



Continental Aluminum

File Man

NG013IK

September 29th, 2014

Mr. Iranna Konanahalli
konanahalli@michigan.gov

Michigan Department of Environmental Quality
SE Michigan District Office Air Quality Division
27700 Donald Court
Warren, MI 48092-2793
Phone: (586)753-3700 Fax: (586)751-4690

E-file: NG013-RVN-20140929



CJE

dc

Sep 10, 2014, VN Response.

Subject: Continental Aluminum Corporation, New Hudson, MI, September 10th Notice of Violation regarding lime system operations, resulting in an odor incident on Saturday, August 30th, 2014

Dear Mr. Konanahalli:

The purpose of this letter is to provide an accounting of operations on August 30th, which resulted in an odor complaint filed by Lyon Township. Additionally, this letter provides an overview of the operations and maintenance systems used at Continental Aluminum for emissions controls, and the completed and planned corrective actions to prevent reoccurrence.

Summary of the Incident

An error in the start-up of the lime injection system (pre-start inspection, checking, and maintenance) was the root cause for an approximately 6 to 8-hour time period in which no lime was flowing to the rotary furnace baghouse following an extended outage. This error resulted in approximately 4 hours of potential excess HAP emissions, and resulted in significant odor complaints in the community.

Most items are procedural in nature and do not require major equipment changes. The plant has implemented corrective actions consistent with Continental Aluminum's air permit (updated Sept. 2013) to prevent reoccurrence of excess emissions and odor. Details related to the incident investigation, root cause analysis, and corrective actions implemented or planned are included for your review. An overview of Continental Aluminum's emissions and odor control systems is also attached.

Regards,

Signature: Tyler Cunningham Date: 9/26/14

Tyler Cunningham
(248)437-1001 Ext. 101

Incident Report (Saturday, August 30th, 2014)

On Saturday morning, August 30th, the rotary furnace and lime feeder had been down for the previous 48 hours for several maintenance activities. Additionally, the secondary lime/carbon feeder was scheduled to be down all weekend for some control panel upgrades being performed by an outside contractor. A backup odor control plan for this work, using higher lime feed rates on the primary rotary lime feeder, was implemented as a precaution.

The rotary furnace began operation around 10 AM after an initial PM check by maintenance. Around 2 PM, the plant received a complaint about serious odor issues. All melting operations were stopped and a full system investigation was conducted. The subsequent investigation revealed an undetected primary lime feeder failure as the root cause. This, combined with the maintenance outage on the secondary system resulted in no lime flowing to the rotary baghouse for approximately 6 to 8 hours before the problem was detected.

The primary lime system was cleaned and repaired prior to starting the rotary furnace back up at 7 PM. Carbon was added to the primary rotary lime system, in addition to the lime that is normally added, and feed rates were increased. Backup inspection plans were also implemented for the remainder of the weekend while the carbon system upgrades were being completed.

Upon investigation, it appears that the potential for excess HCL emissions existed for approximately 3 to 4 hours as a result of melting in the rotary furnace with inadequate lime injection (both the primary and secondary injection systems down for an extended period of time). This condition was undetected at the plant, and resulted in no visible emissions, but likely contributed to the reported odor problems.

Attachment 1 highlights Continental Aluminum's emission controls plan provided for the air permit (updated Sept. 2013) and is attached for reference. It shows that the lime system is the primary control for excess HAP emissions, and that MDEQ-qualified stack performance testing in 2013 demonstrated that the primary lime injection only is required to meet the emissions standards and odor control. As part of the updated air permit, Continental Aluminum uses higher lime-injection rates than were required by the previous permit.

Root Cause Analysis:

The following week, additional root cause analysis was conducted. The findings are as follows:

- 1.) Inadequate maintenance PM check and communications from the rotary furnace extended the planned maintenance outage.
- 2.) Inadequate maintenance employee training in regards to baghouses and use of the shift PM inspection sheet and requirements. The problem was missed by a relatively new maintenance employee who was performing the check in place of the employee who normally performs the check on this shift (1st shift).
- 3.) Inadequate lime system checks by the supervisor on duty (logged every 3 hours, or 4 times per shift)
- 4.) Extra actions plans need to be implemented during a planned outage on the secondary emission control system (the carbon feeder).

