

Reverse Osmosis Mechanical Troubleshooting Hands-On



Copyright © 2006 David H. Paul, Inc.



Copyright © 2006 David H. Paul, Inc.



Copyright © 2006 David H. Paul, Inc.

WHERE & WHEN

For a list of where and when this seminar is being presented, click [here](#).
This seminar can also be presented at your facility.

DAILY SCHEDULE

8:00 a.m. - 11:30 a.m.

Lunch Break

12:30 p.m. - 5:00 p.m.

WHO SHOULD ATTEND

Operators and technicians currently working with RO/NF systems need to be able to effectively address and correct system performance problems. Mechanical troubleshooting is a necessary skill that will save your facility time and money. Management, engineering personnel and anyone else who wants to understand advanced hands-on troubleshooting will also find this seminar tremendously valuable.

WHY YOU SHOULD ATTEND

Learn the most effective ways to keep your RO/NF units running at peak performance. Learn how to recognize and isolate a multitude of problems immediately and effectively. Why be dependant on an outside company or a few individuals when problems arise? The information, tips and techniques you'll learn in this seminar are practical and immediately usable to improve the performance of your system(s).

WHAT YOU'LL RECEIVE

8 hours of interesting, easy-to-understand hands-on RO/NF training

A comprehensive workbook packed with procedures, datasheets and techniques

Personal attention! DHP hands-on seminars are limited to a maximum of 6 attendees

Break refreshments and lunch

INSTRUCTORS



Jason Turner
Plant City, FL



Ed Turner
San Antonio, TX



Robert Decker
Farmington, NM



Bill Dees
Farmington, NM



Alan Lane
Yuma, AZ

Every instructor for the hands-on seminars is/was an instructor at one of DHP's on-campus Associate Degree in Advanced Water Treatment programs. The hands-on seminars are held at DHP's Farmington, NM facility or at one of three college-program location using the same equipment, labs, instruments and training aids as our college students. Each DHP college instructor is a graduate of the four-semester Advanced Water Treatment Program. You won't find anyone more dedicated to students and more excited about water treatment than DHP instructors. DHP instructors have trained over 13,000 water treatment professionals worldwide since 1988.

OVERVIEW OF HANDS-ON TRAINING

- Determining replacement parts and fittings
- Element loading and unloading
- Element Inspection and placement
- Probing and profiling techniques
- Shimming pressure vessel internals
- Diagnosis and repair
- GFD/Flux per pressure vessel determination
- RO/NF unit lay-up procedures



Copyright © 2006 David H. Paul, Inc.

WHAT YOU'LL LEARN

- How to determine the correct replacement parts and fittings for your units
- Tips and techniques for loading and unloading elements
- How much you can learn from a visual inspection and the importance of element placement
- How to isolate problems to a stage then to a specific pressure vessel.
- How to determine exactly where and what the problem is within the pressure vessel without disassembly.
- How to get the most life out of your o-rings and fittings
- How to diagnose and repair common RO problems
- How to determine the actual flux rates for each pressure vessel and stage of an RO unit
- How to properly leave a membrane unit out of operation with minimal effects on performance

DETAILED AGENDA

Morning:

- 7:45 Refreshments (Provided)
- 8:00 Introductions
- Safety in the hands-on areas
 - RO mechanical troubleshooting pre-test
- Preparing the units for operation (4" and 8")
- Four- and eight-inch RO unit walk down
 - Fill and ready feed tanks
- 9:00 Break (Refreshments Provided)
- 9:15 Preparing the units for operation continued
- Hand-held conductivity meter calibration
 - Pretreatment skid start-up
 - Chlorine removal and verification
- 9:50 Determining replacement parts and fittings
- 10:15 Break (Refreshments Provided)
- 10:30 Start up 4" and 8" RO units
- Readings and data collection
 - Shutdown
- 11:05 Element unloading on 4" and 8" RO units
- Visual, external inspection
 - Element placement and management
 - Determining proper probing reference points
 - Reload elements
- 12:00 Lunch (Provided)



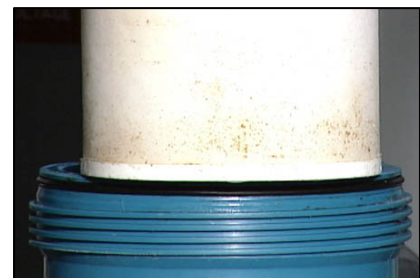
Copyright © 2006 David H. Paul, Inc.



Copyright © 2006 David H. Paul, Inc.

Afternoon:

- 1:00 Probing and profiling on 4" and 8" RO units
- Pressure vessel purging
 - Probing rod preparations
 - Profile
 - Probing
- 2:00 Break (Refreshments Provided)
- 2:15 Determining excess play within a pressure vessel
- Shim thickness determination
 - Shim installation
- 2:35 Bucket test
- Perform a bucket test on an RO unit
- 3:15 Break (Refreshments Provided)
- 3:30 Troubleshooting
- Troubleshoot both RO units with various problems
- 4:10 RO unit lay-up procedures
- Perform a system lay-up on an RO unit
- 4:30 Discussion, questions and answers
- RO Unit mechanical troubleshooting post-test
- 5:00 End



Copyright © 2006 David H. Paul, Inc.

CERTIFICATE OF COMPLETION

Each attendee will receive a DHP *Certificate of Completion* following the seminar.

WHAT OTHERS SAY ABOUT DHP HANDS-ON SEMINARS

DHP has trained over 13,000 water treatment professionals worldwide since 1988. Trainees include industrial, governmental and drinking water clients. The average rating given by attendees for DHP seminars is over 9 (on a scale of 1-10, with 1 being a terrible rating and 10 being an outstanding rating). The following are typical comments from attendees:

“I enjoyed the class very much and would highly recommend it to anyone in the industry.”
Janet Drozda, Operator, Intel

“Outstanding course. Best training program that I have attended
in the water treatment industry!”
George James, Reaction Engineering, Inc.

“Instructor was very knowledgeable and thorough. Course will have large
impact on our cleaning procedure.”
John Paul Robb, Plant Engineer, Trigen Colorado Energy

“Excellent Course! The hands on portion served very well in firming up the concepts and increasing
retention. Level of instruction was good balance of theory and practical...well presented.”
Finley Jones, Sr. Account Manager, Nalco

“Probably the best hands-on course I’ve had in my 10 years as a technician.”
Andy Gutierrez, Technician, Amgen

“Hands-on experience was a valuable experience.”
Melody Martin, Plant Chemist, Oklahoma Gas & Electric

“I thought I knew a good amount about RO systems. After taking this course I realized how little I
actually did know.”
Chris Corsetti, Facilities Engineering Supervisor, Genzyme Corp.

“Excellent instructors. I should have taken this course ten years ago. I could have saved the
company thousands of dollars and weeks of time.”
Charles Hagen, Lab supervisor. Ameradahess

“DHP training took me from having no idea what RO is to being a confident and knowledgeable RO
decision maker.”
Kenneth Gaskill, Maintenance Supervisor, Warner Lambert Co.

“Great course, great teachers, great equipment. I liked the use of multimedia...videos, illustrations,
computers, etc.”
Evan Francis, Operator, Monterey Bay Aquarium