



Innovative Monitoring, Optimization & Fouling Management of *Membrane Desalination Plants*

TWO-DAY TRAINING COURSE

Saudi Water & Power Forum, November 4 & 5, 2008, Jeddah Hilton, Saudi Arabia
By: Eng. Mohamad Amin Saad - MASAR Technologies, Inc., USA

<http://www.masar.com/training/jeddahcourse.html>

MASAR Technologies, Inc., USA and **Dar Al Taqniya Academy**, in collaboration with the IDA and EDS, will hold the third annual MASAR Training Course at the Jeddah Hilton Hotel in Saudi Arabia, on Tuesday & Wednesday, November 4 & 5, 2008 (9:00 a.m. to 5:00 p.m.), following the conclusion of the upcoming **2008 Saudi Water & Power Forum**. The **advanced** and intensive course was conducted by **Eng. Mohamad Amin Saad**, President and Chief Consultant & Trainer of MASAR Technologies, Inc., USA.



MASAR Course venue in the beautiful city of Jeddah

Course Overview

The course format combines formal presentations and group interactive discussions, problem-solving and experience-sharing, highlighted by open-discussion periods throughout the course sections to encourage proactive participation via questions, input and feedback. Main topics of discussion are detailed in the attached Course Agenda below. Each attendee received a multi-media, interactive Course Training CD-ROM, specially designed as a practical and on-the-job training resource, containing all 300+ presentation slides, selected technical publications and useful on-line resources. Each trainee also receives a workbook for presentation and discussion reference and a Certificate of Completion. The course is primarily conducted in English with supplementary explanations in Arabic whenever needed.

Who Should Attend?

The practical training course, based on extensive field experience, is designed for membrane-based water desalination plant operators, engineers, managers, owners and end-users, with at least one year of hands-on field and/or technical experience,



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primarily at seawater and brackish plants utilizing RO and other integrated membrane processes. It is also beneficial for marketing, business, finance and professionals from other industries seeking a better and practical understanding of membrane technology applications, industry and markets. It offers independent, user-minded and comprehensive perspectives on various aspects of the technology applications based on 25 years of technical expertise in the field and real-plant experiences.



Dr. Adil Bushnak of Dar Al-Taqnia with Eng. Saad



MASAR Course CD-ROM's Main Menu



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Six Reasons to attend the next MASAR Course at the Saudi Forum

- 1. Gain** intimate, independent, practical and unbiased training on the membrane desalination technology applications, latest developments, technical issues, problems and field-tested solutions to help you achieve a more successful career and contribute to a more productive business.
- 2. Benefit** from two of the industry's most distinguished and experienced leaders, with over 55 years of combined technical expertise, plant experience and on-site trouble-shooting and problem-solving at major Arabian-Gulf membrane desalination plants in Saudi Arabia, Bahrain, Kuwait & UAE and others worldwide.
- 3. Learn** how to optimize the operational, performance and cost efficiencies of your systems through a hands-on approach, not via standard text-book and classroom tools, to help you identify, trouble -shoot and resolve various operational and technical problems at your own plant.
- 4. Participate** in interactive one-on-one and group discussions on key subjects featured by two open-forum periods focusing on real-plant technical issues, problems & practical solutions in membrane desalination.
- 5. Utilize** the course *CD-ROM* and *Workbook*, with over 300 presentation slides, technical publications and on-line references, as an on-the-job training reference and learning tool, and earn your ***Certificate of Completion***.
- 6. Join** hundreds of industry professionals of various backgrounds and experience levels who selected and benefited from the water industry's established training leader, including over 350 trainees since 2002.

