  
Senior Vice President  
Southern Area Oil Operations,  
Saudi Aramco



**Distinguished Service Award**

**DR. ALI YOUSEF**  
Principal Petroleum Engineering Professional & Chief Technologist of Reservoir Engineering Division  
EXPEC Advanced Research Center (EXPEC-ARC), Saudi Aramco



**DeGolyer Distinguished Service Medal**

**SAEED AL-MUBARAK**  
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Production & Facilities Design Department, Saudi Aramco



**Drilling Engineering Award**

**DR. GUODONG (DAVID) ZHAN**  
Science Consultant & Advanced Drilling Tools Team Leader  
EXPEC Advanced Research Center (EXPEC-ARC), Saudi Aramco



**Regional Production & Operations Award**

**DR. TAO CHEN**  
Petroleum Engineering Consultant  
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**Regional Reservoir Description & Dynamics Award**

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EXPEC Advanced Research Center (EXPEC-ARC), Saudi Aramco



**Regional Data Science & Engineering Analytics Award**

**DR. SERKAN DURSUN**  
Artificial Intelligence Center of Excellence Team Lead  
Computer Applications Department



**Regional Completions Optimization & Technology Award**

**AHMED BUKHAMSEEN**  
Petroleum Engineering Specialist & Focus Area Champion for Advanced Well Systems  
EXPEC Advanced Research Center (EXPEC-ARC), Saudi Aramco



**Regional Formation Evaluation Award**

**DR. ABDALLAH ALSHEHRI**  
Advanced Formation Evaluation Team Champion  
EXPEC Advanced Research Center (EXPEC-ARC), Saudi Aramco



**Regional Drilling Engineering Award**

**ALEXEY RUZHNIKOV**  
Well Engineering Manager  
SLB



# Navigating the Transition: Winds of Change in the Transportation Sector

By the SandRose Editorial Team

It is no exaggeration to state that hydrocarbons have been one of the most pivotal materials in shaping the landscape of our world over the last century and a half. Hydrocarbon products have had a substantial impact on shaping the economic and political dynamics of the 21st century, and have contributed to the improvement of the quality of life globally on an immeasurable scale. While hydrocarbons have a very broad range of applications including the manufacture of consumer goods, power generation, and petrochemicals, few applications have as strong of an association with hydrocarbons as fuels for transportation.

As of 2022, figures indicate that the transportation sector (including road, aviation, and marine) accounts for just over half of oil energy demand by volume. In large developed economies such as the US, this figure lands at two thirds, which clearly indicates that this sector is a large component of global oil demand, particularly in developed nations.

With that being said, the industry and the world at large are undergoing a considerable shift in its energy mix, driven largely by policy changes and rapid advancements in technology. In this evolving landscape, it follows that the role of oil will shift along with this transition, which will undoubtedly have implications on the energy industry.

Figure 1 illustrates the estimated changes in oil demand in bp's Accelerated (moderate) scenario, with the net change split into three primary components: total distance traveled, fuel economy, and alternative fuels - all of which are developments impacting the total oil demand within the road transport sector, which is predicted to steadily decline up to 2050.

Another lens to consider is to analyze trends in the types of total vehicles on the road (known as vehicle parc) for both light and heavy vehicles. It is estimated that the internal combustion engine (ICE) will account for a steadily decreasing share of the vehicle parc, leading to a tipping point between 2040-2050 in which they may be overtaken by battery electric vehicles (EVs).

While this shift in the proportion of oil demand for transportation will have implications for the industry, the nature of those implications requires some more nuanced investigation. While some observers may see this decrease in demand as only a boon for renewables and electrification, the reality is that this proportion of demand is now freed up for reallocation towards petrochemicals and other industrial uses. For every barrel unburned in the transportation sector, another is gained for the production of non-metals, electronic components, medicines, and a vast array of consumer goods.

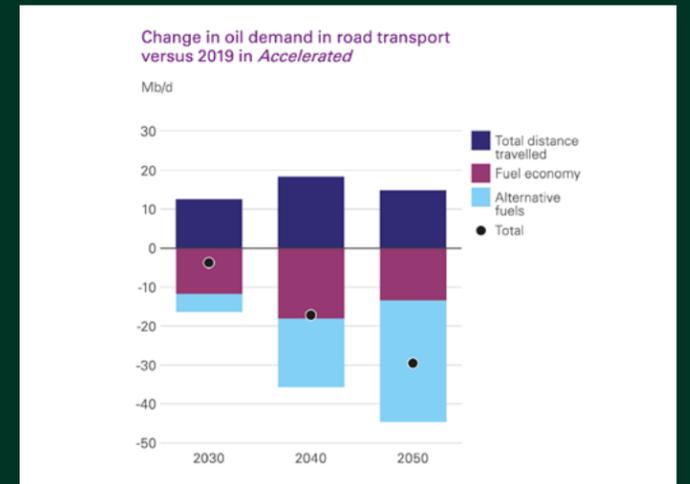


Figure 1: Change in oil demand in road transport versus 2019 in the Accelerated scenario (bp Energy Outlook 2023)

**“While this shift in the proportion of oil demand for transportation will have implications for the industry, the nature of those implications requires some more nuanced investigation.”**



Figure 2: Share of estimated total vehicles on the road by type up to 2050 (bp Energy Outlook 2023)

This unfolds as the world's burgeoning population is estimated to hurtle towards 9.7 billion people by 2050, with the largest growing socio-economic segment being the global middle-class. Expected to grow by approximately 2 billion people, this demographic segment will be the primary driver for increased demand for a wide variety of consumer goods that are derived from petrochemicals.

Despite a general trend of decreasing upstream investments globally, there are certain producers who are well-positioned to benefit from this market shift. The components of a successful and sustainable business model for producers will revolve around (a) having a fully-integrated product life-cycle from exploration to downstream, (b) low lifting costs, and (c) low upstream carbon intensity, further reinforced by rapidly developing carbon capture and sequestration technologies and initiatives.

We can now shift focus towards another key stakeholder in this equation: automotive manufacturers. Sustainability has now become a key objective for this market, reshaping priorities and propelling innovation. The Middle East, long associated with oil and gas

public transport solutions, an emphasis on cycling and walkability, as well as shared autonomous and electric vehicles - all connected to a wider network of domestic and international road, aviation, and marine transport networks.

Driven by the sustainability imperative, a growing emphasis on environmental responsibility reshapes priorities and propels innovation across the Middle East's mobility landscape. This shift is particularly evident in evolving consumer behavior in the region, showing an increased focus on efficiency, electrification, and locally-sourced goods. A recent survey by Bayt revealed that 78% of professionals in the

UAE are willing to pay more for eco-friendly products and services. Such surveys indicate a surge in demand for electric vehicles (EVs), with the region witnessing a 40% increase in EV sales in 2023 compared to the previous year and a global stock surpassing 30 million in 2022, a 78% increase from 2020 (IEA, 2023). While still a minority of the total vehicles on road, EVs demand is still growing as a percentage of new car sales.

Industry giants such as Saudi Aramco are no longer solely focused on black gold. With active investments in



Figure 3: Objectives under Neom's plans for the future of mobility

reserves, is experiencing a considerable shift in its approach to mobility.

In the Kingdom, ambitious plans within the transportation sector are taking shape, from mass mobility solutions such as the Riyadh Metro to more holistic forward-looking mobility blueprints in Neom. Aiming to be the world's first 'zero carbon region', this city of the future is slated to feature renewables-powered

renewables, the company aims to diversify its portfolio while committing to net zero ambitions by 2050. Elsewhere in the region, partnership with companies such as Electreon aim to develop wireless charging for highways, paving the way for a seamless transition to EVs in the region. Concurrently, the company is undergoing a substantial downstream expansion, with projects such as Crude-to-Chemicals aiming to convert 70-80% of each barrel to high-yield chemicals using



Figure 4: The Saudi Public Investment Fund is a majority owner of the US-based, Saudi-manufactured Lucid Air

cutting-edge integrated refining technologies.

Within the automotive sector, companies like Lucid Motors (in which PIF is a majority shareholder) are blazing a trail with luxury EVs boasting an impressive range of over 750 km on a single charge. Their commitment to sustainability extends beyond their vehicles; their state-of-the-art manufacturing facility in Saudi Arabia is powered by renewable energy, thereby minimizing their environmental impact. Elsewhere in this sector, Ceer vehicles are a promising new homegrown competitor in the automotive space, powered by well-established partners such as BMW and Foxconn.

The mobility sector's journey towards sustainability is still in its early stages. As electric and hydrogen-powered vehicles expand their share of the market, other emerging technologies such as synthetic fuels and gasoline compression ignition (GCI) promise to keep ICE vehicles on the road for decades to come.

Saudi Arabia's commitment to sustainability, vast resources, and strategic placement position it to become a global leader in the future of low and zero-emission mobility. By investing in innovation, fostering international and interdisciplinary collaboration, and empowering its citizens, the Kingdom is navigating the energy transition with purpose, paving the way for

a bright future for the Middle East region as a whole.

This pivot towards sustainable mobility is not just about changing vehicles; it's about changing mindsets, embracing new solutions, and working together to build a more prosperous future. Looking ahead, the petroleum industry will be an instrumental global stakeholder in the future of mobility, and beyond.

***"This pivot towards sustainable mobility is not just about changing vehicles; it's about changing mindsets, embracing new solutions, and working together to build a more prosperous future."***

**Note to our readers: If you'd like to respond to the editorial with your own perspective, reach out to us at [sandrose@spe-ksa.org](mailto:sandrose@spe-ksa.org)**

SCAN FOR REFERENCES



# Future of Mobility Interview



**Yasser M. Mufti**

The SandRose team met with Yasser M. Mufti, current Executive Vice President of Products & Customers at Saudi Aramco and a veteran of the industry for an insightful and comprehensive conversation about the future of mobility.

**Before we get into the topic at hand, would you give us a description of your professional background leading up to your current position?**

I'm an electrical engineer by training, having graduated from King Fahd University of Petroleum & Minerals (KFUPM). I joined Schlumberger (now SLB) after graduating and spent five years in the field, mostly in Saudi Arabia. In 1995, I joined Saudi Aramco. It's interesting because in 1993, Saudi Aramco acquired the Saudi Arabian Marketing & Refining Company (SAMAREC), which handled all the refining in the

Kingdom at the time, with the exception of Ras Tanura Refinery. This acquisition created opportunities in the marketing organization.

This marked my transition from logging wells to marketing, which I had not anticipated earlier, but it seemed like a promising opportunity. 28 years later, most of my career has been in marketing and planning. Along the way I also handled the company's crude marketing activities in London, and managed the Hawiyah Gas Plant and other operational departments in order to gain some field experience within the company for a few years. I then joined the Ministry [of Energy] as the Governor of the Kingdom to OPEC.

About 10 years ago, I came back to the beginning of an executive role within Aramco starting with heading the Transformation Program, then headed New Business Development (NBD), Aramco Trading (ATC), Strategy & Market Analysis (SMA), Fuels, and now Products & Customers. You may have heard in the news that all the commercial parts of Downstream have been combined into one area named Products & Customers, which actually ties into our topic today. So, my journey has revolved around marketing, planning, business development, and transactions.

**What do you believe are the primary drivers shaping the future of mobility in the Kingdom and globally?**

As economies develop, and people's income grows, their demand for goods and services rises. Fundamentally, people want to secure a safe space to live, along with other essentials like food. As you see an increase in income, demand for mobility increases for a variety of purposes like work, leisure, or education. So, we can see mobility is intertwined with personal freedom. It is also essential to unlocking business value. Mobility enables trade, which creates mutual benefit between economies that may have been separately self-sufficient in the past. In this sense, mobility enables trade in terms of goods and services. In this dynamic, prosperity is what drives mobility and they are mutually connected. Mobility is also tied to the core human value for freedom to move as we please. In the Kingdom, we've witnessed how women's driving has unleashed pent-up mobility demand and has enabled more opportunity for the Kingdom and its people, which has an implication on the demand for fuels.

**How do you see the evolving relationship between energy producers, automotive manufacturers, and other stakeholders in shaping the trajectory of mobility? What opportunities and challenges do you foresee in terms of collaboration between those different stakeholders?**

For mobility, there are three sectors: aviation, marine, and road. Each can be divided into individual users and businesses, which are interlinked. In the road transportation sector for the longest time, there was very limited contact between the oil suppliers and the automotive industry, despite them being co-reliant. This relationship was disrupted by two main developments: (1) climate change, which placed pressure to reduce the emissions footprint of vehicles and fuels, and (2) the emergence of competitors to the conventional internal combustion engine (ICE).

**There is a system-wide push to reduce emissions. You can choose whether to do so upstream, downstream, or during the mobility process.** To tackle this from a strategic and economic perspective, it makes sense to focus on decarbonizing where it is cheapest to do so – but it's seldom that simple.

In terms of alternatives to ICE, we have electrification or electric vehicles (EVs). This is more disruptive to some stakeholders than others. It is the most disruptive to the automotive industry. For oil producers, there's still substantial demand so they are not quite as disrupted. In this process, the least impacted key stakeholder is the end user. They're simply offered an alternative with marginal differences in the actual ownership experience. While you have other stakeholders such as regulators, supply chain manufacturers, and refiners, I believe the three mentioned earlier are the most important and it's interesting to see how they are differently impacted by this shift. It is also important to note that this impact is non-uniform across different countries and regions. Taking EV uptake as an example, you also have to consider the importance of having a well-developed charging infrastructure in order to facilitate broad adoption.

**What are the primary products and technologies enabling the future of transport?**

It's important that we understand what we're solving for here. We're solving for mobility. Mobility is not the

same as gasoline demand. As we talk about fuels, the end product is mobility, it's the actual miles traveled.

That really is the key thing. The technologies that we're working on are doing two things. Essentially, one is to bring down the cost of mobility through efficiency. The other is reducing the driver's carbon footprint. How do we do that? Synthetic fuels and biofuels are one way. Another is done through producing less CO2 in the production, transportation, and refining of oil to get that gallon of gasoline with less carbon footprint, which also helps in life cycle economics. Why do we do this? Because we believe that oil can be part of the solution to the world's mobility challenges.

***"We believe that oil can be part of the solution to the world's mobility challenges."***

***What challenges do you anticipate when it comes to autonomous vehicles, connectivity, and shared mobility models influencing the oil and gas demand and how is Saudi Aramco and the industry as a whole preparing for those shifts?***

Autonomy, I think, is one of the more difficult challenges that mobility has. It's an incredibly difficult challenge for a variety of reasons, including just the sheer nature of replicating human activity. As for mobility models, that's an interesting one. I look at shared vehicles, shared rides, and ride hailing. I've yet to see something that is really disruptive. I think the mobility models that are coming out are interesting, but I don't think that they've dented demand in a big way.

