Abstract #1

Water Quality Monitoring in Water Supply Systems: An Integrated Approach

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Biographical Sketches of Authors

Professor Ioannis (or Yiannis) Papadimitrakis is a faculty member of the School of Civil Engineering of the National Technical University of Athens (NTUA), in Athens Greece.

He has done research work on a variety of issues in the broader areas of Environmental Fluid Mechanics-Hydraulics and of Marine Hydrodynamics.

He, along with other colleagues from Chemical and Electrical Engineering of NTUA and from abroad, is promoting the ideas of proper design and operation of advanced remotely operating systems for monitoring the quality of (drinking) water in distribution networks (inside cities), in fresh water Reservoirs, and in aqueducts supplying water to treatment facilities.

He received a Diploma in Civil Engineering from the National Technical University of Athens in Greece, two MSc Degrees from Stanford University (one in Water Resource Engineering from Civil Engineering and one in Fluid Mechanics from Mechanical Engineering), and a joint Ph.D form Civil and Mechanical Engineering Departments of Stanford University.

He is the author of numerous Journal and Conference Papers and serves as a reviewer in various Journals.

Dr. Angelos Findikakis is a Senior Principal Engineer with Bechtel National in San Francisco. He is also a Bechtel Fellow, which is the highest Bechtel honor in recognition of technical excellence. As a Bechtel Fellow he acts as Bechtel's technical ambassador and as a special technical advisor to upper management.

He has worked on a variety of environmental and water resources studies, including both surface and ground water problems. Examples of his recent assignments in Bechtel are the study of the National Water Plan for Morocco, the integral study for the environmental remediation of Lake Maracaibo in Venezuela, and the thermal analysis of the Russian Fissile Material Storage Facility. He is currently working on the Yucca Mountain project.

He received his Diploma in Civil Engineering from the National Technical University of Athens, Greece, and his MSc in Water Resources Planning and PhD in Civil Engineering from Stanford University. His doctoral dissertation was on environmental fluid mechanics.

He is also a Consulting Professor in the Department of Civil and Environmental Engineering at Stanford University.

He is the author of several journal and conference papers. He has received different awards including the Straub Award, the ASCE Hering Medal, and the ASCE Horner Award. He is a member of many national and international organizations, societies and committees, including ASCE, AGU, IAHR and Sigma Xi and has served in several professional organization committees.

Abstract

The use of state-of-the-art technology allows the continuous, automated and telemetric monitoring of different physical and chemical parameters that characterize water quality in water supply systems (reservoirs and aqueducts), with simultaneous monitoring of water flows driven by the external forces affecting reservoir circulation, including wind, heat transfer due to solar and atmospheric radiation, incoming river discharges, water withdrawal, etc. This can be achieved by combining in situ automated sensors installed in the reservoirs, the incoming river and at selected locations along the aqueducts from the reservoir to the respective treatment

facility, with software that simulates, in real time, the reservoir hydrodynamics, aqueduct hydraulics and water quality of the entire reservoir and aqueduct system, utilizing actual time series of the monitored parameters through a data assimilation scheme. This paper describes the possibilities offered by currently available technology for integrated water quality monitoring in reservoirs and open aqueducts and discusses the system envisioned for the major reservoirs and aqueducts of the water supply system of the Athens metropolitan area.