



الجمعية الخليجية للصيانة والأتمتة  
Gulf Society For Maintenance & Reliability

# EDUCATION & CERTIFICATION HANDBOOK

YOUR GATEWAY TO EXCELLENCE

TRAINING





## ➤ Introduction

The Gulf Society for Maintenance & Reliability (GSMR) has come a long way since its formation in 2010. Though young when compared to the more established societies in Europe and North America, GSMR has made its presence felt not only in the Arabian Gulf, but also internationally in perpetuating its mission to create a platform to share knowledge and network with maintenance, reliability and asset management professionals within the GCC countries and the whole world. All GCC national oil companies as well as major industrial companies contributed to the success of GSMR. Great strides have been made and GSMR is the proud organizer of the biennial MAINTCON conference that attracts the largest gathering of maintenance, reliability and asset management professionals and vendors in the Middle East. Strategic alliances have been built between GSMR and GCC Engineering societies as well as worldwide maintenance counterparts through the Global Forum for Maintenance and Asset Management (GFMAM). A culture of certification and continuous learning is fostered with the adoption of the Certified Maintenance and Reliability Professional (CMRP) and Certified Asset Management Assessor (CAMA) International Certification as well as various technical exchanges and training programs. The momentum of progress is accelerating and GSMR is committed to continue its role to promote excellence in maintenance, reliability and asset management in the Gulf.

“GSMR is recognized by the Society for Maintenance & Reliability Professionals (SMRP) as an approved provider of continuing education and training aligned with key subject areas related to maintenance, reliability and physical asset management.”

## ➤ Vision

To be recognized maintenance and reliability partners in the Gulf region.

## ➤ Mission

To provide an interactive platform for achieving excellence in maintenance, reliability and asset management through:

- Sharing Knowledge
- Exchanging Best practices
- Providing Training
- Facilitating Professional Certification



**Eyad Al Basrawi**  
 Chairman, GSMR

## » Chairman's Message

As we continue our journey towards excellence, we at Gulf Society for Maintenance & Reliability (GSMR) would like to advance the program of maintenance knowledge transfer & development workshops. GSMR supports development of maintenance and reliability employees across the GCC community through a broad range of knowledge transfer and skill building offerings. Continuous education is becoming increasingly important as new policies, procedures, and practices are being implemented on a continuous basis in GCC industries. Training will enhance core competencies and will significantly impact not only productivity, but also product quality and cost by implementing enhanced work processes, resulting in reduced downtime and improved employee morale.

Our asset management training capability covers a variety of maintenance and reliability topics including planning & scheduling, root cause analysis, predictive maintenance, shutdown management, business driven reliability, CMRP and CAMA Certifications, and more. Our goal is to equip industry professionals with the skills they need to create, implement and sustain improvement initiatives to extend the life of their physical assets. Having certified and experienced instructors with years of industry experience ensures that we can provide you and your team with the best possible training in the industry. In this era of digital revolution GSMR is staying competitive by embracing new skill sets, competences, and ways of thinking by the launch of one-of-its-kind virtual training platform GSMR Virtual Academy, a unique digital platform under the GSMR umbrella, which offers virtual training and certification courses in addition to a wide range of virtual events.

A further enhancement of our program will encompass training for technicians as well as for engineers in the different maintenance, reliability, and asset management fields.

## Message

GSMR Education & Certification Committee plays a vital role in fostering GSMR's position in the regional community and helping in raising awareness towards Maintenance, Reliability and Asset Management Professions. With its unique collection of best-in-class, high caliber and training workshops designed to showcase the latest methodological development and best practices in the fields of maintenance, reliability, and asset management.

The training workshops cover a wide range of subjects gathered from society stakeholders and its prestigious position in the Global Forum for Maintenance & Asset Management (GFMAM). Through the amalgamations of international and regional best practices, the workshops help to promote knowledge transfer and enhance the performance of individuals and their organizations respectively.

In GSMR, our mission lies in providing a platform for matured regional professionals to interact and share their knowledge and hard earned experiences with regional maintenance, reliability & asset management professionals and practitioners, as well as assisting them to gain international recognition like CMRP & CAMA certifications.

In addition to the existing set of well-established number of workshops, GSMR through its position as the first choice for quality training and development in this highly specialized field, can custom make and deliver specific workshops for technicians and engineers.

