



CREATING

HISTORY

GSMR launches GSMR BODY OF KNOWLEDGE



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Creating History: GS MR Launches
GS MR Body Of Knowledge



Special Feature:
Reliable Leaders & Changemakers
in Our Industry



Impact of Climate Change On
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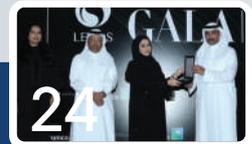
Practices to Restore Combustion
Gas Turbine Generator Efficiency



Successful What-If Analysis
Workshop at KIPIC Al Zour
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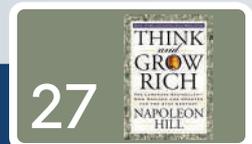
Youth Leader: Najla AlShamsi,
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Creating a Culture of Learning &
Excellence



Professionals' Corner:
Think & Grow Rich



WIN! WIN! WIN!



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Dear Valued GSMR Member,

I trust that you are having a good year so far. We, at GSMR, had an exceptional start to 2022 with the launch of GSMR Body Of Knowledge “GSMR BoK”. A first in the history of the region, GSMR BoK and Certification will undoubtedly put us in the global spotlight, bringing us at par with leading international associations. Additionally, it showcases the Arabian Gulf as a potential hub and a resource pool of skill and knowledge.

On behalf of GSMR’s Board of Directors, I’d like to congratulate the GSMR BoK Project team on this ground breaking accomplishment, which will be a game changer for our profession. The GSMR BoK will soon be made accessible to members, and I invite you to be part of this exciting journey through your valuable feedback. Your support has been instrumental to the success of all GSMR’s initiatives in the past and we continue to seek your participation especially in this significant project.

While uncertainty is inevitable, we’re optimistic about the opportunities that await us this new year. Guided by Vision 2030, the GCC is well on its way to economic transformation and diversification, which is creating ripples across international waters too. Organizations in the GCC are embracing change, leading the way toward cleaner energy and creating further avenues for green infrastructure investments and trade. We’re witnessing a growing need for new technology solutions and an increasing dependency on data and digitization. A shifting energy grid also suggests a major transition in outlook and operations for us as industry professionals — the possibilities are endless.

I sincerely hope you enjoy reading this issue, and, on behalf of GSMR’s Board of Directors, I wish you and your loved ones a safe, happy and prosperous 2022.

Eyad Al Basrawi
Chairman

GSMR renews MoU with Bahrain Society of Engineers

Signing Ceremony

GSMR-BSE

January 28, 2022



Gulf Society for Maintenance and Reliability “GSMR” renewed its MoU with Bahrain Society of Engineers “BSE” during the grand launch ceremony of GSMR Body Of Knowledge.

The two societies have shared a good partnership and relations for over a decade, a major joint initiative being MAINTCON, the region’s most renowned maintenance conference.

Creating HISTORY

Gulf Society for Maintenance & Reliability “GSMR” hosted a grand launch ceremony to announce the release of GSMR Body of Knowledge “GSMR BoK”. The ceremony was attended by GSMR’s Board of Directors, the GSMR BoK Project team and top regional and global maintenance, reliability, and asset management (MR&AM) practitioners.

The result of collaborative efforts between MR&AM experts and practitioners with over 500 accumulative years of experience, GSMR BoK is a significant milestone for our society and for MR&AM practitioners across the Arabian Gulf. The GSMR BoK will be followed by a regional certification, a historic accomplishment, which will revolutionize knowledge sharing and exchange of best practices in our profession.

GSMR BoK is based on **FIVE** pillars

PILLAR 1: MR&AM STRATEGY

PILLAR 2: ASSET RELIABILITY

PILLAR 3: MAINTENANCE WORK PROCESSES

PILLAR 4: SYSTEMS AND TECHNOLOGIES

PILLAR 5: PEOPLE AND LEADERSHIP



GSMR BODY OF KNOWLEDGE

MAINTENANCE, RELIABILITY & ASSET MANAGEMENT

1ST EDITION

28 January 2022

Wynn Grand, Kingdom of Bahrain



The GSMR BoK Team with GSMR's Chairman

GSMR BOK PROJECT CHAMPIONS

Mr. Nezar Al Shammasi
Founding Member of GSMR

Mr. Nader Milibari
GSMR BoK Project Champion

Mr. Saad Al Ulaimi
GSMR BoK Team Member

Mr. Bandar Abulnassr
GSMR BoK Team Member

Mr. Husain Al Ali
GSMR BoK Team Member

Mr. Anas Al Saggaf
GSMR BoK Team Member

Mr. Suriya Narayanan
GSMR BoK Team Member

Mr. Mohammed Tawili
GSMR BoK Team Member



Releasing a regional body of knowledge, which is tailored to the industry in this part of the world is a first-of-its-kind accomplishment. It's a matter of great pride for GSMR and professionals in the Arabian Gulf. It also highlights our commitment to elevating our profession in the region and globally.

– **Eyad Al Basrawi**, Chairman



28 January 2022

dham and Hotel Kingdon of Bahr



GSMR's Chairman receives the GSMR BoK on behalf of GSMR's Board of Directors



We're proud to share this milestone with you all. I'd like to congratulate the team and, on behalf of the entire team, I thank the GSMR BoD for their encouragement at every stage of this most prestigious project. I'd also like to thank all MR&AM experts and practitioners in the region who have closely worked with us as peer reviewers.

– **Nader Milibari**, GSMR BoK Project Champion



GSMR is Seeking DYNAMIC PROFESSIONALS Across the Arabian Gulf to Join its Committees

■ EDUCATION & CERTIFICATION COMMITTEE

It is committed to conducting training workshops of a high standard and providing professional certification opportunities for regional professionals.

■ ASSET MANAGEMENT COMMITTEE

It is committed to elevating the asset management profession, and spreading its value and culture through awareness programs.

■ MEMBERSHIP COMMITTEE

It is committed to expanding GSMR's membership, introducing new membership concepts and increasing member value through benefits and incentives.

■ GSMR EXCELLENCE AWARD COMMITTEE

It is committed to promoting excellence in maintenance, reliability and asset management by recognizing high achievers in the region through the Society's iconic GSMR Excellence Award.

■ WIAM COMMITTEE

It is committed to advocating gender diversity, and women inclusion and empowerment in industry and asset management by promoting women professionals and their contributions, and encouraging their participation in GSMR initiatives.

■ EVENT MANAGEMENT COMMITTEE

It is committed to strengthening GSMR's presence regionally and internationally through a wide range of events including webinars, virtual and physical symposiums and conferences, technical dinners and others.

■ STRATEGIC PARTNERSHIP & COLLABORATION COMMITTEE

It is committed to creating mutual partnerships and collaborations with various regional and international organizations in the public, private and non-profit sectors.

■ MARKETING & PUBLIC RELATIONS COMMITTEE

It is committed to positioning and promoting GSMR as the number one maintenance, reliability and asset management partner in the Arabian Gulf through a comprehensive and proactive marketing strategy.

■ YOUTH COMMITTEE

It is committed to empowering young professionals and students in the GCC, and shaping their careers through a wide range of youth centric programs.

