

Marafiq World

Issue 47 | Oct 2021



Farewell to General
Manager of Corporate
Governance.



The Jubail Orphans
Association honored
Marafiq for its constant
support and continuous
partnership.

The Eastern Province Governor,
Prince Saud bin Nayef Al Saud
recognized Marafiq for its support to
the local economy.



Contents

Message from the President and CEO **p3**

Achievements **p4**

Farewell **p5**

Corporate Events **p7**

Corporate Social Responsibility **p11**

Highlights **p12**

Corporate Strategy **p15**

Human Resources and Services **p17**

Safety **p19**

Corporate Communication **p21**

Reliability **p22**

Asset Strategy Planning **p23**

Technical Services **p24**

Talented Writers **p25**

**Marafiq
World**

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MARAFIQ E- SERVICE

GEOGRAPHICAL Presence

01 | Jubail

Sea Water Cooling
Potable Water
Industrial Waste Water
Sanitary Waste Water

02 | Ras Al Khair

Sea Water Cooling
Potable Water
Industrial Waste Water
Sanitary Waste Water

03 | Yanbu

Power Generation
Power Transmission
Power Distribution
Gas Distribution
Sea Water Cooling
Potable Water
Industrial Waste Water
Sanitary Waste Water

04 | Jeddah

Sanitary Waste Water

05 | Jizan

Power Distribution





Mohammed B. Al-Zuabi
President and CEO

“Refrain from work if conditions are unsafe until the situation is corrected”

Message from the President and CEO

Regarding safety, an incident occurred with a joint-venture company, which could have been avoided if there was complete adherence to the safety procedures such as the Permit-To-Work (PTW) guidelines and governance with the industrial customers. Enhancing the safety culture among field workers and implementing robust intersection management with each potential customer is a crucial learning from this incident. Therefore, we must remain diligent and mindful of being safe in our workplace and at home. Safety starts with each individual, and compliance to systems and procedures is a measure to help you remain safe, so I urge every one of you not to gamble with safety and refrain from work if conditions are unsafe until the situation is corrected. To continue improving our safety culture, we need to continuously involve employees and contractors from various parts of the organization to make safety a shared responsibility. In addition, we need to ensure that we are proactive in reporting Safe Un-Safe Acts (SUSA) through our SharePoint portal.

Environmental protection is a top priority for Marafiq, and in this regard, we give our full attention to strictly following the Royal Commission environmental regulations around the clock. In addition, water recycling started its initiatives for fly-ash and sludge beneficial reuse at both Yanbu and Jubail areas. Marafiq continues its efforts to lead utilities and industries in this direction and will continue working with all concerned government and private entities to be a leading example for others to follow.

Marafiq continues to empower the growth of industries in Jubail and Yanbu through its reliable

supply of power and water. In light of this, Marafiq has been working diligently to enhance its intelligent digital-utility enterprise through various technological tools to offer sustainable, reliable, and cost-effective power and utility services. The utility industry as a whole is undergoing a rapid adaption to digital innovation and transformation. Marafiq has been rolling out a comprehensive digital transformation program that aims to optimize operations, modernize infrastructure, accelerate business performance, advance customer experience, and streamline internal processes. Marafiq plays a prominent role in powering the next wave of growth for the Saudi Vision 2030 industrial ventures and, therefore, will continue its efforts in digitalizing its power generation, water production, and waste-water recycling to enable the Kingdom's ambitious economic plans, especially within the evolving energy-intensive industrial ecosystems.

Marafiq is strategically positioned to provide core and expandable utility services within the Royal Commission areas. In addition to our strategic position with Royal Commission, Marafiq will also aim to enhance its market share by providing water and cogeneration utility services across the Kingdom of Saudi Arabia. This strategic direction will enable Marafiq to take advantage of lucrative opportunities to expand and position itself as a leading supplier and developer of utility services in major industrial cities across the Kingdom.

The success of Marafiq is a result of all the collective efforts from all its staff; together, we are making a difference and building a leading utility service provider within the Kingdom of Saudi Arabia.



Summary of Marafiq's Achievements

- Started wheeling of power from Yanbu to Jubail from mid-March for Seawater Cooling in Jubail.
- Signed a research agreement with Saline Water Conversion Corporation (SWCC) to extract metals and minerals from desalination plants discharged brine.
- Signed an agreement with Al-Safwa Cement company for Fly ash reuse/utilization.
- Improved environmental compliance >98%.
- Patent under registration for the development of methods for monitoring marine waterbody sustainability at discharge sites.
- Resumed internal class training and workshops for all staff.
- Virtual meetings in Yanbu with community customers to listen to their comments, suggestions and concerns regards Marafiq's services.
- Signed an agreement for exporting water between Marafiq and National Water Company (NWC), supplying water to Yanbu downtown increases reliability of water supply to Yanbu.
- Gas Distribution Network availability achieved 100% YTD.
- Enabled 6,633 online meetings through Cisco Webex from January to June 2021.
- Met customer demands with high water quality without any interruptions.
- Improved sustainable and clean environment by reducing CO2 emissions by optimizing Multiple-Effect Distillation (MED) operation strategy.

Farewell to BoD Members



His Excellency the Chairman of the Royal Commission, Chairman of the Board of Directors for Marafiq, Engineer Abdallah Ibrahim Al-Saadon, in the presence of the President and CEO Mohammed Berki Al-Zuabi, honored a number of members of the Board of Directors whose term of service has ended.

- Ali Abdullah Al-Ayed, representing the Public Investment Fund.
- Mustafa Muhammad Al-Mahdi, representing the Royal Commission for Jubail and Yanbu.
- Nabil Abdulaziz Al-Nuaim, representing Saudi Aramco.
- Abdulrahman Ahmad Shamsaddin, representing SABIC.
- Muhammad Eid Al-Khater, representing the private sector.



