

**Promotion of Organizational Energy Saving Projects
-Search by Everyone Energy Conservation Projects-**

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I think that employee who work on energy conservation projects do not have the methodology even if they know that there is also a great outcome and continuity.

We introduce examples of roles of each department according to the procedures of (1) common procedure, (2) validity, (3) program procedures.

**Low-level PCB Waste
-Advantages and Disadvantages of Various Detoxifying Processes-**

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Low-level PCB waste is regulated in Japan in two types such as electrical equipment contaminated with over 0.5 mg/kg PCBs and any kinds of pollutants contained in concentration less than 5,000 mg/kg PCBs. The waste is at present disposed of by incineration or washing at certified or permitted detoxifying facilities. At the facilities various detoxifying processes are applied depending on its properties or sizes; for instance, relatively small or medium size of the equipment is processed by heating and combustion and larger size of transformers are processed by on-site washing. This paper explains each processes applied to existing facilities and evaluates their advantages and disadvantages in view of efficiency and cost.

The Appropriate management of Industrial waste disposal facility

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I will explain the appropriate management of industrial waste disposal facility by case.

"Accidents and inappropriate cases at industrial waste disposal facilities" relate to maintenance and management of industrial waste treatment facilities, risks of other facility management, and environmental pollution of waste treatment facilities.

"Other inappropriate case of industrial waste disposal contractor" relates to the case where processing is incomplete but the manifest has been returned, and the disposer has resolved without processing the waste.

"Check point of statutory inspection etc. of industrial waste disposal facility" is an example of examination content on structural standards concerning treatment facility, industrial waste incineration facility, final disposal site, installation permission of facility, person responsible for management, processing flow, final disposal. Indicate the checkpoint of the field.

An application of high efficiency BOD treatment system (Bio-Attack) to paper industry sewage

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Paper industry sewage is treated by activated sludge process. However, this process is often operated at relatively high BOD volume load about 1.5 kg/(m³·day). Under such condition, it is difficult for conventional biological treatment to respond with BOD load variability of wastewater. As a result, the biological treatment becomes unstable and troubles (such as decrease of transparency in treated water, poor sedimentation by bulking) occur frequently.

We supplied high efficiency BOD treatment system (Bio-Attack: BA) and upstream monitoring system to MARUSAN PAPER Mfg. Co., Ltd. for the purpose of countermeasure of increasing wastewater BOD load, unstable biological treatment, and inhibition of poor sedimentation by bulking.

The installation of this BA brought the following effects, 1) Wastewater BOD about 70 - 90% is treated at BA, the inflow BOD load into aeration tank decreases, and the BOD load becomes stable through the year, 2) Biological treatment becomes stable and transparency get better to 10 - 25 degrees[cm], 3) Filamentous bacteria is reduced, and sludge volume index (SVI) goes down 20 - 30%, 4) Cost of chemical for biological treatment is reduced about 90%. Also, upstream on-line TOC monitoring system controlled the volume of nutrient properly and it helped to improve the performance of BA.

Improving the wastewater treatment stability

-Reducing a cause substance of COD in the upstream side-

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Wastewater treatment system is becoming unstable with raw material deterioration, energy conservation of the facilities and manpower saving in some paper mills.

We approach to improve the wastewater treatment stability by reducing a cause substance of COD in an upstream side, here the upstream side means the producing process before wastewater treatment facilities.

First, we link the upstream side and the wastewater treatment process by our newly developed " S.sensing® system". The S.sensing® system monitor water qualities, for example the ORP, SS consistency, etc, at both upstream side and downstream side, then analysis the correlation between the water qualities and the wastewater treatment stability. The water quality was controlled by using Fuzzicide®, aeration, and retention aid.

This paper reports several study cases, which wastewater treatment was improved by reducing a cause substance of COD and SS in the upstream side.

