

Modeling a nonlinear water transfer between two reservoirs in a midterm hydroelectric scheduling tool

R. Moraga Ruiz de la Muela; J. García González; E. Parrilla Pozzy; S. Nogales Becerra

Abstract-

In a competitive environment, operation and planning decisions of generating units are decentralized. Therefore the management of hydroelectric generation resources requires the development of advanced planning and scheduling tools adapted to the particular needs of each company. This paper presents a method for considering natural water transfers through a pipeline in the context of a midterm hydro scheduling model. The main complexity of gravitational transfer modeling resides in considering the nonlinear relation between the water levels in the connected reservoirs and the transfer flow. The methodology proposed consists first in simplifying the problem by means of a change of variables, subsequently using a piecewise linear approximation of the transfer flow equation in order to consider it within a mixed integer linear programming tool, and ultimately adjusting the final solution. The proposed methodology is currently being used to manage the Sil River hydro basin in the northwest of Spain, with satisfactory results, as shown in the case study.

Index Terms- midterm hydroscheduling; optimization; reservoir management

Due to copyright restriction we cannot distribute this content on the web. However, clicking on the next link, authors will be able to distribute to you the full version of the paper:

[Request full paper to the authors](#)

If your institution has an electronic subscription to Water Resources Research, you can download the paper from the journal website:

[Access to the Journal website](#)

Citation:

Moraga, R.; García-González, J.; Parrilla, E.; Nogales, S. "Modeling a nonlinear water transfer between two reservoirs in a midterm hydroelectric scheduling tool", Water Resources Research, vol.43, no.4, pp.W04499-1-W04499-11, April, 2007.