Farewell to General Manager of Corporate Governance

His Excellency, the Chairman of the Board of Directors, Abdallah Ibrahim Al-Saadon, and Marafiq President and CEO, Mohammed Berki Al-Zuabi recognized the General Manager of Corporate Governance, Abdulla Ibrahim Al-Qater, who has retired as a founding member of Marafiq.



Eastern Province Governor

During the opening of the SAMIF factory for metal industries (new plant in Dammam's 3rd Industrial City on an area of 60,600 square meters), the Eastern Province Governor, His Royal Highness Prince Saud bin Nayef Al Saud recognized Marafiq for its support to the local economy. Furthermore, His Royal Highness honored Marafiq for its sustainable efforts in providing reliable services to its customers. His Royal Highness praised the industrial sector's support in the Kingdom and the various

initiatives that are developing the industry and expanding contribution to the local economy. It is worth mentioning that the SAMIF factory will produce metal structures for buildings, towers, bridges, and tanks for various sectors within the industry.



Board of Directors First Meeting for 2021

On 11 April 2021, Marafiq held its first Board of Directors Meeting for 2021 at Al-Fursan Hall in Jubail Industrial City. Headed by His Excellency, Abdullah Ibrahim Al-Saadon, the Royal Commission for Jubail and Yanbu and Marafiq Chairman, the BoD meeting was also attended by Marafiq executive management.



Board of Directors Second Meeting for 2021

On 1 July 2021, Marafiq held its second Board of Directors meeting for 2021 at Al-Fursan Hall in Jubail Industrial City.



Digital Transformation Journey with Obeikan Investment Group

The President and CEO, Mohammed Berki Al-Zuabi and various executives from Marafiq visited Obeikan Investment Group, which is one of the leading manufacturers in digital transformation and an education solutions provider. The teams discussed Obeikan's successes and key learnings in its digital transformation journey.



Marafiq's Laboratory for Sadara

The President and CEO, Mohammed Berki Al-Zuabi, visited Marafiq's laboratory for Sadara, where he was received by the CEO of Sadara, Dr.

Faisal Al-Faqeer. The parties discussed future cooperation and joint development activities.



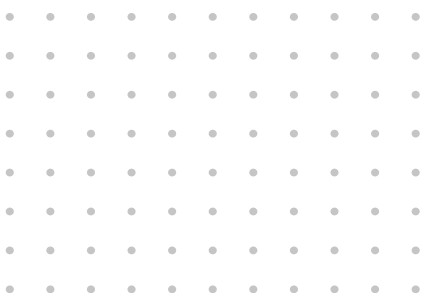
Future Plans with ACWA Power

Marafiq President and CEO, Mohammed Berki Al-Zuabi hosted Mohammad Abdullah Abunayyan, Chairman, ACWA Power at Marafiq Head Office in Jubail to discuss future plans in the water and power business.



Joint Cooperation in the Industrial Cities Workshop

Marafiq team held a two-day coordination workshops at Marafiq Head Office in Jubail from 4 to 5 April 2021 to discuss the joint strategies and cooperation in the industrial cities. The workshop was attended by representatives from Royal Commission for Jubail, Yanbu and Jizan City for Primary and Downstream Industries.



Jubail Orphans Association

The Jubail Orphans Association honored Marafiq for its constant support and continuous partnership. The Chairman of the Society's Council, Fahad Al-Mishal, delivered a memorial shield to the President and CEO, Mohammed Berki Al-Zuabi.



Electrical Equipment Program

Marafiq continuously supports charities as one of its social responsibility and core values. Nabd Al-Khair charity has received Marafiq's support for electrical equipment program that aids needy families.



IMS Auditors Training

As part of the ERM team's efforts to improve its IMS auditing within Marafiq, it is pleased to announce the successful completion of two sessions of the auditors training agenda that was developed for 2021.

intertek

مرافق MARAFIQ

2021

IMS Training

ERM DEPARTMENT
HUMAN CAPITAL DEPARTMENT

"Learning is a treasure that will follow its owner everywhere"

QHSE INTRODUCTION
(31 Jan - 04 Feb)

- ISO 9001
- ISO 14001
- ISO 45001

AHMED KARMALLAH & MUHAMMAD MASOOM SAIF
INTERTEK LEAD AUDITORS

PREPARATION SESSIONS
(22 Mar - 23 Mar)

- Auditing Exercises
- Auditor's Qualities
- Audit Reporting

ABDULRAHMAN AL-HABASHI & AHMED AL-ANGARI
MARAFIQ IMS TEAM

LEAD AUDITOR (IRCA)
(to be scheduled)

- Leading Audits
- IRCA Accreditation
- Certification Exam

FAISAL HUMAYUN & AHMED KARMALLAH
INTERTEK LEAD AUDITORS

Resumption of Face-to-Face Classroom Trainings

The Human Capital Development Department (HCDD) is pleased that its first sessions of internal classroom training held on 4th July 2021, was kicked-off successfully. All Covid-19 precautionary measures were implemented accordingly.



Jeddah Airport 2 ISTP Project Recognition

In recognition of their contribution and support in different stages of the development of Jeddah Airport 2 ISTP Project, Vice President for Finance, Mohammad Mulhim and General Manager, Corporate Strategy awarded the certificate of appreciation to these employees on 30 June 2021.



EFQM Champions Recognized for Completing Training

On 16 June 2021, The President and CEO was briefed about the EFQM Project by Salman Al-Zahrany, Manager of Asset Strategy Planning. The EFQM champions were also recognized by the CEO during the meeting for completing their required training.

