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CONTENTS

Welcoming New Employees

2025 April JAPAN TAPPI JOURNAL
Vol.79, No.4 Abstracts

Latest status and development of NDI Technology for Boiler Inner Water Tube Wall Thinning Using 3D Scanner

Osamu Higashi
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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.

Comprehensive Facility Overhaul with Innovative Materials: Revitalization, Longevity, and Reinforcement

Yohei Watanabe
Somay-Q Technology

Somay-Q Technology is a technology development research institute that solves the world's problems. It uses existing things as they are, regenerating and extending their lifespan. Furthermore, it can solve all problems with a new technology called "reinforcement method" that can restore the strength of the structure.

Measuring temperature of metallic reflective rotating roll using non-contact infrared sensor with short wave length.

Keita Nakagaki
MI System Co., Ltd

There are many metallic reflective rotating rolls used for paper making in the mills such as dryer cylinders and calendar rolls, and it is important for mills to measure those surface temperatures continuously and accurately because of appropriate machine running and keeping paper quality. Usually, the temperature of moving objects can be measured using non-contact infrared sensor (Infrared Thermometer). However, it is hard to measure the temperature accurately because emitted infrared energy (emissivity) from such metallic reflective rolls with mirror finish is quite low. In addition, surrounding temperature of the target will have negative impact on accurate measurement as the interference, especially it will cause big measurement errors if its temperature is lower than 100 degrees Celsius.

We have had any requests from the mills for accurate temperature measurement of metallic reflective rolls. In the beginning, we checked the specifications of any sensors manufactured worldwide, then we have decided to make evaluation test using the sensor, which have been used for Yankee Dryers in Europe, manufactured by Calex Electronics (UK) against the metallic reflective rolls.

This report will show the test result and introduce this sensor.

Remote Monitoring Solution Using Thermal Cameras to Prepare for Fire Risk

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Amnimo, an in-house venture of Yokogawa Electric Corporation, is engaged in business related to video, IoT, and AI. This presentation will introduce Amnimo, its case study of fire risk reduction using video, and its approach to AI.

Efforts to reduce logistics working hours in the papermaking division

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Yashio mill is one of the largest paper mills in Japan. The annual production volume in fiscal year 2021 was achieved over 1.03 million tons. Since then, 1.1 million tons has been set as their objective. Yashio mill is located near Tokyo, the largest consumer area for paperboard. Despite being blessed with a location, the factory site area is small relative to production/shipment volume, resulting in chronic congestion onsite from shipping of products, raw materials, chemicals, biomass fuel, etc. Moreover, it causes lower logistics efficiency coming from increasing external warehouses. Over the past decade, Rengo has been increasing its production capacity through research into manufacturing technologies and proactive capital investment. At the same time, Rengo has been working to solve the aforementioned logistics issues by developing a loading order management system for trucks and a clamp lift in-vehicle terminal for large distribution center operations. However, these initiatives were limited to onsite factory management. Considering the 2024 logistics issue, Rengo have developed an end-to-end management system encompassing the entire distribution process from warehouse dispatch to onsite loading and delivery to customers, aiming to further improve logistics efficiency and management accuracy. This report provides an overview of the system and reports on its effects and the various challenges that arose during development.

Introduction of new roll hardness profiler "RQP Live"

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Tapio Measurement Technologies Oy, a partner company of Nomura Shoji CO., LTD, has developed a new roll hardness profiler, "RQP Live" and has started selling it in the Japanese market. The advantage of RQP Live is that it equips the 3.8-inch display to show the measurement results, which can be used to confirm the hardness at the point of the rolls instantly. "RQP Live" is a highly reliable product that incorporates technology cultivated through the manufacture of "RQP" roll hardness profiler, of which more than 145 units have been sold in the Japanese market. This paper introduces the key points of the innovation.

New generation LED light trap for more efficient pest control

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Ecological survey of nuisance pest are an important component of Integrated Pest Management (IPM). The performance of the traps used for surveys is an important factor in efficient pest control. This report presents the performance of a new generation LED light trap, LED Optclean 8. Despite the energy-saving specifications, LED Optclean 8 had the same performance as the conventional product. This trap has a removable top plate. Presence or absence of the top plate affects the trapping efficiency.

