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**Research on energy-saving premising of safety and safety under energy-saving in nuclear power in China**

ZHOU Tao, CHEN Juan, GUO Miao-miao

(Institute of Nuclear Thermal-Hydraulic Safety and Standardization, North China Electricity Power University, Beijing 102206, China)

**Abstract:** According to the demands of nuclear safety and energy-saving in China, the energy-saving premising of safety and safety under energy-saving were analyzed respectively. Then, the dialectical relationships between energy saving and safety were given clearly, which showed that carrying out energy-saving was the requirement of developing nuclear power, while energy-saving is even more needed for nuclear power. At last, the fundamental principles, the ways and measures of establishing green nuclear plant were proposed by the way of doing well energy-saving premising of safety and safety under energy-saving, which was in accordance with Chinese actual situations.

**Key words:** nuclear power station; safety; energy-saving

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**The present status and improvement suggestions about the construction of Energy Management System in Meishan Steel Company**

XU Xiang-bo

(Energy and Environment Protection Department of Meishan Steel Company, Nanjing 210039, China)

**Abstract:** The present status of Energy Management System in Meishan Steel Company were reviewed and compared to the national Energy Management System standard. Inadequate aspects should be improved were considered and several suggestions were given, which were to complete the energy management process, to enhance the field energy management and to improve the EMS function to provide production optimization guidance.

**Key words:** energy management system; energy management; improvement

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**The analysis of energy saving and emission reduction plan in automobile manufacturing industry**

LI Shu-ting, WEI Ming

(MMI Planning & Engineering Institute IX, Changchun 130011, China)

**Abstract:** Based on automotive plant design practice, to explore the auto industry with advanced production techniques, new technologies and new materials. Through the most streamlined way to analyze the effect of energy saving in automotive manufacturing. Combined with energy-saving programs in the auto plant design, described the value of energy saving and emission reduction in automobile production and manufacturing. Significance of the research aims to promote new technologies and make new materials widely used.

**Key words:** automotive manufacturing; production management; energy saving; emission reduction

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**Experimental study of the wind-PV hybrid system**

HUANG Jun, GU Jie, WANG Xiao-bo

(Inner Mongolia University of Science and Technology, Baotou 014010, China)

**Abstract:** Described the composition of the wind-PV hybrid system, with an example of wind and solar system, equipment and local weather conditions and power generation were introduced, and analyzed the operation of current system.

**Key words:** the wind-PV hybrid system; application; power generation

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**The research on the screw pump closed-loop automatic control system with RBFNNT**

WANG Gui-sheng

(Technical Inspection Center of Shengli Petroleum Administration Bureau, Dongying 257000, China)

**Abstract:** Introduced a new screw pump closed-loop automatic control system. Based on the RBF neural network the model between real-time monitoring electrical parameter and working fluid level were constructed, by means of automatic control of frequency converter, the relationship between production and efficiency was adjusted adaptively. The control system was able to solve the problem of evacuation and over submergence depth, which was adaptive to the application environment. Field application shows that this technology has achieved supply-discharge coordinated production of oil well lifting system and the goal of efficient production and energy-saving. It provides a technical means of closed-loop automatic control for oilfield scientific production and satisfies the needs of automatic control for production procedure and digital oilfield.

**Key words:** closed-loop automatic control; supply-discharge coordinate; submergence depth; working fluid level; RBF neural network

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**Development of automatic control system in annular shaft kiln**

ZHANG Qin

(Baosteel Engineering & Equipment Co. Ltd., Shanghai 201900, China)

**Abstract:** The annular shaft kiln has a advantage of protection of environment security and energy-saving. The annular shaft kiln is one of the main facilities of lime production. In China the manufacturing of this kind of kiln of itself is quite mature, however, its automatic control system has not yet been well developed. Based on the digest and absorb of the technologies of imported annular shaft kilns, Baosteel Engineering Corporation and its co-worker Nanjing Zhongshengyuan Company built an annular shaft kiln for Bayi Steel, which has turned out to be of good performance due to the optimal design of its automatic control system. In the present article, the characteristic of the automatic control system of this kiln was introduced, and the key points of its automatic control technologies were described.

**Key words:** lime burning annular shaft kiln; PLC control system; activity of lime

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**Feedback system for a natural gas calorific value adjustment system**

CHEN Wen, ZHENG Bin, BAI Xing-li

(Guangxi Jiaxun Pipe Engineering Co. Ltd., Nanning 530022, China)

**Abstract:** In order to improve the production quality of ultra-clear glass, the calorific value of the natural gas, which is used as the fuel of the glass melting stove, must be accurately controlled. Using the airflow heating method to measure the calorific value on-line, and adding air to the gas to adjust the calorific value, a calorific value feedback adjusting system was developed. The feed-forward block and two close-loop control methods effectively guarantee the calorific value adjusting quality of the burning gas supplying system. The experiments show that the control accuracy of the system is 1.0%, the repeatability is 0.3%, and the transient response time is within 6s, the oscillation range of the calorific value is reduced from 40.9 ~ 42.8 MJ/m<sup>3</sup> to 34.5 ~ 34.7 MJ/m<sup>3</sup>, and the combustion efficiency is 81.4%. The

glass melting quality imposed by the ultra-clear glass production is fulfilled.

