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أصول

SOOL

SUSTAINABILITY

IN OUR INDUSTRY & ENVIRONMENT

➤ **US Patent for Aramco Shaft Alignment**

➤ **Technical: Holistic Asset Strategy Management Systems**

➤ **Innovation: Effective & Efficient Unit Handling for Maintenance Planning Engineers**

➤ **Interview: LEWAS Rising Star**

➤ **Recommended Reading**

GSMR

الجمعية الخليجية للصيانة والأتمتة
Gulf Society For Maintenance & Reliability

www.gsmrgulf.org

رمضان كريم

Ramadan Kareem



On the solemn occasion of Ramadan,
GSMR's Board of Directors
wish you and your loved ones a blessed and
safe Holy Month.



Avoid large gatherings
Wear your mask to protect yourself and those you love

GSMR GSMR GSMR

C O N T E N T S



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Sustainability
in Our Industry
& Environment

Top Management
& Sustainability
Management

Implementing Green
Energy Technology
in Oil & Gas

Interview:
Youth Leader

Improving
Organizational
Reliability

Innovation:
US Patent for Aramco
Technology

Technical: Effective
& Efficient MPE Unit
Handling

Recommended
Reading



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Dear Valued GSMR Members,

On behalf of GSMR's Board of Directors, I wish you a safe and blessed Holy Month of Ramadan.

It gives me great pleasure to present to you the third edition of Osool. I extend my sincere appreciation and thanks to all who contributed, and to all who reached out to us with your words of praise and encouragement on the overwhelming success of the previous issue.

I would also like to congratulate GSMR's Asset Management Committee who have successfully completed a milestone project of translating the GFMAM Asset Management Landscape Second Edition into Arabic.

In our profession, organizations are becoming more and more conscious of the way they obtain and use resources. It is all about adhering to economically-sound processes, which also minimize negative environmental impacts by conserving energy and

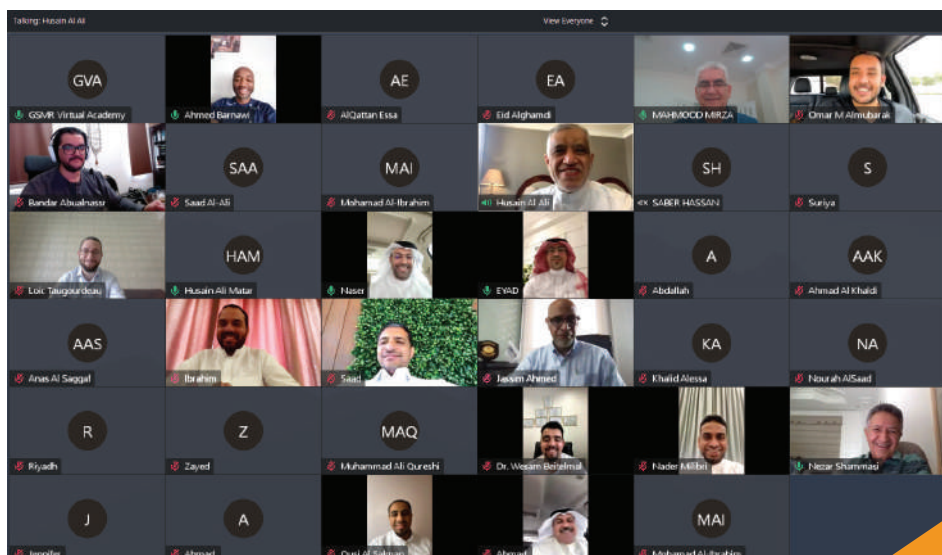
natural resources. However, sustainability extends much beyond, taking employee, community and product safety to the next level. Our special feature showcases views on sustainability in industry and environment by industry experts.

We interview the LEWAS (Leadership Excellence for Women Awards & Symposium) Rising Star 2020 winner, a young engineer, about her professional journey. Youth development and empowerment is a major objective at GSMR. In 2020, a dedicated Youth Committee was established and we also launched Sanad, a program that supports GCC technical students, fresh graduates and job seekers with a wide range of benefits including exemption of 1-year GSMR membership and scholarships to GSMR's training and certification workshops.

The effects of the global pandemic are far from over. However, GSMR Virtual Academy continues to successfully host virtual events and training – we feature the Q1 event coverage in this edition. Your participation is highly sought for all GSMR events and initiatives. We also invite you to join GSMR's Committees; together let's raise the bar for M&R-AM in the Arabian Gulf and beyond!


Eyad Al Basrawi
Chairman

GENERAL ASSEMBLY MEETING 2021



GSMR conducted its first virtual general assembly meeting. The meeting highlighted the accomplishments of the past year through a special video. GSMR Chairman, Mr. Eyad Al Basrawi thanked members on behalf of the Board of Directors for their ongoing participation and contribution to the Society's initiatives and programs. Further, he praised the GSMR Committees for their active contribution and urged members to continue the good work despite the challenges of the global pandemic.

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



SUSTAINABILITY

in Our **INDUSTRY & ENVIRONMENT**

Regional and global industry professionals share their views and insights.

Over the years, sustainability has emerged as a buzzword for manufacturing and industrial businesses. There are several strategies that businesses can embrace for being environmentally responsible while saving money, remaining competitive, and creating an attractive workplace culture.



