



## Membrane Desalination Plants Design, Operation & Performance





*Monitoring, Optimization & Innovative Fouling Solutions*

### TWO-DAY TRAINING COURSE AGENDA

Saudi Water & Power Forum, October 14 & 15, 2009, Jeddah Hilton, Saudi Arabia

By: Eng. Mohamad Amin Saad - MASAR Technologies, Inc., USA

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

<b>Wednesday, October 14, 2009</b>	<b>0900-1700</b>
<b>WELCOME &amp; INTRODUCTION – COURSE &amp; CD REVIEW</b>	<b>0900-0915</b>
<b>I. MEMBRANE PLANT DESIGN CONSIDERATIONS</b> <ul style="list-style-type: none"><li>❖ Technical Parameters</li><li>❖ Feed Chemistry &amp; Characteristics</li><li>❖ Feed Sources –Wells &amp; Open Intakes</li></ul>	<b>0915-1030</b>
 REFRESHMENTS BREAK 	<b>1030-1100</b>
<ul style="list-style-type: none"><li>❖ Pretreatment Requirements<ul style="list-style-type: none"><li>➤ Value &amp; Objectives of Pretreatment</li><li>➤ Biological Control<ul style="list-style-type: none"><li>◆ Disinfection</li></ul></li><li>➤ Colloidal Control<ul style="list-style-type: none"><li>◆ Filtration Systems</li><li>◆ Coagulation &amp; Flocculation</li></ul></li><li>➤ Scale Control<ul style="list-style-type: none"><li>◆ Acidification</li><li>◆ Softening</li></ul></li><li>➤ Anti-Scale Treatments</li></ul></li></ul>	<b>1100-1230</b>
 LUNCH BREAK 	<b>1230-1400</b>
<b>II. SYSTEM OPERATION OPTIMIZATION</b> <ul style="list-style-type: none"><li>❖ Membrane System<ul style="list-style-type: none"><li>➤ Recovery Ratio Impact</li><li>➤ Optimization Considerations</li><li>➤ Brine &amp; Product Staging Configurations</li><li>➤ System Integration – Hybrid Plants</li><li>➤ Pilot Systems – Surface Seawater RO Plants</li><li>➤ Membrane Selection, Additions &amp; Replacements</li></ul></li></ul>	<b>1400-1530</b>
<b>III. ENERGY CONSUMPTION OPTIMIZATION</b> <ul style="list-style-type: none"><li>❖ Energy Recovery</li></ul>	<b>1530-1630</b>
<b>OPEN DISCUSSION, QUESTIONS AND FEEDBACK</b>	<b>1630-1700</b>
<b>CONCLUSION</b>	<b>1700</b>



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<b>Thursday, October 15, 2009</b>	<b>0900-1700</b>
<b>IV. PERFORMANCE MONITORING &amp; EVALUATION</b> <ul style="list-style-type: none"> <li>❖ Data Collection, Monitoring &amp; Reporting</li> <li>❖ ASTM Data Normalization</li> <li>❖ Performance Trending</li> <li>❖ Real-Time, Early-Warning Monitoring &amp; Fouling Detection <ul style="list-style-type: none"> <li>➤ <b>Silent Alarm™</b> Monitoring &amp; Optimization Technology</li> <li>➤ <b>MASAR®</b> Program Applications</li> </ul> </li> </ul>	<b>0900-1030</b>
 REFRESHMENTS BREAK 	<b>1030-1100</b>
<b>V. MEMBRANE FOULING CONTROL STRATEGIES</b> <ul style="list-style-type: none"> <li>❖ Control &amp; Prevention Philosophy</li> <li>❖ Types of Fouling &amp; Scaling <ul style="list-style-type: none"> <li>➤ Biological Fouling</li> <li>➤ Organic Fouling</li> <li>➤ Colloidal Fouling</li> <li>➤ Metal Oxide Fouling</li> <li>➤ Scaling (Chemical Fouling)</li> </ul> </li> </ul>	<b>1100-1230</b>
 LUNCH BREAK 	<b>1230-1400</b>
<b>VI. RO PLANT CASE STUDIES</b> <ul style="list-style-type: none"> <li>❖ Case Study A: Fouling Seawater RO Plant</li> <li>❖ Case Study B: Fouling Brackish RO Plant</li> <li>❖ Case Study C: Non-Fouling Brackish RO Plant</li> </ul>	<b>1400-1430</b>
<b>VII. SYSTEM TROUBLE-SHOOTING GUIDELINES</b> <ul style="list-style-type: none"> <li>❖ 7 Golden Rules</li> <li>❖ Symptoms &amp; Solutions</li> <li>❖ Specialized Testing</li> </ul>	<b>1430-1530</b>
<b>VIII. TOP 30 PRACTICAL PLANT GUIDELINES</b> <ul style="list-style-type: none"> <li>❖ Design</li> <li>❖ Operation</li> <li>❖ Maintenance</li> </ul>	<b>1530-1600</b>
<b>OPEN DISCUSSION, QUESTIONS AND FEEDBACK</b>	<b>1600-1630</b>
<b>CERTIFICATE AWARDS</b>	<b>1630-1700</b>
<b>CONCLUSION</b>	<b>1700</b>