GSMR, Your Partner in Excellence



**Husain Al Ali**  
 Chairman, Education & Certification Committee

### OUR GLOBAL PARTNERS

- ABRAMAN Brazil
- AM COUNCIL Australia
- BEMAS Belgium
- EFNMS Europe
- GSMR Arabian Gulf Region
- IAM UK
- IFRAMI France
- JAAM Japan
- JIPM Japan
- PEMAC Canada
- SAAMA South Africa
- SAMRP USA



**STAY CONNECTED TO GLOBAL MAINTENANCE, RELIABILITY & ASSET MANAGEMENT INNOVATORS**  
 The GSMR community is a member of Global Forum for Maintenance & Asset Management (GFMAM),  
 a body connecting maintenance, reliability and asset management societies worldwide.

# MAINTENANCE & RELIABILITY BODY OF KNOWLEDGE

PHYSICAL SESSION 4 days | VIRTUAL SESSION 5 days

## OVERVIEW:

The workshop is designed to discuss and elaborate on what are considered to be well established, internationally recognized 5 Pillars in the Maintenance and Reliability Body of Knowledge: Business and Management, Manufacturing Process Reliability, Equipment Reliability, Organization and Leadership, and Work Management. The workshop provides a strong foundation for those interested in setting up the highly acclaimed international certificate, CMRP and has a track record of high pass rate.

## KEY OBJECTIVES:

- To discuss the critical knowledge, skills and abilities under each of the pillars in detail
- To review and discuss recommended readings, and practice questions in an interactive group discussion
- To discuss the application of the pillars in real life situations in additional modules

- To offer candidates an opportunity to share their thoughts on CMRP approach with Certified Maintenance and Reliability Professionals, and gain from their experience

## COURSE OUTLINE:

### Day 1:

- Module 1- Introduction & Overview
- Module 2- Business & Management
- Module 3- Manufacturing Process Reliability

### Day 2:

- Module 4- Equipment Reliability
- Module 5- Organization & Leadership
- Module 6- Work Management

### Day 3:

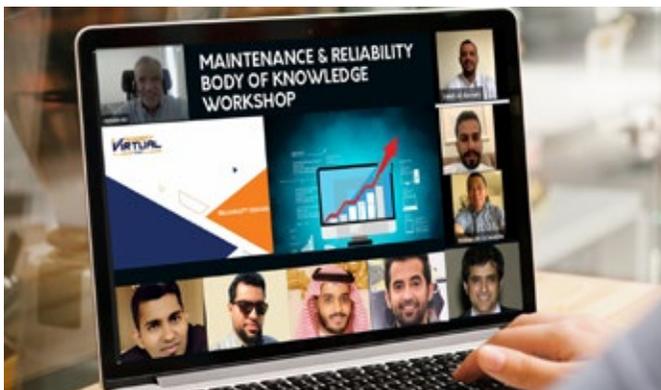
- Module 7- Predictive Maintenance
- Module 8- Reliability in Design

### Day 4

- Module 9- Operator Driven Reliability
- Module 10- Inventory Management

### Day 5

- Module 11- Work Management Process
- Module 12- Metrics



# HOLISTIC PHYSICAL ASSET MANAGEMENT

PHYSICAL SESSION 4 days | VIRTUAL SESSION 5 days

## OVERVIEW:

Over the last few decades, there have been major global advances in asset management standards, concepts and principles. More than ever organizations need to understand the importance of implementing a holistic approach to asset management to realize maximum value from their assets. This course will provide participants guidance on the development, implementation and maintenance of a comprehensive asset management system in the context of ISO 55000. It will also help participants to prepare for and write the Certified Asset Management Assessor (CAMA) Exam.

## KEY OBJECTIVES:

- To understand the concept and importance of Asset Management
- To learn about ISO 55000 suite of standards
- To learn about the different elements of an asset management system
- To understand how to implement ISO 55000 in your organization
- To understand how to maintain and assess the performance of an asset management system

## COURSE OUTLINE:

### Day 1:

- Introduction and ISO 55000
- Strategic Planning
- Asset Management Policy
- Asset Management Strategy & Objectives
- Demand Management
- Asset Management Planning & Asset Management Decision-Making Strategy
- Capital/Operation & Maintenance Operations
- Lifecycle Value Realization
- Resource Strategy

