



EDS WEBINAR

Sustainable and Smart Wastewater Management Approaches for the Future

February 3rd, 2022, 9:00-10:30 CET

Welcome Message: Ursula Annunziata, President EDS

Moderator: Dr Iris Sutzkover-Gutman, Expert Process Engineer, IDE Israel



Bio: Iris Sutzkover-Gutman holds a Ph.D. in Chemical Engineering from the Technion-Institute of Technology. She has a vast academic and field experience in all stages of desalination plants' life cycle, from initial process design through commissioning to on-going operations. She started her professional career as a process engineer at GES and thereafter, served for 10 years as the process manager at the VMD large-scale Palmachim SWRO plant (90 MCM/yr). Today, she works as an expert process engineer at IDE Water Technologies, supporting the design and operation of versatile desalination plants around the world.

Abstracts / Program

Dr. Pang Chee Meng

Chief Engineering and Technology Officer, PUB, The National Water Agency, Singapore

❖ **Utilities' perspective of wastewater treatment with respect to sustainability**

Dr. Raja R. Kadiyala

Vice President and Senior Technology Fellow, Global Market Director for Digital, Jacobs

❖ **Informed AI for the Water Sector**

Dr Lim Zhuan Khai

Nanyang Technological University, Singapore

❖ **Novel A-B Process in Mainstream Deammonification**



Dr. Pang Chee Meng
Chief Engineering and Technology Officer
PUB, The National Water Agency
Singapore

Bio

Dr Pang Chee Meng is the Chief Engineering and Technology Officer of PUB, Singapore's National Water Agency. He leads PUB's Technology Department to administer its R&D program for the development and application of new water technologies. Prior to his current role, Chee Meng was the Director of the Industry and Technology Collaboration Department. He led a team to formulate and implement strategies to grow Singapore's water industry and facilitate the commercialisation of new water technologies. Chee Meng has experience in used water treatment and water-policy development and was actively involved in the development of water-related standards in Singapore and in various international subcommittees that developed new ISO standards for water reuse.

Abstract: Utilities' perspective of wastewater treatment with respect to sustainability

At PUB, Singapore's National Water Agency, sustainability is central to its mission – to ensure a sustainable water supply for Singapore, tame stormwater and protect Singapore's coastline from rising sea levels. As one of the most water stressed countries in the world with limited land and resources, a sustainable approach towards water use and planning has always been inherent in PUB. PUB is one of the few utilities in the world to manage and close the entire water loop, by including NEWater (a high-grade reclaimed water) and desalinated seawater to its portfolio of water sources to meet the nation's demand.

Having successfully closed the water loop, PUB is also looking to close its resource loops by working towards waste and carbon circularity. Within PUB, the major waste stream is sludge generated from its treatment plants. To reduce the amount of sludge sent to incineration, PUB has begun to explore gasification and pyrolysis of the sludge. The slag and biochar produced are then turned into useful products such as construction materials and activated carbon. On carbon circularity, PUB has set a target to achieve net zero emissions by mid-century and has been actively seeking innovative solutions to reduce its carbon footprint. It has put in place a three-pronged strategy to support the realisation of this goal: (1) replace carbon-based energy sources, (2) reduce carbon emissions and (3) remove carbon through capture and utilisation.



Dr. Raja R. Kadiyala
Vice President and Senior Technology Fellow
Global Market Director for Digital
Jacobs

Bio

Dr. Kadiyala is a Vice President and Senior Technology Fellow at Jacobs. He is currently serving as the Global Market Director for Digital. In this role, he provides leadership, direction, and oversight to services associated with Jacobs' Digital Delivery, Geospatial, and Intelligent Systems solution areas.

These solution areas encompass Automated Design, Augmented and Virtual Reality, Geospatial Analytics and Integration, Geodesign, Digital Twins, Process Control Systems, Optimization, Predictive Analytics, Information Modeling, Smart Metering, Artificial Intelligence, IoT and Smart Sensing, Physical Security, Cybersecurity and Emergency Preparedness solutions for public and private sector clients worldwide.

Over his 27-year career at Jacobs, Dr. Kadiyala has worked to plan and implement information and security system solutions across the globe. He has also focused on real time sensing, machine learning, digital twins, control, and analytics for operational optimization. Many of his current efforts are centered on the development of advanced visualization solutions to provide insight into the overwhelming amount of data generated daily. Before joining Jacobs, Dr. Kadiyala worked in the aerospace industry and industrial process control space as a development engineer. He was also a control systems engineer within the Flight Systems Division at NASA and an R&D manager in the automotive and semiconductor manufacturing robotics arena.

Dr. Kadiyala received his bachelor of science, with highest distinction, from Purdue University. He subsequently received his master of science and doctorate from the University of California at Berkeley, all in electrical engineering.

Abstract: Informed AI for the Water Sector

Artificial intelligence (AI) and machine learning (ML) applications can help us achieve sustainability and efficiency goals, giving utilities the information needed to streamline and optimize their operations. By augmenting our existing datasets with synthetic data, informed AI allows ML models to overcome the challenges of narrow historical datasets, which typically capture only a small range of operating conditions. Leveraging both scenario analysis and operational forecasting capabilities, AI applications are giving utilities an ever-expanding set of insights into chemical and energy optimization, green-house gas, and cost reduction opportunities, as showcased by key case studies from around the world.



Dr Lim Zhuan Khai
Nanyang Technological University
Singapore

Bio

Completed PhD in Advanced Water Management Centre (AWMC), University of Queensland, Australia in 2020. Currently working as a Research Fellow at Nanyang Environment and Water Research Institute (NEWRI), Nanyang Technological University (NTU), Singapore.

Abstract: Novel A-B Process in Mainstream Deammonification

The conventional activated sludge (CAS) process has been a core technology in used water treatment for the past century. Yet, with the focus shift from traditional nutrients removal to municipal wastewater reclamation, more energy-efficient and sustainable approaches in treating used wastewater are necessary. With that, COD capture for methane generation can be facilitated in the anaerobic treatment, followed by partial nitrification and anammox (PNA) process for nutrients removal.

Effective operational strategies for NOB suppression and biomass retention are crucial in the mainstream deammonification. This novel A-B process was investigated in a lab set-up and is currently being demonstrated in an ongoing pilot operation at Public Utilities Board (PUB), Singapore.

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