Maher Maamari
Global CCO
GE Digital Oil & Gas



The software is not about the analytics, not about the dashboards, not about the mobility tools, it's about using these technologies to sustain the best practices, work processes and knowledge that those of you in the industry are diligently working to scale every day.

Sustainability is at the very core of what maintenance, reliability and asset management means as a function and practice within the industry. Each of you in the field are diligently working to protect your people, our planet, and profits for your respective organizations. As such, many of you as leading practitioners have developed world class practices and work process for achieving these objectives.

Having worked for many years in the Asset Performance Management software space and talked with hundreds of clients around the globe

about their maintenance and reliability programs, I've come away with one universal truth.

The software is not about the analytics, not about the dashboards, not about the mobility tools, it's about using these technologies to sustain the best practices, work processes and knowledge that those of you in the industry are diligently working to scale every day. With that truth our mission at GE Digital is clear, we will bring simplicity, speed and scale to your digital initiatives in effort to help you meet and exceed your objectives.



Dhari Al Gharaballi
Manager HSE, KIPIC
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A major achievement to drive sustainability is the launch of KPC Group Sustainability Reporting Policy, which ensures effective management and transparent communication on our performance on the three pillars of sustainability - economic, social and environmental, to all our stakeholders.

KIPIC is committed to reporting on sustainability issues and contributing to sustainable development in the State of Kuwait, as well as in the global community. KPC 2040 Strategic Directions have been implemented across the companies, and a strategy has been developed to ensure our alignment with Kuwait National Development Plan, Kuwait Vision, and the United Nations Sustainable Development Goals.

A major achievement to drive sustainability is the launch of KPC Group Sustainability Reporting Policy, which ensures effective management and transparent communication on our performance on the three pillars of sustainability - economic, social and environmental, to all our stakeholders. Our stringent compliance with applicable HSE policies and standards is an ethical and professional value at KPC. We aim to conduct our business in a healthy, safe and environmentally acceptable manner and sustainability is a vital part of our business ecosystem. In recent years, we have demonstrated excellence in many of our initiatives, campaigns and activities, resulting in the receipt of numerous international awards, highlighting our environmental stewardship, people commitment, community engagement and product responsibility.



Top management involvement in **SUSTAINABILITY MANAGEMENT**

of a company is one of the key success factors for sustainable development of the company

says **Reem Al Bastaki**,
Environmental Engineer, Technical Services Dept. at GPIC.



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What are your views on the evolving relation between maintenance and sustainability?

Industrial companies are among the largest responsible for materials and energy flows in an environment where natural resources are running out and the impact of human activities is rising. Sustainable manufacturing aims to develop sustainable production processes, innovative technologies, and new tools for evaluating economic, environmental, and social impacts of industrial assets. In this context, maintenance process is necessary to ensure availability, reliability, and safety of industrial assets, and could become one of the main pillars for sustainable manufacturing; a sustainable

periodic preventive maintenance model that establishes the optimal maintenance period for each system component, which minimizes conventional, environmental, and social costs generated by maintenance interventions. The model, moreover, integrates the concept of Circular Economy (CE), choosing the most suitable spare parts to use in maintenance activities from a sustainable perspective. Moreover, Sustainable Manufacturing (SM) involves the need to move from Linear Economy to CE based on waste reduction through recycle, reuse, remanufacturing and recovery of materials, becoming a paradigm for continued economic prosperity and ecological balance aiming at maintaining and guaranteeing human wellbeing and economic growth. To move towards

economic, environmental, and social challenges, is necessary that all business processes become sustainable, ensuring availability and reliability of system components, guaranteeing safety of employees and community, and minimizing environmental impacts. In this context, the maintenance process has a large potential in pursuit of SM.

How has incorporating sustainability within maintenance affected maintenance KPIs?

Maintenance KPIs have always been focused on productivity, reliability, availability however, not on sustainability performance indicators. Companies today are facing a challenge to implement sustainability in all the business aspects. Maintenance, as one of manufacturing function,

has become an important part to achieve the sustainable company's status. Besides its benefits in minimizing the operating costs and optimizing the equipment durability, an appropriate maintenance also affects the company's overall performance. Thus, integrating sustainability into maintenance activities has become a need. Sustainable maintenance is a process of continuous development and constant improvement of maintenance processes, increasing efficiency (operational excellence), safety of operations and maintenance of technical objects and installations, and is focused on employees.

**How is industry and technology 4.0 influencing sustainability in industry?
What trends can we expect to emerge in the near future?**

The incoming revolution of industry 4.0 technologies could enhance process and product development by facilitating data collection and applicability of sustainable maintenance models. Furthermore, the use of remanufactured or used spare parts could stimulate companies since it probably also involves minimization of internal costs. Therefore,

manufacturers are integrating industry and technology 4.0 with sustainability to achieve sustainable manufacturing. Industry 4.0 technologies are still at a developing stage however, they will be relied on to address challenges and issues related to Triple Bottom Line (TBL) of sustainable manufacturing.

What can M&R professionals and AM managers do to integrate sustainability goals with their organization's objectives and operations?

Top management involvement in sustainability management of a company is one of the key success factors for sustainable development of the company. Top managers not only provide resources and design incentives for employees to promote sustainability initiatives but also strongly influence organizational culture and company-wide decision-making processes through their commitment and leadership. More companies than ever before are integrating sustainability in core business strategies and treating sustainability strategically at a much higher level. Even though Sustainable Development Goals (SDGs) (also called "Global Goals") were defined only in 2015, companies are

increasingly aware of them and use these to set corporate performance targets.

