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Real-time dynamic hydraulic model for potable water loss reduction

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Abstract

South Africa is a water scarce country with limited water resources and steadily growing water demand. Unacceptably high water losses and non-revenue water threaten our water resource security as well as the financial viability of municipal water service provision. Traditional approaches of solving water loss problems are not enough to make a significant improvement; for this, new approaches involving increased automation and monitoring are needed. Furthermore, the sensory and automation ICT-overlay required for the WDN can itself be a cause of technical problems that also need to be solved before water utilities will implement these techniques. This paper propose a real-time dynamic hydraulic model (DHM) based control system connected to near realtime sensing and actuation capability on the WDN as an effective approach to implementing an efficient, reliable and adaptive WDN. This is in contrast to current design and operation of most WDNs that rely on steady-state hydraulic models which have inherent limitations with respect to reliability and efficiency.