

Teaching, mentoring and operator training has been an important part of professional development for John Harrison. He has been an adjunct professor at two universities and served as an instructor at a community college. Operator training and the writing of operational manuals. John has written operating manuals, conducted training seminars, or presented workshops in more than eight states and at several national and international conferences. He was selected to author or chair the following professional manuals of practice (MOPs) on plant operation or design:

- Char/Primary Author, Chapter -Biological Nutrient Removal Facilities (MOP 11),
- Chair/Author, WEF's specialty manual on O&M of Trickling Filters, RBCs and Related Processes (OM-10).
- Chapter Author WEF's specialty manual on Aerobic Fixed-Growth Reactors
- Chapter Author, Manual of Practice for Wastewater Treatment Plant Design (MOP-8)
- Nutrient Control Task Force Member/Coauthor - BNR Design Manual
- Sewer Use Ordinances and MOP on Pretreatment, Reviewer

Mr. Harrison has either, aided in, or been the primary author of operation manuals at five Wastewater Treatment Plants. He has also conducted several operational audits including a combined training and plant audit for the State of Vermont for rotating biological contact plants. Locations where Operation & Maintenance Manuals were written include:

- Newport, OR – Trickling Filter
- Waianae, HI – TF/SC Plant
- Muscatine, IA – RF/AS Plant
- Turlock, CA – RF/AS Plant
- Abington, VA – Bio-Nutrient AS

As a regional leader in fostering greater communications between operators and engineers, Mr. Harrison developed and managed a database entitled "Wastewater Information Exchange" where the following surveys were conducted.

- 4000 Sewage Treatment Plants
- 200 Rotating Biological Contactors
- 400 Trickling Filters/Combined Proc.
- 50 Bio-Nutrient Removal (BNR) Plants
- National Disinfection Survey
- Incineration Survey
- Wetland and Natural System Survey

Audits or operational assessments were conducted by Mr. Harrison at the following locations/facilities.

- Redwood City, CA (The South Bayside System Authority)
- Jacksonville, NC
- Woodburn, OR
- Benicia, CA

Mr. Harrison has conducted workshops on natural systems, BNR, fixed film systems and lagoons. Workshop locations have included California, Washington, Oregon, North Carolina, Florida and New York. An interest in working with operators has resulted in Mr. Harrison being a primary instructor at five training organizations. He has also authored chapters and chaired operations manuals of practice for both the Water Environment Federation and Sacramento State. As a professional courtesy, he coordinated continuing education units (CEU's) for both water and wastewater operators in the State of Oregon for more than 5 years and received an award from the Oregon DEQ and Department of Health for the professional service.

- University of Hawaii - Guest Instructor: *Introduction To Wastewater Treatment*
- Mt. Hood Community College - Managed Program:
  - *Environment Safety and Hazardous Materials*
- Portland State - Adjunct Professor: *Water and Wastewater Treatment Plant Design*
- Guest Speaker and Trainer:
  - *Clackamas Short School*
  - *Oregon Association of Water Utilities*
  - *Operator Certified Training, Inc.*

The following are examples of training and operational related projects Mr. Harrison has conducted.

**Dept. of Health, Hawaii.** Conducted operator training classes on activated sludge and on emerging wastewater technologies. Classes were given on the islands of Oahu, Kauai, Maui and the Big Island of Hawaii. The classes consisted of a 2-day workshop with the goal of educating and providing training opportunities to environmental professionals.

**Tolleson, AZ.** Retained to evaluate the 6 mgd three stage roughing filter followed by trickling filter solids contact facility. An unusual aspect of this project was the defining of nitrification, denitrification and sBOD capacity at various stages of treatment. Services included a two-day interactive workshop with plant operations and also a final project memorandum.

**City of Arlington, WA.** Evaluation of a 1.5 mgd sequencing batch reactor (SBR) plant which include a review of actual to design loadings. The interaction of loading and solids yield, and their impact on solids handling and the ability to remove ammonia was studied.

**City of Santa Barbara, CA.** Operator training workshop on “*Modernizing Wastewater Treatment Plants*” at an 11 mgd activated sludge plant considering the use of biological selectors.

**City of Elko, NV.** Process and plant operation evaluation at a 2.7 mgd combined plastic media trickling filter followed by rotating biological contactor plant. In addition to a written report, operator training and a 1-day workshop was provided.

**City of Tillamook, OR.** Completion of a study, design and construction of a corrective action plan (CAP) ordered by the State of Oregon. Operational and facility changes were implemented to improve plant performance.

**New England Interstate.** Evaluation and reporting on 4 RBC facilities in Environmental Training Center in Vermont. Conducted a state-wide training seminar.

**Washington State Dept of Ecology.** Provided a 2- day workshop on “Process Controls for Operation of Activated Sludge Systems”. The classes were given in Port Angeles, WA and sponsored by the Washington State Department of Ecology.

**New York DEC.** Conducted workshop to 50 owners and operators of fixed film systems.

**Sacramento State, CA.** Authored chapter of training manual for treating industrial waste with fixed film including trickling filters and RBC's (re: Ken Kerri, Professor Emeritus, Civil Engineer).

**Castle & Cooke Resorts, Lanai, HI.** Director of Water Utility with 15-employees, 2-wastewater treatment plants and 3-water systems. Key equipment involved submersible pumps, reservoirs, tanks, meters, effluent filtration equipment and over 50-miles of transmission lines. Responsibilities included initiating/ oversight of more than 20 construction projects with a total estimated cost of \$6M and managing a \$3.2M yearly operating budget.