Follow-Up Corrective Actions:

- 1.) Improved training for the maintenance PM checks and routine lime-flow checks. Continental Aluminum currently uses:
 - a. Maintenance PM check on environmental equipment at the beginning of each shift (CA currently runs two 12-hour shifts each day).
 - b. Four recorded lime feeder checks per shift (once every 3 hours) by the supervisor on duty.
 - c. Recorded lime addition records by the operator every 4 to 6 hours (operator notifies the supervisor on duty if feeder is still full or running too fast).

In regards to this incident, the lime feeder issue would have been caught and prevented if either (a) or (b) had been performed properly. These exceed MACT and permit requirements and should be effective with proper training and improved back-up and maintenance communications.

- 2.) Retraining of all maintenance employees and supervisors in regards to their roles and responsibilities was completed September 5th through 8th. Training included:
 - a. Extra emphasis was placed on shift PM and start-up after extended equipment outages.
 - b. Maintenance employees were instructed to lockout the furnaces when lime feeders or other vital environmental equipment are left inoperable overnight or through a shift change. When these furnaces are locked out, they cannot physically be operated until maintenance employees remove their locks.
 - c. Extra emphasis was placed on supervisors observing the screw conveyor on each lime feeder to make sure that it is turning properly on the "on" cycle, and not only checking the hopper for lime. The free-flowing lime check logs that supervisors fill out have been modified to include more frequent checks, as well as a column where the supervisor records the number of seconds that the screw conveyor turns on the "on" cycle.
 - d. Supervisors and maintenance employees were reminded of the requirement (as part of the OM&M plan) to shut down melting within 2 hours if lime feeders are plugged or not operating properly, and lime is not free-flowing to the baghouses.

- 3.) A process flow chart was developed and posted near all lime and carbon feeders, and in the rotary and deox control booths, to highlight supervisor and maintenance responsibilities and actions with the primary and secondary systems (completed 9/10/2014).
- 4.) Extra feed rate testing and reliability analysis on all primary lime and secondary carbon/lime feeders. Additional equipment reliability improvements will be performed on all 3 feeders.
- Analysis completed 8/20/14.
 - Carbon system upgrade completed 8/31/14.
 - Rotary and lime upgrades to be completed within the year.

Attachment 1

Continental Aluminum Emissions Control Background

This section is provided for clarity around the emission control system design and operating requirements at Continental Aluminum, approved in the New Permit (Sept. 2013) and the upgraded OM&M plan (Dec. 2013). It is important to remember that Continental's emissions and odor control is based on the primary lime injection system only.

Lime is added to the lime injection system to coat the baghouse filter bags and to control HCL and acid-based emissions. This lime coating remains active until a baghouse shake is performed to clean the bags. A lack of lime flowing to the baghouse for several hours after a shake can potentially result in HAP emissions, and if there is a malfunction that prevents lime flow to the baghouses for 4 hours or more, is a reportable event in our SSM. This condition can also result in a burning/acid odor.

Continental Aluminum has installed a secondary in-line backup system which uses a 1:1 blend of lime and carbon, internally referred to as the "carbon system." It is run concurrently with the primary lime system to minimize the impact of any potential primary system failures, and also to provide additional odor control, though it has only limited ability to prevent all odors.

Performance testing conducted July 2013 validated improved emission compliance with the new air permit standards. This testing was observed by MDEQ and conducted under the following worst-case conditions:

- Worst-case scrap and flux additions
- Use of only the primary injection system (the secondary carbon/lime system was not used)
- Higher lime additions relative to the previous permit operating and testing conditions

This test condition was designed to verify operations compliance and was based on using the primary emission control system only, with higher lime feed rates. Continental Aluminum uses the secondary injection system with carbon additions as a back-up system, not as a primary odor and emissions control.

Outlined in our OM&M plan, Continental Aluminum must check and verify the primary feeders for lime flow and operation every 4 hours. If the primary feeder is empty or not operating properly, maintenance is notified immediately and scrap melting is stopped if the primary feeder is not repaired within 2 hours. There is a backup alternative for continued scrap melting by adjusting the secondary feeder to cover the full operating lime parameter requirements specified in the permit.