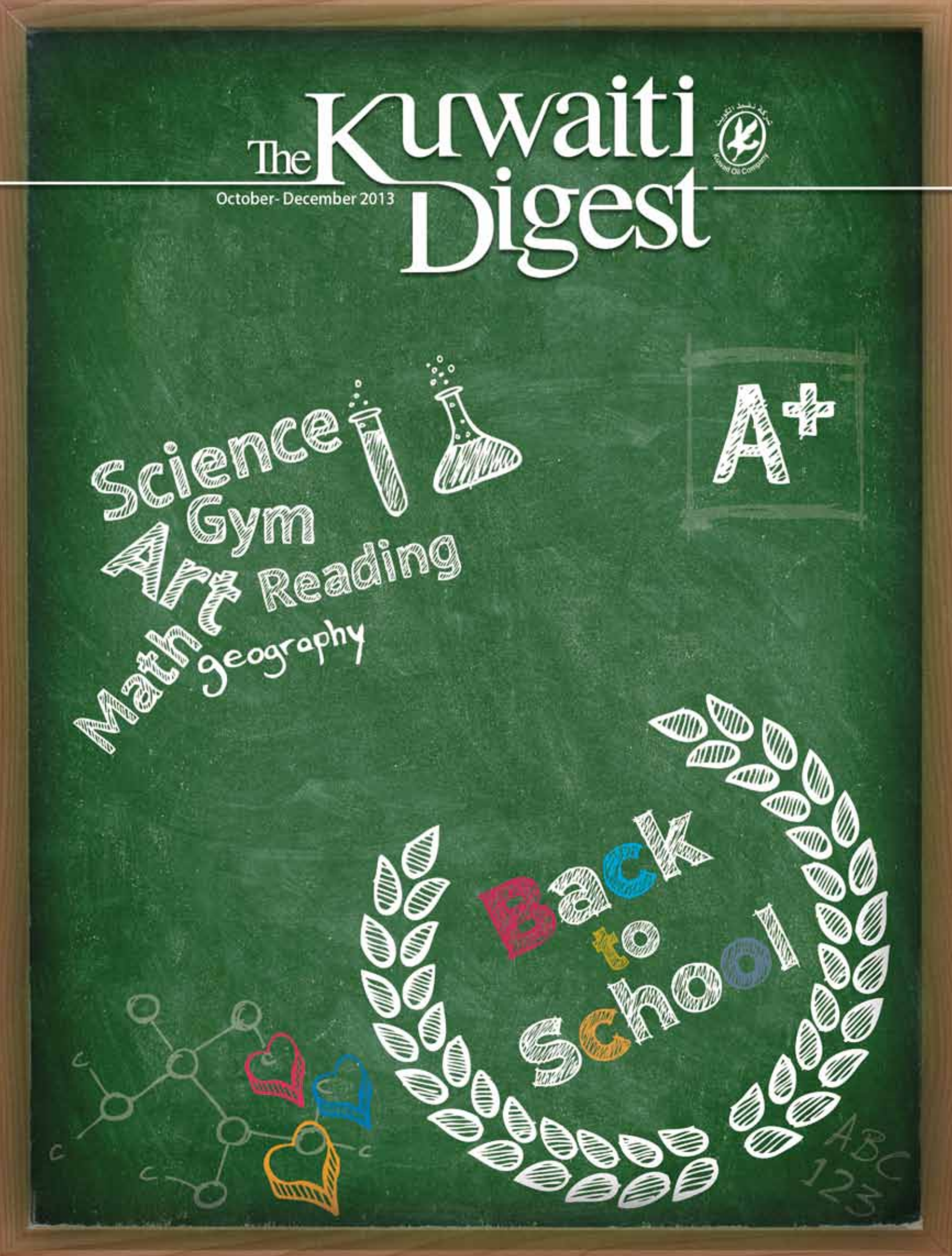
The Kuwaiti Digest

October- December 2013



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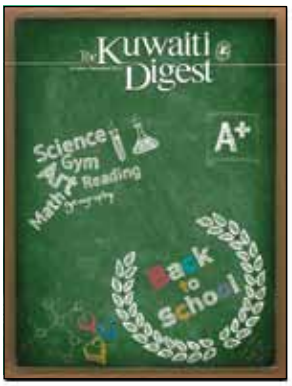

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3 HH the Amir Recognizes KOC Initiatives

10 Relieve Your Stress Campaign

16 Yemeni Minister of Oil and Mines Visits KOC

Contents

The Kuwaiti Digest

Saad Rashed Al-Azmi

Deputy CEO
(Administration & Finance)

As fall approaches and the heat from another Kuwaiti summer begins to cool down, it is my firm belief that KOC is more prepared than ever to address the challenges that lie ahead. While it is true that the pace of life and work in Kuwait tends to slow down a bit during the summer months, especially considering the fact that Ramadan this year fell in the middle of the summer, I found it truly inspiring to see KOC employees dedicated to delivering the same level of commitment to their duties as they do year-round. I would like to offer my sincere thanks and appreciation to all employees who continue to display a hard work ethic, integrity, and responsibility in upholding their duties to the Company and their country, Kuwait.

To begin, I would like to congratulate KOC as a whole for the recent praise it received from His Highness the Amir Sheikh Sabah Al-Ahmad Al-Jaber Al-Sabah, who recently honored a number of KOC employees for the efforts and strides they have made in their respective fields. The details of the projects and efforts that were singled out for commendment can be found in the lead story of this issue. Again, personal congratulations from His Highness the Amir is one of the greatest honors KOC employees can receive, and everyone here at KOC should be proud of the good work that they are currently engaged in.

In regard to KOC operations and our 2030 Strategy, the Company has taken enormous strides toward meeting production goals and completing major projects. Despite some major reshuffling in terms of the Company's organizational structure and higher management, I believe that KOC will be able to finish off the year stronger than ever by meeting or exceeding our production goals and targets while ensuring efficiency and safety for both our employees and the environment. While it is true that we have bid farewell to some long-serving KOC employees, their legacy within the Company will live on. The impact they have made in helping to create KOC into the Company it is today will never be forgotten, and we are forever in their debt because of this.

Included in this edition of The Kuwaiti Digest are a number of technical write-ups and submissions which I encourage you to spend some time with. It is only through the collective effort of all KOC employees that the Company can move forward, and I encourage you to learn more about the work your fellow colleagues are doing for the Company.

I am happy to report that we are on track to turning the goals of our 2030 Strategy into reality while remaining committed to protecting the health and safety of KOC employees, contractors and the Kuwaiti population as a whole. Our commitment to the community and environment remains strong, and we look forward to working harder to deliver on our obligation of exploring for and producing oil for our beloved country, Kuwait.

H.H. the Amir during an honoring ceremony with KOC officials.

H.H. the Amir Recognizes KOC Initiatives

His Highness the Amir Sheikh Sabah Al-Ahmad Al-Jaber Al-Sabah recently honored a number of KOC employees for the efforts and strides they have made in their respective fields. Well Surveillance Group Manager Saeed Al-Shaheen and HSE consultant within the group, Dr. Ibrahim Al Mahdi, were commended after KOC won the second place position for the The Kuwait Electronic Award for Enriching e-Content, or Kuwait E-Award. The prize is awarded by the Kuwait Foundation for the Advancement of Sciences in the HSE domain.

Meanwhile, His Highness the Amir honored the Company's representative, Team Leader HSE Export and Marine Operation Group Mohammed Al-Basry for his active engagement with the Volunteer Work Team and Kuwait Coast Guard in order to preserve the environment in Kubbar and Gharoh Islands. The Amir also commended Project Management Construction Engineer from NK, Abdulrahman Al-Shammari, for his project, which is a website dedicated to construction and interior design whose focus includes helping individuals build their dream homes from scratch. Al-Shammari's website also won the Sheikh Salem Al-Ali IT Award.


مؤسسة الكويت للتقدم العلمي

شهادة تقدير

بناءً على قرار لجنة التحكيم واعتماد اللجنة العليا لجائزة الكويت الإلكترونية

تمنح مؤسسة الكويت للتقدم العلمي

السيد/ سعيد محمد عبدالله الشاهين

ضمن فريق عمل مشروع نظام الصحة والسلامة والبيئة المباشر

شركة نفط الكويت

المركز الثاني لجائزة الكويت الإلكترونية - الدورة الرابعة (2011-2012) في تصنيف الحكومة الإلكترونية

عن مشروع "نظام الصحة والسلامة والبيئة المباشر"

المدير العام

عدنان احمد شهاب الدين

The certificate of appreciation that was presented to KOC.

In a statement he made, Well Surveillance Group Manager Al-Shaheen said, "We presented this project in order to take part in the e-government competition, which is awarded to government institutions. The project was identified as one of the best, and the project itself assesses the performance of employees. The award will remain a source of pride for all of us, for we have been honored by His Highness the Amir, which motivates us to do more for the Company and our country."

With regard to the importance of the project, Al-Shaheen pointed out that the HSE project for Well Surveillance Group employees started in 2008 with the identification of the goals for each employee within the group. These goals are tracked through a report called HSE Live, and the success of each individual indicates their commitment to the standards set in the system for HSE Management, which is a key component of their KPIs. As to how data was gathered, Al-Shaheen maintained that at the beginning of the year, each employee is assigned specific tasks that are included in the system as per their area of specialization. Each report is then reviewed periodically by senior engineers and Team Leaders. He added that this move enhances HSE performance of employees and contractors.

For his part, Dr. Ibrahim Al-Mahdi said, "We thank His Highness the Amir for this gesture, which is aimed at appreciating innovative performance across Kuwait. This is the fourth edition of the award and we are glad that we won the second position in Kuwait. His Highness the Amir's decision to honor us makes us more confident that we are on the right track by using an effective tool for evaluation. As a matter of fact, some government academic institutions have contacted us to implement our system because of its ease of use in evaluating performance."

Dr. Al-Mahdi also mentioned that the project has been nominated for higher awards at the regional and international levels after it became associated with the international IT award. Elaborating on the idea of the project, Al-Mahdi explained that the idea began five years ago to assess the HSE performance of employees within the Company. He noted that the group has 240 employees and 30 contractors, and their management through this system enables them to keep track of their commitment to HSE regulations.

"Since this is linked with the annual evaluation," he said, "it has positively impacted the performance of employees, and we have noticed a sharp drop in the number of incidents while ideas have increased to improve the environment. In fact, this project constitutes a monumental leap for the Group and the Company."

The project seeks to achieve the following:

The attendance of training sessions on HSE.

Reporting a specific number of inspection operations and hazardous situations.

Conducting a specific number of field visits to work sites in the field.

Meanwhile, Team Leader HSE Export and Marine Operations Group Mohammed Al-Basry expressed his delight after being honored by His Highness the Amir. "I've been honored and privileged to have an audience with His Highness the Amir and to listen to his instructions to exert all possible efforts in order to preserve the two islands of Kubbar and Gharo. This has been reaffirmed by His Highness the Crown Prince Sheikh Nawaf Al-Ahmad Al-Sabah when we had an audience with him the following day at Seif Palace."

He added that the KOC Diving Team cleared hazardous waste and debris around the island which were having a negative impact on the surrounding

environment. Al-Basry was received at Seif Palace in the presence of the Chairperson for the Kuwait Volunteer Work Team, Sheikha Amthal Al-Ahmad Al-Sabah, and the representative of the Kuwait Coast Guard. Al-Basry noted that His Highness the Crown Prince underscored the need to preserve the two islands and commended KOC's outstanding efforts, particularly on Kubbar Island. He also highlighted the need to preserve coral reefs around the island while recommending a study be conducted in regard to the best means of protecting the environment in conjunction with the Kuwait Volunteer Work Team.

Al-Basry went on to state that His Highness the Crown Prince also recommended new environmentally-friendly methods to preserve birds and their nests to protect them against any harmful activities. The Team Leader added that there is currently an environmental study to preserve birds in Kubbar in cooperation with the Volunteer Work Team and the Environment Public Authority. Al-Basry also maintained that KOC spares no effort in familiarizing the society on environmentally sound practices, adding that this includes information pertinent to both marine and desert environments.

Meanwhile, in statements he made regarding his project, Construction Engineer Abdulrahman Al-Shammari provided information about his website, which he described as "aimed at adding valuable content to information for anyone planning to build their dream home." Al-Shammari said that the site presents technical information in simple terms that can be easily understood by non-specialists. The site also contains photos for construction and interior design and a video library of educational films about various phases of construction, in addition to technical articles written by specialists from this domain.

H.H. the Amir congratulates KOC employee Mohammed Al-Basry.

Al-Shammari said his site has enjoyed an increase in traffic by way of new and returning visitors, and according to him, the project has won two awards: The Sheikh Salem Al-Ali IT Award and the e-Kuwait Award, which is affiliated with the Kuwait Foundation for the Advancement of Sciences. As for the conditions for taking part in the competition, he said that Arabic was the official language for all sites and applications and that the applicant should protect intellectual property rights and observe decency. In the same vein, Al-Shammari affirmed that winning the award has provided him with the opportunity to have an audience with both His Highness the Amir and His Highness the Crown Prince, which, according to him, has been a source of pride and an incentive to exert further efforts to achieve more goals. Asked whether he has other projects that he is working on, he said that he had several and was awarded the bronze medal from the Sheikh Salem Al-Ali IT Award in recognition of his volunteer work for more than three years.

Al-Shammari added that he has also compiled a book entitled: Your Home, Step by Step, which has been printed and distributed across the GCC. "In fact, the first edition of the book has ran out in markets, and a second edition

Prime Minister Jaber Al-Mubarak Al-Sabah with TL HSE E&MO Mohammed Al-Basry.

has been printed, which is also about to run out. And we are in the process of printing a third one," he said. Detailing the contents of the book, he said, "The first chapter discusses the points that need to be taken into consideration when designing your dream home, and the mistakes that need to be averted in the design. The second chapter tackles the main conditions that need to be followed when choosing a contractor to execute the dream home, while the third chapter explains in detail the phases of construction. The fourth chapter explains steps for implementing mechanical works such as air conditioning, sanitation and elevators, whereas the fifth chapter deals with electrical extensions and the issues that need to be considered in this regard. Finally, the sixth chapter includes models of contracts between an owner and contractors as a reference.

Reacting to a question regarding future projects, Al-Shammari revealed that he is in the process of compiling a new book entitled "Construction Project Management" which is meant for engineers and workers in the construction field. The book will contain information about what an engineer needs to succeed in managing projects.

H.H. the Crown Prince and Sheikha Amthal Al-Ahmad Al-Sabah with representatives from KOC.

Minister of Oil Visits NK

Kuwait's Deputy Prime Minister and Minister of Oil Mustafa Al-Shamali recently conducted a familiarization tour of the North Kuwait Operations Zone. During his visit, the Minister of Oil inspected the workflow at one of the rigs in the Rawdatain Field.

The minister commended the efforts of the workers at the site for their selflessness in carrying out their duties under a variety of difficult circumstances, particularly during the holy month of Ramadan.

Meanwhile, Al-Shamali congratulated the workers on the occasion of Ramadan and wished them further success. He also listened to a detailed explanation about the nature of KOC operations in the area.

The minister was accompanied on the tour by the Chief Executive Officer of the Kuwait Petroleum Corporation Nizar Al-Adsani and the KOTC Chairman and KPC Managing Director for Government and Parliament, Public & Media Relations Sheikh Talal Al-Khalid Al-Sabah and a number of top oil officials. The delegation was received by KOC Chairman Nabeel Burusli and KOC CEO Hashim Hashim, along with a number of senior officials.

Burgan Project Receives International Recognition

The Burgan Reservoir Static and Dynamic Modeling Project from the Fields Development (S&EK) Group has produced an important number of technical results that have been published and presented in conferences worldwide, including AAPG 2012, EAGE and MEOS 2013.

A technical publication based on this project, article SPE 164187 titled "Answering the Challenge of Upscaling a 900 Million-Cell Static Model to a Dynamic Model – Greater Burgan Field, Kuwait" was selected as one of the only three technical papers published in the yearly compilation of the Journal of Petroleum Technology (JPT), the leading magazine of the Society of Petroleum Engineers (SPE). The article was published in the July 2013 issue, in the Technology Focus section dedicated to Reservoir Simulation. Its authors included Farida Ali, Team Leader Greater Burgan Studies Team, Reham Al-Houti, Senior Geologist, Gt. Burgan Studies Team, Laila Dashti, Snr. Reservoir Engineer, Gt. Burgan Studies Team, Muhammad Ibrahim, Gt. Burgan Studies Team, Eddie Ma, Consultant, Gt. Burgan Studies Team, Sergey Ryzhov, Reservoir Engineer, Reservoir Growth Project Team, and Yuandong Wang, Snr. Reservoir Engineer, Gt. Burgan Studies Team.

