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**『Impression Smart Motor Sensor』 Lecture on predictive maintenance solution services
for Low-voltage three-phase cage induction motors**

Shiro Ebara
Product Marketing Div. ALTIMA Company MACNICA

Predictive maintenance is the concept of predicting the failure or abnormality of equipment or equipment and performing efficient maintenance.

By introducing predictive maintenance, it is possible to detect the abnormality in advance and take maintenance measures, thereby preventing sudden troubles.

In conventional preventive maintenance, which cannot detect sudden abnormalities.

Therefore, "condition based maintenance (CbM)" is attracting attention as a new method. By the evolution of sensors and analysis, it is possible to detect the condition of facilities and equipment and predict failures and abnormalities.

"Smart Motor Sensor (SMS)" is a solution for predicting the failure of a three-phase induction cage motor.

It collects data such as vibration and temperature and analyzes it in the cloud to determine the condition of the motor.

SMS makes it easy to attach the sensor to the device, easy to set up, and uses a learning model for automatic determination.

By eliminating the barriers of conventional CbM, it can accurately determine the abnormality or deterioration of the motor.

In addition, SMS has the ability to determine the abnormality for each function of the motor and to grasp the trend of the state transition and deterioration.

It provides the result to the user through a dashboard or smartphone application.

The API can also be used to link with other systems, enabling efficient management of multiple equipment decisions on a single screen.

SMS is attracting attention as a new predictive maintenance method that replaces conventional preventive maintenance.

NDT assessment of boiler pipe's wall thinning using 3D scanner: current technology and future trajectory

Osamu Higashi
Anritsu Corporation

Boiler thinning is required by the Electricity Business Act to inspect the wall thickness by ultrasonic flaw detection. It is a very labor-intensive task to illuminate each of the countless water tubes in a dark boiler to observe the subtle undulations of the thinning parts, and then apply an ultrasonic probe to each of them one by one. The shape, arrangement, and thinning pattern of the water tube are not uniform, and the numerical values by ultrasonic flaw detection vary depending on the operator. There is an increasing demand for inspection technology that does not rely on craftsmanship and does not overlook thinning areas due to fatigue.

**Paralign revolutionary roll parallelism measurement technology.
Enables measurement with higher accuracy than previously possible.
Introduction of roll parallelism measurement technology using a laser ring gyro.**

Yuta Namiki, Keisuke Fujimoto
TTS Ltd.

The facility inspection specialist TTS has started services for the paper, foil, film, printing and steel industries, introducing ring laser gyroscopes to perform roll parallelism measurements in Japan.

Three high precision ring laser gyroscopes measure the parallelism of rolls compared to a single reference, regardless of distances, installation layout and obstruction. Accuracy is as high as $\pm 0.05\text{mm}$ per 1m, ensuring high product quality, while measurements require only 1 to 5 minutes per roll.

Comprehensive graphic measurement results and a correction list are compiled immediately and facilitated on-site adjustment work shortens downtime. Thanks to measurement accuracy and speed, the new service contributes to improvement of quality and productivity.

Age of Renovation Somay-Q will be responsible for

Yohei Watanabe
Somay-Q Technology

Dye Q Technology is a technology development laboratory that solves the world's problems. By using our proprietary technologies of "nano-bonding technology" and "reinforcement technology using new materials," it is possible to reinforce and extend the life of deteriorated concrete and steel parts. By applying new materials and reinforcing them without replacing deteriorated ones, wasteful industrial waste can be generated and significant cost reductions can be realized. In addition, it is widely used in both the interior and exterior of the factory and the type of structure, such as application to low-temperature and wet surfaces, and anti-corrosion paint that does not require kerens. It already has a lot of achievements, and it has been expanded not only to the private sector but also to public works.

**Traditional and State of the art cost reduction approach in abroad
– 5th generation automated paper testing machine**

Hikomichi Yoda
Process Industry Division, ABB K.K.

Currently, industry got strong pressure from the market because Japan government announced carbon neutral industry by 2050. In Japanese industry, especially material industry, there are several serious potential issues like lack of human resource due to less attractiveness for young people, retirement of baby boomer and the technical transfer. On the other hand, there are bright future in paper industry because paper is excellent material for plastic reduction and new functional material, Cellulose Nano Fiber.

ABB started following four approaches to cooperate with customer to solve facing issues.

- 1) Reliable and high performance online measurement for Refiner, Wet end control
- 2) Cutting-edge fiber analyzer for new material development
- 3) Speedy, Safety and high precise paper testing machine
- 4) High speed, high precise and reliable automated paper testing machine

In the paper; 4) High speed, high precise and reliable automated paper testing machine is described. You can understand how to utilize ABB 5th generation automated paper testing machine for mill operation optimization.

The latest information of softness measurement by acoustic and stress

Kazumi Tanikawa
Sanyo Trading Co., Ltd

In many cases, touch feeling evaluation is often performed by a panel test method in which the product staff and inspectors evaluate and quantify the feeling when they actually touch the product. However, what one person finds to be nicer and softer may not feel the same to another. Texture is subjective and tends to vary by individual, gender, and nationality. In order to increase the objectivity of the evaluation, it is desirable to use the equipment rather than the panelists.

