

节能

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ENERGY CONSERVATION

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链条锅炉第七代分层燃烧技术——



SFFFG型

三辊式分层分行分段

给煤装置

130t/h单炉排分层分行分段给煤装置



MHJ—8061型智能煤耗计

1. 三辊式结构 (专利号972182721), 湿煤不粘、冻煤不棚、干煤不自流, 任何煤质条件下供煤都流畅均匀。
2. 配“可变形组合式筛分器” (专利号2006200904651), 可根据煤质状况, 在“分层燃烧”与“分行燃烧”之间任意切换, 具备适应煤种变换的能力。
3. 煤闸板根据锅炉吨位按3~12段布置, 可以对局部煤层厚度 (风阻) 做单独调节。
4. 配MHJ—8061型“智能煤耗计”, 实现单炉、单位时间煤耗量的显示、打印和数据输出。
5. 较普通煤斗相比, 平均节煤5%~10%, 投资回收期两个连续运行月之内; 较早期分层煤斗相比, 平均节煤2%~5%, 投资回收期四个连续运行月之内 (详情请见本刊第58页文章)。

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The power plant energy audit and its applications and prospects

YANG Yan-ling, SHI Qi-guang, ZHAI Shu-wei, et al
(School of Energy & Environment Engineering, Shanghai University of Electric Power, Shanghai 200090, China)

Abstract: The energy audit theory research and development present situation in our country and abroad were elaborated. Put forward the power plant energy audit practice to focus on the evaluation index, the establishment of the false data method to representative energy balance analysis, and explore ways of energy saving and emission reduction, and realize the online energy audit in thermal power plant computer.

Key words: energy audit; power plant; energy management; evaluation index

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The exergy analysis of the air-conditioning heat recovery device

MENG Fan-jin, ZHOU Hai-ni
(Shandong Urban Construction Vocational College, Jinan 250103, China)

Abstract: Based on thermodynamic principles and exergy analysis method, the analytical model of the air-conditioning system heat recovery device was established, the current application of the HVAC system heat recovery technology was analyzed by exergy method. A comprehensive, reasonable scientific analysis and evaluation method of heat recovery energy conservation technology were obtained. Some matters needing attention of the air-conditioning system heat recovery device were summarized, these matters needing attention has certain guiding significance regarding promoted and the use of heat recovery device.

Key words: heat recovery device; thermodynamic analysis; evaluation

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Research of the performance about the solar chimney power plant systems

GUO Huan, CUI Xiao-chao, TANG Shou-zheng
(Department of Engineering Mechanics, Taiyuan University of Science and Technology, Taiyuan 030024, China)

Abstract: The Numerical simulations were performed by using commercial CFD software ANSYS Fluent 13.0 to simulate the distribution of velocity in the solar chimney power plant system. According to the results, when other conditions are changeless, the surrounding height of solar collector almost has no influence on the power output; there is an optimal value of the solar chimney diameter, by which the power output of the system is the most. Furthermore the inclination of heat collector also has a best value, which makes power output of the system is the most.

Key words: solar chimney; numerical simulation; heat collector; Computational Fluid Dynamics (CFD)

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Analysis of CO₂ heat pump drying operating condition

WANG Shuai, OUYANG Jing-ying, WU Yu, et al
(North China Electric Power University, Baoding 071003, China)

Abstract: Based on the analysis of the thermodynamic characteristics of CO₂ transcritical cycle, a simulation analysis was made for the CO₂ heat pump drying system by using the EES software. The results show that the COP and SMER of the system are growing with the increase of the evaporating temperature, while the exhausting temperature goes down. The COP and SMER of the system go down with the increase of the exhausting pressure, and the exhausting temperature of the compressor rises. Therefore, in order to keep the heat pump drying system works normally, we should keep the operating parameters of system are maintained within the following: the evaporating temperature should be under the highest evaporating temperature; when the drying process functions normally and meets the demand of the exhausting temperature of the compressor, the exhausting pressure should go down to the greatest extent.

Key words: CO₂; heat pump drying; evaporating temperature; exhausting pressure

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Economic analysis of absorption heat pump coupling NC turbines in thermal power plant

WANG Xi-lun, YU Gang, CAO Xin-hui, et al
(School of Energy, Power and Mechanical Engineering, North China Electric Power University, Beijing 102206, China)

Abstract: As to the contradiction between the heating demand and heating capacity, and the problem of the utilization of low-grade condensing heat in power plants, this paper took a 300MW extraction-condensing unit (NC unit) as an example, designed the heating program of absorption heat pump coupled NC unit. First, combined with the heating program, proposed the conception of heating area expansion rate. Then, set the heating area expansion rate, the comprehensive energy utilization rate and the thermal and power total income as economic comparison standard, using constant-flow thermodynamic calculation method, compared the three economic indicators of coupling heating way and traditional thermal-power cogeneration heating way. Finally, the results show that the coupled heating mode could expand the heating area, improve the energy efficiency, and increase the economic benefits of the thermal power plant, when the unit capacity did not change.

