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Erratum: *Journal of Hydroinformatics* 1 November 2023; 25 (6): 2253–2267; Optimal charging station placement for autonomous robots in drinking water networks, Mario Castro-Gama, Yvonne Hassink-Mulder

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The publishers regret that there was a typesetting error in the presentation of the abstract for this paper and apologise for any inconvenience caused. The correct abstract can be found below and has been updated in the paper online.

ABSTRACT

Drinking water utilities and commercial vendors are developing battery-powered autonomous robots for the internal inspection of pipelines. However, these robots require nearby charging stations next to the pipelines of the water distribution networks (WDN). This prompts practical questions about the minimal number of charging stations and robots required. To address the questions, an integer linear programming optimization is formulated, akin to set covering, based on the shortest path of the charging stations to each node along a pipeline. The optimization decisions revolve around designating nodes as charging stations, considering the maximum distance (δmax) at which a robot can cover a hard constraint. For optimal placement, two objective formulations are proposed: (i) minimize the total number of stations, representing total cost; and (ii) maximize the total redundancy of the system. The methodology is applied to three WDN topologies (i.e. Modena, FiveReservoirs, and E-Town). Results show the influence of topology on the total number of stations, the number of robots, and the redundancy of the charging stations network. A trade-off between δmax and total number of stations emphasizes robot battery capacity's significance.