The Unit Commitment Problem with Periodicity Constraints

LUíS A.C. ROQUE
Instituto Superior de Engenharia do Porto
LIAAD-INESC-TEC, Department of Mathematics
4200-072 Porto, Portugal
lar@isep.ipp.pt

DALILA B.M.M. FONTES
Universidade do Porto
LIAAD-INESC-TEC, Faculdade de Economia
4200-464 Porto, Portugal
fontes@fep.up.pt

FERNANDO A.C.C. FONTES
Universidade do Porto
ISR-Porto, Faculdade de Engenharia
4200-465 Porto, Portugal
faf@fe.up.pt

This work addresses the Unit Commitment (UC) problem. In the UC problem, the goal is to schedule a subset of a given group of electrical power generating units and also to determine their production output in order to meet energy demands at minimum cost. In addition, the solution must satisfy a set of technological and operational constraints.
Most problems in the literature consider a short horizon scheduling, typically 24 hours, but the solution obtained cannot be repeated even when load demand pattern remains the same.
We analyse the “short horizon effect” when 24 hour scheduling is used repeatedly on a longer period and we introduce periodicity constraints that improve the overall solution on longer periods without compromising the computational load.