***What are you most excited about when it comes to the future of mobility?***

What we've been talking about here, all these developments as they unlock new opportunities. It's just the wonderful nature of the business that gives rise to all these surprises. For example, the unpredictability of how

technology will unfold. One thing that I have learned early in my career is that we seem to repeat systemic mistakes in forecasting energy, in many different parts of the energy system. One of those mistakes is that it's really hard to forecast how people's behavior will change or stay. It's really not easy, and so that makes the whole thing interesting.

***What is your preferred personal mode of transport and why?***

Favorite mode? I love air travel when it's first class, on certain airlines and certain routes. I also think there's just incredible freedom that goes with having your car. Just having your car, doing your little thing and listening to what you want to listen to. The podcasts. Driving the way you want to drive. Having that drink warmer or cooler and your shades and all of that. The car is an extension of you. I'm actually involved with Formula 1 as part of my job, and I had the chance to tour the Aston Martin factory. It's over a century old, and yet state of the art. Some parts of the car are still built by hand. Car-making is fascinating. Some supercars will cost millions, which is incredibly expensive. Who buys these cars? The manufacturers simply call on their loyal

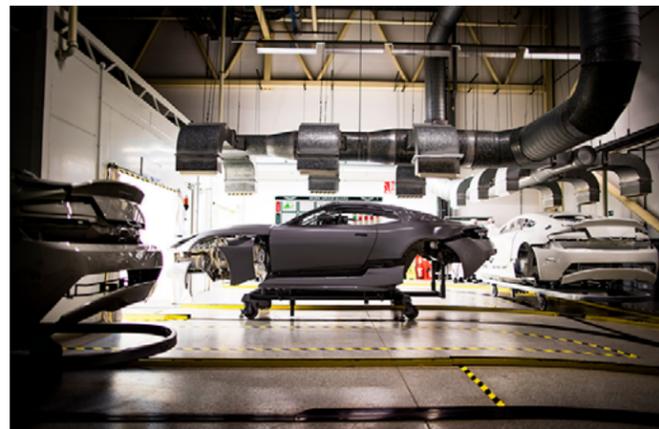


Figure 1: A glimpse of the Aston Martin Factory

customers to purchase them. So, you can appreciate that there is a very special bond between man and machine, and this particular machine is a means to mobility and freedom. It's an emotional connection that is beyond pragmatic.



***How do you perceive the future of transportation in the Kingdom? What are its key enablers?***

The Kingdom is undergoing a huge economic transformation. Part of that future is aviation, as you can see new airports and airlines being announced, which will drive demand for aviation fuels. The Kingdom has a large space with many untapped areas, and we've been witnessing the development of many areas which were previously considered remote. Part of these new projects' success will rest upon their accessibility, which will be enabled by new mobility solutions.

***"There is a very special bond between man and machine, and this particular machine is a means to mobility and freedom. It's an emotional connection that is beyond pragmatic."***



Figure 2: A rendering of the King Abdullah Financial District (KAJD) station in Riyadh, designed by Zaha Hadid Architects

This includes roads, air travel, and even marine transportation, which the Kingdom's Vision 2030 builds upon on several levels. As economic development drives prosperity, demand for mobility will also increase. This also includes mass transportation, like the Riyadh Metro, which I believe will be a game changer. There is also likely to be development in technologies such as electric and hydrogen-powered vehicles and their charging or fueling infrastructure. The future of mobility in the Kingdom is very promising.

# Journey Toward the Commercialization & Design of a Wireline Tool

By Akram R. Al-Barghouti, M. Imran Javed, and Sanjiv Kumar  
Southern Area Production Engineering Department, Saudi Aramco



Saudi Aramco's production engineers are always striving for excellence and innovations. The company's Southern Area Production Engineering Department (SAPED) tailored a unique program to foster innovations. An example is presented in this article where a journey toward commercialization of an SAPED patent titled "Methods & Tools for Determining Bleed-off Pressure After Well Securement Jobs" has been initiated. The central focus of this endeavor is the development of an advanced wireline tool engineering design, which is intended for field applications. Led by a team of highly skilled and innovative production engineers, extensive efforts have been dedicated to conceptualizing a unique tool design along with accompanying procedures that aim to revolutionize well-securement operations and optimize the efficiency of through tubing bridge plugs (TTBP).

This patented tool design encompasses a range of intricate components, meticulously designed to achieve optimal performance and accuracy. These include a gauge cutter, precisely calibrated weight bars, a sensitive tubing end locator, and an additional tool incorporating advanced pressure gauges. This amalgamation of progressive technology and engineering expertise enables the accurate calculation of downhole (DH) static bottom-hole pressure (SBHP) post well securement. By coupling this information with the parameters of shut-in wellhead pressure (SIWHP), the tool facilitates the calculation of wellhead pressure bleed-off during an inflow test, thereby serving as a robust means to confirm the integrity of the securement plug.

Driven by the commitment to continuous improvement and innovation, SAPED's engineers are collaboratively working alongside other organizations involved in the project to develop an integrated digital solution. This digital platform aims to automate the wireline tool's functionality, streamline data acquisition and analysis processes, enable real-time monitoring of crucial well integrity parameters, and empower SAPED engineers with data-driven insights for enhanced decision making. By leveraging the power of automation and digitalization, which are an integral part of its strategy, SAPED strives to ensure the effective utilization of the wireline tool and unlock new dimensions of operational efficiency and excellence.

The significance of well-integrity programs within the oil and gas industry cannot be overstated. These programs serve as the backbone for ensuring the safe and efficient operation of wells across all fields. Central to these programs is the crucial process of well securement, which involves the strategic utilization of tubing bridge plugs to isolate cased hole zones and cap them with a precise amount of cement to safeguard the reservoir. Given the extreme operating conditions and high pressures experienced by these plugs, precise engineering calculations are indispensable for accurately determining the differential pressure across the plugs and maximizing their efficiency.

The successful implementation and commercialization of the newly developed wireline tool design hold tremendous potential for the oil and gas industry.

By mitigating securement plug failures, minimizing rig workover complexities, and optimizing operational efficiency for both rig and rigless interventions, significant cost savings can be realized. This technological breakthrough is expected to result in increased production uptime, reduced unplanned downtime, and enhanced overall operational performance, thereby generating substantial value for oil and gas companies.

In addition to the direct operational benefits, SAPED recognizes the broader industry implications of this innovation. By sharing the innovative wireline tool design, its associated job scope, and implementation strategies with other industry competitors, SAPED aims to foster knowledge sharing, promote collaboration, and accelerate the adoption of best practices across the sector.

To ensure the successful realization of this ambitious endeavor, SAPED has meticulously planned the project

timeline. The aim is to finalize the tool concept design while simultaneously commencing field trials. These trials will play a pivotal role in validating the performance, reliability, and functionality of the wireline tool under real-world conditions. The invaluable insights and data gathered from these field trials will enable SAPED's engineers to refine and optimize the tool's design, guaranteeing that the final product meets the highest standards of accuracy, durability, and effectiveness.

SAPED's relentless pursuit of becoming a premier production engineering entity is exemplified by this transformative initiative. By synergizing innovative engineering design, collaborative efforts with industry peers, and the integration of latest digital solutions, SAPED aims to make a lasting impact on well integrity programs and operational excellence. This forward-thinking approach, characterized by cost optimization, enhanced efficiency, and an unwavering commitment to industry-wide collaboration, positions SAPED at the forefront of production engineering, and ready to spearhead a new era of progress and innovation in the oil and gas industry.

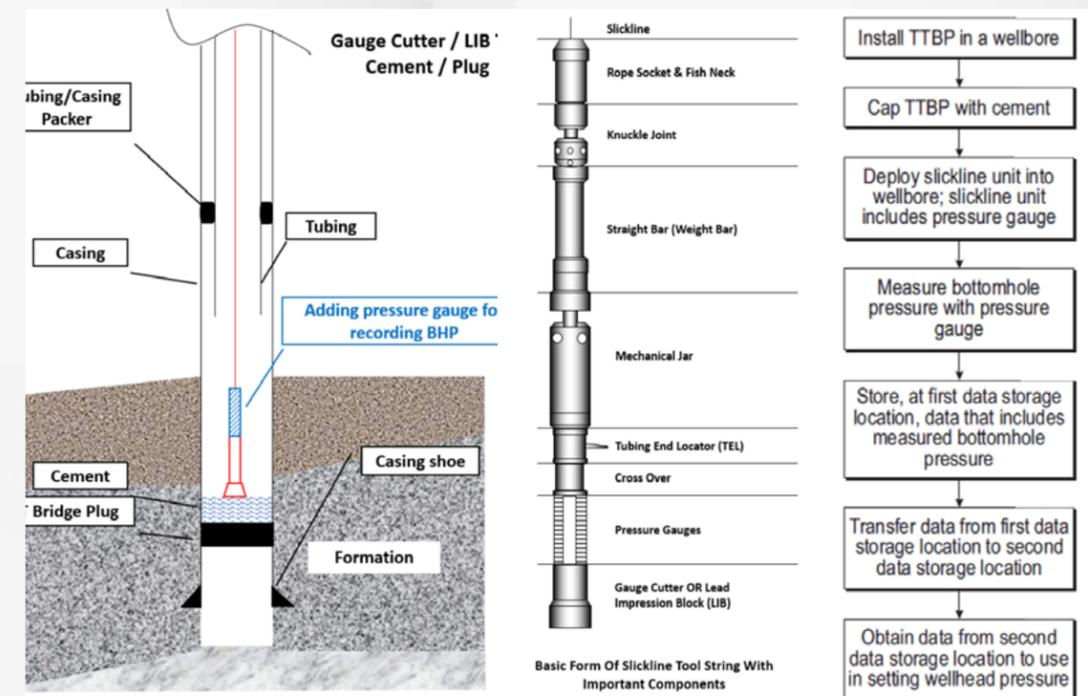


Figure 1: Diagram and process chart illustrating the functionality and procedure of the wireline tool.



# Pedestrian Mobility Interview

with *Dr. Nihal Al Sabbagh*

## Pedestrian Mobility in Cities with Hot Climates

*Would you please describe your academic and professional background, including what motivated you to pursue a career in the architecture and environmental urban design fields?*

I have been teaching, practicing, and conducting research in environmental design and architecture for more than 17 years in the UAE and Egypt. I hold a bachelor's degree in engineering and environmental design from the Arab Academy for Science, Technology, and Maritime Transport (AASTMT) in Cairo, Egypt.

During that time my passion for environmental design and the field of sustainability evolved when exploring a design concept for my studio project. I designed a train station inspired by the wind tunneling effect, where I shaped a free-flowing structure oriented North-west to depend solely on natural ventilation using principles of passive architecture and fully developed through hand drawings. Until now, I rely in all my work on the fundamentals of manipulating the environmental parameters to reduce energy followed by digital tools, simulations, and most recently, the involvement of AI and ML machine learning.

In 2011, I earned a joint master's degree in Sustainable Design of the Built Environment from the British University in Dubai and Cardiff University in the UK. My mission to convince workmates, colleagues, and clients to adopt green strategies in the way buildings and cities are designed and inhabited became a priority. I see buildings as living organisms that interact with their occupants to formulate the cities we want to inhabit. The integration of sustainable buildings starts with the urban environments.

Now, I hold a PhD from the AA, Architectural Association School of Architecture in London. I established an environmental design lab, 'Environas', which provides research-based environmental design solutions for integrating users' behaviors and thermal comfort in buildings and urban streets by leveraging the benefits of technology in this area.

**What are the primary components of a sustainable and healthy mobility infrastructure in an urban environment?**

Urban infrastructure is the cohesive element of outdoor spaces and buildings that shapes the image of the cities we have inhabited for hundreds of years. Detangling and classifying the components of the mobility infrastructure is quite complex, especially when you understand their interconnectedness. I am not a mobility expert, but my research and practice on micro-

mobility active modes allowed me to identify issues within the infrastructure of the urban environment from the perspective of the users.

Generally, an efficient hierarchical road network that does not compromise active micro-mobility modes is vital in urban areas. This influences the infrastructure's connectivity on an urban block scale measured through the length of trips with shorter sidewalks and street crossings. Therefore, the presence of multimodal public transport modes would limit the expansion of vehicular modes. Besides, integrating micro-mobility solutions to support public transport modes ought to be integrated during the early stages of the planning process. When this comes at a later stage, the solutions developed to solve congestion, emissions, and other problems impact the whole sustainable mobility framework at higher costs.

In addition to that, higher attention needs to be paid to the local microclimatic conditions of the city compromised by the built environment on the users to ensure the various needs of inhabitants are met, such as women, children, people with disabilities, etc.

**What are the benefits and importance of walkability in particular? What are the challenges and potential solutions to support and develop pedestrian mobility in cities with hot climates?**

Walkability and pedestrianization are key aspects of sustainable urban development and emission reduction. **The relationship between walkability, physical and mental health, and the design of cities is provided through access to amenities, inclusivity in urban design, and an increase in the use of soft mobility modes.** Walkability contributes to multiple targets in



Figure 1: UN SDGs that are supported by pedestrian mobility

the UN's Sustainable Development Goals (SDGs) 3, 9, 11, and 13, where recent global attention and investments in projects related to walkability are growing.

In hot cities, the influence of the heat on the urban infrastructure and pedestrians' thermal comfort is undermined. Urban materiality is the most crucial parameter to increase the mean radiant temperature over the air temperature by more than 20°C during the early afternoon hours. The allocation of materiality with a high albedo (the fraction of light reflected by a given surface) improves the heat balance of the surfaces.

Many cities adopt an over-greening approach to deal with the heat, which requires high water consumption and higher energy demand. To improve pedestrians' thermal comfort and avoid thermal stress, analyzing the microclimatic conditions for each urban area is essential to allow long durations of exposure in relevance to the heat flow fluctuations within the climatic conditions. Designing with the hourly heat radiation cycles and wind directions must be relevant to the routes and cooling provisions.

The major potential in these cities is the presence of high solar radiation levels, which facilitates the application of integrative solutions for a large area. Such solutions include adding cooling interventions,

advanced material installations, and automated smart infrastructure networks using PVs in hot spots or areas that defer walkability. My PhD design project provided a cooling intervention named 'recovery spaces' that are integrated along pedestrian routes to avoid the 'discomfort' sensation.

**What is your preferred mode of transportation in the cities you've lived in and why?**

I choose to walk whenever possible; it's healthy and free, and I enjoy observing the urban setting. For longer distances, I drive or use the metro, depending on the context. During my stay in London, I walked and used the metro. The city offers a highly efficient TMS (Transport Management System) for its multimodal public transport system with good coverage and connectivity. On bad weather days, you can easily switch between modes of transportation such as buses and metro.

