ISSN1004-7948
CN21-1115/TK

节能

ENERGY CONSERVATION

3
2016

第35卷 第03期（总第402期）

ISSN 1004-7948
03>

节能（月刊）

Jieneng

中国核心期刊（遴选）数据库全文收录期刊
中国学术期刊综合评价数据库（CAJCED）统计源期刊
中国期刊全文数据库（CJFD）全文收录期刊
中文科技期刊数据库全文收录期刊
1981 年创刊　第 35 卷第 3 期（总第 402 期）
2016 年 3 月 15 日出版

主　管：辽宁省科学技术厅
主　办：辽宁省科学技术情报研究所
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出版：《节能》杂志社　　**邮编**：110168
地址：沈阳市浑南新区朗月街 2 甲号
印刷：沈阳中科印刷有限责任公司
订阅：全国各地邮政局
国内发行：辽宁省邮政公司报刊发行公司
国外发行：中国国际图书贸易总公司
邮发代号：8－150　**国外**：M5170
刊号：ISSN1004－7948 / CN21－1115/TK
广告经营许可证号：2101001500026
开户名：辽宁省科学技术情报研究所
开户行：盛京银行沈阳市火炬支行
账号：070310300100309004254
定价：每期 10.00 元　全年 120.00 元

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Energy Conservation(Monthly)
Sponsor: Liaoning Provincial Institute of Science and Technology Information
Publisher: Energy Conservation Magazine Publishing House
Chief Editor: JIN Na
Address: Lang Yue Street No. 2A, Hunnan District, Shenyang City, Liaoning Province, China
Post Code: 110168

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Mar. 2016 Vol. 35, No. 3 Total Issue No. 402

Thermal economy analysis of 1000MW unit under different working conditions based on equivalent enthalpy drop method

CHENG Yi, WANG Jiong
(AN GANG GROUP, Anyang 455003, China)

Abstract: China is a big country of energy production and consumption, so energy- saving and reducing pollution is imperative, when energy becomes more and more prominent. Using energy effectively and thermal economy have a great practical significance. The paper takes the THA and 50% THA conditions of the N1000MW unit as the example to analyze and compare the thermal economy of the unit with the equivalent enthalpy drop method. The purpose is to get the pumping efficiency for analyzing the energy utilization degree. From the calculation results of thermal economy, the exchanger No. 8 can be transformed in the unit. The paper has certain referential value in the relevant power plant.

Key words: energy-saving; thermal economy; equivalent enthalpy drop method

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Analysis of coal saving and emission reduction effect of power system based on the regulation of pumped storage power station

LV Chao-yang, LI Xing-rui
(Wuhan University, Wuhan 430071, China)

Abstract: In the world pay more and more attention to the energy and environmental issues of today, the reasonable exploitation and utilization of clean energy has become the consensus of the construction of energy in the world, where the pumping energy storage power station with mature technology, peak shaving, adjustable pressure characteristics of strong function of PM, in the world the development of clean energy construction recognized. Pumped storage power plant development and operations management in climate change diversity, coal saving face high requirements under the new situation, scientific reasonable arrangements for pumped storage power dispatch mechanism, scientific and reasonable arrangements for pumped storage location in the power system, and give better play to the pumped storage power station coal saving effect. This paper mainly through the pumped storage to different operation schemes of the power plant are analyzed, and analyzed under the different load curve characteristics of pumped storage can work position difference, analysis with pumped storage power to work in different ways, analysis the influence of power system in other power operation mode ring, and then analyzes the consumption of coal in the power system. The theoretical significance and practical value of the research results can provide reference for the sustainable development and construction of pumped storage in China.

Key words: pumped storage; power system; coal saving

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Software development of real time main steam pressure optimization in power plant

XU Li-feng, ZHA Gui-qing, LI Ping-qiang, et al
(Jiuhua Power Plant in Chizhou City Anhui Province, Chizhou 247100, China)

Abstract: In order to achieve the purpose of energy saving and consumption reduction, a real-time optimization system of main stream pressure is developed for 300MW large thermal power generating units. The method of unit operation state reconstruction is put forward based on the matrix equation of thermal system. The calculation accuracy of the model is improved on the basis of the rule of operating parameters by a hybrid modeling method based on mechanism analysis and statistical method. Finally, Delphi programming and MySQL database are utilized to realize real-time optimization of thermal unit main stream pressure and to guide the power unit operation. The software application shows that the constant pressure is adopted between the 100% load and the 80% load, and the sliding pressure is adopted below the 80% load. The heat consumption is gradually decreased with the increase of the load.

Key words: real-time optimization; thermal power unit; mixed modeling; main stream pressure

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Economic analysis of energy saving and environmental protection of flue gas waste heat recovery technology

CHEN Li-ping, WANG Wan-jiang, QI Dian-wei, et al
(School of Architecture Engineering, Xinjiang University, Urumqi 830047, China)

Abstract: Flue gas waste heat recovery technology has the advantages of energy saving, emission reduction, water saving. In order to reduce the using of natural gas in Urumqi, established a calculation model, which is based on the thermodynamics theory and combustion theory; Using the gas source of Urumqi, which including Central Asia gas and Karamay gas, as calculation basis. Calculated the amount of gas saving, the amount of water saving, the amount of the reducing of harmful gas emissions, and the improve efficiency of the gas-fired boilers when they used the flue gas waste heat recovery technology. According to analyzing the results of calculation, it shows that using flus gas waste heat recovery technology can improve the efficiency of boiler about 17.36%. It means that, about 169.0573 million Nm^3 nature gas can be saved per year Nm^3, and about 883.3 thousand tons water can be saved as well. What is more, by using flue gas waste heat recovery technology can reduce the emission of harmful gas; 53.12 ~ 195.65t of NO_x and 1210.22 ~ 3462.57t of CO_2 emissions can be reduced. From the data above, it shows that, the social and economic benefit by using flue gas waste heat recovery technology is very large, thus it can be applied to the heating gas boiler in Urumqi.

Key words: gas-fired boiler; flue gas condensation; waste heat recovery; heat efficiency

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http://www.lnsnys.com

邮发代号：8-150　广告经营许可证号：2101001500026　定价：每期10.00元