What has your organization done to successfully evolve its M&R-AM plans and activities to suit business goals that are increasingly tending toward a holistic approach rather than just profits?

GPIC's triple bottom line business approach, now transformed into the 4P's (planet, people, profit, partnerships) aligns strongly to the UN SDGs. GPIC is a proud supporter of the global goals and has contributed in all the phases right from the participatory process of My World to setting up meaningful indicators; sharing best practices on SDG aligned projects and programs through the UN Global Compact and KPMG's Industry Matrix; aligning corporate goals both short and long term with the relevant SDGs; mainstreaming SDGs in business functions; sharing our sustainability performance publicly through GRI sustainability reports and encouraging others to do the same. Linking SDGs with our Capex projects and modifications through our MOC system is one of our latest initiatives. 



IMPLEMENTING

GREEN ENERGY

Technologies in the OIL & GAS INDUSTRY



Mohammad Behbehani

Electrical Maintenance Engineer, KIPIC

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The severity of needing sustainable electrical energy is increasing by the minute for all industrial sectors worldwide. Electrical power can be generated and produced using a wide variety of methods. Green energy can be categorized as a good sustainable method of power generation and production. Green energy is a way of generating electrical power by using a variety of sources that are environmentally friendly and produce sustainable power without affecting the health of our environment. The pursuit of achieving a sustainable clean method of power generating is spreading globally. Industries worldwide are focusing on adding these methods to benefit from its properties. Union of Concerned Scientists claims that “Most renewable energy sources produce little to no global warming emissions. Even when including “life cycle” emissions of clean energy, the global warming emissions associated with renewable energy are minimal.”

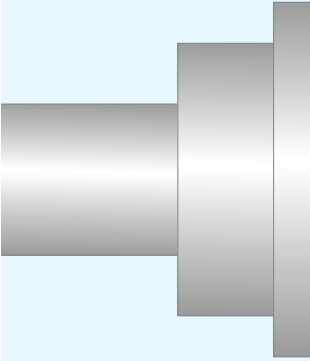
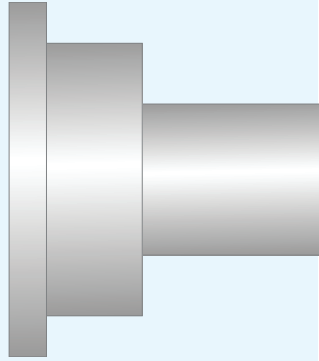
Green energy can be obtained by using various techniques, some are easy to implement while others can be difficult to enforce. Most likely the techniques that are used to acquire green energy depend on the requirement of the concerned party. For example, a building infrastructure can be created in a specific way which can have a great impact in reducing energy consumption thus engaging in the attainment of green energy. Supplementary to that example the obtainment of renewable energy supplies such as “solar power, wind power, geothermal power and hydroelectric power” are

In KIPIC, it is proposed to implement solar energy system in all non-process area buildings to produce 15% of its energy needs. The proposed project will help in preserving 11,428 oil barrels since less energy is consumed

prime examples of achieving clean electrical power generating. These properties will have substantial advantages such as:

- **Non-polluting**
- **Low Maintenance Cost**
- **Reduces Electricity Cost**
- **Avoids Global Warming**
- **Contributes to Sustainable Development**

Implementing green energy technologies in the Oil and Gas sector will associate in achieving all these substantial advantages. In Kuwait Integrated Petroleum Industries Company (KIPIC), it is proposed to implement Solar energy system in all non-process area buildings to produce 15% of its energy needs. The proposed Solar Power System that KIPIC is intending to use is On Grid Solar Power System which is PV systems that only generate power when the utility power grid is available. KIPIC proposed Solar PV installations is a flat roof solar installation. Flat roof solar PV system installation provides flexibility for orienting the solar panels at a specific angle to get the maximum exposure to the sun. By studying the current condition in KIPIC and reviewing the power consumed in KIPIC, implementing such a project will save an equivalent of energizing 173 houses, thus will engage in reducing 6,068 Tons of CO₂ emissions which will correspond in saving 5,714 trees. Additionally, the proposed project by KIPIC will help in preserving 11,428 oil barrels since less energy is consumed. ⚙️

US PATENT FOR ARAMCO'S New SHAFT ALIGNMENT METHOD



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Saudi Aramco's Sea Water Injection Department has several GE Frame-5 gas turbines used in the production and transportation of treated sea water. There is a requirement to frequently perform alignment checks in between the turbine rotor and auxiliaries, to avoid defects and equipment damage.

The new shaft alignment method uses a slow turning device (electric motor or hydraulic ratchet system) jog push button to simultaneously rotate the combined assembly of turbine rotor accessory gear coupling, the accessory gearbox and the auxiliary equipment to perform shaft alignment checks. With this method, the accessory gearbox shaft and auxiliary equipment shafts can be rotated together at the same time, and it becomes possible to use a reverse alignment method with a laser device. This new method does not require disconnecting the coupling between the auxiliary equipment and the accessory gearbox.

Before this invention, the couplings had to be removed first, and then the auxiliary equipment was rotated manually. Shaft alignment was then per-

formed by the Face and Rim method, which is time consuming and less accurate.

This method has decreased shaft alignment time from several hours to only fraction of an hour, with a turbine downtime reduction of 75%. This invention is applicable to all gas turbine models that have a rotor slow turning device (electric motor or hydraulic ratchet system) that can be manually operated by a local control switch or button.