MASAR Course Focus & Topics

The course will discuss technical and practical issues related to the design, operation, monitoring and fouling management of seawater and brackish water desalination plants utilizing membrane technology applications, such as RO, NF, UF & MF. It will help plant engineers and operators in the Middle East and GCC Region better understand how the technology works in real plants, and provide an in-depth training on how to optimize the plants performance and cost-effectiveness from one of the industry's most experienced, hands-on experts. The course will focus on the latest technologies and systems dealing with monitoring, evaluating and detection of membrane fouling and scaling, as well optimizing the operational efficiency and performance of membrane and pretreatment systems in real-time. Main topics of discussion include:



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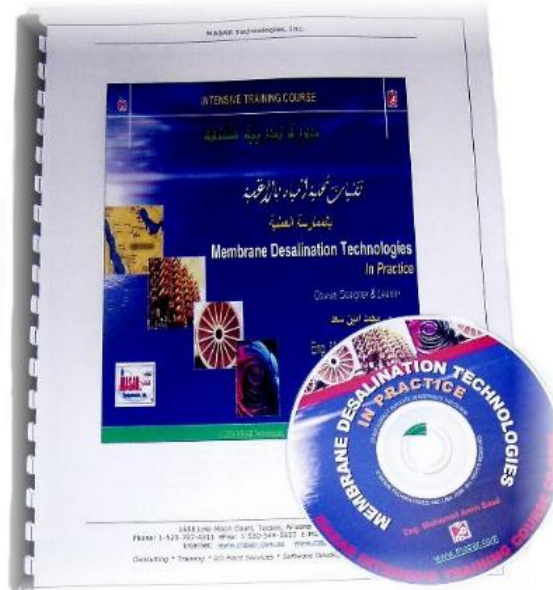
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- Membrane Plant Design Optimization – *Criteria & Considerations.*
- Fouling & Scaling Potentials - *Feed Water Quality, Chemistry & Sources.*
- Pretreatment System Optimization – *Dosing & Filtration Systems.*
- Design & Operation Optimization – *Recovery Ratio & Configurations.*
- Energy Consumption Optimization – *Energy Recovery Devices.*
- Performance Monitoring & Evaluation – *ASTM Normalization & Trending.*
- **Silent Alarm™** Real-time Fouling Detection & Performance Optimization.
- Membrane Fouling & Scaling Control & Prevention Strategies.
- Top 30 Practical Plant Design, Operation & Maintenance Guidelines.

Each day's session is concluded with a period of open discussion, sharing of experiences/field problems among attendees.



MASAR Course includes a multi-media Training CD-ROM and Workbook

Course CD-ROM, Workbook & Certificate

Each trainee receives a comprehensive **course CD-ROM**, with over 300 presentation slides, summary of practical plant O&M guidelines, technical papers, useful references and on-line resources. It is designed with web-style hot links, colorful graphics and illustrations for on-the-job continuing education and reference by plant operators, engineers, supervisors, consultants, vendors and others. We are the **ONLY** trainer in the water treatment and desalination industry giving out a full course training presentation CD-ROM to attendees. Trainees also receive a **Workbook** with



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copies of all presentation slides for review, questions and follow-up during presentations. Each attending trainee also receives a **Certificate of Completion** (you must attend the full two-day course to earn your certificate).

MASAR Course Instructor

The MASAR course will be as conducted by **Eng. Mohamad Amin Saad**, President and Chief Consultant of **MASAR Technologies, Inc.**, with head offices in the United States.



MASAR Course Instructor: Eng. Mohamad Amin Saad

Eng. **Saad** is a leading industry expert. Eng. Saad has extensive field, technical and business experiences in the water desalination and membrane technology industry



Some of the trainees attending the annual Saudi Water & Power Forum course

totaling over 25 years, especially in designing, monitoring, optimizing and troubleshooting tens of key brackish and seawater RO plants around the globe, especially in Saudi Arabia, Kuwait, United Arab Emirates, Bahrain, Malta, the United States and many others (www.masar.com/technology/mas.html). He recently developed from