**Key words:** feedback; natural gas; calorific value adjustment; furnace; melting quality; combustion efficiency

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#### Optimization methods for cooling water system in 300MW units

XIONG Wu, LI Ming-fang, HUANG Shao-jun  
(Guodian Fengcheng Power Generation Co. Ltd.,  
Fengcheng 331100, China)

**Abstract:** The 4 × 300MW power units in FCEP use forced circulation drum boiler with system configuration 2 × 50% capacity of steam pump and a 50% capacity of electric pump. The new method proposes that the electric pump assume the duty of normal operations, emergency-standby and water supply for boiler MFT. It reduces the utilization of electric pump. But it increases the reliability of the pump for daily operations. Since the manual door of the pump needs to be opened normally, it wastes a lot of hot water. The reconstruction of water cooling system reduces the consumption of water and power and improve the efficiency accordingly.

**Key words:** 300MW units; electric pump; cooling water; auto-door; electric power

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#### Polishing mixed-bed resin, the recovery of oil pollution treatment

YANG Yan-ke  
(North China Electric Power Research Institute  
(Xi'an) Co. Ltd., Xi'an 710065, China)

**Abstract:** Due to the lube oil of the feed water pump leaking the condensate system, leading to the oil pollution of polishing mixed-bed resin system. In order to ensure the safe and stable operation of thermal systems, the contaminated resin was revived when the unit was stopped. Presented series tests about resin contamination condition and recovery methods. It also discussed the mechanism of oil pollution and its influencing factors, which can provide reference for the similar incidents.

**Key words:** condensate system; resin; oil pollution; recovery

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#### Effect factors of gas-solid flow characteristics in pulsed fluidized bed

LIN Feng-sheng, HAN Yun-long  
(School of Architecture and Engineering, Anhui University  
of Technology, Ma'anshan 243002, China)

**Abstract:** Pulsed fluidized bed is extraordinarily affected by operational conditions and present different fluidizations. Starting with the physical characteristics of gas and solid phases (pulsed gas and solid particulate), the influencing factors of gas-solid flowing characteristics in pulsed fluidized bed were introduced; besides, how those factors influence the gas-solid flowing and how to get the better fluidization quality with those factors were pointed out as well. Based on the previous study and combined with the practical application, the limitations that could be perfected by future research are presented.

**Key words:** pulsed fluidized bed; effect factor; fluidization; fluidization quality

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#### Application prospect of phase-change energy-storage in building HVAC field

LUAN Guan-xia, LIU Zi-jun  
(No. 6 Institute of Project Planning & Research Of  
Machinery Industry, Zhengzhou 450002, China)

**Abstract:** Introduced the classification of phase-change energy-storage materials. Discussed the application research of phase-change materials in building, heating, ventilating, and air-conditioning fields. The research progress of PCM as phase-change walling materials and system PCM were described in detail. Application prospect of PCM in building HVAC field were expected at the same time.

**Key words:** phase change material; HVAC; phase change wall; energy storage capacity

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#### The designing of BIPV power system in a dormitory roof

LI Guang-ming, LIU Zu-ming, HE Jing-hong, et al.  
(Solar Energy Research Institute of Yunnan Normal  
University; Key Laboratory of Advanced Technique &  
Preparation for Renewable Energy Materials, Ministry  
of Education, Kunming 650092, China)

**Abstract:** Discussed the design and installation of BIPV power system in a limited roof area, in order to use roof area as much as possible. The design process included the construction lighting and PV power system. In addition, the lighting load, optimal installation angle, the number of row and column, the space between front and back of PV array have been calculated in detail. Finally, the two PV operation system scheme that can meet the lighting requirements have been supplied. And it is concluded that different system voltage can affect the design.

**Key words:** limited-areas; optimal design; building integration; operation scheme

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#### The energy saving example of central air-conditioning system based on energy contract management mechanism

XUE Zun-yi, LI Yi-yong  
(Xi'an University of Architecture and  
Technology, Xi'an 710055, China)

**Abstract:** For a central air-conditioning system in one clinical building of the Fourth Military Medical University, analyzed main causes to lead larger system energy consumption, based on energy contract management new mechanism, the related energy saving retrofit had been conducted, and total system energy consumption had been greatly decreased, significant energy saving effect and economy benefits can be obtained.

**Key words:** central air-conditioning system; total system energy consumption; energy contract management; energy saving retrofit; energy saving effect

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#### Causes and solutions about the exhaust gas temperature of air preheater high

GUO Yan-lei  
(Henan Engineering and technology School,  
Jiaozuo 454000, China)

**Abstract:** The exhaust gas temperature of air preheater higher than the design value of during the test run, this problems affecting the safe and economic operation of the boiler. Aiming at this issue, this article run a full in-depth analysis to identify the influence factors and put forward a series of solutions, solved the problem of exhaust gas temperature relatively high from a certain extent.

**Key words:** air preheater; exhaust gas temperature; cause analysis; measures

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### 企业名录

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