



# Reverse Osmosis Specialist Training Level 3

(ROS3)

(Classroom and Hands-on, 4 days)

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## Seminar Details

- Cost:** \$5,240 (ex GST)
- Length:** 4 days (RO301, day 1, can be done as a standalone day)
- Dates:** [Visit website](#) for current offerings as well as proposed events.
- Discounts:** Group discount of 10% when registering three or more at the same time.

## Daily Schedule

| Times     |                            |
|-----------|----------------------------|
| 7:45am    | Registration, Coffee/Tea   |
| 8:00am    | <b>MORNING SESSION 1</b>   |
| 9:15am    | Stretch Break              |
| 9:20am    | <b>MORNING SESSION 2</b>   |
| 10:20am   | Morning Tea                |
| 10:45am   | <b>MORNING SESSION 3</b>   |
| 12:00noon | Lunch                      |
| 12:45pm   | <b>AFTERNOON SESSION 1</b> |
| 1:30pm    | Stretch Break              |
| 1:40pm    | <b>AFTERNOON SESSION 2</b> |
| 3:00pm    | Afternoon Tea              |
| 3:20pm    | <b>AFTERNOON SESSION 3</b> |
| 4:50pm    | Summary and Evaluation     |
| 5:00pm    | Day Close                  |

In partnership with:



## Seminar Description

### David H Paul Inc. Training:

DHP has trained over 20,000 water treatment professionals worldwide since 1988. Trainees include industry, government and municipal clients.

### Seminar Description:

Reverse Osmosis Specialist Level 3 Training (ROS3) consists of RO301 (1 day) and Advanced Troubleshooting of RO Units (3 days).

This seminar consists of three days of classroom and hands-on training covering advanced troubleshooting of RO systems. Sometimes RO systems don't operate as designed. This seminar provides the tools and knowledge needed to monitor and ensure proper operation of an RO system and to troubleshoot an RO system to identify problems at an early stage. While this is an advanced course, enough introductory material will be presented so that when more advanced concepts are covered, attendees will thoroughly understand the advanced concepts.

### RO301

Provides the advanced theory of RO technology for those who can only commit to one day of classroom training. RO301 covers the knowledge required to understand the working of any reverse osmosis (RO) water treatment plant to an advanced level.

Topics included:

- RO System Overview (Advanced)
- RO Water Treatment Chemistry Overview
- RO Water Treatment Microbiology Overview
- Sampling Techniques (Advanced)
- RO Performance and Design Software

### Advanced Troubleshooting of RO Systems (ATRO)

This training extends the theory from RO301 to include the practical understanding and proficiencies needed for correct operation, control, monitoring and troubleshooting of an RO system. This is essential knowledge for anyone who works with, designs, services, installs, operates, maintains and/or troubleshoots RO systems.

Topics included:

- RO Pre-treatment
  - Reading a water analysis report
    1. How to determine if the analysis is complete/reliable
    2. How to determine scaling potentials
    3. How to determine fouling potentials
  - Verifying zero total chlorine
  - Minimizing sulphite injection to reduce biofouling
  - Verifying the ORP level at which to operate
  - Using Silt Density Index (SDI) to troubleshoot the pre-treatment

### RO Unit Operation

- RO Unit Operational Data
- Using normalisation software programs
- Generating performance graphs/trends
  - Normalised Permeate Flow
  - Pressure drops per stage
  - Normalised Salt Passage
- Interpreting and troubleshooting RO unit performance graphs

- Profiling and probing an RO unit
- Interpreting and troubleshooting profiling and probing data
- How to determine if the flow meters are accurate
- How to determine if the RO unit is operating as designed

#### RO Unit Design

- Using RO manufacturer's design software programs
- How to use design software programs to troubleshoot RO units for:
  - Scaling potentials
  - Fouling potentials
  - Mass balance
  - Ion rejections

#### Who Should Attend

Everyone who works with, or will work with, the reverse osmosis and pre-treatment technologies in operating plants needs to know the tips, techniques and proficiencies taught in this seminar, including:

- Operators, especially lead operators
- Maintenance personnel
- I & C Technicians
- Supervisors/Managers
- Engineers
- Original Equipment Manufacturers
- Service technicians
- More

#### Why You Should Attend

##### *From a Personal Standpoint*

1. After successfully completing this 3-day program **you will be in the top 10% of RO personnel in the world** in your level of understanding and proficiency
2. If desired, you can add **Reverse Osmosis Specialist I** to your title and bio
3. Puts you in a better position for job advancement
4. You can't get this information anywhere else
5. The instructor has decades of practical RO water treatment experience
6. The instructor is an RO water treatment consultant
7. The instructor is a professional trainer
8. The seminar covers the material in a step-by-step manner so that everyone will understand the concepts presented
9. The presentation uses a multimedia format, including many videos and animations

##### *From an Employer's Standpoint*

- Trained employees save you money by:
  1. Having the knowledge needed to identify problems at an early stage
  2. Having the ability to troubleshoot even difficult problems many RO systems face
  3. Using this knowledge to correct problems
  4. Less down time of the RO system
  5. Increased system reliability
- Being able to show clients, customers and any applicable governmental agencies that your employees have been independently certified on their knowledge and proficiencies.

### What You Will Receive

Training assessed and accredited by David H Paul Inc., a world leader in high-tech water treatment training.

Training based on the extensive experience of the DHPaul trainers, who have trained around the world at countless facilities.

Interesting and easy-to-understand theory, blended with practical application gained from years of training and operator experience.

The latest in multimedia training including 3-D animations.

A highly illustrated workbook.

M/Tea, A/Tea and Lunch.

Certificate of completion.

### DHP's Training Methodology

DHP uses consulting services from Columbia University in the development of its training seminars.

DHP's training methodology includes:

- Short, interesting, interactive lecture sessions using:
  - Power Point™ slides
  - Video clips
  - Animations
- Group exercises to enhance understanding and retention
- Workshops to further enhance understanding and retention
- Optional daily open-book Knowledge Verification Exam to document what was learned

A Knowledge Verification Exam and hands-on Proficiency Verifications are given each day. Since 1988, DHP has been training water treatment personnel like you. We take you step-by-step through the knowledge and proficiencies needed for advanced troubleshooting of an RO system.

All exams are open book because nobody remembers everything for the rest of their lives...but you'll know in the future where to get the information you need in the book.

We provide a lot of repetition so that you will have no problem getting good scores. For example, to make sure that you know how to use membrane manufacturers' design software to calculate water flux rate and minimum concentrate flow rate, we:

1. First, go over the information in a Power Point™ format.
2. Second, go over the information in a membrane manufacturer's design program.
3. Third, obtain operating data from an actual RO system and compare the actual operational data to the projected values from the design software.
4. Fourth, have a workshop on the topic, which serves as a practice exam for the Knowledge Verification Exam at the end of the day. All workshops are performed in groups to aid in the learning experience. There will be no surprises on the daily Knowledge Verification Exams and they are open book.

**Knowledge Verification Exams are optional. If you don't want to be certified, you don't have to take the exams.**