However, living mostly between car-oriented cities like Abu Dhabi, Dubai, and Cairo, I'm now used to driving. I remember during my childhood in Abu Dhabi, I walked for longer periods of the year as the city offers high safety measures for kids. However, when moving to Dubai, I barely walk. Car ownership is highly facilitated by loans, roads, insurance, and safety, and the design and climate of the city necessitate driving, especially if you have kids.

In Cairo, where I currently reside, I drive and use an e-scooter or a bicycle for shorter distances, as the weather allows that for most of the days. Massive expansions in the road network systems have changed the city's vehicular facilities over the past 3 years to make driving less challenging. The city is currently integrating massive infrastructural development into the railway systems to elevate the quality of the public transport modes used over the past years.

**Do cultural norms play a role in influencing pedestrian or individual behavior? For example, does a tourist walk differently compared to a resident of the same city, and what can we learn from that?**

Encouraging walkability largely depends on the 'culture of walking', which is shaped by multiple factors. Our environmental perception to the surrounding environment interweaves numerous parameters, such as the amenities provided that make us walk, the quality of the sidewalks, safety measures, the climate, and visual comfort. These factors record a mental image to our preference when deciding to walk or use other modes of transportation in any city we reside in or visit. It has been proven that people who depend on on-foot transit have been used to walking. Also, these are the samples interviewed when we explore walkability to improve their environment and ensure they maintain the habit. However, to encourage walkability in urban areas we must consider all the multimodal transport user's.

Tourists are temporary visitors to the urban space; however, they contribute to creating more vibrant realms due to the leisure purposes of occupying the space and the type of activities provided. They depend on public transport, taxis, and walking to experience the city. Thus, prioritizing walkability for these types of travelers is encouraged, i.e., by improving visual imagery, greenery, shade, and so on. This is different when looking at the resident's utilitarian walks. They are frequent users of the space who depend on on-foot transit that requires temporal and spatial mapping of the routes and are influenced by different parameters, such as the length of routes and thermal comfort.

Cities with a metropolitan nature of users are very challenging where you have a wide diversity of backgrounds and walking patterns. My approach to the projects I have been involved in to encourage walkability in multiple hot cities has analyzed the elements of the 'public place' rather than the 'urban space'. This involved considering both tourists and residents. My Environas' COP27 proposal for climate action depended on digital tools to analyze and encourage walkability in Sharm El Sheikh, a touristic hub. This was built on former data gathered in Dubai, which was also a city with a metropolitan nature. The work highlights the influence of microclimatic conditions on pedestrians' comfort and environmental perception.

**To what extent has the automobile shaped the landscape and infrastructure of modern cities, and how will they fit into a sustainable future for transportation?**

It starts with the urban planning and design of the urban block, where the cities we live in today is what shaped the increase of vehicular means of transport. The lesson here is clear when we analyze the share of vehicular provisions in the mobility infrastructure of historical districts versus modern urban areas. The main difference is the compactness of low-density cities, which in turn limits the number of vehicles used.

The expansion of automobiles reduced the need for active transport modes and walkability, which created more sedentary lifestyles with much lower activity levels exerted and reduced the social interaction between city dwellers. My research in Dubai reveals how the lifestyles of full dependence on cars and air-conditioned buildings affect the physiological balance of the human body and reduces the adaptive comfort opportunities to natural weather conditions. Our bodies get used to the perfect temperatures, low humidity and no wind offered in air-conditioned spaces and find difficulty to accept the natural environment of the outdoors. Therefore, the gap between pedestrians' comfort and urban heating is expected to widen over time.

The future of sustainable transportation ought to consider the predicted changes that cities may foresee, such as the influences of climate change and heat rise, for instance, changes within the users' demographics, such as maintaining kids and women over time, and the expansions of the built areas and the population demand accordingly.

**"If you plan cities for cars and traffic, you get cars and traffic. If you plan for people and places, you get people and places." Fred Kent, Project for Public Spaces (Kent, 2005)."**

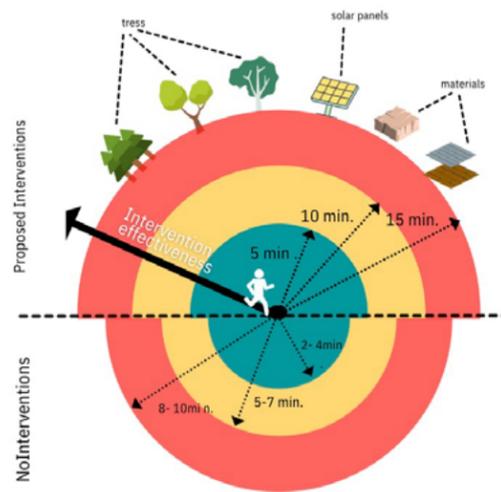


Figure 2: The impact of various cooling interventions on the range of walkability

**Can walking be integrated into other modes of transport, such as public transit, to create a more holistic mobility experience? Do you believe that a paradigm shift is required in the way we approach urban design, or more of a continuous and incremental process of evolution?**

A recent project I worked on at Environas was to develop a climate and comfort design guideline for NEOM to improve micro-mobility in 17 zones within the Gulf of Aqaba

The transport modes included a wide range of e-mobility (water, air, and land), which was requested to integrate with micro-mobility modes that are climatically sensible. Walkability guidelines were requested and included in the project studies. The question remains whether these projects will succeed in creating built environments that improve people's habits and shift from sedentary lifestyles. The integrative technologies used for smart cities are now aiming to bridge these gaps between cities and users.



Figure 3: Renderings showing potential walkway designs with cooling systems in upper rails of the shade structure

**What promising initiatives or innovative technologies have you come across that support sustainable and healthy mobility for pedestrians and other modes of transport?**

The most interesting innovations that I have seen over the past years to promote walkability are either integrated within the infrastructure or wearable garments. I have designed a conceptual device and named it "on demand cooling" for a floating shading device in hot cities, which pedestrians can request through their mobile devices. The design was an application to my PhD at the AA (Architectural Association) of 'recovery spaces', which are cooling interventions added to the infrastructure of hot cities to extend pedestrians' thermal comfort, thereby extending the distances of on-foot trips. Image attached. The interesting part is how similar concepts align with emerging technologies developed to simulate the cities' day-to-day operations using the Internet of Things (IoT) and big data. This new approach to solving complexities has been discussed in multiple urban AI projects on the rise.

**"The way future cities are envisioned nowadays depends on integrating multimodal mobility plans and including widely diverse mobility modes. This is already happening in many new cities."**

# Perforating for Stimulation: Techniques, Challenges, Considerations, and Efficient Workflows

By Abdullah Bin Ziad,  
Well Completion Operations Planning Supervisor, Saudi Aramco



Perforating for stimulation is an essential technique in the oil and gas industry to enhance the production of hydrocarbons from wells. Perforating is the process of creating holes through the well casing and into the surrounding rock formations to establish a path for the oil and gas to flow into the wellbore (Fig. 1). This technique serves to stimulate the well and enhance hydrocarbon production as it increases the connectivity of the reservoir rock and enhances the communication between the reservoir and the wellbore. The success of a perforating operation depends on several factors such as the type of rock formation, the type of perforating technique, the perforation design and workflow, and the wellbore completion design. In this article, we will discuss the various techniques, considerations, challenges, and efficient workflows for perforating.

There are several techniques used for perforating for stimulation, which are selected based on the type and depth of the well, type of formation, type of completion,

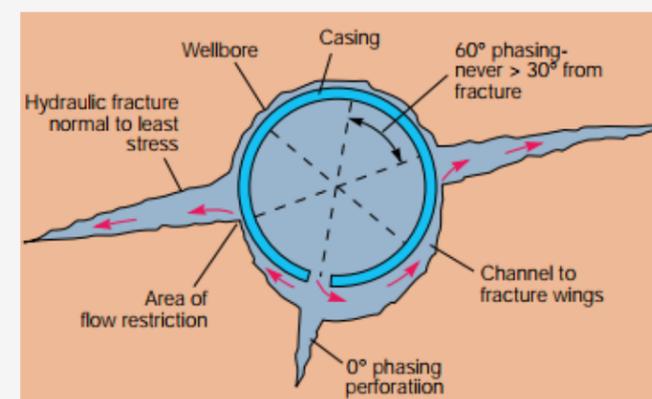


Figure 1: Top view cross-section of a perforated wellbore.

and the required number of perforation holes and density. The most common technique is the shaped charge deployed in perforating guns. These guns shoot explosive charges into the wellbore and create perforations in the well casing and the surrounding rock formations. Second most common technique is the abrasive technique deployed in abrasive jets. This tool releases high-pressure jets of water or sand to create perforations in the casing and rock formations and is suitable for formations that are hard and difficult to perforate using shaped charges technique. Other techniques include circular notching and hydro-mechanical casing cutter, ranging from classical to more contemporary approaches. Selecting the optimal perforation technique and tool is the role of a perforation design engineer, and that can be accomplished based on the stimulation objective and other previously listed factors. Table-1 summarizes the pros and cons of each technique. Note that well intervention refers to operations that involve using tools or equipment inside the well without the use of rigs. A well intervention can be specifically carried out for perforating for stimulation alone, or it can be coupled with other tools by utilizing an optimized coiled tubing in order to run all tools in a single run-in-hole.

Technique	Aspect	Pros	Cons
Shaped Charge	Well Intervention	<ul style="list-style-type: none"> <li>• Cost-effective</li> <li>• Suitable for various well types</li> <li>• Versatile for multiple zones</li> <li>• Can be used with fiber optic cable</li> </ul>	<ul style="list-style-type: none"> <li>• Complex deployment in horizontal wells</li> <li>• Limited compatibility with other tools</li> <li>• Safety risks with unfired guns</li> <li>• Special training in handling explosives</li> </ul>
	Stimulation	<ul style="list-style-type: none"> <li>• Compatible with plug and perf</li> <li>• Allows for acid and nitrogen lift injection within same run in hole</li> </ul>	<ul style="list-style-type: none"> <li>• Creates a large damaged zone around perforations</li> <li>• No guarantee of reduced fracturing pressure</li> </ul>
Abrasive	Well Intervention	<ul style="list-style-type: none"> <li>• Flexible tool configurations</li> <li>• Suitable for various interventions</li> <li>• Provides depth control with real-time data</li> </ul>	<ul style="list-style-type: none"> <li>• Depth control challenges with conventional coiled tubing</li> <li>• Cannot orient to the required direction during slot cutting</li> </ul>
	Stimulation	<ul style="list-style-type: none"> <li>• Conducts perforations, slot cutting, and acid injection</li> <li>• Ideal for high-pressure scenarios</li> <li>• Better wellbore-rock connection</li> </ul>	<ul style="list-style-type: none"> <li>• Nozzle erosion from sand pumping</li> <li>• Potential circulation and coiled tubing stuck issues in depleted reservoirs</li> <li>• Requires proper fluid quality control for sand slurry transport</li> </ul>

Table 1: Summary of the benefits and challenges of shaped charge and abrasive techniques for wellbore stimulation.

It is important to realize how powerful these tools can be. For instance, a shaped charge tool detonation process within a wellbore is illustrated in Figure 2. The detonator cord connects individual shaped charges, and upon detonation, it initiates a chain reaction. In this process, the explosive energy is focused into a high-velocity jet with a tip velocity of approximately 7,000 meters [22,965 feet] per second. This jet generates an immensely powerful pressure wave, exerting pressures as high as 103 gigapascals [15 million PSI].

As depicted in Figure 2, this focused energy is what creates perforation tunnels capable of penetrating through the casing, cement, and the surrounding rock formation. This controlled and precise penetration is a fundamental mechanism in perforating for stimulation to enhance the connectivity between the wellbore and the reservoir.

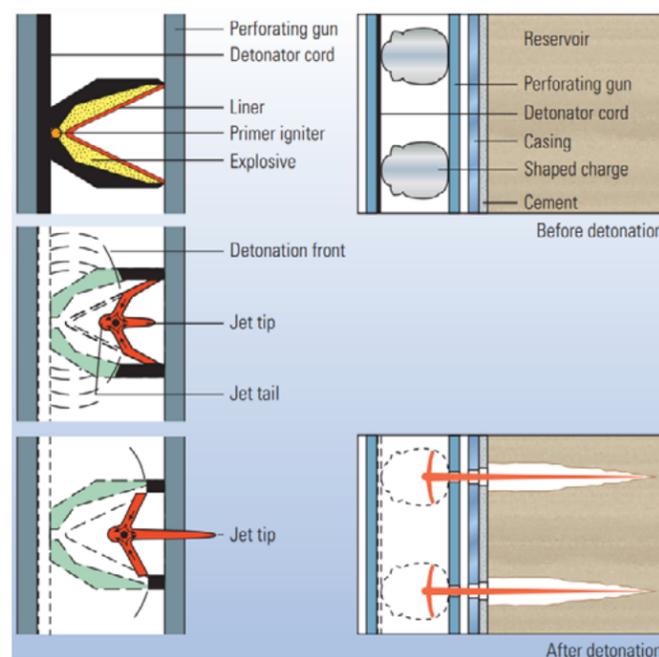


Figure 2: Side cross-sectional view of a shaped charge detonation tool

Nonetheless, perforating for stimulation does not come without challenges, and one significant challenge is the potential for wellbore damage. Wellbore damage refers to any unintended alterations or disturbances in the wellbore structure that can hinder its integrity and functionality. In the context of perforating, this can occur if the perforating charges create a large hole in the well casing or if the perforating guns are not correctly positioned. A large hole in the casing can compromise the structural integrity of the well, potentially leading to leaks, casing deformation, and the intrusion of unwanted materials into the wellbore. This, in turn, can result in decreased well performance and increased operational risks. It is crucial to note that what is considered a “large hole” can vary depending on the specific well and reservoir conditions, making it essential for engineers and operators to carefully assess the potential risks and take appropriate measures to mitigate them.

To address this challenge effectively, it is important to consider various factors, such as casing strength, formation characteristics, and perforation design to ensure that the wellbore remains stable and operational after the perforating operation. Additionally, implementing stringent quality control and monitoring procedures during and after the perforating process can help detect and rectify any issues promptly, minimize the risk of wellbore damage, and ensure the overall success of the stimulation operation. Other challenges include formation damage and equipment failure.

To mitigate these challenges and ensure a proper job, it has become an industry standard to design and follow a workflow for perforating for stimulation that includes the following steps: pre-job planning, perforating gun selection, perforation design, completion design, perforating operation execution, and post-job evaluation. In addition, a decision-making workflow (Fig. 3) can be incorporated to ensure an efficient and successful execution. For instance, in tectonically-influenced basins with horizontal well development, a decision-making workflow can be followed to maximize stimulation efficiency.