This innovative idea has resulted in an annual cost saving (annual man-hour saving) of approximately US\$ 200 000 when taking into account the number of gas turbines (32) operated by SWID. The result of this outstanding cost and time saving is a successfully filed patent at the US Patent and Trademark Office.

Mohamad Al-Ibrahim is the brain behind this innovation. For more info & details on the US Patent Publication, please contact the author.



IMPROVE YOUR ORGANIZATIONAL RELIABILITY

Asset Strategy Management systems and process should start taking on a more holistic approach to ensure optimal balance of risk, cost and performance.



Husain Aldailami

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Over time, it has been widely apparent that design, operation, technology, organizational culture and human behavior all significantly impact reliability. As reliability encompasses much more than just standard maintenance practices and with all the advances in technology, productivity, design, and data processing capabilities, it only makes sense that organizations should start changing and improving their approach towards asset management in order to significantly improve reliability. Asset Strategy Management systems (ASM) and process should start taking on a more holistic approach as reliability strategies need constant refinement and adjustment to ensure they are delivering the optimal balance of risk, cost and performance, given the industry's changing environment.

Implementing optimized ASM involves creating a dedicated process where quite simply the correct strategy decisions and correct strategy content are addressed on all assets all the time. It is essential for organizations to design evergreen, dedicated systematic processes which focus on the governance and review of key elements of asset performance.

Many organizations make the common mistake of believing that once a strategy has been developed, the responsibility of the maintenance/reliability engineer is completed. However, only once the change is implemented in the field does the ASM loop reach to its review stage.

This involves ensuring consistent schedule and review triggers are in place to update the asset strategy based on asset performance and operational conditions, as well as data from predictive maintenance technology. A dedicated ASM system must further enable the swift deployment of reliability strategy updates and ensure they are seen at the field level. Many organizations make the common mistake of believing that once a strategy has been developed the responsibility of the maintenance/reliability engineer is completed. However, this is far from the objectives of an ASM system; only once the change is implemented in the field does

the ASM loop reach to its review stage.

Processes of managing reliability strategies must come hand in hand with the rapid expansion of technology and data intensive systems. Many organizations have created a wide gap between current technological capabilities in the market and their asset management structures. There is an ongoing trend where organizations are undertaking excessive maintenance activities on an informal and random basis. As a result, their maintenance cost index remains high and they're plagued with poor performance, unplanned failures and, most importantly, significant risk. This is where an efficient Asset Management System gets introduced; to create a framework for continuous reliability and asset integrity improvement based on trusted standards and processes. With the dropping oil prices being one out of the many major issues that asset intensive organizations are facing in the Middle East, implementing a dedicated ASM system and gaining the benefits of improving overall organizational reliability could soften the blow and translate to better business outcomes. ⚙️

“NEVER SAY NO TO OPPORTUNITIES”

Says rising Star Award 2020 winner & **Sr. Process Engineer, Technical Services Dept., Bapco, Fatema Husain**. She goes on to emphasize the need to attract young minds to the profession and shares major high-lights of her career.



What inspired you to pursue a career in engineering specifically in Oil & Gas?

I have been interested in science since a very young age. When I graduated from high-school, I was offered a scholarship from the Bahrain Petroleum Company (Bapco) to study Chemical Engineering in Melbourne, Australia. I accepted the scholarship because I knew this will be an interesting major and an exciting field to work in. Right upon graduation, I joined Bapco as a process engineer in the Technical Services Department.

What major challenges did you face and how did you overcome them?

Challenges are opportunities for growth. Having this mindset, I cannot pinpoint a major challenge that I faced, but rather can recall many opportunities for growth. For example, the transition from high school to an overseas university, and from university to my first job, presented me with many scenarios that I had to learn how to tackle by stepping outside my comfort zone.



During equipment inspection in T&I

How can companies help young engineers (career wise, holistic growth and development, etc.)?

Having a structured career development plan from day one on the job for young engineers is vital for their learning and eventually contribution to the company. This may include training courses, in-house or external, but most importantly mentorship, whether formal or informal. Having a mentor, or pool of mentors, is important for young engineers to learn the unwritten rules and tricks to getting the job done.

What can we do as a community to encourage more youth to consider a career in maintenance, reliability and asset management?

It is all about getting to them at an early age from grassroot levels, i.e., primary and high school, through outreach programs. We need to show how interesting these fields are through telling good stories of role models. We see professions such as doctor’s and astronauts being glorified on the media, and if we do something similar to showcase our work fields, that would enhance our image in the public eye.

Tell us more about the Rising Star Award that you won most recently. What do you attribute this achievement to?

I received the Leadership Excellence for Women Awards & Symposium (LEWAS) Rising Star Award for 2020, and prior to that received the Middle East Rising Star Award in 2018 from the



Organizing YouChemE, the youth co-located event at the GDA Conference 2018 with the BChemE team.

World Refining Association. I attribute these wins to my passion towards the chemical engineering field and leveraging the youth in the industry. I co-founded the Bahrain Chemical Engineers (BChemE), the national platform for chemical engineers, and I have been working with the team on organizing youth co-located events in regional conferences, as well as delivering programs for university students. I am also involved in other activities outside my job such as mentoring young students and participating in endurance sporting events.

Who do you consider a mentor/s? What is the most helpful advice you've received?

