Membrane Integrity Monitoring for Reliable Water Reuse

Abstract: Water quality of recycled water needs to be maintained to ensure the safety of treated water, and a HACCP approach to risk management is used in management of recycling plants. This approach uses on-line process monitoring to ensure effective treatment and on-line verification through surrogate monitoring. For membrane processes regular integrity testing is used to ensure membranes are intact and performance is assured. Common integrity tests for membranes include direct methods such as pressure decay tests that are usually performed offline on individual elements, or indirect challenge tests that require evaluation of the rejection of a surrogate or other substance across the system. Currently there are no integrity tests that can be implemented online or in real-time and that offer high enough resolution to represent the full capabilities of high pressure membrane systems, and pressure decay testing of low pressure membranes is not sufficiently sensitive to detect virus size breaches.

This presentation will outline the growing need for recycled water, approaches to managing recycled water systems, operational and service issues that identify the importance of membrane mechanical properties and integrity testing based on novel challenge particles.

Professor Stephen Gray has had a focus on water and membrane research for over 27 years. He is part of research teams that are working towards commercialisation of membrane distillation, have introduced ceramic membranes to Australian industry, and is working to demonstrate membrane integrity monitoring technology. In the field of membrane fabrication he has projects that span nanocomposite UF membranes for increased abrasion resistance, nanocomposite pervaporation membranes for niche applications, ceramic membranes for desalination, and small pore size metal membranes. In 2013 he was recognised as Thought Leader in Lux Research’s international review of water research. He was President of the Aseanian Membrane Society 2018-2019, is Editor of the Journal of Water Reuse and Desalination, and on the editorial board of Water Research, Desalination and Membranes journals.

Thursday, November 5, 2020

11:00 a.m. – 12:15 p.m.

Virtual Seminar:
Zoom: https://uark.zoom.us/j/81616347124?pwd=TFBFNlqwVlBEak9JcDNtZGJMUFNRdz09