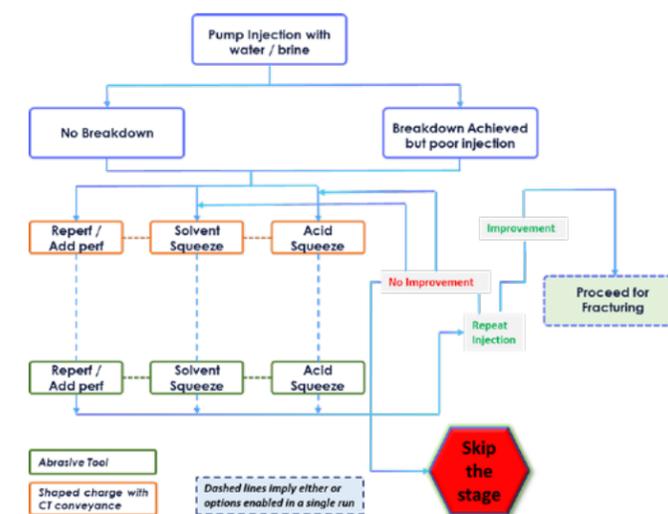


Figure 3: Example of a decision-making workflow

Perforating for stimulation is a critical well intervention measure to revitalize wells and increase hydrocarbon production. A successful perforating operation depends on several factors that a perforation design engineer must evaluate such as the type of formation, the objective of the perforation, the techniques and tools selection, the perforation design, and the perforation workflow to name a few. In addition, decision-making workflows offer a clear action plan that accounts for anticipated challenges of a given formation and a straightforward roadmap to ensure smooth execution. If implemented successfully, a well's life can be elongated and production optimized.

# SandRose Technical Paper Digest

Curated by Yazeed Aldughaiter, Editor-in-Chief

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



## Leveraging Autonomous Moon-Based Rovers for Multiple Near-Term Applications in Field Operations

AUTOMATION, SITE INSPECTION, ROBOTICS, MONITORING, HSE, AEROSPACE TECHNOLOGY

Justin Cyrus, Van Wagner, Joseph Kenrick

ATCE 2023. Paper SPE-215057-MS

Lunar Outpost, a tech startup, has developed the 'Hound' rover, a robot for monitoring oil and gas industry assets. The paper discusses the research and development of the Hound rover, which was designed to meet industry needs identified through stakeholder engagement. The rover underwent rigorous testing to ensure its effectiveness. A comparative analysis showed the Hound rover's advantages over existing procedures, including cost-effectiveness, improved frequency of visits, enhanced observation capabilities, and regulatory compliance. The Hound rover represents a transformative opportunity for the industry, addressing critical issues, improving efficiency, and enhancing safety. The findings have implications for the use of autonomous robots in various industries.



## Kasawari Carbon Capture & Storage (CCS): Unfolding the Largest Offshore CCS Project Realization

CARBON CAPTURE AND SEQUESTRATION, NET ZERO

Mohamed Aiman Mohamed Najib, Muhammad Aizuddin Zainalabidin, Aina Suharny A Rahman, Ahmad Zikri Nor Azlan, M Azlan Mustafa, Grant Veroba, Norsham Nordin

IPTC 2023. Paper IPTC-22927-EA

Kasawari Carbon Capture and Storage (CCS) project is positioned as the world largest offshore CCS upon its commencement by 2025. It is developed as the first CCS project by PETRONAS. It targets to inject up to 3.7Mt CO<sub>2</sub>e per annum (MTPA), store approximately 80MT of CO<sub>2</sub>e over 25 years of operation. The scale is significant as it represents 9% of global CCS operation (2021) and anchors PETRONAS' pathway for Net Zero Carbon Emission (NZCE) by 2050. This paper elaborates on the key challenges, major decisions, and learnings for value assurance in scope definition throughout Framing, Feasibility, and Concept Select phase as per Front End Loading (FEL) methodology. It serves as a future reference in overcoming similar CCS scale complexity and spur momentum for larger industry adoption to meet Net Zero Emissions target by 2050.



## Saudi Arabia's Unconventional Program in the Jafurah Basin: Transforming an Idea to Reality with the Jurassic Tuwaiq Mountain Formation

UNCONVENTIONAL RESOURCES, SHALE GAS, RESERVOIR CHARACTERIZATION, ENERGY ECONOMICS

Ahmed Almubarak, Ahmed Hakami, Ivan Levya, Clay Kurison

WPC 2017. Paper WPC-22-1223

Saudi Aramco is exploring unconventional liquid-rich and dry gas resources, leveraging lessons from North American shale plays. The company has been assessing multiple unconventional plays across Saudi Arabia, including the liquid-rich Tuwaiq Mountain Formation. The paper discusses the journey of this unconventional program, highlighting key lessons learned globally that have transformed the program into reality. It also outlines the company's four-phase de-risking strategy, which includes exploration, appraisal, pilot, and development phases. The success of the play depends on fulfilling these phases. The paper provides insights and considerations for developing unconventional plays in underexplored basins with minimal infrastructure.



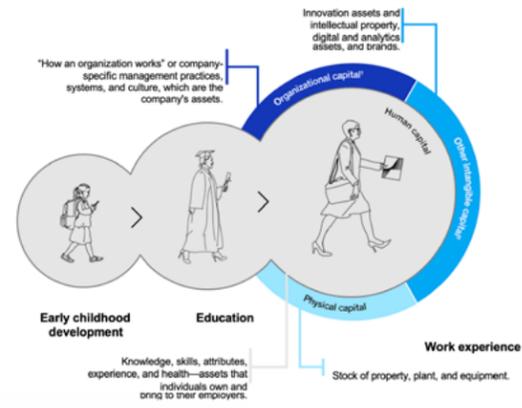
## Review of Non-Metallic Pipelines in Oil & Gas Applications – Challenges & Way Forward

MATERIAL SCIENCE, NON-METALLIC PIPELINES, CORROSION, CARBON FOOTPRINT, HPHT

Amer O. Bukhari, Mohammad Bashar, Ahmed S. Aladawy, Serena L. M. Goh, Pranjal Sarmah

IPTC 2022. Paper IPTC-22301-MS

Nonmetallic pipelines are becoming popular in the oil and gas industry due to their corrosion resistance, cost-effectiveness, and reduced carbon footprint. This paper reviews the current technology and market trends of nonmetallic pipes, with a focus on downhole applications. It highlights the market gap for downhole specifications and discusses the need for industrial standards to qualify downhole tubulars. The paper also conducts a gap analysis to address system and infrastructure challenges related to the use of nonmetallic components in various conditions. It identifies areas where further research is needed to design, test, and qualify nonmetallic pipes for demanding well conditions, aiming to replace steel tubulars for improved properties.



**Figure 1:** Organizational capital is a key activator of human capital in the workplace (McKinsey Global Institute analysis, 2023)

## Unleashing the Power Within: Exploring the Dynamics of Human Capital Management

By Sarah Aldabl, HCM Team Member

In the commercial environment of today the success of a company depends on its capacity to harness and use its most important asset—its workforce—. The strategic method, known as human capital management (HCM), enables businesses to maximize the potential of their workforce. In this article, the dynamic world of HCM is explored, outlining its essential elements and highlighting their critical importance. In addition, examining the methods businesses may use to efficiently manage their human resources. From hiring and choosing employees to providing training, and managing performance. Furthermore, it examines methods to encourage employee engagement, shed light on the crucial relationship between human capital and innovation, and revealing how encouraging a culture of ongoing learning and cooperation can accelerate organizational progress. In addition to navigating HCM problems, solutions are offered, with a strong emphasis on integrating technology, adjusting to remote and flexible work settings, and encouraging diversity and inclusion.

The term “organizational capital” refers to tools for effective communication, motivation, training, and mission statements. Management responsibilities, performance requirements, and office layout are

critical. In many businesses, organizational capital—which is defined as an investment in systems and procedures—can be just as valuable as physical capital (McKinsey Global Institute analysis, 2023).

Human capital is the information, skills, experience, and creativity that people provide to a company. It represents the group’s combined emotional and intellectual capabilities. Thus, it is essential to understand its importance. After all, each organization’s engine is its human capital. Expertise, dedication, and resilience are what enable ground-breaking inventions, customer happiness and problem-solving. The success of a company may depend on its capacity to manage and maximize people’s capitals.

Furthermore, human capital is the driving force behind an organization’s success and is not just a resource. Employees with talent and drive who are supported and developed contribute considerably to the expansion and competitive advantage of a business. Consider companies such as Google and Apple, which are well-known for both their goods and capacity to draw in and hold on to the best talent. Their success is proof of the importance of human capital in determining the future. A productive workforce is built on the foundation of effective recruitment and selection, and companies must match their hiring procedures with their strategic goals. Long-term success can result from hiring people who not only have the necessary talent but also fit the culture of the company. For instance, a company’s recruitment strategy should focus on creative thinkers who share their commitment to innovation.

Maintaining human capital skills is primarily dependent on continuous learning. Employers who make training and development investments provide their staff with the tools they need to adapt to changing market conditions. These programs ensure that human capital remains a valuable asset by improving technical skills and by offering leadership training.

Clarity surrounding expectations is provided by a well-structured performance management system that provides frequent feedback. Employees are encouraged by this transparency, which also enables them to better match their efforts to the objectives of the company. Effective performance management systems lead to increased productivity and better-informed decision-making.

Engagement among employees encourages dedication, innovation, and productivity. Engagement plays important role in lowering attrition rates and increasing innovation in an organization. Human capital is crucial for innovation and is necessary for growth. Organizations can tap into a wealth of ideas from their employees by fostering a culture of inquiry and creativity.

Employers who value learning environments are more adaptable. An organization’s flexibility and competitiveness are increased by offering opportunities for skill development, online courses, and acknowledging learning accomplishments. Silos are broken down, and insight exchange is made possible by fostering teamwork and knowledge-sharing. This is possible through cross-functional meetings and collaboration platforms.

On the other hand, the challenges of managing human capital include managing diverse workforces, employee fatigue and talent retention. From application tracking to performance analytics powered by artificial intelligence, modern HCM depends on technology for efficient operations and meaningful data, such as chatbot. These technologies have improved the management of human resources. Remote and flexible employment options are changing workplaces. Teams are more cohesive in organizations that invest in clear

communication and infrastructure for remote work. A Stanford study involving about 2,500 US citizens found that 55% of workers prefer flexible schedules for work and home. 58% of workers who work from home have started using workplace collaboration technologies more than they were a year ago

(Quixy, 2023). Innovation is fueled by workplace diversity, but managing it calls for commitment to equity and inclusivity. Organizations may effectively embrace diversity with the aid of diversity and inclusion training, mentorship programs, and various hiring policies.

The strength of human capital is an unstoppable force in a dynamic corporate environment, and is key to organizational performance. We have gone into the fundamental elements of HRM, from the fine art of hiring and training to the development of collaborative and innovative workplace culture. Despite these difficulties, it is clear that those who invest in their employees will prosper in the long run. Human capital goes beyond being just a resource; it is the transformative force driving enterprises to previously unimaginable heights. Organizations that harness this potential, accept change, and commit to diversity will not only survive but also thrive, creating a legacy of enduring success, which is plainly obvious in the future.

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*“Believe in yourselves, and be resilient” was Dr. Phaedria Marie St. Hilarie’s advice to over 100 upcoming and established leaders who gathered at Grand Hyatt Al-Khobar on November 6th, 2023 to be inspired at SPE-KSA Human Capital Management’s event.*

open communication. Dr. Phaedria also stressed the importance of coaching and mentoring, and reserves mentoring, in maintaining strong and diverse teams.

The townhall was attended by more than 100 participants, and it attracted a wide range of audience spanning across students and professionals from diverse backgrounds including, Zhongman Petroleum and Natural Gas, SABIC, Saudi Aramco, KFUPM, IAU, SLB, and many more. After the interview, the attendees had the opportunity to consult Dr. Phaedria through a Q&A session. As a gesture of appreciation, participants received digital copies of the book “Dare To Lead” to further their leadership knowledge. In alliance with SPE-KSA’s sustainability core value, the instructions to download the digital book copies were printed on seed paper that could be easily planted.

“Leading with Impact” is the first townhall in Human Capital Management’s “Townhall Series” which will showcase HCM’s commitment to growth, development, empowerment, diversity, and inclusion through a series of moderated interviews, panel discussions, and presentations on various professional development topics.

## SPE-KSA’S HCM HOLDS ITS FIRST EVENT: LEADING WITH IMPACT

Monday November 6th 2023 marked the launch of the SPE-KSA Human Capital Management committee, previously known as Diversity and Inclusion, which aims to advance diversity and inclusion in the oil and gas industry. The committee kicked off its activities with a townhall under the title “Leading with Impact: A Career Journey of Influence” with Dr. Phaedria Marie St. Hilarie, CEO and Chief Consultant at Phaedria Marie Consulting.

The townhall consisted of a moderated interview, led by Ghadeer Alrumaih, Saudi Aramco supervisor and Young Leaders Advisory Board member, and it focused on Dr. Phaedria’s impactful 25-year career as a business leader. During the interview, Dr. Phaedria shared many insights on how to build high-performing and inclusive teams such as top-down advocacy, refiguring key performance indicators, and prioritizing



## SPE-KSA Student Outreach Activities Celebrating Success: Highlights from PMU Student Chapter

*By: Batool Alsunbul & Abdulaziz Alsubaie, University Outreach Team Members*

Prince Mohammad bin Fahd University (PMU) continues to flourish, showcasing their commitment to fostering student engagement and professional development. One of the highlights of their achievements is the semesterly event dedicated to college club recognition, which serves as a gateway for introducing new students to the PMU chapter. This initiative has proven to be highly successful, as over 60 enthusiastic individuals joined the ranks of the chapter, bringing fresh perspectives and diverse backgrounds. The event not only acts as an introduction to the chapter but also provides a platform for socializing with incoming freshman students who are embarking on their academic journey. As most attendees are new to college life, the event becomes an opportunity for camaraderie and support. Additionally, this gathering allows students from various majors to come together and realize the universal benefits of joining the SPE. The members’ efforts showcase how SPE can enrich the academic experience for students, regardless of their major or college affiliation.

One noteworthy outcome of the event was the impact it had on business students. Initially skeptical about the relevance of SPE to their field, they were pleasantly surprised by the chapter’s initiatives, particularly the field trips to prestigious companies like Aramco and Sabic. Witnessing the value these visits held for future career prospects, many business students reconsidered their perceptions and recognized the advantages of engaging with SPE.

Furthermore, the event serves as a platform for collaboration with other clubs, such as the American Society of Mechanical Engineers (ASME). By building connections and sharing ideas, SPE-PMU gains inspiration and insight into enhancing their own chapter activities. The chapter’s president and officers actively participate in these interactions, understanding

the value of such gatherings in elevating the quality of offerings to their members.