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his long field experience the pioneering “**Silent Alarm™**” system and “MASAR®” software program for real-time monitoring and optimization of membrane plants performance and early detection of membrane fouling before it's too late. He has been training government and corporate clients since 1984, and regularly conducts intensive training courses and workshops with the Saudi Water & Power Forum (since 2006), the International Desalination Association's (IDA) World Congresses (Bahrain, The Bahamas, Singapore, Spain & Dubai in 2009), European Desalination Society's (EDS) Conferences (Egypt, Malta, Morocco), and with the Middle East Desalination Research Center (MEDRC). He recently held training courses for the Saudi Power & Water Utility Company for Jubail & Yanbu (MARAFIQ) and for the Dubai Electricity & Water Authority (DEWA) in Dubai, UAE. Other courses held or being planned in 2008 include a 4-day course in Sharjah, UAE, as well as courses for Technology Experts Company in Riyadh, Saudi Arabia, for Sohar Refinery Co. in Oman, and for the Ministry of Electricity & Water in Bahrain.



Trainees attending the 2007 Saudi Water & Power Forum course

About the Company - www.masar.com/services/consulting.html

MASAR Technologies, Inc. is an international membrane technology consulting, plant services, innovative solution developer and training company based in Tucson, Arizona, USA, since 1993. It provides specialized membrane plant monitoring, evaluation, trouble-shooting, optimization and other consulting services. It also develops and licenses innovative and customized software packages designed to monitor and optimize plant operation and performance in real-time, and provide membrane fouling and scaling early-warning detection & measurement. For additional information, visit MASAR Technologies' web site at www.masar.com/training/jeddahcourse.html.



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MASAR Training Course Pre-Registration Fees (By September 30, 2008)

- A. Individuals: **SR4,500 (US\$1,200)** per trainee.
- B. A special pre-registration group rate for 5 or more attendees from the same organization is available at **SR 3,750 (US \$1,000)** per trainee (All group pre-registrants must be pre- paid for by their organization at the same time).
- C. After **September 30, 2008**, and on-site, Registration Fee for anyone is **SR5,050 (US\$1,350)** per trainee.

Course registration fee includes:

1. Course CD-ROM with all presentation slides, technical resources & on-line references.
2. Course Workbook (English) Printed with all presentation slides for individual note-taking, follow-up and questions.
3. Two Coffee & Tea breaks and lunch daily.
4. Certificate of completion issued to all attendees who complete the entire 2-day course.
5. A MASAR Course Completion Gift presented to all attendees who complete the entire 2-day course.

To register or to inquire with any questions, you can complete the Registration Form (*attached below*) and fax it to **Mr. Majid Al-Malki** at:

Dar Al Taqniya Academy

Bushnak Building, Ibrahim Al Tassan St., Jeddah, Saudi Arabia.

Tel.: (966) 02-667-6200 Mobile: (966) 050-463-9280 Fax: (966) 02-660-0664

Email: data@bushnak.com.

Please register early to secure your seat. Hope to see you there!

Course Registration Form and Course Agenda are attached below.



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COURSE AGENDA

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REGISTRATION FORM

Please fill in the Registration Form and fax or e-mail it to below contact details

| | | |
|------------------------|--|-----------------------|
| Name | | الاسم |
| Organization | | جهة العمل |
| Job Title | | المسمى الوظيفي |
| Mailing Address | | عنوان المراسلة |
| P.O.Box | | صندوق البريد |
| Country | | الدولة |
| Work Tel. | | هاتف العمل |
| Home Tel. | | هاتف المنزل |
| Mobile | | الجوال |
| Fax | | الفاكس |
| E-mail | | البريد الإلكتروني |

Mark on course you like to participate:

Date: Nov. 4-5, 2008

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Methods of Payment

Check/Cash to "Dar Al-Taqniya".

