

# Florida Department of Environmental Protection

## Memorandum

TO: Michael G. Cooke, Division of Air Resource Management

THRU: Trina Vielhauer, Bureau of Air Regulation *TV*

FROM: Jeff Koerner, Air Permitting North Program *JK*

DATE: December 21, 2005

SUBJECT: Smurfit-Stone Container Enterprises, Inc. - Panama City Mill  
Project No. 0050009-022-AC  
No. 4 Combination Boiler - OFA and Venturi Improvements, Revision

Smurfit-Stone Container operates the existing Panama City Mill, which is located at One Everitt Avenue in Panama City, Bay County, Florida. The Department issued Permit No. 0050009-021-AC on November 3, 2005 to authorize improvements to the existing overfire air (OFA) system and existing wet venturi scrubber for the No. 4 Combination Boiler. In this permit, the maximum steam production rate was identified as 300,000 lb/hour.

For the current project, the applicant requested a revision to allow a maximum steam production rate of 330,000 lb/hour when at least one of the other plant boilers is not in operation. The applicant provided relevant operational information and test data indicating that the boiler will comply with emissions standards at this rate. Such operation would only occur for short durations while one unit was down for repair or maintenance. Permit No. 0050009-022-AC revises and supersedes the original permit (No. 005009-021-AC) to reflect changes to the steam production rate. The project is not expected to increase emissions of any pollutant. The project results in a minor source air construction permit and is not subject to PSD preconstruction review.

The Department distributed an "Intent to Issue Permit" package on November 21, 2005. The applicant published the "Public Notice of Intent to Issue" in the Panama City "New Herald" on December 6, 2005. The Department received proof of publication on December 9, 2005. No petitions for administrative hearings or extensions of time to petition for an administrative hearing were filed. No comments were received.

Day #90 is March 4, 2006. I recommend your approval of the attached Final Permit for this project.

Attachments

**PERMITTEE**

Smurfit-Stone Container Enterprises, Inc.  
Panama City Mill  
One Everitt Avenue  
Panama City, FL 32402

**PERMITTING AUTHORITY**

Florida Department of Environmental Protection  
Division of Air Resource Management  
Bureau of Air Regulation, Air Permitting North Program  
2600 Blair Stone Road, MS #5505  
Tallahassee, Florida, 32399-2400

**PROJECT**

Air Permit No. 0050009-022-AC  
Panama City Mill – No. 4 Combination Boiler, Revision

This permit authorizes improvements to the existing overfire air (OFA) system and existing wet venturi scrubber for the No. 4 Combination Boiler. The Department issued Permit No. 0050009-021-AC on November 3, 2005 to authorize the proposed work for this project. Permit No. 0050009-022-AC revises and supersedes the original permit (No. 005009-021-AC) to reflect changes to the steam production rate. The existing unit is located at Smurfit-Stone Container's Panama City Mill, which is located at One Everitt Avenue in Panama City, Bay County, Florida.

**NOTICE AND PUBLICATION**

The Department distributed an "Intent to Issue Permit" package on November 21, 2005. The applicant published the "Public Notice of Intent to Issue" in the Panama City "New Herald" on December 6, 2005. The Department received proof of publication on December 9, 2005. No petitions for administrative hearings or extensions of time to petition for an administrative hearing were filed.

**COMMENTS**

No comments on the Draft Permit were received from the public, the Department's Northwest District Office, or the applicant.

**CONCLUSION**

Only minor revisions were made to correct typographical errors. The final action of the Department is to issue the permit with the changes described above.

STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

NOTICE OF FINAL PERMIT

In the Matter of an  
Application for Permit by:

Smurfit-Stone Container Enterprises, Inc.  
Panama City Mill  
One Everitt Avenue  
Panama City, FL 32402

Air Permit No. 0050009-022-AC  
Panama City Mill  
No. 4 Combination Boiler  
OFA and Venturi Improvements  
Revision for Steam Production Rate

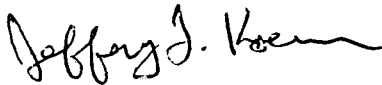
*Authorized Representative:*

B. G. Sammons, General Manager

Enclosed is Final Permit No. 0050009-022-AC, which revises previous Permit No. 0050009-022-AC with regard to the steam production rate of the No. 4 Combination Boiler. The existing Panama City Mill is located at One Everitt Avenue in Panama City, Bay County, Florida. As noted in the attached Final Determination, only minor changes and clarifications were made. This permit is issued pursuant to Chapter 403, Florida Statutes.

Any party to this order has the right to seek judicial review of it under Section 120.68 of the Florida Statutes by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with the clerk of the Department of Environmental Protection in the Office of General Counsel (Mail Station #35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000) and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The notice must be filed within thirty (30) days after this order is filed with the clerk of the Department.

Executed in Tallahassee, Florida.



Trina Vielhauer, Chief  
Bureau of Air Regulation

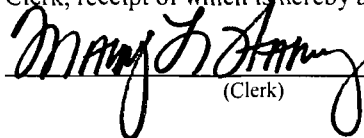
CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Notice of Final Permit (including the Final Permit and Final Determination) was sent by certified mail (\*) and copies were mailed by U.S. Mail before the close of business on 12/23/05 to the persons listed:

Mr. B. G. Sammons, Smurfit-Stone Container Enterprises, Inc.\*  
Mr. Tom Clements, Smurfit-Stone Container Enterprises, Inc.  
Mr. David Buff, Golder Associates Inc.  
Ms. Sandra Veazey, NWD Office

Clerk Stamp

**FILING AND ACKNOWLEDGMENT FILED**, on this date, pursuant to §120.52, Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

  
(Clerk)

12/23/05  
(Date)



# Department of Environmental Protection

Jeb Bush  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Colleen M. Castille  
Secretary

## PERMITTEE:

Smurfit-Stone Container Enterprises, Inc.  
Panama City Mill  
One Everitt Avenue  
Panama City, FL 32402

### *Authorized Representative:*

B. G. Sammons, General Manager

Air Permit No. 0050009-022-AC Facility ID No. 0050009 SIC No. 2611 OFA and Venturi Improvements Permit Expires: September 13, 2007
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## PROJECT AND LOCATION

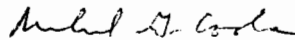
This permit authorizes improvements to the existing overfire air (OFA) system and existing wet venturi scrubber for No. 4 Combination Boiler. The goal of the project is to reduce controlled particulate matter emissions at the stack to comply with the NESHAP Subpart DDDDD particulate matter emissions limit of 0.07 lb/MMBtu. The existing unit is located at Smurfit-Stone Container's Panama City Mill, which is located at One Everitt Avenue in Panama City, Bay County, Florida.

## STATEMENT OF BASIS

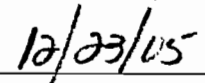
This air pollution construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to perform the work in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department. This permit revises and supersedes original Permit No. 0050009-021-AC.

## CONTENTS

- Section 1. General Information
- Section 2. Administrative Requirements
- Section 3. Emissions Units Specific Conditions
- Section 4. Appendices



Michael G. Cooke, Director  
Division of Air Resource Management



(Date)

**FACILITY AND PROJECT DESCRIPTION**

The permittee operates an existing pulp and paper mill (SIC No. 2611) in Panama City. The mill includes the No. 4 Combination Boiler (Emissions Unit 016), which is authorized to fire wood/bark, coal, fuel oil, and natural gas. The unit is authorized to operate as a backup for the lime kiln to destroy non-condensable gases (TRS/HAP/VOC) from the batch digesting system and multiple effects evaporator system. The unit is also authorized to operate as a backup to the No. 3 Combination Boiler to destroy HAP and TRS emissions in the condensate stripper off-gases (SOG). Existing air pollution controls include an overfire air (OFA) system and a venturi wet scrubber. The permittee proposes several improvements to these existing control systems in an effort to reduce controlled particulate matter emissions from No. 4 Combination Boiler at the stack to comply with the NESHAP Subpart DDDDD particulate matter emissions limit of 0.07 lb/MMBtu.

**REGULATORY CLASSIFICATION**

Title III: The facility is a major source of hazardous air pollutants (HAP).

Title IV: The facility operates no units subject to the acid rain provisions of the Clean Air Act.

Title V: The facility is a Title V major source of air pollution in accordance with Chapter 213, F.A.C.

PSD: The facility is a PSD-major source of air pollution in accordance with Rule 62-212.400, F.A.C.

NSPS: The facility operates units subject to the New Source Performance Standards in 40 CFR 60.

NESHAP: The facility operates units subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) in 40 CFR 63.

**RELEVANT DOCUMENTS**

The Department issued Permit No. 0050009-021-AC on November 3, 2005 to authorize the proposed work for this project. Permit No. 0050009-022-AC revises and supersedes the original permit (No. 005009-021-AC) to reflect changes to the steam production rate. The original permit, applications and additional information received to make the applications complete are not a part of this permit; however, the information in these documents is specifically related to this permitting action and is on file with the Department.

## SECTION 2. ADMINISTRATIVE REQUIREMENTS

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1. Permitting Authority: All documents related to applications for permits to operate an emissions unit shall be submitted to Air Resources Section of the Department's Northwest District Office at 160 Governmental Center, Pensacola, Florida 32502-5794.
2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Air Resources Section of the Department's Northwest District Office at 160 Governmental Center, Pensacola, Florida 32502-5794.
3. Appendices: The following Appendices are attached as part of this permit: Appendix A (Citation Format); Appendix B (General Conditions); and Appendix A (Common Requirements).
4. Applicable Regulations, Forms and Application Procedures: Unless otherwise indicated in this permit, the construction and operation of the subject emissions unit shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The terms used in this permit have specific meanings as defined in the applicable chapters of the Florida Administrative Code. The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations. [Rules 62-204.800, 62-210.300 and 62-210.900, F.A.C.]
5. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]
6. Modifications: The permittee shall notify the Compliance Authority upon commencement of construction. No emissions unit or facility subject to this permit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]
7. Relaxations of Restrictions on Pollutant Emitting Capacity. If a previously permitted facility or modification becomes a facility or modification which would be subject to the preconstruction review requirements of this rule if it were a proposed new facility or modification solely by virtue of a relaxation in any federally enforceable limitation on the capacity of the facility or modification to emit a pollutant (such as a restriction on hours of operation), which limitation was established after August 7, 1980, then at the time of such relaxation the preconstruction review requirements of this rule shall apply to the facility or modification as though construction had not yet commenced on it. [Rule 62-212.400(2)(g), F.A.C.]
8. Title V Permit: This permit authorizes the proposed construction activities related to the existing air pollution controls. A Title V air operation permit is required for regular operation of the permitted emissions unit. The permittee shall apply for a revised Title V air operation permit at least 90 days prior to expiration of this permit, but no later than 180 days after commencing operation. To apply for a Title V air operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the appropriate Permitting Authority with copies to the Compliance Authority. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

## SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

### A. No. 4 Combination Boiler (EU-016)

This section of the permit addresses the following emissions unit.

#### **Emissions Unit No. 016 – No. 4 Combination Boiler**

No. 4 Combination Boiler is an existing unit at the Panama City Mill. The unit is currently authorized to fire carbonaceous fuels (includes wood, bark and primary clarified wood fibers), coal (maximum of 1.7% sulfur by dry weight), natural gas and No. 2 or 6 fuel oil (maximum of 2.4% sulfur by weight). Existing air pollution controls include an overfire air (OFA) system and a venturi wet scrubber. Title V air operation permit No. 0050009-020-AV specifies the following capacities: The total maximum operational heat input of this emissions unit is 545 MMBtu/hr based on a 24-hour average. The heat input shall not exceed 472 MMBtu/hr from fuel oil, 395 MMBtu/hr from coal, 474 MMBtu/hr from carbonaceous fuels, or 512 MMBtu/hr from natural gas. The total heat input to the Nos. 3 and 4 combination boilers due to carbonaceous fuels shall not exceed 501 MMBtu/hr based on a 24-hour average.

#### **OTHER REQUIREMENTS**

1. Other Permits: The No. 4 Combination Boiler remains subject to all applicable requirements from previously issued air construction and operating permits. The conditions of this permit are in addition to and supplement all other applicable permit requirements. The Department reserves the right to review this project in combination with future proposed projects related to this unit. This permit supersedes Permit No. 0050009-021-AC, which was originally issued for this project. [Rule 62-4.070(3), F.A.C.]

#### **CONTROL EQUIPMENT IMPROVEMENTS**

2. Overfire Air System: The permittee is authorized to perform the following general work on the existing overfire air system: Conduct a Computational Fluid Dynamics (CFD) modeling analysis. Based on the results of the analysis, modify or add overfire air ports, ductwork, velocity dampers, air nozzle assemblies, air flow measuring devices, and combustion control system to improve carbonaceous fuel firing. The project goal is to reduce unburned carbon to 20% or less, provide more stable combustion with a constant negative furnace pressure, and reduce uncontrolled particulate matter emissions from the boiler furnace to less than 4.2 lb/MMBtu.
  - a. Within 15 days of completing the CFD report, the permittee shall submit a written report of the findings to the Bureau of Air Regulation and the Compliance Authority.
  - b. Prior to commencing physical work on this project, the permittee shall submit a report to the Bureau of Air Regulation and the Compliance Authority summarizing the proposed changes based on the CFD modeling analysis.
  - c. Within 15 days of completing the physical work, the permittee shall provide a report to the Bureau of Air Regulation and the Compliance Authority summarizing the actual OFA improvements made.[Application; Rule 62-4.070(3), F.A.C.]
3. Existing Wet Scrubber: The permittee is authorized to return the current fixed throat venturi scrubbing system to a variable throat venturi scrubbing system, which is the original design for this equipment. The project goal is to provide more control over the scrubber pressure differential and control of particulate matter emissions with the variable throat design. The permittee shall notify the Compliance Authority within 15 days of completing the proposed work. The permittee shall install, calibrate, operate and maintain a device to continuously monitor and record the scrubber pressure drop. [Application; Rule 62-4.070(3), F.A.C.]

SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

A. No. 4 Combination Boiler (EU-016)

PERFORMANCE RESTRICTIONS

4. Permitted Capacity:

- a. When all boilers at the plant are in operation, the maximum continuous steam rate for the No. 4 combination boiler shall not exceed 300,000 lb/hour (24-hour average).
- b. When at least one of the other plant boilers is not in operation, the maximum continuous steam rate for the No. 4 combination boiler shall not exceed 330,000 lb/hour (24-hour average).

The permittee shall install, calibrate, maintain, and operate equipment to continuously monitor and record the steam production rate to demonstrate compliance with this requirement. [Rules 62-210.200(PTE) and 62-212.400(2)(g), F.A.C.]

EMISSIONS PERFORMANCE TESTING

5. Initial Performance Tests: Within 90 days of restarting the unit after completing the proposed work, the permittee shall conduct performance tests to determine the following emissions rates from the No. 4 Combination Boiler: carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM), and volatile organic compounds (VOC). The tests shall be conducted under the following conditions:

- a. Each test shall consist of three 1-hour test runs.
- b. The boiler shall fire only a combination of wood and coal. No more than 6.2 tons per hour of coal shall be fired for each 3-run test average.
- c. The boiler shall produce at least 300,000 pounds per hour of steam for each 3-run test average.

If the boiler is unable to operate within 90% of this specified steaming rate during the initial tests, the Department reserves the right to reduce the maximum steaming rate. The PM test shall demonstrate compliance with the applicable standards specified in the Title V air operation permit. The tests for CO, NOx, and VOC are for informational purposes. [Rule 62-297.310(7)(a)1, F.A.C.]

6. Test Notification: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. [Rule 62-297.310(7)(a)9, F.A.C.]

7. Test Methods: Required tests shall be performed in accordance with the following reference methods.

EPA Test Method	Description of Method and Comments
1-4	Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content {These methods are performed as necessary to support the other methods.}
5	Determination of Particulate Matter (PM) Emissions
7E	Determination of Nitrogen Oxide (NOx) Emissions
10	Determination of Carbon Monoxide (CO) Emissions The method shall be based on a continuous sampling train.
18	Calculation Method for NOx, PM, and VOC Emission Rates
25A	Determination of Volatile Organic Compounds (VOC) {The permittee may elect to conduct EPA Method 18 on a simultaneous sample to determine emissions of methane and ethane, which may then be deducted from the determination of total hydrocarbons (THC) to determine VOC emissions. Otherwise, all measured THC shall be assumed to be VOC.}



## SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

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### A. No. 4 Combination Boiler (EU-016)

Tests shall also be conducted in accordance with the requirements specified in Appendix C of Section 4 of this permit. The above methods are described in 40 CFR 60, Appendix A, and adopted by reference in Rule 62-204.800, F.A.C. [Rules 62-204.800 and 62-297.100, F.A.C.; 40 CFR 60, Appendix A]

#### RECORDS AND REPORTS

8. Test Reports: The permittee shall prepare and submit reports for all required tests in accordance with the requirements specified in Appendix C of Section 4 of this permit. For each test run, the report shall also indicate the following: emissions rate (lb/MMBtu, lb/hour, and ppmvd @ 7% oxygen for gases); flue gas oxygen content (%); steam production rate (lb/hour); wood and coal firing rates (tons/hour); heat input rates from each fuel (MMBtu/hour); total air flow (acfm and lb/hour); overfire air distribution (%); and venturi wet scrubber pressure differential (recorded at 15-minute intervals during test). In addition, the permittee shall take a sample of coal and wood fired during each test. Each sample shall be analyzed for: higher and lower heating values (Btu/lb, dry); moisture content (%); sulfur content (% by weight); and ash content (% by weight). Results of the analyses shall be summarized in the test report.

[Rule 62-297.310(8), F.A.C.]

**SECTION 4. APPENDICES**

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- Appendix A. Citation Formats
- Appendix B. General Conditions
- Appendix C. Common Conditions

**SECTION 4. APPENDIX A**  
**CITATION FORMATS**

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*The following examples illustrate the format used in the permit to identify applicable permitting actions and regulations.*

**REFERENCES TO PREVIOUS PERMITTING ACTIONS**

Old Permit Numbers

*Example:* Permit No. AC50-123456 or Air Permit No. AO50-123456

*Where:* “AC” identifies the permit as an Air Construction Permit

“AO” identifies the permit as an Air Operation Permit

“123456” identifies the specific permit project number

New Permit Numbers

*Example:* Permit Nos. 099-2222-001-AC, 099-2222-001-AF, 099-2222-001-AO, or 099-2222-001-AV

*Where:* “099” represents the specific county ID number in which the project is located

“2222” represents the specific facility ID number

“001” identifies the specific permit project

“AC” identifies the permit as an air construction permit

“AF” identifies the permit as a minor federally enforceable state operation permit

“AO” identifies the permit as a minor source air operation permit

“AV” identifies the permit as a Title V Major Source Air Operation Permit

PSD Permit Numbers

*Example:* Permit No. PSD-FL-317

*Where:* “PSD” means issued pursuant to the Prevention of Significant Deterioration of Air Quality

“FL” means that the permit was issued by the State of Florida

“317” identifies the specific permit project

**RULE CITATION FORMATS**

Florida Administrative Code (F.A.C.)

*Example:* [Rule 62-213.205, F.A.C.]

*Means:* Title 62, Chapter 213, Rule 205 of the Florida Administrative Code

Code of Federal Regulations (CFR)

*Example:* [40 CFR 60.7]

*Means:* Title 40, Part 60, Section 7

**SECTION 4. APPENDIX B**  
**GENERAL CONDITIONS**

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The permittee shall comply with the following general conditions from Rule 62-4.160, F.A.C.

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.
4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.
6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.
7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:
  - a. Have access to and copy and records that must be kept under the conditions of the permit;
  - b. Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
  - c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
  - a. A description of and cause of non-compliance; and
  - b. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida

**SECTION 4. APPENDIX B**  
**GENERAL CONDITIONS**

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Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
12. This permit or a copy thereof shall be kept at the work site of the permitted activity.
13. This permit also constitutes:
  - a. Determination of Best Available Control Technology;
  - b. Determination of Prevention of Significant Deterioration; and
  - c. Compliance with New Source Performance Standards.
14. The permittee shall comply with the following:
  - a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
  - b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
  - c. Records of monitoring information shall include:
    - 1) The date, exact place, and time of sampling or measurements;
    - 2) The person responsible for performing the sampling or measurements;
    - 3) The dates analyses were performed;
    - 4) The person responsible for performing the analyses;
    - 5) The analytical techniques or methods used; and
    - 6) The results of such analyses.
15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

**SECTION 4. APPENDIX C**  
**COMMON CONDITIONS**

*{Permitting Note: Unless otherwise specified in the permit, the following conditions apply to all emissions units and activities at the facility.}*

**EMISSIONS AND CONTROLS**

1. **Plant Operation - Problems**: If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the permittee shall notify each Compliance Authority as soon as possible, but at least within one working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; steps being taken to correct the problem and prevent future recurrence; and, where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit or the regulations. [Rule 62-4.130, F.A.C.]
2. **Circumvention**: The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C.]
3. **Excess Emissions Allowed**: Excess emissions resulting from startup, shutdown or malfunction of any emissions unit shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration. [Rule 62-210.700(1), F.A.C.]
4. **Excess Emissions Prohibited**: Excess emissions caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction shall be prohibited. [Rule 62-210.700(4), F.A.C.]
5. **Excess Emissions - Notification**: In case of excess emissions resulting from malfunctions, the permittee shall notify the Department or the appropriate Local Program in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department. [Rule 62-210.700(6), F.A.C.]
6. **VOC or OS Emissions**: No person shall store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems deemed necessary and ordered by the Department. [Rule 62-296.320(1), F.A.C.]
7. **Objectionable Odor Prohibited**: No person shall cause, suffer, allow or permit the discharge of air pollutants, which cause or contribute to an objectionable odor. An "objectionable odor" means any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance. [Rules 62-296.320(2) and 62-210.200(203), F.A.C.]
8. **General Visible Emissions**: No person shall cause, let, permit, suffer or allow to be discharged into the atmosphere the emissions of air pollutants from any activity equal to or greater than 20 percent opacity. This regulation does not impose a specific testing requirement. [Rule 62-296.320(4)(b)1, F.A.C.]
9. **Unconfined Particulate Emissions**: During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary. [Rule 62-296.320(4)(c), F.A.C.]

**TESTING REQUIREMENTS**

10. **Required Number of Test Runs**: For mass emission limitations, a compliance test shall consist of three complete and separate determinations of the total air pollutant emission rate through the test section of the stack or duct and three complete and separate determinations of any applicable process variables corresponding to the three distinct time periods during which the stack emission rate was measured; provided, however, that three complete and separate determinations shall not be required if the process variables are not subject to variation during a compliance test, or if three determinations are not necessary in order to calculate the unit's emission rate. The three required test runs shall be completed within one consecutive five-day period. In the event that a sample is lost or one of the three runs must be discontinued because of circumstances beyond the control of the owner or operator, and a valid third run cannot be obtained within the five-day period allowed for the test, the Secretary or his or her designee may accept the results of two complete runs as proof of compliance, provided that the arithmetic mean of the two complete runs is at least 20% below the allowable emission limiting standard. [Rule 62-297.310(1), F.A.C.]

