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Analysis on hybrid system of wind/photo voltaic/hydrogen fuel cell

YANG Wei-hua, SUN Wen-ye, XU Zhi-xin, et al
(School of Urban Construction, HeBei University of Engineering, HanDan 056038, China)

Abstract: With the expansion of the global energy crisis, the development and utilization of new energy source (especially, the wind energy and solar energy) have been paid great attention in many countries. The paper proposes the hydrogen fuel cell system on the basis of wind solar hybrid power generation. The system can be used in wind and solar energy, and the excess power generated by the system can be used for hydrogen production by water electrolysis, which can effectively stores the energy and can be used as the fuel gas of the hydrogen fuel cell. The research combines the energy supply and storage, not only ensuring the continuity and stability of the power supply, but greatly reducing the waste of energy.

Key words: wind/ photo voltaic generating station; electrolytic water; hydrogen fuel cell

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Summary of hydro turbine cavitation erosion on line monitoring

XIONG Jian

(HUADIAN Electric Power Research Institute, Hangzhou, 310030, China)

Abstract: Cavitation is the main destroy form of hydropower generating units, the implementation of the hydroelectric generating cavitation state on-line monitoring for hydropower plant preventive maintenance, reduce maintenance costs and determine the optimal unit conditions, has important significance in ensuring safe operation. On the basis of previous studies, this paper summarizes the three aspects of cavitation erosion mechanism, monitoring method and engineering application, in order to be a reference for the on-line monitoring of cavitation erosion.

Key words: On-line monitoring; cavitation erosion mechanism; monitoring method; engineering application

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Review of the use of jet refrigeration technology

CHAO Liang-liang, LIU Qing-rong, RUAN Ying-jun, et al
(Shanghai University of Electric Power, Shanghai 200090, China)

Abstract: Introducing the theory and composition of the working fluid jet type refrigeration cycle, respectively, and then operating param-

eters, system optimization (improved system for circulating form), main application areas and applicability of low temperature heat source and other aspects are discussed and researched. Finally, believe that the jet refrigeration has broad application prospects.

Key words: ejector refrigeration; working fluid; system optimization; application area

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A brief analysis of the significance of computer technology's application in construction energy auditing
ZHANG Bo, SHANG Shao-wen

(ShenYang architecture university school of municipal and environmental engineering, Shenyang 110168, China)

Abstract: The construction energy auditing in our country is in its infancy, lagging behind the advanced level of foreign energy auditing. With the extensive penetration of computer technology to all walks of life, the computer technology to assist the construction energy auditing is an inevitable trend. This article makes an analysis and research of the computer technology's application in construction energy auditing and report drafting according to the structural characteristics of the construction energy auditing, combining construction energy auditing and computer technology's current situation, which provides a reference for the development of the construction energy auditing. This is of great significance to promote the application of computer technology in the construction energy auditing.

Key words: construction energy auditing; computer technology; application

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The research of the synergistic removal of flue gas pollutants in CFB boiler

XIA Hui, ZHOU Zhen, LU Teng-fei, et al

(North China University of science and technology, TangShan 063009, China)

Abstract: The commercial operation of the circulating fluidized bed is the best clean coal power generation technology and CFB boiler flue gas pollutants removal is a technical problem in theory and practice to solve. The 240 t/h Boiler in Tangshan Hao Chemical Co. Ltd. as the research object by analysis of circulating fluidized bed boiler flue gas characteristics, to explore the synergistic interaction between control method and apparatus for removing existing coal-fired flue gas between each pollutant; through multi-stage humidification semi dry technique and adding composite modified additive to increase the desulfurizer particles with uniform wetting and absorbent particles and the specific surface area and to extend the absorber reaction time, maximum achieve collaborative and efficient removal of pollutants in the flue gas. To provide theoretical and technical support to optimize the design and operation of the research results can be used for CFB power plant.

Key words: CFB boiler; flue gas pollutants; multi-stage humidification; synergistic removal

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Design research on hot-wall Kang built-in baffle

WANG Cheng, YU Jin, HE Na

(School of Municipal and Environmental Engineering, Shenyang Jianzhu University, Shenyang 110168, China)

Abstract: Design a new hot-wall Kang system built-in baffle. The hot-wall Kang system is divided into winter and summer two kinds of working conditions. In the winter, the flue gas inflows into the kang to provide the heat for indoor by heating the kang board. In the summer,

it inflows into the flue of kang in-wall, in the process of going to the outdoor it pass by the convection bank to heat the cold water in it. And the heated water will be used for the shower. Now the flue gas won't pass by the kang, in this way it can avoid the situation of overheating of the kang surface. The new system reasonable and effective avoids the situation of cold winter hot summer by controlling the direction of the flue gas in different seasons. And it can improve the comfort of the human living environment.

