

EDUCATION

Indian River Community College – 1973-1975
University of Texas at Arlington – 1979-1981

PROFESSIONAL SOCIETIES

Member, International Desalination Association (IDA)
Member, American Membrane Technology Association (AMTA)
Member, American Water Works Association (AWWA)
Member, Southeastern Desalting Association (SEDA)
Member, South Central Desalting Association (SCDA)

SUMMARY OF EXPERIENCE

Mr. Harris has over 28 years of experience in the design, construction, commissioning, trouble-shooting and evaluation of membrane water treatment facilities. His expertise extends from mechanical and electrical disciplines to the complex programming required for the operation and monitoring of these systems. He has been involved with pilot scale process studies as well as evaluation and correction of large-scale membrane process problems.

DETAILED EXPERIENCE

June 2003 to Present

**HARRISSMITH SERVICES, INC.
Cheriton, Virginia**

Hr. Harris is President and co-founder of Harrissmith Services, Inc. (HSI).

He is responsible for the day-to-day operations and scheduling for the company and provides most of the field related responsibilities. Some of the projects HSI has done to date include:

- Construction supervision and field designs for a 100 kgpd seawater desalination system in the Caribbean.
- Construction supervision and operational consulting on six (6) different seawater desalination projects in the U.A.E. for a major US membrane systems manufacturer. These projects ranged in size from 500 – 2000 m3/d
- Engineering buildability review for a 6 mgd brackish membrane project in California.
- Value Engineering, Commissioning and Process Optimization for a 3.2 mgd Seawater NF project in Dubai, U.A.E.
- Consulting and technical work for Rostek, Associates of Tampa, including:
 - Value Engineering peer review for two (2) different membrane projects in Florida.

- Construction review and commissioning management for the above mentioned projects.
- Pilot unit design and fabrication for a NF system design in Florida.
- Operational consultation for a brackish membrane system in North Carolina.
- Instruction for MOC (Membrane Operators Certification) schools in Dubai, U.A.E. and Muscat, Oman.

April 2000 to June 2003

**ADVANCED MEMBRANE SYSTEMS, INC.
Yorktown, Virginia**

Mr. Harris was Systems Manager for Advanced Membrane Systems (AMS) and provided extensive experience and capabilities in the operation, evaluation and fabrication of water process systems. Services included operations assistance, training, consulting and custom design, fabrication and start-up of membrane filtration/separation systems for water and wastewater applications.

- Provided project management direction for system design, fabrication, installation and commissioning of water and wastewater treatment equipment utilizing membrane technologies. System types included Microfiltration, Ultrafiltration, Nanofiltration, Brackish Water Reverse Osmosis and Sea Water Reverse Osmosis systems.
- Provided cost estimation, proposal preparation, system design and PLC/MMI programming.
- Provided construction supervision, commissioning and troubleshooting services.
- Provided construction supervision, commissioning and operator training for a 20,000 gpd SWRO system for the U.S. Dept of State Embassy in Monrovia, Liberia.
- Provided design, construction and commissioning assistance to the Bureau of Reclamation for a seawater desalination pilot study in South Texas focused on different pretreatment technologies. This included designs regarding: Seawater intake infrastructure, Pre-treatment system piping utilizing four (4) different pre-treatment styles and SWRO unit with two (2) separate SWRO systems.

1999 – April 2000

**ENERGY RECOVERY, INC.
Chesapeake, Virginia**

Served as a Technical Manager for a manufacturer of an innovative device for energy recovery used with SWRO (Seawater Reverse Osmosis) systems.

- Provided mechanical and electrical design consultation, control system programming, startup and commissioning of SWR systems throughout the world.
- Provided for the implementation of test programs for device effectiveness.
- Provided design and production of technical and marketing literature, advertisements and trade show materials and displays.