**SECTION 4. APPENDIX C**  
**COMMON CONDITIONS**

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11. Operating Rate During Testing: Testing of emissions shall be conducted with the emissions unit operating at permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impractical to test at permitted capacity, an emissions unit may be tested at less than the maximum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test rate until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. [Rule 62-297.310(2), F.A.C.]
12. Calculation of Emission Rate: For each emissions performance test, the indicated emission rate or concentration shall be the arithmetic average of the emission rate or concentration determined by each of the three separate test runs unless otherwise specified in a particular test method or applicable rule. [Rule 62-297.310(3), F.A.C.]
13. Test Procedures: Tests shall be conducted in accordance with all applicable requirements of Chapter 62-297, F.A.C.
  - a. *Required Sampling Time*. Unless otherwise specified in the applicable rule, the required sampling time for each test run shall be no less than one hour and no greater than four hours, and the sampling time at each sampling point shall be of equal intervals of at least two minutes. The minimum observation period for a visible emissions compliance test shall be thirty (30) minutes. The observation period shall include the period during which the highest opacity can reasonably be expected to occur.
  - b. *Minimum Sample Volume*. Unless otherwise specified in the applicable rule or test method, the minimum sample volume per run shall be 25 dry standard cubic feet.
  - c. *Calibration of Sampling Equipment*. Calibration of the sampling train equipment shall be conducted in accordance with the schedule shown in Table 297.310-1, F.A.C.[Rule 62-297.310(4), F.A.C.]
14. Determination of Process Variables
  - a. *Required Equipment*. The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
  - b. *Accuracy of Equipment*. Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value.[Rule 62-297.310(5), F.A.C.]
15. Sampling Facilities: The permittee shall install permanent stack sampling ports and provide sampling facilities that meet the requirements of Rule 62-297.310(6), F.A.C.
16. Test Notification: The owner or operator shall notify the Department, at least 15 days prior to the date on which each formal compliance test is to begin, of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted for the owner or operator. [Rule 62-297.310(7)(a)9, F.A.C.]
17. Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it shall require the owner or operator of the emissions unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions unit and to provide a report on the results of said tests to the Department. [Rule 62-297.310(7)(b), F.A.C.]
18. Test Reports: The owner or operator of an emissions unit for which a compliance test is required shall file a report with the Department on the results of each such test. The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed. The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the

**SECTION 4. APPENDIX C**  
**COMMON CONDITIONS**

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test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA or DEP Method 9 test, shall provide the following information:

1. The type, location, and designation of the emissions unit tested.
2. The facility at which the emissions unit is located.
3. The owner or operator of the emissions unit.
4. The normal type and amount of fuels used and materials processed, and the types and amounts of fuels used and material processed during each test run.
5. The means, raw data and computations used to determine the amount of fuels used and materials processed, if necessary to determine compliance with an applicable emission limiting standard.
6. The type of air pollution control devices installed on the emissions unit, their general condition, their normal operating parameters (pressure drops, total operating current and GPM scrubber water), and their operating parameters during each test run.
7. A sketch of the duct within 8 stack diameters upstream and 2 stack diameters downstream of the sampling ports, including the distance to any upstream and downstream bends or other flow disturbances.
8. The date, starting time and duration of each sampling run.
9. The test procedures used, including any alternative procedures authorized pursuant to Rule 62-297.620, F.A.C. Where optional procedures are authorized in this chapter, indicate which option was used.
10. The number of points sampled and configuration and location of the sampling plane.
11. For each sampling point for each run, the dry gas meter reading, velocity head, pressure drop across the stack, temperatures, average meter temperatures and sample time per point.
12. The type, manufacturer and configuration of the sampling equipment used.
13. Data related to the required calibration of the test equipment.
14. Data on the identification, processing and weights of all filters used.
15. Data on the types and amounts of any chemical solutions used.
16. Data on the amount of pollutant collected from each sampling probe, the filters, and the impingers, are reported separately for the compliance test.
17. The names of individuals who furnished the process variable data, conducted the test, analyzed the samples and prepared the report.
18. All measured and calculated data required to be determined by each applicable test procedure for each run.
19. The detailed calculations for one run that relate the collected data to the calculated emission rate.
20. The applicable emission standard and the resulting maximum allowable emission rate for the emissions unit plus the test result in the same form and unit of measure.
21. A certification that, to the knowledge of the owner or his authorized agent, all data submitted are true and correct. When a compliance test is conducted for the Department or its agent, the person who conducts the test shall provide the certification with respect to the test procedures used. The owner or his authorized agent shall certify that all data required and provided to the person conducting the test are true and correct to his knowledge.

[Rule 62-297.310(8), F.A.C.]

**RECORDS AND REPORTS**

19. Records Retention: All measurements, records, and other data required by this permit shall be documented in a permanent, legible format and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. Records shall be made available to the Department upon request. [Rules 62-4.160(14) and 62-213.440(1)(b)2, F.A.C.]
20. Annual Operating Report: The permittee shall submit an annual report that summarizes the actual operating rates and emissions from this facility. Annual operating reports shall be submitted to the Compliance Authority by March 1st of each year. [Rule 62-210.370(2), F.A.C.]



**SENDER: COMPLETE THIS SECTION**

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. B. G. Sammons, General Manager  
 Smurfit-Stone Container Enterprises, Inc.  
 Panama City Mill  
 One Everitt Avenue  
 Panama City, Florida 32402

2. Article Number  
 (Transfer from service label)

7000 1670 0013 3109 9847

PS Form 3811, February 2004

Domestic Return Receipt

102595-02-M-1540

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature  Agent  
 Addressee  
*Shirley Roseant*

B. Received by (Printed Name) C. Date of Delivery  
 \_\_\_\_\_ *12-28-05*

D. Is delivery address different from item 1?  Yes  
 If YES, enter delivery address below:  No

3. Service Type  
 Certified Mail  Express Mail  
 Registered  Return Receipt for Merchandise  
 Insured Mail  C.O.D.

4. Restricted Delivery? (Extra Fee)  Yes

**U.S. Postal Service**  
**CERTIFIED MAIL RECEIPT**  
 (Domestic Mail Only; No Insurance Coverage Provided)

**OFFICIAL USE**

Postage	\$	Postmark Here
Certified Fee		
Return Receipt Fee (Endorsement Required)		
Restricted Delivery Fee (Endorsement Required)		

Mr. B. G. Sammons, General Manager  
 Smurfit-Stone Container Enterprises, Inc.  
 Panama City Mill  
 One Everitt Avenue  
 Panama City, Florida 32402

PS Form 3800, May 2000 See Reverse for Instructions

7000 1670 0013 3109 9847



*Containerboard Mill Division*

December 8, 2005

Mr. Jeff Koerner, Project Engineer  
Florida Dept. of Environmental Protection  
Twin Towers Office Bldg  
2600 Blair Stone Rd, MS #5505  
Tallahassee, FL, 32399-2400

Re: Permit No. 0050009-022-AC  
#4 Combination Boiler, EU016

Dear Mr. Koerner

The proof of public notice for the above permit is attached. It was published in the Panama City "News Herald" on December 6. We had no comments on the draft permit, and would like to thank you for the quick turn around  
Please call me at (850) 785-4311 x470 if you have additional questions.

Sincerely

A handwritten signature in black ink, appearing to read 'Tom Clements'.

Tom Clements  
Environmental Mgr.

Shared/environ/Ind boiler MACT/FDEP Dec08-05 note

RECEIVED

DEC 09 2005

BUREAU OF AIR REGULATION

# Florida Freedom Newspapers, Inc.

PUBLISHERS OF THE NEWS HERALD  
Panama City, Bay County, Florida  
Published Daily

## State of Florida County of Bay

Before the undersigned authority appeared \_\_\_\_\_

Glenda Sullivan, who on oath says that (s)he

is Classified Manager of The News Herald, a daily

newspaper published at Panama City, in Bay County, Florida; that the attached copy of

advertisement, being a Legal Advertisement - 1063

in the matter of Public Notice of Intent

Issuance of Air Permit

in the Bay County

Court, was published in said newspaper in the issue of \_\_\_\_\_

December 6, 2005

Affiant further says that The News Herald is a direct successor of the Panama City News and that this publication, together with its direct predecessor, has been continuously published in said Bay County, Florida, each day (except that the predecessor, Panama City News, was not published on Sundays), and that this publication together with its said predecessor, has been entered as periodicals matter at the post office in Panama City, in said Bay County, Florida, for a period of 1 year next preceding the first publication of the attached copy of advertisement; and affiant further says that he or she has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

*Glenda Sullivan*

State of Florida  
County of Bay

Sworn and subscribed before me this 6th day of December  
A.D., 2005 by Glenda Sullivan, Classified Manager  
of The News Herald, who is personally known to me or has produced n/a  
as identification.

*Marie Forrest*  
Notary Public, State of Florida at Large



Marie Forrest  
MY COMMISSION # DD209621 EXPIRES  
May 5, 2007  
BONDED THRU TROY FAIR INSURANCE, INC.

1063  
Florida Department of Environmental Protection  
Draft Air Construction Permit No. 0050009-022-AC  
Smurfit-Stone Container Enterprises, Inc. - Panama City Mill  
No. 4 Combination Boiler, Control Equipment Improvements - Revised Steam Rate  
Bay County, Florida  
Applicant: The applicant for this project is the Smurfit-Stone Container Enterprises, Inc. The applicant's authorized representative and mailing address is: Mr. B. G. Sammons, General Manager of the Panama City Mill, Smurfit-Stone Container Enterprises, Inc., One Everitt Avenue, Panama City, FL 32402  
Facility: Location: Smurfit-Stone Container Enterprises, Inc. operates an existing pulp and paper mill (SIC No. 2611) located at One Everitt Avenue in Panama City, Bay County,

Florida: The Department issued Permit No. 0050009-021-AC to authorize improvements to the existing overfire air system and existing wet scrubber for the No. 4 combination boiler to reduce particulate matter emissions. The permit specified a maximum steam rate of 300,000 lb/hour based on the vendor design. The applicant requests a revision of the permit to allow a maximum steam rate of up to 330,000 lb/hour during periods when another plant boiler is taken out of service. Based on the available information, the proposed changes to the existing pollution controls will not increase the capacity of the existing boiler in terms of the maximum permitted heat input rate or the steam production rate. The retrofit overfire air system is being designed for a continuous steam production rate of 300,000 pounds per hour. However, the boiler is currently capable of operating at steam rates of approximately 330,000 lb/hour, has demonstrated compliance at these levels, and the project vendor for the OFA system states that the higher steam rate is achievable. Therefore, the revised draft permit allows the No. 4 combination boiler to operate at a steam rate of up to 330,000 lb/hour when one of the other plant boilers is not in operation. This preliminary determination is based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the draft permit. No air quality modeling analysis is required because the project is not reasonably expected to result in increased emissions.  
Permitting Authority: Applications for air construc-

ing Authority will accept written comments concerning the proposed Draft Permit for a period of fourteen (14) days from the date of publication of this Public Notice. Written comments must be provided to the Permitting Authority at the above address. Any written comments filed will be made available for public inspection. If written comment received result in a significant change to the Draft Permit, the Permitting Authority shall revise the Draft Permit and require, if applicable, another Public Notice.  
Petitions: A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed with (received by) the Department's Agency Clerk in the Office of General Counsel of the Department of Environmental Protection, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida, 32399-3000. Petitions filed by any persons other than those entitled to written notice under Section 120.60(3), F.S., must be filed within fourteen (14) days of publication of this Public Notice or receipt of a written notice, whichever occurs first. Under Section 120.60(3), F.S., however, any person who asked the Permitting Authority for notice of agency action may file a petition within fourteen (14) days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205 F.A.C.  
A petition that disputes the material facts on which the Permitting Authority's action is based must contain the following information:  
(a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address and telephone number of the petitioner; the name address and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial rights will be affected.

*Alan Forest*  
ic, State of Florida at Large

BEST AVAILABLE COPY

based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the draft permit. No air quality modeling analysis is required because the project is not reasonably expected to result in increased emissions.

**Permitting Authority:** Applications for air construction permits are subject to review in accordance with the provisions of Chapter 403, Florida Statutes (F.S.) and Chapters 62-462-210, and 62-212 of the Florida Administrative Code (F.A.C.). The proposed project is not exempt from air permitting requirements and an air permit is required to perform the proposed work. The Bureau of Air Regulation is the Permitting Authority responsible for making a permit determination for this project. The Permitting Authority's physical address is: 111 South Magnolia Drive, Suite #4, Tallahassee, Florida. The Permitting Authority's mailing address is: 2600 Blair Stone Road, MS #5505, Tallahassee, Florida 32399-2400. The Permitting Authority's telephone number is 850/488-0114.

**Project File:** A complete project file is available for public inspection during the normal business hours of 8:00 a.m. to 5:00 p.m. Monday through Friday (except legal holidays), at address indicated above for the Permitting Authority. The complete project file includes the Draft Permit, the Technical Evaluation and Preliminary Determination, the application, and the information submitted by the applicant, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Permitting Authority's project review engineer for additional information at the address or phone number listed above.

**Notice of Intent to Issue Air Permit:** The Permitting Authority gives notice of its intent to issue an air permit to the applicant for the project described above.

The applicant has provided reasonable assurance that operation of proposed equipment will not adversely impact air quality and that the project will comply with all appropriate provisions of Chapters 62-462-204, 62-210, 62-212, 62-296, and 62-297, F.A.C. The Permitting Authority will issue a Final Permit in accordance with the conditions of the proposed Draft Permit unless a timely petition for an administrative hearing is filed under Sections 120.569 and 120.57, F.S. or unless public comment received in accordance with this notice results in a different decision or a significant change of terms or conditions.

**Comments:** The Permit-

identification number, if known; (b) The name, address and telephone number of the petitioner; the name, address and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial rights will be affected by the agency determination; (c) A statement of how and when the petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so state; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and, (g) A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the agency to take with respect to the agency's proposed action. A petition that does not dispute the material facts upon which the Permitting Authority's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C. Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Permitting Authority's final action may be different from the position taken by the petitioner in this Public Notice of Intent to Issue Air Permit. Persons whose substantial interests will be affected by any such final decision of the Permitting Authority on the application have the

right to petition to become a party to the proceeding; in accordance with the requirements set forth above.

**Mediation:** Mediation is not available for this proceeding.  
December 6, 2005

# Florida Department of Environmental Protection

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## Memorandum

TO: Trina Vielhauer, Chief - Bureau of Air Regulation  
FROM: Jeff Koerner, Air Permitting North Program *JK*  
DATE: November 15, 2005  
SUBJECT: Smurfit-Stone Container Enterprises, Inc. - Panama City Mill  
Project No. 0050009-022-AC  
No. 4 Combination Boiler - OFA and Venturi Improvements  
Revised Steam Rate

Attached for your review are the following items:

- Intent to Issue Permit and Public Notice Package;
- Technical Evaluation and Preliminary Determination;
- Draft Permit; and
- PE Certification

We recently issued a final permit authorizing improvements to the existing overfire air (OFA) system and existing wet venturi scrubber for the No. 4 Combination Boiler. The applicant requests a revision to allow a 10% increase in the maximum steam rate when another boiler is taken out of service. The applicant provided additional information indicating that the boiler is currently capable of operating at steam rates of approximately 330,000 lb/hour, has demonstrated compliance near these levels, and the project vendor for the OFA system states that the higher steam rate is achievable. The revised Draft Permit authorizes operation at the higher steam rate when one or more of the other plant boilers are not in service. The Technical Evaluation and Preliminary Determination provides a detailed description of the project, rule applicability, and emissions standards. The P.E. certification briefly summarizes the proposed project. Day #74 is January 16, 2005. I recommend your approval of the attached Draft Permit for this project.

Attachments

**P.E. CERTIFICATION STATEMENT**

**PERMITTEE**

Smurfit-Stone Container Enterprises, Inc.  
Panama City Mill  
One Everitt Avenue  
Panama City, FL 32402

Air Permit No. 0050009-022-AC  
No. 4 Combination Boiler  
OFA and Venturi Improvements  
(Revised Steam Rate)

**PROJECT DESCRIPTION**

Permit No. 0050009-021-AC authorized improvements to the existing overfire air system and existing wet scrubber for the No. 4 combination boiler to reduce particulate matter emissions. The permit specified a maximum steam rate of 300,000 lb/hour based on the vendor design. The applicant requests a revision of the permit to allow a maximum steam rate of up to 330,000 lb/hour during periods when another plant boiler is taken out of service. The applicant provided the following information in support of this request.

- Alstom, the vendor for the overfire air retrofit project, provided a statement that the boiler-drum internals can handle steam rates of up to 339,000 lb/hour. However, the boiler may be limited by the maximum airflow that can be provided by the existing forced draft fan. Alstom also recommended a circulation study if the boiler has experienced excessive tube failures or blistering due to poor circulation.
- Operational records (2003 to 2005) indicate significant boiler operation at steam rates of up to 324,000 lb/hour.
- Emissions test results demonstrating compliance with the current permit standards at steam rates up to 324,000 lb/hour.

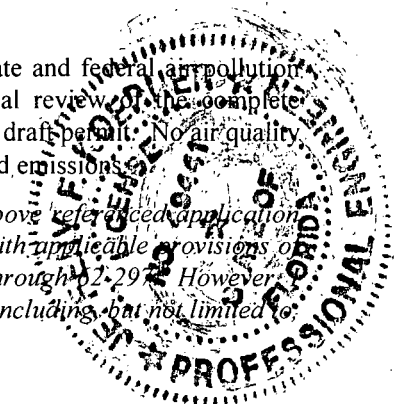
The plant is planning additional work for other boilers in the near future. When a boiler is taken out of service for modification or repair, it will be important that the remaining units be able to provide as much steam as possible. The No. 3 combination boiler is approximately the same size as the No. 4 combination boiler (505 MMBtu/hour) and the two recovery boilers are larger (721 MMBtu/hour).

Based on the available information, the proposed changes to the existing pollution controls will not increase the capacity of the existing boiler in terms of the maximum permitted heat input rate or the steam production rate. The retrofit overfire air system is being designed for a continuous steam production rate of 300,000 pounds per hour. However, the boiler is currently capable of operating at steam rates of approximately 330,000 lb/hour, has demonstrated compliance at these levels, and the project vendor for the OFA system states that the higher steam rate is achievable. Therefore, the revised draft permit specifies the following conditions:

- When all boilers at the plant are in operation, the maximum continuous steam rate for the No. 4 combination boiler shall not exceed 300,000 lb/hour (24-hour average).
- When at least one of the other plant boilers is not in operation, the maximum continuous steam rate for the No. 4 combination boiler shall not exceed 330,000 lb/hour (24-hour average).

The preliminary determination is that the proposed project will comply with all applicable state and federal air pollution regulations as conditioned by the draft permit. This determination is based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the draft permit. No air quality modeling analysis is required because the project is not reasonably expected to result in increased emissions.

*I HEREBY CERTIFY that the air pollution control engineering features described in the above referenced application and subject to the proposed permit conditions provide reasonable assurance of compliance with applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4 and 62-204 through 62-297. However, I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including, but not limited to, the electrical, mechanical, structural, hydrological, geological, and meteorological features).*



*Jeffery F. Koerner*

Jeffery F. Koerner, P.E.  
Registration Number: 49441

11-17-05  
(Date)



# Department of Environmental Protection

Jeb Bush  
Governor

Twin Towers Office Building  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

Colleen M. Castille  
Secretary

November 16, 2005

CERTIFIED MAIL – Return Receipt Requested

Mr. B. G. Sammons, General Manager  
Smurfit-Stone Container Enterprises, Inc.  
Panama City Mill  
One Everitt Avenue  
Panama City, FL 32402

Re: Project No. 0050009-022-AC  
Smurfit-Stone Container Enterprises, Inc. - Panama City Mill  
No. 4 Combination Boiler - OFA and Venturi Improvements  
Revised Steam Rate

Dear Mr. Sammons:

On November 4, 2005 the Department received your request to revise the steam rate specified in original Permit No. 0050009-021-AC, which authorized improvements to the existing overfire air (OFA) system and existing wet venturi scrubber for No. 4 Combination Boiler at the existing Panama City Mill. The Department intends to approve this request as conditioned in the attached draft permit. Enclosed are the following documents: "Technical Evaluation and Preliminary Determination", "Draft Permit", "Written Notice of Intent to Issue Air Permit", and "Public Notice of Intent to Issue Air Permit".

The "Technical Evaluation and Preliminary Determination" summarizes the Permitting Authority's technical review of the application and provides the rationale for making the preliminary determination to issue a Draft Permit. The proposed "Draft Permit" includes the specific conditions that regulate the emissions units covered by the proposed project. The "Written Notice of Intent to Issue Air Permit" provides important information regarding: the Permitting Authority's intent to issue an air permit for the proposed project; the requirements for publishing a Public Notice of the Permitting Authority's intent to issue an air permit; the procedures for submitting comments on the Draft Permit; the process for filing a petition for an administrative hearing; and the availability of mediation. The "Public Notice of Intent to Issue Air Permit" is the actual notice that you must have published in the legal advertisement section of a newspaper of general circulation in the area affected by this project.

If you have any questions, please contact the Project Engineer, Jeff Koerner, at 850/921-9536.

Sincerely,

Trina Vielhauer, Chief  
Bureau of Air Regulation

Enclosures

"More Protection, Less Process"

Printed on recycled paper.

# WRITTEN NOTICE OF INTENT TO ISSUE AIR PERMIT

*In the Matter of an  
Application for Air Permit by:*

Smurfit-Stone Container Enterprises, Inc.  
Panama City Mill  
One Everitt Avenue  
Panama City, FL 32402

Air Permit No. 0050009-021-AC  
Panama City Mill  
Bay County, Florida  
No. 4 Combination Boiler  
OFA and Venturi Improvements  
Revised Steam Rate

*Authorized Representative:*

B. G. Sammons, General Manager

**Facility Location:** Smurfit-Stone Container Enterprises, Inc. operates an existing pulp and paper mill (SIC No. 2611) located at One Everitt Avenue in Panama City, Bay County, Florida.

**Project:** The Department issued Permit No. 0050009-021-AC, which authorized improvements to the existing overfire air system and existing wet scrubber for the No. 4 combination boiler to reduce particulate matter emissions. The permit specified a maximum steam rate of 300,000 lb/hour based on the vendor design. The applicant requests a revision of the permit to allow a maximum steam rate of up to 330,000 lb/hour during periods when another plant boiler is taken out of service. Details of the project are provided in the application, the enclosed "Technical Evaluation and Preliminary Determination", and the enclosed Draft Permit.

**Permitting Authority:** Applications for air construction permits are subject to review in accordance with the provisions of Chapter 403, Florida Statutes (F.S.) and Chapters 62-4, 62-210, and 62-212 of the Florida Administrative Code (F.A.C.). The proposed project is not exempt from air permitting requirements and an air permit is required to perform the proposed work. The Bureau of Air Regulation is the Permitting Authority responsible for making a permit determination for this project. The Permitting Authority's physical address is: 111 South Magnolia Drive, Suite #4, Tallahassee, Florida. The Permitting Authority's mailing address is: 2600 Blair Stone Road, MS #5505, Tallahassee, Florida 32399-2400. The Permitting Authority's telephone number is 850/488-0114.

**Project File:** A complete project file is available for public inspection during the normal business hours of 8:00 a.m. to 5:00 p.m., Monday through Friday (except legal holidays), at the address indicated above for the Permitting Authority. The complete project file includes the Draft Permit, the Technical Evaluation and Preliminary Determination, the application, and the information submitted by the applicant, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Permitting Authority's project review engineer for additional information at the address or phone number listed above.

**Notice of Intent to Issue Permit:** The Permitting Authority gives notice of its intent to issue an air permit to the applicant for the project described above. The applicant has provided reasonable assurance that operation of proposed equipment will not adversely impact air quality and that the project will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297, F.A.C. The Permitting Authority will issue a Final Permit in accordance with the conditions of the proposed Draft Permit unless a timely petition for an administrative hearing is filed under Sections 120.569 and 120.57, F.S. or unless public comment received in accordance with this notice results in a different decision or a significant change of terms or conditions.

**Public Notice:** Pursuant to Section 403.815, F.S. and Rules 62-110.106 and 62-210.350, F.A.C., you (the applicant) are required to publish at your own expense the enclosed "Public Notice of Intent to Issue Air Permit" (Public Notice). The Public Notice shall be published one time only as soon as possible in the legal advertisement section of a newspaper of general circulation in the area affected by this project. The newspaper used must meet the requirements of Sections 50.011 and 50.031, F.S. in the county where the activity is to take place. If you are uncertain that a newspaper meets these requirements, please contact the Permitting Authority at above address or phone number. Pursuant to Rule 62-110.106(5), F.A.C., the applicant shall provide proof of publication to the Permitting Authority at the above address within seven (7) days of publication. Failure to publish the notice and provide proof of publication may result in the denial of the permit pursuant to Rule 62-110.106(11), F.A.C.

**Comments:** The Permitting Authority will accept written comments concerning the proposed Draft Permit for a period of fourteen (14) days from the date of publication of the Public Notice. Written comments must be provided to the Permitting Authority at the above address. Any written comments filed will be made available for public inspection. If written



## WRITTEN NOTICE OF INTENT TO ISSUE AIR PERMIT

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comments received result in a significant change to the Draft Permit, the Permitting Authority shall revise the Draft Permit and require, if applicable, another Public Notice.

**Petitions:** A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57, F.S. The petition must contain the information set forth below and must be filed with (received by) the Department's Agency Clerk in the Office of General Counsel of the Department of Environmental Protection, 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. Petitions filed by the applicant or any of the parties listed below must be filed within fourteen (14) days of receipt of this Written Notice of Intent to Issue Air Permit. Petitions filed by any persons other than those entitled to written notice under Section 120.60(3), F.S., must be filed within fourteen (14) days of publication of the attached Public Notice or within fourteen (14) days of receipt of this Written Notice of Intent to Issue Air Permit, whichever occurs first. Under Section 120.60(3), F.S., however, any person who asked the Permitting Authority for notice of agency action may file a petition within fourteen (14) days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the Permitting Authority's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address, and telephone number of the petitioner; the name, address and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial interests will be affected by the agency determination; (c) A statement of how and when each petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so state; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and, (g) A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the agency to take with respect to the agency's proposed action. A petition that does not dispute the material facts upon which the Permitting Authority's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Permitting Authority's final action may be different from the position taken by it in this Written Notice of Intent to Issue Air Permit. Persons whose substantial interests will be affected by any such final decision of the Permitting Authority on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

**Mediation:** Mediation is not available in this proceeding.

Executed in Tallahassee, Florida.



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Trina Vielhauer, Chief  
Bureau of Air Regulation

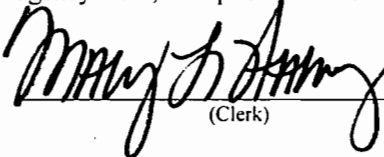
CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this "Written Notice of Intent to Issue Air Permit" package (including the Public Notice, the Technical Evaluation and Preliminary Determination, and the Draft Permit) was sent by certified mail (\*) and copies were mailed by U.S. Mail before the close of business on 11/21/05 to the persons listed below.