Mentors are those help you discover your hidden potential. I have been blessed to have many mentors throughout my journey who helped me do the same. Even though it might not be a formal mentoring relationship, seeking advice from others and being genuinely interested in learning, attracts mentors to you, who will be more than willing to help and to share knowledge.

The best advice that I received from a dear mentor is: 'be authentic'. It is amazing what you can achieve if you let yourself behave and act upon your beliefs, values and passions.

How has your role at your current organization enriched you as a professional and as a person?

My role as a process engineer revolves around monitoring and optimizing process units and

troubleshooting process problems. This entails dealing with different people from different backgrounds and thinking critically. Through this role, I am sharpening my communication skills and influencing capacity. To assist in that, I joined the Bapco Toastmasters Club, a corporate club dedicated to improving leadership and communication skills of its members. Currently, I am serving as the Club President in an effort to give back to this community which I learned a lot from.

What is your most memorable career experience?

I have been fortunate to have had the opportunity to travel through my job on assignments and training courses, including trips to Italy, Singapore, India, and the USA. Meeting different people, experiencing different cultures and understanding the way people work professionally around the world has been eye opening indeed.

What advice would you share with fresh graduates and young engineers?

Never say no to opportunities because each one will add to your growth and experience, and as Facebook COO, Sheryl Sandberg says, "If you're offered a seat on a rocket ship, don't ask what seat. Just get on! 🚀"

In 2020, GSMR announced "Sanad", a program to **support GCC students, fresh graduates and young job seekers.**

Under this initiative, applicants are carefully shortlisted and selected, and receive a wide range of benefits including exemption of first year's GSMR membership fee and scholarships to attend GSMR training and certification workshops.

For more info, call +973 17180398 or email: hello@gsmrgulf.org



ELEMENTS TO

EFFECTIVE & EFFICIENT

Handling of Units

FOR MAINTENANCE PLANNING ENGINEERS

Maintenance Planning Engineers are responsible for planning and tracking the maintenance activities of their assigned units. Unit Handling Elements offers a new, tried and tested concept to guide Maintenance Planning Engineers.

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Shaymaa Ashkanani



Nourah AlSaad



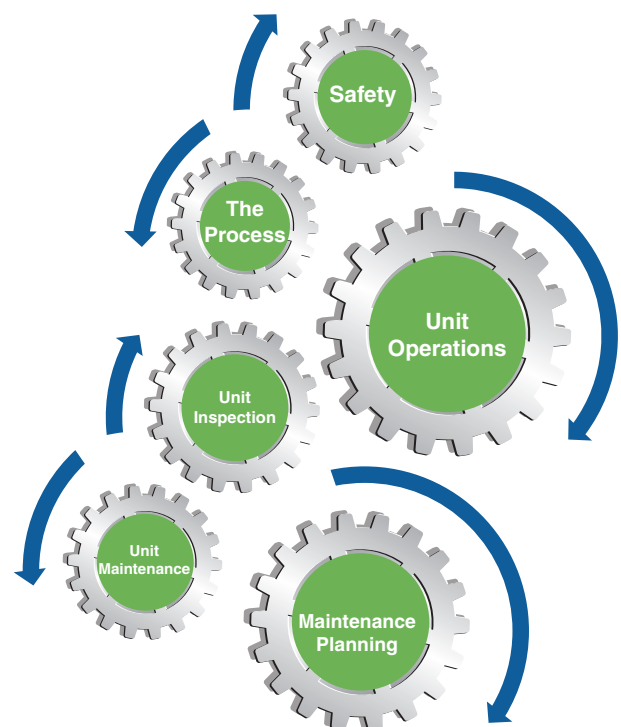
Latifa AlQallaf



Aisha Al-Jalahmah

All companies rely on their machinery/ equipment to produce revenue and it is the responsibility of the maintenance planning engineer to ensure that all the equipment is maintained on time and is running properly. Maintenance Planning Engineers are responsible for planning and tracking the maintenance activities of their assigned units.

To help all planning engineers handle their units effectively and efficiently, we created the six handling elements. These elements are shaped as inter-connected gears because when one element is turned the others move in accordance. The gears depict the relationship and interaction between these six elements; required for handling a unit as a planner. With the help of these elements, a clear path is crafted to show any maintenance planning engineer the basic steps they need to go through to be confident in handling their unit. It is essential that the MPL Engineer follows the elements in the sequence shown diagram



Element One: Safety

For Reference: HSE S&F Group

- Know all the Hazards associated with your unit & the plant in general.
- Read the related risk register, Safety Procedures and MSDS (Material Safety Data Sheets)
- Attend all the required HSE Courses.

Element Two: The Process

For Reference: The Process Team

- Store and read the related drawings, such as the PEFS/P&IDs and equipment drawings to understand how the unit functions.
- Know the process, the capacity, its inputs, outputs, and process limits.
- Understand the system and the sub-system of the equipment.
- Understand the upstream and downstream unit relationships and their impact



Element Three: Unit Operations

For Reference: Operations Group

- Meet the respective operations team and know your unit location. It is better to visit the site with a team and with the knowledge of the operations site supervisor (Beware of the ongoing maintenance works, especially hot work permit).
- Familiarize yourself with the unit and its equipment arrangement locations.
- Understand the role of each equipment and try to learn their operations by reading the O&M Manuals.

