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Pressure management for leakage reduction using pressure reducing valves. Case study in an Andean city

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Description / Abstract

A very common problem in distribution systems is water leakage, which can be reduced by pressure management. The objective of this study was to evaluate the reduction of water leakage by optimizing the pressure using pressure reducing valves (PRV). The corresponding hydraulic model of a real distribution network was developed using the EPANET software. After the hydraulic model was calibrated and validated, the analysis of the pressure in the nodes, the velocity in the pipes, through the technical performance indicators (TPI) was performed, in addition, the leakages were quantified. The initial results indicated the need to optimize the pressure, nodes with excessive pressures were found in the lower part of the network. WaterNetGen was used as an extension of EPANET software to model leakages based on pressure after determining the leakage coefficient and considering the installation of two PRVs. The results allowed optimizing the appropriate pressure in 30.83% of the nodes and minimizing leakages in 31.65%. In turn, the simulation assuming the installation of two PRVs determined that the TPI would increase from 79.81% to 97.45%. The focus of this study is recommended to the companies that supply drinking water as a support tool for planning to reduce leakages.

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