- Mr. B. G. Sammons, Smurfit-Stone Container Enterprises, Inc.\*
- Mr. Tom Clements, Smurfit-Stone Container Enterprises, Inc.
- Mr. David Buff, Golder Associates Inc.
- Ms. Sandra Veazey, NWD Office

Clerk Stamp

**FILING AND ACKNOWLEDGMENT FILED**, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated agency clerk, receipt of which is hereby acknowledged.

  
(Clerk)

11/21/05  
(Date)

# PUBLIC NOTICE OF INTENT TO ISSUE AIR PERMIT

## Florida Department of Environmental Protection

Draft Air Construction Permit No. 0050009-022-AC  
Smurfit-Stone Container Enterprises, Inc. - Panama City Mill  
No. 4 Combination Boiler, Control Equipment Improvements – Revised Steam Rate  
Bay County, Florida

**Applicant:** The applicant for this project is the Smurfit-Stone Container Enterprises, Inc. The applicant's authorized representative and mailing address is: Mr. B. G. Sammons, General Manager of the Panama City Mill, Smurfit-Stone Container Enterprises, Inc., One Everitt Avenue, Panama City, FL 32402.

**Facility Location:** Smurfit-Stone Container Enterprises, Inc. operates an existing pulp and paper mill (SIC No. 2611) located at One Everitt Avenue in Panama City, Bay County, Florida.

**Project:** The Department issued Permit No. 0050009-021-AC to authorize improvements to the existing overfire air system and existing wet scrubber for the No. 4 combination boiler to reduce particulate matter emissions. The permit specified a maximum steam rate of 300,000 lb/hour based on the vendor design. The applicant requests a revision of the permit to allow a maximum steam rate of up to 330,000 lb/hour during periods when another plant boiler is taken out of service.

Based on the available information, the proposed changes to the existing pollution controls will not increase the capacity of the existing boiler in terms of the maximum permitted heat input rate or the steam production rate. The retrofit overfire air system is being designed for a continuous steam production rate of 300,000 pounds per hour. However, the boiler is currently capable of operating at steam rates of approximately 330,000 lb/hour, has demonstrated compliance at these levels, and the project vendor for the OFA system states that the higher steam rate is achievable. Therefore, the revised draft permit allows the No. 4 combination boiler to operate at a steam rate of up to 330,000 lb/hour when one of the other plant boilers is not in operation. This preliminary determination is based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the draft permit. No air quality modeling analysis is required because the project is not reasonably expected to result in increased emissions.

**Permitting Authority:** Applications for air construction permits are subject to review in accordance with the provisions of Chapter 403, Florida Statutes (F.S.) and Chapters 62-4, 62-210, and 62-212 of the Florida Administrative Code (F.A.C.). The proposed project is not exempt from air permitting requirements and an air permit is required to perform the proposed work. The Bureau of Air Regulation is the Permitting Authority responsible for making a permit determination for this project. The Permitting Authority's physical address is: 111 South Magnolia Drive, Suite #4, Tallahassee, Florida. The Permitting Authority's mailing address is: 2600 Blair Stone Road, MS #5505, Tallahassee, Florida 32399-2400. The Permitting Authority's telephone number is 850/488-0114.

**Project File:** A complete project file is available for public inspection during the normal business hours of 8:00 a.m. to 5:00 p.m., Monday through Friday (except legal holidays), at address indicated above for the Permitting Authority. The complete project file includes the Draft Permit, the Technical Evaluation and Preliminary Determination, the application, and the information submitted by the applicant, exclusive of confidential records under Section 403.111, F.S. Interested persons may contact the Permitting Authority's project review engineer for additional information at the address or phone number listed above.

**Notice of Intent to Issue Air Permit:** The Permitting Authority gives notice of its intent to issue an air permit to the applicant for the project described above. The applicant has provided reasonable assurance that operation of proposed equipment will not adversely impact air quality and that the project will comply with all appropriate provisions of Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297, F.A.C. The Permitting Authority will issue a Final Permit in accordance with the conditions of the proposed Draft Permit unless a timely petition for an administrative hearing is filed under Sections 120.569 and 120.57, F.S. or unless public comment received in accordance with this notice results in a different decision or a significant change of terms or conditions.

**Comments:** The Permitting Authority will accept written comments concerning the proposed Draft Permit for a period of fourteen (14) days from the date of publication of this Public Notice. Written comments must be provided to the Permitting Authority at the above address. Any written comments filed will be made available for public inspection. If written comments received result in a significant change to the Draft Permit, the Permitting Authority shall revise the Draft Permit and require, if applicable, another Public Notice.

**Petitions:** A person whose substantial interests are affected by the proposed permitting decision may petition for an administrative hearing in accordance with Sections 120.569 and 120.57, F.S. The petition must contain the information set

**(Public Notice to be Published in the Newspaper)**

## PUBLIC NOTICE OF INTENT TO ISSUE AIR PERMIT

forth below and must be filed with (received by) the Department's Agency Clerk in the Office of General Counsel of the Department of Environmental Protection at 3900 Commonwealth Boulevard, Mail Station #35, Tallahassee, Florida 32399-3000. Petitions filed by any persons other than those entitled to written notice under Section 120.60(3), F.S. must be filed within fourteen (14) days of publication of this Public Notice or receipt of a written notice, whichever occurs first. Under Section 120.60(3), F.S., however, any person who asked the Permitting Authority for notice of agency action may file a petition within fourteen (14) days of receipt of that notice, regardless of the date of publication. A petitioner shall mail a copy of the petition to the applicant at the address indicated above, at the time of filing. The failure of any person to file a petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57, F.S., or to intervene in this proceeding and participate as a party to it. Any subsequent intervention will be only at the approval of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the Permitting Authority's action is based must contain the following information: (a) The name and address of each agency affected and each agency's file or identification number, if known; (b) The name, address and telephone number of the petitioner; the name address and telephone number of the petitioner's representative, if any, which shall be the address for service purposes during the course of the proceeding; and an explanation of how the petitioner's substantial rights will be affected by the agency determination; (c) A statement of how and when the petitioner received notice of the agency action or proposed action; (d) A statement of all disputed issues of material fact. If there are none, the petition must so state; (e) A concise statement of the ultimate facts alleged, including the specific facts the petitioner contends warrant reversal or modification of the agency's proposed action; (f) A statement of the specific rules or statutes the petitioner contends require reversal or modification of the agency's proposed action; and, (g) A statement of the relief sought by the petitioner, stating precisely the action the petitioner wishes the agency to take with respect to the agency's proposed action. A petition that does not dispute the material facts upon which the Permitting Authority's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Permitting Authority's final action may be different from the position taken by it in this Public Notice of Intent to Issue Air Permit. Persons whose substantial interests will be affected by any such final decision of the Permitting Authority on the application have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

**Mediation:** Mediation is not available for this proceeding.

**(Public Notice to be Published in the Newspaper)**

**TECHNICAL EVALUATION  
&  
PRELIMINARY DETERMINATION**

**APPLICANT**

Smurfit-Stone Container Enterprises, Inc.  
Panama City Mill  
One Everitt Avenue  
Panama City, FL 32402

**PROJECT**

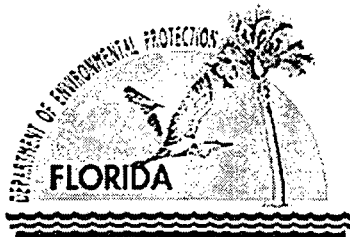
Draft Air Construction Permit No. 0050009-022-AC  
No. 4 Combination Boiler – OFA and Venturi Improvements  
*(Revised Steam Rate)*

**COUNTY**

Bay County, Florida

**PERMITTING AUTHORITY**

Florida Department of Environmental Protection  
Division of Air Resource Management  
Bureau of Air Regulation  
Air Permitting North Program



November 15, 2005

*{Filename: 0050009-022-AC - TEPD}*

## 1. GENERAL PROJECT INFORMATION

### Processing Schedule

- 11/04/05 Received application to revise maximum steam rate in Permit No. 0050009-022-AC.
- 11/10/05 Received additional information on steam rate and Alstom's "Technical Report" on retrofit for overfire air system; complete.

### Facility Description and Location

Smurfit-Stone Container Enterprises, Inc. operates an existing pulp and paper mill (SIC No. 2611) located at One Everitt Avenue in Panama City, Bay County, Florida. The UTM coordinates of the Panama City Mill are Zone 16, 632.8 km East, and 3335.1 km North. This site is in an area that is in attainment (or designated as unclassifiable) for all air pollutants subject to a National Ambient Air Quality Standard (NAAQS).

### Regulatory Categories

Title III: The facility is a major source of hazardous air pollutants (HAP).

Title IV: The facility operates no units subject to the acid rain provisions of the Clean Air Act.

Title V: The facility is a Title V major source of air pollution in accordance with Chapter 213, F.A.C.

PSD: The facility is a PSD-major source of air pollution in accordance with Rule 62-212.400, F.A.C.

NSPS: The facility operates units subject to the New Source Performance Standards in 40 CFR 60.

NESHAP: The facility operates units subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) in 40 CFR 63.

## 2. PROJECT DESCRIPTION

The Department recently issued Air Permit No. 0050009-021-AC, which authorizes a retrofit to the existing overfire air system and variable throat venturi scrubber for the No. 4 combination boiler. The improvements are necessary to reduce particulate matter emissions in order to meet the applicable requirements of NESHAP Subpart DDDDD in 40 CFR 63 (Industrial, Commercial, and Institutional Boilers and Process Heaters). The NESHAP compliance deadline for the existing unit is September 13, 2007.

The current Title V air operation permit identifies the capacity as follows, "The total maximum operational heat input of this emissions unit is 545 MMBtu/hr based on a 24-hour average. The heat input shall not exceed 472 MMBtu/hr from fuel oil, 395 MMBtu/hr from coal, 474 MMBtu/hr from carbonaceous fuels, or 512 MMBtu/hr from natural gas. The total heat input to the No. 3 and No. 4 combination boilers due to carbonaceous fuels shall not exceed 501 MMBtu/hr based on a 24-hour average." The annual capacity factor has been approximately 72% and is not expected to change as a result of this project. The project will not increase the capacity of the boiler in terms of maximum permitted heat input rate or steam production rate.

Air Permit No. 0050009-021-AC specifies a maximum steam production rate of 300,000 pounds per hour (24-hour average), which is based on vendor information for the design of the retrofit overfire air system. The applicant requests a revision of the air construction permit to allow limited operation at a steam rate of up to 330,000 lb/hour. The 10% higher steam rate would be allowed during periods when at least one of the other plant boilers is not in operation. The applicant provided the following additional information to support the request.

- Alstom, the vendor for the overfire air retrofit project, provided a statement that the boiler-drum internals can handle steam rates of up to 339,000 lb/hour. However, the boiler may be limited by the maximum airflow that can be provided by the existing forced draft fan. Alstom also recommended a circulation study if the boiler has experienced excessive tube failures or blistering due to poor circulation.

## TECHNICAL EVALUATION AND PRELIMINARY DETERMINATION

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- Plant records (2003 to 2005) indicate boiler operation at steam rates of up to 324,000 lb/hour.
- Past emissions tests demonstrate compliance with the current permit standards at higher steam rates.

Date	Steam Rate (lb/hr)	PM, lb/MMBtu	SO <sub>2</sub> , lb/hr	TRS, ppm	Opacity
10/22/03	317,000	0.06	2	0.7	12.1
10/08/04	322,000	0.05	17	0.01	13.7
10/12/05*	324,000	0.04	360	0.8	<15
Standard	N/A	0.2	781	5	30

\* Represents preliminary test data.

The plant is planning additional work for other boilers in the near future. When a boiler is taken out of service for modification or repair, it will be important that the remaining units be able to provide as much steam as possible. The No. 3 combination boiler is approximately the same size as the No. 4 combination boiler (505 MMBtu/hour) and the two recovery boilers are larger (721 MMBtu/hour).

### 3. CONCLUSION

Based on the available information, the proposed changes to the existing pollution controls will not increase the capacity of the existing boiler in terms of the maximum permitted heat input rate or the steam production rate. The retrofit overfire air system is being designed for a continuous steam production rate of 300,000 lb/hour. However, the boiler is currently capable of operating at steam rates of approximately 330,000 lb/hour, has demonstrated compliance near this level, and the project vendor for the OFA system states that the higher steam rate is achievable. Therefore, the revised draft permit specifies the following conditions:

- When all boilers at the plant are in operation, the maximum continuous steam rate for the No. 4 combination boiler shall not exceed 300,000 lb/hour (24-hour average).
- When at least one of the other plant boilers is not in operation, the maximum continuous steam rate for the No. 4 combination boiler shall not exceed 330,000 lb/hour (24-hour average).

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations as conditioned by the draft permit. This determination is based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the draft permit. The Department reserves the right to review this project in combination with future proposed projects related to this unit. No air quality modeling analysis is required because the project does not result in a significant increase in emissions. Jeff Koerner is the project engineer responsible for reviewing the application and drafting the permit. Additional details of this analysis may be obtained by contacting the project engineer at the Department's Bureau of Air Regulation at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

# DRAFT PERMIT

## PERMITTEE:

Smurfit-Stone Container Enterprises, Inc.  
Panama City Mill  
One Everitt Avenue  
Panama City, FL 32402

### *Authorized Representative:*

B. G. Sammons, General Manager

Air Permit No. 0050009-022-AC Facility ID No. 0050009 SIC No. 2611 OFA and Venturi Improvements Permit Expires: September 13, 2007
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## PROJECT AND LOCATION

This permit authorizes improvements to the existing overfire air (OFA) system and existing wet venturi scrubber for No. 4 Combination Boiler. The goal of the project is to reduce controlled particulate matter emissions at the stack to comply with the NESHAP Subpart DDDDD particulate matter emissions limit of 0.07 lb/MMBtu. The existing unit is located at Smurfit-Stone Container's Panama City Mill, which is located at One Everitt Avenue in Panama City, Bay County, Florida.

## STATEMENT OF BASIS

This air pollution construction permit is issued under the provisions of Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to perform the work in accordance with the conditions of this permit and as described in the application, approved drawings, plans, and other documents on file with the Department. This permit revises and supersedes original Permit No. 0050009-021-AC.

## CONTENTS

- Section 1. General Information
- Section 2. Administrative Requirements
- Section 3. Emissions Units Specific Conditions
- Section 4. Appendices

*(DRAFT PERMIT)*

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Michael G. Cooke, Director  
Division of Air Resource Management

(Date)



## SECTION 1. GENERAL INFORMATION

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### **FACILITY AND PROJECT DESCRIPTION**

The permittee operates an existing pulp and paper mill (SIC No. 2611) in Panama City. The mill includes the No. 4 Combination Boiler (Emissions Unit 016), which is authorized to fire wood/bark, coal, fuel oil, and natural gas. The unit is authorized to operate as a backup for the lime kiln to destroy non-condensable gases (TRS/HAP/VOC) from the batch digesting system and multiple effects evaporator system. The unit is also authorized to operate as a backup to the No. 3 Combination Boiler to destroy HAP and TRS emissions in the condensate stripper off-gases (SOG). Existing air pollution controls include an overfire air (OFA) system and a venturi wet scrubber. The permittee proposes several improvements to these existing control systems in an effort to reduce controlled particulate matter emissions from No. 4 Combination Boiler at the stack to comply with the NESHAP Subpart DDDDD particulate matter emissions limit of 0.07 lb/MMBtu.

### **REGULATORY CLASSIFICATION**

Title III: The facility is a major source of hazardous air pollutants (HAP).

Title IV: The facility operates no units subject to the acid rain provisions of the Clean Air Act.

Title V: The facility is a Title V major source of air pollution in accordance with Chapter 213, F.A.C.

PSD: The facility is a PSD-major source of air pollution in accordance with Rule 62-212.400, F.A.C.

NSPS: The facility operates units subject to the New Source Performance Standards in 40 CFR 60.

NESHAP: The facility operates units subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) in 40 CFR 63.

### **RELEVANT DOCUMENTS**

The Department issued Permit No. 0050009-021-AC on November 3, 2005 to authorize the proposed work for this project. Permit No. 0050009-022-AC revises and supersedes the original permit (No. 005009-021-AC) to reflect changes to the steam production rate. The original permit, applications and additional information received to make the applications complete are not a part of this permit; however, the information in these documents is specifically related to this permitting action and is on file with the Department.

## SECTION 2. ADMINISTRATIVE REQUIREMENTS

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1. Permitting Authority: All documents related to applications for permits to operate an emissions unit shall be submitted to Air Resources Section of the Department's Northwest District Office at 160 Governmental Center, Pensacola, Florida 32502-5794.
2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the Air Resources Section of the Department's Northwest District Office at 160 Governmental Center, Pensacola, Florida 32502-5794.
3. Appendices: The following Appendices are attached as part of this permit: Appendix A (Citation Format); Appendix B (General Conditions); and Appendix A (Common Requirements).
4. Applicable Regulations, Forms and Application Procedures: Unless otherwise indicated in this permit, the construction and operation of the subject emissions unit shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403 of the Florida Statutes (F.S.), and Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.). The terms used in this permit have specific meanings as defined in the applicable chapters of the Florida Administrative Code. The permittee shall use the applicable forms listed in Rule 62-210.900, F.A.C. and follow the application procedures in Chapter 62-4, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations. [Rules 62-204.800, 62-210.300 and 62-210.900, F.A.C.]
5. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]
6. Modifications: The permittee shall notify the Compliance Authority upon commencement of construction. No emissions unit or facility subject to this permit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]
7. Relaxations of Restrictions on Pollutant Emitting Capacity. If a previously permitted facility or modification becomes a facility or modification which would be subject to the preconstruction review requirements of this rule if it were a proposed new facility or modification solely by virtue of a relaxation in any federally enforceable limitation on the capacity of the facility or modification to emit a pollutant (such as a restriction on hours of operation), which limitation was established after August 7, 1980, then at the time of such relaxation the preconstruction review requirements of this rule shall apply to the facility or modification as though construction had not yet commenced on it. [Rule 62-212.400(2)(g), F.A.C.]
8. Title V Permit: This permit authorizes the proposed construction activities related to the existing air pollution controls. A Title V air operation permit is required for regular operation of the permitted emissions unit. The permittee shall apply for a revised Title V air operation permit at least 90 days prior to expiration of this permit, but no later than 180 days after commencing operation. To apply for a Title V air operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the appropriate Permitting Authority with copies to the Compliance Authority. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

## SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

### A. No. 4 Combination Boiler (EU-016)

This section of the permit addresses the following emissions unit.

#### Emissions Unit No. 016 – No. 4 Combination Boiler

No. 4 Combination Boiler is an existing unit at the Panama City Mill. The unit is currently authorized to fire carbonaceous fuels (includes wood, bark and primary clarified wood fibers), coal (maximum of 1.7% sulfur by dry weight), natural gas and No. 2 or 6 fuel oil (maximum of 2.4% sulfur by weight). Existing air pollution controls include an overfire air (OFA) system and a venturi wet scrubber. Title V air operation permit No. 0050009-020-AV specifies the following capacities: The total maximum operational heat input of this emissions unit is 545 MMBtu/hr based on a 24-hour average. The heat input shall not exceed 472 MMBtu/hr from fuel oil, 395 MMBtu/hr from coal, 474 MMBtu/hr from carbonaceous fuels, or 512 MMBtu/hr from natural gas. The total heat input to the Nos. 3 and 4 combination boilers due to carbonaceous fuels shall not exceed 501 MMBtu/hr based on a 24-hour average.

#### OTHER REQUIREMENTS

1. Other Permits: The No. 4 Combination Boiler remains subject to all applicable requirements from previously issued air construction and operating permits. The conditions of this permit are in addition to and supplement all other applicable permit requirements. The Department reserves the right to review this project in combination with future proposed projects related to this unit. This permit supersedes Permit No. 0050009-021-AC, which was originally issued for this project. [Rule 62-4.070(3), F.A.C.]

#### CONTROL EQUIPMENT IMPROVEMENTS

2. Overfire Air System: The permittee is authorized to perform the following general work on the existing overfire air system: Conduct a Computational Fluid Dynamics (CFD) modeling analysis. Based on the results of the analysis, modify or add overfire air ports, ductwork, velocity dampers, air nozzle assemblies, air flow measuring devices, and combustion control system to improve carbonaceous fuel firing. The project goal is to reduce unburned carbon to 20% or less, provide more stable combustion with a constant negative furnace pressure, and reduce uncontrolled particulate matter emissions from the boiler furnace to less than 4.2 lb/MMBtu.
  - a. Within 15 days of completing the CFD report, the permittee shall submit a written report of the findings to the Bureau of Air Regulation and the Compliance Authority.
  - b. Prior to commencing physical work on this project, the permittee shall submit a report to the Bureau of Air Regulation and the Compliance Authority summarizing the proposed changes based on the CFD modeling analysis.
  - c. Within 15 days of completing the physical work, the permittee shall provide a report to the Bureau of Air Regulation and the Compliance Authority summarizing the actual OFA improvements made.[Application; Rule 62-4.070(3), F.A.C.]
3. Existing Wet Scrubber: The permittee is authorized to return the current fixed throat venturi scrubbing system to a variable throat venturi scrubbing system, which is the original design for this equipment. The project goal is to provide more control over the scrubber pressure differential and control of particulate matter emissions with the variable throat design. The permittee shall notify the Compliance Authority within 15 days of completing the proposed work. The permittee shall install, calibrate, operate and maintain a device to continuously monitor and record the scrubber pressure drop. [Application; Rule 62-4.070(3), F.A.C.]

SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

A. No. 4 Combination Boiler (EU-016)

PERFORMANCE RESTRICTIONS

4. Permitted Capacity:

- a. When all boilers at the plant are in operation, the maximum continuous steam rate for the No. 4 combination boiler shall not exceed 300,000 lb/hour (24-hour average).
- b. When at least one of the other plant boilers is not in operation, the maximum continuous steam rate for the No. 4 combination boiler shall not exceed 330,000 lb/hour (24-hour average).

The permittee shall install, calibrate, maintain, and operate equipment to continuously monitor and record the steam production rate to demonstrate compliance with this requirement. [Rules 62-210.200(PTE) and 62-212.400(2)(g), F.A.C.]

EMISSIONS PERFORMANCE TESTING

5. Initial Performance Tests: Within 90 days of restarting the unit after completing the proposed work, the permittee shall conduct performance tests to determine the following emissions rates from the No. 4 Combination Boiler: carbon monoxide (CO), nitrogen oxides (NOx), particulate matter (PM), and volatile organic compounds (VOC). The tests shall be conducted under the following conditions:

- a. Each test shall consist of three 1-hour test runs.
- b. The boiler shall fire only a combination of wood and coal. No more than 6.2 tons per hour of coal shall be fired for each 3-run test average.
- c. The boiler shall produce at least 300,000 pounds per hour of steam for each 3-run test average.

If the boiler is unable to operate within 90% of this specified steaming rate during the initial tests, the Department reserves the right to reduce the maximum steaming rate. The PM test shall demonstrate compliance with the applicable standards specified in the Title V air operation permit. The tests for CO, NOx, and VOC are for informational purposes. [Rule 62-297.310(7)(a)1, F.A.C.]

6. Test Notification: The permittee shall notify the Compliance Authority in writing at least 15 days prior to any required tests. [Rule 62-297.310(7)(a)9, F.A.C.]

7. Test Methods: Required tests shall be performed in accordance with the following reference methods.

EPA Test Method	Description of Method and Comments
1-4	Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content {These methods are performed as necessary to support the other methods.}
5	Determination of Particulate Matter (PM) Emissions
7E	Determination of Nitrogen Oxide (NOx) Emissions
10	Determination of Carbon Monoxide (CO) Emissions The method shall be based on a continuous sampling train.
18	Calculation Method for NOx, PM, and VOC Emission Rates
25A	Determination of Volatile Organic Compounds (VOC) {The permittee may elect to conduct EPA Method 18 on a simultaneous sample to determine emissions of methane and ethane, which may then be deducted from the determination of total hydrocarbons (THC) to determine VOC emissions. Otherwise, all measured THC shall be assumed to be VOC.}

### SECTION 3. EMISSIONS UNIT SPECIFIC CONDITIONS

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#### A. No. 4 Combination Boiler (EU-016)

Tests shall also be conducted in accordance with the requirements specified in Appendix C of Section 4 of this permit. The above methods are described in 40 CFR 60, Appendix A, and adopted by reference in Rule 62-204.800, F.A.C. [Rules 62-204.800 and 62-297.100, F.A.C.; 40 CFR 60, Appendix A]

#### RECORDS AND REPORTS

8. Test Reports: The permittee shall prepare and submit reports for all required tests in accordance with the requirements specified in Appendix C of Section 4 of this permit. For each test run, the report shall also indicate the following: emissions rate (lb/MMBtu, lb/hour, and ppmvd @ 7% oxygen for gases); flue gas oxygen content (%); steam production rate (lb/hour); wood and coal firing rates (tons/hour); heat input rates from each fuel (MMBtu/hour); total air flow (acfm and lb/hour); overfire air distribution (%); and venturi wet scrubber pressure differential (recorded at 15-minute intervals during test). In addition, the permittee shall take a sample of coal and wood fired during each test. Each sample shall be analyzed for: higher and lower heating values (Btu/lb, dry); moisture content (%); sulfur content (% by weight); and ash content (% by weight). Results of the analyses shall be summarized in the test report.

