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Solutions based on new technology for effective energy utilization

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Yaskawa Siemens Automation & Drives Corporation (hereafter referred to as YSAD), a joint venture between Yaskawa Electric Corporation Japan (hereafter referred to as YEC) and Siemens AG Germany (hereafter referred to as Siemens), was founded in 1999. YSAD offers industrial electrical systems for all industries (with the exception of steel and public work projects), electric products sales and after-sales service for YEC products and SAG drives. In this article we introduce novel solutions for effective energy utilization based on new technology utilizing YEC and Siemens products.

Examples of recent trends for energy saving strategies using new technologies can be found in both EVs (Electric Vehicles) and FCVs (Fuel Cell Vehicles), which are actively driving the transportation sector. Even in the business sector large-scale buildings are required to comply with Energy Conservation Law, which is expected to accelerate the energy saving with the introduction of fuel cells and heat pumps. In the industrial sector, inverters have been employed for many years and the Top Runner Program for electric motors and transformers has also been put in force. According to the Energy White Paper published by Ministry of Economy, Trade and Industry, in the time period from 1973 to 2014 energy consumption in the industrial sector has been reduced by 80% while the GDP growth rate itself was 240%. However, as industrial sectors account for about half of all domestic energy consumption, energy conservation promotion is still required.

In order to address these demands it is essential to introduce new energy saving technology, examples of which are introduced here.

Activities for Energy Saving in Sendai Mill

Shingo Shimoyama
Sendai Mill, chuetsu Pulp & Paper Co.Ltd.

The paper industry is an energy-intensive industry, and energy saving activities are an effective means for environmental issues and cost reduction.

Our factory has made efforts for energy saving activities throughout the factory and has achieved goals.

However, with the progress of activities, effective projects are decreasing and in recent years it has been difficult to achieve more energy saving targets.

In order to acquire energy saving benefits at this factory, we are working to raise employee's awareness of energy conservation and find out new projects, mainly by members of energy conservation management committee.

Here, we introduce examples that our factory has implemented.

Activities for Energy Saving in Akita Mill

Nobuhiro Date
Akita Mill, Nippon Paper Industries Co., Ltd.

On the Activities for Energy Saving in Akita Mill, we did not achieve the expected target enough in 2015. For breaking this situation, we started the new energy saving activities named “Neigah Activities” in 2016. They were carried out four times a month by the special members selected several sections and also supported by the outside consultancy (Japan Business Innovation Consulting Co., Ltd.). As the new target of energy savings, we set 3% of the energy consumption in the previous year.

On the first half of term, we confirmed the flow and the material valance for each equipment or process, and investigated the quantity of electric power, water, steam, and air. We recognized the energy consumptions of each item from them. On the latter half, we analyzed the each condition and whether the energy was used effectively, and looked for the difference between actual and specification of each equipment. We picked up and listed the themes for energy saving once we imagined, and prioritized based on benefits and costs.

The members gained some matters and knowledge from each other by discussing with illustrations and pictures. Through these activities, we achieved 3.23%, and exceeded the target.

Niigata Mill Energy Saving Case

Masahito Washidu
Niigata Mill, Hokuetsu kishu Paper Co.,Ltd.

In recent years, countries have been required to take measures against global environmental problems such as global warming, and Japan aimed to reduce CO2 emissions in FY 2030 by 26% from FY 2013 by draft of COP 21 promise.(1 Hokuetsu Kishu Paper also has been trying to conserve energy by launching an energy conservation project in order to contribute to the draft of the promise of COP 21. In this paper, we introduce examples of energy conservation by 'Steam trap diagnosis in Niigata factory' and 'First screen high efficiency improvement of Niigata No. 8' conducted at the Hokuetsu Kishu Paper Niigata Plant.

Effective utilization of energy by chemicals for boiler water treatment

Koji Aoki
Kurita Water Industries Ltd.

Chemicals for boiler water treatment are evolved out of a long process for requirement of energy saving. In this paper, 3 topics which we concerned in the energy saving activities of each factory with boiler water treatment chemicals are briefly described.

Low pressure boilers in which feed water are mainly softened water have a problem with mineral scales deposited on the internal heating surface. The scales adversely affect energy efficiency of those boilers. A scale remover has been required in addition to conventional chemicals, but if remover is added excessively, the boiler tubes made of carbon steel may be damaged.

Kurita Water Industries has invented a multi-purpose chemical for preventing scaling and corrosion in boilers and removing deposited scales. It contributes to the energy saving of each factory through the stable and efficient boiler operation.

Energy Saving Bag Filter

Hiroyasu Hattori

HATTORI ENGINEERING Ltd.

In this paper three topics which I was concerned to the development were briefly described.

We understand the importance of particulate filtration and emissions monitoring delivering environmentally friendly and economically viable solutions to your business.

Increasing economic and environmental pressures on the paper industry places significant importance on maximizing manufacturing performance and process efficiencies throughout the entire plant operation.

Pentair Environmental Systems (PES), through its globally recognized brands Goyen and Mecair, continue to deliver industry leading filter cleaning systems and emissions monitoring solutions to industry, supported by over 100 years of combined market intelligence and application experience.