### Day 2:

- Shutdown & Outage Strategy
- Technical Standards & Legislation
- Asset Creation & Acquisition
- Systems Engineering
- Configuration Management
- Maintenance Delivery
- Reliability Engineering
- Asset Operations & Resource Management
- Shutdown & Outage Management
- Fault & Incident Response
- Asset Decommissioning & Disposal

### Day 3:

- Asset Information Strategy , Standards & Systems
- Data & Information Management
- Procurement & Supply Chain Management
- Asset Management Leadership
- Organizational Structure & Culture
- Competence Management
- Risk Assessment and Management
- Contingency Planning & Resilience Analysis

### Day 4:

- Sustainable Development
- Management of Change
- Asset Performance & Health Monitoring
- Asset Management System Monitoring
- Management Review, Audit & Assurance
- Asset Costing & Valuation
- Stakeholder Engagement
- Asset Management System

### Day 5:

- Day 4 recap
- Revision



# MAINTENANCE PLANNING, SCHEDULING & WORK CONTROL

PHYSICAL SESSION 4 days | VIRTUAL SESSION 5 days

## OVERVIEW:

In a world striving for cost optimization and operational excellence, Maintenance Planning and Scheduling has a great role. They are the main tools for balancing operational and maintenance efficiency with operation and maintenance costs, maximizing the efficient use of work time, material, and assets, and increasing the workforce productivity from 25% to about 60% “tools in hand”. Richard D. Palmer said in his handbook, which is the main reference for Maintenance Planning and Scheduling: “One cannot discuss maintenance planning without first considering an overall perspective of maintenance itself”. The course will explain how to build an effective maintenance planning function.

## KEY OBJECTIVES:

- To give broad understanding of maintenance, maintenance function and their relevant aspects
- To help understand how to select the most cost-effective maintenance strategy for each asset to control its risks and costs
- To give a global view of the importance, objectives, and benefits of the maintenance planning and scheduling process to save time and cost and to ensure efficient utilization of the maintenance resources to maximize productivity
- To explain the fundamentals of planning and scheduling such as: concepts, processes, tools, techniques, methodologies, roles and responsibilities, KPIs, analysis, reporting, etc
- To explain the important role and functions of the Computerized Maintenance Management System (CMMS) as a main Maintenance Planning and Scheduling tool
- To explain in detail the planning, scheduling and work management processes
- To highlight the types of KPIs (leading and lagging), main maintenance and maintenance planning KPIs and benchmarking against relevant world class best practices

## COURSE OUTLINE:

### Day 1:

- The Big Picture
  - Where is Maintenance and Maintenance Planning and Scheduling in the big picture?
- Understanding Maintenance
  - Definition
  - Main Maintenance types and strategies
  - Maintenance Strategy Selection

### Day 2:

- Maintenance Organization Objectives and Challenges
- Understanding Maintenance Planning and Scheduling as a great strategy for moving companies from reactive to proactive mode and raising Maintenance productivity significantly

### Day 3:

- Understanding Maintenance Planning and Scheduling (continued)
- Computerized Maintenance Management System (CMMS) as a main tool for Maintenance Planning, Scheduling and Control

### Day 4:

- Work Management
- Backlog Management

### Day 5:

- Spare Parts Management and Optimization
- Project Management Principles and Practices as main planning and scheduling tool
- Key Performance Indicators (KPIs)
- Benchmarking against the Industry Best Practices

# ROOT CAUSE ANALYSIS FOR MAINTENANCE & RELIABILITY APPLICATIONS

PHYSICAL SESSION 4 days | VIRTUAL SESSION 5 days

## OVERVIEW:

In any business, problems, failures and incidents lead to deviating from meeting the business goals and desirable outcome. There are many ways to discover and solve such obstacles. Root Cause Analysis (RCA) is a very effective problem-solving method that focuses on finding and resolving the underlying causes and not only the symptoms of problems/failures/incidents thus preventing them from reoccurring again and again.

Reliability of any system is greatly improved by decreasing the probability of its components failures, and maintenance and reliability personnel are key players in decreasing the probability of such failures in any plant.

This workshop is designed to acquaint the participants with the concepts, methodologies and practices of RCA. Participants will learn how to conduct a systematic Root Cause Analysis (RCA) as applied to maintenance and reliability. The workshop starts with an overview of the various RCA methods such as the linear method (5 Whys), fault trees, fishbone, and the barrier analysis method. Then, the focus shifts to one systematic RCA method that should lead to the same root causes regardless of who uses the method.