1984 - 1999

**HYDROPRO, INC.
Lake Park, Florida**

Served as the Manager of Field Services. Provided management of the Construction and Technical Service Divisions for a manufacturer of membrane treatment systems for potable, industrial, and agricultural water usage. Duties included:

- Providing mechanical and electrical design consultation; on-site construction supervision of large (1 MGD plus) brackish and seawater membrane treatment systems.
- Start-up and Operator training for large Membrane Systems.
- PLC and MMI programming in a number of software environments.
- Evaluation, troubleshooting, and operational consultation for existing membrane systems throughout the world.
- Projects related to the above services include:
 - Construction supervision, commissioning and operator training for a 1.2 mgd two-pass BWRO system making de-mineralized water for a copper mining facility in Zaldivar, Chile.
 - Construction supervision, programming, commissioning and operator training for a 5.0 mgd BWRO system for the City of Ft. Stockton, Texas.
 - Design, construction supervision, programming, commissioning and operator training for a .75 mgd SWRO system in Sharm el Sheik, Egypt.
 - Construction management, commissioning and operator training for a 12.0 mgd BWRO system for the City of Chesapeake, Virginia.

1982 – 1984

**BASIC TECHNOLOGIES, INC.
Riviera Beach, Florida**

Served as a Field Service Technician responsible for the installation, evaluation, and troubleshooting of membrane treatment systems in the US and overseas.

- Responsibilities included mechanical and electrical design consultation and installation and troubleshooting of electrical control systems.

1979 – 1982

**MOSTEK CORPORATION
Lewisville, Texas**

Served as the D.I. Maintenance Technician. Responsibilities included installation, maintenance and troubleshooting components related to the production of .75 MGD de-ionized water for semi-conductor manufacture.

- Responsibilities included electrical component work up to 480V 3-phase, design and fabrication of specialty chemical handling systems.
- Design and implementation of membrane cleaning systems
- Listed as journeyman level electrician

1975 – 1978

**SELF EMPLOYED
Fort Pierce, Florida**

Specialized in custom building and fabrication for home and small commercial facilities.

1973 – 1975

**Indian River Utilities
Vero Beach, Florida**

Was responsible for the installation, operation and maintenance of small package water and wastewater systems throughout several Florida counties. Installed and operated one of the oldest reverse osmosis systems in Florida in Vero Beach.

SELECTED PUBLICATIONS AND PRESENTATIONS

Indian River Plantation: The Evolution, 16-Year History and Operating Experience of the Oldest R.O. Water Treatment Plant on Hutchinson Island, Florida. Charles G. Harris, American Desalting Association Biennial Conference, West Palm Beach, FL, September 1994.

Turbocharging: Recovering Lost Energy. Charles G. Harris, AWWA Membrane Technology Conference, Baltimore, MD, August 1995.

Desalting for the Mining Industry. Charles G. Harris, William Hendershaw, American Desalting Association Biennial Conference, Monterey, CA, August 1996.

“In the End or on the Side?” – A Process Design Questionnaire. Charles G. Harris, American Desalting Association Biennial Conference, Monterey, CA, August 1996.

Construction Cornucopia – A Plethora of Potential Problems. Charles G. Harris, American Desalting Association Biennial Conference, Williamsburg, VA, September 1998.

Energy Recovery for Membrane Desalination. Charles G. Harris, European Desalination Society Conference on Desalination, Amsterdam, Netherlands, November 1999.

Construction and Commissioning for Membrane Desalting. Charles G. Harris, European Desalination Society Conference on Desalination, Amsterdam, Netherlands, November 1999.

Energy Incentives with Modular Desalting. Charles G. Harris, American Membrane Technology Association Biennial Conference, Lake Tahoe, NV, August 2000.

Modular Desalting for Specialized Applications. Charles G. Harris, International Water Association Conference on Membrane Technology, Paris, France, September 2000.

TEACHING ACCREDITATION

Florida Water and Pollution Control Operators Association, Various operator certification short schools since 1990, *Reverse Osmosis Operations and Complex Control Systems*

Southeastern Desalting Association, operator certification program, *Reverse Osmosis Maintenance and Operation*, 1994 – 1995

University of Florida TREEO Center, operator certification program, *Reverse Osmosis Troubleshooting*, 1992 – 1994

SEDA Program MOC School, adapted for Middle East environments, in Dubai, UAE and Muscat, Oman, January 2005