Element Four: Unit Inspection

For Reference: Inspection & Corrosion Team

- Prepare for the inspection related recommendations / reports (IATs & ICRs)
- Please note the difference between inspection related equipment and non-inspection equipment
- Familiarize yourself Familiarize yourself with the Inspection tests and necessary preparations

Element Five: Unit Maintenance

For reference: Maintenance Execution Teams

- Spend time with different maintenance disciplines and learn about their related equipment
- Know the manpower counts Actual Vs. Planned
- Collect and read all maintenance procedures
- Differentiate between maintenance activities to know the maintenance work required.



Below is a reference table to help in categorizing maintenance types:

MAINTENANCE TYPES	
<p>Corrective Maintenance (CM): Improving conditions by fixing obvious issue (Deterioration etc.) Usually restoring equipment to operational limit while the unit is still in service.</p> <p>Maintenance Type: Reactive Maintenance</p>	<p>Corrective triggered from Preventive & Predictive Activities (CPM): Restoring equipment issues that were found during Preventive and predictive maintenance activities.</p> <p>Maintenance Type: Reactive Maintenance</p>
<p>Breakdown Maintenance (BM): Restoring equipment functionality when the equipment is unusable or has broken down. (Includes Mechanical Failure)</p> <p>Maintenance Type: Reactive Maintenance</p>	<p>PM Work order for an Inspection Item: For Equipment endorsed by Inspection and Corrosion Team for a definite period of further operations</p>
<p>Preventive Maintenance (PM): Maintenance done on equipment periodically to ensure its functionality and performance measures.</p> <p>PM Inspection Item: equipment endorsed by Inspection and Corrosion Team for a definite period of further operations.</p> <p>Non-Inspection Item: equipment endorsed by the maintenance discipline.</p> <p>Maintenance Type: Proactive Maintenance</p>	
<p>Plant Modification (MOD): This is used for modification of process parameter changes and/or hardware modifications.</p> <p>Maintenance Type: Reactive / Proactive Maintenance</p>	<p>Predictive Condition Monitoring (PCM): Using Equipment to ensure that that the equipment is working up to specifications. Done by the respective maintenance team.</p> <p>Maintenance Type: Proactive maintenance</p>
<p>Planned Inspection (PI): Work order initiated by the inspection team.</p> <p>Maintenance Type: Reactive / Proactive maintenance</p>	<p>Planned Shutdown Process Unit Level (PSD): Created as a parent work order for all activities to be done during the shutdown. All these shutdowns are included in the 5-year plan. All shutdown related equipment included.</p> <p>Maintenance Type: Proactive maintenance</p>
<p>Project Work (PROJ): Created for project work orders. Budget is from CAPT.</p>	

Element Six: Maintenance Planning

For Reference: Maintenance Planning Seniors

- Contracts Handling
 - Familiarize yourself with the maintenance contracts
 - Also include tasks related to CPO creation
- PM (Preventive Maintenance) Jobs:
 - Understand / Develop Job plans for Preventive Maintenance of Equipment
 - Create a PM Plan on a yearly basis to achieve 100% PM compliance
 - Liaise with Operations to agree on the release dates and prepare a schedule accordingly
 - Circulate the plan and schedule to all other teams for Implementation
 - Monitor the progress of execution by regularly tracking the Actual PM Percentage compliance Vs. the Planned Percentage compliance
 - IAT / ICR / Backlog
 - Track your IATs & ICRs regularly and carry out necessary actions.
- Routine Jobs (CM/BM):
 - Follow up with the CM and BM work-orders which are raised regularly
 - Prioritize the work-orders and take the necessary actions
- Material Procurement:
 - Follow up on all required materials and ensure their availability before as and when required. Key focus shall be given on material related to PM and Shutdown activities.
 - Estimate the material requirement for PMs, inspection related materials
 - Discuss with respective maintenance team and finalize the required quantity
 - Initiate material requests and obtain supervisor's approval
- Shutdowns:
 - A turnaround needs to be an effectively planned, scheduled, well-controlled executed event. Below is a simplified three-phase system to guide the MPL Engineer in planning Turnarounds/shutdowns. Please note the below system does not eliminate the importance of the shutdown manual.



Phase 1 Turnaround Planning

1. Develop optimized shutdown scope & objectives

Read the post Shutdown Report: If this is not a Zero Inspection Shutdown then, go to the previous post shutdown report and read it thoroughly.
2. Create Initial Scope List & Conduct the first Scope Challenge meeting
3. Finalize the work scope and circulate it.

Identify resources required: manpower (decide the total manhours), heavy equipment (create required heavy equipment list and plan per job), material (ensure material availability & ordering time), critical material (material with long lead time) and service contractors (define contractors' scope). The earlier you initiate the material ordering process the better.
4. Start Preparing the shutdown scope book.
5. Determine activity duration & start creating the shutdown bar

Phase 2 Turnaround Scheduling

1. Analyze the shutdown plan:
 - a. Preparation of preliminary schedule, includes brain storming session, fat rat exercise, etc. and finalize critical path
 - b. Finalize Shutdown Schedule
 - c. Define the critical path
 - d. Level the resources
 - e. Establish a schedule
 - f. Communicate the scope book

Phase 3 Turnaround Execution

1. **Pre-Turnaround activities:** Company site facilities mobilization - Service contractor mobilization - Workshop pre-fabrication - Cold line inspection - Scaffolds
2. **Execution activities:**
 - Shutting down activities (Pre-maintenance activities): Activities that are completed by the operations team prior to handing over the equipment to the maintenance execution

team. Not all these activities need to occur it depends on the equipment:

- a. De-Pressurize: Decreasing the pressure.
- b. Isolate: Closing the valves
- c. Blind: Safety Measure - Positive isolation
- d. (There is always an approved blind list and a blinding sequence from operations, battery limit blinding is first)
- e. Steaming out: Nitrogen Purging or Chemical Decontamination
- f. Hot Bolting: Open and Closing bolts to remove accumulations and smooth the screw threads to ease the blinding process.
- g. Bolt Reducing: opening the bolts (alternatives)
 - Maintenance execution Activities: The planned maintenance activities are to be executed accordingly.
 - Startup Activities: After all maintenance activities completed the equipment can be restarted and handed back to asset custodian.