Key words: baffle; hot-wall Kang; summer and winter conditions; comfort

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Heat transfer performance analysis of single-loop oscillating heat pipe

MA Tong-xing

(Jiangsu province chemical engineering design institute Co. Ltd., Nanjing 210024, China)

Abstract: The test studied the heat transfer performance of a single-loop red copper-water oscillating heat pipe at three different liquid filling rates, and theoretical analysis was performed on the test results. The results showed that: at relatively low heat transfer power, reducing the liquid filling rate or increasing the thermal transfer power could raise the heat transfer performance of heat pipe; increasing the heat transfer power or reducing the liquid filling rate could both increase the circulating flow rate of medium inside the pipe and the latent heat transfer amount and transfer proportion of the heat pipe; the volumetric power produced from phase change of medium in the pipe was used to overcome the resistance to medium flow, and with the increase of heat transfer power, the circulating power increases first before decreasing, that means there is a stable circulation heat transfer limit; when the medium in the pipe is in the irregular local oscillating phase, its oscillating resistance power was much higher than the corresponding resistance power converted into circulating flow.

Key words: single loop oscillating heat pipe; experimental research; performance analysis

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Impact analysis of the air pre-heater transformation of a 600MW supercritical boiler

GU Wei, ZHU An-yu, CHENG Zheng

(Huaneng Chaozhou Power Co. Ltd., Chaozhou 238000, China)

Abstract: One power plant made a transformation on the air pre-heater of a 600 MW supercritical once-through boiler, and solved the air pre-heater's serious problems of ash fouling and low temperature corrosion in low temperature section, which are caused by the transformation of denitrification. This transformation ensured the security of operation, but the efficiency of heat exchange decreased after the transformation of air pre-heater. This paper introduced the transformation of air pre-heater and through the contrastive analysis and calculation of parameters of wind and smoke system before and after the transformation of air pre-heater, this paper also summarized the effect of air pre-heater on the unit operation, so as to verify the results of air pre-heater. It is hoped to provide valuable reference for the transformation of air pre-heater and be helpful for the adjustment of operating parameters.

Key words: supercritical; air preheater; low temperature corrosion; wind and smoke system

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The study on arrangement of solar photovoltaic with a cooling device in Shenyang area

WANG Xi, WANG Yue-ren, CHEN Qi

(Shenyang Jianzhu University, College of Municipal and Environmental Engineering, Shenyang 110168, China)

Abstract: Put forward the type of solar photovoltaic/thermal system, it combines the solar photovoltaic power generation technology and the solar heat collection and cooling technology. It improves the photoelectric conversion efficiency, at the same time, it outputs of the available heat for life, and it also makes up for the traditional solar energy utilization in a number of deficiencies. Setting up the model of photovoltaic-solar panels to compare the analysis of the arrangement results throughout the year of two kinds of monolithic photovoltaic-solar panels which one vertical to the ground is decorated in the south fa? ade building and another is tilted 42° arrangement in the roof. Comparing the photovoltaic conversion efficiency and average power of two kinds of arrangement in quantitative, and combined with practical application to choose the optimal arrangement. The result shows that the vertical arrangement in south fa? ade is more suitable.

Key words: photovoltaic-solar panels; arrangement form; year-round operation simulation

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Application research of the power distributed of triple-stage pump heating system

MA Jin-xin, WU Zhi-xiang, LV Yan-zhao

(Xi'an Polytechnic University, Xi'an 710048, China)

Abstract: Now the research of power distributed heating system mainly concentrated on the secondary pump heating system, the research of power distributed of triple-stage pump heating system is less. In this paper, analyzing and comparing the pressure diagram and energy consumption and economy of the distributed power triple-stage pump heating system and the traditional central heating system and the distributed power secondary pump heating system, summed up the characteristics of the distributed power triple-stage pump heating system, which can provide a certain guidance to HVAC designers when they plan to make a design.

Key words: power distributed of heating system; triple-stage pump; pressure diagram; energy consumption; economy

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Application analysis of ground source heat pump in energy-saving

ZHAO Yuan-yuan, LI Zheng, ZHU Da-long

(School of Thermal Engineering, Shandong Jianzhu University, Jinan 250101, China)

Abstract: The present situation and existing problems of the existing system are introduced, and the use of shallow geothermal energy as an alternative energy source is proposed. Through before and after the energy-saving reconstruction of ground source heat pump system energy consumption analysis and ground source heat pump system of buried tube heat exchanger heat balance analysis, it expounds the technical reliability of ground source heat pump system, economic rationality and produce environmental benefits to determine ground source heat pump energy-saving renovation of building. Analysis shows that the energy saving transformation can significantly reduce coal consumption. The development and utilization of renewable energy is clean energy, which is conducive to environmental protection and sustainable development. The ground source heat pump system has low operating cost, good energy saving effect, long and efficient operation, and has high economic benefit in the long run. This study has a good demonstration effect on the application of ground source heat pump system to other renewable energy sources.

Key words: energy -saving; GSHP; hot and cold balance

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