2011 IERE-RWE Düsseldorf Workshop, May 23-26, 2011

Mr. Lothar Balling, Siemens AG, Energy Solutions

Executive Vice President GT Power Plant Solutions Europe, Africa, Asia, Australia

Flexible Operation of Combined Cycle Power Plants

Abstract

Combined cycle power plants (CCPP) have a large share in today's power generation in Europe. The increasing contribution of CCPPs to power generation over the past decade can be explained through their high efficiency and relatively low investment costs.

Meanwhile, regenerative production methods like wind power and solar power have entered the power generation market in larger shares. Renewable resources certainly lead the way to reduced CO_2 emissions, but on the other hand their limited availability and predictability pose a considerable challenge. Time periods of calms and overcast climate, day and night conditions have to be covered by fossil-fired power plants. This way, the requirements to the operational flexibility and rapid load response of the fossil fleet, as formulated in grid codes and customer specifications, are constantly increasing. These developments drive modern power plant design to put a strong focus on operational flexibility.

As an example, the integration of modern technologies and consequent optimization of the plant start-up process have recently enabled Siemens to build fastest-starting CCPP in France, Netherlands…

In the United Kingdom the strict requirements of the UK grid code to operational behavior in case of frequency deviations can be met by deploying a range of new technologies. Throughout Europe, the increasingly requested ability of island and part-load operation can be provided by introducing additional and innovative plant control concepts.

The verification and validation of these abilities took place not only in theory but also during real plant operation. This means, that the actual customer benefit, resulting from e.g. reduced fuel consumption during the start-up process, can be realized in power plants already today.

This paper describes the innovations in the area of plant flexibility and the results and improvements achieved in recently commissioned combined cycle power plants in Europe.