In collaboration with SPE-KSA, the student chapter organized Membership Drive Event on October 24th, with the attendance of dean of engineering, Dr. Jamal Nayfeh, where SPE-KSA team participated by delivering an informative presentation on SPE, its activities, and benefits that students get when becoming active members. The event included awarding “Most active member of the year” from the chapter. Finally, a competition was held where members who gets highest number of new member to join the chapter will be awarded. During this event, more than 50 new members joined SPE-PMU.





## ADIPEC and DGS Participation

In addition to their campus activities, SPE-PMU has proudly represented their university on a global scale. Three exceptional members were selected out of thousands of students from 13 universities from the Middle East and North Africa to participate in the prestigious SPE ADIPEC Exhibition and Conference University Program 2023. Held in Abu Dhabi from 1-3 October, this event offered a unique platform for networking and learning within the petroleum engineering community, youth engagement activities, a visit to ADNOC, and attending technical sessions from industry experts.

Another significant achievement for the chapter was their participation in the DGS Professional Meeting held on October 8th in Al-Khobar, where they had the privilege of hosting Edward Wiarda, the President of the European Association of Geoscientists and Engineers (EAGE). Wiarda delivered a captivating presentation titled "Energy Transition," providing valuable insights into the evolving energy landscape.

SPE-PMU chapter continues to thrive, bridging gaps between students of different majors, debunking misconceptions, and providing enriching experiences. Through their events and achievements, they exemplify the spirit of collaboration, growth, and professional development, ensuring a promising future for their members at Prince Mohammad bin Fahd University.



## A Vibrant Beginning: SPE-KFU Student Chapter's Dynamic Kickoff and Industry Immersion

By: Ghaida Aljuhani, University Outreach Advisory Team Lead

Embarking on the academic year with zeal and purpose, the recent SPE-KFU Student Chapter Orientation Day and Organized Visits set a determined tone for students in the College of Engineering at King Faisal University, laying the groundwork for an exciting and fruitful year ahead.

The Orientation Day on August 27th was a special event that welcomed both new and returning students to the SPE-KFU Student Chapter. It kicked off with a friendly reception to build a sense of community and camaraderie among the students. The officer team set a great example by sharing their own experiences in the SPE-KFU and SPE-KSA spectrum, inspiring and motivating incoming students to ensure the spirit of the student chapter remained ablaze. The orientation activities were designed to help students understand the goals, objectives, and opportunities offered by the SPE-KFU Student Chapter and the wider SPE-KSA network. During the orientation, various initiatives and activities planned for the upcoming year were introduced, providing a glimpse of what to expect. In addition, this event also gave officers a chance to be acquainted with the specific needs and expectations of the incoming cohort.

Building on the momentum of the past academic year, the student chapter organized a visit to Air Products Company on September 19th, a global leader in industrial gases and chemicals. While the visit aimed to showcase the hydrogen production process and its applications in various industries, it was also an opportunity to start a debate and discussion on the future of sustainable energy and the role that petroleum engineering will play in this transition. Ultimately, this aligns with the goals of Vision 2030, which seeks to enhance educational sustainability and develop sustainable innovation in Saudi Arabia.

Through these activities, the SPE-KFU Student Chapter strives to be an entity that goes beyond the confines of the classroom, providing students with a platform to expand their horizons and gain practical insights.

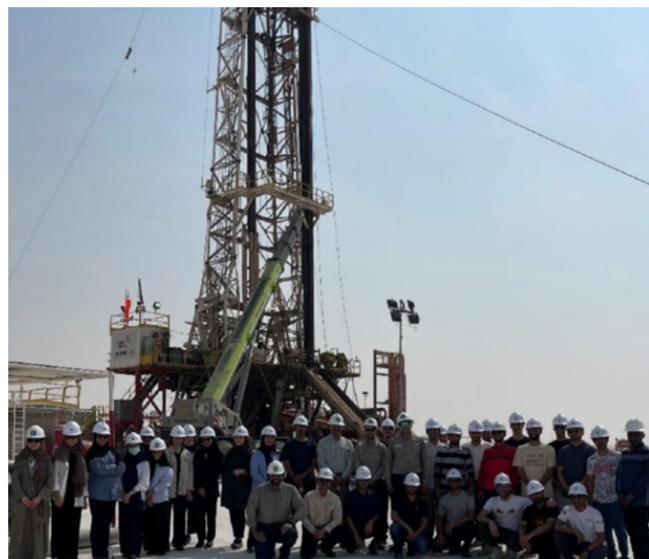


## University Flagship 1st Rig Visit of the Term

*By: Abdulrahman Alromaih & Reema Bukhamsin, University Outreach Team Members*

The Student Outreach Team organized the 1st University Flagship Rig Visit of the term on November 1st, at Drilling and Workover (D&WO) facilities at Saudi Aramco. More than 400 student applications were received, and a total of 30 university students from diverse backgrounds and universities within the kingdom were selected. The visit aimed to provide students with real-life experience and expand their knowledge of the oil and gas industry by having a comprehensive understanding of drilling rigs and the services they can supply. Students had the opportunity to visit a drilling rig and various supporting facilities within D&WO to observe its operations firsthand.

During the University Flagship rig visit, the day began with a trip to the rig site, followed by a tour of the Real-Time Operating Center (RTOC) in the Drilling and Workover Department. During the field trip, students were able to witness an operational rig and be exposed to the main components of the rig including the monkey board, doghouse and electrical control house and their functionality. Then, students were introduced to the RTOC's main drilling principles and techniques, as well as the monitoring system that is used to remotely monitor hundreds of oil and gas rigs around the kingdom.



## SPE-KFUPM Activities: Hosting Annual Opening Ceremony & Organizing School Visits

*By: Nayef Almugrin, University Outreach Team Member*

SPE-KFUPM started its new cycle with an opening ceremony for the new Chapter and Board members. The ceremony featured speeches from the Dean of the College of Petroleum Engineering and Geoscience, faculty advisors and chapter president, where celebrated the remarkable achievements of the previous chapter, as in achieving the Excellence Award, and reemphasizing on the chapter's vision.

In addition, SPE-KFUPM has collaborated in organizing three school visits, two from Al-Khobar and one from Riyadh, including males and females. These visits were utilized as a knowledge sharing venue with the school students to help them learn more about the university, industry and to showcase the university and CPG's programs along with their facilities and laboratories.

## Inspiring Minds: Reflecting on SPE-KSA Meet The Expert Hybrid Hosting Dr. Morten Meldal, a Nobel Laureate

*By: Nora Alsudairi, Student Outreach Events & Management Team Lead*

In the sphere of knowledge transfer and sharing, students have emerged as integral contributors to innovation and progress. Reflecting on the fruitful past event, SPE-KSA "Meet the Expert Hybrid" conducted at King Fahd University of Petroleum and Minerals (KFUPM) on November 7, 2023, underscores the significance of seamlessly integrating academia with invaluable industry insights.

A notable feature of the event was the distinguished presence of Nobel Prize laureate Dr. Morten Meldal, whose pioneering work in Chemistry served as a source of inspiration for aspiring learners. Students were afforded a unique opportunity to witness firsthand the direct application of theoretical knowledge to pragmatic problem-solving, a manifestation of the event's core commitment to inspiring students to become the leaders of tomorrow's solutions.

The program of "Meet The Expert" was developed for the first time to be tailored as a hybrid format to accommodate diverse learning preferences, facilitated both in-person attendance at KFUPM's Building 78, Auditorium, and a virtual participation. This inclusive approach ensured that students are able to partake in this unique learning experience without limitations.



The thoughtfully curated program commenced with welcoming remarks from SPE-KSA Student Outreach Committee Chairperson. Following that, an ice-breaker session was delivered with a special prize offered by SPE-KSA Student Outreach Committee – a trip to Shaybah. Then, Dr. Meldal steered with his journey in obtaining a Nobel prize, to the technical presentation that contained interactive discussions and Q&As, that inspired students in emphasizing practical applications that seamlessly bridged the theoretical and practical projects.

Concluding SPE-KSA "Meet The Expert Hybrid" was a moment of reflection on the wealth of knowledge exchanged and the meaningful connections forged. As guests departed from KFUPM, the experience extended beyond the confines of the academic discussions. To provide a holistic understanding of Saudi cultures and traditions, a journey to one of the local museums offered a glimpse into the rich tapestry of Saudi heritage, providing an opportunity for cultural exchange. Special thanks to SPE-KSA Student Outreach Events & Management team members for the success of the first "Meet The Expert Hybrid".



## SPE-KSA Celebrates 65-year Milestone Anniversary

Established in 1959 as the first SPE section outside of the US, the SPE-KSA section proudly celebrates the milestone of its 65th anniversary this year. Following an illustrious legacy of achievements and service to its members and the industry at large, SPE-KSA currently stands as the single largest section globally.

Over the years and successive terms, experience was passed down from one team to the next with the common goal of disseminating industry knowledge, cultivating the skillsets and broad acumen of our members, as well as giving back to our community.

The current SPE-KSA Executive Board serves its members through a variety of platforms and media, including lectures, workshops, boot camps, competitions, conferences, community outreach programs, and social trips, as well as through its flagship publication: SandRose Magazine.

Looking ahead, the SPE-KSA Executive Board team and its community eager to continue building this distinguished heritage towards new heights of excellence, growing and adapting alongside a dynamic energy industry landscape.

### SPE-KSA Young Professionals Networking & Engagement: Insights – A Beacon of Knowledge Exchange and Networking

*By Sara Alruwais & Mohammed Almannai,  
YP Team Members*

*The Society of Petroleum Engineers, Kingdom of Saudi Arabia section (SPE-KSA), through its Young Professional Networking and Engagement committee, recently launched the first session of "Insights" – an exciting event that unites experts, thought leaders, and emerging professionals from diverse backgrounds. This insightful gathering aims to cater to a wide range of interests, fostering an enriching environment that empowers young professionals to learn, connect, and grow. The kickoff panel session on October 31st featured a special guest, Mr. Khalid Al-Ahmed, the Director of International and Regional Investor Relations at Saudi Aramco, who delved into the intriguing topic of the Aramco IPO.*

The stage was set on Tuesday, October 31st, as the curtain was raised on the first Young Professionals Networking & Engagement event, "Insights". This panel session was not just a gathering; it was a vibrant platform designed to foster knowledge exchange and networking among young professionals, setting the stage for intellectual conversations and professional growth. This organized gathering brings together experts, thought leaders, and eager young professionals from a wide spectrum of backgrounds together. The diversity in both topics and guest speakers aims to cater to a broad array of interests, creating an enriching environment that empowers young professionals to learn, connect, and grow.

In the first event, it was an honor to welcome Khaled Al-Ahmed, who serves as the Director of International and Regional Investor Relations at Saudi Aramco. With a distinguished career in the energy sector that extends beyond two decades, Mr. Al-Ahmed has been instrumental in the successful execution of the historic Aramco IPO. His wealth of expertise and profound insights sparked a viewpoint into the panel session, laying the groundwork for engaging discussions. The event was well-attended by 40 participants from diverse backgrounds, further enhancing the richness of the discussions.

Moderated by Mohammed Al Essa, a Reservoir Management Engineer at Saudi Aramco, the topic of discussion for the panel session was the "Aramco IPO." Khaled Al Ahmed provided invaluable insights into the intricacies of this significant milestone in the world of finance and energy.

From the inner workings of one of the world's largest energy companies to the global implications of taking Saudi Aramco public, the conversation was nothing short of enlightening.

"Insights" aims to enrich young professionals by providing them with the knowledge and connections that can contribute to their progress in their respective fields. The discussions, like the one on the Aramco IPO, are just the beginning of what promises to be an insightful series of events. As we embark on future events, we invite you to be a part of this vibrant platform for learning and networking.

**Stay tuned for more exciting panel sessions to expand your horizons as the path continues to illuminate with professional and intellectual discovery.**



# Effective Medication Depends ON EFFICIENT COMMUNICATION

*By Sainul A. Parakkal, Rita J. Jabbour and Zakariya H. Dobayan*

Pharmacists worldwide play an essential role in the health of the individuals in the communities they serve. Their specialization is the medications prescribed by your physician. Collecting your medication from the pharmacist is not just a medication transaction but an opportunity to enhance your understanding of the medication and better care for your health. Taking an active role in this process leads to better management of your medications and the best possible health outcomes. This article provides some tips to help you get the most from your pharmacy visit.

## READ & UNDERSTAND YOUR PRESCRIPTION

Before visiting the pharmacy, take the time to read and understand the prescription provided by your doctor. Familiarize yourself with the name of the medication, dosage instructions, and other details. Doing so enables you to ask questions that can impact your health.

## COMMUNICATION IS KEY

Pharmacists are knowledgeable professionals who can provide valuable insight and answer your questions regarding the medications you have been prescribed. When you talk to the pharmacist, have an open, honest, and transparent conversation. Share relevant information about your medical history, allergies, or other medications you are currently taking. This information helps the pharmacist ensure the prescribed medicine is safe and appropriate for you. Do not hesitate to ask questions about your medication; thoroughly understanding your prescription empowers you to take it correctly and manage any potential concerns effectively.

## LABELING & PACKAGING

Before opening your prescription packaging, the first thing to do is read the labeling and any accompanying information. Trustworthy medications should have a clear, readable label that includes the name of the drug, dosage strength, active ingredients, expiration date, storage instructions, and any warnings or precautions specific to the medication. Furthermore, any patient information accompanying your prescription provides valuable information about that medication.

## KNOW THE BRAND AND GENERIC NAME (ACTIVE INGREDIENT) OF YOUR MEDICATION

It is essential to be familiar with your medication's brand and generic name. Medications are commonly known by their brand names, which the manufacturer chooses. The generic term, however, refers to the active ingredient, which is the same regardless of the manufacturer. For example, depending on the manufacturer, a medication containing the active ingredient "atorvastatin" may be marketed under different brand names, such as Lipitor or Lorvast. Awareness of the brand and generic names can help ensure that you take the correct medication. If you are not sure, consult your doctor or pharmacist.

## MEDICATION COUNSELING

Take advantage of the medication counseling services offered by pharmacists. In these sessions, the pharmacist provides personalized information regarding your medication, including its purpose, when, how, and what to expect. They can also offer advice on potential lifestyle adjustments, strategies to help you take your medication as prescribed, and ways to store it correctly.

## KNOWING YOUR MEDICATION

Understanding the purpose of your medication is essential. Ask your pharmacist about the intended benefits and goals of your treatment. Knowing the medication targets and the expected outcomes helps you track your progress and communicate effectively with your doctor the next time you visit.