[Rule 62-297.310(8), F.A.C.]

**SECTION 4. APPENDICES**

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Appendix A. Citation Formats

Appendix B. General Conditions

Appendix C. Common Conditions

**SECTION 4. APPENDIX A**  
**CITATION FORMATS**

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*The following examples illustrate the format used in the permit to identify applicable permitting actions and regulations.*

**REFERENCES TO PREVIOUS PERMITTING ACTIONS**

Old Permit Numbers

*Example:* Permit No. AC50-123456 or Air Permit No. AO50-123456

*Where:* “AC” identifies the permit as an Air Construction Permit  
“AO” identifies the permit as an Air Operation Permit  
“123456” identifies the specific permit project number

New Permit Numbers

*Example:* Permit Nos. 099-2222-001-AC, 099-2222-001-AF, 099-2222-001-AO, or 099-2222-001-AV

*Where:* “099” represents the specific county ID number in which the project is located  
“2222” represents the specific facility ID number  
“001” identifies the specific permit project  
“AC” identifies the permit as an air construction permit  
“AF” identifies the permit as a minor federally enforceable state operation permit  
“AO” identifies the permit as a minor source air operation permit  
“AV” identifies the permit as a Title V Major Source Air Operation Permit

PSD Permit Numbers

*Example:* Permit No. PSD-FL-317

*Where:* “PSD” means issued pursuant to the Prevention of Significant Deterioration of Air Quality  
“FL” means that the permit was issued by the State of Florida  
“317” identifies the specific permit project

**RULE CITATION FORMATS**

Florida Administrative Code (F.A.C.)

*Example:* [Rule 62-213.205, F.A.C.]

*Means:* Title 62, Chapter 213, Rule 205 of the Florida Administrative Code

Code of Federal Regulations (CFR)

*Example:* [40 CFR 60.7]

*Means:* Title 40, Part 60, Section 7

**SECTION 4. APPENDIX B**  
**GENERAL CONDITIONS**

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The permittee shall comply with the following general conditions from Rule 62-4.160, F.A.C.

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.
2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.
3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey and vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.
4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgment of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.
5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.
6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.
7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:
  - a. Have access to and copy and records that must be kept under the conditions of the permit;
  - b. Inspect the facility, equipment, practices, or operations regulated or required under this permit, and,
  - c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:
  - a. A description of and cause of non-compliance; and
  - b. The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida



**SECTION 4. APPENDIX B**  
**GENERAL CONDITIONS**

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Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.
11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 62-4.120 and 62-730.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.
12. This permit or a copy thereof shall be kept at the work site of the permitted activity.
13. This permit also constitutes:
  - a. Determination of Best Available Control Technology;
  - b. Determination of Prevention of Significant Deterioration; and
  - c. Compliance with New Source Performance Standards.
14. The permittee shall comply with the following:
  - a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.
  - b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application or this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.
  - c. Records of monitoring information shall include:
    - 1) The date, exact place, and time of sampling or measurements;
    - 2) The person responsible for performing the sampling or measurements;
    - 3) The dates analyses were performed;
    - 4) The person responsible for performing the analyses;
    - 5) The analytical techniques or methods used; and
    - 6) The results of such analyses.
15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

**SECTION 4. APPENDIX C**  
**COMMON CONDITIONS**

*{Permitting Note: Unless otherwise specified in the permit, the following conditions apply to all emissions units and activities at the facility.}*

**EMISSIONS AND CONTROLS**

1. **Plant Operation - Problems:** If temporarily unable to comply with any of the conditions of the permit due to breakdown of equipment or destruction by fire, wind or other cause, the permittee shall notify each Compliance Authority as soon as possible, but at least within one working day, excluding weekends and holidays. The notification shall include: pertinent information as to the cause of the problem; steps being taken to correct the problem and prevent future recurrence; and, where applicable, the owner's intent toward reconstruction of destroyed facilities. Such notification does not release the permittee from any liability for failure to comply with the conditions of this permit or the regulations. [Rule 62-4.130, F.A.C.]
2. **Circumvention:** The permittee shall not circumvent the air pollution control equipment or allow the emission of air pollutants without this equipment operating properly. [Rule 62-210.650, F.A.C.]
3. **Excess Emissions Allowed:** Excess emissions resulting from startup, shutdown or malfunction of any emissions unit shall be permitted providing (1) best operational practices to minimize emissions are adhered to and (2) the duration of excess emissions shall be minimized but in no case exceed two hours in any 24 hour period unless specifically authorized by the Department for longer duration. [Rule 62-210.700(1), F.A.C.]
4. **Excess Emissions Prohibited:** Excess emissions caused entirely or in part by poor maintenance, poor operation, or any other equipment or process failure that may reasonably be prevented during startup, shutdown or malfunction shall be prohibited. [Rule 62-210.700(4), F.A.C.]
5. **Excess Emissions - Notification:** In case of excess emissions resulting from malfunctions, the permittee shall notify the Department or the appropriate Local Program in accordance with Rule 62-4.130, F.A.C. A full written report on the malfunctions shall be submitted in a quarterly report, if requested by the Department. [Rule 62-210.700(6), F.A.C.]
6. **VOC or OS Emissions:** No person shall store, pump, handle, process, load, unload or use in any process or installation, volatile organic compounds or organic solvents without applying known and existing vapor emission control devices or systems deemed necessary and ordered by the Department. [Rule 62-296.320(1), F.A.C.]
7. **Objectionable Odor Prohibited:** No person shall cause, suffer, allow or permit the discharge of air pollutants, which cause or contribute to an objectionable odor. An "objectionable odor" means any odor present in the outdoor atmosphere which by itself or in combination with other odors, is or may be harmful or injurious to human health or welfare, which unreasonably interferes with the comfortable use and enjoyment of life or property, or which creates a nuisance. [Rules 62-296.320(2) and 62-210.200(203), F.A.C.]
8. **General Visible Emissions:** No person shall cause, let, permit, suffer or allow to be discharged into the atmosphere the emissions of air pollutants from any activity equal to or greater than 20 percent opacity. This regulation does not impose a specific testing requirement. [Rule 62-296.320(4)(b)1, F.A.C.]
9. **Unconfined Particulate Emissions:** During the construction period, unconfined particulate matter emissions shall be minimized by dust suppressing techniques such as covering and/or application of water or chemicals to the affected areas, as necessary. [Rule 62-296.320(4)(c), F.A.C.]

**TESTING REQUIREMENTS**

10. **Required Number of Test Runs:** For mass emission limitations, a compliance test shall consist of three complete and separate determinations of the total air pollutant emission rate through the test section of the stack or duct and three complete and separate determinations of any applicable process variables corresponding to the three distinct time periods during which the stack emission rate was measured; provided, however, that three complete and separate determinations shall not be required if the process variables are not subject to variation during a compliance test, or if three determinations are not necessary in order to calculate the unit's emission rate. The three required test runs shall be completed within one consecutive five-day period. In the event that a sample is lost or one of the three runs must be discontinued because of circumstances beyond the control of the owner or operator, and a valid third run cannot be obtained within the five-day period allowed for the test, the Secretary or his or her designee may accept the results of two complete runs as proof of compliance, provided that the arithmetic mean of the two complete runs is at least 20% below the allowable emission limiting standard. [Rule 62-297.310(1), F.A.C.]

**SECTION 4. APPENDIX C**  
**COMMON CONDITIONS**

11. Operating Rate During Testing: Testing of emissions shall be conducted with the emissions unit operating at permitted capacity. Permitted capacity is defined as 90 to 100 percent of the maximum operation rate allowed by the permit. If it is impractical to test at permitted capacity, an emissions unit may be tested at less than the maximum permitted capacity; in this case, subsequent emissions unit operation is limited to 110 percent of the test rate until a new test is conducted. Once the unit is so limited, operation at higher capacities is allowed for no more than 15 consecutive days for the purpose of additional compliance testing to regain the authority to operate at the permitted capacity. [Rule 62-297.310(2), F.A.C.]
12. Calculation of Emission Rate: For each emissions performance test, the indicated emission rate or concentration shall be the arithmetic average of the emission rate or concentration determined by each of the three separate test runs unless otherwise specified in a particular test method or applicable rule. [Rule 62-297.310(3), F.A.C.]
13. Test Procedures: Tests shall be conducted in accordance with all applicable requirements of Chapter 62-297, F.A.C.
  - a. *Required Sampling Time*. Unless otherwise specified in the applicable rule, the required sampling time for each test run shall be no less than one hour and no greater than four hours, and the sampling time at each sampling point shall be of equal intervals of at least two minutes. The minimum observation period for a visible emissions compliance test shall be thirty (30) minutes. The observation period shall include the period during which the highest opacity can reasonably be expected to occur.
  - b. *Minimum Sample Volume*. Unless otherwise specified in the applicable rule or test method, the minimum sample volume per run shall be 25 dry standard cubic feet.
  - c. *Calibration of Sampling Equipment*. Calibration of the sampling train equipment shall be conducted in accordance with the schedule shown in Table 297.310-1, F.A.C.[Rule 62-297.310(4), F.A.C.]
14. Determination of Process Variables
  - a. *Required Equipment*. The owner or operator of an emissions unit for which compliance tests are required shall install, operate, and maintain equipment or instruments necessary to determine process variables, such as process weight input or heat input, when such data are needed in conjunction with emissions data to determine the compliance of the emissions unit with applicable emission limiting standards.
  - b. *Accuracy of Equipment*. Equipment or instruments used to directly or indirectly determine process variables, including devices such as belt scales, weight hoppers, flow meters, and tank scales, shall be calibrated and adjusted to indicate the true value of the parameter being measured with sufficient accuracy to allow the applicable process variable to be determined within 10% of its true value.[Rule 62-297.310(5), F.A.C.]
15. Sampling Facilities: The permittee shall install permanent stack sampling ports and provide sampling facilities that meet the requirements of Rule 62-297.310(6), F.A.C.
16. Test Notification: The owner or operator shall notify the Department, at least 15 days prior to the date on which each formal compliance test is to begin, of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted for the owner or operator. [Rule 62-297.310(7)(a)9, F.A.C.]
17. Special Compliance Tests: When the Department, after investigation, has good reason (such as complaints, increased visible emissions or questionable maintenance of control equipment) to believe that any applicable emission standard contained in a Department rule or in a permit issued pursuant to those rules is being violated, it shall require the owner or operator of the emissions unit to conduct compliance tests which identify the nature and quantity of pollutant emissions from the emissions unit and to provide a report on the results of said tests to the Department. [Rule 62-297.310(7)(b), F.A.C.]
18. Test Reports: The owner or operator of an emissions unit for which a compliance test is required shall file a report with the Department on the results of each such test. The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed. The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the

**SECTION 4. APPENDIX C**  
**COMMON CONDITIONS**

test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA or DEP Method 9 test, shall provide the following information:

1. The type, location, and designation of the emissions unit tested.
2. The facility at which the emissions unit is located.
3. The owner or operator of the emissions unit.
4. The normal type and amount of fuels used and materials processed, and the types and amounts of fuels used and material processed during each test run.
5. The means, raw data and computations used to determine the amount of fuels used and materials processed, if necessary to determine compliance with an applicable emission limiting standard.
6. The type of air pollution control devices installed on the emissions unit, their general condition, their normal operating parameters (pressure drops, total operating current and GPM scrubber water), and their operating parameters during each test run.
7. A sketch of the duct within 8 stack diameters upstream and 2 stack diameters downstream of the sampling ports, including the distance to any upstream and downstream bends or other flow disturbances.
8. The date, starting time and duration of each sampling run.
9. The test procedures used, including any alternative procedures authorized pursuant to Rule 62-297.620, F.A.C. Where optional procedures are authorized in this chapter, indicate which option was used.
10. The number of points sampled and configuration and location of the sampling plane.
11. For each sampling point for each run, the dry gas meter reading, velocity head, pressure drop across the stack, temperatures, average meter temperatures and sample time per point.
12. The type, manufacturer and configuration of the sampling equipment used.
13. Data related to the required calibration of the test equipment.
14. Data on the identification, processing and weights of all filters used.
15. Data on the types and amounts of any chemical solutions used.
16. Data on the amount of pollutant collected from each sampling probe, the filters, and the impingers, are reported separately for the compliance test.
17. The names of individuals who furnished the process variable data, conducted the test, analyzed the samples and prepared the report.
18. All measured and calculated data required to be determined by each applicable test procedure for each run.
19. The detailed calculations for one run that relate the collected data to the calculated emission rate.
20. The applicable emission standard and the resulting maximum allowable emission rate for the emissions unit plus the test result in the same form and unit of measure.
21. A certification that, to the knowledge of the owner or his authorized agent, all data submitted are true and correct. When a compliance test is conducted for the Department or its agent, the person who conducts the test shall provide the certification with respect to the test procedures used. The owner or his authorized agent shall certify that all data required and provided to the person conducting the test are true and correct to his knowledge.

[Rule 62-297.310(8), F.A.C.]

**RECORDS AND REPORTS**

19. Records Retention: All measurements, records, and other data required by this permit shall be documented in a permanent, legible format and retained for at least five (5) years following the date on which such measurements, records, or data are recorded. Records shall be made available to the Department upon request. [Rules 62-4.160(14) and 62-213.440(1)(b)2, F.A.C.]
20. Annual Operating Report: The permittee shall submit an annual report that summarizes the actual operating rates and emissions from this facility. Annual operating reports shall be submitted to the Compliance Authority by March 1st of each year. [Rule 62-210.370(2), F.A.C.]

# P.E. CERTIFICATION STATEMENT

## PERMITTEE

Smurfit-Stone Container Enterprises, Inc.  
Panama City Mill  
One Everitt Avenue  
Panama City, FL 32402

Air Permit No. 0050009-022-AC  
No. 4 Combination Boiler  
OFA and Venturi Improvements  
(Revised Steam Rate)

## PROJECT DESCRIPTION

Permit No. 0050009-021-AC authorized improvements to the existing overfire air system and existing wet scrubber for the No. 4 combination boiler to reduce particulate matter emissions. The permit specified a maximum steam rate of 300,000 lb/hour based on the vendor design. The applicant requests a revision of the permit to allow a maximum steam rate of up to 330,000 lb/hour during periods when another plant boiler is taken out of service. The applicant provided the following information in support of this request.

- Alstom, the vendor for the overfire air retrofit project, provided a statement that the boiler-drum internals can handle steam rates of up to 339,000 lb/hour. However, the boiler may be limited by the maximum airflow that can be provided by the existing forced draft fan. Alstom also recommended a circulation study if the boiler has experienced excessive tube failures or blistering due to poor circulation.
- Operational records (2003 to 2005) indicate significant boiler operation at steam rates of up to 324,000 lb/hour.
- Emissions test results demonstrating compliance with the current permit standards at steam rates up to 324,000 lb/hour.

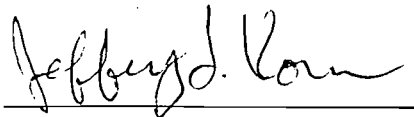
The plant is planning additional work for other boilers in the near future. When a boiler is taken out of service for modification or repair, it will be important that the remaining units be able to provide as much steam as possible. The No. 3 combination boiler is approximately the same size as the No. 4 combination boiler (505 MMBtu/hour) and the two recovery boilers are larger (721 MMBtu/hour).

Based on the available information, the proposed changes to the existing pollution controls will not increase the capacity of the existing boiler in terms of the maximum permitted heat input rate or the steam production rate. The retrofit overfire air system is being designed for a continuous steam production rate of 300,000 pounds per hour. However, the boiler is currently capable of operating at steam rates of approximately 330,000 lb/hour, has demonstrated compliance at these levels, and the project vendor for the OFA system states that the higher steam rate is achievable. Therefore, the revised draft permit specifies the following conditions:

- When all boilers at the plant are in operation, the maximum continuous steam rate for the No. 4 combination boiler shall not exceed 300,000 lb/hour (24-hour average).
- When at least one of the other plant boilers is not in operation, the maximum continuous steam rate for the No. 4 combination boiler shall not exceed 330,000 lb/hour (24-hour average).

The preliminary determination is that the proposed project will comply with all applicable state and federal air pollution regulations as conditioned by the draft permit. This determination is based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the draft permit. No air quality modeling analysis is required because the project is not reasonably expected to result in increased emissions.

*I HEREBY CERTIFY that the air pollution control engineering features described in the above referenced application and subject to the proposed permit conditions provide reasonable assurance of compliance with applicable provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 62-4 and 62-204 through 62-297. However, I have not evaluated and I do not certify aspects of the proposal outside of my area of expertise (including, but not limited to, the electrical, mechanical, structural, hydrological, geological, and meteorological features).*



Jeffery F. Koerner, P.E.  
Registration Number: 49441

11-17-05

(Date)

**SENDER: COMPLETE THIS SECTION**

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Mr. B. G. Sammons, General Manager  
 Smurfit-Stone Container Enterprises, Inc.  
 Panama City Mill  
 One Everitt Avenue  
 Panama City, Florida 32402

2. Article Number  
 (Transfer from service label) **7001 0320 0001 3692 4040**

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540

**COMPLETE THIS SECTION ON DELIVERY**

A. Signature  Agent  
 Addressee  
*Rose Matteson*

B. Received by (Printed Name) C. Date of Delivery  
 11/28/05

D. Is delivery address different from item 1?  Yes  
 If YES, enter delivery address below:  No

3. Service Type  
 Certified Mail  Express Mail  
 Registered  Return Receipt for Merchandise  
 Insured Mail  C.O.D.

4. Restricted Delivery? (Extra Fee)  Yes

**U.S. Postal Service  
 CERTIFIED MAIL RECEIPT**  
 (Domestic Mail Only; No Insurance Coverage Provided)

**OFFICIAL USE**

7001 0320 0001 3692 4040

Postage	\$
Certified Fee	
Return Receipt Fee (Endorsement Required)	
Restricted Delivery Fee (Endorsement Required)	

Postmark  
 Here

Total Sent to  
 Mr. B. G. Sammons, General Manager  
 Smurfit-Stone Container Enterprises, Inc.  
 Panama City Mill  
 One Everitt Avenue  
 Panama City, Florida 32402



Containerboard Mill Division

November 2, 2005

Mr. Jeff Koerner  
Florida Dept. of Environmental Protection  
2600 Blair Stone Rd.  
MS #5505  
Tallahassee, FL, 32399-2400

RECEIVED

NOV 04 2005

BUREAU OF AIR REGULATION

Re: Request for revision of Permit  
Project No. 0050009-021-AC  
*0050009-022-AC*

Dear Mr. Koerner

We request a minor revision of the above permit. The mill needs to revise permit condition #4, "Permitted Capacity". The reasons for this request were previously covered in the comment memo of October 18, 2005, and in various telephone conversations. The mill requests that the current limit of 300,000 pounds per hour, based on a 24 hour average be changed to 330,000 pounds per hour, based on a 24 hour average. This new limit will be allowed only when another boiler is down. During all other periods, the 300,000 pound per hour limit would apply. Summarizing the rationale for this request:

1. We have operated this boiler at greater than 300,000 pounds per hour in the past. The last three years of stack testing were conducted at an average of 321,000 pounds per hour. The requested limit does not represent an increase in capacity. A small spreadsheet summarizing the past three years of stack testing is attached, as is additional information.
2. An evaluation of the overfire air system operation (OFA) was attached to the October comment memo. The manufacturer believes that the boiler and the OFA system can function correctly at 330,000 #/hr.
3. Operating with only three boilers is an unusual condition. It generally results in lower production and lower mill wide emissions. Allowing the boiler to operate at a higher production during these periods will have no appreciable impact on emissions as compared to normal operation.
4. We are requesting the lower of 330,000 pounds per hour, or the steaming rate at which we can demonstrate compliance. This provides reasonable assurance of compliance.

The permit requires two "pre-construction" items. These are the Computational Fluid Dynamics (CFD) modeling and a summary of the proposed changes. The CFD report is attached. The proposed changes were included in the permit application, and have not been modified as a result of the modeling. Additional information on the changes is also in the CFD report.

Please call Tom Clements at (850) 785-4311 x470 if you have additional questions.

Sincerely



Bobby G. Sammons  
General Manager

Shared/IBM/#4 BB permit reply Nov05



Smurfit-Stone Container Corp. Pamama City Mill					
#4 Bark Boiler Stack Test Results					
Date	Steam flow	Particulate	SO2	TRS	VE
	klbs/hr	lbs/mmbtu	#/hr	ppm	%
10/22/2003	317	0.06	2	0.7	12.1
10/8/2004	322	0.05	17	0.01	13.7
10/12/2005*	324	0.04	360	0.8	<15
<b>Limit =</b>	<b>N/A</b>	<b><u>0.2</u></b>	<b><u>781</u></b>	<b><u>5</u></b>	<b><u>30</u></b>
*= preliminary					

11/2/05

## 2005 Stack Testing Notes

The figures given are preliminary and could change a small amount.

The #4 Combination Boiler was tested on October 12, from approximately 0930 to 1805 hours. The steam flow of 324,000 #/hr was an average across this period.

Individual test results are not yet available. These will be included in the final report, which is expected to be issued by the second week in November. This report will also include the exact test times per run.

The testing service used was ESS of 18631-H Northline Dr., Cornelius, NC, 28031  
Phone: (704) 892-4405

The ESS lead tester was Robert Hamlin. The ESS account manager for the mill is Bill Kissel. The mill support team for the testing was T. Clements, L. Thomas, and M. Groome.

**SUMMARY OF SMURFIT STONE ON-SITE EMISSION ESTIMATES  
OCTOBER 10 - 13, 2005**

EMISSION SOURCE	EMISSION LIMIT	POLLUTANT
RECOVERY BOILER	0.044 gr/dscf @ 8% O2 17.5 ppm @ 8% O2 35%	PARTICULATE MATTER TRS VE
No. 3 BARK BOILER	0.3 lbs/MMBtu BARK 0.1 lbs/MMBtu OTHER FUELS 109.5 lbs/hr 887 lbs/hr 5 ppm @ 10% O2 30%	PARTICULATE MATTER PARTICUALTE MATTER PARTICUALTE MATTER SO2 TRS VE
No. 4 BARK BOILER	0.3 lbs/MMBtu BARK 0.1 lbs/MMBtu OTHER FUELS 86.7 lbs/hr 781 lbs/hr WITH NCGs 772 lbs/hr WITHOUT NCGs 5 ppm @ 10% O2 30%	PARTICULATE MATTER PARTICUALTE MATTER PARTICUALTE MATTER SO2 SO2 TRS VE
SDTV	0.2 lbs/ton BLS 0.048 lbs/3000 lbs BLS 20%	PARTICUALTE MATTER TRS VE
LIME KILN	29.83 lbs/hr 20 ppm @ 10% O2 20%	PARTICULATE MATTER TRS VE
SLAKER	14 lbs/hr 20%	PARTICULATE MATTER VE

No. 1SDTV

PM=0.11 lb/tbls  
TRS= 0.02 lb/3000 lbs BLS

No. 1A RB

PM=0.004 gr/dscf @ 8% O2

No. 1B RB

PM=0.002 gr/dscf @ 8% O2

No. 2A RB

PM=0.005 gr/dscf @ 8% O2

No. 2B RB

PM=0.006 gr/dscf @ 8% O2

No. 3 CB

PM=0.063 lb/mmbtu  
PM= 41 lbs/hr  
SO2 = 399 lbs/hr  
TRS= 1 ppm @ 10% O2

(Allowable ~ 0.2 lb/mmbtu)

No. 4 CB

PM= 0.040 lb/mmbtu

(Allowable ~ 0.2 lb/mmbtu)

PM= 31 lbs/hr  
SO2 = 360 lbs/hr  
TRS= 0.8 ppm @ 10% O2

No. 2SDTV

PM= 0.12 lb/tbls  
TRS= 0.03 lb/3000 lbs BLS

Lime Kiln

PM= 13 lbs/hr  
TRS= 8 ppm @ 10% O2

Slaker

PM= 1.0 lb/hr

*"All VE's of units monitored have been well below the VE limits"*

CORRECTED

SMURFIT STONE PANAMA CITY  
STACK TEST FLOWRATE DATA  
OCTOBER 10-13, 2005

SOURCE	FLOW (ACFM)	FLOW (DSCFM)	FLOW (SCFM)	OXYGEN (%)	TEMP (F)	H2O (%)
COMBO BOILER 3	225,000	151,000	199,472	6.8	139	24.3
COMBO BOILER 4	261,000	180,000	230,769	6.3	141	22.0
LIME KILN	48,590	26,385	41,034	7.6	164	35.7
SLAKER	9,482	5,335	8,023	AMBIENT	164	33.5
NO. 1 SDTV	47,070	29,794	40,371	AMBIENT	156	26.2
NO. 2 SDTV	46,123	28,780	40,028	AMBIENT	152	28.1
NO.1A RECOVERY	157,000	78,606	111,182	5.8	288	29.3
NO. 1B RECOVERY	158,000	79,667	114,960	5.7	268	30.7
NO. 2A RECOVERY	163,000	76,518	111,705	5.9	310	31.5
NO. 2B RECOVERY	175,000	77,145	114,799	7.1	346	32.8

Comp

# SMURFIT-STONE CONTAINER CORPORATION NO. 4 BARK BOILER STACK EMISSIONS TEST LOG

DATE: 10-12-05

TEST:  TRS  
 PARTICULATE

TESTERS: Bob Hamilton  
OPERATOR: R. [unclear]

Comp  
4/2

TIME	BARK (MMBTU)	FUEL OIL (MMBTU)	COAL (MMBTU)	NATURAL GAS (MMBTU)	TOTAL (MMBTU)	SCRUBBER FLOW (GPM)	SCRUBBER pH	NOG IN/OUT	REMARKS
9:30	75	71	245	43	430	1094	6.9	out	
10:00	103	70	246	43	470	1096	7.0	out	
10:30	95	70	247	40	456	1094	7.0	out	
11:00	99	69	247	38	459	1097	7.0	out	
11:30	97	69	248	37	454	1090	7.0	out	
12:00	96	69	248	40	452	1093	6.9	out	
12:30	95	69	248	40	453	1088	7.0	out	12:55 NOG in #4BB
1:00	93	69	248	40	454	1090	8.6	IN	
1:30	96	69	248	40	458	1089	8.5	IN	
2:00	98	69	248	40	460	1090	8.5	IN	1:55 - Particulates Finished
3:00	100	69	248	40	462	1091	6.7	out	2:06 - NOG out #4BB
4:00	98	69	248	40	460	1086	6.9	out	
5:00	97	69	248	40	460	1098	6.9	out	
6:00	92	69	248	40	455	1099	7.0	out	
7:00	93	70	248	40	456	1121	7.0	out	
8:00	97	70	248	40	459	1124	7.0	out	8:00 PM Stack Test Completed
9:00									

NOTE: TAKE READINGS EVERY 30 MINUTES ON PARTICULATES AND EVERY HOUR ON TRS.