■ M&R DIGITAL TRANSFORMATION COMMITTEE

It is committed to promoting digitization, efficiency and the use of technology in the fields of maintenance, reliability and asset management.

■ SOCIAL RESPONSIBILITY COMMITTEE

It is committed to creating a sense of community among GSMR's members through value added activities that support initiatives and causes in the Arabian Gulf.

■ COUNTRY COORDINATION COMMITTEES (Saudi Arabia – Western, Central and Eastern; Kuwait; Bahrain; UAE; Oman)

They represent GSMR in their respective GCC countries and are committed to expanding and strengthening GSMR's presence in the Arabian Gulf.

Applications received will be reviewed by the respective GSMR Committee Chairs. Only shortlisted candidates will join.
For more information or to join, call +973 1718 0398 or email officeadmin@gsmrgulf.org



Training & CAMA Exam

TRAINING CALENDAR 2022

HOLISTIC PHYSICAL ASSET MANAGEMENT WORKSHOP & CAMA EXAM

- JUNE 12-16
- SEPTEMBER 11-15
- DECEMBER 4-8

CAMA CERTIFICATION

GSMR as a member organisation has hosted **6%** of the exams for the period ending December 2021

For individual registration / corporate sessions, email: jennifer.joseph@gsmrgulf.org

BECOME
PART OF THE
GSMR FAMILY!

Join GSMR's growing community of maintenance, reliability and asset management professionals. Enjoy a wide range of benefits and programs including free webinars with certificates, discounted online certified workshops, opportunities to be featured across GSMR's media channels and publication, extensive networking with and exposure to regional and international professionals, and MUCH MORE!



**RELIABLE
LEADERS & CHANGE-
MAKERS IN OUR IN-
DUSTRY**

Professionals across the Arabian Gulf highlight the peaks and troughs of their careers and share valuable lessons to hold on to in 2022.



THE PANDEMIC HAS ACCELERATED OUR TRANSFORMATION TO DIGITALIZATION



1. Please define your leadership style.

Leading a group of professional engineers and technicians, I have adopted a participative style of leadership where the responsibility is shared with the team to foster enthusiasm and invoke participation with ideas and suggestions. As a new company, we had to assemble a team where we anticipated the normal phase of team development: forming, storming, norming, and performing. We managed to accelerate the phases through team-work and a shared vision and mission.

2. What was the biggest obstacle you overcame in 2021?

With the COVID-19 impact on many industries especially aviation, supply chain and related spare parts availability was a major concern to manufacturers and service providers. This challenge impacted the maintainability and availability of equipment, especially the mean time to repair (MTTR) KPI. Close coordination by supply chain and global suppliers and logistic companies helped mitigate part of this challenge. Additionally, the team focused more on failures' root cause analysis (RCA) and predictive maintenance techniques to reduce failure rates, which helped reduce unavailability.

Nader Milibari

CEO, TLD Arabia Equipment Services

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TLD Arabia Equipment Services (TLDAES) was established in 2020 as a joint venture between Saudi Ground Services and TLD GSE.

3. How did the lessons learned from this experience help you enhance TLDAES's process?

Setting various parameters to observe the performance indicators has helped us measure the progress and identify areas that require more attention, not only in maintenance but in supply chain as well. The whole operation is an integrated process where all sections must work in harmony. Indicators such as mean time to repair (MTTR), rework KPI, minimizing lead time and focusing on critical equipment have all enhanced TLD Arabia's ability to increase GSE serviceability. Moreover, we are focusing on full PM quality assurance and quality control (QAQC) implementation, predictive maintenance, MTBF/MTTR improvements, and failure mode and effects analysis (FMEA) implementation on all GSE types to optimize preventive and corrective maintenance in addition to improving maintenance reliability for our clients.

4. How will they help you plan for uncertainty in 2022?

Having systemized operation makes it easy to set goals based on true measures. With the uncertainty of the global aviation sector, recovering from the consequences of COVID-19, TLD Arabia is planning to continue investing in performance monitoring and digitalization where the company is deploying one of the largest conditions monitoring system installations for ground support equipment (GSE) globally. The system will connect over 2000 GSE around the Kingdom of Saudi Arabia to help optimize GSE's fleet, streamline maintenance activities, and improve equipment availability and reliability. Such fleet optimization will support efficient operations for clients and help in better management and responses to higher degrees of uncertainties.

5. What did the global pandemic teach you as an industry leader and in life in general?

I believe that there is a silver lining in each situation, including the pandemic. On a professional level, the pandemic has accelerated our transformation to digitalization as online transactions, virtual meetings, remote working, distance learning and so on have become an integral part of day-to-day business activities. On the personal level, I learned that the rules of the game can change at any moment. So, one must adapt to change. Moreover, the pandemic has enhanced our general healthcare practices.

6. What do you consider as the KPIs for organizational readiness in ref to industrial uncertainty, equipment failure, etc.?

In relation to the KPIs for organizational readiness, I believe we cannot overlook the implementation of performance management program and deployment of employees' efficiency and productivity KPIs. The readiness of the employees is critical to the readiness of the organization to face industrial uncertainty.

7. Who is a mentor that you look up to? Any interesting advice you've received and live by?

I was blessed to have had the chance to work with some of the best industry leaders at Aramco. My stint here provided me with a platform to interact with leading organizations and societies related to maintenance, reliability, and asset management (MR&AM), which is a very critical field for safe and reliable operations. Further, I had the opportunity

to lead and contribute to major MR&AM initiatives and projects, which significantly helped me to adopt MR&AM best practices, initiatives, and programs in the ground support field in the aviation industry. Today, the Kingdom of Saudi Arabia is moving strategically to improve the aviation industry with the recent National Aviation Strategy that was endorsed earlier this year by H.E. Prince Mohammed Bin Salman Al Saud. Our vision in TLDAES is aligned with this strategy to complement reliable and safe operations starting with the reliability of ground services.

8. Any new opportunities and challenges to watch out for in the new year?

Building on the aftereffects of the COVID-19 pandemic, I believe that the utilization of digital solutions is an opportunity to look for in 2022. Asset management solutions and GSE diagnosis systems are also likely to play a vital role in GSE maintenance industry. Moreover, I think the new year will be a good opportunity to take KPIs to the next level of OKR (objectives and key results) in order to be able, not only to measure performance, but set the objectives.

9. How is the GCC's role in the global energy market evolving? How ready are we and what can we do to prepare?

As for the role of the GCC in the global energy market, cooperation is the base to stabilize demand and supply. With focus on the COVID aftereffects and uncertainty in aviation industry, it is advisable for organizations to adopt clean energy solutions, adhere to advanced safety measures and adapt to the agility of how businesses are moving. Moreover, it is highly advisable to focus on logistics and its role in lifting up the business.

10. Any message you'd like to share with our members and readers?

I would like to thank GSMR and its E-magazine, Osool for the valuable and active contribution in the field of MR&AM, which is critical and essential to operations across industries. The collaborations and knowledge sharing that GSMR is facilitating through such platforms will help industries in the region to adapt to the best practices and proven initiatives in MR&AM, which will further enhance the safety and reliability of industrial operations leading to higher value realizations and profitability. 🛠️



“THE NEW NORMAL”

I spent my first few years of childhood living in the desert before moving to a house allocated by Abu Dhabi government in the early 1980s. I still remember the two-hour drive between school and our desert “tent”. My father, thinking that it was not a sustainable lifestyle, stubbornly refused to move to newly constructed villages or towns where the government encouraged its Bedouins to “at least try” to live in a modern community. Without today’s communication technology back then, it took years to convince people that change is coming, and it will be the “new normal”.