In statements he made regarding the occasion, Manager FD (S&EK) Jamal Al-Humoud maintained that these types of accomplishments were "The result of the high-end professional and world-class work of our FD (S&EK) employees, who are some of the best experts at KOC."

"The publication of the results of the Greater Burgan Studies Project in the JPT magazine is particularly remarkable, considering that our work was chosen among hundreds of other technical publications worldwide," said TL GBS Farida Ali Abdullah.

The project was led by KOC Consultant and Project Manager Eddie Ma, who works with Senior Geologist Reham Al-Houti, Engineer Laila Dashti, Specialist Merlon Robles and a group of contractors from Schlumberger led by Eng. Muhammad Ibrahim.

The project continues to add value to the subsurface studies of FD (S&EK), and is currently in the phase of forecasting different production scenarios of the future production of the Greater Burgan Area. The full text of the technical paper published by the Greater Burgan Studies Team can be found on the Society of Petroleum Engineers website or Journal of Petroleum Technology.

A summary of the abstract of the paper follows:

The Greater Burgan field is the world's largest sandstone oil field. It has been producing since 1946 under primary depletion from natural water drive. Sub-surface modeling is an integral part of reservoir management and Kuwait Oil Company (KOC) has been investing significant amount of resources in this technology to support field development planning and depletion strategy. In 2001, the first comprehensive Greater Burgan full-field geological model was built with 65 million cells encompassing all the major reservoirs. Subsequently, a reservoir simulation study with a 1.6 million cells dynamic model was conducted in 2003 utilizing parallel simulation technology. In the last decade, active field development plans have resulted in major surface facility upgrades and more than 300 new wells drilled. The existing sub-surface models no longer sufficed to meet technical requirements and as a result, an unprecedented Greater Burgan sub-surface modeling project was commenced in 2009. This is a 4-year project consisting of structural, static and dynamic modeling. It started with Sequence Stratigraphy Study followed by Geo-modeling. The latter was completed in August 2011 and subsequently paved way for the Dynamic Modeling phase of the study. This paper discusses up-scaling of the high resolution geological model and the specific problems that the study team had to overcome in the process.

State-of-the-art technologies were applied to the construction of the biggest-ever geological model (900 million cells) of the Greater Burgan field. The high resolution of the static model was necessitated by not only the sheer size of the field, but also, by the complex depositional environment defining the internal architecture of the reservoir and the resultant heterogeneity in the system. Sedimentological and stratigraphic data were used extensively to describe the internal architecture of the reservoir, capturing the level of heterogeneity observed in the field. A primary use of this high resolution model was to create a basis for the flow simulation model used in reservoir management. Although computing technology has advanced significantly, conducting flow simulations on such a fine scale model demands prohibitive amount of computation and becomes impractical when a time constraint is imposed on the project. Therefore, model up-scaling is essential to conduct simulations in a reasonable run time. Preservation of volumetric quantities and flow features were the two key considerations for the successful up-scaling. While volumetric conservation can be achieved by following a strict procedure, preserving flow features across the various reservoirs imposes a great challenge. This paper addresses actual challenges encountered during the up-scaling process. The discussion focuses on the following topics:

1. Choice of the model size considering both computational time and accuracy of simulation results. Need for multi-scale approach with three simulation models: Fine, Coarse, and Very Coarse - each to be used to answer specific questions of the study.

2. Right balance between areal and vertical grid coarsening that ensures adequate model physics and preservation of geological features.

3. Mechanistic modeling to support decisions made in the process of up-scaling.

4. Preservation of flow features in various reservoirs, difference between massive and more heterogeneous reservoirs.

5. Transferring water saturation between fine and coarse models: testing various approaches to find one that produces the best volumetric match.

Relieve Your Stress Campaign

As part of its efforts to provide the best quality of services and uphold the health of its employees - both physical and psychological - KOC recently hosted a campaign titled "Relieve Your Stress" which was held at the Unity Center. The event, which was organized by the Health, Safety and Environment Team (North Kuwait), had the stated purpose of informing KOC employees about stress and ways to combat it. During the event, a number of KOC employees with medical backgrounds defined stress, its causes, symptoms, and ways to alleviate the negative repercussions that stress can have on our lives.

The Relieve Your Stress Campaign was held under the patronage of Emad Sultan, Deputy CEO (NK), who also delivered the event's opening remarks. During his address to the audience, Sultan upheld the importance of the event, citing the fact that almost all employees in a variety of different positions are likely to experience work-related stress in some shape or form at some point in their careers. Because KOC strives to get the best possible performances out of its employees while ensuring they are happy and content in their line of work, Sultan maintained that it was extremely important for KOC employees to understand the triggers of stress and how to deal with the symptoms that are sometimes associated with it. He also added that the hectic nature of modern life and the demands of the workplace sometimes blind employees to the reality of how much stress they are actually under. This campaign, he said, will do much in the way of providing clear information to employees so that they may become happier in their line of work and lives in general.

Following the Deputy CEO's opening remarks, Dr. Aref Al-Abbasi, Chief Clinical Officer from the Medical Group, delivered his presentation. Dr. Al-Abbasi maintained that the triggers of stress are often all around us, whether we realize it or not. Triggers of stress can vary from morning or afternoon traffic, work-related stress in the office, social stresses, family stresses, and a long list of other factors that can contribute to stress in one's life. However, he asked, what exactly is stress? By definition, stress can be described as a mental, emotional, or physical strain or tension. Scientifically, stress is a physiological reaction by an organism to an uncomfortable or unfamiliar physical or psychological stimulus.

Dr. Al-Abbasi went on to say that stress is a very common affliction which many people suffer from in today's society. The demands of work and family, when not properly dealt with in a positive manner, can contribute to psychological stress, and in the worst-case scenarios, physical symptoms of stress can be manifested which pose an additional risk to our health and well-being. After his short introduction, Dr. Al-Abbasi invited his colleagues from the Medical Group to deliver their in-depth presentations about stress, its triggers, and how to live a better, stress-free life.

Dr. Entesar Al-Hendal, from the Family Medicine division of the Medical Group, took the stage after Dr. Al-Abbasi to discuss Occupational Stress. Occupational Stress, as the name suggests, is stress which affects us because of events or triggers which take place in the workplace. In particular, Dr. Al-Hendal maintained that "job burnout" is a special type of job stress which many employees run the risk of facing. Job burnout, she said, can include stress about one's job due to doubt about one's competence in the workplace. It can also be related to doubts about the value of one's work.

What are the ways to identify cases of job burnout? Dr. Al-Hendal described critical or cynical feelings about the nature of one's work as identifying characteristics of job burnout. But the list does not just stop there. She added that irritability in the workplace, impatience, not being productive, disillusionment, drug or alcohol abuse, changes in sleep and appetite, backaches or any other physical pains and depression are all signs of job burnout which should be addressed as soon as possible to prevent the addition of even more stress.

After delivering her definition of what job burnout actually is, Dr. Al-Hendal went on to discuss the actual causes of job burnout. These, she said, can include lack of control at work or the inability to influence important work-related decisions, dysfunctional work dynamics and a lack of harmony in the workplace or a mismatch in values, especially if your values differ from the values of those you work with. In addition, the simple cause could be a poor job fit. Some people simply cannot thrive in a position that does not suit their interests, skills or capabilities. Being stuck in a position that is not right for you can not only contribute to high levels of psychological and physical stress, but also contribute to the development

of depression. There are, however, even more factors which can lead to job burnout, such as the lack of a social support system. Individuals sometimes find their social networks, be it friends or family, are lacking in terms of empathy and understanding, which can lead to even more stress in the workplace. A lack of balance between work and a life at home can also contribute negatively. Many individuals may find that the time spent at work outweighs the time spent with family and friends. A preoccupation with work-related activities can do much in the way of hindering personal relationships when an individual spends most of his or her time in the office or worrying about work-related issues.

Who, exactly, is at risk for job burnout? Dr. Al-Hendal maintained that those in high stress positions, such as the health profession, are generally more at risk. However, job burnout has no boundaries, and can affect anyone in any profession. Symptoms and consequences of job burnout can include insomnia, heart disease, stroke, diabetes, and sometimes drug or alcohol abuse. Dr. Al-Hendal recommended that individuals suffering from any of these symptoms of job burnout contact their doctors or medical health providers.

According to Dr. Al-Hendal, there are a number of ways to deal with job burnout, with the most important way being to first identify the cause or causes of job stress. After the cause is identified, one should then evaluate their options so that they may better be able to reach a compromise or solution. Ways to combat job burnout is to change your attitude or get some exercise, which is often overlooked. Individuals should try their best to rediscover enjoyable aspects of their work, spend time doing the things they like, and seek support from friends and family. If all else fails, Dr. Al-Hendal said that one should address their interests, skills, and passion. After they compile a list, one should examine all the positives and negatives of their current situation before asking themselves: Do I need a new job?

After Dr. Al-Hendal's informative presentation about job burnout, Dr. Walid Daoud, MD Preventive Medicine, took the stage to deliver his presentation about stress. Highlights from Dr. Daoud's presentation are as follows:

• Stress knows no bounds and can present itself in many lines of work.

• Stress can lead to loss of productivity and diminished confidence. However, in cases where individuals can overcome stressful situations and succeed, their confidence levels and self-esteem actually grows stronger.

• Symptoms of stress can include headaches, stomach problems, over/under eating, sleep disturbances, mild or chronic fatigue, and muscle aches and pains.

• Psychological symptoms of stress can include forgetfulness, anger, frustration, anxiety, depression, feelings of powerlessness, irritability and drug abuse.

• Long-term symptoms of stress can include hypertension, heart disease, stroke and diabetes.

• Stress, which has multiple causes, can also have multiple solutions. There are many ways to improve one's life and decrease levels of stress, and this can include exercise, changes in diet and lifestyle, improving relationships in the home and office, or changing jobs entirely.

Emad Sultan, Deputy CEO (NK) addresses the audience.

Following Dr. Daoud's presentation about stress, Social Worker Shahed Adel Haider and Abdullah Al-Kandary, Physical Therapist from Ahmadi Hospital, offered their suggestions for ways to combat stress. Haider maintained that a well-rounded lifestyle with an emphasis on physical activity such as exercise is an excellent way to lead a balanced life that is unaffected by common stresses. On the other hand, Al-Kandary delivered suggestions for healthy habits in the home and workplace to help keep employees physically fit, which is an important factor in how stress can affect individuals. He emphasized the importance of proper posture when working for long hours behind a computer, the necessity to take frequent breaks and drinking plenty of water in addition to regular exercise and stretching as ways to deal with stress.

After the presentations, Deputy CEO (NK) Emad Sultan honored those who took part in the campaign and helped make it a reality. The floor was then opened to the audience to interact with and receive information from outside parties who had set up booths inside the Unity Center to showcase a variety of health-related information.

Meanwhile, a significant number of KOC employees opted to donate blood in a designated area within the Unity Center. The blood donation campaign was conducted in coordination and cooperation with the Central Blood Bank.

Performance Management & Business Intelligence at KOC – A Case Study

Submitted by Safa Al-Nashmi, TPL Specialist I (IT), Corporate Information Technology Group

The Company's leaders and Managers have always sought to predict, plan and control the Company's performance - in part to satisfy KOC's strategic business objectives and in part to achieve targeted performance through exploration of new reserves and the increase of Oil and Gas Production.

Today, in the face of intense global competition, the requisite to perform is high, and thus it is increasingly important for KOC to capitalize on the best available methods and tools for Performance Management, in order to meet its strategic objectives.

It is very important to know 'how' KOC is performing at any point in time and 'why' it is performing the way it is. Moreover, it is important to understand the driver behind the performance, and also to ascertain where KOC is currently and what should be done next.

Answering the question 'how' is usually done with tools like dashboards and score cards. Understanding 'why' KOC is getting the results is something typically done with reporting and analysis tools.

Finally, understanding 'what' KOC should be doing next is achieved with planning, predicting analytic and forecasting, and this all falls under the umbrella of Performance Management and Business Intelligence (PM&BI).

The role of PM&BI is becoming more pervasive nowadays and is affecting the way information is used, analyzed and applied. As a result, organizations can lead, decide, measure, manage and optimize performance to achieve greater efficiency and financial benefits. PM&BI is now becoming key to the better management of performance, associated with multiple dimensions of an organization and its business processes. It is helping businesses with long-term planning and day-to-day decision making, to run the business efficiently (or to achieve greater efficiency or improved business efficiency), increase productivity and achieve the Company's goals. (i.e. helping the organization achieve business objectives).

PM&BI Project Objectives:

To help KOC optimize business performance by encouraging process effectiveness as well as the efficient use of financial, human, and material resources.

Performance Management (PM): Provides a holistic view of KOC's commitments and performance which in turn demonstrates both present and possible future capability that would help meet organizational strategic objectives and targets. It helps align the organization towards its key objectives and enables decision makers to track and manage the Company's strategy, measure goals, and monitor performance.

Business Intelligence (BI) is an umbrella term that includes the applications, infrastructure, tools, and best practices to organize information, analyze it, manage business processes and integrate systems with an aim towards increasing overall productivity and managing performance. Business Intelligence (BI) can be defined as the process of turning data into information and then into knowledge.

It is important for KOC to examine PM&BI project's potential especially in the area of usability, manageability, reliability, functionality, adaptability and make a business case for the return on investment (ROI) and the total cost of ownership. This will help KOC to align the organization's people, processes, information and technology investments in order to improve performance and optimize company resources.

Moreover, PM and BI best practices emphasize that PM&BI is integral to developing the company's business strategy and its execution, in order to provide maximum value to the organization. As such, the related technology and applications must be core to the organization's IT architecture and applications portfolio.

In this context, a conceptual framework was developed by CITG, synthesizing the extant literature on the PM&BI business value including IT services and process design. The framework provides a set of technical, financial measurements and series of tools for evaluating KOC's performance and perspectives and highlights the tangible and non-tangible benefits.

KOC PM&BI Business Case Study:

The comprehensive assessment that was conducted by Corporate Information Technology Group (CITG) shows that adopting Performance Management (PM) and Business Intelligence (BI) to drive the Company's performance and profits is important, required and necessary. Moreover, the assessment addresses the value of the PM&BI Project and what it brings to the Company in relation to the objectives and overall strategy promises. It illustrates how we can better manage the organization's resources, including how the IT function can be better managed and also highlights its contribution to the organization's performance.

ROI Key Metrics

The Return-On-Investment of the PM&BI Project has been measured based on certain assumptions, facts and criteria, which are listed below:

We have assumed that the estimated investment of a PM&BI Project, during a period of 6 years of implementation and support is KD 2,600,000.

- For this study it was assumed that the average number of KOC (PM) Reports generated and published per year is 87 reports, of 9 different types.
- The average number of knowledge workers involved: 1,500 employees.
- The average days and hours spent to deliver a report is approximately 2 days (i.e. 16 hours).
- Average hours spent on each of the PM&BI tasks out of a total of 100%:
- Finding and Collecting data (14%)
- Analyzing data (20%)
- Validating data (10%)
- Approving data (5%)
- Consolidating data (15%)
- Creating reports & Graphs (15%)
- Communication and Collaboration (15%)
- Workflow (6%)
- The estimated elapsed time before KOC begins to see benefits from the PM&BI solution is 9 months.
- The average monthly wage per knowledge worker is KD 1,200.

