Preface

Ever since pump scheduling made its first appearance in the mid-1970s, the quest to develop a real-time, optimal-control system for water-distribution networks has continued. The aim has been to not only exploit the energy tariff structure as in the case of pump scheduling, but also optimize the control settings so as to refine pressure management, thereby maximizing the performance of the network. In this way, the operational cost savings would be increased through a general reduction in pumping pressures as compared with manual control, whilst at the same time, the standard of service to customers would be improved in terms of delivery pressures, continuity of supply and water quality.

The problem was that if network performance were to be included, there had to be an efficient means of predicting the consequences of different control settings on the pressure regime and an effective way of selecting the best combination to meet the needs of the prevailing situation. Moreover, since the demand for water is highly variable, the process would have to be repeated at short time intervals if optimal control were to be achieved, or at least approximated to a degree that made little or no practical difference. Up until now, it has been the sheer computational burden in combination with the short length of time between updates that has defied resolution, as hydraulic simulation was the only means available to predict the consequences of different control settings. However, in recent years, a possible solution to this conundrum has emerged as a result of the more widespread use of data-mining techniques.

The opportunity to pursue the goal of real-time, optimal control of water-distribution networks arose in December 2000, with funding from the European Commission, under its Vth Framework Research Programme. This special edition of the *Journal of Hydroinformatics* chronicles the progress of the POWADIMA (**Po**table **Wa**ter **Di**stribution **Ma**nagement) research project in developing a generic control system for water distribution. The authors of the ensuing papers wish to thank the Editors of the Journal for providing the means of publishing the research project as a whole, rather than having to resort to piecemeal dissemination in a variety of different periodicals. It is to be hoped that the readership will find the papers sufficiently interesting to justify the Editors' confidence in taking this unprecedented step in the history of the Journal.

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