Environmental Engineering and Management Journal *May 2020, Vol. 19, No. 5, 747-753*
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

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EFFICIENCY INDICATOR FOR ASSESSMENT OF WATER DISTRIBUTION NETWORKS CARRYING CAPACITY

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Abstract

A water distribution network's (WDN's) flow capacity decreases over time mainly because of the unplanned demand growth at its consumption points, increased water loss, and increased internal roughness caused by aging of pipes. In this context, this work presents a new performance indicator, the Carrying Capacity Indicator (I_{CC}). It will enable utility managers to evaluate WDNs' hydraulic and energy efficiency. The I_{CC} was applied in a real case study: a sector of the João Pessoa WDN, in Brazil. Considering only design criteria (in relation to nodal demands and pipe roughness), the I_{CC} decreased from 203.5% in the first year of the network's operation to 70.6% in its 30th year of operation. Simulation results are provided to demonstrate that the proposed indicator can be successfully applied to a wider class of WDNs.

Key words: hydraulic efficiency, performance indicators, water supply networks

Received: February, 2019; Revised final: August, 2019; Accepted: November, 2019; Published in final edited form: May 2020

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