Figure 1: A sample of the Key Metrics used in the Financial Analysis

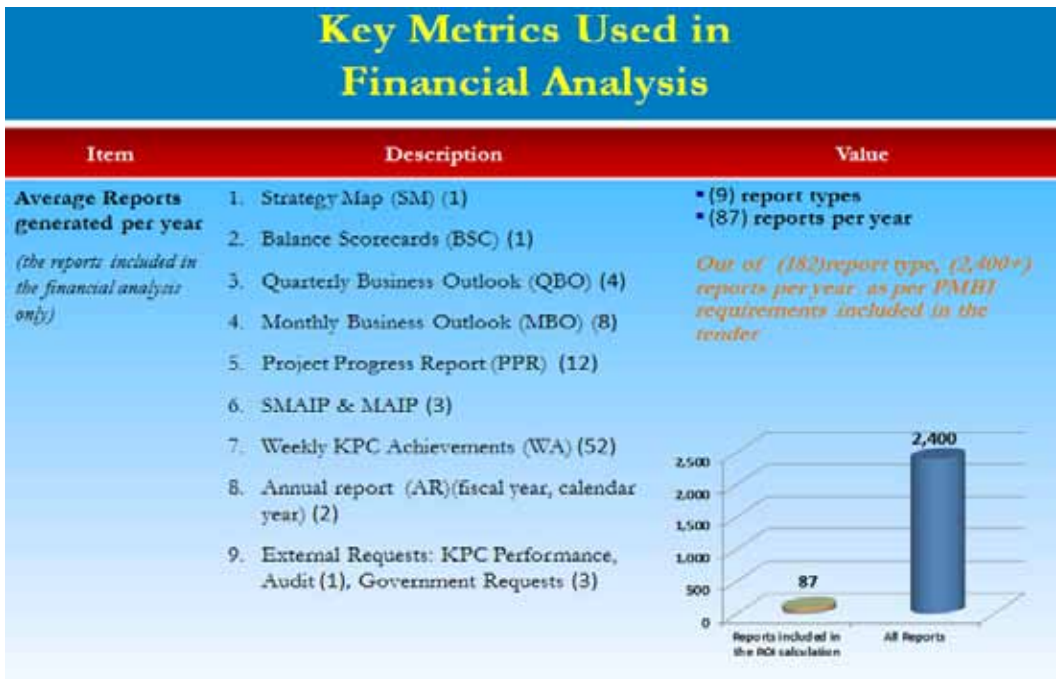


Figure 1 shows a sample of the Key Metrics used in the Financial Analysis:

Financial Analysis Approach

After defining the key metrics components of the ROI we come to the business-value measurements. The business value ROI template incorporates the associated calculations and key metrics data, and helps translate the collected data into accurate and objective business-value measurements. This template uses ROI analysis, which includes in addition to costing and benefiting summaries, soft benefits such as employee productivity and time.

The calculated benefits for the reduction in hours spent by Knowledge Workers on PM&BI Tasks were summarized as follows:

- Finding and collecting data (15%)
- Analyzing data (15%)
- Validating data (15%)
- Approving data (15%)
- Consolidating data (15%)
- Creating reports (15%)
- Communication and Collaboration (15%)
- Business Process Automation (15%)
- Re-work (15%)
- Manage PM&BI tasks with fewer resources (2%)

The calculated benefits include:

- Increased Business Operational Efficiency and Knowledge Worker Productivity
- Improved information Access (15%)
- Improved information Analysis (15%)
- Improved Document and Graphics Creation (15%)
- Improved Communication and Collaboration (15%)
- Business Process Automation (15%)
- Reduce re-work (15%)
- Indirect Benefits:
- Support requirements of PM&BI tasks with fewer resources (2%)
- Elimination of business process activities

Return of Investment ROI	2.79%
Risk Adjusted ROI [ROI - (NPV investment/NPV cash flow)]	2.36
Net Pay Value (NPV) Savings	2,783,170.460
Payback period (including deployment period)	22

Figure 2 Illustrates the Financial Analysis Approach:

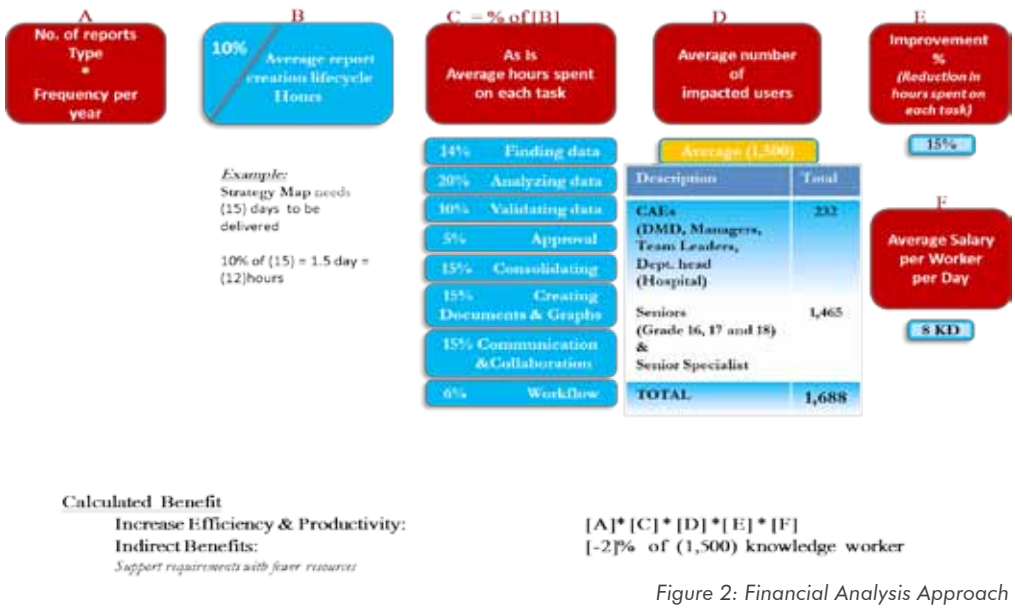


Figure 2: Financial Analysis Approach

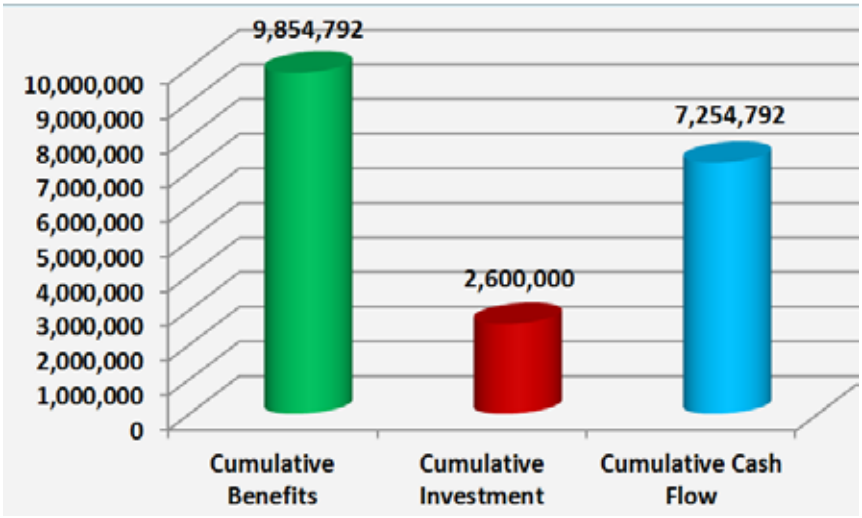


Figure 3: Cumulative Benefits, Investment and Cash Flow per Year

The outcomes reveal that the Company will achieve 2.79% as return on investment (ROI) which is the ratio of the net gain from the PM&BI Project within 6 years based on the above assumptions listed in the ROI Key Metrics section, and 22 months (Payback Period) is the time needed to recoup the cost of the PM&BI investment.

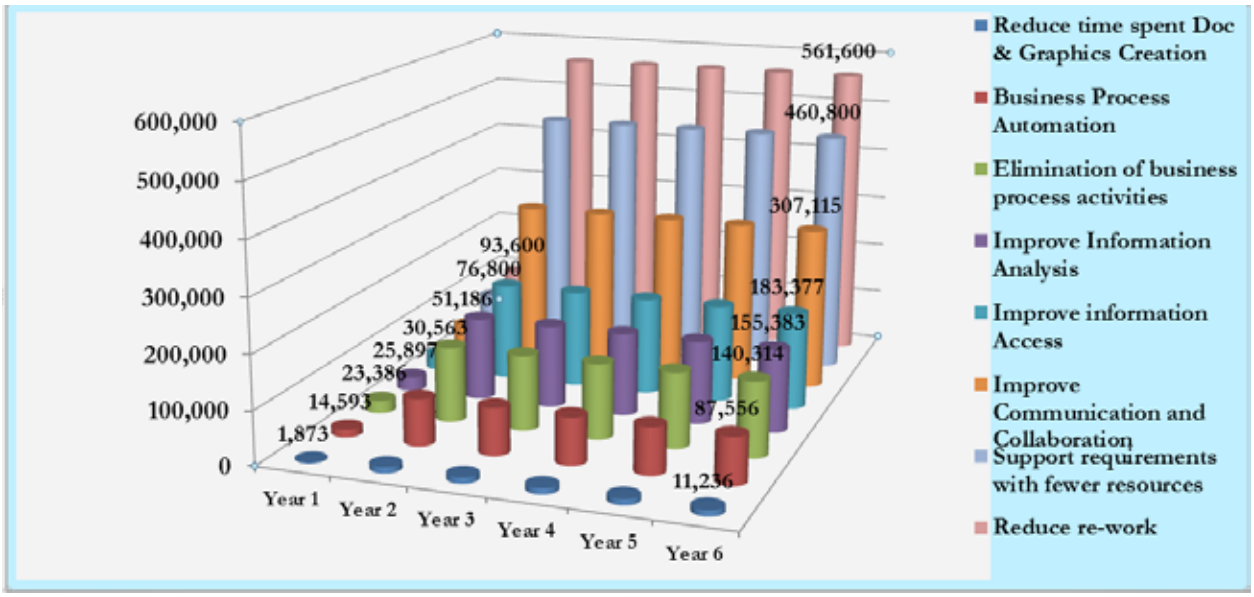


Figure 4: Savings per year for 6 years Contract duration

Business Benefits highlights

- Increased insight into the Company's business systems and data.
- Helps make business decisions based on quality information, solid facts and optimizes the costs for better management.
- Timely answers to business questions, which in turn makes information available on time.
- Explore new opportunities through a clear insight into business.
- Rapid response to unforeseen events.

Conclusion

Although the study was conducted by including some of the PM&BI components solution, it shows that the PM&BI solution will be able to contribute to the objectives and overall strategy of the organization by reducing costs and increasing effectiveness and productivity.

Yemeni Minister of Oil and Mines Visits KOC

The Yemeni Minister of Oil and Mines, Ahmad Abdullah Daris, recently visited KOC as part of efforts to increase instances of cooperation and familiarity between the oil sectors of both countries. During his visit, the Yemeni Minister of Oil and Mines was received by CEO Hashim Hashim and a number of senior officials from KOC and the oil sector.

The Yemeni Minister's visit included a tour of the KOC Display Center, where he was provided with information about the history of oil in Kuwait, from its discovery, early days, and up to the present day. He was also provided with information that defined the monumental role that KOC's exploration and production efforts have played in the development of the State of Kuwait.

Following the minister's tour of the Display Center, the visiting delegation and accompanying officials then conducted a field tour of Burgan Field. In a written statement that he made in the VIP Guestbook, Minister Ahmad Abdullah Daris commended the management methods of this vital economic resource by Kuwaiti nationals. He also expressed his satisfaction with visiting the second largest oilfield in the world and stated that the workflow displayed there impressed him because of the efficient manner in which it is conducted.

The minister then described his visit to the country as fruitful, adding that he discussed with oil officials aspects of cooperation in the domains of exploration and oil investments between the two sisterly countries.

A group photo of the visiting delegation and KOC officials.

KOC CEO Hashim Hashim presents a token of appreciation to the Yemeni Minister of Oil.

About Yemen's Oil Industry:

Yemen is a small oil producer and does not belong to the Organization of the Petroleum Exporting Countries (OPEC). Unlike many regional oil producers, Yemen relies heavily on foreign oil companies that have production-sharing agreements with the government. Income from oil production constitutes 70 to 75 percent of government revenue and about 90 percent of exports. Yemen contains proven crude oil reserves of more than 4 billion barrels (640,000,000 m3). According to statistics published by the Energy Information Administration, crude oil output averaged 413,300 barrels per day (65,710 m3/d) in 2005, a reduction from 423,700 bbl/d (67,360 m3/d) in 2004. For the first eight months of 2006, crude oil output was flat, averaging 412,500 bbl/d (65,580 m3/d).

A Comparison of KOC's Emergency/ Disaster Management & GIS Technology Approach

Submitted by
Koreich Abdulrahman,

Senior Electrical
Engineer, OTS S&EK

Emergency/Disaster Management deals with both natural and manmade disasters. It involves preparedness, response and recovery in order to lessen the impact of disasters. Emergency Management can be classified into the phases and activities listed below:

• **Planning:** Activities necessary to analyze the possibility of an emergency or disaster and the possible impacts on life, property, and the environment.

• **Mitigation:** Activities that eliminate or reduce the probability of an emergency or disaster. For example, establishing an Emergency Management System/programs or procedures to minimize the risks and hazards in the operational areas to avoid possible occurrence of an emergency.

• **Preparedness:** Activities necessary to the extent that mitigation measures did not or could not prevent disasters, which includes having training programs, installing early warning systems/alarms, and creating Emergency Response Teams, etc.

• **Response:** Activities that follow the emergency or disaster.

• **Recovery:** Activities necessary to return all systems to normal operation.

• Most recently, "Prevention" has been added to the above Phases/Activities which focuses on preventing the Human Hazard.

The purpose of this paper aims to evaluate the Emergency Management methods followed/ used by KOC and indicate how GIS Technology can contribute to help implement an efficient Emergency Management System. But first, let's define the terms used in those activities:

• **Emergency:** It is a deviation from a planned or normal activity that endangers or adversely affects people, properties or environment.

• **Disaster:** An emergency becomes a Disaster when it exceeds the capability of the local resources to manage it.

• **Risk:** It is the likelihood of an emergency to occur.

• **Hazard:** Hazard refers normally to any physical characteristics that may cause an emergency. For example, active volcanoes, flammable materials and radioactive plants are all hazards.

KOC's Corporate Emergency Response Plan:

The plan is meant to provide all hazard emergency response guidance for KOC First Responders, Management, Facilities, Groups and Company Directorates. It is also the link for the subsequent implementation of the site or threat as defined by Specific Plans or Procedures as listed in KOC GE.026 Paragraph 1.6.

The "Corporate" Plan consists of Sub-Plans or procedures dealing with different "Emergency" Actions depending on the type of emergency and its location or related facilities.

The company has classified the Emergencies (Crisis) into the categories below:

Category "0" (Minor):
Incidents that can be dealt with by personnel on site.

Category "1" (Serious):
Incidents that are resolved by KOC First Responder Resources such as Fire Team, Ambulance, HSE Teams & Security.

Category "2" (Major):
Significant incidents that require additional Senior Management attention and involves Incident Management Team & KOC Crisis Management Team.

Category "3" (Disaster):
Dealt with as CAT 2 with additional involvement of KPC Senior Personnel & National Authorities.

Major incidents (CAT 2) along with Disaster incidents (CAT 3) will be supported by Control Centers who will communicate & monitor the incidents until full restoration of the services.

Glancing through the company's Emergency Response Plan, one may notice that it is elaborate about the plans, procedures and responsibilities of each individual, team or function of any emergency personnel involved in the mentioned activities. During any type of emergency, the involved members know exactly what to do and who to contact, but they don't have enough details about the incident and the involved facilities until they reach the location and evaluate the situation at close range. This vital information could help in saving lives and property and would make a huge difference in emergency/ disaster situations.

GIS & Its Contribution to Emergency/Disaster Management

All phases of emergency/disaster management depend on data from a variety of sources. During an emergency, it is critical to have the right data, at the right time, displayed logically and in an easy format (i.e. a Map), to respond and implement the most appropriate action. Emergency personnel often need detailed information concerning pipelines, facility/building layouts, electrical distribution, GC systems, etc. By utilizing GIS technology, all departments can share information through databases on computer-generated maps in one location. Without this capability, emergency personnel must gain access to a number of Group/ Department Managers/Team Leaders, their unique maps, and their unique data. This will force the emergency responders to guess, estimate, or make decisions without the right or adequate information. This eventually will cost time, money, assets, and most importantly, loss of life. The importance of GIS is due to the fact that it provides a mechanism to centralize and visually display critical information during emergencies.