3. As a planner during the shutdown your role is to:

- Coordinate the entire shutdown
- Issue daily activities (24 hrs) plan
- Monitor & report shutdown daily progress (Planned Vs. Actual)
- Providing guidance for the team on daily basis to avoid any delays, and tackle any delays as soon as possible
- Track IAT's on daily basis by inspection and take action:
- Provide material and manpower
- Heavy equipment arrangements
- Assign IAT to the concerned division


4. Post Turnaround activities:

- Shutdown evaluation & Cost Analysis
- Post shutdown report with lessons learned

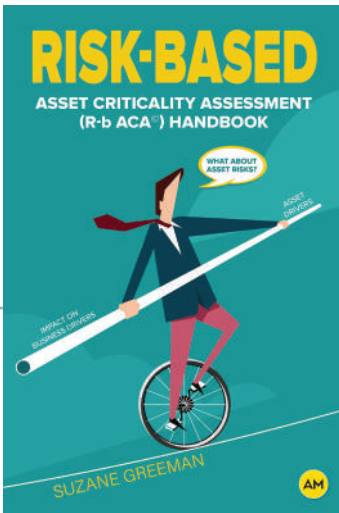
Being a Maintenance Planning Engineer comes with its divine responsibility to ensure the full optimization of the available and required resources to execute the Maintenance activities in the most optimum quality and reduced cost. To achieve this objective, we have developed what we called the six elements for handling the refinery units starting with the Element of Safety, then understanding the Process fundamentals of that unit along with the Unit Operations principles, followed by understanding the necessary periodic Inspection, then reaching to the Unit Maintenance and finally ending with the Maintenance Planning Gear. The concept revolves around drawing the picture of interconnecting gears to resemble the close relation between the 6 mentioned elements that are added as a term of reference and to showcase their importance in effectively learning any unit.

Within the geared elements, the Maintenance Planning Engineer will find steps, details, and

some handy tips to use. For instance, in the Maintenance Element, attached is a schedule that displays the different Maintenance types. In addition, since managing turnarounds is an essential part of the MPL Engineer's job, we proposed a guided 3 phase system that summarizes the main information required to plan for a shutdown.

The Unit Handling Elements do not downgrade or eliminate the structured-on job training or the training manuals, on the contrary, they work as a guide for the Maintenance Planning engineer to better handle their units and the responsibilities it entails. All the information presented to you, are made to define your career path as an MPL Engineer and would even enhance your on-job training experience that is made to make you the best future Maintenance Planning Engineer. 





RECOMMENDED Reading

Book:

Risk-Based Asset Criticality Assessment

Originally Published: December 10, 2018

Author: Suzane Greeman



A review by:

Dr. Wesam Beitelmal, CAMA

Assistant Professor

Dhofar University


✉: wbeitelma1.du.edu.om

Available on [Amazon.com](https://www.amazon.com)

In this issue, I would like to introduce you to a wonderful book on asset management – Risk-Based Asset Criticality Assessment (R-b ACA) handbook. It is written by Suzane Greeman, a well-known expert in this field with more than 20 years of experience in Asset Management. Her knowledge and practical experience are reflected throughout the book's chapters.

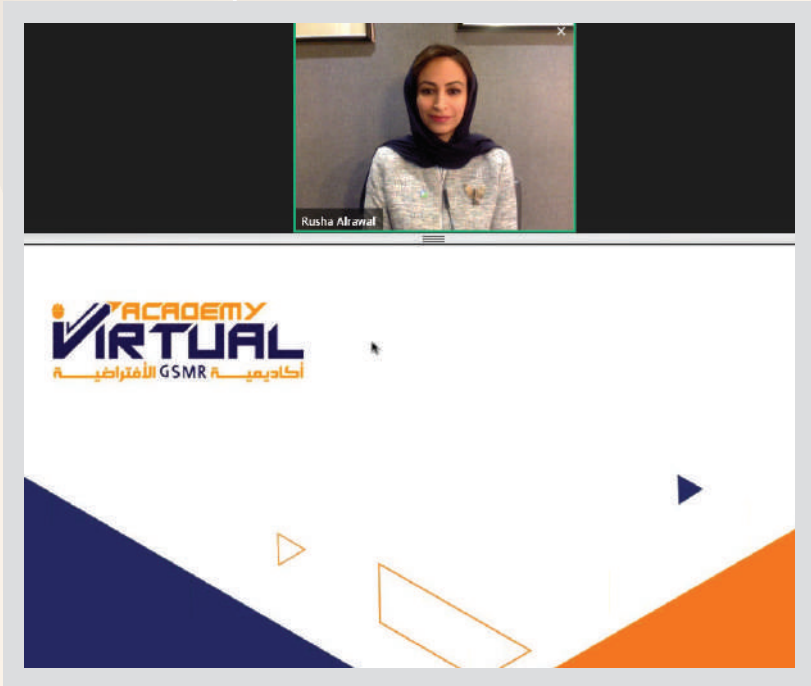
In the book, Suzane takes the reader/practitioner on a journey to learn the basic knowledge of asset criticality as a first milestone to implement asset management in ones' organization. It includes the ways to answer questions on what is the asset/s value, what risks are surrounding the asset, its outputs, and what are the costs to mitigate these risks. These should consider the dynamic environment of the industry by considering the asset lifecycle concept.