TESTING LIMITS:	TOTAL MMBTU	PERMIT LIMITS:	BARK	474 MMBTU	MIN. LIMITS:	SCRUBBER FLOW
	MINIMUM (90%)		OIL	472 MMBTU		1096 GPM
	TARGET (95%)		COAL	395 MMBTU		
	PERMIT MAXIMUM (100%)		GAS	512 MMBTU		
			3&4 BB BARK	501 MMBTU		



**ENVIRONMENTAL SOURCE SAMPLERS, INC. — AIR QUALITY CONSULTANTS**

**SMURFIT-STONE CONTAINER CORPORATION  
PANAMA CITY, FLORIDA  
PARTICULATE MATTER, SO<sub>2</sub>, TRS AND VISIBLE EMISSIONS  
TEST REPORT  
COMBO BOILER NO. 4  
OCTOBER 8, 2004**

**Prepared for:  
Smurfit-Stone Container Corporation  
Panama City, Florida**

**Prepared by:  
Environmental Source Samplers, Inc.  
Cornelius, North Carolina**

18631-H Northline Drive • Cornelius, NC 28031  
Phone 704.892.4405 • Fax 704.892.8127  
[environmentalsourcesamplers.com](http://environmentalsourcesamplers.com)

## 1.0 INTRODUCTION

On October 8, 2004, Environmental Source Samplers, Inc. (ESS) conducted particulate emissions testing for the Smurfit-Stone Container Corporation's mill located in Panama City, Florida. Particulate emissions testing was performed on the stack associated with Combo Boiler No. 4.

A series of three (3) particulate test runs was performed on the stack associated with Combo Boiler No. 4. Particulate emissions sampling was performed as outlined in EPA Method 5. EPA Methods 1-4 were used in support of EPA Method 5.

A series of three (3) TRS test runs were also performed on the stack associated with Combo Boiler No. 4. TRS sampling was performed as outlined in EPA Method 16A.

A series of three (3) SO<sub>2</sub> test runs were also performed on the stack associated with Combo Boiler No. 4 in combination with each EPA Method 5 test. SO<sub>2</sub> sampling was performed as outlined in EPA Methods 5 and 6.

In addition, ESS conducted visible emission observations simultaneously with each EPA Method 5 PM emission test run in accordance with the procedures outlined in EPA Method 9.

The purpose of the testing was to determine the units' ability to meet particulate, SO<sub>2</sub> and TRS emission limits included in the Facility's Air Permit.

Personnel present during the test series included:

Mr. Tom Clements, Smurfit-Stone Container Corporation  
Mr. Charlie Garner, Environmental Source Samplers  
Mr. Rusty Caton, Environmental Source Samplers  
Mr. Matt Graham, Environmental Source Samplers  
Mr. Ray Bean, Environmental Source Samplers  
Mr. James Burgin, Environmental Source Samplers  
Mr. John DeMarinis, Environmental Source Samplers



## 2.0 SUMMARY AND DISCUSSION OF RESULTS

The test results are summarized on the following pages. Field data sheets are included in Appendix A; calculations in Appendix B; operational data in Appendix C; laboratory data in Appendix D; and calibration data in Appendix E.

The test results and the allowable emission rates are summarized below:

### PARTICULATE EMISSIONS SUMMARY

SOURCE	MEASURED
COMBO BOILER NO. 4	38.077 LBS/HR
COMBO BOILER NO. 4	0.0239 GR/DSCF
COMBO BOILER NO. 4	0.0483 LBS/MMBTU

### VISIBLE EMISSIONS SUMMARY

SOURCE	MEASURED
COMBO BOILER NO. 4	13.73 %

### TRS EMISSIONS SUMMARY

SOURCE	MEASURED
COMBO BOILER NO. 4	0.0153 LBS/HR
COMBO BOILER NO. 4	0.0153 PPM
COMBO BOILER NO. 4	0.0119 PPM@10%O2

### SO2 EMISSIONS SUMMARY

SOURCE	MEASURED
COMBO BOILER NO. 4	16.53 LBS/HR

SMURFIT STONE  
COMBO BLR NO. 4  
PARTICULATE EMISSIONS TEST SUMMARY

RUN #	1	2	3	AVG
DATE	10/8/04	10/8/04	10/8/04	
TIME START (EST)	1255	1416	1538	
TIME COMPLETE (EST)	1359	1519	1642	
FLUE GAS TEMP (F)	144.0	145.0	145.3	144.8
FLUE GAS VELOCITY (FPS)	92.89	93.05	93.11	93.02
FLUE GAS FLOWRATE (MM ACFM)	0.271	0.272	0.272	0.272
FLUE GAS FLOWRATE (MM DSCFM)	0.188	0.189	0.183	0.186
VOL OF GAS SAMPLES (DSCF)	38.25	38.03	36.18	37.49
MOISTURE (%)	21.4	21.0	23.3	21.9
ISOKINETIC SAMPLE RATE (%)	93.6	92.6	90.7	92.3
BAROMETRIC PRESSURE (IN HG)	30.04	30.04	30.04	30.04
STACK PRESSURE (IN HG)	30.10	30.10	30.10	30.10
OXYGEN (%)	7.5	6.6	6.5	6.9
CARBON DIOXIDE (%)	12.0	12.4	12.6	12.3
CARBON MONOXIDE (%)	0.0	0.0	0.0	0.0
NITROGEN (%)	80.5	81.0	80.9	80.8
MOLECULAR WEIGHT OF GAS(MOLES)	27.73	27.80	27.54	27.69
PARTICULATE (GR/DSCF)	0.0163	0.0178	0.0377	0.0239
PARTICULATE (LBS/HR)	26.229	28.791	59.212	38.077
PARTICULATE (LBS/MMBTU)	0.0347	0.0355	0.0747	0.0483

SMURFIT STONE CONTAINER  
 PANAMA CITY MILL  
 SO2 EMISSIONS SUMMARY

Environmental Source Samplers, Inc.



COMBO BOILER NO. 4

RUN NO.	CATCH WEIGHT (mg)	ALIQUOT RATIO	TOTAL CATCH WEIGHT (mg)	SAMPLE VOL (DSCF)	GRAMS/LB	FLOWRATE (dscfm)	MIN/HR	SO2 (lbs/hr)
1	36.5	2	73.00	38.25	453.5927	188000.00	60	47.46074
2	0.8	2	1.60	38.03	453.5927	189000.00	60	1.049189
3	0.8	2	1.60	36.18	453.5927	183000.00	60	1.067826
AVERAGE	12.7		25.40	37.49		186667		16.53

Run 1 - 1305 - 1335

2 - 1610 - 1640

3 - 1915 - 1945

**SMURFIT-STONE PANAMA CITY  
COMBO 4 TRS TEST SUMMARY**

TITRATION	1A	1B	2A	2B	3A	3B
SAMPLE VOLUME (MLS)	50	50	50	50	50	50
ALIQVOT VOLUME (MLS)	10	10	10	10	10	10
BARIUM PERCHLORATE (MLS)	0.01	0.01	0.01	0.01	0.01	0.01
AVG TITRATION (MLS)	0.01		0.01		0.01	
BLANK TITRATION (MLS)	0.01		0.01		0.01	
METER START (CM)	39.3455		39.6966		40.0497	
METER STOP (CM)	39.6905		40.0455		40.3917	
METER VOLUME (CF)	12.182		12.320		12.076	
METER CORRECTION FACTOR	1.0160		1.0160		1.0160	
BAR. PRESSURE (IN. HG)	30.04		30.04		30.04	
AVG METER TEMP (F)	74.66		78.80		75.38	
AVG METER TEMP (C)	23.70		26.00		24.10	
CORRECTED VOL (DSCF)	12.274		12.317		12.151	
BARIUM PERCHLORATE NORMALITY	0.0128		0.0128		0.0128	
TRS AS SO2 (PPM)	0.015		0.015		0.016	
TRS AS SO2 (10-4 LB/DSCF)	0.0000		0.0000		0.0000	
FLOWRATE (DSCFM)*	186,000		186,000		186,000	
TRS AS H2S (LB/HR)	0.0153		0.0152		0.0154	

\*AVERAGE FLOWRATE FROM M5-PM EMISSION TEST RUNS USED

Run 1 - 1000 - 1300  
 2 - 1306 - 1604  
 3 - 1610 - 1910



**Smurfit-Stone Container Panama City  
Bark Boiler 4  
8-Oct-04  
12:06 PM - 13:15 PM**

MIN	0	15	30	45	MIN	0	15	30	45
1	15	15	15	15	31	20	20	20	20
2	15	25	20	20	32	20	20	20	20
3	20	20	15	15	33	15	20	15	15
4	15	15	15	15	34	20	20	15	15
5	15	15	15	15	35	15	15	15	15
6	15	15	15	15	36	15	15	15	20

**6 Minute Avg 16.25**

**6 Minute Avg 17.5**

MIN	0	15	30	45	MIN	0	15	30	45
7	15	15	15	15	37	20	20	15	20
8	15	15	15	15	38	10	10	10	10
9	20	20	15	15	39	10	10	10	10
10	15	15	15	15	40	10	10	10	10
11	15	15	15	15	41	10	10	10	10
12	15	25	25	25	42	10	10	10	10

**6 Minute Avg 16.6667**

**6 Minute Avg 11.45833**

MIN	0	15	30	45	MIN	0	15	30	45
13	20	20	15	15	43	10	10	10	10
14	15	15	15	15	44	10	10	10	10
15	15	15	15	15	45	10	10	10	10
16	15	15	15	15	46	10	10	10	10
17	15	15	15	15	47	10	10	10	10
18	15	15	15	15	48	10	10	10	10

**6 Minute Avg 15.41667**

**6 Minute Avg 10**

MIN	0	15	30	45	MIN	0	15	30	45
19	15	15	15	15	49	10	10	10	10
20	15	15	15	15	50	10	10	10	10
21	15	15	15	15	51	10	10	10	10
22	15	15	15	15	52	10	10	10	10
23	15	15	15	15	53	10	10	10	10
24	15	15	15	15	54	10	10	10	10

**6 Minute Avg 15**

**6 Minute Avg 10**

MIN	0	15	30	45	MIN	0	15	30	45
25	15	15	20	20	55	10	10	10	10
26	20	20	20	20	56	10	10	10	10
27	20	20	20	20	57	10	10	10	10
28	20	20	20	20	58	10	10	10	10
29	20	20	20	20	59	10	10	10	10
30	20	20	20	20	60	10	10	10	10

**6 Minute Avg 19.58333**

**6 Minute Avg 10**



# SMURFIT-STONE CONTAINER CORPORATION

## NO. 4 BARK BOILER STACK EMISSIONS TEST LOG

DATE: 10-8-04

TEST:  TRS  
 PARTICULATE

TESTERS: Charlie  
 OPERATOR: Chas Scott

TIME	BARK (MMBTU)	FUEL OIL (MMBTU)	COAL (MMBTU)	NATURAL GAS (MMBTU)	TOTAL (MMBTU)	SCRUBBER FLOW (GPM)	SCRUBBER pH	NOG IN/OUT	REMARKS
10 <sup>00</sup> AM	78.22	142.07	196.26	40.0	460.21	1121	7.0	out	
10 <sup>30</sup> AM	86.88	93.39	236.57	40.0	461.30	1118	7.0	out	
11 <sup>00</sup> AM	92.30	70.67	244.94	40.0	452.36	1123	7.0	out	
11 <sup>30</sup> AM	93.13	70.22	244.94	40.0	452.78	1121	7.0	out	
12 <sup>00</sup> Noon	93.96	73.87	244.93	40.0	452.27	1120	6.9	out	
12 <sup>30</sup> PM	86.83	71.87	244.93	40.0	448.11	1130	8.9	out	NCG IN 1250p
1 <sup>00</sup> PM	87.25	69.62	244.93	40.0	446.27	1133	9.8	IN	
1 <sup>30</sup> PM	97.71	66.48	244.94	40.0	453.62	1134	8.7	IN	
2 <sup>00</sup> PM	104.39	66.76	244.94	40.0	460.58	1137	8.5	IN	
2 <sup>30</sup> PM	99.54	66.55	244.93	40.0	455.48	1138	9.2	IN	
3 <sup>00</sup> PM	95.33	66.52	244.98	40.0	451.20	1185	8.2	IN	
3 <sup>30</sup> PM	93.71	66.69	248.22	40.0	458.97	1104	8.1	IN	
4 <sup>00</sup> PM	94.19	66.34	255.18	40.0	460.71	1104	8.6	IN	
4 <sup>30</sup> PM	89.57	66.17	263.28	40.0	463.51	1104	8.2	IN	
5 <sup>00</sup> PM	92.54	66.67	266.61	40.0	469.21	1104	8.0	IN	
5 <sup>30</sup> PM	92.97	65.38	265.23	40.0	467.95	1105	9.1	IN	
6 <sup>30</sup> PM	87.18	65.05	269.89	40.0	460.59	1106	10.0	IN	Testing finished 7 <sup>12</sup> PM
7 <sup>30</sup> PM									

NOTE: TAKE READINGS EVERY 30 MINUTES ON PARTICULATES AND EVERY HOUR ON TRS.

TESTING LIMITS:	TOTAL MMBTU	PERMIT LIMITS:	BARK	474 MMBTU	MIN. LIMITS:	SCRUBBER FLOW
	MINIMUM (90%)		OIL	472 MMBTU		1096 GPM
	TARGET (95%)		COAL	395 MMBTU		
	PERMIT MAXIMUM (100%)		GAS	512 MMBTU		
			3&4 BB BARK	501 MMBTU		

---

Work Order No. 03939.009.001

**No. 3 and No. 4 Bark Boilers  
Compliance Test Report  
Smurfit-Stone Container Corporation  
Panama City, Florida  
22-23 October 2003**

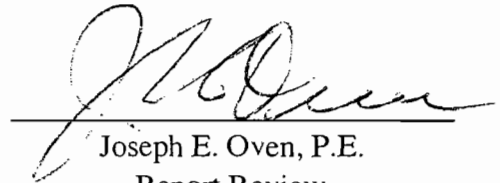
Prepared For

**SMURFIT-STONE CONTAINER CORPORATION**

1 Everett Avenue  
Panama City, Florida 32412-0560



Wayne Roberts  
Project Manager  
Approved for Transmittal



Joseph E. Oven, P.E.  
Report Review  
Approved for Transmittal

Prepared By

**WESTON SOLUTIONS, INC.**

1625 Pumphrey Ave.  
Auburn, Alabama 36832-4303  
Phone: (334) 466-5600 Fax: (334) 466-5660

**1 December 2003**



## SECTION 1 INTRODUCTION

Weston Solutions, Inc. (WESTON®) was retained by Smurfit-Stone Container Corporation (Smurfit-Stone) to conduct particulate matter (PM), sulfur dioxide (SO<sub>2</sub>), total reduced sulfur (TRS), and visible emission (VE) testing on the Nos. 3 and 4 Bark Boilers at the mill in Panama City, Florida. The purpose of the testing was to demonstrate compliance with Florida Department of Environmental Protection (FDEP) permit limits.

WESTON performed the emission testing during 22-23 October 2003. The project team was comprised of the following individuals.

Name	Project Role
Wayne Roberts	Project Manager/Test Team Leader
Gary Lloyd	Technical Director/Test Team Member
Jon Howard	Quality Assurance Manager
Landie Fowler	Test Team Member
Paul Green	Test Team Member
Temp Simpkins	Test Team Member
Wayne Childress	Test Team Member
Curtis Cotney	Test Team Member
Cory Landers	Test Team Member
Natalie Hornsby	Report Coordinator

Mr. Tom Clements of Smurfit-Stone coordinated the testing with mill operations and served as WESTON's technical contact throughout the effort. Mr. Richard Brookins of FDEP was present during a portion of the testing.





## SECTION 2 RESULTS AND DISCUSSION

Table 2-1 presents the mean results of the emission testing with comparison to the permit limits. The results are less than the applicable standards for each source.

**TABLE 2-1  
SUMMARY OF EMISSION TEST RESULTS**

	Mean Test Value	Permit Limit
<b>No. 3 Bark Boiler</b>		
Particulate Matter, lb/hr	47	109.5
Particulate Matter, lb/MMBtu	0.10	0.3
Sulfur Dioxide, lb/hr	122	485
Total Reduced Sulfur, ppm @ 10% O <sub>2</sub>	0.56	5.0
Visible Emissions, %	14.6	30
<b>No. 4 Bark Boiler</b>		
Particulate Matter, lb/hr	26	86.7
Particulate Matter, lb/MMBtu	0.058	0.3
Sulfur Dioxide, lb/hr	<1.7	781
Total Reduced Sulfur, ppm @ 10% O <sub>2</sub>	0.67	5.0
Visible Emissions, %	12.1	30

Tables 2-2 through 2-5 provide detailed summaries of the emission results. Any differences between the calculated results presented in the appendices and the results reported in the summary tables are due to rounding for presentation.

**TABLE 2-4**  
**NO. 4 BARK BOILER DETAILED**  
**SUMMARY OF PM, SO<sub>2</sub>, AND VE EMISSION RESULTS**

	Run 1	Run 2	Run 3	Mean
Date	10/22/03	10/22/03	10/22/03	----
Time Began	1106	1339	1517	----
Time Ended	1211	1444	1620	----
<b>Stack Gas Data</b>				
Temperature, °F	145	144	144	144
Velocity, ft/sec	85	87	88	87
Moisture, %	21	21	21	21
CO <sub>2</sub> Concentration, %	15.1	15.1	15.4	15.2
O <sub>2</sub> Concentration, %	6.4	6.4	6.6	6.5
VFR, x 10 <sup>5</sup> dscfm	1.70	1.73	1.75	1.73
<b>Particulate Matter</b>				
Isokinetic Sampling Rate, %	103	106	105	105
Concentration, gr/dscf	0.018	0.019	0.017	0.018
Emission Rate, lb/hr	26	28	25	26
Permit Limit, lb/hr	----	----	----	86.7
Emission Factor, lb/MMBtu	0.058	0.062	0.055	0.058
Permit Limit, lb/MMBtu	----	----	----	0.3
<b>Sulfur Dioxide</b>				
Concentration, ppm	<1.0	<1.0	<1.0	<1.0
Emission Rate, lb/hr	<1.7	<1.7	<1.7	<1.7
Permit Limit, lb/hr	----	----	----	781
<b>Visible Emissions<sup>a</sup></b>				
Mean Opacity %	----	----	----	12.1
Permit Limit %	----	----	----	30.0

<sup>a</sup>The VE observations were made from 1125 to 1225.

Preliminary source evaluation determined that the Slaker exhibited cyclonic flow characteristics. At the direction of Smurfit-Stone, the PM testing was conducted without alignment correction at each traverse point. This approach was consistent with testing performed for previous tests.

**TABLE 2-5  
NO. 4 BARK BOILER DETAILED  
SUMMARY OF TRS EMISSION RESULTS**

	Run 1	Run 2	Run 3	Mean
Date	10/22/03	10/22/03	10/22/03	----
Time Began	1100	1452	1814	----
Time Ended	1400	1753	2114	----
<b>Stack Gas Data</b>				
O <sub>2</sub> Concentration, %	6.3	6.4	6.5	6.4
<b>Total Reduced Sulfur</b>				
Concentration, ppm	0.74	1.11	0.82	0.89
Concentration, ppm @ 10% O <sub>2</sub>	0.55	0.83	0.62	0.67
Permit Limit, ppm @ 10% O <sub>2</sub>	----	----	----	5.0



## SECTION 3 SOURCE TESTING METHODOLOGY

The emission testing program was conducted in accordance with the U.S. EPA Reference Methods summarized in Table 3-1. Method descriptions and quality assurance data are provided in the referenced appendices.

**TABLE 3-1  
SOURCE TESTING METHODOLOGY**

Parameter	Method Number	Appendix Reference		Comments
		Method Description	Quality Control Data	
Volumetric Flow Rate	1,2,3,4	B.1	E	Note 1
Particulate Matter	5	B.2	E	Note 1
Sulfur Dioxide	6C	B.3	E	Note 2
Visible Emissions	9	B.4	E	Note 3
Total Reduced Sulfur	16	B.5	E	

Note 1: Both the No. 3 and No. 4 Boilers were determined to be cyclonic.

Note 2: Sulfur dioxide interference studies for the Bover Western Research Analyzer used for analysis on Bark Boiler systems are on file at WESTON's Auburn, Alabama office.

Note 3: On the day of testing there was little/no wind, which allowed the tester to differentiate the plumes from the CO-located stacks.

# SMURFIT-STONE CONTAINER CORPORATION

## NO. 4 BARK BOILER STACK EMISSIONS TEST LOG

DATE: 10-22-03

TEST:  TRS  
 PARTICULATE

TESTERS: \_\_\_\_\_  
 OPERATOR: Denny/Green

Hourly - Pg. 6

TIME	BARK (MMBTU)	FUEL OIL (MMBTU)	COAL (MMBTU)	NATURAL GAS (MMBTU)	TOTAL (MMBTU)	SCRUBBER FLOW (GPM)	SCRUBBER pH	NGG IN/OUT	REMARKS
1130	97	41	284	36	447	1113	9.0	IN	
1200	95	41	286	40	453	1115	9.0	IN	1ST RUN FINISHED AT 1212
1230	90	40	286	40	454	1118	9.1	IN	
100	93	40	286	40	457	1129	9.0	IN	
130	97	40	286	40	460	1122	9.0	IN	2ND RUN STARTED AT 1300
200	83	40	286	40	450	1122	9.1	IN	1ST 3HR TRS TEST FINISHED - 206
230	84	39	284	40	452	1122	8.8	IN	2ND RUN TRS STARTED 257
300	96	39	286	40	457	1119	9.0	IN	3RD RUN PARTICULATE + TRS START - 317
330	90	40	286	40	450	1125	9.0	IN	3RD RUN PART + TRS FINISHED - 422
400	80	40	284	40	457	1116	9.0	IN	
430	89	40	286	40	457	1125	8.9	IN	
500	84	39	286	40	452	1119	9.0	IN	
530	87	39	286	40	453	1120	9.0	IN	
600	91	39	286	40	462	1120	9.1	IN	
630	88	39	286	40	456	1125	9.0	IN	
700	87	39	286	40	457	1124	9.0	IN	
730	87	39	286	40	455	1125	9.2	IN	
800	92	39	286	40	459	1122	9.1	IN	

NOTE: TAKE READINGS EVERY 30 MINUTES ON PARTICULATES AND EVERY HOUR ON TRS.

