



The RULE

VOLUME 1 ISSUE 3



Mill's Jump Start on Cluster Rule Compliance Proves Successful

In an effort to increase plant capacity and meet environmental compliance, a Southeastern U.S. paper corporation, recently modernized its 50-year-old Kraft mill. As a single line mill, integration of the new system into the current mill operations was critical. The corporation requested USFilter perform a complete evaluation of the plant upgrade because of HPD Products' industry experience and familiarity with the pulping and recovery processes.

In order to meet the capacity and environmental objectives, the mill retired its existing long tube vertical (LTV) evaporators and blow-heat system. HPD Products provided and installed falling film evaporators with condensate segregation, forced circulation concentrators, a blow-heat recovery system, foul condensate stripping system, NCG collection system and cooling tower.

A unique aspect of the modernization is USFilter's turnkey approach. HPD Products provided engineering support from mill evaluation and process design to construction management and training. HPD Products was responsible for connecting the existing internal systems with new equipment. The complex system came online the first attempt and started six weeks ahead of schedule.

After four years of operation, mill personnel are pleased with the systems' operation. The mill manager adds, "Installation of the integrated condensate segregation and stripping system allowed the mill to get a jump start on Cluster Rule compliance. And the stripper has proven to be very efficient in methanol removal."

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Methanol Rectification

When installing a foul condensate stripping system, one of the major issues is Stripper-Off Gases (SOG) disposal. The most common approach is to send these gases to a thermal oxidation device to destroy the Volatile Organic Compounds (VOC) and Total Reduced Sulfur (TRS) that are present. However, some mills have reported that this option sometimes leads to operating problems because of the high amount of water contained in the SOG. Thermal oxidation also does not offer flexibility due to the necessity of always maintaining the oxidizer on-line to destroy the generated SOG.

To circumvent this problem, ENVIRONAIR SIPA recommends liquefying the methanol by sending the SOG to a rectification tower. In most cases, the rectification is operated with low-pressure steam injected in the bottom part of the stripper. The off gases are condensed in a two-stage condenser to produce 80-90% pure liquid methanol. Some of the methanol is refluxed to the tower. The uncondensed gases (consisting mostly of TRS) are vented from the last stage of the condenser to the Low Volume High Concentration (LVHC) system. The rectifier bottom liquid is sent to a decanter for the removal of the red oil.



The remaining aqueous phase is sent back to the foul condensate tank.

Typically, a well designed rectifier will recover 95% of the methanol contained in the SOG and purify it to produce a liquid containing

85% methanol, thus doubling its total heat of combustion. The amount of steam used to operate the system is about 0.4 lb steam/lb methanol. Thus, the energy content of one pound methanol at 80% is 11 times greater than the energy it takes to produce it from the SOG. Therefore, the methanol rectification option is an interesting avenue for mills experiencing problems with injecting water-rich fuels into their existing thermal oxidation devices. This option also

allows temporary storage of liquid methanol and makes the process more flexible since the thermal oxidizer does not have to be kept on-line at all times.

The EPA (Environmental Protection Agency) does not consider the rectified methanol as a hazardous waste under RCRA (Resource Conservation and Recovery Act). Therefore, the sources burning this rectified methanol are excluded from RCRA as long as the combustion is performed at the facility generating the steam.

Last Minute

Information

RECENT PROJECT AWARDS:

At press time, ENVIRONAIR SIPA was awarded the contract for the treatment of NCGs at Quebec province Kraft mill St. Laurent Paperboard Inc. in La Tuque.

ENVIRONAIR SIPA will supply equipment, provide project management and install systems for the collection, transport and treatment of NCGs. This contract is a typical Cluster Rule compliance project. The execution of the work requires a short turn around time.

Read more information on this project in the next issue of *The Rule*.

USFilter Acquisition Complements Biological Treatment Offering

USFilter offers single-source solutions for Cluster Rule compliance through a complete range of proven technologies, process engineering and project management capabilities. USFilter's biological treatment systems are proven to effectively reduce organics and methanol in accordance with Cluster Rule regulations.

The biological treatment solutions include Sequencing Batch Reactor (SBR) and Selector Plug Flow Reactor (SPFR) activated sludge treatment systems, and anaerobic treatment systems. The systems are provided by USFilter's Jet Tech Products group, Envirex Products group and Aquaflow Products group. A recent USFilter acquisition, Aerator Products group, complements the Cluster Rule Compliance team's biological treatment offering through its aeration and mixing systems.

For more than three decades, USFilter's Aerator Products group has provided pulp and paper mills with reliably performing, simple to operate and easy to maintain aeration, mixing and spray cooling products.

Aqua-Lator Floating Spray Coolers at the Celgar Pulp Company in Castlegar, British Columbia, enabled the company to operate its

treatment plant efficiently and effectively. The spray coolers operate in a cooling basin between the primary clarifier and the aeration basin to reduce the wastewater temperature so a high, sustained level of performance of microbial activity can take place in the aeration basin.