## KEY OBJECTIVES:

- To gain knowledge about the various RCA methods, their strengths and weaknesses, and when one is favored over the other
- To master a systematic method of conducting root cause analysis that should lead to the same root causes regardless of who uses the method
- To learn to develop effective corrective actions to address the identified root causes of the problem being analyzed

- To learn the key success factors of an RCA program
- To learn how to present the findings of an RCA study and the recommend corrective actions in proper report and presentation formats.

## COURSE OUTLINE:

### Day 1:

- Introduction about what RCA is and what OCA methods exist in the literature
- Defining RCA problems and their impacts on the business

### Day 2:

- Process mapping of RCA problems
- Data gathering and listing potential immediate causes

### Day 3:

- Charting the gathered issues in a fault-tree format
- Determining root causes

### Day 4:

- Developing corrective actions
- Preparing proper RCA reports and presentations

### Day 5:

- Exercising the whole RCA process



# PRINCIPLES AND PRACTICES OF PREDICTIVE MAINTENANCE

PHYSICAL SESSION 4 days | VIRTUAL SESSION 5 days

## OVERVIEW:

The workshop provides essential knowledge required for embarking on a program to enhance maintenance performance through early identification of potential failures to eliminate and minimize equipment breakdowns.

The workshop will discuss the various technologies available in the market to help with the efforts of early detection of failures, and how to integrate their applications with the activities required for achieving excellence through the implementation of Best in Class Maintenance Work Process. Work control, planning, and scheduling will be covered. Better utilization of Computerized Maintenance Management Systems (CMMS) will also be covered in this workshop.

## KEY OBJECTIVES:

- To provide an overview on Maintenance management principles
- To organization's Expectations from Maintenance Managers
- To principles of Best in Class Maintenance Work Process
- To essential elements of maintenance work Planning & Scheduling
- To principles and Practices of Predictive Maintenance
- To optimize Preventive and Predictive maintenance
- To focus your resources on critical equipment
- To work with contractors more effectively
- To develop organizational competence

## COURSE OUTLINE:

### Day 1:

- Introduction & Overview
- Maintenance & Reliability Best Practices
- Maintenance Strategy

### Day 2:

- PM Optimization
- Asset Performance Management

### Day 3:

- CBM/PdM
- PdM Technology

### Day 4:

- Rotating Equipment
- Metrics

### Day 5:

- RCM/SRCM Introduction
- FMEA Introduction



# MAINTENANCE WORK PROCESS- COURSE OUTLINE

PHYSICAL SESSION 4 days | VIRTUAL SESSION 5 days

## OVERVIEW:

The workshop offers a thorough explanation of the best-in-class maintenance Work Process (MWP) for industrial plants to help the organizations in their journey away from a reactive to a proactive culture.

MWP is an integrated and comprehensive methodology to help manufacturing plants and industries to consistently make and execute the highest value decisions about maintenance of physical assets. This workshop covers the elements of the MWP with interactive sessions, exercises, tests, and real life case studies and examples to enhance the level of knowledge, reinforce team building, improve communication, and provide better understanding of the role that each can play to improve the reliability of the equipment, and help achieve the high performance goals of the organization.

## KEY OBJECTIVES:

- To introduce the journey towards the establishment of a comprehensive, consistent, and integrated MWP, to help the transformation from a reactive to a proactive culture.
- To offer a detailed explanation of the elements that constitute the MWP and the justifications for its implementation, with the benefits that can be expected by the organization.

## COURSE OUTLINE:

Explanations of the 7 step's elements that constitute a best-in-class MWP, which are as follows:

- Work Identification & Prioritization
- Planning
- Scheduling & Backlog Management
- Work Execution
- Work Closure & Documentation
- Performance Review & KPI's
- Data integrity and CMMS

Roles & Responsibilities of the planners, schedulers, and the others engaged in the implementation of the process.

In addition, MWP Best Practices handouts will be distributed to the participants.



# BUSINESS DRIVEN RELIABILITY

PHYSICAL SESSION 4 days | VIRTUAL SESSION 5 days

## OVERVIEW:

The Business Driven Reliability (BDR) Workshop reflects on the M&R issues from a business perspective. It will provide an insight in best practices of the Maintenance Work process, and review the basic skills of the maintenance & Reliability Engineers and will provide participants with an understanding of Reliability Centered Maintenance (RCM) and Root Cause Analysis (RCA) techniques.