## UNDERSTAND PROPER DOSAGE & ADMINISTRATION

It is crucial to understand your medication's dosage and administration instructions fully. Your pharmacist can clarify the instructions, including the best time to take your medications and whether to take them with food, and answer all your questions. Knowing how to handle your medication properly maximizes its effectiveness.

## DISCUSS POTENTIAL DRUG INTERACTIONS

If you are taking other medications, whether they are prescribed, over-the-counter, or herbal, it is essential to discuss the possibility of drug interactions with your pharmacist. The pharmacist can assess your medications' compatibility and identify potential risks. By proactively addressing drug interactions, you minimize the chances of adverse interactions and optimize the safety and effectiveness of your treatment.

## RECOGNIZE POTENTIAL SIDE EFFECTS

Knowing the possible side effects of the medications you take is essential. Your pharmacist can provide you with the most common ones to watch out for and, if you develop any, when you should seek medical attention. Awareness of your body and possible side effects helps minimize and manage unintended consequences and ensures your safety.

## ADHERENCE & COMPLIANCE

Discuss ways to ensure that you fully and adequately follow your medication schedule. Your pharmacist can provide you with strategies you can follow to maintain a consistent medication routine. The pharmacist can also help you with ways to set reminders and overcome any problems you may face. Sticking to your medication

routine throughout the prescription is vital for the best health outcome.

## KEEP TRACK OF REFILLS & EXPIRATION DATES

Know the number of refills available for your medication and when they expire. This information helps you plan and ensure you have an uninterrupted supply of medication. If your prescription is running low or nearing its expiry date, contact your doctor or pharmacist in advance to arrange for a refill.

Receiving your medication from the pharmacist is an opportunity to participate actively in your healthcare journey. By familiarizing yourself with your prescription, engaging in open communication, asking questions, understanding the purpose and potential side effects of your medication, and prioritizing your medication routine, you optimize the benefits of your treatment.

**AT JHAH, PHARMACISTS CAN BE REACHED TO ANSWER YOUR QUESTION BY CALLING 800 305 4444.**

## SPE-KSA Technical & Professional Program Distinguished Lecturer Series Hosts Dr. Claudia Sorgi

By Farah Altarouti, SPE-KSA T&PP Team Member

The SPE Distinguished Lecturer Program, hosted by the SPE-KSA Technical and Professional Programs (T&PP), serves as a dynamic catalyst for knowledge sharing and technical development in the oil and gas industry. Through the hosting of distinguished lecturers, T&PP provides a powerful platform to enhance technical capabilities and foster the growth of industry professionals in Saudi Arabia. The program's first event of this prominent series was held on November 19th, 2023, featuring renowned geomechanics expert Dr. Claudia Sorgi, who brought her extensive experience to the forefront with the participation of 70 attendees.

Dr. Sorgi, an esteemed figure in the field of theoretical and applied geomechanics, captivated the audience with her thought-provoking lecture titled **"New Energy, New Challenges: Are Geomechanics Solutions Advanced Enough for the Transition Journey?"** In her engaging presentation, she delved into the emerging challenges and limitations faced by the evolving energy sectors. Dr. Sorgi shed light on the immense potential of geomechanics modeling to provide solutions that can facilitate a seamless energy transition.

Traditionally, geomechanics modeling solutions in the petroleum industry have considered a single phase in saturated porous soils and rocks, forming the basis for reservoir monitoring and modeling. However, Dr. Sorgi emphasized that these solutions often oversimplify the complexities of modern-day scenarios, which predominantly involve multiphase systems. She urged the industry to recognize that geomechanics modeling has evolved far beyond its current applications and has the potential to play a pivotal role in subsurface characterization, propelling us forward on the path to sustainable energy solutions.

As the industry rapidly shifts towards geothermal energy and carbon capture, utilization, and sequestration

(CCUS) endeavors, Dr. Sorgi highlighted the risks associated with carbon dioxide sequestration. These risks include compromising the integrity of reservoirs, seals, and wells, as well as potential issues with well injectivity and surface heave. The lecture also explored the challenges of short-term CO<sub>2</sub> injection in depleted reservoirs, a common strategy for secondary enhanced oil recovery, and the long-term effects of CO<sub>2</sub> storage on cement integrity, such as increased porosity and mechanical damage. The effective incorporation of new energy solutions in practical modeling will largely contribute to the success of both geothermal energy and carbon storage endeavors.





In her closing remarks, Dr. Sorgi emphasized the immense value the oil and gas industry's vast experience in subsurface measurements, characterization, and modeling can bring to energy transition applications. She called for the integration of Thermo-Hydro-Mechanical-Chemical (THMC) Coupling into geomechanics solutions for operational subsurface characterization and modeling. While this approach has been successfully utilized in academic applications, it remains an untapped field in oil and gas reservoir modeling. Dr. Sorgi encouraged industry professionals to find an approach beyond oversimplification while avoiding unnecessary complexity.



The lecture drew a diverse audience of professionals and subject matter experts eager to engage with Dr. Sorgi. The post-lecture session witnessed lively discussions, with attendees posing insightful questions on various aspects of the lecture. This event perfectly aligned with the mission of SPE-KSA T&PP to empower professionals, facilitate knowledge exchange, and build valuable connections within the ever-evolving oil and gas industry in Saudi Arabia.



The SPE Distinguished Lecturer Program continues to make a significant impact by keeping professionals updated with the latest industry trends and advancements. It serves as a beacon of excellence, fostering a culture of continuous learning and collaboration that ultimately contributes to the sustainable development of the oil and gas industry in Saudi Arabia and beyond.

**To explore further reading segments related to the topic, scan the QR code.**



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## SPE-KSA Technical & Professional Program NMO Roundtable Discussion: Leadership Journey

*By Rawan Tahifh & Faisal Aldossary, SPE-KSA T&PP Team Members*

SPE-KSA Technical & Professional Programs committee successfully hosted its first event of the term on October 25, 2023, a captivating roundtable discussion titled "Leadership Journey", organized by the NMO team. This thought-provoking discussion delved into the essential characteristics of exceptional leaders and emphasized the significance of the journey itself. Moderated by Rayan Alghanim, a Petroleum Engineer at Saudi Aramco, the discussion was enriched by distinguished guests Majed Al-Dubaikel, CEO of Shabab Mujtamaie; Bedoor Al-Kaabi, Career Development Manager at Saudi Aramco; and Dr. Mohammed Al-Naimi, Leadership Instructor at Saudi Aramco. Each shared invaluable perspectives, sparking engaging conversations and profoundly impacting the SPE-KSA community. The event witnessed an impressive attendance of 105 enthusiastic participants, setting them on their own transformative path to effective leadership.

According to our distinguished panel, leadership goes beyond commanding a team or holding a title. A leader serves as a guiding light, a mentor, and a source of inspiration. Their combined wisdom sheds light on the nuanced aspects of leadership in the modern era, delving into the principles that surround the evident qualities of a leader and the prospects

for aspiring young individuals within Saudi's Vision 2030. The discussion unveiled intrinsic qualities that distinguish exceptional leaders apart, such as **empathy, mindfulness, consciousness, and visionary thinking.**

Effective leadership begins with the ability to establish meaningful connections and articulate ideas clearly. Building robust networks and nurturing open lines of communication are foundational skills. The speakers emphasized that leaders are motivators who lead by example, infusing positivity and instilling a sense of purpose in their teams. Open communication and a feedback-driven environment were conveyed as pivotal, fostering trust and collaboration.



Leaders are entrusted with making crucial decisions, often in high-stress situations. Their ability to make well-informed, timely choices is crucial to progress. The speakers acknowledged that mistakes are inevitable, but a great leader learns from them, demonstrating resilience and growth. Great leaders are adept problem-solvers who confront challenges head-on, offering innovative solutions that drive their teams forward. Self-awareness, continuous self-assessment, and self-discipline were emphasized as catalysts for personal growth. The concept of **“starting with why”** as quoted by Simon Sinek, was mentioned, underscoring the power of giving people a purpose and its impact on the entire team. Leaders with high emotional intelligence can understand and connect with their teams on a deeper level, resulting in higher morale and productivity. The speakers stressed that leaders are committed to nurturing the growth and success of those they lead, while maintaining a positive attitude that reflects on the workforce.

To encapsulate the key takeaways from the discussion, empathy was highlighted as a cornerstone of effective leadership, building trust and strong connections. The importance of having a vision was also emphasized, along with simplicity and authenticity. Leaders who keep things straightforward and remain approachable create an environment where individuals feel comfortable and engaged.

Amid the demands of leadership, our speakers offered a heartfelt reminder to young professionals: prioritize a balanced life. It is essential to set clear boundaries, maintain meaningful relationships, and allocate time for self-care. Achieving this balance enhances well-being and fosters long-term career satisfaction and success. Leadership is a continuous process of improvement and personal development to be savored along the way. The current generation is willing to take risks and lead, but they need to learn and listen to navigate difficult conversations.

The event concluded with a discussion on the most important qualities of a leader, as highlighted by each

of our panelists. Dr. Mohammed Al-Naimi explained that empathy is the greatest tool, while esteemed speaker Majed Al-Dubaikel emphasized adaptability and the ability to make decisions swiftly. Bedoor Al-Kaabi stresses the importance of work-life balance to avoid burnout and insists that experience enhances leadership but is not essential. Pursuing leadership cultivates personal growth and necessary skills, shaping one’s character.

The discussion underscored that leadership must be adaptable and ready to embrace change, emphasizing that it is a skill that requires ongoing refinement. A leader should perpetually learn, grow, and continuously evolve because leadership is not just about wielding power; it’s about influencing, nurturing, and forging connections. Effective leadership is a continuous journey that can be profoundly rewarding when embraced with the right mindset and values.

A crucial takeaway from the discussion was the importance of self-awareness. The panelists highly recommended “The Extraordinary Leader” as an invaluable resource for a comprehensive 360-degree assessment, which aims to assist individuals in identifying areas of improvement and key strengths.

**To take the assessment and gain insights into the roundtable discussion, scan the QR code.**

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# A Thrilling Journey: The Community Championships 2023, a Total Treat!

By Veronica Egbe, age 11, grade 6



## **Perfection at Ras Tanura Beach: A Spectacle of Events**

Everything had been perfectly arranged, and the stage was set for excellence at Ras Tanura Beach as the Surf House welcomed a steady stream of enthusiastic crowds awaiting the event to start. While my mother ordered lunch from a nearby restaurant, I took a moment to soak in the beach's beauty, I marvelled at the graceful waves reaching the fold-up chairs in the distance, and the radiant sun casting its golden rays upon the sandy shore. With numerous events happening simultaneously, it was a challenge to decide where to begin amidst the excitement and activity. Perhaps selecting my personal favourite could help solve this dilemma. I'm certain you'll agree.

## **Thrills and Triumphs: Crawls, Ditches, and Sprints!**

One of the highlights was the specially designed course for kids, which I personally found incredibly enjoyable! Each group was organized based on the child's age to ensure fairness. The course consisted of a small rope climbing wall, followed by a long crawl. Participants then encountered a rectangular tub filled with water and a special material at the bottom, which added weight to slow down their feet. After navigating through a miniature ditch and ascending a sandy slope, they faced another crawl, this time in a deeper ditch, which they repeated twice. The course concluded with a long sprint on thin wooden planks, with participants racing towards victory! Volunteers rewarded the participants with water bottles and headbands, making it a memorable experience for everyone to showcase their athletic abilities.

## **A Rollercoaster Ride of Emotions: Pushing Limits**

Next, there was the triathlon, which happened to be one of my personal favourites. It involved three main sports: swimming, cycling, and running. Each group selected one teammate to participate in one sport. In

the previous community championship, my team and I won a bronze medal. This year, I aimed to secure at least second place. Though I didn't know my teammates well, the challenge brought us together, fostering support and unity. We proudly named our team "Warriors" and lived up to its name. While each of us faced struggles in our respective challenges, we completed the laps, rounds, and tracks. The event took place at the Ras Tanura swimming pool, and the atmosphere was filled with tension and anticipation. All eyes were fixed on the man standing at the edge of the brick wall, providing instructions to the younger kids before moving on to my grade level. The competition was fierce, with everyone driven to win. As I listened attentively, blocking out any distractions, everything seemed clear, yet my stomach churned with nervousness. Upon crossing the finish line, a wave of relief and accomplishment washed over me. However, as exhaustion began to set in, I pushed myself and was determined to finish strong. It was at this point my mother became concerned for my well-being. She noticed my persistent coughing, and a teammate's mother worried I might be having an asthma attack. As a precaution, I was promptly transported to the hospital in an ambulance. Thankfully, I returned home perfectly fine and in good health. Nevertheless, the race went well, though I experienced exhaustion after completing my 10 km bike ride. It certainly was quite an adventure for me, and our team secured fourth place. The competition was excellently organized, and I eagerly await the next one! I learned that preparation is key, and with more preparation, I could have built the stamina for a greater challenge.





### ***A Dreamlike Spectacle: Relieving the Opening Ceremony***

Now, let's delve into the opening ceremony, which was truly a dreamlike experience. The stage was adorned with flickering flames, creating an enchanting glow, while the performers were bathed in mesmerizing lights. I'll never forget the breath-taking trick where two football performers seamlessly passed the ball from their backs to one another. It was a mind-boggling feat that left me in awe. There was also a basketball performer who showcased extraordinary skills with not one, but two basketballs. The tricks they performed were unbelievable, and I can confidently say that I have never witnessed anything better. Additionally, the stationary bike contest ignited excitement among the crowd, as I was genuinely impressed by the speed and finesse displayed by some of the kids. Unfortunately, I had to leave Ras Tanura at 6 p.m. to head home, but I found myself wishing I could have stayed longer. The opening ceremony was a spectacle that will forever remain etched in my memory.

### ***The Community Championship's Vibrant Spirit: Embracing Challenges***

Wasn't that an interesting tour of the community championship events? These activities were an absolute blast, and every detail was meticulously arranged. I am incredibly happy to say that I live in Saudi Arabia, a country filled with amazing people and extraordinary ideas. The community championship is just one of the

many events that contribute to making Dhahran camp the incredible place it is today. I eagerly look forward to participating again next year. This year's competition posed a greater challenge with the increased distance from 5 km to 10 km, pushing everyone to give their best. ***Participating in this challenge was a growth opportunity for everyone. As my late inspiring tutor, Mr. Charles, taught me, "Good, better, best – never let it rest... until your better is best."*** Now that you've witnessed the exhilaration of these events, I encourage you to provide your children with the opportunity to experience this excitement as well. Who knows, you might even consider joining in yourself! Personally, I believe this year's community championship was exceptionally eventful and challenged contestants to push their limits, which is precisely what we must endeavour to do in our lives. I advise youngsters my age to keep going and keep trying, even if it takes them out of their comfort zone. It's the only way to explore new things and discover our strengths. Having the ambition to do well and working towards it is crucial.

