

Automatic isolation and restoration in the distribution networks in Iberdrola

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Abstract

Motivated by a recent change in the Spanish regulation **Iberdrola Distribución** undertook together with **Siemens A.G. Austria** the implementation of an algorithm to improve the response time of the isolation and restoration process at the Control Centers.

Penalties for outages longer than 3 minutes have recently been increased dramatically in Spain and Iberdrola, trying to minimize its impact, has installed a centralized program in its control systems triggered after each definitive trip in the MV radial network. The algorithm analyzes all the incoming information from the fault detectors in the field (also fault distance in the future) and topology to efficiently isolate the fault first, and then to restore all possible customers in the minimum time within safety conditions. The program is called **ARA** for the Spanish “Automatic Isolation and Restoration”.

Although a first release of ARA is installed in the real time systems at the moment, it has only been used in simulation mode. About 100 different outages have been successfully analyzed and compared with the operations done by the Dispatchers. Results don't show significant differences in response times when Dispatchers deal with one single outage and the work load is low, but response times are reduced significantly when they have to face more than one outage at a time (storm or busy conditions). ARA should be seen as a mechanism to reduce stress situation at the Control Centre and will probably change the way control systems are operated today, warning about faulty segments rather than just alarms (letting Operators concentrate in crew management).

Iberdrola intend to put ARA in operation in 3Q of 2011. This will already be a big challenge for the utility as it will be the **first time to deploy automatic network commands from a control system in a close loop**, but probably the first step in a new concept of algorithms boosted by the AMI and automation deployments ongoing in Iberdrola.