Royal Commission's Lifelong Learning City awards

On 9 June 2021, the Royal Commission of Jubail CEO, Mustafa Al-Mahdi presented a trophy to Ahmed Khleawi Al-Khleawi, General Manager Human Resources and Services as a member of the Lifelong Learning Committee of Royal Commission of Jubail representing Marafiq. The awarding was held during the inauguration of the Royal Commission's Lifelong Learning City and the awarding of the center's logo contest winners in Jubail Industrial City.



Potable Water Pump Station Project in Ras Al-Khair

The President and CEO, Mohammed Berki Al-Zuabi and Vice President of Operations and Maintenance Jubail, Mahmoud Saleh Al-Theeb conducted a site visit at the potable water pump station project in Ras Al-Khair Industrial City (RIC) on 31 May 2021.





By: **Ahmed M. K. Al-Shangiti**
General Manager
Corporate Strategy

“The strategy is strongly associated with the organization’s high-level business goals”

Business Goals are Critical to Long-Term Success

Goals are the driving factors that lead an individual or an organization to its logical trajectory, but it is evident that most of the time, they fail to achieve the goals as they were perceived or even not at all. According to a research paper from University of Scranton, around 92% of people don’t achieve their goals, each year.



This is where the strategy plays its role, the definition of strategy is multilayered and cascades across business segments. Its broadest meaning is to provide a game plan for how the organization will achieve its strategic goals. This game plan is typically focused on achieving commercial and/or positioning success in the marketplace, as per the defined goals.

For a strategy to be successful the following should be kept in mind:

- The strategy is strongly associated with the organization’s high-level business goals.
- The implementation design for the execution of the strategy is practical, achievable and market aligned.
- They are based on realistic evidence or corroborated assumptions.

- They closely consider the organization’s capabilities and capacity to execute.
- The market validation is done for the assumptions, before executing.

Mostly, the organizations develop short- and long-term strategies to achieve pre-defined goals for each phase. Short term strategies are defined for specific goals to be achieved in a smaller time frame. Mostly, they are to make your way, show your existence and measure the results.

Long term strategies are to build on these short-term gains. These plans are arguably the most crucial to the continued success of a business, ultimately highlighting the way in which business segments interact to achieve long-term profitability, returns on investment and market share.

Short Term Actions for long term RESULTS



While developing a strategy, we need to be aware of a few elements that enable the strategist to formulate a strategy that has the highest probability of meeting its objectives:

- Clear and correlating vision and mission statements.
- Top-down strategy design.
- Identify strategy focused area.
- Learning from case studies.
- SWOT analysis.
- Formulate 1st draft of the strategy.
- Comparative studies with successful and failure cases.
- Formulate 2nd draft of the strategy.
- Outline key timelines and initiatives.
- Validate the strategy with impact group.
- Finalize the final version of strategy.

In today's world, it rarely happens that a good strategy be valued until the organization faces a failing strategy. Therefore, the strategy execution must be considered during-the-journey assessment and ensure that things are moving in the right direction.



Virtual Training to Upskilling and Multiskilling Marafiq Workforce

Upskilling training has an abundance of advantages, from improving employee motivation to cost-saving. Marafiq uses the Training Need Analysis (TNA) methodology to identify and assess gaps in current employees' knowledge.

TNA allows staff to realize their grey areas, develop their career development path, and then offer the time and resources to help them to nurture accordingly.

When Covid-19 became a reality in early 2020, everything changed dramatically. Marafiq was also forced into lockdown mode, with a large percentage of the workforce suddenly operating from home. The training department faced unique challenges since its inception and was affected deeply by the pandemic. Although the situation required out of box solutions, the Human Capital Development Department (HCDD) team and management handled the problem timely and vigorously by implementing a virtual training methodology.

Marafiq's business needs and interest in virtual training accelerated at an unprecedented pace to keep up with the development needs of its employees. As a result, Marafiq addressed the issue and strategically implemented an approach that provided a virtual platform to meet the requirements for the various developments. As a result, the Marafiq Virtual Academy and Virtual Training via Webex meetings was launched, which was a step towards excellence that mitigated the Covid-19 risk.

Marafiq's Virtual Academy offered the following benefits:

- Just-in-time learning that can be applied immediately.
- Spaced learning opportunities, especially when physical distancing was mandatory.
- Greater chance for individualized contribution, feedback, and coaching.
- Ability to reach employees that are isolated or challenged.
- Access to coursework from anywhere at any time.
- Combination of structure and freedom.
- Effective time management.
- Asynchronous discussions with classmates.

The launch of Marafiq Virtual Training helped employees at all levels, from management to field working staff, to keep their soft and technical skills up-to-date. The core areas for soft and technical skills include:

- Leadership courses
- Management courses
- Finance courses
- Microsoft Office Applications courses
- Maintenance library
- Specialized programs for power generation and water production
- Occupational health and safety programs
- Project management library

Employees in Marafiq enjoy using the Marafiq Virtual Academy, and it has become a powerful tool in upskilling and multiskilling our workforce.

By: **Ahmed K. Al-Khleawi**

General Manager
Human Resource
and Services



“Marafiq’s business needs and interest in virtual training accelerated at an unprecedented pace to keep up with the development needs of its employees”



MARAFIQ

VIRTUAL ACADEMY

LEARN. PRACTICE. GROW.



towards
excellence



By: **Fouad A. Jambi**
 Manager, Industrial
 Security - Yanbu

**“You can’t
 manage
 what you
 can’t
 measure”**

– **Peter Drucker**

Safety Performance and Key Focus Area

Measuring safety performance is as much part of a health and safety management system as sales, financial, production or order management. The primary purpose of measuring health and safety performance is to provide information on the progress and current status of the organization’s key focus area strategies, processes, activities towards the control of health and safety hazards.