Energy - saving centrifugal dehydrator

—Energy - saving effects in the sewage treatment plant—

Daisuke Handa

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Centrifugal dehydration technology has long been used for dehydration treatment of sewage sludge, and development for reduction of cake moisture content and low power has been carried out. While centrifugal dehydration technology is capable of large-scale treatment and has the advantage of stability of treatment, there is still strong demand for reduction of electric power consumption by low-power generation. In this paper, not only features of newly introduced energy saving centrifugal dehydrator but also characteristics of the sewage treatment facility and energy saving effect after the introduction are introduced.

Low-Frequency Noise Countermeasure in a factory

-Listen and Feel how we can resolve the Noise Problem-

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When the noise exceeds the regulation standard at the site boundary, the effect of the noise countermeasure is determined by the composite value of the countermeasured noise source and other noise sources that have not taken measures.

The method of surrounding the noise with the soundproof box is most effective, and the method of installing the silencer and the soundproof hood at the air supply / exhaust port is also relatively effective.

Measures on the propagation path of noise include installation of sound absorbing materials and sound insulating walls, but in many cases, it is not possible to obtain the effect as much as measures on the sound source side.

When there are complaints from neighboring people, noise of frequencies close to low frequency sounds or low frequency sounds tends to be problematic indoors.

The reason is that, in a detached house or the like, in general, the noise in the high frequency range is comparatively attenuated in the room compared to the outdoors, whereas the low frequency sound is difficult to attenuate.

We have developed our own "measuring equipment to visualize noise sources", we confirmed in a short time which noise source influence the position of workers, and the effect of the measure is confirmed by simulation are considering.

Predictive Maintenance by Acoustic and Vibration Diagnostics Utilizing IoT

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In recent year predictive maintenance to carry out maintenance depending on condition of individual equipment is focused. Predictive maintenance includes a merit such as reduction of the maintenance cost and the minimization of the downtime. Maintenance includes the case of judgement using sounds from the equipment. However, the performances of those applications often degrade due to noises such as neighboring sounds. One of the technologies to solve the problem is sound source separation technology. A desired sound and noise are separated by using the technology, and a desired sound is used to monitor the condition of equipment continuously.

This paper introduces the concept for predictive maintenance, procedure to install

IoT technology, and sound source separation technology. Finally, it is shown that a sound source separation technology is effective for predictive maintenance.

Measures to prevent odors using diffusion simulation

-Make the odor visible-

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Unlike other atmospheric pollution, odor is the pollution due to human senses, so evaluation methods and planning countermeasures are difficult.

In order to solve odor problem, it is not preferable that just introduce deodorizing equipment. To consider later cost and labor, it is preferable that conducting a preliminary survey properly, and take measure as necessary.

In this paper, I introduce diffusion simulation to predict surrounding influence of odor and daily management using odor sensor.

Causes of gloss ghosting and effect of properties of the paper on the gloss ghosting

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Gloss ghosting is an undesirable phenomenon that occurs in the sheet-fed offset printing. An ink gloss differential on the reverse side imagery appears in the form of a ghosted image of the front side printing. As it gives a significant damage to the appearance of the printed product, the value as a commodity deteriorates. It was reported that oxidizing vapors released from the drying ink of the front side printing accelerate the drying of the reverse side ink film between adjacent sheets in the printed load. However, the detailed mechanism of gloss ghosting has many unclear points. We have investigated what is happening on the surface of the printed ink film, and the effect of the paper properties on the gloss ghosting.

In our study, it was confirmed that the condition of contact between the front side printing surface and the reverse side printing surface is important to determine whether the gloss ghosting occurs or not. It was found that the time interval between front side printing and reverse side printing greatly influences the gloss ghosting. We were able to clarify the mechanism of the gloss ghosting by tracking both the oxidizing vapors generation amount from the front side printing and the arithmetic average roughness Ra

of the surface of the printed ink film. Gloss ghost appeared clearly as the difference in Ra value between the printed surface accelerated drying by oxidizing vapors and the surrounding area was larger. In conclusion, there was a tendency that gloss ghosting is less likely to occur in printing papers with smaller variations in Ra value over time on the printed surface.