George Mason University Chilled Water Decision Support System

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Abstract: George Mason University (GMU) utilizes a chilled water system to provide cooling to its Fairfax campus, ensuring a cool and comfortable environment for students and faculty. In daily operations, operators make decisions about which machines to turn on and off, and how much cooling is provided throughout the day. Currently, decisions are made mainly through automation or heuristics, both which are not optimal. In order to reduce costs and increase efficiency of the chilled water system, and to help GMU meet its environmental goal of climate neutrality by 2050, a decision support system (DSS) was created for operators to help make optimal decisions for cooling needs. Utilizing a previous case study on cooling optimization, our DSS provides optimal system configuration through forecasting of future conditions and stochastic mixed integer optimization.

Keywords: Decision Support System, HVAC, Energy, Optimization, Simulation, Forecasting