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發電管理與控制技術
Generation Management and Control

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摘要

本論文在探討發電管理系統 (Generation Management System, GMS) 的兩個主要構成元件：自動發電控制 (Automatic Generation Control, AGC) 與經濟調度控制 (Economic Dispatch Control, EDC)。自動發電控制是利用互連網路中配有自動發電控制系統之發電機組，隨時自動調整發電機組之瞬間出力，使得發電端及負載端在面臨即時波動時，仍能隨時保持平衡。透過自動發電控制的功能，電廠內的發電機組在不同發電模式之下的發電情況得以被監控，而能同時滿足內部區域的電量負載與排定銷售至外部區域的電量之電力安全調度。另一方面，利用經濟調度控制的功能，可以決定電廠內發電機組的最小發電燃料成本，協助電廠能在最低的發電成本下供應電力，同時達成電廠內部各發電機組間最佳化的發電分配。

Abstract

In this report, the theories of automatic generation control (AGC) and economic dispatch control (EDC) are discussed, which are the two major components of generation management system (GMS). In an interconnected system, the role of the AGC is to instantaneously adjust the generation units, installed with the AGC modules, so as to keep the power balance between sources and sinks. The generation status of power units under different control modes is supervised by AGC, which can balance the needs both for the power consumption of internal controlled area and for the scheduled exchange Mega-Watt (MW) under the safety power dispatch. On the other hand, the minimal fuel cost of the units in the power plant is calculated by the EDC, so that the power plant applying GMS could generate power at the minimal cost as well as achieve the optimal generation dispatch.