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Dispatch and Control System for Smart Grid:

New Generation of EMS in China

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This presentation introduces the newly developed and implemented EMS in China.

The history development of EMS in China is briefly introduced, and then problems and challenges in traditional EMS are analyzed. To satisfy the 6 requirements proposed by GO 15 (formerly Very Large Power Grid Organization, VLPGO), China developed the new EMS (D5000) from 2004-2010, the first version of the D5000 was put into operation in 2010, and since then until 2016, 249 systems have been put into real operation in China.

The system architecture and design rule are given. An unified supporting platform is developed to support integrating diverse functions in traditional EMS. Three classes of applications, real-time monitoring and early warning, day-ahead planning and security checking, and dispatch management, are designed. These three classes of application are arranged in three network security zones, i.e. control zone I, production zone II and management zone III respectively.

To meet the requirement for longitudinal transfixion to support integrated operation of different hierarchical EPCC of State grid, regional grids and provincial grids, applications in same security zone in the EPCC with longitudinally different hierarches are connected by corresponding VPN sub-networks.

Basic platform includes 4 classes of transmission bus, 4 classes of data base and 4 classes of MMI. The basic platform unified diverse tech standard specifications and API.

Main application functions and operation results of the D5000 are given. The benefits of the implemented EMS are:

Enhancement of

- observability for the power grid
- controllability of the power grid

- coordination dispatch ability for hierarchical EPCC
- stability operation level of the power grid (on-line DSA)
- optimization allocation for power resource
- accept ability for renewables powers
- Ability to withstand major disasters and cyber attacks

This new EMS of D 5000 has been operating in EPCC in China.