It was at this time that Polio - a disabling and life-threatening disease caused by the poliovirus - was also spreading and afflicting children with weak immune systems or who were not jabbed. I was one of those children. Due to a lack of awareness and limited access to health care I was not vaccinated.

Salma Al Hajeri

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Today, the Emirates has embarked on a journey in pursuit of a polio-free world by helping other nations to vaccinate millions of their children. There are strong parallels to the current challenges we face with the COVID-19 pandemic. As with Polio, the vaccine has been a vital tool in fighting the disease. But today people remain apprehensive, even though it will lead us to a COVID-19 free world. It seems that change is harder to accept than we might otherwise assume.

In contrast to some of the social norms in my hometown, I joined the Faculty of Engineering at Al Ain University in 1995 and graduated in 2001 as the first female engineer from my small town. A few years later, my relatives and neighbours started to encourage their daughters to follow my footsteps. My story has helped to promote the importance of education for young women in what was a fairly conservative community.

Today, I hold three degrees and have been in the oil and gas industry for 20 years. Since 1995, according to the World Bank labour force, participation of women in the UAE has increased from 28 percent to 52 percent in 2019.

The reason I share my story is to reflect on the “new normal” and the role of “change” in our lives. There is no doubt that as a global community and as an Oil & Gas industry, we are grappling with many challenges. But it is also true that we have faced adversity in the past and found ways to overcome seemingly insurmountable hurdles to progress and develop.

So what does a “new normal” look like? One thing is undeniable, and that is that the pace of change – much of it driven by technology – will only accelerate. Individuals who keep going during the most challenging times, adapt, stay optimistic and choose to grow will be the winners on this journey.

For our industry, we have seen a glimpse of what could be a “new normal” with many companies embarking on a transformational journey to stay in the race. This has meant investing in technology, committing to help address climate change, developing ambitious goals for energy transition and finally, attracting talented people to the sector.

In my view, change is a constant and it is coming faster than we thought. But history has taught us that to thrive in an era of rapid change, we must look at it as an opportunity, not a threat. That has been my story, and it is also the story of our nation here in the UAE. 

THE NEW NORMAL

Reflecting on 2021 - yeartwo with COVID

GARETH BOYD

Regional Business Development Manager, Asset Management – EMEA

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1. Please define your leadership style.

This is probably a question for some of my colleagues, but I would hope it comes across as leading from example, giving colleagues the freedom to get on with their jobs and being open and approachable. If something isn't going well, I am always happy to voice my opinion and support where required.

2. What was the biggest obstacle you overcame in 2021?

I think the biggest challenge we have faced in 2021 is around recruitment and moving resources around the world to support the various projects we have:

i. With regards to the recruitment issue, there is currently and will probably always be resources out there who can do the job and tick a box, but I feel it is more important to spend the time finding the right people who are going to be ambassadors for your company and help drive the project forward. In a recent project we were setting up for, this has taken much longer than we expected and resulted in us having to use existing inter-

nal resources for short-term cover. Thankfully we had the flexibility and open-mindedness to be able to do this, and I think being flexible is paramount during these times.

ii. On the resourcing side, we have, in the last year, had to call on remote support from our resources across the world, to provide support regardless of where the project is, to keep things moving. Knowing and understanding the capabilities of our global resource pool has helped us to be flexible.

3. Please summarize the major lessons learned from this experience.

I think the main lesson from the above example and generally brought about from the presence of COVID is the need to plan for the worst and hope for the best; always remain flexible; and always be open minded to new ideas and approaches.

4. How will they help you plan for uncertainty as an industry leader in 2022?

I feel we always need to prepare for unexpected hiccups and be able to react to them. I believe

that to do this the communication between people has to be exemplary and almost non-stop. Without excellent communication, gaps appear, and things start to fall down cracks or get missed so it is vital that no matter if we have good or bad news that it is shared among those impacted by it.

5. What did the global pandemic teach you as an industry leader and in life in general?

One thing the pandemic has taught me is that there is more to life than work and we must always make time for our friends and family, as you don't get second chances with them. As the saying goes 'work to live, don't live to work'.

6. What do you consider as the KPIs for organizational readiness?

I'm not sure I would use KPIs as such but rather ensure that we always have a robust change and risk management plan in place. Over the lifecycle of an organisation's assets or development, change will occur; people come and go; processes; software; new assets; rules and regulations; organizational priorities; and organisations need a structured process to manage these changes and adapt to the new situation. At the heart of asset management and managing this is the Plan Do Check Act (PDCA) process. This cycle time can vary for different elements and departments, depending on internal and external changes/risks but constant focus on changes makes an organisation more resilient and helps continuous improvement.

7. Who is a mentor that you look up to? What is the best advice you've received and live by?

My former line manager is someone I look up to and I admire his way of thinking and approach to life and work in general. The best advice I have received is to always back yourself and your opinion, even if it is going against people apparently more senior and experienced than you as there is a good chance you know more than them and as long as you can justify and substantiate what you are saying, you'll be fine.

8. Any new opportunities and challenges to watch out for in 2022?

I think the challenge for a lot of people and companies will be the ability to come out of the shackles of the COVID pandemic. It's not been an easy couple of years for anyone, but we cannot

use that as an excuse to sit still and do nothing for the next two years.

