

## Robust Water Network Optimization for Batch Processes

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Water network design has frequently been optimized to minimize the total cost of the water management system. To achieve this purpose in the large scale process, mathematical methods are used as a main tool. Since there are the uncertainties of the water supply, which are resulted from the increasing water demands and the sudden changes in climate, we should consider the potential scenarios of changes in the water supply quantity or the fresh water cost before formulating the mathematical model for water network design. Based on the scenario analysis, we pursue the minimization of mean to cover the uncertainties. On pursuing minimization of the mean cost, we face the risk associated with the deviation, which is expressed in the variance, large differences between the mean cost and the cost of each scenario. To solve the deviation problem, we adopt the stochastic programming model considering robust optimization to the water network, so more flexible and robust water model network for Batch Processes is proposed.