Most of the data needed by emergency personnel and for emergency management is of a spatial nature which can be located on a map. This abstract will explain how GIS technology can be used efficiently to help by providing the data needs for emergency personnel and how it can become an essential part of Emergency Management.

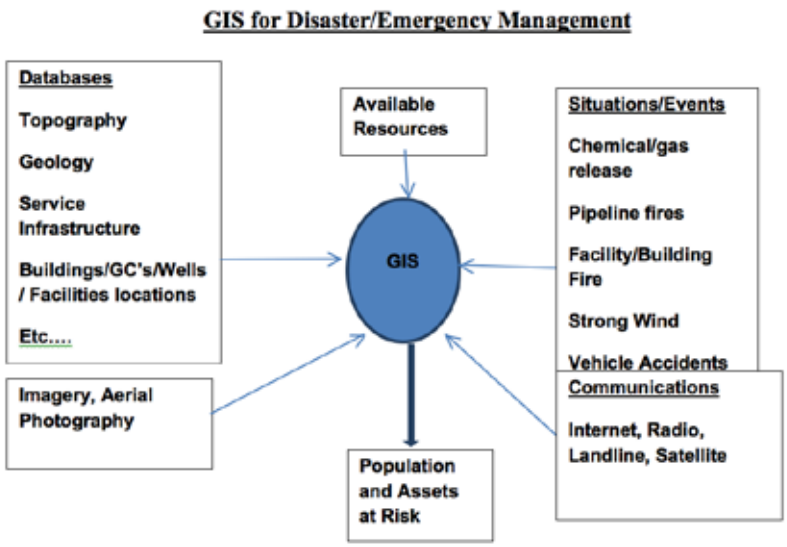
Using GIS Technology:

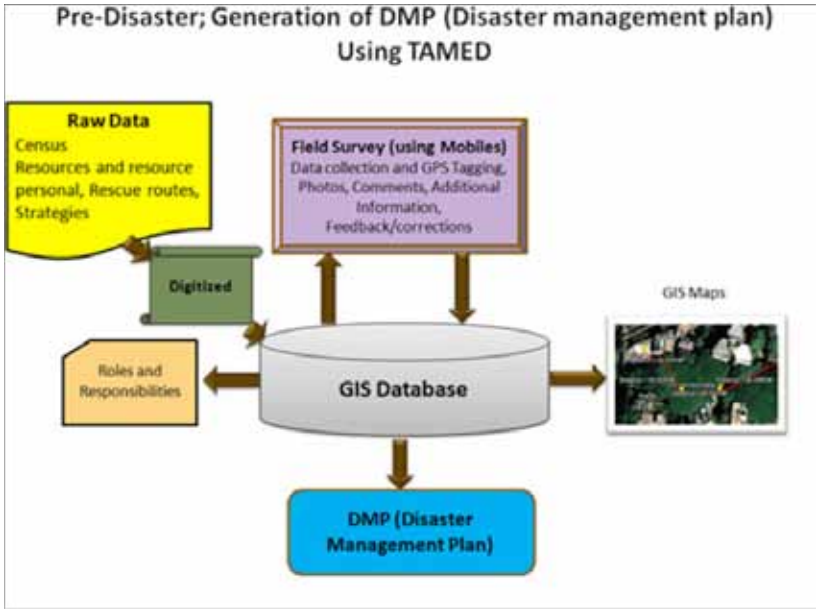
- For planning purposes, personnel can pinpoint hazards and begin to evaluate the consequences of potential emergencies/disasters. When a hazard such as a pipeline explosion is viewed with other map data (i.e. streets, buildings, GC's locations, manifolds and wellhead locations, power lines, storage facilities, etc.), emergency personnel can begin to prepare mitigation, preparedness, response, and recovery needs. The data at hand can pinpoint the assets and people that are at high risk from a potential emergency or disaster. Company/emergency personnel can focus on where mitigation efforts will be necessary and where they need to focus on when it comes to response, and the type of recovery efforts that they might need. Before Emergency Management programs can be implemented, a thorough analysis and planning must be done. GIS facilitates this process by allowing planners to view the appropriate combinations of spatial data through the generated maps.

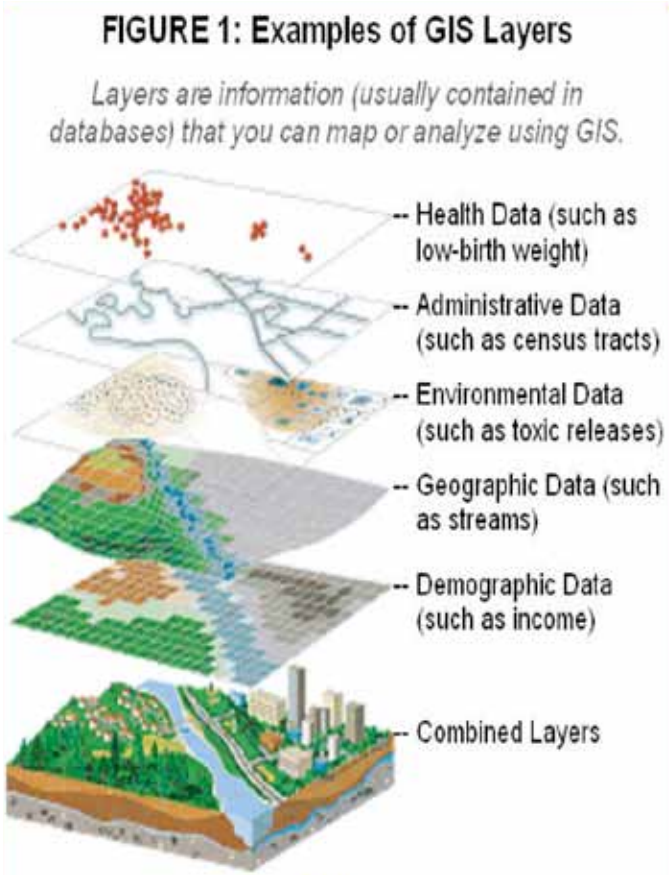
- For mitigation purposes, when a potential emergency situation is identified, mitigation needs can be determined and prioritized. In the case of a pipeline explosion, what assets/people are within the immediate impact zone of the pipeline? What facilities are in high hazard areas (i.e. Key wells, primary roads, office buildings, etc.)? Accordingly, mitigation may include implementing procedures that limits office buildings in nearby locations. Utilizing existing databases linked with geographic features in GIS makes this possible. GIS can identify the likely path of an oil spill based on currents and wind. More importantly, human life and other properties at risk from these emergencies can be quickly identified and targeted for action.

- For preparedness, GIS can provide answers to questions such as: Where should fire stations be located if a five-minute response time is needed or expected? What evacuation routes should be selected if a toxic cloud is accidentally released from a plant on different wind patterns? Who are the affected people that should be notified during an emergency?

- For response, GIS can provide detailed information that will help the emergency crew in responding to the fire before they arrive at the site. For example, during a building fire, it is possible to identify the closest hydrants, electrical panels, hazardous materials, and floor plan of the building while driving to the emergency site. For oil spills or a chemical cloud release, the direction and speed of movement can be modeled to determine evacuation zones and containment needs.







To summarize, Emergency/ Disaster Management Systems are implemented through the analysis of information. Most of the information is of a spatial nature and can be integrated. Once information is mapped and data is linked to the map, then Emergency Management Planning can start. Historically, emergency management systems are planned and implemented based on reactions to emergencies as they occur. GIS allows emergency management needs to be identified prior to an incident. Emergencies such as an oil spill can be modeled and displayed in GIS and emergency personnel can use the model for training purposes to analyze the consequences of a possible disaster. The application of GIS can lessen the surprises of the emergencies and their expectations and help us in speeding up recovery time.

An Overview of Electric Submersible Pumping Systems at KOC

Submitted by: Mohammad Taqi,
Engineer Elect Maint, Operations
Technical Services Team (S&EK)

A submersible pump, or Electric Submersible Pump (ESP), is a device which has a sealed motor close-coupled to the pump body. The whole assembly is submerged in the fluid to be pumped. Submersible pumps are used in oil production to provide a relatively efficient form of "artificial lift" that is able to operate across a broad range of flow rates and depths. By decreasing the pressure at the bottom of the well (by lowering bottom hole flowing pressure, or increasing drawdown), significantly more oil can be produced from the well when compared with natural production. The pumps are typically electrically powered and referred to as Electrical Submersible Pumps (ESP).

ESP systems (Figure 1) consist of both surface components (housed in the production facility, for example an oil platform) and sub-surface components (found in the well hole). Surface components include the motor controller (often a variable speed controller), surface cables and transformers. Subsurface components typically include the pump, motor, seal and cables. A gas separator is sometimes installed.

Surface Equipment & Power Cable

Above Surface Equipment:

1. Switchboard
2. Motor Controls
3. Variable Speed Drive
4. Transformer
5. Power Cable

Under Surface Equipment

Under Surface Equipment:

1. Power Cable, Motor Lead Extension

2. Pump: The pump is a multi-stage centrifugal design. Each stage consists of an impeller, a diffuser and a bearing. (Figure 2)

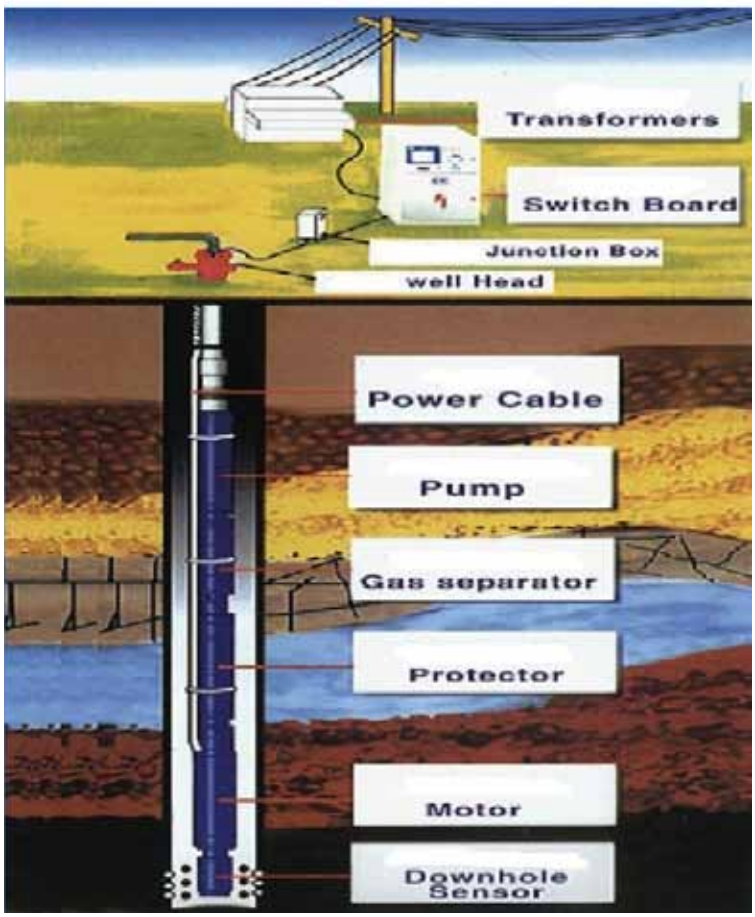
3. Gas Separator/Intake

4. Protector

5. Motor

6. Sensor

- Check Valve, Drain Valve: Other protective devices are located above the pump discharge: The check valve that closes on shutdown of the unit and prevents back spinning and the drain valve that allows for pulling the ESP without a wet tubing string.



The ESP System – Figure (1)

One style of submersible pump for industrial use – Figure (2)

Kuwait Oil Company's ESPs Project

As part of an expansion of an existing mature oil field, several new facilities and a number of ESPs will be installed over the coming years at Kuwait Oil Company. Operations Support Group/Operations Technical Services (S&EK) Team, along with the concerned Teams, recently planned a project to construct an ESP Power Distribution Network System along with five 11 kV Elevated Area Substations for this purpose.

The overall project scope is to construct five 11Kv distribution substations which will feed ESP wells for 1,000 new ESPs to be installed in Burgan Field by 2030. KOC's schedule is to install the first wave of these ESPs (600 new ESPs) by 2023, and the second wave (400 ESPs) by 2030.

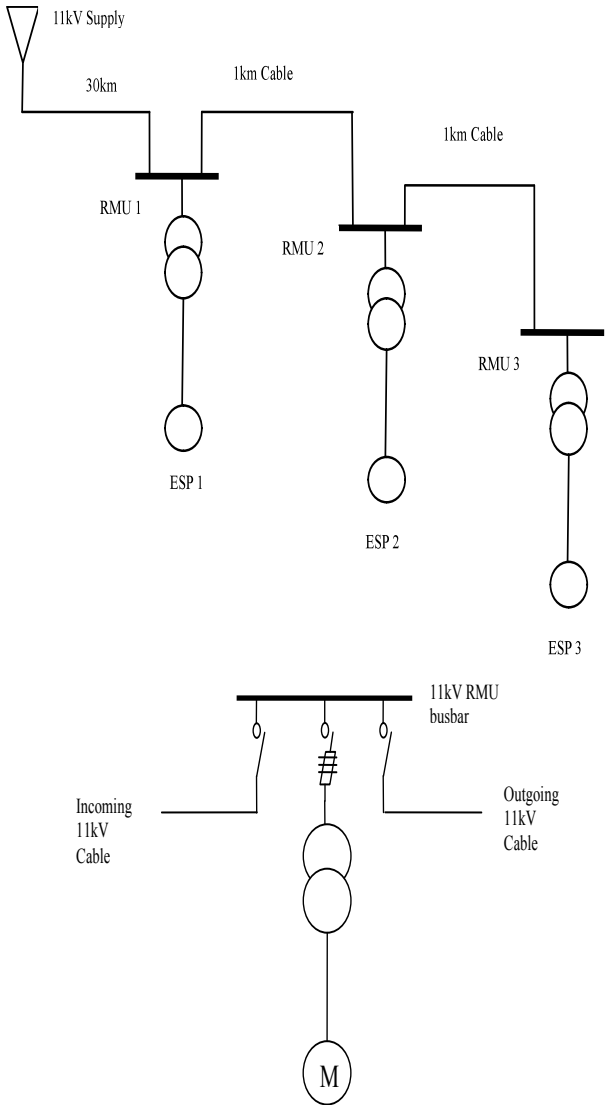
The 600 new ESPs are to be installed in two phases as well: 400 ESPs to be installed by 2016 and 200 ESPs to be installed by 2023 (all under the Artificial Lift Project). This shall include the installation of the ring main unit, transformer, cable laying and termination from area substation to the ring main unit, and from ring main unit to the tapping transformer. The project will also include the provision of fences and lighting.

The future ESPs will be configured as follows:

- ESP rating will be between 50 HP to 120 HP, but may rise to 200 HP if water cut is increased.
- ESPs will generally be Direct On-Line (DOL) starting, however some may be Variable Speed Drive (VSD) operated.
- 15 ESPs water source wells in the Wara PMP may be up to 277 HP.

It is assumed that the ESPs will be in a typical configuration for most Oil and Gas plants, i.e. the ESP unit will consist of a 440 volt submersible pump and cable, control panel, Motor Control Center (MCC), housing and all other associated ancillary items.

The power system that feeds the ESPs will be based on a series of 11kV ring fed systems (Figure 3), which operates normally open at the ring mid-point.



Ring Main Unit System – Figure (3)

In normal operation the incoming power will be proportionally divided by the two incoming circuit breakers, depending on the total load connected and the distances of the connecting cables that form the ring.

Power Demand for ESP Project

The load for each ESP initially may range from approximately 50 to 120 HP (38 to 89.5 KW). As the reservoir pressure declines and water cut rises to 80-90% , the load may go up to 200 HP (150 KW) in the future.

Therefore, the total power demand of the future ESPs will depend on the final quantity of wells and the individual consumption of each ESP, as well as consideration for the electrical system losses. Based on the information provided, it is known that the majority of the ESPs rating will vary from between 50 HP up to 200 HP, however 15 ESP water source wells of the WMDP area are rated at 277 HP. Figure (4) describes the total demand load for 600 ESPs by 2023; 400 Wells are estimated for the Phase 1 stage (by 2016) of the project and a further 200 are expected during Phase 2 (by 2023).