9. How is the GCC's role in the global energy market evolving? How ready are we and what can we do to prepare?

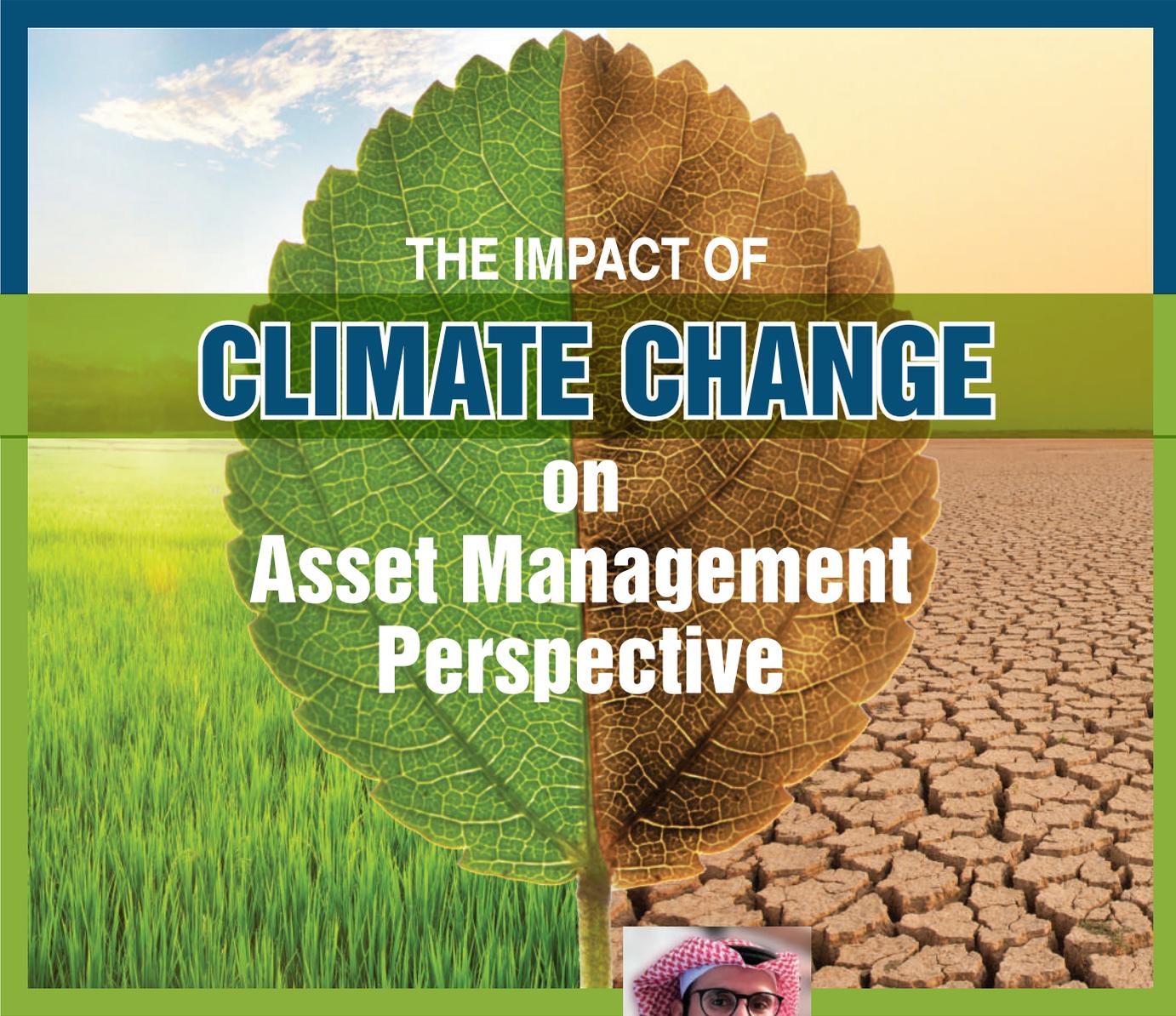
I think the GCC plays a pivotal role in the global energy market as collectively they are in the top three natural resource reserves of the world, if not at the top. Whilst everyone recognises the need to drive renewable energies and the need to reduce our greenhouse gas emissions, in my opinion, we also must accept that oil and gas will continue to play a fundamental role in our ongoing development, so the challenge that the GCC can drive is making this source of fuel cleaner, and less damaging to our environment.

I personally feel that in many regards the GCC is embracing change and uncertainty and driving us towards cleaner energy – if you look at Saudi Aramco for example, they are doing a lot of work to reduce their methane emissions and are one of the lowest emitters in the world when compared to the level of production they have.

In order to prepare, I think a lot of companies and assets need to improve their existing and on-site data. Too many times, I speak to people or go on to plants where they have very little or out of date information in the ERP systems, which hinders the knowledge they have on their plant and more importantly restricts their decision-making ability. For me, if I owned assets, I would be looking to cleanse and complete their asset data, which would in turn allow them to deploy Industry 4.0 solutions and software etc., ultimately making them more efficient. The PDCA process as mentioned earlier is also critical for organizations to consider in these times in particular.

10. What's a message you'd like to share with our members and readers?

I think GSMR is a great organisation, and it is by being part of this and other similar organisations that we can share ideas and best practices and continue to drive our companies and countries forward, so I would encourage people to continue being as involved as they can be. 



THE IMPACT OF
CLIMATE CHANGE
 on
**Asset Management
 Perspective**



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Climate change is a long-term variation in global climate patterns. One of its obvious results is the increase in the average global temperatures during last decades. The earth’s climate now is changing faster than at any point in history. The change is largely due burning fossil fuels such as natural gas, oil, and coal. Burning these materials will release the greenhouse gases into atmosphere, which will trap heat from the sun’s rays inside the atmosphere and cause temperatures to rise above normal conditions. This rise in the earth’s temperature is known as global warming, which is happening at a fast rate recently.

Around the world, temperatures and sea levels are rising, rainfall is becoming less and strong storms are occurring in shorter periods. Each of these has potential negative consequences that all of us are aware about. From an engineering perspective, this change threatens the services and assets that we

rely on and jeopardizes the quality of life of people. So, it becomes an essential mission and target to adopt a worldwide strategy to mitigate the negative impact of the climate change.

Climate change creates severe hazards with potential harm (e.g. coastal erosion, sea level rise, storm surge, flooding, drought, wildfires, landslides etc.). These hazardous will be reflected badly on infrastructure, which is often overlooked. Hence, it’s necessary to

provide cost-effective ways to manage the impact of climate change and maintain the service delivery to the public. Furthermore, the hazards of climate change can greatly impact the efficiency and lifespan of assets, which can result in inappropriate, costly or even dangerous service failures, where the economic implications will be much substantial. Therefore, as long as asset management focuses on sustainable service delivery in the face of future challenges and risks, it must also be adapted to tackle these challenges.

Physical assets operate in a dynamic environment where they are exposed to short and long-term variability in environmental conditions. Thus, it's an important input to asset management to have an adequate understanding of this variability. This includes forecasting of environmental changing conditions that are expected to happen over the life of an asset.

Effective asset management has become a key factor in the face of limited resources, growing population, aging infrastructure and climate-related disruptions. Globally, each country invests millions of dollars in infrastructure every year to meet the basic needs of their community. However, if they fail to consider climate change impacts on existing and future assets, then it will be an economical risk for not obtaining the full value from these investments due to the early failure of assets, which most of the countries are struggling with.

Therefore, one of the important direction that should be considered in asset management is climate resilience. It aims to improve the reliability of service delivery, increase asset life and protect financial expenditures. However, these expenditures should

be planned, designed, located, built and operated in a way that anticipates and responds to the change in climate conditions and accommodates or quickly recovers from disruptions caused by severe climate events or chronic climate stresses. Ensuring that assets are climate-resilient offers a range of possible benefits, including:

1. More reliable services and less severe disruptions in operation activities during normal events.
2. Increased asset life by building and operating assets that could tolerate climate change.
3. Reduced cost by designing assets that bear climatic conditions and avoid the need to retrofit in the future.

