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Abstract: This paper is on the problem of short-term hydro scheduling (STHS), particularly concerning head-dependent reservoirs under competitive environment. We propose a novel method, based on mixed-integer nonlinear programming (MINLP), for optimising power generation efficiency. This method considers hydroelectric power generation as a nonlinear function of water discharge and of the head. The main contribution of this paper is that discharge ramping constraints and start/stop of units are also considered, in order to obtain more realistic and feasible results. The proposed method has been applied successfully to solve two case studies based on Portuguese cascaded hydro systems, providing a higher profit at an acceptable computation time in comparison with classical optimisation methods based on mixed-integer linear programming (MILP). (C) 2010 Elsevier Ltd. All rights reserved.

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