

ATTACHMENT A

for

Lakeland Regional Medical Center
1324 Lakeland Hills Blvd.
Lakeland, Polk County

Facility ID No. 1050095

This attachment contains the following two (2) documents:

- Memorandum dated October 30, 1991, from Lakeland Regional Medical Center's consultant, Brian S. Cumming, P.E., of Ralph Hahn & Associates, Inc.
- Letter dated November 8, 1991, from Lakeland Regional Medical Center's consultant, Brian S. Cumming, P.E., of Ralph Hahn & Associates, Inc.



M E M O R A N D U M

TO: Harry Kerns
Department of Environmental Regulation

FROM: Brian S. Cumming, P.E.
Ralph Hahn & Associates

DATE: October 30, 1991

RE: LRMC Waste to Energy Generator
L91-651A

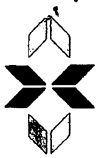
Per your request, this memo contains the information you requested on October 24, 1991, regarding the by-pass damper for the above referenced project:

1. State the reasons for the by-pass.

Response:

There are several different reasons for the by-pass damper. It is required on all incinerator systems in order to protect the heat recovery boiler and baghouse from excessive temperatures which may cause injury to equipment and personnel operating the incinerator system. Below are some of the common reasons the emergency by-pass damper will open:

- A. A loss in draft occurs. This could be related to an ID fan belt breaking or a damper failure. The expected occurrence of this is once every two or three years.
- B. High temperature in the boiler. This will occur if there is a problem with the boiler or steam system. This will occur perhaps once each year.
- C. Low water makeup in the boiler. This can happen if water does not fill up the boiler due to boiler feed pump failure. The expected worst case occurrence of this is once every five years.
- D. To avoid having the entering temperature of the baghouse above the recommended 450° temperature. By by-passing the baghouse on high inlet temperature, the bag-house filters will not catch on fire which would avoid a life safety hazard.



E. Loss of compressed air to the emergency by-pass damper. This would very rarely occur due to the storage capability of the compressed air system.

2. Provide a complete control sequence for the emergency by-pass damper.

Response:

The control sequence is not complicated for the emergency by-pass system. Sensors which measure the draft pressure, temperature into the boiler, water fill level in the boiler, and baghouse inlet temperature are hard wired to a safety panel in the incinerator control panel. Contact closure of any sensor limit will drive the emergency by-pass damper to the open position.

3. Explain the by-pass interlock system.

Response:

Upon activation of the opening of the emergency by-pass damper the waste loader will be disabled so that no additional waste can be fed into the incinerator system. The loader will not be enabled again until the emergency damper is closed.

4. What will be emitted during by-pass operation?

Response:

During by-pass operation Stage II and III burners will remain on to keep carbon monoxide levels to a minimum. Airborne acids and particulate will pass through the stack uncontrolled. The exact HCl and particulate emitted is solely based upon the waste which would be burning inside the incinerator primary chamber at the time of emergency by-pass. The HCl concentrations may possibly be higher than the state requirements for approximately 10 minutes. After 10 minutes, the HCl emissions will diminish below the DER requirements. Particulate will emit as long as the burnout process occurs (about one hour). After the one hour period, particulates will be .03 gr/dscfm @ 7% O₂ or less due to the lack of reloading the incinerator.

5. Please state the typical duration of the by-pass condition.

Response:

The by-pass valve typically is opened between a few minutes and at the maximum two hours depending upon the



reason the by-pass damper was open. If the reason was draft related then typically the damper is opened for a few minutes until the draft problem is corrected and then goes back to normal operation. If the problem is a high temperature or lack of water in the boiler for the baghouse entering temperature the emergency damper will open until the solution can be corrected by the operator or control system. Typically, these boiler conditions occur if there is overcharging of high BTU content waste occurring in the incinerator. The exact time depends upon the nature of the problem and how fast it can be corrected. The emergency stack by-pass will not be open longer than two hours after opening.

6. Will the draft air continue in the primary chamber?

Response:

Yes, draft air will continue in the primary chamber through a natural means due to the stack effect.

7. What environmental impact will occur during by-pass?

Response:

The environmental impact will be negligible. The slight potential increase in HCl concentration for 10 minutes will be offset by the lack of additional loading during the emergency period. The average HCl emissions over the first hour should be equal to or less than the allowable levels. A slight increase in particulate will be emitted into the environment for no more than one hour period. This concentration level is estimated to be .08 gr/dscfm.

