ELECTRA REX

A Researcher Exchange Programme for Smart Grids

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LINEAR DECISION RULES FOR POWER SYSTEM BALANCING CONSIDERING DISTRIBUTED ENERGY RESOURCES

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The increasing penetration of renewable energy resources and alongside reduction of centralized generation requires flexibility to be provided from other control reserves. As demand side resources are widely regarded as key to this flexibility, we observe that, in contrast to conventional controllable generation, a) demand side resources cannot continuously be activated (limited energy flexibility), and b) these resources require much shorter planning and reservation periods, as they follow other use patterns. With respect to conventional and energy constrained flexibilities, two types of control signals are investigated in this study to active the corresponding flexibilities, namely the fast and slow signals. These two types signal generally represents the system imbalance signals and reflect the features/requirements of the power system.

In order to address the different realization of the control signals, a linear decision rule based robust control method [1] is used in this study to optimally dispatch the policies to the flexibility resource providers. Compared to [1], the main contribution of this study is the integration of two types of control signals and the linear decision rules. By using these two types of control signals, it is expected that the fast signal can be mainly used for activating energy constrained resources, while the conventional flexibility resources are mainly activated by the slow signal.

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REFERENCES

[1] Warrington, J., Goulart, P., Mariethoz, Sebastien., Morari, M., Policy-based reserves for power systems, IEEE Transactions on Power Systems, Volume 2, 2013, pp. 4427-4437.

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Location of the exchange

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Route description
Route description with Googlemaps

RPR 0244.195.916 Turnhout