Key words: co-generation; coupling heating; coefficient of exhaust; economy; heating area expansion rate

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Benchmarking analysis based on the standard supply coal consumption rate of thermal power enterprises

LAN Jun-jie, CHEN Hai-ping, ZHONG Ya-juan, et al
(School of Energy, Power and Mechanical Engineering, North China Electricity Power University, Beijing 102206, China)

Abstract: The benchmarking management is one of the most important management methods of thermal power enterprises currently, the recommend of which has set up a solid theoretical and practical basis for the enterprise to establish a scientific management mode. At present, major thermal power enterprises in China have adopted this method to guide the management gradually, and achieved remarkable results. Standard supply coal consumption rate is a major indicator of thermal power enterprise benchmarking management. This paper proposes a new method of analyzing standard supply coal consumption rate, and analyzes the overall gap in the thermal power enterprises standard supply coal consumption rate briefly, due to the installed capacity and energy consumption level factors respectively. It has great significance for the development of enterprises.

Key words: benchmarking analysis; supply coal consumption; installed structure

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Distribution of energy consumption evaluation method of nuclear power plant base on unit consumption

SONG Zu-rong, CHANG Meng, PAN Xiang
(Nuclear and Radiation Safety Center,
Beijing 100082, China)

Abstract: Unit consumption structure of products is taken as the index of reducing the energy consumption by applying the methods of unit consumption analysis which is based on the second law of thermodynamics. The evaluation methods in the nuclear power system can be divided into two. One is the distribution of standard fuel consumption and its additional unit consumption. The other is the distribution of standard coal consumption and its additional unit consumption. Both of them reflect the energy consumption distribution under different fuel standard. The third generation AP1000 unit is taken as the object and the safe operation of nuclear units. The temperature level of heat transfer between the reactor core and nuclear circuit is improved and in the same time the medium parameters in the turbine system of conventional circuit is also improved, which improve the nuclear unit efficiency significantly. In addition, reducing the steam humidity in the normal island is conducive to reducing the energy consumption of regenerative system.

Key words: unit consumption analysis; exergy analysis; nuclear industry; AP1000; energy consumption

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Comparative studies on the external walls with different thermal insulation models

WEI Xu-chun, ZHANG Zhi-gang

(Tianjin Institute of Urban Construction School of Energy and Safety Engineering, Tianjin 300384, China)

Abstract: The two heat insulating ways that are outside heat insulating and inside heat insulating were compared. Wall temperature distribution and wall inside surface temperature were analyzed. Based on the above, the advantage and disadvantage of the two heat insulating ways were analyzed. The result shows that the outside heat insulating way is better than the inside heat insulating way in some ways. To use the way of outside heat insulating, room comfort was enhanced and wall crazing was reduced. The influence of thermal bridges on heat insulating was eliminated effectively and energy cost was also reduced.

Key words: outside heat insulating way; inside heat insulating way; temperature of inside surface; temperature distribution; thermal bridges

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Design of wind-light complementary power generating control system based on STM32

Cao Yuan-li, Li Shi-guang, Mei Shou-bin, et al

(College of Information and Electrical Engineering,
Shandong University of Science and Technology,
Qingdao 266590, China)

Abstract: A wind-light complementary power generating control system of low power consumption and high performance with STM32 as the core is designed, introducing the system works and the hardware circuit design. The control system has the highest power tracking control, storage battery charging and discharging control and the over-charge and over discharge protection function. The system transmits the collected voltage, current and temperature signals to STM32, the control is regulated by the corresponding outputting of PWM values to make the generating system output the maximum power. Thus, the energy efficiency is improved and the life of the storage battery is extended. The experimental results prove that with reliable operation con-

dition, easy maintenance and low cost, this system has a very high application value.

Key words: wind-light complementary; battery; STM32; lab view

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Based on solar-heat storage technology development of absorption refrigeration, heating, heating water joint operation system

YANG An-li, WANG Hai-feng, CHEN Li-li, et al

(School of Chemical Engineering and Energy, Zhengzhou University, Zhengzhou 450001, China)

Abstract: Based on solar energy collector and heat regenerator, this is a set of energy conversion and collect equipment, for absorption refrigeration, heating, heating water by providing thermal driver. System composition: includes solar heat storage part, Sharing collection hot heat storage device of cooling, heating, heating water three functions such as circulation system, Circuit and its automatic control parts. The system is to the sun by thermal collectors and heat storage radiant energy conversion devices as heat and stored in form of, will diversify, low grade with high grade of solar energy into heat energy, and other forms of waste heat can be through heat stored on the device design the system of heat storage device inside. Three big get heat energy as it needs to improve the energy efficiency.

Key words: solar energy; functions cycle; energy-saving and environmental protection

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Analysis on factors influencing exhaust temperature low of piston compressor and its improvement

LI Kai, XU Ze-hui, CAO-Hong

(China Petroleum Tarim Oilfield Company,
Korla 841000, China)

Abstract: Introduces the structure and principle of reciprocating compressor, analyses the causes of compressor outlet temperature is too low the reason, put forward by controlling the air cooling device of air to the improvement measures, improve the compressor discharge temperature, to ensure the normal operation of the unit.

Key words: piston compressor; temperature; fault analysis

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Effective way of tar in the emulsification of the clarification tank

WANG Xiao-zhen, SUN Xiao-fei, LI Ying-chao

(Pingdingshan Coal Group Tianhong Coking
Company, Pingdingshan 461713, China)

Abstract: In the coke production process, the ammonia and tar are produced at the same time, after the gas-liquid separator is treated separately. With the coal, coke production conditions or abnormal gas purification in the production process, the tar in the mechanization of tar, ammonia, to clarify the probability of the tank a wide range of emulsifying a substantial increase, thereby causing great threat to the normal production process of the coking plant. Coke and chemical production recovery in the actual production may cause the phenomenon of tar emulsion to a brief analysis and discussion.

Key words: blending; coke; chemical production; tar emulsion

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