Safety performance management against the organizations key focus areas nurture the development of the health, safety and hazard control by:

- Providing information on how the system operates in practice
- Identifying areas where remedial action is required
- Providing a basis for continual improvement
- Providing feedback and motivation

It is anticipated that the safety performance measures should be derived principally to meet the organizations internal and external needs.

**“Each
 organization
 must
 create and
 communicate
 performance
 measures
 that reflect
 its unique
 strategy”**

– **Kaplan**

Although the primary focus for performance measurement is to meet the internal needs of the organization, there is an increasing need to demonstrate to external stakeholders (regulators, government bodies, shareholders, suppliers, contractors, etc.) that arrangements to control health and safety risks are in place, operating correctly and effectively.

Effective safety performance management against organization's key focus areas can be effectively measured through a balanced approach of the following means:

Measuring efforts and successes: Pro-active monitoring

An important key to improving safety performance is through effective utilization of leading measures, which measure the output of our safety efforts which are mostly proactive (in-direct).

- Few of the tools are surveys, safety improvement reports from staff, analysis, management response to safety.
- Line management response to safety.
- Employees participation in safety efforts.

When designed with employees input and participation, these measures can serve as an influence to increase employee motivation for safety. Well designed and executed leading measures may also serve as a catalyst to drive positive change in an organization.

Measuring failure: Reactive monitoring

Failures in risk control also need to be measured to provide opportunities for organizations to check performance, learn from failures and improve the health and safety management system. Reactive monitoring arrangements include systems to identify and report:

- Injuries and work-related ill health.
- Other losses such as damage to property.
- Incidents, including those with the potential to cause injury, ill health or loss.
- Hazards and faults.
- Weaknesses or omissions in performance standards and systems.

Measuring the health and safety culture

The health and safety culture of an organization is an important factor in ensuring the effectiveness of risk control. Measuring aspects of the safety culture therefore forms part of the overall process of measuring health and safety performance.

Measuring progress with plans and objectives

One of the key outputs of the planning process is plans and objectives to develop, maintain and improve the health and safety management system. The overall goals set at the highest level in the organization need to be put into effect by a series of linked plans and objectives. These should cascade down the various levels within the organization with efficient measurement system in place.

Measuring safety performance against the key focus areas is an ongoing activity, so in one sense the measurement process is continuous. However, like any other activity measurement should be both efficient and effective, so the frequency with which it takes place needs to be planned appropriately e.g. monthly, quarterly and annually. Performance measures are only useful if there is a baseline against which to compare the measured results and identify follow up actions.





By: **Saeed K. Al-Abdullah**
Manager, Corporate
Communication

“We must continue to have our finger on the pulse to sustain a high level of stakeholder engagement and satisfaction”

Corporate Communication Efforts in Addressing Stakeholder Related Matters on Social Media

Stakeholder management is one of Marafiq’s most important focus areas; as the corporate communication department, we are positioned to support various departments that interface with strategic customers. In this regard, we monitor and scan our stakeholders and analyze their situational issues to develop appropriate and explicit messages that improve stakeholder engagement and satisfaction.

During the two months of August and September, Marafiq received 1,478 messages across all its various social media accounts; these include direct messages, comments, and mentions. As a result, the corporate communication department, with the support and input from various departments positively focus its attention on stakeholder engagement and improving the response rate.

With the intensive support of the employees in our customer relations department, customers who raised their issues through Marafiq’s Twitter account were contacted, and their issues were discussed, and the majority of them resolved. Furthermore, it is worth mentioning that residential customers can quickly raise tickets through the eMarafiq application, which is user-friendly with many functionalities (this app can be downloaded from the Apple and Android stores).

Social media has become a powerful communication tool that supports our digital strategies to develop online stakeholder relationships and develop Marafiq’s brand. In addition, Marafiq continues to look towards the horizon for new growth opportunities within the Kingdom of Saudi Arabia, and as its business expands, so too will its influence and followers. Therefore, we must continue to have our finger on the pulse to sustain a high level of stakeholder engagement and satisfaction.



Marafiq's Reliability Improvement Program

Marafiq's company-wide reliability improvement program is reaching maturity through developing a mind-set of proactive approaches that build a culture of reliability. There have been many new developments and vital achievements in 2020.

The long-term asset management project has been kicked-off to develop an asset management policy, strategy and ensure that all stakeholders are aligned to deliver the long-term asset plans. It helps Marafiq to focus on the whole life-cycle activities rather than short-term and avoid an urgent CAPEX scenario.

To prevent a hazardous condition and mitigate the consequences, Marafiq has implemented an Instrumented Protective Function (IPF) system for its protection devices. A big milestone related to the preparation of IPF Design Engineering Practice, IPF Lifecycle Document and IPF Testing Procedures have been completed with Marafiq internal resources and validated by Exida (which is a leading global consultant and certification body in functional safety).

People's reliability has a direct impact on the production and

service quality. "Marafiq has provided robust certification programs to enhance competency in the area of Reliability, Maintenance, Risk Based Inspection and Asset Management." Approximately 40 employees have successfully achieved international certifications in CMRP, API 580 and CAMA in the last two years.

"The recurrence of failures have significantly reduced by using a structured Root Cause Analysis (RCA) technique." This has enabled us to improve our plants availability for power generation units in Yanbu from 75% in 2015 to 93.3% in 2020 and ensured a resilient infrastructure to avoid outages.