It can be seen from the table that there is a significant variation in loads, which depends on what typical value of ESP rating is assumed. For the purpose of this, it has been advised that the worst case scenario will be taken, as this provides the most pessimistic operating case for electrical system planning purposes.

The total demand for the future 1,000 ESPs is estimated at approximately 134.6 MW, with 600 ESPs by 2023 with a total power demand of 81.3 MW and 400 ESPs from 2023 to 2030 with a total power demand of 53.3 MW.

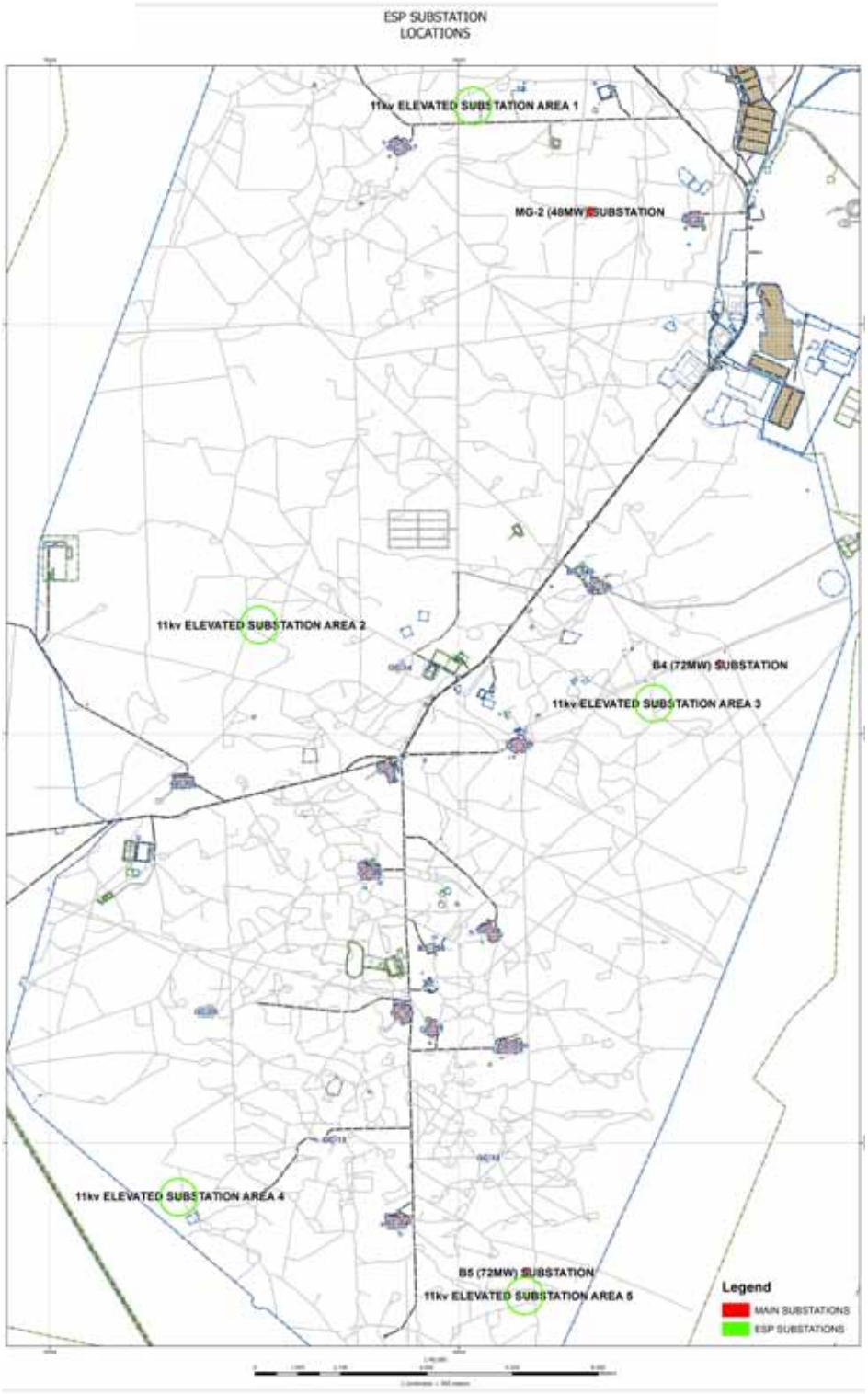
	Lowest Case	Average Case	Worst Case
Phase 1 (2016)	15.7 MW	35.1 MW	54.5 MW
Phase 2 (2023)	6.7 MW	16.8 MW	26.8 MW
Total	22.4 MW	51.9 MW	**81.3 MW**

Figure (4)

Note 1: Lowest case assumes all wells are rated at 50 HP apart from water source wells at 277 HP.

Note 2: Average case assumes all wells are rated at 125 HP apart from water source wells at 277 HP.

Note 3: Worst case assumes all wells are rated at 200 HP apart from water source wells at 277 HP.



Five 11kV Elevated Area Substations for ESP Project

The five area substations are located such that all of the ESPs are covered and within the 9 km "area of influence." The main substations that will feed the associated five area substations are then located such that they are not more than 6 km away from the area substation (Figure 5).

Conclusion & Result

Burgan Field is maturing and this is reflected in a drop in formation pressure and increase in production well water cut. Therefore, the wells will die without artificial lift and the required production potential cannot be maintained into the future. Providing power for Artificial Lift (A/L) Projects to power the Electrical Submersible Pumps (ESPs) is compulsory. Consequently, crude production will be maintained as stipulated in the KOC Strategic Objectives.

The Impact of New Drilling Technologies on Future Production

A recent report released by market research firm Lux Research maintains that new oil drilling technologies could increase the world's petroleum supplies six-fold in the coming years to 10.2 trillion barrels.

The most common and controversial technique is hydraulic fracturing, or fracking, in which chemical-laced water is injected to break up subterranean rock formations to extract oil and natural gas. But the Lux report details a host of exotic so-called Enhanced Oil Recovery (EOR) technologies - from solar-powered steam injection to micro-organisms - that could be used to extend the life of old oil fields and gain access to so-called unconventional petroleum reserves like oil sands.

"In light of current oil prices, the peak oil hysteria and projection of $300 [a barrel] prices of a few years ago seem overblown – if not outright silly," the report states. "But in a sense, they were accurate forecasts of what would have happened if EOR technologies had not come online and made unconventional oil reserves - which vastly exceed conventional ones - accessible."

However, it may be some time before major increases through EOR techniques materialize. The development of such technologies is predicated on high oil prices - at least $100 a barrel - to offset the costs and induce a conservative industry to invest in and deploy new methods. And many of the technologies are still young.

Morever, as we've seen with fracking, political opposition to technologies that could pollute the environment and use lots of water could derail their use. And as climate change accelerates,

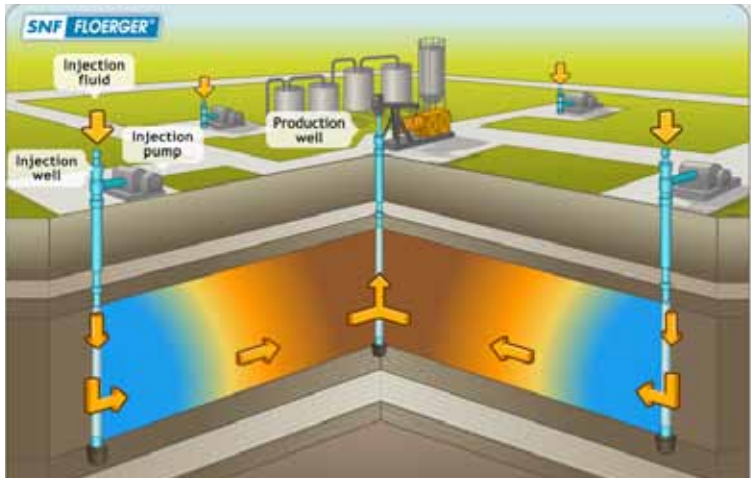
opposition to carbon-intensive extraction of fossil fuels and their expanded use is sure to grow.

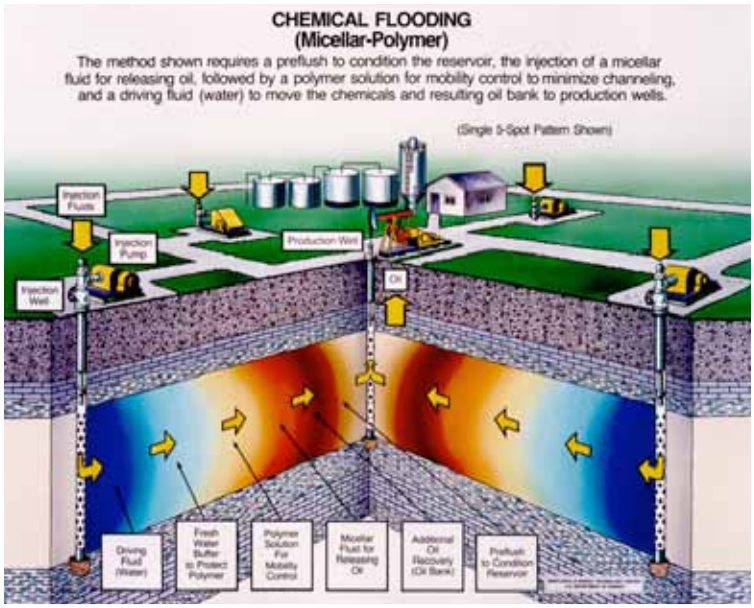
Still, here are some of the technologies startups and multinationals alike are pursuing:

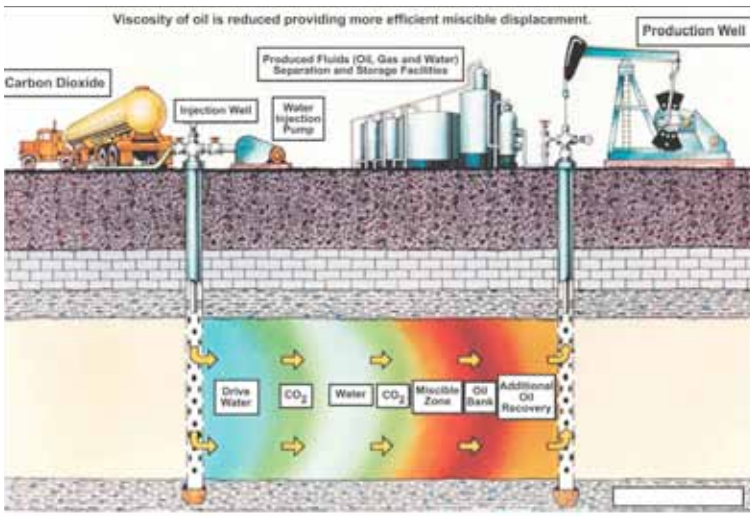
Thermal Intervention: This method injects steam into wells to extract heavy oils or oil sands. The problem is that it takes a lot of energy to generate that steam, so some oil companies are turning to solar energy instead of natural gas or other fossil fuels. Chevron, for instance, has deployed solar fields built by BrightSource Energy and GlassPoint Solar at old oil fields in California to help recover heavy petroleum.

Chemical EOR: This method injects polymers and alkaline compounds into oil fields to help loosen oil from rock formations and push it into production wells. The China National Petroleum Corporation is the leader in this method, which it is betting will be 20% more efficient than just flooding wells with water to bring oil to the surface. But in places like the US, one can expect opposition to introducing large volumes of chemicals underground anywhere near water supplies. Some other drawbacks: Chemical EOR doesn't work well in oil reservoirs where temperatures are high and there's a lot of salt and sulfur.

Microbial EOR: This uses environmentally benign microorganisms to break down heavier oils and produce methane, which can be pumped into wells to push out lighter oil. The technology dates from the 1950s but only recently has it been put to limited use. An experiment with microbial EOR in Malaysia, for instance, increased oil production by 47% over five months. But oil and gas engineers are not biologists, the report notes, and may be reluctant to embrace the technology.





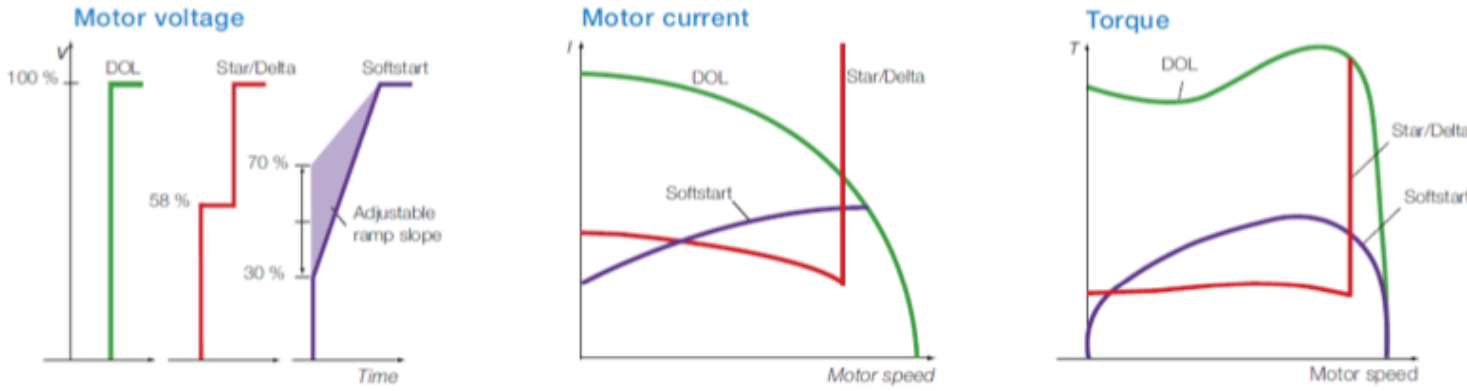


A Comparison of Variable Frequency Drives & Soft Starters

Submitted by:
Ahmad Al-Hajji,

Snr. Engineer Elect. Maint., Operations Support Group

Despite the various applications in which electrical motors are used for, the common challenge encountered in operating such equipment is overcoming the start-up period. The activity of starting up a motor involves a demand of high torque and large amounts of energy in order to accelerate the motor's rotor to full speed. The subjected energy required by standard motors is five to six times the Full Load Amps (FLA) in what's defined as an "In-Rush Current" phenomena. These excessive forces imprint undesired mechanical and electrical stress on a motor's rotors, causing reduction of operational lifetime and higher maintenance expenditures. Therefore, a necessity to control/overcome such challenges was answered by two Operational/ Technical methodologies, which are Soft-Starters (SS) and Variable Frequency Drives (VFD). Both technologies provide slow torque and low current starts, however, the basic foundations and theory of operations differs.



Graphs showing the basic differences between direct-on-line starting (DOL), star-delta starting and soft starting in terms of the motor voltage (V), motor current (I) and motor torque (T).

Figure 1: Motors Methods of Operations Curves.

Variable Frequency Drives control electrical motor speeds during start-ups to shut-downs by rectifying the input AC supply through the rectifier, then cleaning/transferring the DC supply to the invertor using DC links and filters. The invertor works on reforming an AC sine wave using a series of transistors in a formation known as "Pulse Width Modulation Technology." The subject technology serves electrical motors commonly used for dispatch pumps, multispeed conveyors and ESPs.