The implications of climate change on asset management will have a wide-range and complex levels. Even in very well-resourced countries, it's difficult to quickly adapt asset portfolio to become completely climate resilient, and it requires a gradual, systemic change to reach to the optimum level. To ensure that, we need to prioritize the most critical services and assets and undertake a systematic climate risk assessment to identify the most serious risks posed by climate change. Finally, proactive asset management will definitely help us mitigate the impacts of climate change and improve the overall response to unexpected natural disasters. However, it requires coordination, consultation and buy-in from each stakeholder, to enable proper implementation of these plans and perspectives. 🛠️



Practices to Restore

Combustion Gas Turbine Generator Efficiency

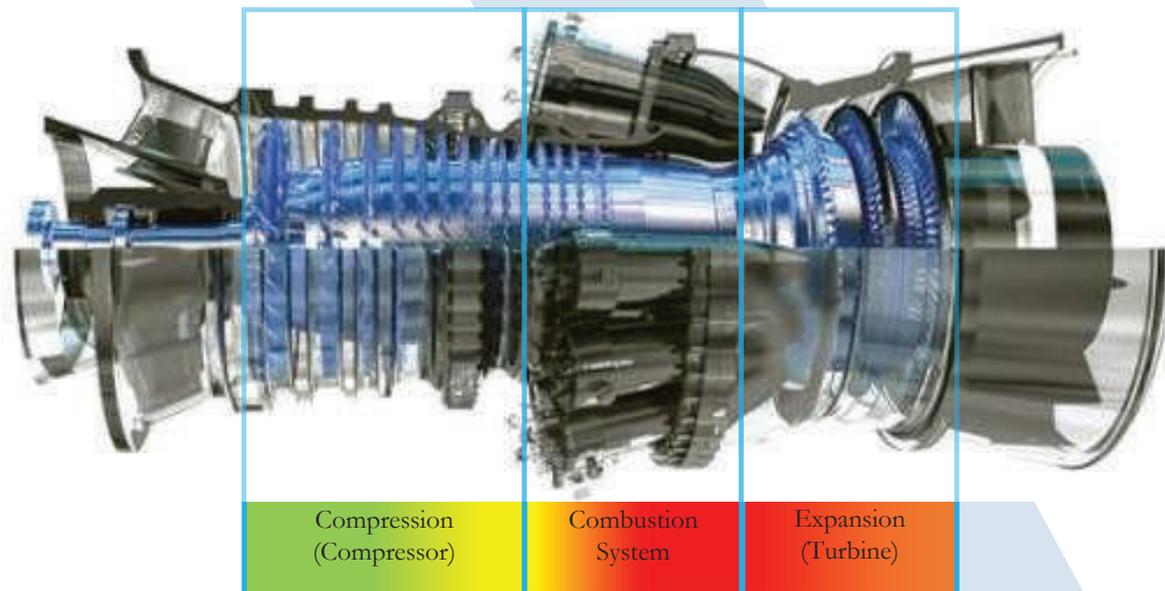
Gas turbines are the most widely used power generating technology that can be, for simplicity, divided into three main processes: compression, combustion and expansion — in which the compressor consumes up to 65% of the power generated by the turbine. The remaining power is used to generate electrical power by the generator, which is called “Peak load” refer to electricity use at its highest points during a day. Therefore, it is vital to monitor and maintain the efficiency of gas turbines’ compressors because typically about 70-85% of loss accumulated during gas turbine operation is attributable to compressor fouling.



NADHEER ALQUDSI

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The efficiency of gas turbine degrades during normal operation due to air borne contaminants that have two forms: hard particles, such as dust, dirt, sand, rust and carbon particles, which cause erosion and fouling; or soft particles, such as oil, air borne salt and pollen, which cause fouling. Air borne contaminants attach themselves to the compressor blades and air intake filters that the hard particles change the shape of the airfoil, change the airfoil inlet angle, increase surface roughness and reduce

the airfoil throat opening, while the soft particles increase the differential pressure across the filters. As a result, gas turbine overall efficiency declines. Accordingly, the gas turbine could be operated with one of the following options:

- Continue normal operation regardless of degradation.
- Perform compressor online water wash.
- Perform compressor offline water wash.

Nevertheless, these options need proper evaluation to go with the optimal one. Bear in mind that the first option will dramatically drop overall machine efficiency and cause non-recoverable loss because of consequent flow path damage, surface erosion/corrosion, tip and seal clearance increase, etc. The second option can be done without unit shutdown, but the water and chemicals that are injected into the air-intake of the compressor, will clean compressor first stages only before evaporation, which limits the effectiveness of the cleaning process. In addition, there is a danger of airfoil surface erosion. The third option is the most effective, but it requires machine shutdown. Besides, the air intake filter replacement option shall be considered whenever the differential pressure across the filters increased to, or close to, alarm level.

Regular and continuous condition monitoring and operational parameters review shall include: field visits, facility operators input, and PI Processbook trends of critical parameters that have the following effect on the gas turbine:

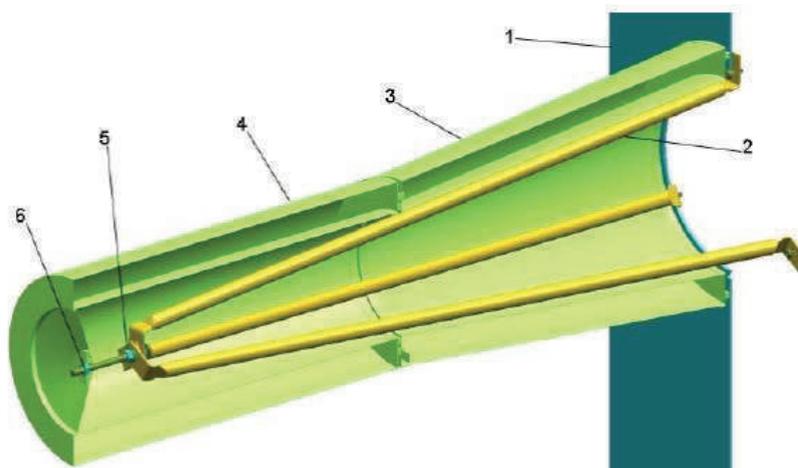
- Turbine efficiency increases with the compression ratio.
- Turbine efficiency increases as the turbine inlet temperature increases, which is the temperature after the combustion system.
- Turbine efficiency increases as the turbine exhaust temperature decreases, which eventually is the controlling parameter for the peak load power generation.

There are other factors that contribute to the machine’s efficiency, such as compressor inlet temperature, air fuel ratio, humidity, etc. However, operational facilities always focus on controllable parameters.

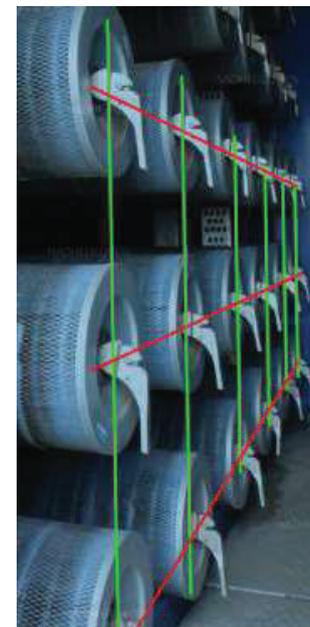
Our plant considered only compressor offline water wash due to its effectiveness and low associated risk. Now, the plant has two strategies to maintain the gas turbine efficiency via compressor offline water wash. The first strategy is carry out compressor offline water wash yearly along with PM activities. The second strategy is condition-based — whenever the gas turbine efficiency decreases, the facility operations team plans for compressor offline water wash during the nearest shutdown opportunity.