Germany's emtec electronic company's TSA softness measurement device is a device that evaluates the softness and texture of paper products such as tissue products. A measurement method that simulates the vibration and stress felt by human fingertips, and measures the three parameters that affect the feel of the hand: true "softness", "smoothness/roughness", and "rigidity/flexibility". In addition, the overall texture is evaluated as an HF value.

Performance evaluation of low attracting insects between sunlight type LEDs, high CRI LEDs, and white LEDs.

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Business Development Division, Ikari Shodoku Co.,Ltd.

The study was conducted to evaluate the insect control performance of sunlight type LEDs, high color rendering index (CRI) LEDs, white LEDs and prototype of LEDs in a comparative laboratory test. *Musca domestica* (house flies) and *Megaseria sclaris* (scuttle flies) were used in the study. The number of houseflies captured by high CRI LEDs was significantly higher than that of white LEDs. The number of house flies and scuttle flies captured by sunlight type LEDs was significantly higher than those captured by white LEDs. The number of scuttle flies captured by sunlight type LEDs was significantly higher than that of high CRI LEDs. The number of house flies captured by white LEDs was significantly higher than that of prototype of LEDs. The results of this study show that high CRI LEDs and sunlight type LEDs have higher insect attracting power than white LEDs. On the other hand, prototype of LEDs have lower attractiveness than white LEDs. These results suggest that insect attractiveness is not only influenced by UV light but also by visible light.

Key Points for Manipulation of Several Data and Effective Measures Concerning with Pest Management

Takeo Ishizaki
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For the appropriate pest management, we have to consider both the effectiveness and the efficiency because many factories have limited staff and time to spare for pest management. In this paper, some key points for manipulation of several data and effective measures concerning with pest management were mentioned.

At first we have to connect the monitoring data (investigation using trapping tools such as light trap) with other data, for example the insect contamination data gained from the defect detector, which is very important because these information indicates the direct contamination into the products. Also it is useful to utilize the data for the cause of insect (e.g. wind direction and speed), which leads to the preventive actions. In addition, in order to manipulate these data effectively, I recommend 'analysis of correlation', which can verify the hypothesis for the insects' invasion.

As for the effective measures, we have to consider the characteristics of insects. Then it is useful for us to think of pest management strategy that we construct the measures based on the insects' invasion routes, which consists of the approach from the outside to the factories, the border of inside and outside, the approach to the productive area in the factories, and the habitation of insects near the productive area.

Finally, I introduce some specific measures such as traps, extermination, partitions, and so-called '5S'. The important thing is that we need to select measures considering not only the merit, but also the demerit or risk.

Report on the Results of the Fiscal 2023 Follow-up Survey on” JPA’s Carbon Neutrality Action Plan” and Related Information on Measures against Global Warming in the Japanese Paper Industry

Yasuharu Sakina
Japan Paper Association

The Japan Paper Association (JPA) established its “Voluntary Action Plan on Environment” in 1997, in response to The Japan Business Federation’s call to the Japanese business community to organize “The Voluntary Action Plan on Environment”. Since then, JPA has carried out a follow-up survey and published the results every year.

As the Voluntary Action Plan finished in fiscal year (FY)2012, JPA newly started “the Action Plan towards a Low Carbon Society” which is renamed “Carbon Neutrality Action Plan (Phase II)” this year and has been actively addressing global warming prevention in order to achieve the following targets set in the plan:

- Reduce energy derived CO₂ emissions by 38% by FY2030 from the FY2013 level .
- As a source of CO₂ absorption, increase total forest plantation area at home and abroad by 375,000 ha to 650,000 ha by FY2030 from the FY1990 level .

According to the results of FY 2023 follow-up survey (actual results for FY 2022), fossil-energy derived CO₂ emissions in FY 2022 was 14.33 million tons, which is 1.5 million tons lower than those in FY 2021(15. million tons) and is 4.5 million tons lower compared to those in FY 2013(18.83 million tons). This is attributed to each manufacturer’s active efforts including energy saving and energy conversion from fossil energy to non-fossil energy such as biomass energy.

In addition to the results of the follow-up survey, this report introduces the current energy situation in the Japanese paper industry.

Creation of polycaprolactone–wood pulp composites and the evaluation of degradability in soil

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Plastic waste has become a reality as a major global risk to the environment due to a lack of disposal facilities. Furthermore, CO₂ continues to be generated throughout plastic production and plastic waste processes, damaging the environment as a greenhouse gas. To address these environmental problems from a standpoint of environmentally friendly materials, the concept of a biodegradable polymer composite is proposed in this research. Cellulosic pulp fibers and polycaprolactone (PCL) are both biodegradable and can be applied to create a biodegradable plastic-pulp fiber composite. In addition, it possesses excellent mechanical and structural properties depending on the design and manufacturing technology. In this study, we applied traditional papermaking techniques and heat pressurization to produce a PCL-cellulose composite with a high rate of degradation in soil and specific mechanical properties. Fourier transform infrared spectroscopy and scanning electron micrographs exhibited PCL was retained among pulp fibers. The soil degradation test clarified the PCL-cellulose composite degraded faster than plain pulp sheet since PCL is more biodegradable than cellulose.