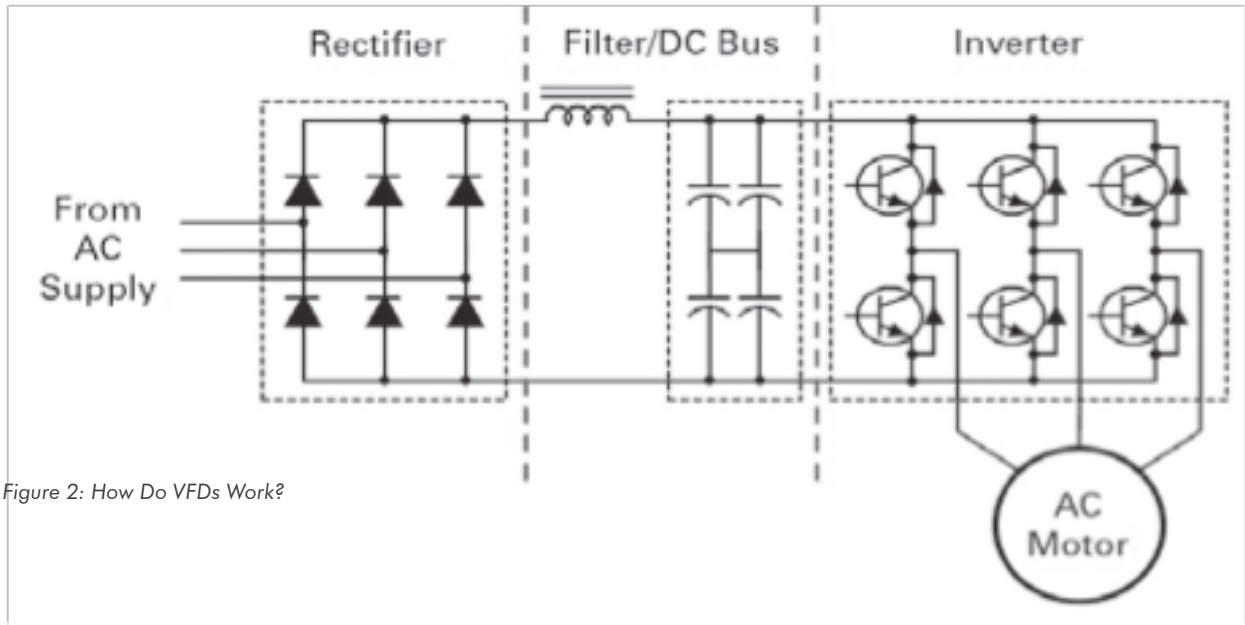


Figure 2: How Do VFDs Work?

VFD Systems are no strangers to KOC, as they were presented, purchased, installed and commissioned in various Gathering Centers and Booster Stations. One of the most recognized VFD Systems in KOC fields are the 11 Rubicon-Siemens Legacy – Generation 1 VFDs, delivered through Project EF/862-1075 "VSM Driven Crude Transit Pumps for 11 GC's –SEK". The subject drives dispatch almost 80% of SEK Crude Production, which makes it one of the most critical instruments in KOC's arsenal of production equipment. The project was handed over in late 2007 and has proven to be one of the most successful production enhancement activities. As a result, a similar project is being prepared currently to install VFDs in the remaining two Gathering Centers in the SEK Field area, which are GC – 6 & 20.

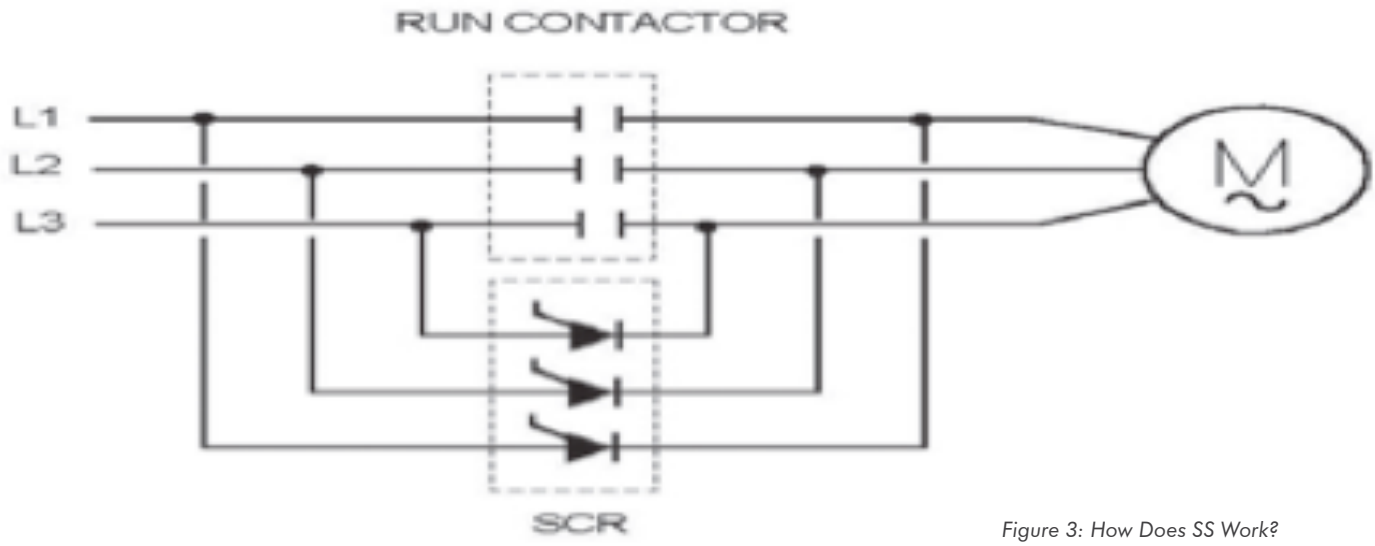


Figure 3: How Does SS Work?

Soft Starters control the current and torque of electrical motors by varying their input voltage. Thyristors or Silicon Controlled Rectifiers installed parallel to the motor's phases is used to serve poster pumps, fans and continuous speed motor applications.

Unfortunately, Soft Starters are not commonly known throughout KOC. At GC-23, the Allen-Bradley Soft Starter, which is connected to the crude dispatch pump's by-pass line, represents the only noticeable value in the operation system. Such absence of technology can be related to the outdated idea of limited operability options provided by Soft Starters and the requirements of Production Operations to vary the speed/frequency of most of the driven motors (Crude Transit Pumps & CRU Compressors) in order to meet the production targets. Modern Soft Starters have proven quality in soft starting and soft stopping of motors in addition to the Torque Control features and low maintainability in comparison to VFDs. Those advantages were not an option in the past and can be of great use once properly re-introduced to the fields and design engineers.

In conclusion, both applications have advantages and disadvantages in terms of cost, ease of operation, energy saving and enhancing equipment lifetime; however, defining the requirement of an application is the key to choosing between them (graphs, schematics and a comparison table shall be included in the manuscript).

Characteristics	SS	VFD
Initial cost (CAPEX)	Lower	Higher
Reduces motor starting voltage	Yes	Yes
Reduces motor starting current	Yes	Yes
Reduces energy use	Some	More
Extends motor, equipment life	Yes	Yes
Varies motor speed	No	Yes
Efficiency	~ 99.5%	~ 95% to 97%
Operational complexity	Lower	Higher
Current feedback via CTs	Yes	Yes
Torque per amp ratio	Moderate	Very high
Performance parameters	Few	Many
Tuning functions	Few	Many
Maintenance cost (OPEX)	Reduced	Higher

Table 1: SS vs. VFD

KOC Discovers New Oil Field in Kabd

KOC recently announced the discovery of a new oil field that is believed to hold commercial quantities of oil and gas in Kabd, which is in West Kuwait.

During a press announcement, CEO Hashim Hashim told reporters that the primary results of the discovery marked the flow of commercial quantities of oil and gas from the field, which is located to the north of Minagish Field.

Hashim emphasized that 5,500 barrels per day and 4.5 million square feet of associated gas poured out of the exploratory well in the new field.

"The well will be developed soon. The phase that follows could take four to five years before commissioning the field on the official output timetable, after the completion of the demarcation of the reservoir limits in the field and the count of the required wells to reach the maximum production from it," Hashim said.

He added that the new field is located far from the residential areas and farmland and that Kabd is a large area. The field, he said, is situated at the extreme north near Salmi.

Multi-Stage Proppant Fracturing

A Pioneer of Stimulation for Kuwait Reservoirs

Submitted by:
Well Surveillance Group

In recent years the demand of Oil and Gas has increased significantly and consequently the demand for Kuwait's Oil & Gas production has soared as well.

Due to the high demand of Oil and Gas production, Kuwait has intensive demand from Service Companies to enhance the current well's production from its Sand Stone reservoirs.

Kuwait Oil Company in the past has relied heavily in performing Mud Acid Stimulation in the sand stone formation without performing proper lab testing from other service companies.

Schlumberger has taken the stimulation technique a step forward and introduced the concept of Hydraulic Proppant Fracturing by developing and applying Permeable Flow Channel by removing the link between stimulating sand stone formation with Mud Acid.

Hydraulic Proppant Fracturing was commercialized in year 1947. The stimulatin & the skin reduction of these wells are exponentially enhanced with respect to pumping Mud Acid Treatments.

Demand for Oil and Gas will boost frac activity in future and in order to tap this market potential

Schlumberger has to implement this technology in Kuwait that differentiates Schlumberger from its competitors.

The extremely high permeability of the Rock properties of Kuwait lay down a challenge and contributed the success of pumping Proppant Fracture Treatments in such formations.

Hydraulic Proppant Fracturing treatment was pumped in Burgan South Kuwait. The paper discusses the initial results based on initial injection rates for the treatment evaluation.

The paper describes the complete and detailed roll out process starting from its preparations up to execution and results evaluation.

The complicated preparation process which consisted from technical part (well candidate selection based on design preparation and validation, well completion planning) and operation part (equipment preparation, staff training, specific laboratory testing) helped execute the hydraulic proppant fracturing treatments with excellence in service delivery.

The project demonstrates better injection results for the Wara Sands. The Wara sand zone was treated with Mud acidizing only in the past; hence, Wara Sand zone allows for a direct comparison between Conventional Fracturing to Mud Acidizing stimulation treatment with respect to this well & zone.

The project also discusses the way forward for Hydraulic Proppant Fracturing treatments in Kuwait and steps being taken to extend the Hydraulic Fracturing envelope to all fields in Kuwait.

INTRODUCTION OF PROPPANT FRACTURING IN KUWAIT

Proppant fracturing is Schlumberger's path breaking technology in the stimulation domain in Kuwait. The mechanisms of hydraulic fracturing are based on providing a conductive path for a fluid medium to flow through.

This is achieved by creating a fracture in the rock and packing this fracture with proppant in case of Mud Acid Stimulation where near wellbore damages are only dissolved and pushed into the formation. The proppant pack width near wellbore will increase the conductivity many folds in comparison to simple matrix stimulation.

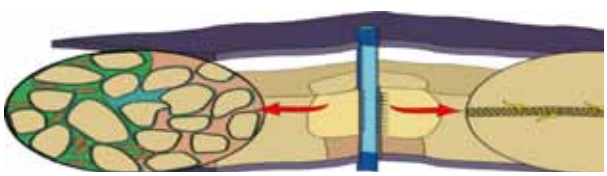


Figure2. Sandstone Stimulation vs. Proppant Fracturing

PROPPANT FRACTURING IN WARA SAND

The executed well is a part of a pilot waterflood project located in the South of Kuwait. The zone of interest Wara Sands is located between Ahmadi & Mouddud formations.

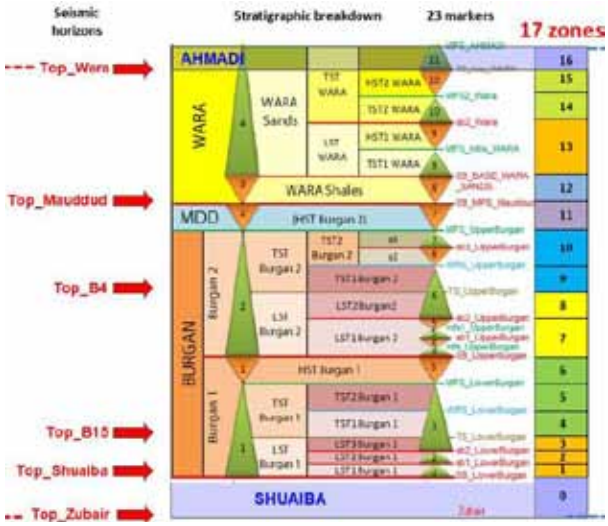


Figure3. Formation Layout

The well was completed on the 25th of September, 2009 as a water injector into the WARA Sandstone formation. The formation consists of succession of sand, shale & silt layers.

The sand layers are of varying sand quality with no known communication existing between them at the wellbore. The well has been put on water injection throughout the WARA formation perforated interval as indicated below.

Perforation Intervals, ft				
Formation	Top	Bottom	Perf Int	Tot Perf
	ft	ft	ft	ft
WARA SANDS	4,520	4,524	4	78
	4,530	4,534	4	
	4,554	4,584	30	
	4,623	4,660	37	
	4,666	4,669	3	

Figure4. WARA Sands Perforation Intervals

Three production logging had been previously performed dating Nov 2010, May 2011 & Aug 2011 observing continuous decline in total water injection rate with poor distribution of water injection amongst the sand layers.

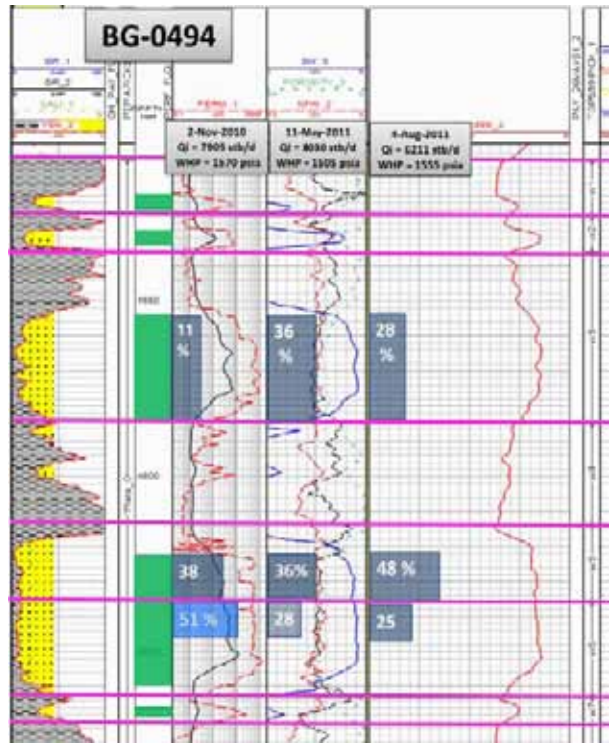


Figure5. Injection Water distribution amongst perfs

The injected water quality for the pilot well is of poor quality with high particle size averaging 250 microns & TDS of 25 mg/L.

Therefore the objective of the treatment was set to overcome the existing skin damage, optimize the distribution of the injected water across the perforated seven layers, and to enhance the weep efficiency by providing the conductive path to accommodate the poor injected water.

DESIGNING PROPPANT FRACTURING TREATMENT

Data provided by the client was extensively reviewed with reservoir modeling and injection forecast performed to provide the optimum solution. All the studies concluded implementing Multi-Stage Hydraulic Proppant Fracturing to stimulate the entire wellbore separately to provide homogeneous stimulation across the wellbore.

The design criteria of the treatment fluid is based on the following parameters of the well & formation.

Property	Value	Units
Depth	4520 - 4660	Ft
Permeability	300 - 900	mD
Porosity	21	%
Reservoir Press	1760	Psi
Net Effective Pay Zone	78	Ft
Reservoir Temp	137	°F
H2S	Nil	%
CO2	Nil	%
Formation Type	SandStone	N/A
Formation	WARA	N/A

The treatment design initiated with the selection of the proper fluid type to create a fracture and to provide enough viscosity to ensure that proppant can be transported properly from surface into the fracture.

Considering all the above, YF-100 fluid system had been selected to accommodate the design requirements. The proppant selected for the design was 20/40 HSP Sinterball to provide sufficient proppant fracture permeability. The plot below shows the permeability of proppant packet with its subjected to Closure Pressures.

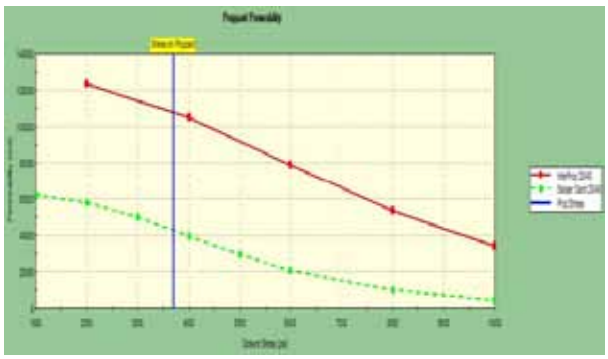


Figure6. Proppant Stress Profile

Stress profiles were imported from the OH logs with commonly used correlations to estimate the mechanical properties of each sand layer to simulate the Fracture induction into the formation.

OPERATIONAL / DESIGN CONSIDERATION

Various design scenarios were examined to induce proppant in this well.

1) One massive Fracture from surface to cover the 78 ft section.