Transfer to Account Name: "Dar Al-Taqniya"

Samba Bank, Account 4523296, A/c Currency: Saudi Riyals

OR: A/c 055010369, A/c Currency: EUR

SWIFT Code: SAMBSARI, ABA: 36074626 Branch: Al-Andolas Street, Jeddah, Saudi Arabia

Please send copy of your Check or Transfer to Fax. +966-2-660-0664 or by e-mail: data@bushnak.com







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|---|------------------|
| Tuesday, November 4, 2008 | 0900-1700 |
| WELCOME & INTRODUCTION – COURSE & CD REVIEW | 0900-0915 |
| I. MEMBRANE PLANT DESIGN CONSIDERATIONS | 0915-1030 |
| <ul style="list-style-type: none">❖ Technical Parameters❖ Feed Chemistry & Characteristics❖ Feed Sources – Surface & Well | |
|  REFRESHMENTS BREAK  | 1030-1100 |
| <ul style="list-style-type: none">❖ Pretreatment Requirements<ul style="list-style-type: none">➤ Biological Control<ul style="list-style-type: none">◆ Disinfection➤ Colloidal Control<ul style="list-style-type: none">◆ Filtration Systems◆ Coagulation & Flocculation➤ Scale Control<ul style="list-style-type: none">◆ Acidification◆ Softening➤ Anti-Scale Treatments | 1100-1230 |
|  LUNCH BREAK  | 1230-1400 |
| II. SYSTEM OPERATION OPTIMIZATION | 1400-1530 |
| <ul style="list-style-type: none">❖ Membrane System<ul style="list-style-type: none">➤ Recovery Ratio Impact➤ Brine & Product Staging Configurations➤ System Integration – Hybrid Plants➤ Pilot Systems – Surface Seawater RO Plants➤ Membrane Selection, Additions & Replacements | |
| III. ENERGY CONSUMPTION OPTIMIZATION | 1530-1630 |
| <ul style="list-style-type: none">❖ Energy Recovery | |
| OPEN DISCUSSION, QUESTIONS AND FEEDBACK | 1630-1700 |
| CONCLUSION | 1700 |







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|---|------------------|
| Wednesday, November 5, 2008 | 0900-1700 |
| IV. PERFORMANCE MONITORING & EVALUATION <ul style="list-style-type: none"> ❖ Data Collection, Monitoring & Reporting ❖ ASTM Data Normalization ❖ Performance Trending ❖ Real-Time, Early-Warning Monitoring & Fouling Detection <ul style="list-style-type: none"> ➤ Silent Alarm™ Monitoring & Optimization Technology ➤ MASAR® Program Applications | 0900-1030 |
|  REFRESHMENTS BREAK  | 1030-1100 |
| V. MEMBRANE FOULING CONTROL STRATEGIES <ul style="list-style-type: none"> ❖ Control & Prevention Philosophy ❖ Types of Fouling & Scaling <ul style="list-style-type: none"> ➤ Biological Fouling ➤ Organic Fouling ➤ Colloidal Fouling ➤ Metal Oxide Fouling ➤ Scaling (Chemical Fouling) | 1100-1230 |
|  LUNCH BREAK  | 1230-1400 |
| VI. SYSTEM TROUBLE-SHOOTING GUIDELINES <ul style="list-style-type: none"> ❖ 7 Golden Rules ❖ Symptoms & Solutions ❖ Specialized Testing | 1400-1500 |
| VII. RO PLANT CASE STUDIES <ul style="list-style-type: none"> ❖ Case Study A: Fouling Seawater RO Plant ❖ Case Study B: Fouling Brackish RO Plant ❖ Case Study C: Non-Fouling Brackish RO Plant | 1500-1530 |
| VIII. TOP 30 PRACTICAL PLANT GUIDELINES <ul style="list-style-type: none"> ❖ Design ❖ Operation ❖ Maintenance | 1530-1600 |
| OPEN DISCUSSION, QUESTIONS AND FEEDBACK | 1600-1630 |
| CERTIFICATE AWARDS | 1630-1700 |
| CONCLUSION | 1700 |