

عنوان مقاله:

Economic Environmental Dispatch of Thermal Units and Compressed Air Energy Storages

محل انتشار:

پنجمین کنفرانس بین المللی مهندسی برق و کامپیوتر با تاکید بر دانش بومی (سال: 1396)

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خلاصه مقاله:

Nowadays, different energy storage technologies are attracting world attention due to their capabilities in adding more flexibility on power system operation and planning. Meanwhile, compressed air energy storages are able to participate in bulk energy management with higher power capacity for long discharge time period. In addition, advanced adiabatic compressed air energy storage (AA-CAES) has an overall efficiency up to 70% with near-zero carbon footprints in comparison with conventional types. Hence, this paper aims to present a day-ahead dynamic economic emission dispatch model for thermal and AA-CAES units taking into account their operational constraints such as power balance criterion, ramp up and down limits, generation capacity, transmission losses, charge and discharge constraints of AA-CAES, etc. A mixed integer non-linear programming (MINLP) problem is solved using SBB solver under general algebraic modeling system (GAMS) software package to minimize total operating cost and emissions of thermal units in the presence of AA-CAES over a 24-hour time interval. Numerical results reveal that optimal charge and discharge of AA-CAES reduces total generation cost and greenhouse gas pollutants, significantly.

کلمات کلیدی:

(Dynamic economic environmental dispatch (DEED), advanced adiabatic compressed air energy storage (AA-CAES

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