2) Segment the layers to make multiple Fractures with Copper Head Plugs.

3) Install a multistage stage completion.

Analyzing all the parameters and finally Schlumberger & KOC came to a conclusion of performing 3 proppant fracturing treatments to be performed back to back as a rig operation; in order to optimize the operations time & reduce the cost of the rig.

JOB EXECUTION

The Proppant Fracturing job was pumped in the bottom most zone and went to 100% completion as per original design.

Stage Name	Pump Rate bpm	Fluid Name	Fluid Vol. bbl	Prop Conc. PPA	Prop Mass lb	Slurry Vol. bbl	Pump Time min
PAD	32	YF145	1071	0	0	1071.4	33.5
1.0 PPA	32	YF145	262	1	11000	271.8	8.5
2.0 PPA	32	YF145	262	2	22000	281.6	8.8
3.0 PPA	32	YF145	238	3	30000	265	8.3
4.0 PPA	32	YF145	238	4	40000	274	8.6
5.0 PPA	32	YF145	214	5	45000	254.7	8
6.0 PPA	32	YF145	214	6	54000	262.7	8.2
FLUSH	32	WF140	31	0	0	31.2	1

Figure7. Pumping Schedule of Main Frac

The propped treatment was pumped into the two zones selected out of the three while the third zone had DataFRAC performed to understand the formation properties.

The following are the results of the computer simulation of the Fracture treatment using Schlumberger Software.

Property	Value	Units
Initial Frac Top TVD	4520.0	ft
Initial Frac Bottom TVD	4669.0	ft
Prop Frac Xf	193.3	ft
EOJ Hyd Height at Well	209.2	ft
Avg Prop Width	0.136	in
Net Pressure	587	psi
Effective Cond.	2368	md.ft

Figure8. Fracture Geometry in 2 zones as Average

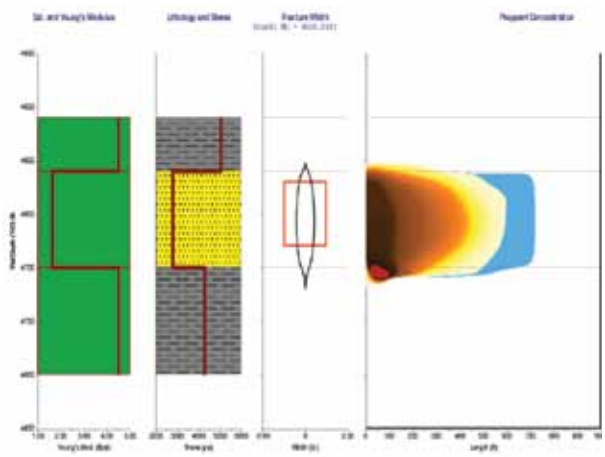


Figure9. Fracture Geometry & Stress profile

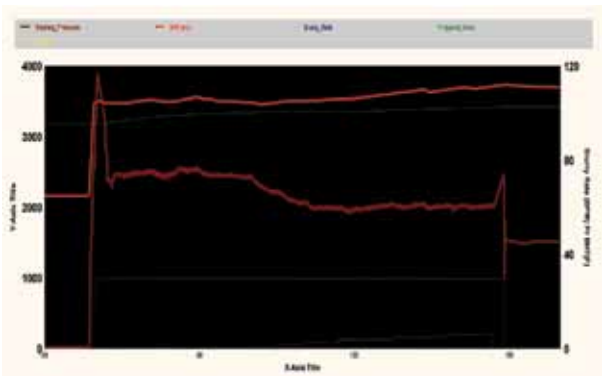


Figure10. Fracture Geometry & Stress profile.

MULTI-STAGE COPPERHEAD* PLUGS

To provide an optimum isolation system to segment the proppant fracturing within the interval, copper head plugs were deployed.

Figure11. COPPERHEAD Plug*

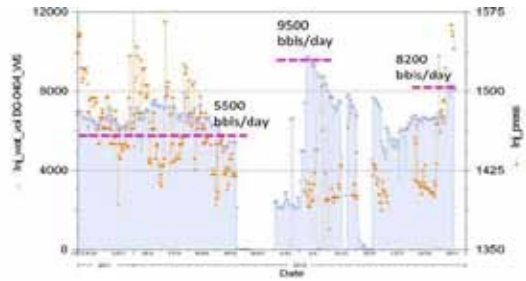
Copperhead plugs are rated up to 10,000 psi at 350 of and 15,000 psi at 400 of, COPPERHEAD* drillable bridge and flow through frac plugs withstand the toughest HP/HT operating conditions for reliable zonal isolation during multistage stimulation. With the existing 7", 23 ppf, K-55 Casing, the COPPERHEAD* plugs easily were able to set and provide optimum isolation between the stages.

3 Multi-Stage DataFRAC's were performed with a pump rate of 30 bpm and surface pressure of 7,500 psi. The COPPERHEAD* Plugs sustained these parameters and all proppant was placed successfully into the formation.

After the completion of the treatment in a particular zone, the COPPERHEAD* Frac plugs were milled out using the Single trip COPPERHEAD* removal blade mill in one run. The plugs were milled out in 15 – 20 minutes in a single run.

The initial injection values are based on PLT logs run in these wells The plug components are designed to drill out quickly into small, consistently sized cuttings that are circulated out of the well.

INJECTION RESULTS



The initial injection values were based on running PLT logs in this well. The initial result shows WARA sands are injecting at the rate of 3000 bpd. This initial injection result was due to improper coverage of the entire perforated interval. After the fracture treatment, the injection rate rose to 5,000 bpd and running the PLT indicated uniform injection coverage across the perforated interval.

KOC CEO Visits Ahmadi Hospital

KOC has a long history of reaching out to employees and their families and providing them with the support services that define the Company's reputation as an organization that truly cares about the community it operates in. The Company's senior officials realize the importance of fostering a sense of community and responsibility, which is reflected in the many services and outreach programs that KOC engages in.

On the recent occasion of Eid Al-Fitr, KOC CEO Hashim Hashim visited Ahmadi Hospital in order to extend Eid greetings to patients who were receiving care there. Many of these patients were unable to spend Eid with their families because the necessary treatment they were receiving obligated them to remain under care at Ahmadi Hospital.

Hashem was accompanied by the DCEO for Exploration & Gas Menahi Al-Enezi and DCEO for Planning & Commercial Jamal Jaafar during the tour, which was comprised of several hospital wards, the Emergency Section, the Pharmacy and the Security Unit. During the visit, the CEO and his deputies presented patients with gifts and wished all who were receiving medical treatment prompt recoveries.

On the conclusion of the tour, Hashem expressed satisfaction over the good organization of the hospital and hailed the genuine efforts exerted by its staff, especially during festivities and events.

Acting Hospital Manager Dr. Khaled Al-Suweilem said that it was customary for Higher Management to pay visits to the hospital on various occasions. He labeled the initiatives as "humanitarian acts" that are received by patients and employees with the utmost appreciation and gratitude.

Acting Administrative Services TL Mohammad Al-Bous also hailed the efforts of all employees who spent Eid away from their families to fulfill their humanitarian role and lend helping hands to patients.

About Ahmadi Hospital:

- Kuwait Oil Company offers Health Services to employees and their families through Ahmadi Hospital.
- Ahmadi Hospital was inaugurated in April of 1960 to treat KOC employees and their families. In the 1980s, these services were extended to all oil sector employees.
- Ahmadi Hospital provides many services, medical treatment and other relevant support services. Among these important services are: Emergency, General Practice, Internal Medicine, General Surgery, Orthopedics, Dermatology, Obstetrics & Gynecology, Pediatrics, Ophthalmology, Ear, Nose & Throat, Dentistry, Preventive Medical Services, Radiology, Anesthesia, Intensive Care Unit, Laboratory, Physiotherapy and Dietary services.
- Ahmadi Hospital also offers Home Visits to older patients and those who are bedridden. In addition, Ahmadi Hospital can also refer patients that need specialized care to locations abroad so that they can receive the care they need.

KOC Bids Farewell to Al-Rushaid, Al-Sardi, Hashim

KOC recently held a farewell party in honor of former Chairman and Managing Director Sami Al-Rushaid, former Deputy Managing Director (Major Projects & TS) Mazen Al-Sardi and former Deputy Managing Director (NK) Hosnia Hashim.

The event, which was held at the Crown Plaza Hotel in Farwaniya, was attended by a host of top officials from the oil sector, including KPC CEO Nizar Al-Adsani and the Chairman of KOC Nabeel Burusli.

In a speech he delivered on the occasion, KOC CEO Hashim Hashim recalled memories he had of the honorees and the time they spent together at KOC and the role they have played in meeting the strategic goals of the Company and serving Kuwait. He asserted that the Company achieved a great amount of work and progress under their leadership.

For his part, Al-Rushaid expressed profound appreciation for the recognition as he recalled the moments he shared with his colleagues and the achievements made thanks to a spirit of cooperation and the spirit of teamwork which he said is very prevalent at KOC.

The ceremony also included similar speeches by Mazen Al-Sardi and Hosnia Hashim who reaffirmed KOC's distinction in dealing with its employees, while wishing further successes for its plans and projects.

The event's program also included the screening of a film made by the Public Relations and Information Group on Al-Rushaid's illustrious journey since joining the oil sector. In addition, the key milestones of Al-Sardi and Hashem's journey were shown. The documentaries were well-received by the attendants, while the honorees received tokens of appreciation at the end of the ceremony.

Selecting a Coach: Lessons from the World of Sport

Submitted by:
Frans Heerden,
Consultant, Training & Career Development Group Admin.

The business world has adopted the coaching philosophy and practices from the world of sport. People tend to expect that good sportsmen and women can automatically become good coaches in the sport they excel at; however, this is rarely – if ever – the case.

How is it possible that the best sports stars rarely become excellent sport coaches? Is it not logical to reason that a good sports person is equal to a good sports coach? This assumption seems to be invalid. Few good sports people make it to the ranks of good sport coaches. How can this be explained? This brief article attempts to answer the question.

In a study conducted by psychologists Mike Anderson and Kristin Flegal, the researchers asked expert golfers and beginners to take some short putts on a fairly flat, straight green. The golfers then spent several minutes describing the putts they had just taken. They then worked on an unrelated task. Upon completing the unrelated task, the golfers were asked to perform the putts again. After spending time describing their past putts, and working on an unrelated task, the expert golfers needed twice as many attempts to sink their putts. The performances of a control group of golfers, who were not asked to describe their putting process, were not affected by describing their putts. These less skilled players even improved a little bit when asked to recount what they had just done.

Dr. Sian Beilock, explains this phenomenon as follows. As one gets better and better at what they do, their ability to communicate their understanding or to help others learn that skill often gets worse and worse. She is of the opinion that this communication can even lessen their performance. Beilock continues to explain by reminding us about golfer Ralph Guldahl, who won the US Open in both 1937 and 1938 and then the Masters in 1939. He was, at the time, one of the best players in the world. Then he wrote, "Groove Your Golf" - a how-to guide for the beginning player. Guldahl never won another championship again.

Good athletes and skilled performers often have trouble putting their actions into words in the first place. That's why those who perform at the highest levels should think twice about teaching their skills to others. When a scratch golfer participating in the research conducted by Dr. Beilock was asked to describe a putt he just took, he replied, "I don't know, I don't think while I putt."

An answer to the question seems to be the following explanation offered by Dr. Beilock: "When your performance flows largely outside of your conscious awareness, your memories of what you've done are just not that good. This makes it hard to teach what you know to someone else."

The research by Beilock, Anderson and Fleigal seems to answer the question in a way.

An important conclusion that can be drawn from the research mentioned above is that superior performers may have great difficulty in communicating their way or approach that made them successful.

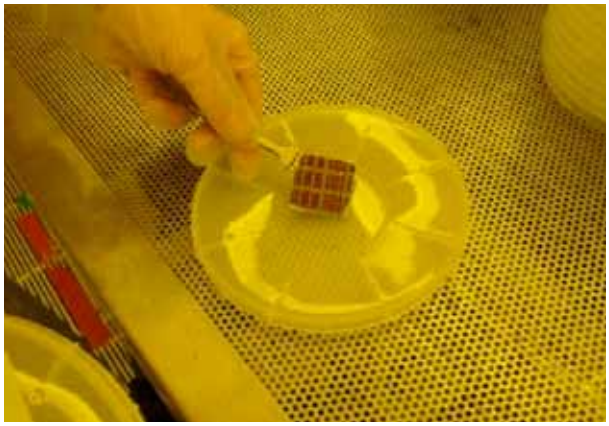
When selecting a coach in the world of work, it is less important to choose a more successful person (CEO, Manager or Team Leader) as a coach. A choice of a coach with exceptionally well-developed communication skills is more important. This is confirmed by another legend in sport, the famous Sir Alex Ferguson. He regards well-developed communication skills as one of four key abilities he uses to qualify good football coaches. When asked what he regards as the best characteristics of a coach, he listed the following abilities in addition to sound communication:

- Observation
- Perseverance
- Imagination

In the world of work there may be a belief that only the best Deputy Chief Operating Officer or manager can be a good coach. The lessons from the world of sport clearly disprove this belief. Selecting a coach on the basis of other attributes and abilities such as those identified by Sir Alex Ferguson may be more appropriate.

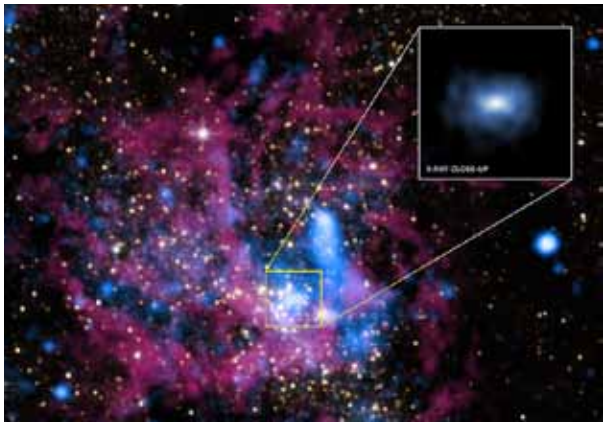
Good and professional coaches are not easy to find. But that should not discourage or limit the coaching process. Coaches that are able to observe behavior, persevere in the task of coaching, and who have lively imaginations in combination with sound communication skills, can facilitate a sound coaching process.

UAE Scientists Double Energy Obtained from Solar Cells



Scientists working on a multimillion dollar research project have almost doubled the amount of energy obtained from solar cells. Researchers from Masdar Institute of Science and Technology made the breakthrough by constructing the cells using the chemical element germanium mixed with the usual silicon. Dr Ammar Nayfeh, an assistant professor in microsystems engineering at the institute and head of the project, maintained the Germanium has better optical properties for solar cells than silicon and that electrons move faster in germanium, which allows for more current to be obtained.The project was launched in 2011 with the aim to provide smaller, faster and less power-hungry devices by optimising the capture of solar energy. Germanium has also proven to absorb a lot more light than other materials, which means smaller quantities can be used. Masdar Institute has so far conducted its experimental work at the Massachusetts Institute of Technology in Boston and Bilkent University in Turkey, but its own 300-square-metre clean room is almost ready for use. The institute has also begun building a team of experts from MIT and Masdar for a new centre for photovoltaic research at Masdar. The solar project is expected to complete by the end of next year. The goal is to set up a solar plant in Abu Dhabi that could supply not only the UAE but also neighboring countries.

NASA's Chandra Observatory Catches Giant Black Hole Rejecting Material



Astronomers using NASA's Chandra X-ray Observatory have taken a major step in explaining why material around the giant black hole at the center of the Milky Way Galaxy is extraordinarily faint in X-rays. This discovery holds important implications for understanding black holes. New Chandra images of Sagittarius A*, which is located about 26,000 light-years from Earth, indicate that less than 1 percent of the gas initially within Sgr A*'s gravitational grasp ever reaches the point of no return, also called the event horizon. Instead, much of the gas is ejected before it gets near the event horizon and has a chance to brighten, leading to feeble X-ray emissions. The researchers found that the Chandra data from Sgr A* did not support theoretical models in which the X-rays are emitted from a concentration of smaller stars around the black hole. Instead, the X-ray data show the gas near the black hole likely originates from winds produced by a disk-shaped distribution of young massive stars. The event horizon of Sgr A* casts a shadow against the glowing matter surrounding the black hole. This research could aid efforts using radio telescopes to observe and understand the shadow. It also will be useful for understanding the effect orbiting stars and gas clouds may have on matter flowing toward and away from the black hole.