We can be proud of what we have accomplished in the past years in support of the far-reaching reliability improvement goals. As we succeeded in the past, we can succeed in the future. However, it is important to learn from our past because the future will not necessarily be a simple continuation of what we have seen thus far. Corporate climate is exposed to the waves of rapid change and diversification.



By: **Ayman A. Y. Taher**
Manager, Asset
Performance and
Integrity

**"Improve
our plants
availability
for power
generation
units in Yanbu
from 75% in
2015 to 93.3%"**





By: **Salman A. Al-Zahrany**
 Manager, Asset Strategy
 Planning

Improving Performance Through the Excellence Model (EFQM)

Excellence is about doing the best, developing culture of excellence in the organization, open the path to success, and improve performances and achieve outstanding results.

Since the establishment of Marafiq in 2003, it has shown continued commitment to its internal development management systems to continue moving towards the highest possible levels of performance according to the best practices. This year, Marafiq starts implementing the EFQM model (European Foundation Quality Management) as part of its excellence journey. A team was created from various functions to lead the implementation, establish Marafiq excellence system, and help to recognize Marafiq efforts through EFQM before the end of 2021. EFQM is one of the most important excellence models adopted worldwide. It is helping organizations to understand their key strengths and potential gaps, and provides a framework that promotes collaboration necessary to achieve their objectives.

The EFQM model structure is based on the simple but powerful logic of asking three questions:

- “Why” does this organization exist? What purpose does it fulfil? Why this particular strategy? (**Direction**).
- “How” does it intend to deliver on its purpose and its strategy? (**Execution**).
- “What” has it actually achieved to date? What does it intend to achieve tomorrow? (**Results**).

The EFQM model consists of seven main criteria:

1. Purpose, vision and strategy
2. Organizational culture and leadership
3. Engaging stakeholders
4. Creating sustainable value
5. Driving performance and transformation
6. Stakeholder perception
7. Strategic and operational performance

RADAR is the acronym that EFQM uses to describe the logic behind the diagnostic tool it has been developed to help better manage the current way of working and diagnosing the strengths and opportunities for improvement.

The RADAR logic states the needs to determine the Results that aim to achieve as part of its strategy, have in place a number of Approaches that will deliver the required results, both now and in the future, Deploy these approaches appropriately, Assess and Refine the deployed approaches to learn and improve.



EFQM Foundation Training

Disposal and Utilization of Fly Ash to Protect the Environment

In a time of increasing environmental concerns and regulations, Marafiq finds the best practices being used to safeguard our environment by increasing the efficiency of waste management and recycling initiatives.

Vision 2030, also demand to raise our responsibility for future generations and essential to the quality of our daily lives by putting more efforts to improve the management and the reuse/ recycling of all types of wastes.

In recent years, Marafiq has conducted several internal and external studies to improve waste recycling. One of them is a recent comprehensive study regarding the effective management and recycling of fly ash and develop market assessment of prospective opportunities to identify policy options related to the full utilization of the fly ash waste.

Fly ash is a by-product of oil-burning at power industry and an industrial hazardous waste having the great significance to its multifunctional applications. It is defined as a fine-grained residue of oil combustion in power generation stations of electrical energy. These particles are smaller and almost totally spherical in shape, allowing them to flow easily.

The study explored the concept of fly ash utilization as a secondary alternative fuel (raw material) in cement kiln for cement production plant so the less amount to be sent to the disposal facilities. This saves the landfill space but further reduces greenhouse gas emissions and other pollutants. In the past the collection and disposal of the fly ash generated by Yanbu power plants was carried out by third party which involved collection, handling, disposal and treatment (as per the Royal Commission regulation) with a cost estimate of around SR 10 million per year.

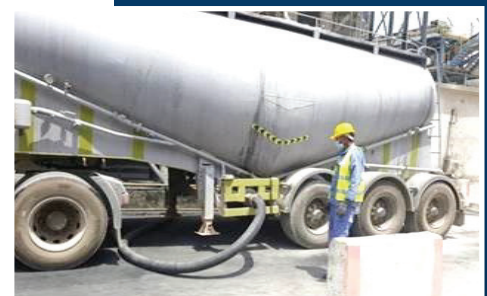
As a result of this study, Marafiq and Al-Safwa Cement agreed to use the fly ash in their kiln. The process of burning the fly ash along with the other kinds of waste in the cement kiln at high temperature use it up completely without leaving behind any residue. Not only that but the cost of fly ash disposal has also reduced from SR 10 million to SR 2.8 million to cover the transportation to cement facility.

Implementation of such actions will strengthen our plant waste management and recycling processes and safeguard our environment that eventually achieve resource efficiency.



By: **Ali A. A. Al-Aseeri**
Manager, Technical Services

“Marafiq finds the best practices being used to safeguard our environment”



On 5 May 2021, Marafiq successfully unloaded its first fly ash truck in Al-Safwa Cement facility.



By: **Maha M. Al-Qahtani**
Customer Relation
Department -Jubail

“I was excited to be one of the Marafiq family members”

Empowering Employees In Marafiq

Contradicting emotions, is a common feeling amongst employees for the first few working days. These sorts of feelings happened to me when I moved to Marafiq in Jubail, seven months ago, as a Customer Relations Department (CRD) employee. I was excited to be one of the Marafiq family members, at the same time stressed and eager to prove myself to the management. Adjusting to Marafiq working environment was a challenge, I didn't know what to expect. I'm normally the person who is able to strike up a conversation with everyone and talk about all related subjects. Though I had great previous working experience the case with Marafiq was different. My first day as a CRD employee was a busy experience full of meetings new people and learning valuable information about my new career. I was ready and prepared for diverse introductions and varied conversations on my first day, because It's significant for me to have a strong first impression towards my coworkers and my managers.