Efficient air intake filters will attenuate the differential pressure across filters and the fouling formation rate over the compressor blades. To ensure effective filtration, the operation facility shall consider the following points:

- All filters are aligned horizontally and vertically.
- Filters’ holder legs are in the correct sequence.
- All filters shall be properly tightened using a torque meter and no filter will be free to rotate.
- Filters have to perfectly matched with no gap between filter sets (Pos. 3 and 4) nor between the filter and housing (Pos 1 and 3).



| Pos. | Designation | Pos. | Designation |
|------|------------------------|------|----------------------------|
| 1 | Tube sheet | 4 | Cylindrical filter element |
| 2 | Element support | 5 | Front nut |
| 3 | Conical filter element | 6 | Retention nut + washer |



As part of plant continuous condition monitoring and regular operational parameters review, the plant adopted an initiative called “Reliability Technical Alert” or RTA. This one page monthly report highlights the major findings and recommendations progress to the plant’s management. Thus, a comprehensive review of critical operational parameters is conducted on a monthly basis prior to issuing the RTA report.

Eventually, the efficiency of the gas turbine can be maintained by minimizing the fouling formation over compressor blades and removing fouling once formed, which is achievable via proper air intake filter condition and installation, along with a regular compressor offline water wash. 



CRITICAL EQUIPMENT SELECTED FOR CONDITION MONITORING

| OIL | | | | | | | | | | | | | |
|---------------------------|------------|------------|------------|---------------------------|------------|------------|------------|---------------------------|-------------|----------------|-------------|-------------|-------------|
| N. Stab AXL Shipper Pumps | | | | N. Stab AXL Booster Pumps | | | | S. Stab C-19 Bottom Pumps | | APS 7 GC Pumps | | | |
| 102-GT-314 | 102-GM-315 | 102-GM-316 | 102-GM-317 | 102-GM-114 | 102-GM-115 | 102-GM-116 | 102-GM-117 | 120-GT-303A | 120-GT-303B | 142-GM-106A | 142-GM-106B | 142-GM-107A | 142-GM-107B |

| NGL | | | | | | | | | | |
|--------|-----|----------|---------------|-------|-----------|-------|-----------|-----------|------------|-------|
| N. NGL | | S. NGL I | | | S. NGL II | | | | S. NGL III | |
| 334 | 340 | 461 | 461-G-101 A/B | 462-A | 462-B | 462-C | K/KT-203A | K/KT-203B | 499-A | 499-B |

| UTL | | | | | | | |
|-------------------|--------|--------|----------------|------------|------------|------------|------------|
| Gas Turbine - M58 | | | Air Compressor | | | | |
| CGTG-7 | CGTG-8 | CGTG-9 | 111-KM-827 | 111-KT-828 | 111-KT-829 | 100-KT-101 | 100-KM-106 |

 Equipment with Active RTA  Equipment without RTA

| PUBLISHED RELIABILITY TECHNICAL ALERT (RTA) | | | | PENDING RELIABILITY TECHNICAL ALERT PER EQUIPMENT | | |
|---|-----|-----|---------|---|---|---|
| | OIL | NGL | UTILITY | OIL | NGL | UTILITY |
| RTA Published YTD | 0 | 1 | 2 | Equipment | (1) 461-G-101 A&B Pumps Mechanical Seal issues. | (2) Instrument Air Compressors' intercooler failures. |
| RTA Published this Month | 0 | 0 | 1 | | (3) Potential ejection of end cap/piston of N2 accumulators installed in hydraulic oil circuit for Nozzle Guide Vane (NGV.) | (4) CGTGs primary air intake filters low effectiveness. |
| RTA Exceeding 30 Days | 0 | 1 | 1 | | | |

- (1) 461-G-101A&B Pumps current metallurgy of API Plan piping for the mechanical seal allows for sulfuric acid build-up in the piping. RTA recommendation already completed for one pump only.
- (2) Intercoolers have out of spec cooling water and/or incorrect tube metallurgy.
- (3) Reliability Technical Alert for All 462 and 499 Gas Turbines - Verification of the Condition of N2 Accumulators on NGV.
- (4) Dust accumulation was observed in the machine internal parts due to lack of primary filter effectiveness.

See Attached Files For RTA

Abqaiq Plants Maintenance Services Division / Reliability Unit

Saudi Aramco: Company General Use



Successful WHAT-IF ANALYSIS WORKSHOP

at KIPIC Al Zour Refinery



Mohammad Rashed Al-Marri
Maintenance Planning Engineer
KIPIC

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INTRODUCTION

What-If Analysis Workshop is a technique which consists of structured brainstorming used to determine the potential risks/concerns in a given scenario. What-if analysis is used to compare different scenarios and their potential outcomes based on fluctuating conditions.

The purpose of a What-if Analysis is to determine the effect of these outcomes in a statistical model in conjunction with risk assessment. A What-If Analysis workshop was conducted to assess and evaluate the reliability and functionality of Sulfur Block of KIPIC Al-Zour Refinery.

METHODOLOGY



There are five major steps to conduct a What-if Analysis:

Step 1: Build a Team/Team Development

Before starting the process, we have to build an excellent team of potential people. The team members should not assume anything in advance so that at the time of brainstorming, they can see the reality or previous data as it is and make their decisions.

Step 2: Develop What-if Questions

After building a good team, next, we have to develop What-if questions with the team. The questions should be related to the problem and have the potential to determine the advantages, disadvantages, and risks of the project.

Step 3: Calculation of Risks

After developing all the What-if questions, now it's time to calculate, what possible risks we face. We should observe all the questions deeply and assess all the possible risks by making different scenarios.

- What-If Scenarios
- Causes
- Consequences
- Safeguards



Step 4: Recommendations

After calculating the possible risks, the team should select critical scenarios that have no safeguards, or are a potential risk. These scenarios will then be discussed in various brainstorming sessions of the workshop, which leads to collective ideas, improvements and recommendations.

All the recommendations will be assessed and streamlined. Each recommendation will be assigned to the corresponding teams with respective target dates for further implementation upon concurrence from all the workshop team members.

Step 5: Evaluation

Once the recommendation is implemented, the workshop team will constantly evaluate if the potential risk is mitigated according to the assumptions made during the workshop. If there is

no positive outcome from the recommendation, then the workshop team has to re-evaluate the What-if scenario and propose a new action plan.

CASE STUDY

At KIPIC Al Zour Refinery, What-If Analysis Workshop was conducted to assess and evaluate the reliability and functionality of some major aspects of the sulfur block.

One of the critical What-if scenarios considered was

the simultaneous failure of both the sulfur transfer pumps in the sulfur block. The causes, consequences and safeguards were identified as part of the workshop as shown below.

| WHAT-IF | CAUSES | CONSEQUENCES | SAFEGUARD |
|--|---|---|--|
| Two pumps failure (Sulfur Pit Transfer Pump) | <ul style="list-style-type: none"> Liquid sulfur solidification due to lack of steam jacket temperature in the pump Liquid sulfur solidification due to temperature variation in the pit. Condenser cooler failure Low level of sulfur pit Power failure | <ul style="list-style-type: none"> Level in the sulfur pits will increase above allowable limit, leading to train shutdown. H₂S emissions will be high, affecting safety and environment | <ul style="list-style-type: none"> When the train has shutdown, the inlet feed of the train can be diverted to the other two trains, which can handle the capacity. During initial commissioning/start-up of first refinery, if both pumps fail due to common causes, transfer pump from another train can be removed and installed (within six to eight hrs). Feed from other units can be reduced to a minimum to mitigate the situation. |

This helped in asserting that relevant safeguards are available in the case of an occurrence of the scenario. Furthermore, during the workshop, these safeguards were studied in detail and further enhanced. For example, a comprehensive schedule was prepared to estimate the time, resources and equipment required to transfer a pump from another train.