With five 75 hp spray coolers in place, the plant monitors wastewater temperature and operates one to five of the spray coolers to achieve the desired temperature. This flexible use of equipment helps to control energy costs while maintaining process integrity. According to mill managers, the Aqua-Lator Spray Coolers provide the dual benefits of cost effectiveness and flexibility.

For more information about Aerator Products, contact Peter Huber at 815-623-2111.

FISCAL YEAR 2000: *Environmental Plan*

The U.S. Environmental Protection Agency announced its proposed Fiscal 2000 plan February 1, 1999. The plan includes several new programs that bring together businesses and communities. Some of the new initiatives proposed are:

- Clean Air Partnership Fund will promote innovative technology to help communities reduce harmful air pollution and greenhouse gases.
- Fighting Childhood Asthma. The program will implement an interagency initiative for education, outreach and air monitoring to reduce children's exposure to toxins in the environment which exacerbate asthma.
- Clean Water Action Plan will continue the agency's efforts to restore rivers, lakes, coastal waters, etc.
- Flexibility in Addressing Water Quality Problems. Program will allow states greater flexibility to address water quality problems from non-point source pollution.
- Cleaning Up Waste Sites and Redeveloping Contaminated Lands.
- Advancing Citizens Right-to-Know and Improving Information. The Chemical Right to Know program will improve public access and strengthen citizen's rights in their communities.
- Improving Air Quality and Reducing Urban Air Toxics. This program will have significant focus in urban air toxics to reduce the risks to sensitive populations.
- Climate Change Technology Initiative. The program continues the agency's efforts to address the challenge of climate change through partnerships with businesses and local governments.

* Excerpted from February 1, 1999 EPA news release, "President Clinton's Fiscal Year 2000 EPA Budget: Building Healthy Communities for the 21st Century." www.epa.gov

Removal of SO₃ from Non-Condensable Gases

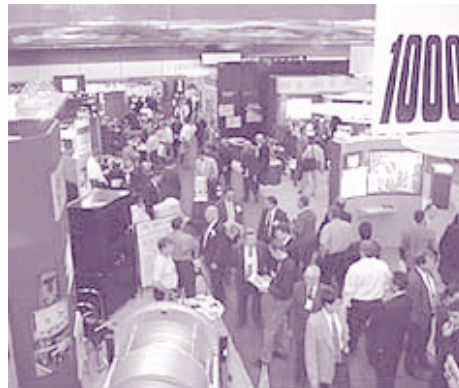
Among the many aspects Kraft mills must consider for Cluster Rule compliance, one key facet is the destruction of non-condensable gases (NCG). Burning these gases lead to the formation of SO_x due to the presence of total reduced sulfur.

When the combustion is operated in normal conditions, SO_x produced consists mostly of SO₂ (97%) with a small amount of SO₃ (3%). Outside normal operating ranges (above 1750°F, for instance), up to 10% of the SO_x may be in the form of SO₃. When the gases exiting the oxidizer are cooled below the acid

dew point in the presence of water, the gaseous SO₃ is transformed into a fine mist of sulfuric acid.

The short residence time of the gases in conventional post-combustion treatment equipment (quenching vessel, wet scrubber) is not sufficient to allow for these droplets to coalesce and to be removed from the gas phase. In wet scrubbers, about 99% of the SO₂ is absorbed into the liquid, while only 10 to 20% of the SO₃ is removed from the gas. The sulfuric acid makes its way through the absorption process up to the stack where it produces a blue plume.

The highly corrosive properties of sulfuric acid make it a dangerous substance that must be eliminated before the gas is released to the atmosphere. Thus, to absorb it efficiently, one has to use an equipment designed to remove particulate matter, since SO₃ droplets behave like particles. The appropriate types of equipment to perform this operation is a High Efficiency Mist Eliminators, Venturi Scrubbers or Wet Electrostatic Precipitators. ENVIRONAIR SIPA has developed expertise in selecting the appropriate equipment for every possible operating condition.



CPPA/EXFOR Exhibition

Thank you for visiting the ENVIRONAIR SIPA and USFilter booths at the Pulp and Paper Technical Association of Canada 85th meeting last January in Montreal, Canada.

Cluster Rule Compliance team members will be available to discuss the team's technologies and capabilities at the TAPPI '99 show in Atlanta, Georgia. Visit us March 1-4, 1999 at the USFilter booth #1616.

CRC Team Products Available for Cluster Rule Compliance

- Condensate Segregation Systems
- Condensate Stripping Systems
- NCG/SOG Treatment Systems
- Activated Sludge Treatment Systems
- Anaerobic Treatment Systems
- SO_x Treatment

Meet us at:

WHAT	WHERE	WHEN	AT
TAPPI '99	Atlanta, Georgia World Congress Center	March 1-4, 1999	Booth #1616

"The RULE" is a quarterly newsletter published by USFilter and ENVIRONAIR SIPA. For more information, please contact us:

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