



The RULE

VOLUME I ISSUE I



Creation of Cluster Rule Compliance Team

Released by the United States Environmental Protection Agency on November 14, 1997, the Cluster Rule is aimed at reducing air and water pollution within pulp and paper mills. For several years, the industry has studied the environmental challenges expected with the regulation's release. Now, mills must complete their evaluations and select technical and commercial solutions.

USFilter and ENVIRONAIR SIPA created the Cluster Rule Compliance (CRC) team to offer strategic business solutions to pulp mills affected by the Cluster Rule. The CRC team will address the needs of mill engineers and engineering consultants through integrated processes and services.

Comprised of industry experts, the team consists of names familiar to the pulp and paper industry like USFilter/HPD, ENVIRONAIR SIPA, USFilter/Aquaflow, USFilter/Envirex and USFilter/Jet Tech. The team can provide single-source solutions ranging from biological treatment alternatives to foul condensate stripping and segregation to NCG collection and treatment.

USFilter/HPD and ENVIRONAIR SIPA offer complete systems related to evaporation, condensate segregation, steam stripping, NCG handling and treatment expertise. USFilter/Aquaflow, USFilter/Jet Tech and USFilter/Envirex represent the team's wastewater treatment expertise. Through a vast internal technology base and strategic alliances, the team can provide mills with every available technology for Cluster Rule compliance.

The team's principal value is its ability to integrate solutions into existing mill processes and infrastructure. The team understands the mill processes, so it can work closely with the industry to ensure selected compliance solutions will positively affect the production process.

Backed by the process expertise and financial strength of USFilter and ENVIRONAIR SIPA, the team can ensure reliable performance guarantees with single-source responsibility. With the ability to design, manufacture, install, start up, operate and own the equipment and systems, the Cluster Rule Compliance team is the single-source for Cluster Rule compliance solutions.

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SEAMLESS INTEGRATION OF FOUL CONDENSATE SEGREGATION & COLLECTION

(PART I OF SEGREGATION TECHNOLOGIES)

Condensate segregation will be a component in many pulp mills' Cluster Rule compliance programs. USFilter/HPD condensate segregation systems are designed to integrate seamlessly and cost effectively within the mill operation, while meeting process and environmental goals. In a series of articles, we will discuss the various process approaches to condensate segregation, beginning with existing evaporator train retrofit using external liquor heaters and secondary condensers.

Most vapor streams generated in an evaporator train are contaminated with volatile organic (mostly methanol) and TRS compounds. Condensate segregation is the process by which these vapors separate into two fractions. The segregation process collects a majority of the contaminants into a small volume, while a larger volume of relatively clean condensate is recovered for reuse within the pulp mill.

As a contaminated vapor stream condenses, each of its components condenses in order of their relative volatilities with the least volatile component, obviously water, condensing first. By using a two-step condensing approach, we can expect to condense mostly water with minimal contamination in the first step, and find substantial methanol and TRS contamination in the second step.

These well-known principles are used today in modern evaporator designs as well as turpentine collection systems. The same principles can be applied to existing, older evaporator trains through various process approaches: external heaters, additional evaporator effects, and pre-evaporation. Each approach can substantially increase evaporation capacity. To define the right process configuration, both short and long-term mill objectives must be considered.

RETROFIT WITH EXTERNAL HEATERS & SECONDARY CONDENSERS

Methanol and TRS within the weak black liquor feed are volatilized during the initial evaporation stages (effects #4, #5 and #6 of a sextuple effect train). By heavily venting the shell side of effects #5 and #6, and the surface condenser to auxiliary "condensers," condensate segregation is achieved. The auxiliary "condenser" is typically a liquor afterheater for the #5 and #6 effect evaporators, although mill water or boiler feed water may be processed through these external heaters. Foul condensate collected from the heaters, secondary condenser and vacuum system is then returned to the mill for further treatment as required under the Cluster Rule.

Effective segregation depends on many factors, but the most critical factor is the venting rate between each condensing step. In the first condensing step, the venting rate must be sufficient to allow most of the methanol and TRS components in the vapor stream to "pass through." So, it is crucial the second condensing step provide a sufficient heat sink to condense the heavy vent from the first condensing step.