TESTING LIMITS:	TOTAL MMBTU	PERMIT LIMITS:	BARK	474 MMBTU	MIN. LIMITS:	SCRUBBER FLOW
	MINIMUM (90%)		OIL	472 MMBTU		1096 GPM
	TARGET (95%)		COAL	395 MMBTU		
	PERMIT MAXIMUM (100%)		GAS	512 MMBTU		
			3&4 BB BARK	501 MMBTU		

## SMURFIT-STONE CONTAINER CORPORATION NO. 4 BARK BOILER STACK EMISSIONS TEST LOG

DATE: 10-22-03

TEST: / TRS  
/ PARTICULATE

TESTERS:   
 OPERATOR: GREEN

Hourly - Pg. 6

TIME	BARK (MMBTU)	FUEL OIL (MMBTU)	COAL (MMBTU)	NATURAL GAS (MMBTU)	TOTAL (MMBTU)	SCRUBBER FLOW (GPM)	SCRUBBER PH	NGG IN/OUT	REMARKS
8:30pm	88	40	286	40	458	1128	9.1	IN	
9:00pm	87	39	286	40	455	1121	9.1	IN	
9:30pm	91	39	286	40	457	1122	9.0	IN	
10:00pm	88	39	286	40	455	1100	9.0	IN	

**NOTE:** TAKE READINGS EVERY 30 MINUTES ON PARTICULATES AND EVERY HOUR ON TRS.

<b>TESTING LIMITS:</b>	<b>PERMIT LIMITS:</b>	<b>MIN. LIMITS:</b>
TOTAL MMBTU	BARK	SCRUBBER FLOW
MINIMUM (90%) 491	OIL 472 MMBTU	1096 GPM
TARGET (95%) 518	COAL 395 MMBTU	
PERMIT MAXIMUM (100%) 545	GAS 512 MMBTU	
	3&4 BB BARK 501 MMBTU	

October 2005

ALSTOM

# Panama City Bark Boiler CFD Modeling

**ALSTOM**



## Technical Report

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Summary: A vintage CE-type power boiler at Smurfit Stone – Panama City FL is being retrofit with a new air system. A CFD study was performed in conjunction with that project to evaluate the new air system relative to the current system. These CFD results suggest that, at the same fuel firing rate, the proposed HMZ air system yields improved performance with lower superheater inlet temperatures, lower CO levels and less unburned carbon. At the tested load point, CO levels at the same bark and total airflow decreased from 1430 to 575 PPM, and the backpass carbon loss decreased from 3.4% to 1.7%. CO and Carbon Loss also dropped significantly, 986 ppm and 1.6% respectively, at lower excess air levels. The improvement was achieved by the combination of an HMZ air system and a fabric stoker seal to reduce infiltration. The Model indicates an increase in carbon loss at the higher bark firing rates as would be expected with the increased load conditions. The series of 8 runs described in this report included bark and bark/coal firing with combinations of reduced leakage, higher loads, and lower excess air levels inline with the anticipated design levels for the upgraded boiler .

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## 1.0 INTRODUCTION

Alstom Power is in the process of upgrading the firing system for a vintage CE-type power boiler for Smurfit Stone Container Corp (SSCC) Panama City, Florida mill, unit #4. Planned modifications to boiler #4 include the installation of a new Overfire Air (OFA) system, a fabric stoker seal to reduce infiltration, and other airflow control equipment. As part of this process, CFD was used to examine the proposed Horizontal Mixing Zone (HMZ) OFA design firing bark as well as coal with bark, for a range of loads.

In order to develop a reasonable representation of the current firing conditions to calibrate the CFD baseline cases, field testing was conducted by Alstom during August 2005 to measure all necessary parameters for steam side boiler performance, as well as other inputs necessary for a CFD model such as specific air flow distribution, fuel composition, and outlet gas compositions for both bark and coal/bark firing. Case load conditions for firing bark + coal + oil were not modeled as this operating condition is not expected to result in higher CO and carbon loss emissions. Based on the test data<sup>[1]</sup>, a FLUENT CFD model was calibrated for both bark, and for bark + coal firing conditions. However, the localized grate combustion and entrainment distribution due to localized bark piles and air streams passing around these piles impact entrainment and ultimately carbon carryover. Representing actual grate bed conditions in a CFD model is difficult, therefore, some assumptions were made for the purpose of modeling. These assumptions impact the specific results, hence quantitative results should be treated on a relative basis only.

The CFD runs examined the proposed new HMZ air system for normal and maximum bark load conditions under the anticipated operating conditions. The CFD modeling described in this report includes the geometry, test conditions, results, and modeling approach used, along with predictions and recommendations. Engineering performance calculations for different operating conditions were used to develop the test matrix. While the engineering performance predictions serve as the basis for the commercial guarantees, the CFD modeling provides insight to the 3-D flow, temperature and mixing patterns for the different options. The CFD predicted results are based on extrapolation of the baseline conditions at the mill. These predictions indicate that the new HMZ air system with a stoker fabric seal provides a significant improvement to the furnace, allowing operation at lower excess air levels with reduced carbon loss and CO emissions.

## 2.0 Modeled Geometry and Test Conditions

### 2.1 Furnace Geometry

A three-dimensional model of the boiler arrangement shown in Fig. 1 was generated from original and proposal drawings. The proposed new HMZ air system will include nozzles on the front and rear wall as shown in Fig. 2. The HMZ nozzles are arranged in large vs. small configuration so that on the opposite walls, a large nozzle faces a small nozzle on the opposite wall. A small lateral

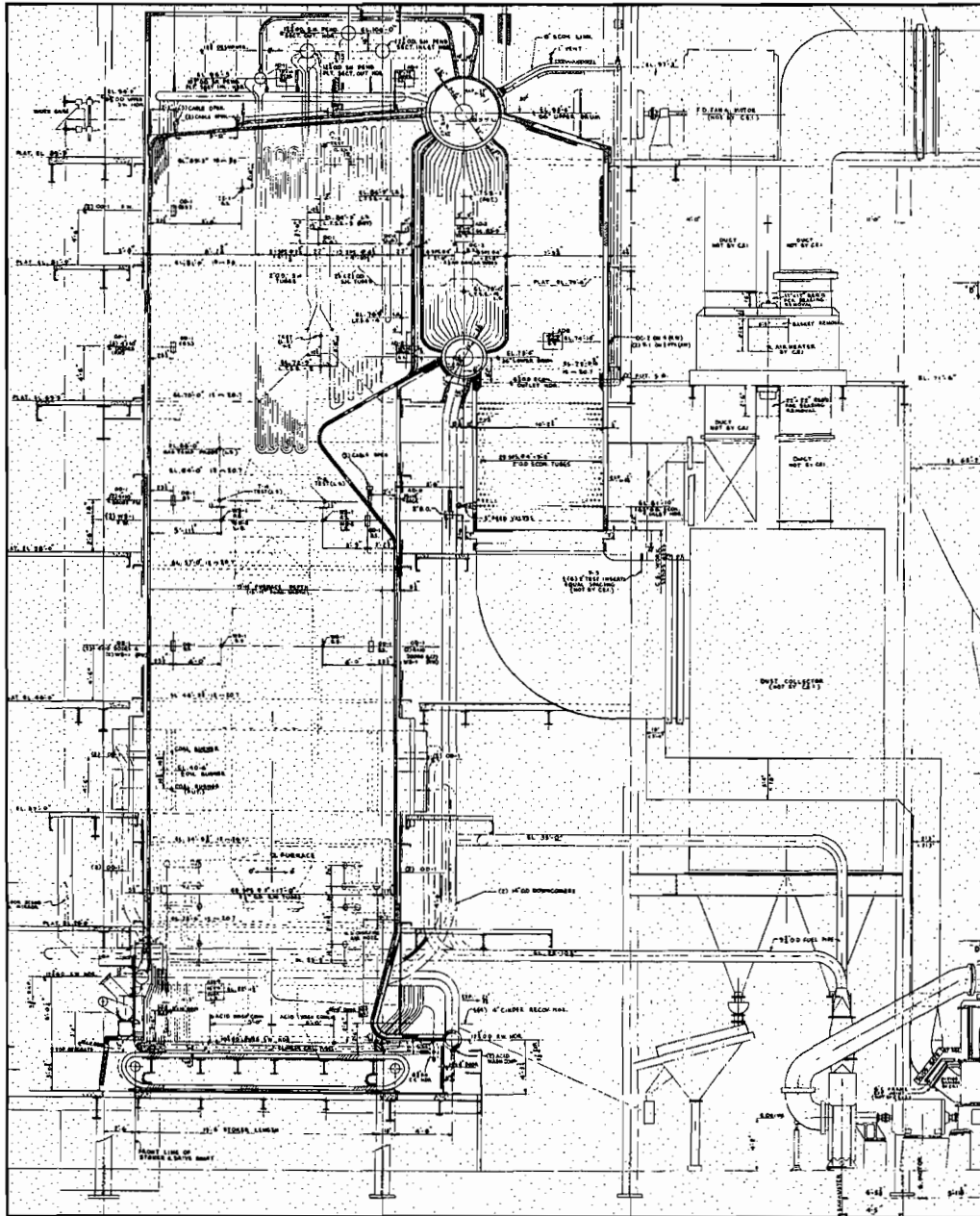


Fig. 1 Side Elevation of Unit #4 at SSCS - Panama City

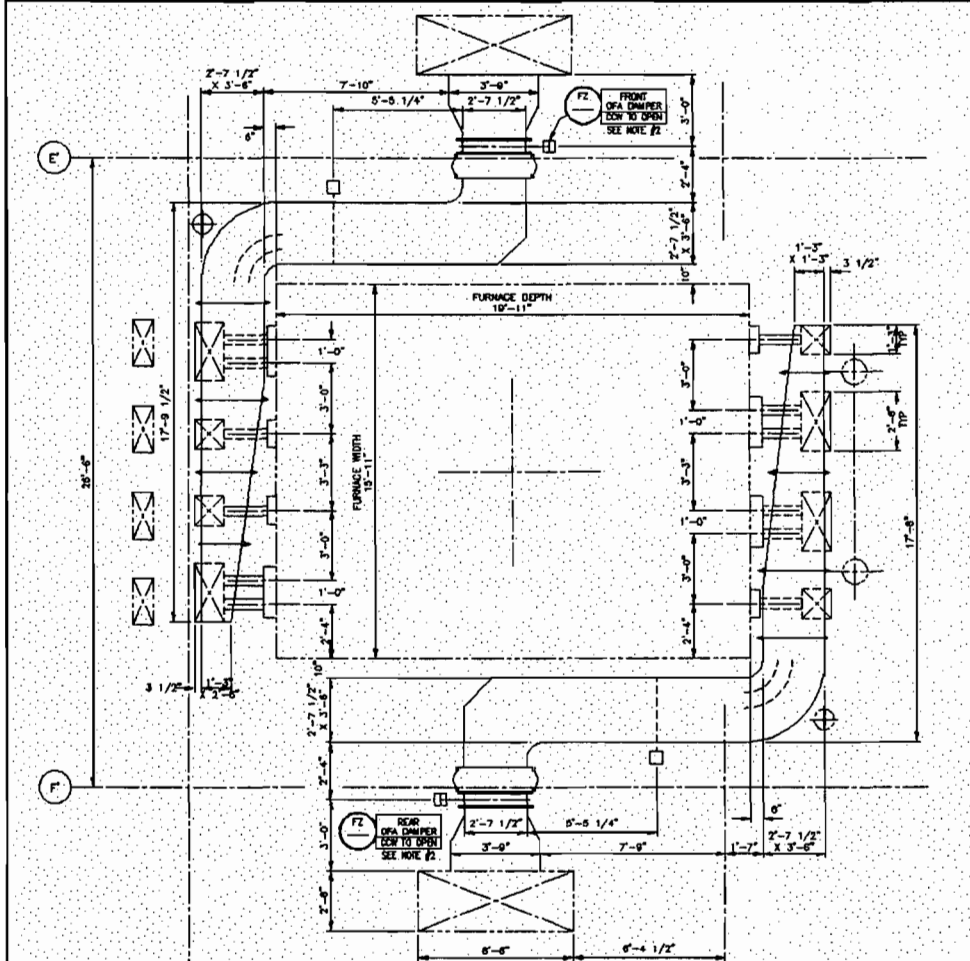


Fig. 2 Proposed HMZ Layout for Panama City – Unit #4.

offset between the nozzle pairs causes increased shear and establishes a preferred trajectory to avoid instability as the jets intersect in the center. This HMZ design concept has been widely applied to ALSTOM boilers of many types. The specific arrangement of the HMZ design is dependent on the boiler size, aspect ratio and other factors. CFD modeling was conducted for this specific arrangement to assist in the performance design evaluation. For this boiler study, the current boiler operation was tested at two firing conditions. The fuel and airflow rates were measured. In combination with the outlet gas sample grid measurements, the CFD model was calibrated with the existing hardware and used to extrapolate performance with the new air system and grate seal. This helps to show that the retrofit design will meet performance targets. The CFD modeling provides useful qualitative 3-D predictions of the flow fields, gas temperatures, and species. The CFD model can be used to screen designs and different operation conditions; however, the CFD predictions are based on extrapolation from the test conditions that may not be fully representative of the new boiler operation.

## 2.2 Air System Components Modeled

A computational mesh was generated for the Panama City Unit #4 boiler that included components of the current and retrofit air system. The mesh was composed of approximately 750,000 cells, with concentration of the nodes in the lower furnace. The modeled geometry is shown in **Fig. 3**. In addition to the furnace, the model includes a block directly below the stoker that is used in conjunction with a custom heat exchanger model for the grate. This block is used to represent the heating of the undergrate air as it passes through the grate keys based on local combustion and furnace radiation to the grate surface. Other inputs to the furnace model include:

Undergrate air: The total undergrate air is based on process data measurements. Undergrate air was uniformly distributed over the entire surface. In actual operation however, the air will be biased front to rear as necessary.

Stoker Perimeter Leakage: The current stoker is believed to allow a significant amount of infiltration. This leakage into the furnace was provided through a gap between the top of the stoker and the furnace sidewalls. The leakage was uniformly distributed around the stoker for only the baseline runs. For the retrofit cases, the leakage levels are assumed to be much lower. For these cases, the leakage flow was added to the undergrate air in the model. There were no other “holes” in the boiler to allow infiltration.

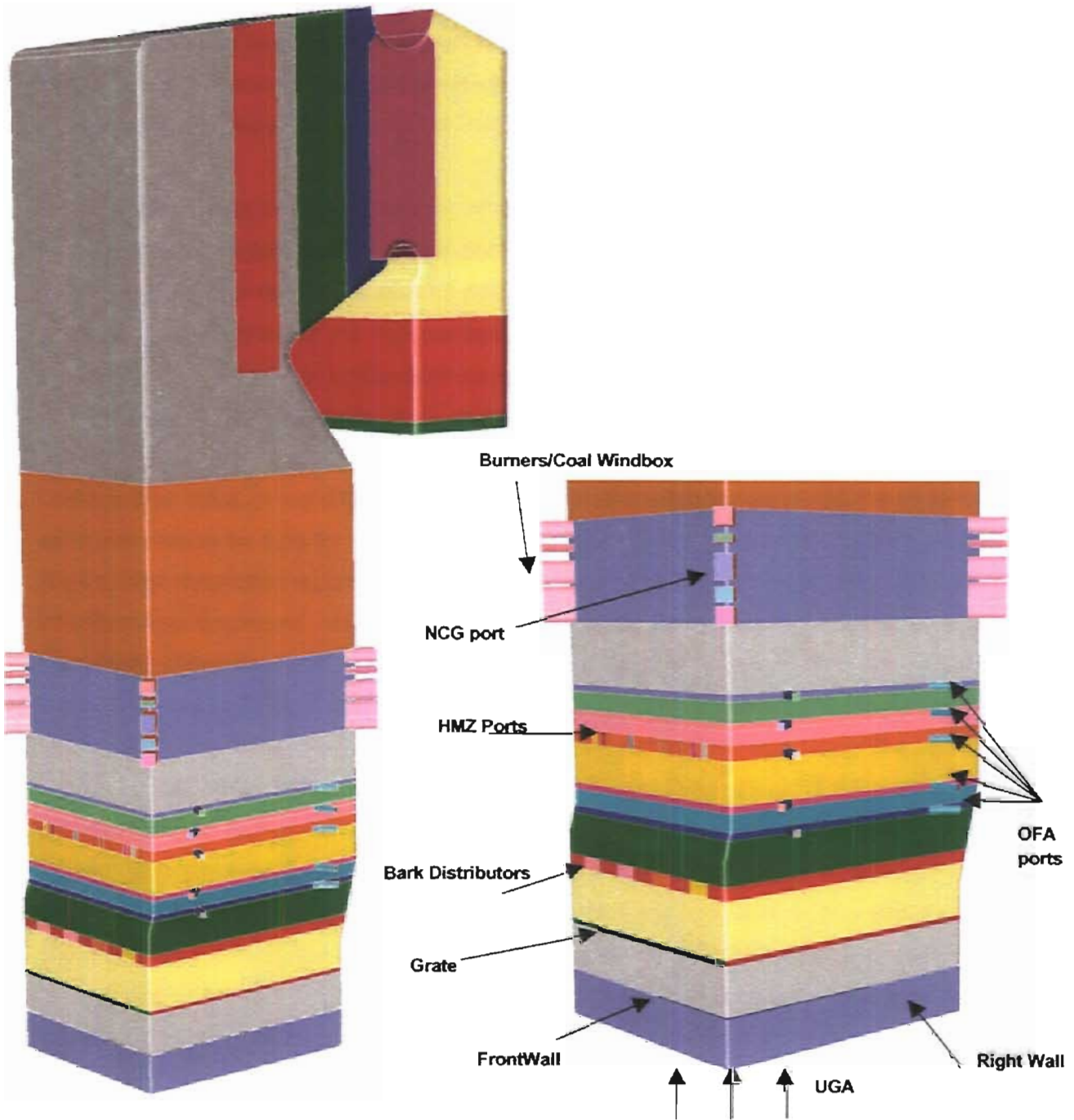
Bark Distributors: Bark particles were injected through the four compartments. No transport air was used because mechanical distributors spread the bark. The distributors will experience some minor amount of leakage. However for modeling purposes the post-retrofit leakage sources were combined with the undergrate airflow.

Cinder Injection Nozzles: A group of four rear wall cinder injection nozzles were prescribed.

Sidewall OFA Nozzles: There are five levels of sidewall OFA nozzles. The five levels of sidewall tangential air are arranged with an alternating swirl direction. In practice, only five nozzles were found in service – Four nozzles at the middle level and a nozzle at the left front corner of top level. Nozzle stubs were included to allow the nozzle trajectory to be defined by a flow rate at the upstream face. These sidewall OFA nozzles were not in service with the HMZ system active in the model.

HMZ nozzles: The 4 x 4 HMZ nozzles were located on the front and rear walls at an elevation 11 feet above the top of the stoker. The nozzles were arranged such that two individual nozzles were located close together to represent a “large” nozzle. In the model, the constant-velocity dampers that are integral to the OFA design to vary the nozzle area at the furnace plane were represented by selectively turning off portions of the nozzle opening.

Burner/ Coal Windbox: Air to the burner windboxes was provided uniformly to the air compartments with the required direction. With pulverized coal firing, transport air was provided with the coal particles. The flow rates for the primary transport and secondary air were based on the PI-data.



**Fig. 3 CFD Model Generated with inlets indicated.**

## **3.2 Matrix and Test Conditions**

The objectives of the tests conducted were to calibrate the baseline conditions for both bark and for coal and bark firing, and then extrapolate how the furnace would perform with the new air system and other modifications. The runs are divided between the baseline, or existing furnace conditions and the retrofit cases as follows:

### **3.2.1 Baseline Runs**

Two baseline conditions were modeled; bark and coal / bark. Data measurements from the August testing were used to determine the air inputs to the model, along with the net heat input and outlet gas flow. Determination of the total combustion air was based on fuel flow rates and outlet gas O<sub>2</sub> levels determined using an economizer-sampling grid. Engineering calculations to measure efficiency also include feedwater flows, steam flows, temperatures and other parameters. These performance engineering calculations were used as a basis for the total combustion airflow rates. Leakage flow rates, or the difference between the total combustion air minus the air to the fans were assumed to be 12% for the baseline case. The leakage flows are difficult to measure. The 2004 outage inspection report indicated several areas of the stoker pier and backstop seal where infiltration was suspected. However these could only be estimated. For the CFD modeling, prescribing where this leakage air actually enters the boiler must be defined. For the baseline runs the 12% leakage airflow of 42,150 lb/hr was admitted through a gap around the perimeter of the stoker. Baseline Case 1 – 100% bark with 45,150 lb/hr of as-fired bark using 354,150 lb/hr of total combustion air for an excess air level of 10.4% O<sub>2</sub>. The existing sidewall OFA nozzles were used with five nozzles, four at the middle level, and one additional nozzle from top level on the left front corner. This yields only 5.7% of the combustion air admitted through the sidewall OFA ports, or an OFA/UGA split of 10/90. Consistent with the test conditions, the windbox flow was a substantial 109,000 lb/hr, even with the coal off. The windbox compartment dampers were assumed to be open, and a uniform velocity through the secondary air nozzles was used. The baseline bark test indicated 10.4% O<sub>2</sub> at the economizer outlet. The model was set to achieve that level.

For the baseline Case 2 - Bark and Coal , the bark flow was reduced to 26,600 lb/hr, and 22,000 lb/hr coal fired. This CFD run had an O<sub>2</sub> level of 3.9% at the economizer outlet, with the total airflow of 388,650 lb/hr. Consistent with coal firing, the burner airflow increased to 168,000 lb/hr.

### 3.2.2 Retrofit Cases

The upgraded OFA system was modeled in cases 3-8. For the retrofit cases, the existing sidewall OFA nozzles were closed off, and the HMZ nozzles were modeled at design velocities of 230 to 240 ft/second. The objective of Cases 3 and 4 was to model the operation of the boiler as a comparison between the baseline Cases 1 and 2. In essence, runs 3 and 4 have the same steaming conditions and similar air flows as runs 1 and 2, with the exception that the HMZ is installed for runs 3 and 4 with the appropriate OFA/UGA splits. Note that runs 3 and 4 are strictly used for comparison purposes and the boiler is not expected to run under these non-ideal conditions. The objective of runs 5 to 8 was to model the boiler the way it will be operating after the retrofit. For all of the retrofit cases (3-8), the stoker leakage was reduced, because the anticipated tightening up of the stoker/boiler with the seal. Even with the stoker seal, some infiltration into the boiler will occur. Our assumption was to allocate the predicted 5% leakage flow with the undergrate air, since there were no other logical openings to inject this tramp air. This may be valid because infiltration through the stoker hopper may be expected. The retrofit bark cases (3, 5, and 6) also have reduced windbox airflow rates. It was assumed that these flows would be better controlled after the modifications. For a system comparison at high excess air, run 3 was conducted using 10.5% outlet O<sub>2</sub> level. It may be more relevant to examine the bark runs (5 and 6) which were run with fuel and air rate equivalent to 6% O<sub>2</sub> on a dry basis, presuming the boiler will be able to run with less air and achieve higher efficiency. Case 4 is similar to the conditions of case 2, which was tested at lower than 4.0% outlet O<sub>2</sub>.

The HMZ nozzle velocities were set to be approximately 230-240 ft/s by adjusting the fraction of the nozzle open. This allows sufficient jet velocities to provide good mixing performance at different loads. Table 1 below lists the fuel firing rates and outlet O<sub>2</sub> levels for the different CFD runs.

Although the Mill intends to fire oil in combination with bark and coal under certain operating conditions, ALSTOM does not deem it necessary to model this condition using CFD. This is due to the fact that firing oil with bark and coal would essentially reduce CO levels as compared with firing bark and coal alone, and would therefore not represent a worst-case scenario.



**Table 1: Test Runs**

Run	Condition	Bark lb/hr	Coal lb/hr	Outlet O2 %vol (dry)	Comments
1.	Baseline Bark	45,150	OFF	10.4	Calibrate Bark Firing
2.	Base Coal+Bark	26,600	22,000	3.9	Calibrate Bark and Coal Firing
3.	Retrofit Bark	45,150	OFF	10.3	HMZ System to Baseline Comparison
4.	Retro Coal+Bark	26,380	22,000	3.3	HMZ System to Baseline Comparison
5.	Retrofit Bark	45,150	OFF	5.8	HMZ System with Low Excess Air
6.	Max Bark	69,720	OFF	5.9	HMZ with Max Bark
7.	<del>Max</del> Bark/Coal	56,770	14,625	3.9	HMZ with <del>max</del> Coal + Bark
8.	<del>Max</del> Bark/Coal	65,200	13,720	6.2	HMZ with <del>max</del> Coal and 50% Moisture

**Bark**

Note: All cases were run with 39.5% moisture bark except Case 8 with 50% moisture.

## **4.0 Results:**

### **4.1 Summary**

The inputs for all of the runs and the performance predicted by these CFD runs appear in Table 2. The retrofit case results are related to the calibration of the baseline condition. In order to calibrate the baseline Case 1, tuning of the bark combustion characteristics was necessary. To achieve similar outlet CO levels in the CFD model which were 1,400 PPM of CO at the furnace outlet running at an outlet O<sub>2</sub> level of 10.5%, a significant level of suspension burning and carryover appear to have been present. This was confirmed in discussions about the operation during the model tuning phase. Once the CFD model solid combustion parameters were calibrated for the baseline runs, they were unchanged for the retrofit runs. However, the suspension burning and carryover rates could have been higher in the furnace due to non-uniformities on the grate. The CFD model assumed uniform undergrate air distribution and reasonably uniform combustion on the grate.

With the new upgrade air system, the unburned bark carryover levels dropped significantly. It would be determined that with lower predicted carbon loss, the carryover and particulate loading leaving the boiler would also decrease. For example, entrained carbon loss for Case 3 was approximately half of the baseline Case 1. These two cases are equivalent with respect to bark flow and heat input. CO levels were less than half of the baseline case.

