The Efficiency Improvement Programs for Thermal Power Plants in Taipower

Chun-Ching Lin, Tai-Jan Yang, Pi-I Wang, I-Chien Lee, Jiing-Lin Chen
Mechanical Engineer, Energy Research Laboratory,
Taiwan Power Research Institute, Taiwan Power Company, Taipei, Taiwan

Abstract

Thermal efficiency is an important issue for the power plants, particularly when the fuel price has been escalated in recent years. Measures that have been taken to improve the thermal efficiency include equipment replacement/upgrade, maintenance and real time adjustment of the operation parameters. Equipment replacement/upgrade and routine maintenance works are not addressed here because the goal for the first one is reliability and the second one is nothing special. This presentation will focus on the thermal performance improvements by way of real time adjustment of the operation parameters.

In order to make sure that which operation parameters could be effectively adjusted, suitable analysis tools would be needed. This includes the performance evaluation software and instrumentations, which have been applied in Taipower, will be addressed in this paper. The performance evaluation software helps to identify where to look at if the performance is discovered degradation. While the instrumentations take real time operation data to pinpoint the locations of where might be the problem? The performance monitoring systems that have been developed are discussed. Optimization of boiler operation using a commercially available package is also described. The balance of pulverizing coal flow is presented. Economizer outlet emissions data is collected and the evaluation of a boiler performance are presented. Using the plant real time data, following the energy and mass balance to inspect where might be adjusted in order for the performance returning back to what it should be is also presented in this paper.

Problems that have been encountered are discussed. What kinds of tools are the most helpful? What are the limitations of applying these kinds of tools? How to interpret the data obtained? All the topics related to the performance improvement will be discussed during the presentation.