

Abstract

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Hydraulic Evaluation of 1st Gathering of New Cairo City, Egypt Water Distribution Network

Numerous studies in recent years have focused on increasing water distribution networks (WDNs) reliability as these networks are subjected to several types of failure. This paper presents an investigation and evaluation of the 1st Gathering of New Cairo City (Egypt) WDN and recommends a solution to increase network hydraulic reliability. The proposed methodology follows three steps: (1) model and evaluate WDN (2) obtain and analyse evaluation indicators (3) propose solution and recalculate evaluation indicators. Nodal pressure and tanks water levels were used as evaluation indicators. EPANET2 was used as a hydraulic simulation program to perform extended period simulation. It was also intergraded with Microsoft Excel® in order to retrieve and represent the evaluation indicators in addition to performing statistical analysis of data. The evaluation showed system hydraulic failure due to insufficient pumps discharge and very low storage capacity. The proposed solution recommended increasing number of pumps to be 7 identical pumps, increasing storage capacity to be 33,000 m³ and replacing some pipes. As a result, the proposed solution increases the reliability of the network and the level of service offered by water supplier.