In this article, I will provide you with my story about my experience in Marafiq and I will compare my first day to my current day in Marafiq. From the first day, the Human Resources Department (HRD) successfully established a warm welcoming environment through an orientation meeting, which helped in reducing my nervousness in the first day at Marafiq. During the meeting, HRD provided the necessary information such as; an introduction to Marafiq vision and mission, functions and culture. Also, a review of Marafiq's organizational chart and benefits

plan information. The closing orientation meeting included signing paperwork, providing an ID card, and reviewing Marafiq's policies. Additionally, HRD had assigned an employee to show me around the building and to introduce me to my manager, who provided a fruitful guidance and information about the department and the purpose of the functions within CRD, the meeting followed with a memorable discussion about the expectations to ensure success in the department.

I am proud to be a Marafiq employee, member of the CRD team, IMS Internal Auditor, SharePoint site Publisher, evacuation coordinator, assigned CRD purchase requestor in SAP System, and support as an eservice administrator. This was all in seven months from the first day of joining Marafiq. With the support of the CRD Jubail leader and Human Capital Development (HCD) management my Independent Development Program (IDP) have been finalized and reflected on my Marafiq Academy application, and has enabled me to complete a lot of courses with the encouragement of my manager. With the great leadership from my CRD manager, the support of the CRD team and directions of other business units in Marafiq, I have had an enormous opportunity to empower myself through the development program. This has helped me to improve my knowledge and to shape my skills to develop my future career path and growth in Marafiq. The contradicting feeling that I once had on the first day have changed to be self-confident, honored and joy of being one of the Marafiq employees.

Marafiq History In The Making

A New Era Has Emerged

Marafiq has successful leaders that are empowering its workforce, and engage with a diversity of nationalities within its talent pool and provides opportunities for everybody to make a positive contribution to the Saudi economy.

I am proud to be a woman working in Marafiq, Vision 2030 mission statement states that, "Saudi women are an important component of our strength, constituting more than 50% of the total number of university graduates. We will continue to develop their talent, invest their energies, and enable them to have the right opportunities to build their future and contribute to the development of our society and economy". Marafiq has a strong commitment to empowering the Saudi youth, particularly through its Professional Development Program, which is supported by Marafiq's leadership.

Employees have an opportunity to grow in a nurturing environment which will take Marafiq to its next horizons. Marafiq continues to develop employees' talents and investing their energies will inevitably strengthen their position in decision-making positions and successions in their career. This forms one of the main pillars of the Kingdom's National Transformation Program 2020 and Vision 2030, which aims to increase national talent participation in the labor market. We know that Marafiq Human Resources Department is the backbone of the company so their tremendous efforts towards developing their talented employees and champions must be recognized and appreciated.

We are all aware of what has been done and the efforts made towards acquiring the best talents, and we wish nothing else but to add significant value to Marafiq's business.



By: **Maha A. Al-Mazroa**
Enterprise Risk
Management
Department

"The beauty of the world lies in the diversity of its people"

– (Author Unknown)

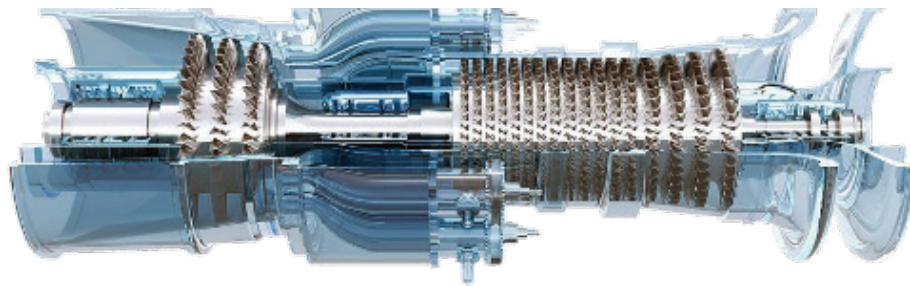




By: **Ayed M. Al-Harathi**
Sr. Engineer,
Process Power
Technical Services
- Yanbu

“I volunteer to share the knowledge developed in this tool and guide whoever is interested”

Gas Turbine Performance



A gas turbine test is conducted for several reasons. For example, a contractual performance test relates to verifying the performance guarantees provided by the OEM or EPC of the plant. Most turbines are provided with a heat-rate guarantee-not just a power output guarantee. Heat rate is the measure of how much power is produced for the amount of energy.

Another reason to conduct a performance test is to evaluate the performance of the unit in a daily basis. The difference between a contractual evaluation and a periodic test mainly relays in the accuracy of the testing instrumentation used. A contractual test uses high-accuracy testing equipment to ensure that the test (conducted typically for 3 hours) has the lowest test uncertainty for contractual purposes. In the case of an evaluation conducted in a regular (daily or weekly) basis, we are looking to calculate the trend of values that will show the change overtime of the gas turbine performance.

For both types of tests, a good guideline to ensure a quality evaluation is the ASME PTC 22 performance testing code.

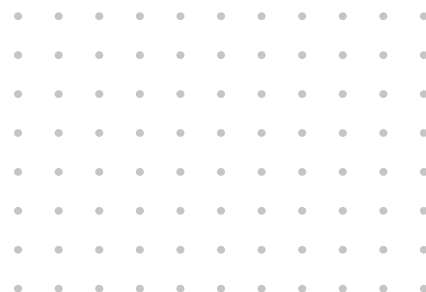
Our article will focus on the continuous evaluation conducted a site to track the performance of the unit over time. For this type of evaluation, the following factors should be taken into consideration.