8. What are the maximum ground level concentrations caused by the by-pass conditions?

Response:

Due to the infrequency of the emergency by-pass conditions, the ground level HCl concentrations will be no higher than the concentrations of the incinerator operating on a full time basis during the emergency by-pass systems. The 10 minute spike of potential increased concentration of HCl will be offset by the incinerator not operating at full capacity during the time period after that 10 minute period. Therefore, the ground level concentration will be the same or less than the concentration submitted previously.

9. What frequency will emergency by-pass occur? (Based on other facilities.)



Response:

No written data is obtainable from the manufacturers. However, he has stated that the by-pass does not occur very often. Usually a few times per year after the first two months of operation. During the first two months of operation, debugging the system occurs which may open the by-pass damper several times.

10. What precautions will be taken to avoid by-pass?

Response:

One of the main reasons emergency by-pass occurs is due to the loss of power which shuts down fans and other equipment. The system has been designed so that all components are on the emergency power system of the hospital. This emergency power will automatically transfer over from the power company source to keep the incinerator operating during loss of power conditions.

Another precaution made was to oversize the compressed air storage tank which will allow the emergency by-pass damper to remain closed for during the time it takes to repair or to replace the compressor should it fail.

11. What is the probability of the emergency by-pass damper opening?

Response:

Due to the large number of variables and lack of hard data it is impossible to calculate the exact probability of this emergency by-pass happening. As a realistic estimation, the emergency by-pass system will activate a few times per year. During the first two months of operation this may happen several times.

Ralph Hahn and Associates, Inc.

CONSULTING AND DESIGN ENGINEERS

D.E.R.

NOV 13 1991

SOUTHWEST DISTRICT
TAMPA

November 8, 1991

Mr. Jim McDonald
Department of Environmental Regulations
4520 Oak Fair Blvd.
Tampa, FL 33610-7347

Re: LRMC Waste to Energy Generator
RHA #L90-651A
AC53-19060

Dear Jim,

This letter addresses the information requested by your office during our meeting last week regarding the above referenced project. The comments and responses are listed as follows:

1. Comment:

Does the lime feed stop during baghouse by-pass operation?

Response:

Yes, the lime feed loader would stop feeding lime into the system upon opening of the baghouse by-pass damper.

2. Comment:

At what times does the baghouse by-pass the damper open?

Response:

The baghouse by-pass damper only opens during startup and shutdown sequences. All other times it is 100% closed. The purpose of opening the by-pass damper is to allow for heat up of the system to prohibit cool, moist gases from entering the baghouse. During the by-pass operation there is no waste being burned because the loader is locked out and will not operate.

The by-pass damper is controlled by the main control panel. During shutdown sequence, the burners remain on and the by-pass damper remains closed which allows all gases to pass through the baghouse during the shutdown period. During the cool down process, the burners are turned off and all gases continue to flow through the

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baghouse until the temperature drops below the design temperature of 250°. At that time the baghouse damper stays in the open position until system startup occurs and temperature is increased to 250°. Therefore, all emissions produced as a result of waste incineration will pass through the baghouse pollution control equipment.

3. Comment:

Is there any way to stop combustion in lieu of having an emergency stack by-pass (i.e. such as nitrogen injection or by some other means)?

Response:

No. No other technique or technologies are available to immediately stop an incineration system from incinerating which would eliminate the need for a by-pass damper.

4. Comment:

Can emergency by-pass be eliminated?

Response:

No. The emergency by-pass system is required for all incinerators.

5.. Comment:

Provide a no-threat level analysis on the emergency stack for emissions during the emergency by-pass period. System must comply with the allowable three minute level only.

Response:

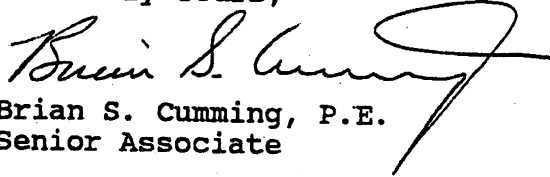
See attached calculations showing the no-threat level analysis. The analysis has shown that the emergency stack will meet the three minute no-threat level requirement of 150. A no-threat level analysis does not apply to any time frame over three minutes due to the fact that the HCl emissions only occurs for a ten minute period. Note that the NTRL analysis stack temperature was 440° F. when the actual emission temperature is at >1,800° F. This results in a very conservative calculation.



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If you have any additional questions or need additional information please let me know. I would appreciate your prompt attention to this information as discussed in our meeting.

Sincerely Yours,



Brian S. Cumming, P.E.
Senior Associate

cc: Terry Bell, LRMC
Mike Childs, LRMC