Then, the main concepts of R-b ACA are presented and discussed followed by an interesting connection between applying asset management principles and risk management approach. Suzane smoothly transitions between them with detailed discussions on R-b ACA risk management processes. She starts by explaining the relationship between organization context and asset drivers. In this discussion, many methods of prioritizing asset drivers are explained, as well as how these outputs could be used to calculate both, probability of failure of an asset and the asset risk number. Finally, the main requirements from the organization for successful implementation of these concepts and methodologies of management are discussed such as change of management, trained teams, useful updated data and information.

The figures and tables are well designed and presented, and add value to the content of the book. Learning and enjoyable reading are what I can guarantee to you about this book! 

WEBINARS and TRAINING and CERTIFICATION WORKSHOPS January - March 2021

WEBINAR



**How
 Women Can Better
 Handle Change**

Presenter:
Dr. Rusha Al Rawaf
 Moderator:
Latifa Al Qallaf

WORKSHOP

**Principles &
 Practices of Predictive
 Maintenance specially
 tailored for KIPIC,
 Kuwait**

Facilitator:
**Husain Al Ali,
 CMRP, CMA**



WEBINAR

Gas Turbine Performance Trouble Shooting

Presenter:
Mahmoud Khalifa
Moderator:
Khalid Al Essa

GAS TURBINE PERFORMANCE TROUBLESHOOTING
A SIMPLE AND EFFECTIVE METHOD of USING PERFORMANCE PARAMETERS

60 minutes (FREE WEBINAR + Q & A)
10:30 AM (GMT + 3) Kuwait Riyadh - 6th February 2021

PRESENTED BY
MAHMOUD KHALIFA
40+ YEARS EXPERIENCE
IN
GAS TURBINES

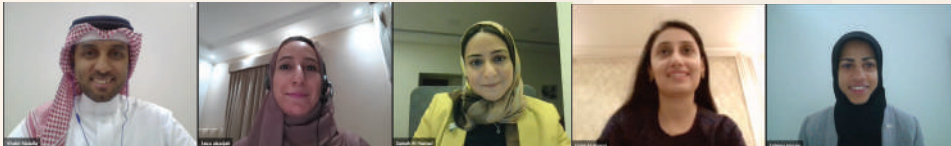
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GSMR
الجمعية الخليجية للصيانة والاعتمادية
Gulf Society For Maintenance & Reliability

WEBINAR

Women's Day Special in association with WIAM Committee: Business Benefits of Gender Diversity



Panelists:
Dalal Al Asousi, Faiza Alzadjali, Fatema Husain
Moderator:
Khalid Al Essa

WEBINAR

Analytics Driven Operational Excellence

Presenter:
Maher Maamari, Daniel Rodas
Moderator:
Husain Al Dailami

GE Digital

VIRTUAL ACADEMY

Analytics Driven Operational Excellence
Gulf Society for Maintenance & Reliability (GSMR)

WORKSHOP

M&R Body of Knowledge (and CMRP Exam)

Facilitator:
Husain Al Ali, CMRP, CAMA



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WIN! WIN! WIN!

Send your entries to
melissa.nazareth@gsmrgulf.org
with your full name, company name,
photo and GSMR ID, and stand the
chance to win

EXCITING PRIZES

Lucky winners will be announced.
Last date for entries: June 30, 2021

When was GSMR Virtual Academy launched?

- (a) May 2020
- (b) October 2020
- (c) January 2021

WINNER

of the competition published in the
February 2021 edition



Yerem Davtyan
UAE
GSMR ID: 727

Answer Key...

3	2	6	7	1	4	9	5	8
7	4	1	9	5	8	3	2	6
5	8	9	6	2	3	4	7	1
8	5	7	4	9	1	6	3	2
4	1	2	5	3	6	7	8	9
9	6	3	8	7	2	1	4	5
1	7	8	2	4	9	5	6	3
2	9	4	3	6	5	8	1	7
6	3	5	1	8	7	2	9	4

“Generosity is giving more than you can, and pride is taking less than you need.” – *Khalil Gibran*

Quick 5 Ramadan Tips

- Be safe for yourself and your loved ones
We urge you to follow the health and safety guidelines laid down by the Government and Health authorities
- Stay hydrated
Drink sufficient water before you start your fast and after fasting hours to ensure you remain active and don't feel sluggish and fatigued
- Sleep well
Ensure you get a good night's sleep and rest for a bit during the day if you must. A mind that's well rested can focus better and be more productive
- Eat nutritious foods
While it may be tempting to eat sugar laden and greasy foods, try and avoid them especially right before you start fasting and when you're breaking your fast. Eating foods that gradually increase your energy instead of suddenly spiking it will do you well
- Pay it forward in your own small way
While generosity must be expressed all year round, Ramadan is a wonderful time to remind ourselves of our blessings and help the needy. Count your blessings!