With regard to the tabulated emissions, the carbon loss was expressed as both carbon and entrained solid particulate expressed as a fraction of the gross fuel heat input. There were no direct measurements of the current carbon loss to calibrate the model to, but with these settings in the model, a reasonable match to CO levels for both bark and coal+ bark firing was attained. Heat loss associated with the heat content of CO gas was ignored. Carbon loss from particles remaining on the grate and deposited into the stoker front hopper were also ignored, since operators will likely adjust undergrate airflows and bark distributors to minimize such losses.

## **4.2 Comparison Plots**

The flow distribution, lower furnace combustion and improved mixing for the retrofit design are clearly superior to the current operation. To provide a visual comparison of the baseline bark run 1 to the retrofit case with low excess air, case 5, a series of plots are presented in **Figs 4- 8**. An isosurface plot of velocity equal to 50 ft/s appears in **Fig. 4**. This contour level is just above the vertical velocity range inside the furnace, and highlights the penetration of jets with significant momentum and mixing energy. Inside these surfaces, the velocities increase up to the initial injection velocity, or up to 240 ft/s. For the baseline case, only a small zone of coverage by the sidewall jets can be detected. By contrast, the HMZ air jets spread over most of the cross section above the grate. The strong air jets provide turbulent mixing oxygen to the grate combustion zone for increased heat release in the lower furnace.

The vertical velocity distribution is compared in **Fig. 5**. In this figure, the vertical velocity zones in excess of 40 ft/s appear red. The added energy of the HMZ level drives entrainment of combustible gases leaving the stoker toward the front and rear walls. However, the jets also provide aerodynamic blockage, so the zones between the nozzles have velocities greater than the prescribed 40 ft/s level, while at the center the velocities is downward toward the stoker. By contrast, the current OFA system has insufficient impact on the lower furnace mixing, and a plume of velocity in the center remains untouched. The impact of the HMZ system on lower furnace temperatures is dramatic, as shown by the temperature distribution in **Fig. 6**. The mixing of combustibles with the overfire air accelerates the gas phase reactions and heat radiated to the bed compared to the base case, which has temperatures near the stoker that are several hundred degrees cooler. The baseline case has combustion delayed to the upper furnace, due to the suspension burning fraction and air provided by the tangential windboxes. The stratification of gas temperatures near the coal windboxes is due to the low injection velocities prescribed. It was assumed that the 109,000 lb/hr to the windbox was uniformly distributed to the 5 secondary elevations, with a nozzle velocity of 36 ft/s. The wide color range for this plot does not reveal the fact that the horizontal furnace outlet temperatures were 80F lower for the retrofit.

For the gas mixing distribution, the Oxygen distributions are shown in **Fig. 7**. The baseline case has high O<sub>2</sub> levels near the grate due to the delayed combustion compared to retrofit case. Even in the upper furnace, the baseline case shows significant oxygen stratification. In the low O<sub>2</sub> zones of the baseline case, entrained char particles will likely pass out of the furnace without fully burning, contributing to carbon loss. By contrast, run 4 has much lower O<sub>2</sub> levels in the upper furnace, with little variation below the nose. This improves the char burning efficiency and also the CO burnout,

as illustrated in **Fig. 8**. A limited range from 0 to 1,000 PPM was used which is appropriate for the upper furnace and backpass zone. In the lower furnace the CO levels are far in excess of the 1,000 PPM range. In the stoker zone the substoichiometric region can have CO levels of several percent CO, or more. A higher range was used for the detailed plots for each case that appear later in this report. In the upper furnace CO levels are significantly lower for run 4 compared to the baseline case.

In addition to the bark comparison illustrated by these figures, the coal and bark comparison is important. Each of the runs is described in more detail after the modeling approach section. The figures for each of these cases are included in a separate PowerPoint file.

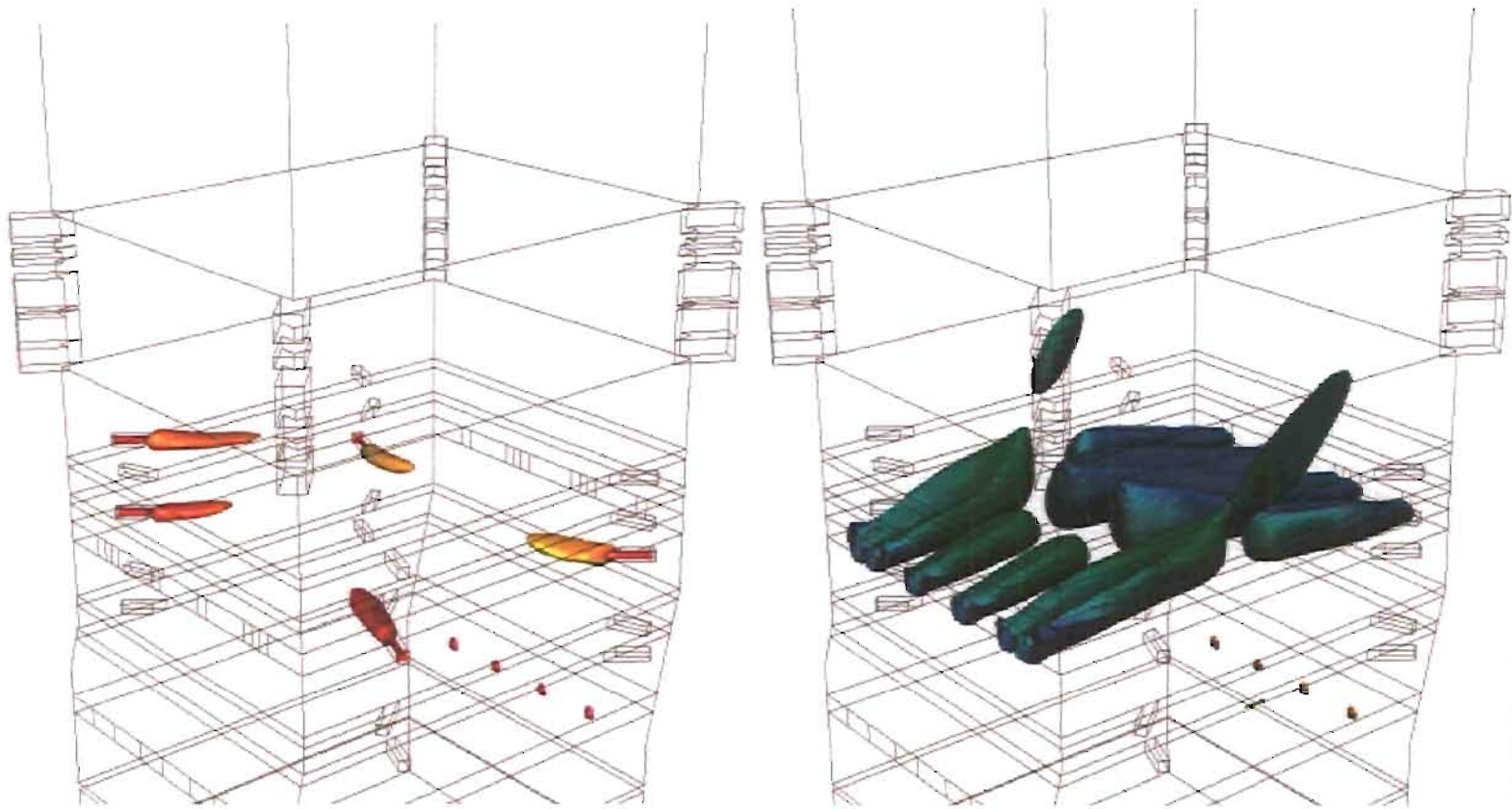
The results for the co-fired Cases 2, 4, and 7 are also important, because coal is frequently used at this unit. While increased bark firing may be possible in the future, the performance of the unit with coal as predicted by the CFD model is discussed here briefly. For the baseline Case 2 with coal, it was noted that the upper furnace combustion levels increase dramatically. The impact on the furnace performance with coal is significant. With coal acting as a significant fuel source, the performance improvement contributed by the HMZ bark OFA system change is relatively modest. However the carbon loss for Case 4 did decrease compared to Case 2. In fact, run 4 had the lowest carbon loss of all 8 runs. The combination of higher gas temperatures with coal, with improved mixing to burn the bark lower due to the HMZ and reduced infiltration all contribute to improved combustion. CO levels are significantly lower for all cases where coal is fired.

**Table 2. Summary of Inputs and Results**

Table 2 Summary of Inputs and Results		Baseline		Retrofit		Retrofit, low excess air			
		bark	bark & coal	bark	bark & coal	bark	max. bark	bark & coal	50% moisture bark & coal
INPUTS:	Case #	1	2	3	4	5	6	7	8
Steam Flow	Lbs/hr	138,000	267,000	138,000	267,000	138,000	221,000	300,000	300,000
Wood Steam Flow	Lbs/hr	138,000	85,000	138,000	84,500	138,000	221,000	180,000	180,000
Coal Steam Flow	Lbs/hr	0	182,000	0	182,500	0	0	120,000	120,000
Bark Fuel Flow	Lbs/hr	45,150	26,600	45,150	26,380	45,150	69,720	56,770	65,200
Bark Moist. Content	% m.c.	39.5	39.5	39.5	39.5	39.5	39.5	39.5	50.0
Coal Fuel Flow	Lbs/hr	0	22,000	0	22,000	0	0	14,625	13,720
Total Combustion Air	Lbs/hr	354,150	388,650	354,150	379,500	252,100	382,420	442,400	439,000
Total Burner Air	Lbs/hr	109,000	168,000	24,000	239,100	24,000	24,000	158,900	171,000
UGA + OFA	Lbs/hr	203,000	179,000	330,150	121,400	228,100	358,420	261,400	246,050
UGA	Lbs/hr	174,670	150,670	144,375	46,530	107,400	138,530	109,530	114,925
OFA	Lbs/hr	20,230	20,230	165,075	66,770	100,000	192,670	143,770	123,025
OFA / UGA split	% / %	10 / 90	10 / 90	50 / 50	55 / 45	44 / 56	55 / 45	55 / 45	50 / 50
Cinder Reinjection Air	Lbs/hr	8,100	8,100	8,100	8,100	8,100	8,100	8,100	8,100
Coal Transport Air	Lbs/hr	0	41,000	0	36,000	0	0	36,000	36,000
Leakage Air	Lbs/hr	42,150	41,650	12,600	19,000	12,600	19,120	22,100	21,950
Gross Heat Input	MBtu/hr	235.9	401.1	235.9	401.1	235.9	369.2	474.7	488.1
Grate Heat Rate	Btu/hr-ft <sup>2</sup>	776,650	452,400	776,650	454,100	776,650	1,200,000	976,900	1,012,000
RESULTS:		1	2	3	5	4	6	7	8
CO at exit of ECON	ppm, dry	1,430	270	575	314	986	1,234	500	302
CO at exit of ECON	Lbs/Mbtu	2.05	0.25	0.83	0.28	1.01	1.23	0.44	0.25
O2 at exit of ECON	%, dry	10.4	3.9	10.3	3.3	5.8	5.9	3.9	6.2
O2 at nose of arch	%, dry	10.8	4.6	10.4	3.9	6.0	6.3	4.4	6.8
Avg. Temperature at arch	F	1,670	2,268	1,541	2,219	1,590	1,825	2,134	2,023
Carbon Loss	%	3.4	1.0	1.7	0.3	1.6	4.2	3.3	2.6
% Loss (Heat Input Basis)	%	1.7	0.6	0.9	0.2	0.8	2.1	1.9	1.3

## Comparison Iso-Surface of Velocity = 50 fps

Oxygen  
%dry



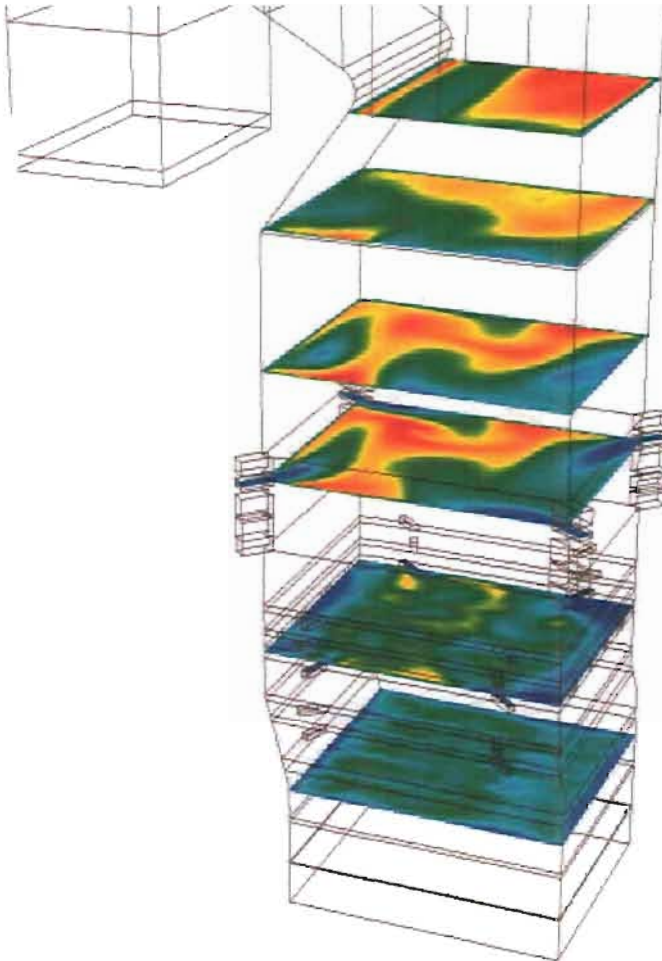
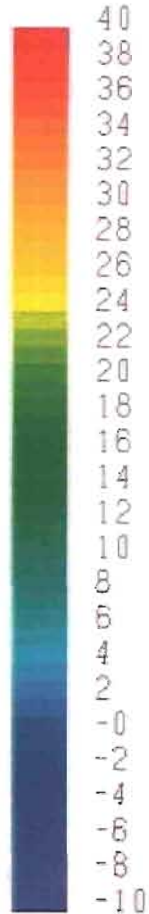
**Baseline Case 1**

**Retro - Case 5**

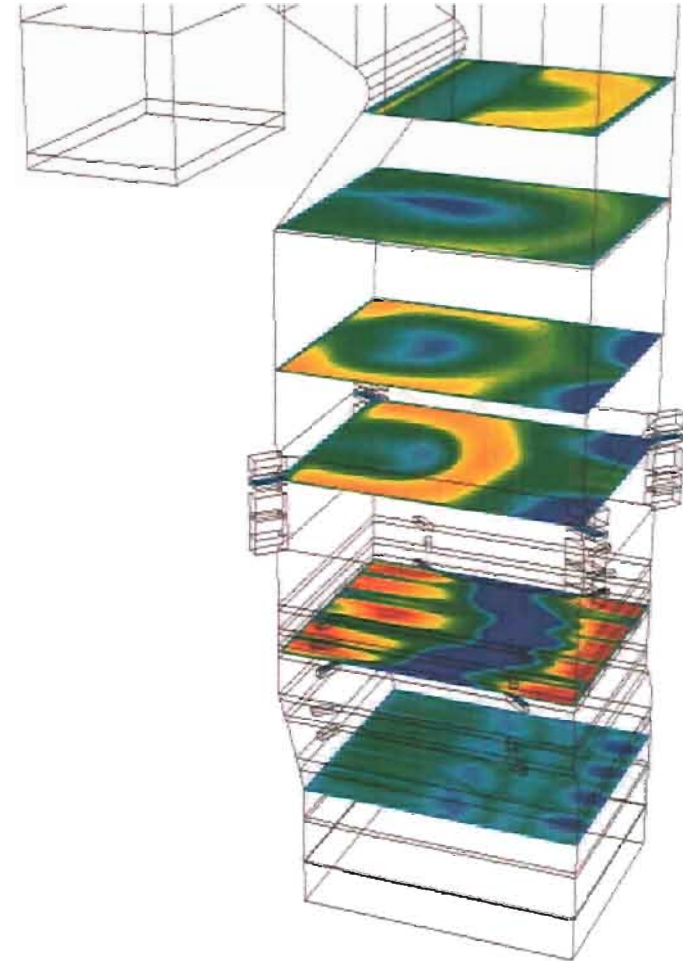
**Fig. 4 Iso-surface of Velocity – 50 ft/s**

## Comparison: Vertical Velocity Distribution

Vertical Velocity  
ft/s



**Baseline Case 1**



**Retro - Case 5**

**Fig. 5 Vertical Velocity Distribution at Horizontal Planes**

# Comparison: Temperature Distribution

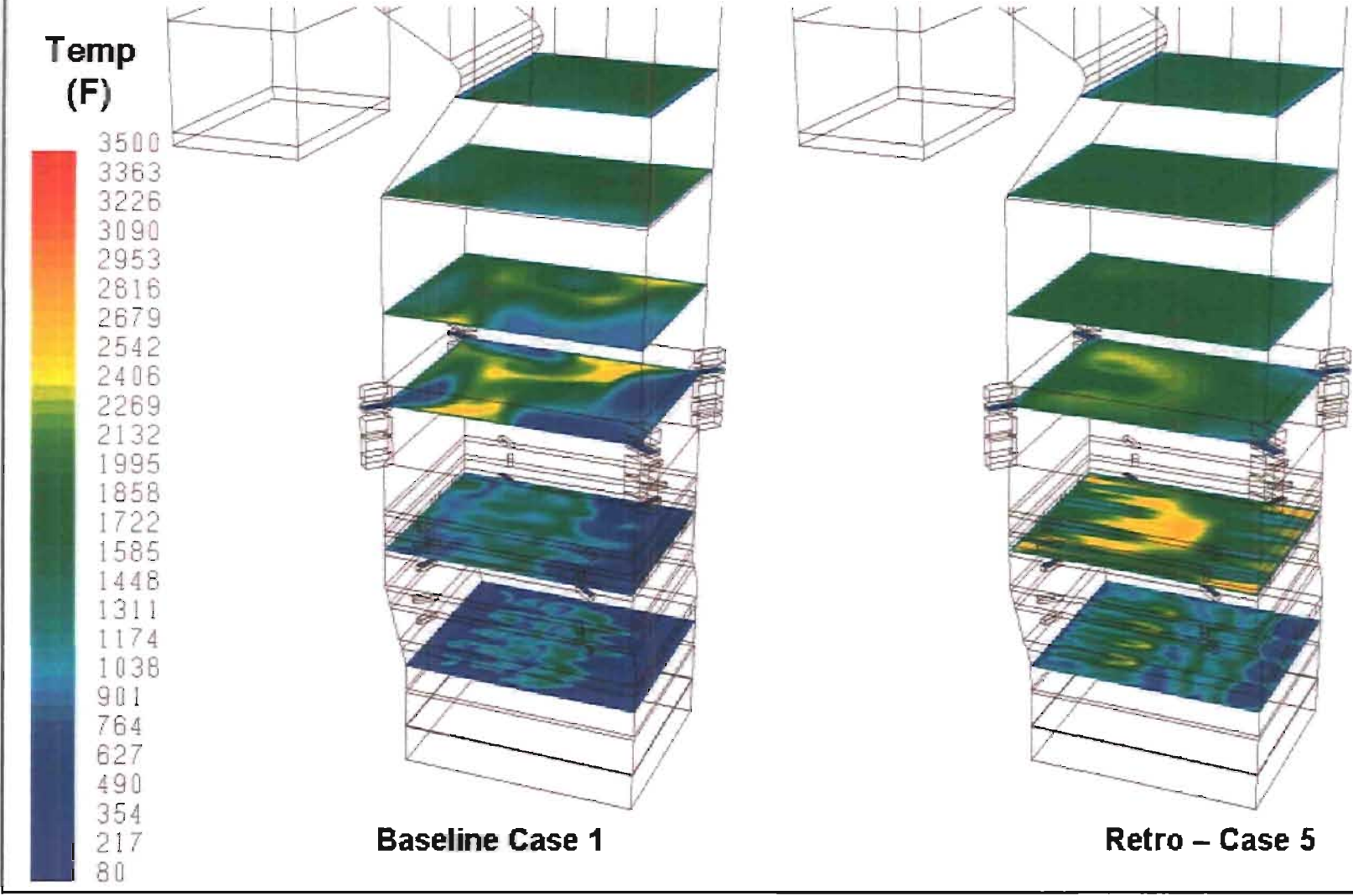
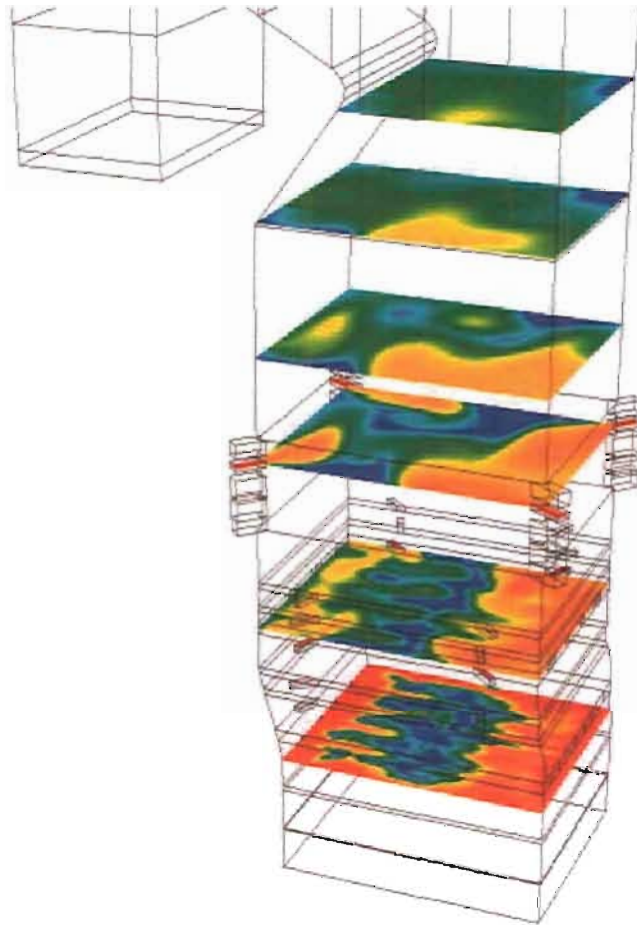