# Learning Python

## Ali M. Alismail

***Drilling Engineer,  
Gas Drilling Engineering Department  
Saudi Aramco***

Since my school days, I've been captivated by the world of mathematics and its numerous applications in our daily lives. This profound interest steered me towards a major in engineering, as it offers both the essence of mathematics and its practical applications. During my undergraduate years at The University of Texas at Austin, while studying petroleum engineering, I noticed a significant buzz around data science and artificial intelligence. Although not directly related to my field of study, I decided to enroll in a few courses in anticipation of their math-heavy nature.

One particular course that stood out was Applied Statistics. Delving into statistical techniques for testing hypotheses and modeling real-life problems, I was astounded by the vast applicability of the knowledge gained. Whether in engineering, medicine, or the social sciences, the principles learned were universally relevant. This realization marked the beginning of my continuous exploration into the realm of data science. I began taking at least one course each semester to deepen my understanding. Courses in machine learning, scientific programming, and applied mathematics fueled my passion. I even became part of a Linguistics research



group, utilizing data science to study how humans switch between languages in their written and spoken communication. It became increasingly clear that these skills were set to become exceedingly vital in the future. As modern technology enables companies to accumulate vast amounts of data, the demand for adept individuals to process and leverage this data for operational enhancement will continue to escalate.

Following my graduation, I commenced my professional journey at Saudi Aramco as a drilling foreman. Initially, my role didn't provide ample opportunity to apply the statistical and programming knowledge I had accumulated during my academic years. However, I was determined to keep my skills sharp by applying them to a few personal projects. One notable project involved

analyzing football data to identify talented players. Analyzing detailed football event data, including passes and shots, I developed models to identify player talent in specific game aspects. This analysis proved instrumental for clubs and agents in spotting undervalued players for recruitment.

Two years into fieldwork, a six-month assignment as a Drilling Engineer in the Gas Drilling Engineering Department at Aramco broadened my perspective. In this new role, I realized that analytical skills were nearly as crucial as engineering prowess. Reviewing substantial volumes of data and deriving conclusions grounded in solid statistics became a fundamental aspect of my job. This realization presented an opportune moment to finally apply my accumulated knowledge and augment my company's value.

One significant challenge our department faced was the unpredictability of a specific subsurface parameter. Armed with relevant data supplied by colleagues, I immersed myself in the data, eventually constructing a predictive model for the target parameter. Employing techniques learned during my college courses, I carefully selected the pertinent variables and crafted a model that significantly reduced uncertainty concerning the target parameter. The success of this model led to its widespread adoption within my department.

Another challenge pertained to data collection. Whenever we planned to drill a new well, we had to gather extensive data from different sources to help design the well. The data collection task often took days, if not weeks, to complete. Recognizing the repetitive yet time-intensive nature of this task, I developed a Python algorithm automating these processes, drastically reducing the time needed to plan a new well. This automation, now utilized by my engineer colleagues, has resulted in substantial time savings. Due to my involvement in these projects, I was permanently transferred from drilling operations to engineering, where I

could better leverage my skills and add value to my company.

The coding and statistical skills I acquired during my academic journey not only enriched my contributions to the company but also enabled me to transition into a role better aligned with my capabilities. Even in the realm of petroleum engineering, I discovered the immense relevance of coding and data analytics to my job. I strongly encourage students and young professionals in our industry to invest in mastering coding and statistics. Not only can these skills be immensely enjoyable, but they also augment your contributions as an employee, benefiting your company as a whole.

In essence, my experiences and projects underscore the significance and impact of coding and statistics in today's professional landscape. As I look to the future, I envision a path where my expertise in data analytics and engineering converge to pioneer innovative solutions, driving growth and efficiency in the energy sector.

For those aspiring to tread a similar path, my advice is simple—embrace the power of numbers, the art of coding, and the science of statistics. Unlock the potential they hold, and you'll find yourself at the forefront of innovation, shaping the future of industries. Through dedication and a commitment to lifelong learning, you can make a significant impact and inspire others to follow suit.

In closing, remember that our abilities are catalysts for progress. Let us harness them to drive positive change, embracing the ever-evolving landscape of technology and engineering.

# A GEOLOGIST'S SEARCH FOR THE LOWEST SPOT IN THE KINGDOM OF SAUDI ARABIA

This article follows the author's search for the lowest spot in the Kingdom of Saudi Arabia, based on historical records and corroborated by remote sensing.

**Nicoli Garner, Saudi Aramco**

*"Next day we crossed the Sabkhat Mutti. We decided we must make a detour and cross these salt-flats near their head, otherwise the camels might become inextricably bogged, especially after the recent heavy rain. They would only have to sink in as far as their knees to be lost."*

**— Wilfred Thesiger, Arabian Sands (1959)**





Nicoli Garner standing on polygonal mud crack structures formed by gypsum precipitation in Jaub Depression.

I was compelled to see this depression firsthand after reading Thesiger's description of the area, and how his group came so close to dying during the crossing. Sabkhat Mutti was known to be just east of Highway 95, which passes through the northern section of the Empty Quarter (Rub' al Khali) Desert. As a geologist, what I noticed when reading Thesiger's account of his 1947-48 second crossing of the Empty Quarter was how he avoided the low points and salt flats as they were dangerous, soft, and sticky (inextricably bogged), especially since it was raining during his trip.

The early descriptions of this depression were recorded in Thesiger's travel notes, but an explanation of the geological underpinning has not been presented until now. Similar depressions occur throughout the Central Arabian graben system, which formed as a result of Quaternary fault motions as identified by surface mapping conducted by the U.S. Geological Survey (USGS) in the early 1960s (Bramkamp et al., 1961). The extent of this faulting was underestimated because the tectonic features vanished under the alluvial gravels and aeolian sands eastward and were believed to be limited to the Awsat, Nisah and Sahba Grabens, south of Riyadh. However, this theory was revisited in the early 1980s and early 1990s when the Space Shuttle Imaging Radar (SIR) revealed a 250km lineament system below the extensive tertiary strata (Dabbagh et al. 1997). These lineaments connect the Nisah and Sahba fault

***"A miserable camp-site in the Jaub (Depression). By now hunger, thirst and tiredness were a burden, and all depended on finding some water and grazing. Day after day there was nothing for the camels. Each morning I expected to find some of them dead... Those were bad days"***

***– Wilfred Thesiger, Arabian Sands (1959)***

One of many facets that attracts me to the field of geology is discovering the many literary and mapping works of our field's geologic pioneers. While working as a geologist in Saudi Arabia, I was introduced to Arabian Sands by Wilfred Thesiger. After his arrival in Saudi Arabia in 1945, Thesiger spent several years living with Bedouin tribes, studying their way of life and culture. During his time in the region, Thesiger embarked on several challenging expeditions, including crossing the Empty Quarter, Rub' al Khali Desert, which was an incredibly difficult and dangerous undertaking. His travels and experiences in the region were documented in his book, Arabian Sands.

I read Thesiger's passages referencing geographic depressions, salt-flats, and quick sands in an area just south of the Qatar peninsula and was unequivocally convinced that I must follow Thesiger's footsteps to find what is believed to be the lowest point in Saudi Arabia.

The lowest surface elevation within the Arabian Peninsula is located in the Jaub Depression, inland from Sabkhat Mutti. This location has been verified by digital elevation mapping, a hand-held GPS device, and field observations. The Jaub Depression was described by Thesiger in the accounts of his 1947-48 crossing of the Empty Quarter. We applied current geological knowledge, observations from historical records, surface mapping, and satellite imagery to retrace Thesiger's steps, literally. This ultimately confirmed the elevation and developed insights into the origins of this closed basin below sea level.

systems with the 700km east-west oriented Trans-Arabian Gulf Fault System under the Arabian Gulf, together defining the southern edge of the Eastern Arabian Tectonic Block. Our analysis shows that the last landward expression of this extensive fault/lineament system is a 5km wide and 26km long basin known as the Jaub Depression as discussed in Thesiger's notes. Thesiger had crossed nearly a century earlier as part of a field study for the British Government to determine the source of locust breeding grounds that plagued the eastern region of the Arabian Peninsula.

The lowest elevation within the Jaub Depression is located in the northeastern portion of the basin (23°50'54.65"N, 51°32'22.82"E) at a depth of 17.5 meters below sea level. Large portions of the basin are covered with wind-blown aeolian deposits, while the basin edges are marked by alluvial fan infill. The occurrence of numerous polygonal mud crack structures formed by gypsum is observed and attributed to the remnants of ephemeral lakes that identify the lowest drainage point in the basin. The large evaporitic "salt-flats" (gypsum and halite) polygonal crust was formidable to traverse in an air-conditioned off-road vehicle; I can see why Thesiger's camels walked around this hazard. Satellite imagery, digital elevation mapping, and hand-held GPS device enabled the rediscovery of this remote geomorphic feature, which was

originally recorded by Thesiger:

***"we crossed some salt-flats to the far side of the Jabrin depression, my map showed only a single well called Dhiby, located at the end of his great journey across the Sands."***

As you read the pages describing Thesiger's difficulties in 1948 – walking through this same depression as part of a camel caravan led by Bedouin guides – you can trace the British explorer's tracks across a satellite image, while protected from the heat in an air-conditioned off-road vehicle. How different the exploration approach was a century ago. The added level of safety and comfort provided by modern GPS systems, satellite phones, and protection from the harsh elements, does not make the Jaub Depression, the lowest point in Saudi Arabia, any less desolate. The location is still without water, sand still stretches out in all directions, and gypsum mud cracks pockmark the surface. Other than Highway 95 and the remnants of the Dhiby well, there is little to be found for 50 kilometers in any direction. While I can relate to the wonder that Thesiger must have experienced as he witnessed the sublime beauty of the Empty Quarter (Rub' al Khali), I would never attempt to retrace his footsteps in the harsh desert environment without modern technology for navigation and comfort.

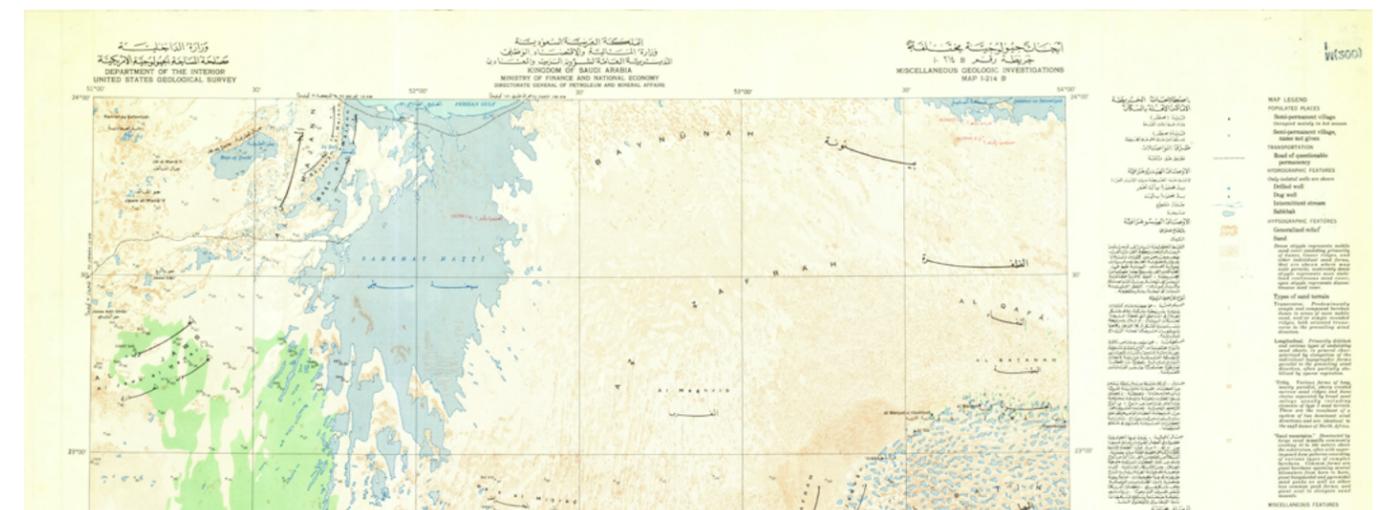


Image from Geological Map of the Northeastern Rub Al Khali Quadrangle, Kingdom of Saudi Arabia. Prepared by the U.S. Geological Survey and the Arabian American Oil Company Bramkamp et al (1961).



## Set Your Body in Motion with Power Yoga

### Dr. Shama Egbe

*Compliance Coordinator  
Upstream Business Support Department  
Saudi Aramco*

Up until a year ago, my exact response to someone mentioning yoga to me, as you may guess – “please, it’s too slow for me!” I am now finding out that my response is the norm when it comes to perceptions about yoga. Like many others, I had heard so much about the benefits of yoga, but it had never really sunk in. Like many things in life, you never really understand them until you experience them yourself.

My need for fitness began after piling on a few kilos beyond my BMI, and the puffs and pants I was experiencing while climbing up the stairs. Like most of us, I was confident about getting my dose of daily exercise by getting back on a regimen of high intensity cardio and fast-paced routines, as I have managed to do so in my younger days.

However, the reality was far from that. The journey to the gym seemed like a thousand miles, even though it was just around the corner. The consistency with exercise was becoming impossible to sustain throughout the busy schedule of life, combatting with the highs and lulls and I found myself worrying about a point of no return!

With no solutions left in my pocket, a friend then suggested yoga to me, so I hesitantly gave it a shot with the attitude of “it is better than nothing.” Now one year later, I am the strongest propagator of yoga, and as cliché as it may sound, it has “changed my life.”

### **The balancing act**

I had always heard about the benefits of yoga as improving “the mind-body connection.” I knew we need to be mobile, flexible and fit, but did wonder why I needed to “connect.”

With every asana meaning pose I learned, I began to understand that the simple balancing acts of yoga help promote mental stability as they shift our focus from the chaos of our outside world, and bring our attention to ourselves. All we can control is our own being, and yoga helps quiet the mind, which is key to reducing anxiety and stress – that are constant side effects of today’s lifestyle.

Who would have thought that standing tall like a tree on one leg called Vrksasana, engages our core and straightens our legs, and helps relieve sciatica and rheumatism? As for Garudasana, called the eagle pose, it involves crossing the legs over one another and using the power of the hands in sync, engaging the shoulder and upper back. One of my favorites is the dancer pose, Natarajasana, stretches the hamstrings, hips and chest, as well as strengthens the ankles and calf muscles.