In addition, as a result of recommendations from the workshop, further enhancements and updating of SOPs were implemented. (One of the recommendations was to assess and ensure adequate temperature of the sulfur pit and outlet header pipeline to avoid common cause failure due to outlet blockage.)

between all the teams in the workshop. Close follow up and regular meetings were held to facilitate prompt actions.

Various potential risks were identified during the workshop. Complete and in-depth analysis of the risks were carried out with the help of all the teams involved. Numerous recommendations were proposed as part of the workshop, which helped in enhancing the current system.

Through this What-If Analysis workshop, I am proud to say that we, at KIPIC, were able to successfully assess the potential risks related to the sulfur block at KIPIC Al Zour Refinery and find solutions to improve the functionality of the system. Recommendations as part of the What-If Analysis Workshop are currently under implementation. 

CONCLUSION

As the Maintenance Planning team, we were the main focal point and responsible for coordinating

THE FIRST RUNNER-UP OF THE 2021

LEWAS RISING STAR AWARD

NAJLA ALSHAMSI

Engineer – HV Switchgear, Transmission Power – Transmission Engineering Electrical at Dubai Electricity and Water Authority (DEWA) shares views on leadership and the energy sector.



■ **Tell us a little about your journey so far.**

My successful journey started when I graduated from high school with excellent grades, which qualified me to be among elite students who were selected for the DEWA scholarship to be future engineers. Since then, DEWA has provided all the support to shape my skills, increase my knowledge and build my capabilities. DEWA is considered one of the leading government authorities in the UAE and I'm very proud to be part of it.

■ **How can young professionals take on leadership roles and initiatives at the workplace?**

As a young engineer, I believe creating opportunity rather than waiting for it is the key. First, young professionals are advised to work on developing their skills and take extra responsibilities beyond their roles to show their capabilities and strengths for leadership positions, which will support their career growth. Second, challenges are a great source of inspiration and innovation, so, overcome challenges creatively. Finally, build the habit of "being comfortable with being uncomfortable" because all opportunities are outside one's comfort zone.

■ **What contributions do you aspire to make to the maintenance, reliability and asset management fields?**

I aspire to contribute, as part of a community of professionals, toward shaping the future of maintenance, reliability and asset management

through implementing the latest technologies like AI, big data, data hashing, etc. to optimize time, increase quality and support expanding life spans of assets with optimum reliability.

■ **What challenges does the global energy sector need to prepare for?**

Shifting to renewable energy through diversifying energy resources in response to the global increase in energy demand are linked with multiple challenges such as cost, energy quality, energy storage and locations. Cost is on the top of the challenges pyramid as cost of renewable energy networks designs are significantly higher in comparison to hydrocarbon networks. Energy quality is an issue due to uncontrolled fluctuations in energy productions via renewable sources (solar panels/wind), which may impact customers' satisfaction. This creates a need to adapt new technology solutions for energy storage with minimum losses. Locations is a challenge with the consideration of future urban revolution without impacting green lands.

■ **How can we prepare for a changing power grid i.e., a more digitalized and decentralized model?**

We are stepping into the future of the 3D's of energy: digitalization, decentralization and decarbonation. In order to ensure readiness for digitalization through wider access to data with the support of trending technologies such as AI, IoT, big data, block chain, etc. we must invest on building our engineers' capabilities in dealing with the rapid shift along



with raising cyber security knowledge. In terms of decentralization, which plays a vital role in reducing transmission line losses and limiting threats of cyber-attacks as hackers may impact portion of the generation, we need to implement governance frame work in response to the decision-making process of mixed decentralized and smaller centralized interties of the network, develop methodologies to maintain overall system stability, refine policies and clearly define level of authority at each level and, most importantly, plan ahead the adequate disposal of power production wastes to limit environmental risks.

■ **What does the transition to renewable sources mean for the energy sector in the GCC and globally?**

Shifting to renewable sources for energy generation in the GCC region is preparing us for a promising future of a post-fossil fuel era where diversity of energy resources is essential to meet growth in demand. In view of future anticipation, it opens the door for new job opportunities for new power generations, transmission and distribution networks. The acceleration in finding clean energy alternative resources supports the GCC’s commitment to meet their sustainable energy targets along with achieving the global 2030 sustainable agenda.

■ **In your opinion, what traits and accomplishments led you to win multiple awards?**

Awards were never a target for me, but the

consequence of hard work and a series of success stories. I truly believe that success is a blend of confidence, hard work and effective teaming. Following my passion and enjoying my job are my motives to always keep going beyond expectations, which have reflected in my excellent performance. As a result, I have successfully merged engineering (Bachelor), innovation (Master) and work experience to always look for challenges/areas of improvement to sharpen my skills through challenging myself.

■ **What did you gain from your scholarship at the American University of Sharjah?**

Besides graduating from one of the best universities in the world, which equipped me with all the technical skills and a strong electrical engineering foundation, I learned to work effectively under pressure, which helped me in the workplace. My experience also shaped my soft skills through being part of a homogenous model of diverse cultures, which raised my cultural awareness and supported my professional expertise through viewing diversity as a great source of collective intelligence.

■ **Any interesting advice you’ve received and still follow?**

His Highness Sheikh Mohammed bin Rashid Al Maktoum, Vice President, Prime Minister and Ruler of Dubai says, “The race for Excellence has no finish line.” I believe, following this success tip helped me build a framework of continuous improvement and understanding that excellent people never quit. ⚙️



CREATING A CULTURE OF LEARNING & EXCELLENCE

MAINTCON was launched as a vehicle for the exchange of knowledge and best practices in the fields of maintenance, reliability and asset management, highlights **Saad Al Ulaimi**, Conference Technical Committee Chair.

Tell us a bit about the origins of the Conference

Soon after the formation of the Gulf Society for Maintenance Professionals (GSMP), now Gulf Society for Maintenance & Reliability (GSMR), on January 2010, the Middle East Maintenance & Reliability Conference (MAINTCON) was launched. December 2010 marked the birth of this joint initiative between GSMR, and the Bahrain Society of Engineers (BSE), the sole objective being to offer industry professionals a unique platform for learning and networking. The success of the first MAINTCON paved the way for a series of biennial editions, which were whole-heartedly received and praised by maintenance, reliability and asset management professionals around the world.

What can we expect for MAINTCON 2022?

MAINTCON 2022 will be held from 27 – 30, November under the theme, “Industry 4.0 – Innovation & Technologies in the New Normal”. We’re expecting no less than 1,500 participants, and in addition to an extensive technical program including technical presentations and for full-day specialized workshops delivered by regionally and internationally well-known industry consultants, there will be other attractions — GSMR Excellence

Award ceremony, Innovation Corner, which was launched in 2018 and received wide acclaim, an Exhibition featuring companies and service providers, showcasing their latest products and services.