1. Gas Turbine Correction Curves

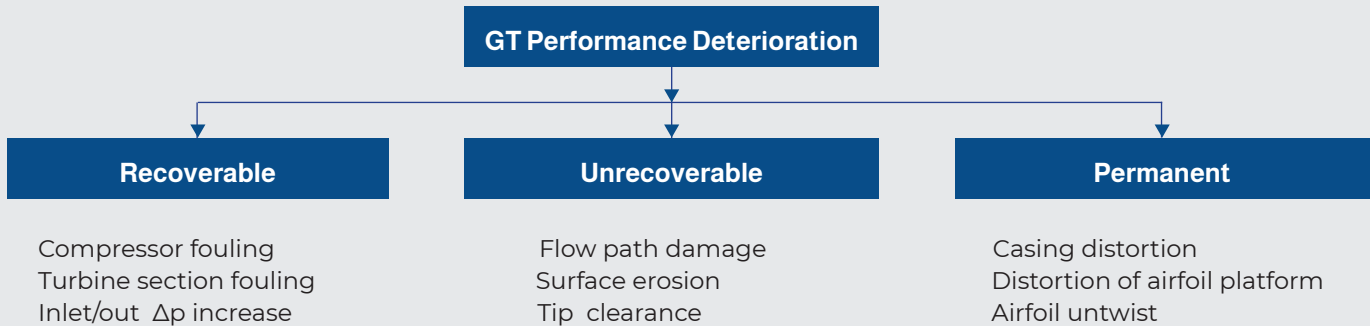
The gas turbine performance varies based on the weather conditions. Factors such as ambient temperature, relative humidity and ambient pressure. Other factors also play also an important role, such as the frequency of the grid or the power factor and the low heating value and density of the fuel. In order to be able to compare the results power plants have a set of reference conditions. (ISO, site average conditions, etc.). In order to calculate the test results back to the refence condition and have results that can be compared overtime, there is the need to use gas turbine correction curves. The power output and heat rate are measured and corrected back to the reference conditions using the gas turbine correction curves.

2. Gas Turbine Degradation

One important factor to consider is the gas turbine performance degradation. All turbomachinery experiences losses in performance over time. Performance degradation is one of the types of deterioration in a gas turbine.



A further classification of performance degradation is the following:



Gas Turbine Performance Model Development

At our site (Marafiq), GE conducted a performance test for multiple gas turbines currently in various stages of rehabilitation- some completed and others are in progress as part of the rehabilitation scope.

During this period, we took the initiative to develop a standard gas turbine performance template for Marafiq gas turbine units.

The model prepared is primarily reference from Performance Test Code (PTC) – 22 and General Electric. It needs to be mentioned that it has taken considerable time to reach the final template; integrating several primary sheets for various parameters, checking, and crosschecking with various sample parameters - running into 1095 readings across multiple equations.

Each time the results were set off against the results from Performance guarantee tests obtained from GE and required modifications were carried out, as needed, before reaching the current template.

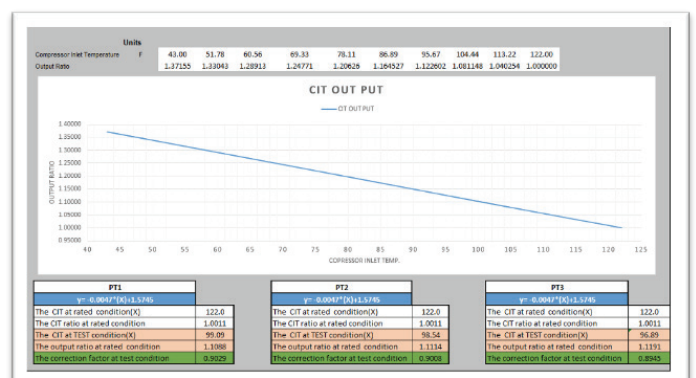
I volunteer to share the knowledge developed in this tool and guide whoever is interested. The model consists of the following:

1. Automated Data Collection

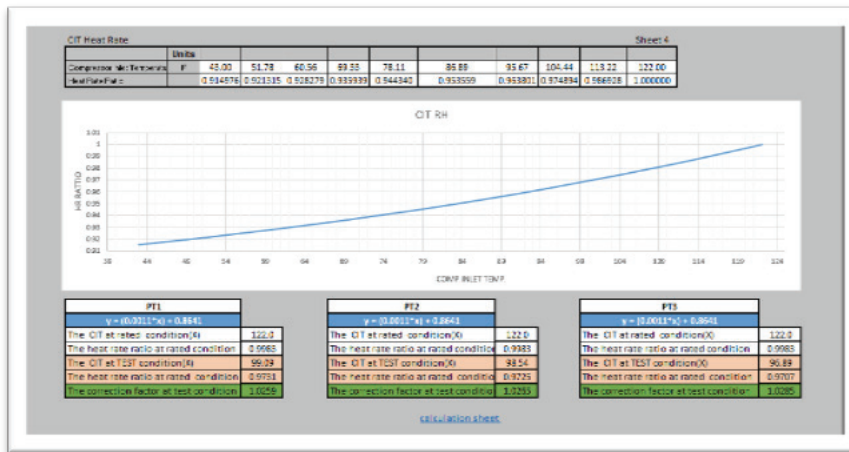
Tag	WQ	TTXM	TNH	FQG	iftg	DWATT
COUNT	352	352	352	352	352	352
Average	5.46	1004.36	3599.63	11.02	43.07	67.89
Maximum	5.51	1005.55	3602.85	11.06	43.17	68.28
Minimum	5.40	1003.55	3596.95	10.96	42.96	67.50
Std Deviation	0.02	0.35	1.39	0.02	0.04	0.14
unit	lb/s	F	%	lb/s	F	KW
	5.4641685	1004.03076	3601.45068	11.02652645	42.95944595	67.92838397
	5.4648420	1004.30481	3601.48511	11.02725363	42.9635562	67.93347687
	5.4577465	1004.08337	3601.27759	11.01919079	42.96768188	67.97685242
	5.4583025	1003.9328	3601.00562	11.02453804	42.96774292	67.86257935
	5.46032	1004.51032	3600.67749	11.01535558	42.96775436	67.90859985
	5.4493151	1004.27972	3600.48291	11.01368332	42.97172546	67.88561249
	5.4922247	1004.07074	3600.4812	11.02153882	42.96777725	68.00431824
	5.4641912	1004.58191	3600.45288	11.01106167	42.97177124	67.8534696
	5.4680281	1004.40741	3600.14722	11.02353867	42.97175538	67.8735733
	5.4720322	1004.46161	3600.0271	11.02435017	42.97594452	67.95690155
	5.4403782	1004.23779	3600.19698	11.01483727	42.97583771	67.66486359
	5.4576535	1004.30273	3600.3042	11.01783562	42.97600555	67.77939115
	5.4561172	1004.45087	3600.50903	11.02235889	42.98819733	67.70146179
	5.4549136	1004.60742	3600.36816	11.01386833	42.97536359	67.90856334
	5.4362321	1004.5531	3600.51807	11.01963806	42.98421097	67.7002182

2. Configured Correction Curves

2.1. Inlet Temperature Correction with Output



2.2. Inlet temperature correction with heat rate



3. Calculation Sheet

GAS TURBINE PERFORMANCE CORRECTION			
The correction factors			
POWER		HEAT RATE	
Inlet Temperature (C)		Inlet Temperature (C)	
PT1	0.90203	correction factor	1.0253
PT2	0.80079	correction factor	1.0265
PT3	0.89455	correction factor	1.0285
Inlet Humidity (%)		Inlet Humidity (%)	
Water Injection		Water Injection	
PT1	1.0000	correction factor	1.0000
PT2	1.0000	correction factor	1.0000
PT3	1.0000	correction factor	1.0000
Fuel Composition		Fuel Composition	
PT1	1.0021	correction factor	0.9953
PT2	1.0021	correction factor	0.9953
PT3	1.0021	correction factor	0.9953
Total Corrections=		Total Corrections	
PT1	0.9023	PT1	1.0194
Masured MW	67.89	NG LHV kj/kg	44021
Corrected Power Output (MW)	61.26	Fuel flow kg/hr	17979
		HC Measurement GJ/hr	791
		HR at Test condition KJ/kWh	11658
		Corrected Heat Rate, LHV (kJ/kWh)	11881
Total Corrections=		Total Corrections	
PT2	0.8998	PT2	1.0246
Masured MW	68.04	NG LHV kj/kg	44009.0000
Corrected Power Output (MW)	61.23	Fuel flow kg/hr	18011.2500
		HC Measurement GJ/hr	793
		HR Calculation at Test condition KJ/kWh	11649
		Corrected Heat Rate, LHV (kJ/kWh)	11936
Total Corrections=		Total Corrections	
PT3	0.8970	PT3	1.0260
Masured MW	68.30	NG LHV kj/kg	43993
Corrected Power Output (MW)	61.26	Fuel flow kg/hr	18060
		HC Measurement GJ/hr	795
		HR Calculation at Test condition KJ/kWh	11633
		Corrected Heat Rate, LHV (kJ/kWh)	11936
Corrected Power Output (MW)		Corrected Power Output (MW)	
61.249		61.249	
Corrected Heat Rate, LHV (kJ/kWh)		Corrected Heat Rate, LHV (kJ/kWh)	
11919		11919	
Gas Turbine thermal efficiency %		30.70	

Model Results

The gas turbine test results will be determined using this model. The thermal performance of the gas turbine when operating at test conditions and correcting these test results to the specified reference conditions.

The model has an explicit procedure to determine the following performance results:

- (a) Corrected power
- (b) Corrected heat rate (1/efficiency)

Comparison with the OEM Results

✓ Model output

Average Corrected post performance test-NG

GTG#7 Tested in simple cycle on Natural Gas fuel		
Parameters	Units	Average Result
Power Net Output	KW	61,249
Corrected Heat Rate, (LHV)	KJ/KWh	11,919

✓ GE model output

Average Corrected Post-Uprate Performance Results - NG

GTG#7 Tested in Simple Cycle on Natural Gas Fuel			
Parameter	Units	Average Result	Notes
Power Net Output	KW	61,985	None
Corrected Heat Rate, (LHV)	KJ/KWh	11,909	None

Results Comparison and Difference

The results obtained using the developed model Vs. the OEM results vary by 1.2%. I compared several times over the testing period of our gas turbines. The main difference lies in the different instruments used to measured power output, fuel flow and the measurements used for correcting the test results.

Further Developments

The main goal of this exercise is to be able to have a calculation tool calculate the performance of our gas turbine in a regular basis. This will allow our teams to develop further analysis and plans to avoid excessive

performance degradation on the gas turbines and conduct a preventive maintenance. Further analysis will derive from the initial used of this gas turbine performance calculation tool. It is in the interest of our company to focus the attention on the gas turbines efficiency to attain our profitability and strict environmental goals. This requires our team to be aware of the parameters that affect power plant performance. Each team member can contribute to improve the plant efficiency if the right tools and training is provided.