The Methods to Achieve Timely and Efficient Pest Management

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In the management of insect control in the pulp and paper industry, it is important to be aware of the appropriate timing to take action and to shift from follow-up to prevention through timely activities.

One effective method for moving away from follow-up management is an "insect control calendar". This is a tool to promote measures against the causal system, rather than based on the results of monitoring data, by clarifying specific measures for each target insect, the division of roles, and the timing of implementation. In addition, by determining the strength or weakness of seasonal measures in the insect control calendar, or by determining measures according to factory operating conditions, it will be possible to reduce waste and burdens that would result from uniform annual activities.

On the other hand, when it comes to issues that need to be focused on, such as monitoring insect trapping in the most important areas, obtaining monitoring data in real time will lead to "timely activities". We have launched "Pescle Insects", an AI monitoring system for flying insects, jointly developed with Ryoden Trading Co.,Ltd. This system contributes to the efficiency of monitoring flying insects and enables the implementation of countermeasures at the most appropriate time.

Finally, in this era of rapid change, insect control management must be prepared for such changes, or we will be slow to respond. It is important to establish an insect control and prevention management plan based on changes in the climate and surrounding environment, factory operating conditions, and the SDGs.

Utilizing low-cost IoT devices in production sites

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Various manufacturers provide commodity grade IoT edge devices for very low cost nowadays. Due to their limited reliability and robustness, those devices are not widely used for industrial application in Japan. For applications where high reliability is not required, those devices may be an attractive option to realize improved management for minimum cost. As a pilot project in commodity grade IoT edge device utilization, we implemented a hyperthermia risk alert system and a solo worker surveillance system. The IoT edge device firmwares were developed using open-source library and only limited part of the firmware had to be developed by ourselves. Commodity grade mesh network system was used as the communication backbone. We chose a general-purpose cloud service, Google Workspace as a server, which receives measured data, generate charts from the data, and sends alert e-mail. The cloud service provider assures >99.9% uptime percentage, which meets our demand required in this kind of purpose. To compensate the reliability lower than industrial sensor system, watchdog timer technique was used. The developed system has been in service more than two years without essential problem. Only by changing sensor device, the hyperthermia risk alert system can be applied to another application.

The use of wearable device for heat stroke countermeasure initiatives

Hideo Masuda
NIPPON PAPER INDUSTRIES CO.,LTD.

Our Company established "Medium-term Safety Activity Plan" in July 2020. Based on its mission Ensuring that nobody is injured within the premises of its mill, we implements the safety activities for three pillars, which are (1)Developing Safe working environments, (2)Managing risks, (3)Training personnel to work safety. We try the heat stroke countermeasure with the use of wearable device for the purpose of "Developing Safe working environments".

I will introduce about the details of its initiatives at this report.

Report on the Results of the FY2024 Follow-up Survey of the" JPA's Carbon Neutrality Action Plan" and Related Information on Measures against Global Warming in the Japanese Pulp and Paper Industry

Toshiya Noma
Japan Paper Association

The Japan Paper Association (JPA) established its "Voluntary Action Plan on Environment" in FY1997, 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 FY2012, JPA newly started "the Action Plan towards a Low Carbon Society"FY2013 which is renamed "Carbon Neutrality Action Plan" FY2021 and has been actively addressing global warming prevention in order to achieve the following targets set in the plan:

- Reduce energy derived CO_2 emissions by 38% by FY2030 from the FY2013 level .
- As a source of CO_2 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 2024 follow-up survey (actual results for FY 2023), fossil-energy derived CO_2 emissions in FY 2023 were 13.4million tons, a decrease of 0.94 million tons(6.6%) compared to FY2022 and a decrease of 5.43million tons(28.8%) compared to FY2013, with progress rate of 75.8% towards the target reduction.

On the other hand, the total forest plantation area was 520,000 ha, a decrease of 4,000 ha compared to FY2022.

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

A Report on ISO/TC6 Meeting

Seiki Yoneshige
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ISO/TC6 34th Plenary meetings were held on November 25-29, 2024 in Beijing, China. The number of registered delegates representing twenty countries was eighty-one. These meetings had been held online during the COVID-19 period, but this was the first to be held as a hybrid meeting (face to face meeting with possibility to join virtually via Zoom) since restrictions were relaxed.

Six delegates representing Japan attended TC6/SC2 and TC6 plenary meeting.