While the primary and secondary surface condensers can always be arranged to vent sufficiently from the primary to the secondary condenser, this is not, typically, the case with the liquor afterheater systems. For these systems, the heat sink is driven by evaporator train operating conditions, temperature/pressure profile, and liquor flow through the heaters. Typically, the heat sink from the external afterheaters is not sufficient for the high removal rates required on effects #5 and #6. To address this issue, vent rates from the #5 and #6 effect heating elements are artificially increased by venting these units not only to their respective afterheaters but to the secondary surface condenser.

Look for Part II of "Seamless Integration of Foul Condensate Segregation" in the next issue of *The Rule*.

Collection, Transport and Treatment of NCG at Cascades East-Angus Inc.



In January 1997, Cascades East-Angus, a mill located in southern Quebec, solved its air pollution problems by integrating two systems from ENVIRONAIR SIPA.

In operation for more than 100 years, the East-Angus mill operates five batch digesters to produce unbleached pulp softwood with a total capacity of 150 ADTPD.

Cascades East-Angus implemented systems for the treatment of three major gas outlets: HVLC gases from the brown stock washers, dust contaminated air from the dissolving tank and LVHC gases from the digesters, blow tank, evaporators and concentrator.

Because the HVLC gases from the brown stock washers were already very close to meeting the regulations for TRS concentrations, the most economical solution was to install a HVLC scrubber using the weak wash as a scrubbing medium.

The gas from the dissolving tank is contaminated with sodium salt particles, which must be reduced before the gas is released to the atmosphere. Cascades installed a two-level spray tower using weak wash to remove the particles at about 80% efficiency. The particle concentration in the outlet gas now meets the regulations.

Due to their explosive nature, great care must be taken in the collection and transport of LVHC gases. A regenerative thermal oxidizer integrated by ENVIRONAIR SIPA allows for the combined destruction of HVLC and LVHC gases. Both gases are injected in two different sections of the oxidizer. A fan installed at the oxidizer outlet is used to draw the gases through the collection system and the oxidizer itself. A series of flame arrestors and rupture discs has also been installed to prevent any potential explosion.

CLUSTER RULE Update

The official release date of the Cluster Rule & Federal Register publication was April 15, 1998. The rule becomes effective on June 30, 1998. The following is a snapshot of the final rule's impact to pulp mills:

Air: The final air rule covers MACT1 emissions (non-combustion sources from pulping and bleaching operations at chemical and semi-chemical wood pulping mills); and MACT III emissions (non-combustion sources from mills that mechanically pulp wood, pulp secondary

fibers, or pulp non-wood materials, and those that use paper machine additives and solvents).

*Water: The final water rule applies to mills in Subpart B (Bleached Papergrade Kraft and Soda) and Subpart E (Papergrade Sulfite) Subcategories and includes BAT limitations and Best Management Practice (BMP) requirements.**

* Information source: EPA, United States Environmental Protection Agency, www.epa.gov

The TAPPI Cluster Rule Symposium & CRCT Reception



In conjunction with the TAPPI Cluster Rule Symposium held February 18-20 in Atlanta, Georgia, the Cluster Rule Compliance team hosted a reception and exhibition to highlight the team's capabilities for Cluster Rule compliance technologies.

More than 100 industry and consultant representatives attended the reception. Exhibits displayed the capabilities of USFilter and ENVIRONAIR SIPA within the pulp and paper industry as well as the value added by the recently established team for Cluster Rule compliance. The team will provide

single-source solutions ranging from biological treatment alternatives to foul condensate stripping and segregation to NCG collection and treatment.

The TAPPI symposium included technical papers and roundtable discussions regarding the essential legal, financial and technical issues regarding the complexities of compliance with the Cluster Rule. Industry personnel engineering consultants, suppliers and representatives from academia, the U.S. EPA, and other environmental regulatory agencies attended various TAPPI sessions.

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
TAPPI- Engineering Conference	Miami, Fontainebleau Hotel	September 13 – 17, 1998
TAPPI- Pulping Conference	Montreal, Queen Elizabeth Hotel	October 25 – 29, 1998
EXFOR- CPPA	Montreal, Palais des Congres	January 26 – 28, 1999
TAPPI '99	Atlanta, Georgia World Congress Center	March 1-3, 1999

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

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