## KEY OBJECTIVES:

- To develop an equipment criticality matrix for effective maintenance strategies
- To conduct RCM methods and to establish effective maintenance strategies
- To establish an effective RCA Program and to eliminate repeat failures
- To have a work identification process and prioritize to maximize business performance
- To learn different types of Predictive Maintenance technologies and their application
- To learn various statistical analysis techniques for reliability analysis
- To learn a unique work management process for early defect detection
- To understand the roles and responsibilities that impact reliability strategy effectiveness
- To establish reliability performance measures to track and guide reliability improvement
- To understand the importance of aggressive work identification

## COURSE OUTLINE:

- The role of reliability engineers in industry
- Basic reliability engineer skills and tools
- An introduction to statistical analysis in reliability
- Familiarization with condition monitoring techniques
- Conducting RCM analysis to establish maintenance strategies
- Conducting RCA analysis to eliminate failures

# APPLIED MAINTENANCE MANAGEMENT

PHYSICAL SESSION 4 days | VIRTUAL SESSION 5 days

## OVERVIEW:

The Applied Maintenance Management workshop provides essential knowledge required for achieving excellence in maintenance management, work control, and planning and scheduling. Better utilization of Computerized Maintenance Management Systems (CMMS) will also be covered in this course. A pre and post seminar self-assessment will be given to indicate delegates competency improvements. The assessment is taken from the petro skills industry standard competency map for maintenance management.

## KEY OBJECTIVES:

- To understand world class maintenance standards and how to apply them
- To learn key performance indicators for your dashboard
- To learn the essential elements of work planning & scheduling
- To optimize preventive and predictive maintenance
- To learn how to focus your resources on critical equipment
- To learn how to work with contractors more effectively
- To develop organizational competence

## COURSE OUTLINE:

- Module 1- Introduction
- Module 2- Modern M&R Manager
- Module 3- Work Management Process Overview
- Module 4- Leadership & Teamwork
- Module 5- Maintenance Budgets & Control
- Module 6- Equipment History
- Module 7- Reliability in Design
- Module 8- The role of reliability engineer
- Module 9- Measuring Reliability
- Module 10- Workforce Management
- Module 11- Inventory Management
- Module 12- Key Performance Indicators
  - World Class Standards
  - Maintenance strategies
  - Expectations from Modern M&R Managers
  - Planning and scheduling
  - Optimizing of preventive and predictive maintenance programs.
  - Identifying critical equipment
  - Best use and utilization of CMMS
  - Developing & Control of maintenance budgets
  - Supplier certification
  - Developing organizational competence
  - Presenting your action plan



# MANAGING SHUTDOWN MAINTENANCE

PHYSICAL SESSION 4 days | VIRTUAL SESSION 5 days

## OVERVIEW:

The workshop will define the purpose of and types of shutdowns. The workshop will also highlight the factors effecting shutdown duration in addition to some specific shutdown and post shutdown management techniques. The training course is delivered to assist shutdown management teams, planners, managers, supervisors, engineers and other stakeholders to understand all the end-to end activities required with the delivery of successful shutdowns and turnarounds. Improved shutdown delivery methods, when underpinned by sustainable shutdown processes and procedures, will yield substantial savings associated with:

- Extended shutdown intervals developed by the definition;
- Value for money shutdowns, improve performance to shutdown scope management;
- Resource optimization by the application of sound scheduling techniques incorporating critical path analysis;
- Control of shutdown durations and the minimization of overruns through improved planning, scheduling, management structures and allocation of responsibilities;
- Improved maintenance and reliability practices and work method efficiency.