Would you please elaborate on the technical program?

We’ve already received an overwhelming response for abstracts submissions and while these are being reviewed, we encourage and invite further submissions before March 31, 2022. The Technical Committee will whet these submissions based on carefully designed criteria and shortlist the most interesting, relevant and creative papers that will be presented during the Conference.

MAINTCON was launched as a vehicle for the exchange of knowledge and best practices in the fields of maintenance, reliability and asset management. We are proud to share that in all these years, the Conference has stayed true to this purpose and will continue to be a hub for continuous learning and excellence.

RECOMMENDED

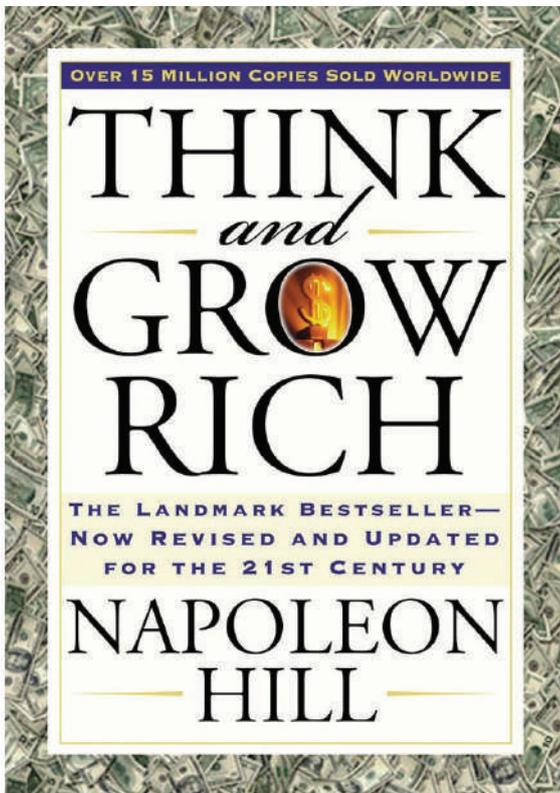
Reading

THINK AND GROW RICH

By Napoleon Hill

Originally Published: 1937

Available on Amazon.com



We are now in the early stage of the post-pandemic period and all we need now is the right kind of motivation that will lift our spirits. Hence, I recommend the book “Think and Grow Rich” written by Napoleon Hill, which helped me to invent a ‘new me’.

This book deals with the art of tuning our thoughts to achieve big and get rich. Born in poverty, the author struggled his way up and was commissioned by Scottish American Industrial Giant, Andrew Carnegie for an onerous task of interviewing 500 millionaires to find out their secret of success and develop them as principles so that everyone can benefit from it. The author spent almost 25 years in this mission and formulated thirteen steps that would lead anyone to riches.



A review by:

Rajkumar Anand, PMP

Contracts Engineer

KIPIC, Maintenance Support Services

✉ r.anand@kipic.com.kw

The author states that the first step for accumulating riches or to achieve anything you want is to have a burning desire for it. And the second step is to develop faith that you are capable of achieving it. These steps may sound simple but aren't. Finding out our exact desire itself is a stupendous task and building faith is even tougher.

Then the author has formulated a principle named ‘auto-suggestion’, which involuntarily drives the body and mind towards the set goal. He has given some steps to the auto-suggestion in motion, which may seem absurd while you read, but you will surely be fascinated when you experience it.

Also, the book elucidates in detail the art of selling one's personal services by enhancing one's attributes by means of acquiring leadership qualities, specialized knowledge, defeating the six ghosts of fear, and gaining self-confidence.

These steps are not just words, or lame principles invented by the author. Instead, each step is validated with real-life stories of millionaires and explicated: how these steps led them to achieve big. There are numerous stories throughout this book that are proofs that these steps will work.

While the motto of this book is more oriented toward financial benefits, I see it as a magical formula that will make you achieve anything you want like getting your dream car, building your own business, earning a coveted degree or certification, etc.

Millions of people were benefited from this book, including me, and I assure the same for you too.

Happy Reading!

EVENTS



Training On Root Cause Analysis for Maintenance & Reliability Applications, Oct 3-7



Webinar with UE Systems, Oct 13

Webinar with Dr. Seth Muthuraman, Independent AM Expert, Oct 24

VIRTUAL
Academy

**WEBINAR ON
Asset Risk Management
and Equipment
Performance Centre**

Dr. Seth Muthuraman
October 2021

GSMR
Gulf Society for Maintenance & Reliability

gsmrgulf.org

Virtual Events & Training Workshops

OCT-DEC 2021

**Integrity Operating Windows (IOWs)
Leading Indicators to Mechanical Integrity**

Faisal Alsalmán
Reliability Engineer

November 2021

GSMR
gsmrgulf.org

Webinar with Faisal Alsalmán,
Reliability Engineer, KIPIC, Nov 24

**WEBINAR ON
METHANE EMISSIONS
LEAK DETECTION**

JOHN CRANE ASSET MANAGEMENT SOLUTIONS

NOVEMBER
2021

GSMR
gsmrgulf.org

Webinar with John Crane,
Asset Management Solutions, Nov 7

Webinar with
Dr. Sh. Fay Al Khalifa,
Smart Sustainable
Cities Expert, Dec 6

Smart Sustainable Cities

Maintenance and Reliability Applications in Real Estate

Dr. Fay Al Khalifa

GSMR
SMART SUSTAINABLE URBANISM LAB SSSU

“Don't live the same year 75 times and call it a life.” - **Robin Sharma**

WIN! WIN! WIN!

When was the GSMR Body of Knowledge launched?

- a.) 27th November 2021
- b.) 28th February 2022
- c.) 28th January 2022

Send your answer to melissa.nazareth@gsmrgulf.org with your full name, company name, photo and GSMR ID, and stand the chance to win exciting prizes! Winners will be announced

Last date for entries: April 30, 2022



Winner of the competition published in the October 2021 edition

Nourah Al Saad

Maintenance Planning Engineer
KIPIC

7 SECRETS

TO EMBRACING CHANGE

1. **SIMPLY NOTICE** that you are in the midst of change. Don't try to run and hide. If you have a journal, write about changes you notice.
2. **FACE YOUR FEELINGS** about the change, especially when the change is imposed and beyond your control.
3. **FIGURE OUT WHEN TO ACCEPT AND WHEN TO REJECT THE CHANGE.** Reflect on what you are accepting, rejecting, and doing something about.
4. **ADOPT AN ATTITUDE OF ANTICIPATION, AND BE GRATEFUL.** Welcome change as an opportunity.
5. **CHOOSE YOUR THOUGHTS AND ATTITUDES ABOUT EACH CHANGE.** Remember, negative thoughts block your creativity and problem-solving abilities.
6. **LEARN TO RELAX (MORE).** Deep breathing works for many people. Exercise helps most of us to relax. Choose the way that works best for you.
7. **SET SMART GOALS** so you can consciously guide the change.