We offer a dedicated Research and Development team pioneering industry leading products and customizing solutions. World class manufacturing in two locations, global offices and local technical experts who will ensure all aspects of particulate filtration and emissions monitoring are optimized, supporting your business in delivering quality product, competitively.

Energy and Cost saving by Doctoring optimization

Toshifumi Wakabayashi
Valmet K.K.

Our experience says that 99% of all doctoring positions can be somehow improved. Very often, the money spent on doctor blades is considered as doctoring costs. However, doctoring affects costs far beyond the cost of blades and holders, and therefore there is often a large improvement potential. The improvement can come from a variety of sources like increased runnability, improved blade durability, more efficient logistic solutions, reduced energy consumption and more. Sometimes unit price of a blade can be important for a mill, but most often the focus should be on other ways of improving the doctoring economics. This paper introduces energy and cost saving by doctoring optimization.

Introduction　of energy-saving examples that can be realized at low cost

Takehiro Uwafuji
Miura Co., Ltd.

MIURA has recently strengthened the proposal of "total solutions" to solve customers' problems, under the slogan "Let's deliver the cheapest, best heat, water and environmental products in the world to customers around the world".

Energy conservation by large-scale capital investment is also continuingly high demand, but energy conservation examples that can be realized at low cost are increasing year by year, from this point of view, from the viewpoint like this, from the viewpoint of heat related, compressor related, water related, factory waste hot water I will introduce relevant energy saving case examples.

In any case, "visualization" of energy is important, and we hope that our technology will contribute to your energy conservation plan even a little.

Introduction of Fajar Paper PM8 Engineering

Ryosuke Taki
Paper Machinery Engineering Dept., Kobayashi Engineering Works, Ltd.

We, Kobayashi Engineering Works, Ltd. received an order in 2014 of renovation & relocation project of PM8 from Fajar Paper who is biggest paperboard supplier in Indonesia. The purpose of this PM8 project is a secondhand machine imported from Europe was producing the information paper and remodeling to produce the corrugating boxboard.

Chlorine and Potassium Removal System using Evapo-Crystallization method CRP System; Chlorine Removal Process

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In the craft pulp recovery cycle, chloride and potassium coming from wood chip as raw material are accumulated in the process, and what is concentrated in effluent

gas dust drained from a recovery boiler is well known. A melting point of the dust decreases by concentrated chloride and potassium, and there might be concern about clogging of the boiler, corrosion, and drop of the boiler ability. Conventionally, the method to decrease the chloride and potassium concentration that rose was to discard the dust at electric dust collector. Therefor this conventional method causes loss of the soda and expenses to supply soda increase. In the effort that craft pulp industry continues working hard to raise the integrity for the recovery cycle, this problem is becoming a serious problem. To improve this problem, the system removal chloride and potassium included in the dust is necessary. The CRP™ system which is evapo-crystallization method has been developed in such a background. The CRP™ system which piled up the experiences at all over the world is introduced.

ACA Permi Online Air Permeability Analyzer and RoQ Roll Hardness Profiler

Yohei Suzuki
SHIN-NIHON CORPORATION

Generally, Porosity measurement used to considered that it can not be measured on-line as it takes time. Therefore, it has been measured by sampling at off-line.

Permi Online Porosity Analyzer of ACA Systems (Finland) is a system that can measure porosity on-line in real time. Permi can calculate the porosity by any method such as Gurley, Bendtsen, Coresta at high speed. The measurement data will be saved in SQL format on the server PC. Online porosity measurement will bring many merits such as system control and quality control.

Measurement of roll hardness has been common with hammering method or Schmidt hammer. However, these methods have problems such as measurement error and time consuming. RoQ Roll Hardness Profiler of ACA Systems is a next-generation device that solves these problems. It is possible to measure the roll hardness with high accuracy. Furthermore, measurement data can be taken out in Excel format.

Biorefinery of Oil Palm Empty Fruit Bunch by Nitric Acid Prehydrolysis Soda Cooking. Production of Furfural and Dissolving Pulp

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Abundant waste agricultural residues such as oil palm empty fruit bunch (EFB) can provide alternative sources of biomass for producing furfural. The aims of this study were to propose a method of preparing furfural and dissolving pulp (DP) from EFB using prehydrolysis with nitric acid, and to examine how the prehydrolysate, which contains xylan, can be used for furfural production. The furfural yield in the nitric acid prehydrolysate was increased to 6.2% of the EFB material weight by dehydration with an acid catalyst. Nitric acid prehydrolysis followed by soda cooking under atmospheric pressure was also applied to the preparation of DP. The obtained pulp was then bleached by using peroxymonosulfuric acid (Psa), chlorine dioxide (D0, D1), and hydrogen peroxide (Ep) in the elementary chlorine-free Psa-D0-Ep-D1 sequence. The pulp demonstrated a brightness of 90.4% ISO and a viscosity of 6.5 cP, which met the National Standard of Indonesia, although the xylan content was a little high and the α-cellulose content was 83.0%.