ABSTRACT for the 2018 ISA WWAC Symposium

Advancing national water systems with safe and secure Industrial IoT applications

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ABSTRACT

Industrial IoT (IIoT) systems are a growing paradigm with technical and economic significance for national water systems. IIoT is a cyber-physical system of interconnected sensors and actuators, which enable more effective decision making by water utilities. Information lies at the heart of IoT, feeding into a continuous cycle of sensing, decision making, and industrial analytics. Industrial IoT is tightly bound to cyber-physical systems and in this respect is an enabler of smart decisions in water/wastewater sector by enabling services of higher quality and facilitating the provision of advanced functionalities. However, characteristics of Industrial IoT systems present very important safety and security challenges that need to be addressed for IIoT to reach its full potential. Addressing these challenges and ensuring security in IIoT products and services is a fundamental priority for water utilities. One of the main concerns is the impact that the different threats may have since attacks on Industrial IoT deployments could dramatically jeopardize people’s security and safety, while additionally IIoT in itself can be used as an attack vector against national water systems. The aim of this presentation is to highlight the importance of addressing security and safety challenges of IIoT products for advancing water systems. It is critically important to understand what needs to be secured and to develop specific security measures to protect the IIoT systems and water utilities from cybersecurity threats.

Beyond technical security measures, the adoption of Industrial IoT systems by water utilities raises many regulatory challenges. The rapid rate of change in IIoT technology has outpaced the ability of the associated legal and regulatory structures to adapt. This has led most vendors to take their own approach when designing IIoT devices, causing interoperability issues between devices from different vendors, and between IIoT devices and legacy systems. Furthermore, vendors might be inclined to limit security features to ensure a low cost of IIoT products and thus product security might not be able to protect water systems against IIoT attacks. Since the “time to market” pressure for IoT products is very high, this imposes constraints on the available efforts to develop security by design. For this reason, what we frequently see in the practice is that vendors developing IIoT products generally place more emphasis on functionality and usability than on security. This presentations will discuss why this approach is not acceptable in water/wastewater industry, and why only secure and safe IIoT systems should be used within water systems. During the presentation, the water utilities will be encouraged to utilize secure and safe Industrial IoT systems for their water/wastewater solutions and the practical approaches on engineering safe and secure Industrial IoT systems will be provided.

ABOUT THE AUTHOR

Goran Novkovic is Senior Manager in Cyber-Kinetic Security practice with PwC. He is Professional Engineer with 20 years of experience in Operational Technology/ Industrial Control Systems Cybersecurity. Goran provides expertise in OT/ICS cybersecurity management and combines it with IT/OT convergence, industrial intelligence and innovative technology solutions. He is helping water utilities to define their cybersecurity goals and objectives, to determine where they currently are and where they want to be in terms of organizational cybersecurity and digital transformation. Goran is working with water/wastewater organizations to successfully manage OT/ICS challenges by establishing strong OT Cybersecurity Governance, defining OT Cybersecurity Frameworks and developing OT Cybersecurity Programs from scratch. His approach to OT/ICS Cybersecurity includes addressing safety and security of information, technology, people and facilities. He is helping water utilities to improve cybersecurity culture by developing and delivering cybersecurity training and awareness programs. Goran takes cybersecurity initiatives as opportunities for optimization, improvement and innovation for every water and wastewater organization no matter the size or industry sector.

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Sincerely,

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