汽轮机蒸汽流程改造供热的安全经济性分析

摘　　要

我国对环境问题越来越关注，自从可持续发展国策实施以来，我国把国民生产总值能源消耗指标越来越细化，对节能减排也有了更多更严的要求，热电联产作为国际、国内节能减排的排头兵，发挥着越来越大的作用。由于我国北方冬季集中供暖要求，和南方工业园区小机组自备电厂迫于环保压力的不断拆除，加之电力企业的无序性建设，缺乏热源却同时冗余电源是我国当前能源行业的主要问题之一，纯凝机组汽轮机改造供热是解决问题的较好方法。改造过程中会面临一系列问题，通过查阅文献进行全面分析，其中旁路抽汽供热作为纯凝机组改造为热电联产机组的方式之一，近年来一直深受广大有需求企业的青睐，尤其是高、低旁路联合改造供热，目前技术在不断更新和广泛应用。

本文旨在对汽轮机蒸汽流程改造的全过程进行可行性分析，论证方案的同时不断提升改造流程。主要工作内容如下：

首先，通过实例对比分析再热蒸汽供热、中间抽汽供热、低真空供热、背压供热、旁路供热五种改造方案，对火电机组灵活性改造进行深入探究，对结论进行分析比较，为适应我国现阶段火电机组改造提供一定参考。

其次，文中详细对机组改造后热经济性、调峰能力和风电消纳能力进行分析和对比论证，通过实例对热经济性等进行计算。对调峰电价、消纳风电问题进行一定分析，可供企业选择参考。同时对改造后机组轴向推力、机组本体外部件等的安全性进行分析。

关键词：供热改造；旁路供热；经济性分析；安全性

Title Safety and economy analysis of steam process transformation heating of steam turbine

Abstract

China pays more and more attention to environmental issues. Since the implementation of the national policy of sustainable development, China has refined the energy consumption index of GDP more and more, and has more and more strict requirements for energy conservation and emission reduction. As the leader of international and domestic energy conservation and emission reduction, cogeneration plays an increasingly important role. Due to the requirements of central heating in winter in North China, the continuous demolition of small unit self provided power plants in South Industrial Park under the pressure of environmental protection, and the disorderly construction of power enterprises, the lack of heat source and redundant power supply is one of the main problems in the current energy industry in China. The transformation of pure condensing unit steam turbine heating is a better way to solve the problem. There will be a series of problems in the process of transformation. Through literature review, a comprehensive analysis is made. As one of the ways to transform a pure condensing unit into a cogeneration unit, bypass extraction heating has been favored by the majority of enterprises in need in recent years, especially the combined transformation of high and low bypass heating. At present, the technology is constantly updated and widely used.

The purpose of this paper is to analyze the feasibility of the whole process of steam turbine transformation, demonstrate the scheme and improve the transformation process. The main work is as follows:

First of all, through the comparative analysis of five transformation schemes of reheat steam heating, intermediate extraction steam heating, low vacuum heating,

back pressure heating and bypass heating, this paper makes an in-depth study on the flexibility transformation of the thermal power unit, analyzes and compares the conclusions, and provides some reference for the transformation of the thermal power unit at the present stage in China.

Secondly, the paper analyzes and compares the thermal economy, peak load regulation capacity and wind power consumption capacity after the unit transformation, and calculates the thermal economy through examples. This paper analyzes the problems of peak load adjustment price and wind power consumption, which can be used as a reference for enterprises. At the same time, the safety of the axial thrust and the external parts of the modified unit are analyzed.

Key words: H**eating transformation; Bypass heating;Economic analysis; Safety**