## KEY OBJECTIVES:

- To implement a detailed shutdown process that is managed as a standard consistently
- To specify the roles and responsibilities for executing the activities defined in the shutdown process, including the roles to manage, plan, schedule, and execute shutdowns and the personnel capability required for these roles
- To specify the operational mechanisms (meeting schedules, format, objectives, and timing) needed to

drive the process flow and interactions

- To explain the governance process and rules to make sure shutdown process is effective and efficient
- To perform metrics and efficient control mechanisms to monitor shutdown effectiveness

## COURSE OUTLINE:

### Day 1

- Introduction to shutdown planning and management processes
- The 'must do' steps for an effective shutdown
- The first phase of the shutdown planning "Definition"

### Day 2

- The second phase primely planning
- Roles and responsibilities that impact effective shutdown
- A work identification process and prioritization that maximizes business performance
- To use a work breakout structure and critical path to optimally schedule a shutdown

### DAY 3

- The third phase "Execution"
- To develop a detailed plan for the agreed shutdown scope of work
- A formal decision-making process that enhances maintenance shutdown effectiveness

### Day 4

- The fourth phase "Post Turnaround"
- To use effective project scheduling tools and processes
- To develop and implement shutdown reporting processes

# CERTIFIED MAINTENANCE & RELIABILITY PROFESSIONALS (CMRP)

2 HOURS (PEARSON VUE TESTING CENTER)

## OVERVIEW:

The Certified Maintenance & Reliability Professional (CMRP) program is the #1 leading credentialing program for certifying the knowledge, skills and abilities of maintenance and reliability professionals. The CMRP is accredited by the American National Standards Institute (ANSI), which follows ISO standards for its accreditation and processes. Examining more than just textbook information, the CMRP is a thorough examination of a broader scope of expertise measured against a universal standard. It was developed to assess professionals' aptitude within the five pillars of the Maintenance and Reliability Body of Knowledge: Business Management, Equipment Reliability, Manufacturing Process Reliability, Organization and Leadership, and Work Management. Boost your confidence and authority by adding an internationally-recognized certification after your name.

## KEY OBJECTIVES:

- To have a better understanding and awareness of the increase in complexity of the Maintenance & Reliability (M&R) Professional work environment.
- To acquire an international recognition and distinction of the M&R professional.
- To the possibility for the professionals to demonstrate knowledge & experience.
- To the possibility for the employer to ascertain the desired standard for the leaders in the M&R profession.
- To establish an uniformity and levels of required knowledge for the M&R professional.
- To all round balanced approach Body of Knowledge for the M&R Professional.



# CERTIFIED ASSET MANAGEMENT ASSESSOR (CAMA)

2 HOURS (REMOTELY PROCTORED EXAM)

## OVERVIEW:

The Certified Asset Management Assessor (CAMA) program is one of the leading credential programs for certifying the knowledge, Competency & skills in asset management standards based on ISO 55001.

CAMA has been developed and is offered by the World Partners in Asset Management, a partnership of non-profit professional associations including the Asset Management Council (Australia), the Society of Maintenance and Reliability Professionals (USA), Gulf Society for Maintenance & Reliability (GSMR), ABRAMAN (Brazil), IFRAMI (France) and PEMAC (Canada).

CAMA is a globally recognized certification in compliance with ISO 55001, ISO 17021-5 and ISO 19011. The focus is about maximizing the value of your physical assets through setting the standards and platform for Asset Management in profit and non-profit organizations such as government and semi-government agencies.

## KEY OBJECTIVES:

- To have a better understanding of asset management framework and requirements in line with ISO 55000, ISO 55001 and ISO 55002
- To determine the minimum requirements for the organization's personnel competency and experience to develop and implement asset management Plans
- To become globally recognized as asset management professional
- To qualify individuals to become an assessor for ISO 55001
- To establish the framework and requirements for organizations to develop and implement asset management plans

- Maximize the assets value.
- To improve asset reliability & compliance.
- Ensure the best cost of ownership of the assets and maximize the asset life cycle.
- Higher customer's and stakeholder's satisfaction.
- Enhance data mining and assets information.
- Better decision making based on entire life cycle of assets.
- Minimize the failures and safety incidents.



**STAY CONNECTED TO GLOBAL MAINTENANCE,  
RELIABILITY & ASSET MANAGEMENT INNOVATORS**

The GSMR community is a member of Global Forum for Maintenance & Asset Management (GFMAM), a body connecting maintenance, reliability and asset management societies worldwide.

For further information please get in touch with

**Ms. Jennifer Joseph**

Training & Certification Coordinator

✉ jennifer.joseph@gsmrgulf.org / ☎ (Office) +973 17180398



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Gulf Society For Maintenance & Reliability

☎ +973 17810398 ☎ +973 33944779  
🌐 www.gsmrgulf.org ☎ info@gsmrgulf.org

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