Engineers Build Lithium-Ion Battery Able to Last for 27 years

Officials at Germany's Centre for Solar Energy and Hydrogen Research Baden-Württemberg, (ZSW) claim their improvements to lithium-ion batteries allow a single battery to be recharged up to 10,000 times while still retaining 85% of its charging capacity. Such a battery, if used in an electric car, they note, would allow its owner to recharge the battery every day for 27.4 years. The newly redesigned batteries have approximately four times the density of current batteries (1,100 Watts per kilogram) and have been designed for use in storing power created by wind and solar farms and also in automotive vehicles. Besides the initial high cost of car batteries for electric vehicles, one of the main factors preventing further adoption of electric vehicles is the knowledge that the batteries will need to be replaced after just eight to ten years of use (and in some cases as few as just 3). Batteries that could last 25 or 30 years would likely outlive many of the other cars' parts, or the car itself, and if not too expensive, could finally give car buyers a compelling reason to switch from those that still rely on gasoline.

Reading Brainwaves through the Ear

Neuroscientists often use electroencephalography (EEG) as an inexpensive way to record electrical signals in the brain. Though it would be useful to run these recordings for long periods of time, that usually isn't practical: EEG recording traditionally involves attaching many electrodes and cables to a patient's scalp. Now engineers at Imperial College in London have developed an EEG device that can be worn inside the ear, like a hearing aid. They say the device will allow scientists to record EEGs for several days at a time; this would allow doctors to monitor patients who have regularly recurring problems like seizures or microsleep. By nestling the EEG inside the ear, the engineers avoid a lot of signal noise usually introduced by body movement. They can also ensure that the electrodes are always placed in exactly the same spot, which, they say, will make repeated readings more reliable. However, since the device attaches to just one area, it can record only from the temporal region which limits its potential applications to events that involve local activity.

KOC Employees Visit Kuwait University

KOC Laboratory employees recently organized a field visit to the laboratories of Kuwait University in order to become acquainted with their equipment and facilities. This activity falls within the framework of the Collaboration Agreement that was signed between both parties in March of 2012, which in part calls for laboratory improvement while also further developing the activities of WK labs.

A group of KU students, led by Dr. Osamah Al-Omair, took part in the new KOC project for the development of Um Ghudair wells and suggested some appropriate solutions for crude flow restrictions in pipelines.

Kuwait University recently forwarded some potential solutions to the Um Ghudair project to the Water Handling Team, a gesture highly appreciated by Operations Manager (WK) Omar Sadeq and Water Handling Team Leader (WK) Salman Al-Qabandi.

Sadeq commended the study forwarded by KU and described the included proposals as instrumental in the future studies of the university students. Meanwhile, Al-Qabandi affirmed that expanding the participation with Kuwait University on future KOC projects will serve the interests of both parties.

Deep Drilling Team Wins 3rd Indoor Soccer Championship

The Deep Drilling Group Team recently won the third KOC Ramadan Indoor Soccer Championship after beating the Exploration Group Team in a match that was attended by CEO Hashem Hashem and a number of Company officials.

On the conclusion of the event, Hashem delivered the Championship Cup to the winners and medals were distributed to the players of both teams. Referees, the best goalkeeper, the best player and the best scorer were also honored.

While the competition between teams was fierce, matches were nonetheless conducted in a cordial atmosphere of friendship. A draw for valuable gifts was also held during the occasion.

Gifts and cups were also distributed to the winners of the cards, checkers, snooker and chess contests that took place at the Unity Centre. The contests were organized in collaboration with the Kuwait Mind Sports Association.

In total, 32 teams represented KPC subsidiaries in this year's competition.

An Overview of Cholesterol

Have you been diagnosed with high cholesterol? Is lowering your cholesterol a goal? The first step is to find out: What is cholesterol?

Cholesterol is a waxy, fat-like substance made in the liver and other cells and found in certain foods, such as food from animals, like dairy products, eggs, and meat.

The body needs some cholesterol in order to function properly. Its cell walls, or membranes, need cholesterol in order to produce hormones, vitamin D, and the bile acids that help to digest fat. But the body needs only a limited amount of cholesterol to meet its needs. When too much is present, health problems such as heart disease may develop.

Cholesterol levels among adults today are generally higher than they have been in the past. According to a 2010 study conducted by the Minsitry of Health in cooperation with the World Health Organization (WHO), about 42 percent of the Kuwaiti population suffers from some form of high cholesterol. These high cholesterol levels are often the reason behind many coronary heart disease and cardiovascular conditions. Educating individuals about the dangers of high cholesterol levels is one way to help fight bad cholesterol before it negatively affects your health. Use the information below to find out how you can stop bad cholesterol from affecting your health.

Cholesterol and Heart Disease

When too much cholesterol is present, plaque (a thick, hard deposit) may form in the body's arteries narrowing the space for blood to flow to the heart. Over time, this buildup causes atherosclerosis (hardening of the arteries) which can lead to heart disease.

When not enough oxygen-carrying blood reaches the heart, chest pain - called angina- can result. If the blood supply to a portion of the heart is completely cut off by total blockage of a coronary artery, the result is a heart attack. This is usually due to a sudden closure from a blood clot forming on top of a previous narrowing.

Types of Cholesterol

Cholesterol travels through the blood attached to a protein - this cholesterol-protein package is called a lipoprotein. Lipoproteins are classified as high density, low density, or very low density, depending on how much protein there is in relation to fat.

- Low density lipoproteins (LDL): LDL, also called "bad" cholesterol, can cause buildup of plaque on the walls of arteries. The more LDL there is in the blood, the greater the risk of heart disease.

- High density lipoproteins (HDL): HDL, also called "good" cholesterol, helps the body get rid of bad cholesterol in the blood. The higher the level of HDL cholesterol, the better. If levels of HDL are low, the risk of heart disease increases.

- Very low density lipoproteins (VLDL): VLDL is similar to LDL cholesterol in that it contains mostly fat and not much protein.

- Triglycerides: Triglycerides are another type of fat that is carried in the blood by very low density lipoproteins. Excess calories, alcohol, or sugar in the body are converted into triglycerides and stored in fat cells throughout the body.

What Factors Affect Cholesterol Levels?

A variety of factors can affect cholesterol levels. They include:

- Diet. Saturated fat and cholesterol in the food you eat increase cholesterol levels. Try to reduce the amount of saturated fat and cholesterol in your diet.

- Weight. In addition to being a risk factor for heart disease, being overweight can also increase cholesterol. Losing weight can help lower your LDL and total cholesterol levels, as well as increase HDL cholesterol.

- Exercise. Regular exercise can lower LDL cholesterol and raise HDL cholesterol. You should try to be physically active for at least 30 minutes on most days.

- Age and Gender. As we get older, cholesterol levels rise. Before menopause, women tend to have lower total cholesterol levels than men of the same age. After menopause, however, women's LDL levels tend to rise.

- Diabetes. Poorly controlled diabetes increases cholesterol levels. With improvements in control, cholesterol levels can fall.

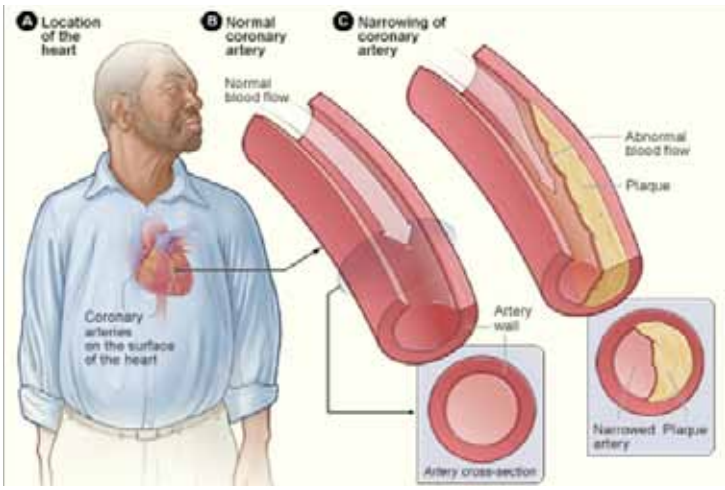
- Heredity. Your genes partly determine how much cholesterol the body makes. High blood cholesterol can run in families.

- Other causes. Certain medications and medical conditions can cause high cholesterol.

How Much Cholesterol Is Too Much?

Everyone over the age of 20 should get their cholesterol levels measured at least once every five years.

When being tested, your doctor may recommend a non-fasting cholesterol test or a fasting cholesterol test. A non-fasting cholesterol test will show total cholesterol and HDL cholesterol. A fasting cholesterol test, called a lipid profile or a lipoprotein analysis, will measure your LDL, HDL, and total cholesterol. It will also measure triglycerides. Your doctor may start with a non-fasting cholesterol test and then recommend a lipid profile, based on the results.



Doctors recommend that total cholesterol stay below 200. Here are the numbers:

Total Cholesterol	Category
Less than 200	Desirable
200 - 239	Borderline High
240 and above	High

Your LDL, HDL, and triglyceride levels are important as well.

How Can I Lower My Cholesterol and Risk of Heart Disease?

A few simple changes can help lower cholesterol and risk for heart disease:

- **Eat low-cholesterol foods.** The American Heart Association recommends that you limit your average daily cholesterol intake to less than 300 milligrams. If you have heart disease, limit daily intake to less than 200 milligrams. People can significantly lower their dietary cholesterol intake by keeping their dietary intake of saturated fats low and by avoiding foods that are high in saturated fat and that contain substantial amounts of dietary cholesterol.

- **Quit smoking.** Smoking lowers HDL ("good") cholesterol levels. This trend can be reversed if you quit smoking.

- **Exercise.** Exercise increases HDL cholesterol in some people. Even moderate-intensity activities, if done daily, can help control weight, diabetes, and high blood pressure -- all risk factors for heart disease.

- **Take medication as prescribed by your doctor.** Sometimes making changes to your diet and increasing exercise is not enough to bring cholesterol down. You may also need to take a cholesterol-lowering drug.

How Is High Cholesterol Treated?

The main goal in lowering cholesterol is to lower LDL and raise your HDL. There are two key ways to lower cholesterol: eat a heart-healthy diet and take cholesterol-lowering drugs.

Doctors determine your "goals" for lowering LDL based on the number of risk factors you have for heart disease.

- If you have 0-1 risk factor for heart disease, you are at low-to-moderate risk. Lifestyle changes are recommended to keep the cholesterol in check.

- If you have 2 or more risk factors, you are at moderate risk or next-highest risk, depending on what heart disease risk factors you have. Sometimes your doctor will try lifestyle changes alone, but most of these people require cholesterol-lowering drugs.

- If you have known heart disease, diabetes, or multiple risk factors, you are at high, or very high, risk. These people may require a combination of cholesterol-lowering drugs and lifestyle changes to control their cholesterol levels.

What Drugs Are Used to Treat High Cholesterol?

Cholesterol-lowering drugs include:

- Statins
- Niacin
- Bile-acid resins
- Fibric acid derivatives

Of these, statins are the only drugs proven to prevent heart attacks. These medications are most effective when combined with a low-cholesterol diet.

KOC Launches Medical Periodic Checkup Campaign

KOC recently launched the Periodic Medical Checkup Campaign through a media awareness program that was conducted in collaboration with the Public Relations & Information Group, in a bid to reach a 100% of the Company staff this year.

The Head of Ahmadi Hospital's Medical Board, Dr. Adel Al-Abbasi, reiterated that the campaign was organized in response to the directives of KOC Higher Management and that it was aimed at discovering the elements that cause sickness at early stages.

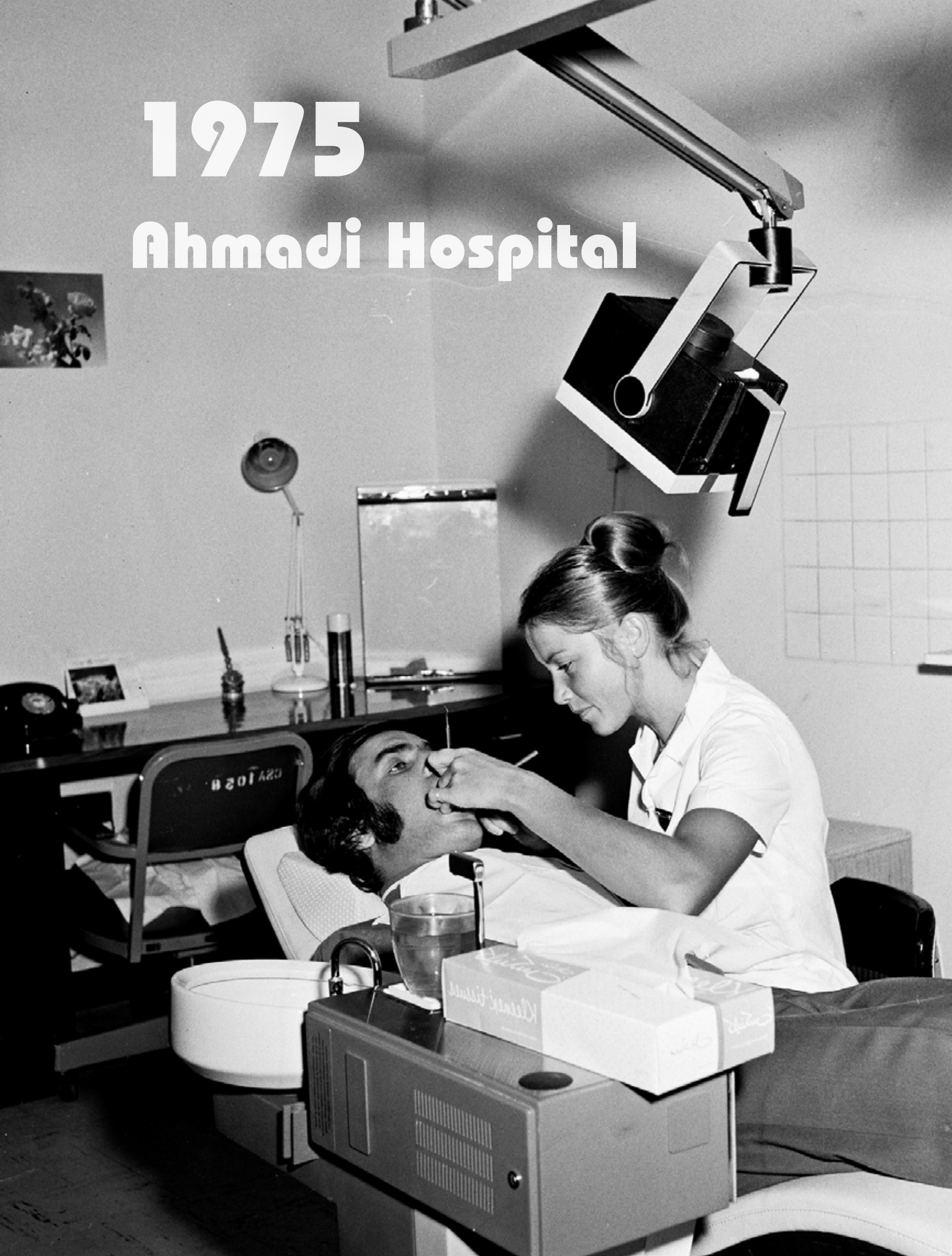
He maintained that the early discovery of chronic diseases would help diminish their impact in the future and that the campaign was aimed at unveiling such causes while setting up programs to limit their hazards.

Dr. Al-Abbasi upheld the need to perform periodic checkups on all KOC staff this year, and at the same time, affirmed that the Hospital's Preventive and Industrial Medical Care Unit were ready to accomplish their missions.

KOC Organizes Eid Al-Fitr Celebration for Children

KOC recently organized an evening gathering on the second day of Eid Al-Fitr for the children of Company employees. The party, which took place at the KOC Tent, was comprised of several shows and a buffet.

Senior Administrative Affairs Officer Jasem Al-Nasser said that the Community Services Team organized the party so that children and their parents could share the Eid celebration in a pleasant, family atmosphere. The event was also comprised of a number of activities and contests for children and adults.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