A must-do in power yoga is the famous sun salutation, Surya Namaskar, which can be considered a one-stop shop consisting of a sequence of 12 yoga poses performed in a flowing sequence, coordinated with deep breathing – which help strengthen the heart, muscles and joints. It is one of the calorie-burning exercises that promote weight loss, improve digestion, and boost energy levels, increasing alertness and stamina.

Simply paying attention to how your body feels in each pose and trying to let go of any thoughts or momentary worries channels a great sense of strength and focus on the present moment.

### **What is Power Yoga?**

If yoga is useful, then what is Power Yoga about?

This is where I actually got sold. Power Yoga takes the calm elements of traditional yoga – balancing, breathing and meditation, and combines them with fast-paced and vigorous physical postures. If one wants a full body

workout that offers a perfect blend of the much sought-after cardio, strength training, and flexibility exercises into one dynamic routine, Power Yoga is the answer.

Due to its well-balanced pace of exercise, with every session I could feel that I am recharging and regenerating my body instead of wearing it down. No wonder Power Yoga is super beneficial at improving cardiovascular health, building muscle strength and endurance, and increasing range of motion.

***“With every session I could feel that I am recharging and regenerating my body instead of wearing it down.”***

### **Great for all ages**

The pace that Power Yoga provides makes it suitable for all ages. With an increased level of control, there is a positive impact on concentration levels. This may be beneficial to even children as the increased focus can contribute to enhanced cognitive functioning, which is fundamental to learning.

Generally, the older adults take a back seat with any rigorous exercise for fear of risking injury, but the reverse is true. With the stretching and strengthening that yoga offers, there can actually be an improvement in flexibility and lessening of any discomfort from those hindering aches and pains. Here’s what my 60-year-old mum has to say – “Slowly and steadily yoga took away all my pains. Yoga gave me a sound mind and a sound body – two birds with one shot!”

Also, while we all exercise to lose weight and look good, it is becoming more important to take care of our mental health. I would rather focus my children more on how to develop greater self-awareness, self-acceptance, and resilience, than worry about how they look.

***“Slowly and steadily yoga took away all my pains. Yoga gave me a sound mind and a sound body – two birds with one shot!”***

### ***Helps you get your beauty sleep***

Another one of the most important contributing factors from yoga is sleep! Have you ever wondered why we don't sleep enough? In the world of social media and constant feeds, where is the time to switch off?

Just by taking that one hour of your day to calm the mind and body, it is amazing to see how easy it gets to fall asleep, and more importantly, stay asleep. The deep breathing exercises and physical exertion helps improve circulation and oxygen delivery to the brain, and at the same time, stay energized and focused throughout the day. In today's busy lives, no one is immune to stress and anxiety, and I had succumbed to the idea that there was no way to resolve it. However, as I consistently did yoga, I found myself surprisingly more in control of my moods, temper, and just felt "happier."

### ***Super beneficial for women's health***

I am compelled to mention the extra benefits of Power Yoga for women. With simple poses like the Chakrasana, which is the wheel pose, we can stimulate the endocrine glands, and help improve hormonal balance to reduce the symptoms of menstrual cramps and menopause. Furthermore, it also increases bone density in the spine and hips, which can help prevent osteoporosis and the risk of age-related injuries. A must add – the wheel pose is also said to help open up the heart and promote feelings of love, compassion, and forgiveness!

### ***Don't wait too long to jump on the yoga wagon***

The simplest way I can describe what Power Yoga does is that it helps in finding our "chi," which is said to be the vital energy held to animate the body internally. By incorporating Power Yoga into our daily lives, we have a shot at establishing a sense of balance and control in our lives, so don't delay taking a shot at it.



The pose here is a variation on rajkapotanasana – the pigeon pose that relieves lower back pain and stiffness.

If you are new to Power Yoga, it is very important to find a qualified yoga instructor who can help you learn the poses safely and correctly. My saving warrior has been my online yoga instructor, Meenakshi Kukreti (**Instagram @fierce\_fitlife**), who works personally with you according to your needs, ailments as well as fits around whatever time zone you are in. So I don't miss out on my dose of yoga even during holidays! You can see her level of agility and passion for yoga in this beautiful, inspiring pose.

# Exploring the Expanse: Bold Steps Towards New Worlds

By Yazeed Aldughaiter  
Editor-in-Chief

Humankind's fascination with space predates history itself. For millennia, humans have pondered the mysteries of the final frontier. Celestial bodies have been worshiped by prehistoric societies, inspired artists, and served as vital navigation tools for explorers throughout time. The inherent drive to comprehend and explore space is deeply intertwined with fundamental human drives for curiosity and innovation.

However, it is noteworthy that our first daring space missions have only occurred within the past half-century, which is but a fraction of the time that humanity has gazed towards the cosmos. In this modern era, countries are vying for their places within the annals of space exploration history, and the Kingdom is no exception to this ambitious endeavor. The results of these forays promise to have profound technological, scientific, and existential implications. As the Kingdom takes its first strides into this expanse, what can we expect from this interstellar form of mobility?



Figure 1: The emblem for Rayyanah Barnawi and Ali Alqarni's mission

First established as a commission in 2018, the Saudi Space Agency (SSA) is an independent governmental body chaired by the Minister of Telecommunications & Information Technology, H. E. Abdullah Alswaha. It stands as a testament to the Kingdom's commitment to venture beyond the bounds of Earth. Among SSA's stated objectives and roles are to prepare studies and research, develop satellite systems and technologies, execute human exploration missions, and support the peaceful use of space technologies.

With that said, the Kingdom's involvement in this domain is not a recent development. The first Arab to journey into space was HRH Prince Sultan bin Salman, who, in 1985, joined a seven-member crew aboard the space shuttle Discovery. During his seven-day stint in space, Prince Sultan bin Salman represented the Arab Satellite Communications Organization (ARABSAT), carried out several

experiments designed by Saudi scientists, and even had a call with his uncle, HRH the late King Fahd. Shifting our focus back to the present, the Kingdom is now proud to have two Saudi astronauts (Rayyanah Barnawi and Ali Alqarni) embarking on a momentous mission to the International Space Station (ISS), marking a first milestone in a new era for Saudi space exploration.



***"The first day or so we all pointed to our countries. On the third or fourth day, we were pointing to our continents. By the fifth day, we were aware of only one Earth." – HRH Prince Sultan bin Salman***

While tremendously exciting, space exploration is also associated with astronomical costs. This reality has prompted many to raise a valid question: What's the point? Are there not worthier causes for spending the millions spent on individual missions? (For reference, NASA's 2023 budget was approximately \$25 billion). The simple answer is that space exploration provides an invaluable avenue for scientific human progress. The potential for discoveries and inventions resulting directly from space exploration and experimentation is likely to yield drastic advancements in the quality of life on Earth in the long term.

It is also a noble cause, as the dividends of these endeavors may only be realized by future generations, as we have realized with the contributions of luminaries such as Copernicus, Galileo, Kepler, and countless others. Space exploration has already enabled many inventions and technologies that we take for granted,



Figure 2: HRH Prince Sultan bin Salman in training for his mission

(e.g. the internet, GPS, and television), medical imaging technology (e.g. MRI and CAT scans), portable cordless vacuums, smoke detectors, and solar panels. Beyond these pragmatic considerations, space exploration also has substantial philosophical implications regarding our Earth's humble place in the universe.

Examining space exploration from the perspective of the energy industry unveils intriguing parallels. Beyond its contribution to various forms of renewable energy, technologies used in space exploration also rely on sophisticated remotely-actuated equipment much like those used in subsurface completions. The same rovers used to probe the surface of planets like Mars have been used to inspect oil and gas facilities, which underscores these industries' often-overlooked interconnectedness.

Both these fields also heavily depend on testing, logging, and monitoring equipment which utilize seismic, nuclear, and electromagnetic sensing devices, among others. In a broader sense, space exploration and the energy industry are deeply committed to technological innovation that can drive the well-being and progress of life on Earth. Finally, both industries benefit from global cooperation and collaboration to share expertise, resources, and infrastructure.

As we direct our attention to the future of our human civilization, and particularly considering the Kingdom's role on the global stage, we are bearing witness to a

variety of interconnected shifts, challenges, and critical developments in both the energy landscape and space exploration.

While the global energy industry is adapting to a sustainable net-zero future, we are witnessing an increasing number of countries propelling their space programs to new heights, as exemplified by India's recent lunar mission. Both of these endeavors will depend on rapid technological development and policy shifts, with the ultimate goal of enriching life on Earth. We may even witness an era where the two fields directly intersect, as some experts posit the feasibility of mining natural resources from extraterrestrial planets.

Extrapolating the trajectories of these two industries holds tremendous promise for humanity's future, one where our collective efforts, driven by curiosity and ingenuity, can lead us toward a future as bright as we can imagine. In the words of Carl Sagan, "We make our world significant by the bravery of our questions and the depth of our answers."

SCAN FOR REFERENCES



# Sandrose Reviews

By Yazeed Aldugahtither, Editor-in-Chief

For this edition of SandRose Reviews, we bring you a diverse collection of media to explore our physiology, our planet, and the inspiring people that live in it. Whether you're reading a book, watching a documentary, or listening to a podcast, we hope you discover new aspects of our natural and built environments as well as yourself with your preferred immersive storytelling experience. Check out our top picks below!

For future editions, we will be taking 'Recs from our Readers,' if you'd like to submit your reviews, send them to SandRose (sandrose@spe-ksa.org) for a chance to be featured.

## RECS FROM OUR READERS

We're delighted to share an assortment of mixed-media submissions from our SandRose community; delve into the fantastic selections from our readers in this edition below!

### Podcast



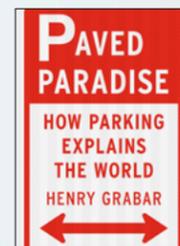
**Abdullah Alzahrani,**  
Petroleum Engineer

#### **Finjan Thmanyah:** **Professional Development**

Explore this episode of the "Finjan Thmanyah" podcast with Naif Alfaheid, a veteran Human Resources manager with 25 years of experience. In this episode, gain invaluable advice of effective colleague interactions, essential skills for success, and the significance of continual skill refinement in your career. Ultimately, this episode's discussion is tailored for those aspiring for lasting excellence in their careers, delivering insights for continual growth and success.



### Books



#### **Paved Paradise: How Parking Explains the World (2023)**

by Henry Grabar

*"By square footage, there is more housing for each car in the United States than there is housing for each person."*

Parking might not be on the top of your list of most interesting topics to read about, but Paved Paradise is likely to transform how you think about the spaces in which we store our ubiquitous vehicles. More than a book on storage or transportation, this work is a fascinating and witty exploration of how parking shapes cities, and the lives of their inhabitants.

While the book primarily focuses on the US, it reveals surprising trends, consequences, and realizations about how one of humanity's most primary forms of mobility deeply affects our societies. The book tackles controversial case studies on garages and innovative solutions to the parking problem while insightfully linking them to profound matters such as urban design, climate change, housing affordability, and social justice. This book promises to challenge your preconceived notions not only on parking and transportation, but also about how we choose to live and what we choose to value.

*If you enjoyed Paved Paradise, you may also enjoy New Mobilities: Smart Planning for Emerging Transportation Technologies by Todd Litman.*

### Film



#### **Becoming Cousteau (2021)**

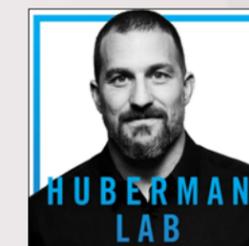
*"For most of history, man has had to fight nature to survive. In this century, he is beginning to realize that in order to survive, he must protect it."*

Did you know that we have barely explored 20% of the deep ocean, and mapped even less of it? As much of an enigma as it is a source of inspiration, the ocean's ecosystems are such an integral part of life on earth, and yet we know comparatively so little about it. In comes Mr. Cousteau, a man who has dedicated his life to exploring and protecting the ocean. In this captivating documentary, you will be lured into the world of this iconic explorer, inventor, filmmaker, and conservationist.

This film depicts the enthralling experience of the man behind the invention of the aqualung (the first scuba tank) from his early career as a naval officer, all through his ascent to global recognition, and up to his visionary perspectives on the importance of protecting our environment. Becoming Cousteau features stunning never-before-seen archival footage, including everything from the depths of the ocean wilderness to interviews with Cousteau's colleagues, family, and friends. His legacy is a tapestry of both struggles and milestones in a journey that has impacted millions and continues to do so. It is a work that promises to inspire you to reflect on both the beauty and the fragility of the marine world, and what it meant for a man who was driven by burning passion and a childlike curiosity that we can all relate to.

*If you enjoyed Becoming Cousteau, check out My Octopus Teacher.*

### Podcasts



#### **Huberman Lab (ongoing)**

*"When your mind isn't where you want it to be, use your body to control your mind."*

Dr. Andrew Huberman is a neuroscientist and professor at Stanford University, although you are far more likely to know him through his podcast Huberman Lab. Beyond the man himself, this podcast regularly features subject matter experts at the very cutting edge of their respective fields for frank, science-driven discussions to help you learn how to aid your mind and body in working together for the betterment of your wellbeing as well as your physical and mental performance.

Beyond neuroscience, this weekly show covers topics as varied as physiology, biomechanics, and nutrition. As a scientist and academic, Dr. Huberman consistently leads with evidence-based arguments from pioneering research and packages it in a way that is digestible to the layperson (i.e. us). Listening in will aid your understanding of just how comprehensively your nervous system controls our behaviors, choices, and perceptions and how to regulate it for our own improvement. This podcast stands out not only in the caliber of its guests, but also in the accessibility and actionability of its content despite its highly technical grounding. You can expect to learn helpful insights and advice towards optimizing your fitness, mobility, and overall well-being.

*If you enjoyed Huberman Lab, be sure to give The Ready State with Kelly and Julliet Starrett a listen.*



# Sandrose Readers' Lens



**IN THIS SECTION, WE PROUDLY SHARE PHOTO SUBMISSIONS FROM OUR VIBRANT COMMUNITY, BEAUTIFULLY ENCAPSULATING THEIR REMARKABLE TALENT FOR CAPTURING MOMENTS THAT RESONATE WITH THEM**

*"Six years ago, under a Pembrokeshire sky, I met the Milky Way. Eyes straining against the darkness, I waited, and meandered from dusk till dawn. Slowly, like a curtain rising on a magnificent play, I could see lanterns hung high in the velvet night, each one a story untold. In that moment, standing humbled beneath the boundless tapestry of creation. Life, I realized then, is not a race to the finish line. It's about these stolen moments, these breathless encounters with the extraordinary. It's about chasing stardust, not chasing time. It's about waking up to the wonder still clinging to the air after the sunrise, and carrying it with you into every sunrise to come."*

*-Elias Alzayer, Photographer*

*Follow Elias on Instagram @eliasalzayer*

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