Fig. 6 Temperature Distribution at Horizontal Planes

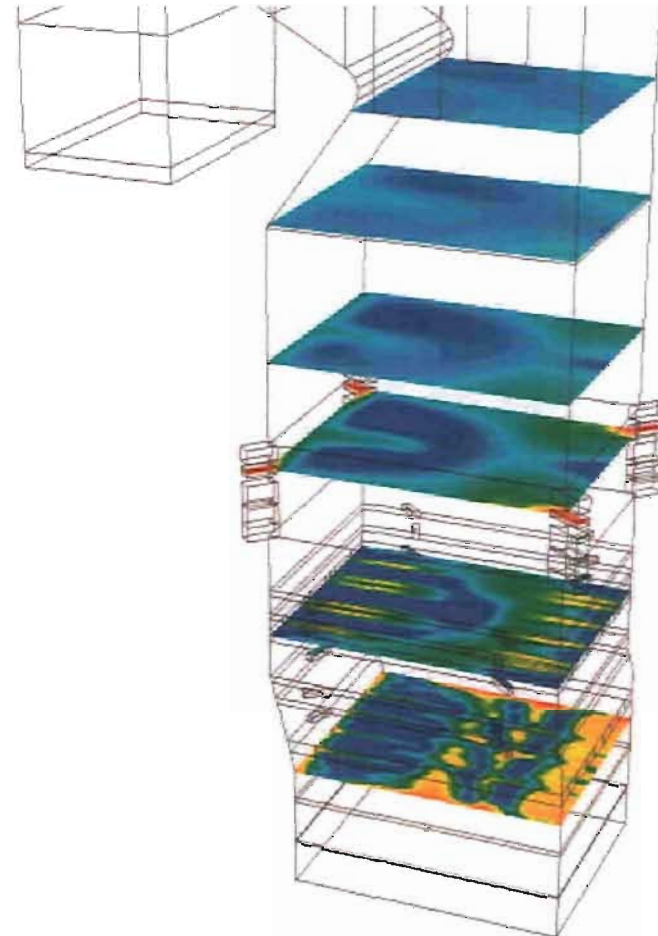


## Comparison: Planar O<sub>2</sub> Distribution

Oxygen  
%, dry



**Baseline Case 1**



**Retro - Case 5**

**Fig. 7 O<sub>2</sub> Distribution at Horizontal Planes**

## Comparison: Planar CO Distribution

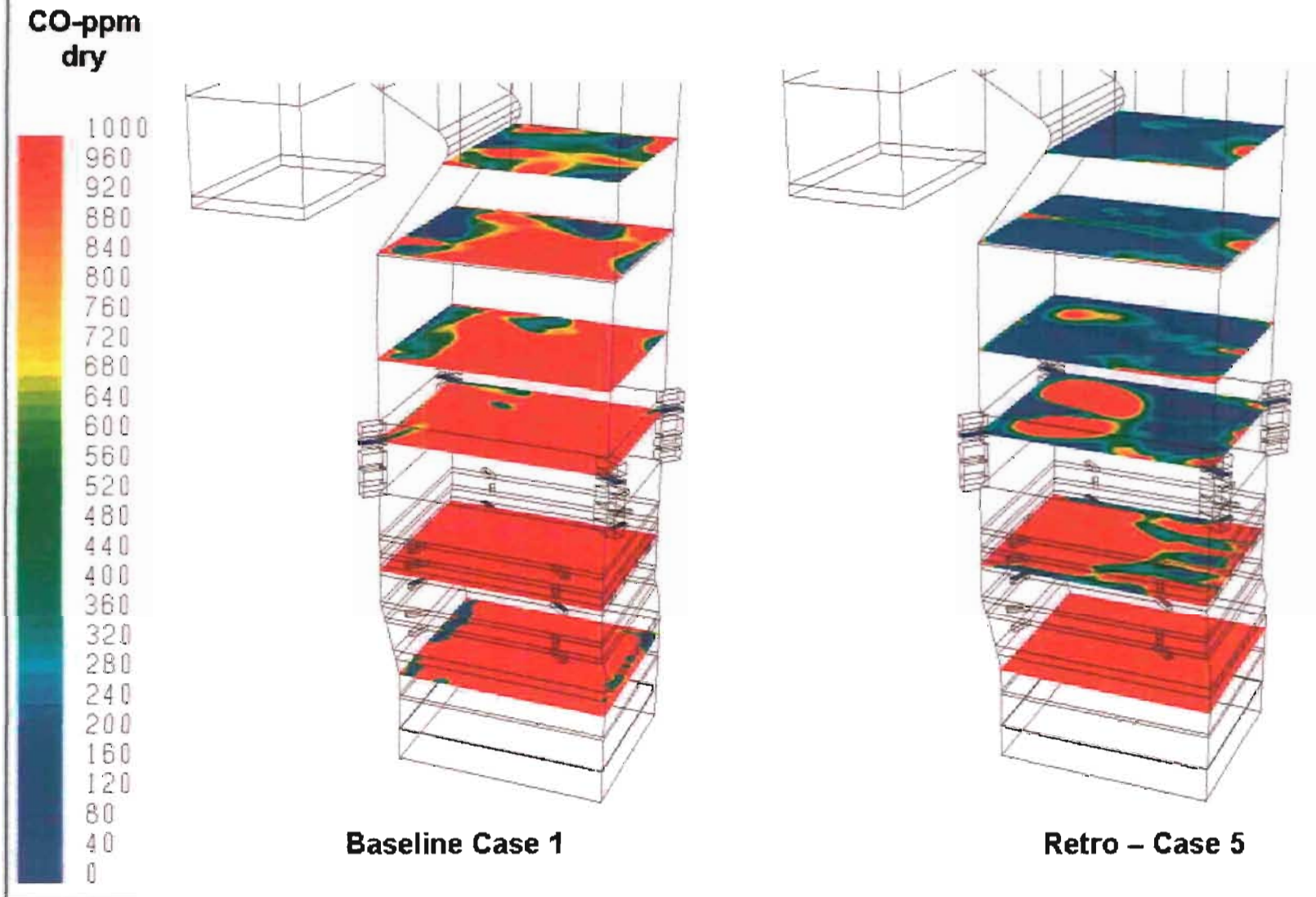


Fig. 8 CO Distribution at Horizontal Planes

## 5.0 MODELING APPROACH

The proposed retrofit air system will feature a front and rear wall Horizontal Mixing Zone (HMZ) design. The current 5 level sidewall air system nozzles will no longer be used. In addition, a fabric stoker seal will be installed to reduce the infiltration into the furnace and increase boiler efficiency. In conjunction with Performance Engineering calculations and design standards, some assumptions were required to estimate infiltration or tramp air quantities for the current and retrofit conditions. It is anticipated that the boiler will operate at lower excess air levels after the grate leakage air is reduced. The CFD modeling revealed some interesting effects of the current tangential burner air level, which will still be used to some degree, with or without coal firing.

The CFD modeling was performed using the commercially licensed CFD software FLUENT. The standard code was modified to represent the specific combustion characteristics of bark on moving grate stokers. The approach to the customization of FLUENT for this purpose has been previously described<sup>[2]</sup>. This report describes the modeling approach, model inputs, and predicted results for the modeled cases, with an emphasis on the bark firing mode before and after retrofit. Plots included in a companion PowerPoint presentation illustrate the flow distribution, species, and temperature profiles for each case. In addition, unburned carbon levels were predicted for the different cases.

Combustion of bark on a traveling grate is a dynamic process. Boiler operators constantly monitor the combustion characteristics while combustion controls tune air and fuel feeders to maintain steam flows as conditions change. Maintaining constant operation for stoker fired bark boilers is indeed challenging. From a boiler design perspective, simulation of this process using Computational Fluid Dynamics (CFD) presents challenges. The goal of simulating the boiler requires specification of all the air streams entering the furnace, along with the task of representing combustion on the stoker. A quasi steady-state approximation of the bark combustion process is used for the fuel, while a steady-state solution of the velocities and temperatures at each control volume in the modeled region is solved numerically. Bark particles of different diameters are injected with a random component to the trajectories. Next, the gas phase reactions and flow variables are recalculated for the updated fuel trajectories. The process alternates until a reasonably constant result is determined. For the gas-phase combustion, volatile species are allowed to burn using a global two-step reaction scheme. The gas phase reactions contribute to the overall heat release, along with the solid phase char burning that contributes to the CO pool for the gas phase combustion reactions. Gas radiation is modeled using the Discrete Ordinates

method. The intensity function is solved over a finite number of directions at each cell in the domain. The radiation calculations include heat extraction to the waterwall and convective surfaces.

FLUENT includes the physical models that are defined to represent the described gas phase and particle combustion submodels. However, customization of the particle models for a moving grate process is used. Custom code was developed for this application and supplements the basic FLUENT framework to better handle the in-flight and grates burning process. Bark and coal particles are treated individually. Bark particles are injected from the distributors and can burn in suspension or on the grate surface. Particles pass through drying, devolatilization and char burning phases with rates depending on local temperatures and gas compositions. Larger particles tend to land close to the rear wall while smaller particles tend to land closer to the center of the grate. The CFD simulation takes this into account by spreading out bark particles according to their sizes. Depending on the local velocities on the grate, a particle may be retained on the surface or escape and continue burning in-flight. Particles escaping with residual carbon are tabulated. In addition, some particles may move all the way to the front ash hopper with remaining combustibles. The total mass for the entrained carryover particles is reported as combustion performance indicator.

The specific bark properties are used for each simulation. Bark samples taken during August testing by ALSTOM, were sent to ALSTOM's Power Plant Lab (PPL) and analyzed. The analysis included chemical analysis, proximate analysis and sieve screening for aerodynamic characteristics defined in the CFD model. In this manner the model is representative of the snapshot for the testing period. The bark analysis is tabulated in this report. In addition to the bark sample analyzed by PPL, a different bark sample analyzed by Columbia Analytical Lab was modeled in Case 8 for comparison purposes.

For the CFD modeling the bark was partitioned into a range of particle sizes. For this study, we used 8 particle size groups. Particles are retained in a burning layer just above the stoker surface, and migrate from back to front based on the stoker grate speed. An example of the particle trajectories for this study (Case 5) is shown in **Fig. 9**. The colors represent the burning state, with red particles still containing char. After the particles are completely combusted the track is not shown for clarity. From this plot it can be seen that the front wall OFA nozzles entrain some of the smaller particles. Three size groups are shown together in this plot, the small, medium and largest fractions. The larger particles land on the grate and may escape and burn in suspension, or be retained for their entire burn on the grate.

In calibrating the baseline bark case, the airflow distribution was defined using the PI-data, testing logs and some assumptions on the infiltration. The outlet gas O<sub>2</sub> and CO concentrations were measured. Tuning of the baseline case included refinement of the bark entrainment characteristics to match the measured CO levels. Once set for the baseline case, all combustion model settings related to bark and coal burning characteristics were retained for the remainder of the runs. Thus, the predictions were tuned to a baseline case for which data was available, and the other cases extrapolate from the baseline. Relative trends and patterns generated by the CFD model provide engineering with useful information on the relative performance of the baseline system to the retrofit performance.



**Fig. 9 Bark Particle burning trajectories colored by state**

## 6.0 Case by Case Results

Section 4.2 provided a specific comparison of the baseline to the retrofit air system firing bark. Other operating conditions such as co-firing coal with bark, increased load, and lower excess air levels were also simulated. The results for these runs are included in this section on a case-by-case basis. A general description of each case and the key features of each are described. For each run velocity isosurface and pathlines are included along with the velocity, temperature, and species distributions. For reference, these figures and the associated case are:

- Case 1. Figures 7 - 10
- Case 2. Figures 11 - 14
- Case 3. Figures 15 - 18
- Case 4. Figures 19 - 22
- Case 5. Figures 23 - 26
- Case 6. Figures 27 - 30
- Case 7. Figures 31 - 34
- Case 8. Figures 35 - 38

### Case 1. Baseline Bark Firing:

For the existing system burning bark only with 12% leakage, the current sidewall OFA system has high carbon loss and CO emissions. Near the grate, ambient air infiltration (tramp air) results in cooler temperatures around the edge of the stoker. This flow acts to sweep some of the bark away from the edges and delay drying and ignition, so that the cooling effect is mostly due to bark redistribution than temperature effects. This results in more concentrated bark combustion near the center, and stratification. This stratification initiated at the grate persists into the upper furnace. Entrainment of burning particles in this center zone increases the suspension burning level, and increases the carbon loss and CO at the outlet. The windbox air injection velocities are too low with our assumption of the dampers open. A slight bulk rotation of the gases due to the tangential level causes the high O<sub>2</sub> zone to shift from the front wall lower in the furnace to the left wall at the arch.

### Case 2. Baseline Bark and Coal:

The run was based on field tests that had lower excess air levels. To represent this case, the bark flow was reduced from 45,150 to 26,600 lb/hr and the coal firing rate was 22,000 lb/hr. With coal firing, the center zone of the furnace was much hotter, with the support fuel contributing to higher bark combustion rates. As a result, the outlet CO levels were much lower. The CFD model was able to reproduce the field data reasonably well. It is assumed that the mill would prefer to attain

higher bark firing rates without relying on coal, however it was clear that firing coal was beneficial to increasing bark combustion rates even at the grate level. The temperature plots show the impact of coal firing. The O<sub>2</sub> distribution plots illustrate the impact of co-firing on the O<sub>2</sub> distribution, which is low in the center of the furnace.

#### Case 3. Retrofit HMZ Bark:

This case is a comparison of the baseline bark to the retrofit design at high excess air levels. The impact of the air system change with reduced leakage is highlighted. With the stoker leakage and undergrate air reduced, temperatures in the lower furnace are significantly higher than the baseline. The mixing of the HMZ nozzles accelerates the combustion and burnout. With high excess air levels, the CO emissions were reduced from 1,430 to 575 PPM. Carbon loss levels were also reduced.

#### Case 4. Retrofit HMZ Bark and Coal:

This case represents the HMZ system running at 3.3% outlet O<sub>2</sub>. Operation data for this condition was not available, but is believed to be a reasonable coal and bark comparison from the baseline to the new system. With lower excess air and coal firing, the upper furnace temperatures are higher than the bark case, increasing the carbon burning rates. The hot zone in the center contrasts with cases firing bark alone. The overall change in bark combustion performance for this case relative to the baseline case 2 was muted because coal was the predominant fuel fired. Bark impacts were relatively minor to the overall emissions. With coal firing the windbox velocities are increased, providing additional mixing benefit. This can be seen in the OFA tracer pathline plot and velocity isosurfaces.

#### Case 5. Retrofit HMZ Bark with Low Excess Air:

The case highlights the impact of running the HMZ design with lower excess air. The low excess air condition is likely to be the preferred operating mode with the revised air system and stoker seal. Note that the figures for this run are included and described relative to the baseline case in the earlier summary comparison.

#### Case 6. Retrofit HMZ Maximum Bark with Low Excess Air:

This case is similar to case 3 with bark feed rate increased and lower excess air. The nozzles were set with all of the nozzles associated with the “doubles” set fully-open, while the small nozzles were



75% open. This combination allowed the HMZ velocities to be nearly uniform, at the design velocity. The performance of the unit with maximum bark may require careful attention to the bark distribution on the grate by tuning the feeder speed and undergrate air distribution to attain best performance. With tuning of the bark injection to spread the fuel uniformly, the predicted O<sub>2</sub> distribution in the upper furnace was quite good. The CO emissions were slightly lower than case 1 at lower load and higher O<sub>2</sub>. It was noted that the exit CO levels were higher than at the arch due to entrained particulates giving off CO in the convective section that was not fully oxidized. The predictions by the CFD model are again relative to the baseline calibration.

#### Case 7 Retrofit HMZ Bark and Coal with Low Excess Air:

This case represents an increased load relative to the tested conditions and yielded reasonable results at increased firing rates. As seen by the earlier runs, the benefits of firing coal with bark contribute to a performance improvement at the same load. With coal firing, the furnace zone is significantly hotter than with bark alone. These hotter temperatures are projected to the grate, for increased combustion rates. Elimination of the stoker leakage around the perimeter was also beneficial. However, as the firing rate increases linearly, the carryover rates increase would be expected to increase on a second order progression.

#### Case 8 Retrofit HMZ Bark and Coal with Low Excess Air:

This case is similar to case 7 except higher moisture bark, Columbia Analytical Analysis, was fired with slightly less coal. With this combination, the outlet O<sub>2</sub> levels were higher, resulting in lower CO levels and improved carbon burnout. This higher moisture bark case was run to compare the results with Case 7 that was run with the sample taken during the August testing.

## 7.0 CONCLUSIONS

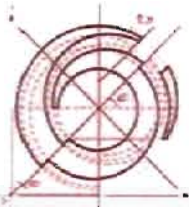
A CFD evaluation of the current operation and retrofit HMZ air system for Smurfit Stone Container - Panama City unit #4 was conducted. Using the baseline testing as a guide to setting up the current operation, a range of future operating conditions was simulated. Based on this study, several benefits were observed. In addition to the HMZ air system itself, several air system operation characteristics were found to be important. From this study we conclude:

1. Replacing the existing sidewall OFA system with a front and rear HMZ OFA system, as modeled provides significantly improved lower furnace mixing, lower carbon loss, and higher gas temperatures near the grate for the same firing rate. Compared to the baseline case, the flow patterns generated with HMZ system is expected to provide a significant improvement in bark burning.
2. Tuning of the HMZ nozzle dampers to provide an OFA/UGA split of 55/45 improved the performance of the system at peak loads. Increased bark firing at lower excess air levels compared to the current operation yielded lower CO levels with only slightly higher carbon loss.
3. The impact of stoker infiltration associated with the installation of a fabric-filter-seal provided an improvement to the grate combustion, and improved the burning performance. The stoker leakage reduction could not be accurately measured for modeling purposes. With the combination of reduced level of furnace air infiltration and the HMZ air system, a significant combustion performance improvement was predicted for the tested load conditions.
4. At increased bark firing rates, carryover rates, as expected, increase. However with careful tuning of the grate combustion the increase may be more modest than the relative model trends due to the assumptions made for the baseline grate combustion distribution. A comparison of carbon loss results as shown in the baseline Case 1, prorated to the higher design bark firing rates at increased boiler load, to the Max. Bark Case 6, predicts a drop in carbon loss and associated carryover on an equivalent throughput basis.
5. With coal firing added to the bark combustion, increased upper furnace gas temperatures and higher temperature near the grate were predicted. For wet bark conditions, the use of coal firing to improve grate combustion may still be important. With coal firing, the boiler can operate at significantly lower excess air levels with lower CO emissions due to the increased combustion rates.

## **8.0 References**

[1] Steven Gibowski “Smurfit Stone Container Corp. Panama City, FL #4 Bark Boiler Testing, August 11<sup>th</sup>, 2005”, ALSTOM Internal Report, August 19, 2005.

[2] P.J. Chapman, S. Morrison, “Biomass Boiler CFD Modeling and Design Validation”, TAPPI Engineering and Finishing Conf, San Antonio, TX, Dec 2001.

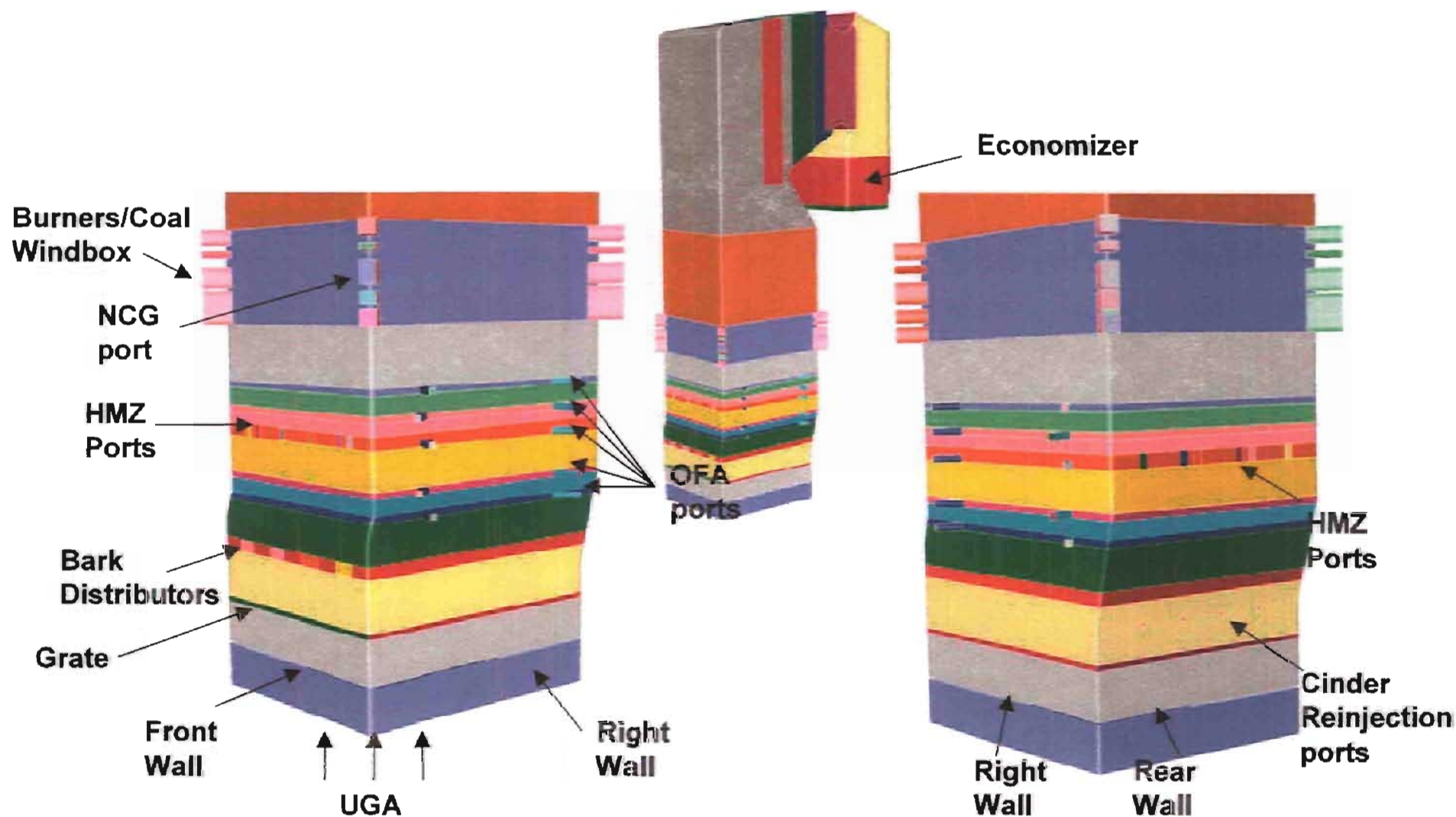


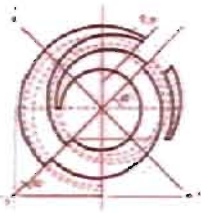
# CFD Model

Figure 1



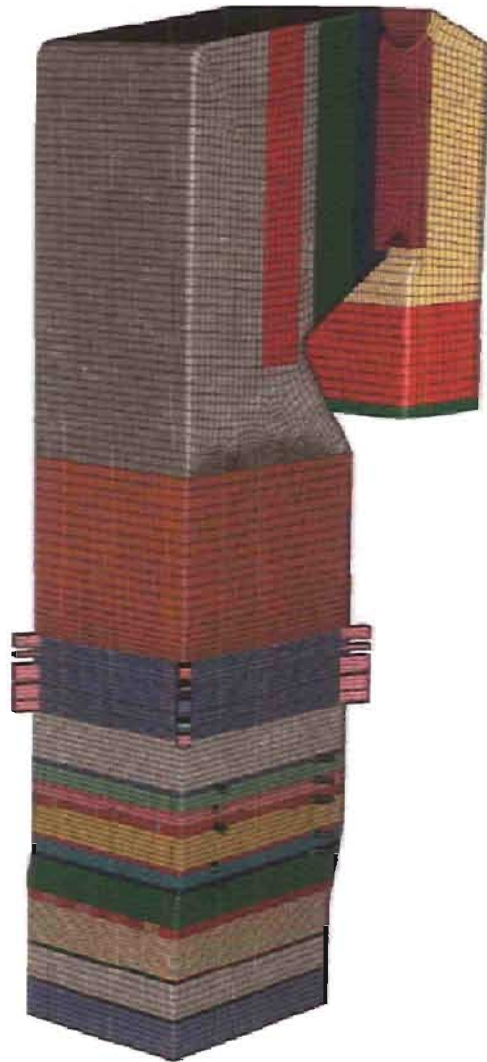
## Single Model for Simulating Both Existing and HMZ OFA Systems



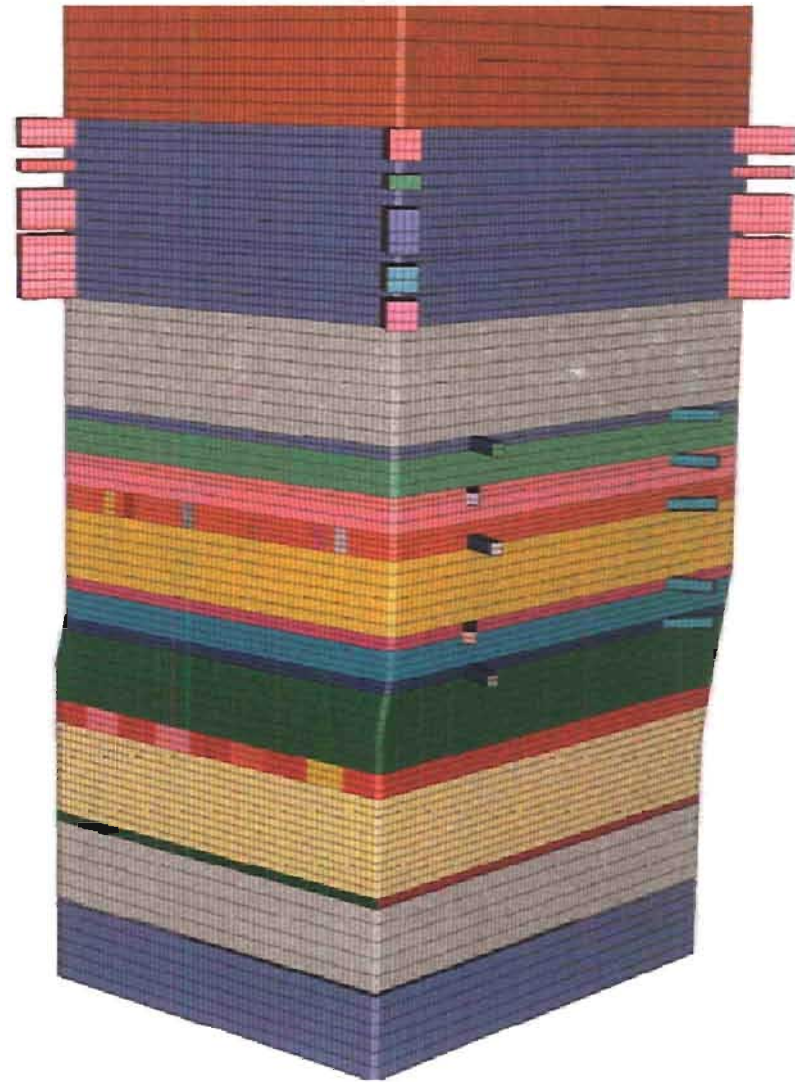


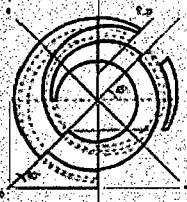
# CFD Mesh

Figure 2



720,000 Cells





## Cases Simulated

**ALSTOM**

**Case 1: Existing OFA, Bark Only**

**Case 2: Existing OFA, Bark & Coal**

**Case 3: HMZ OFA, Bark Only**

**Case 4: HMZ OFA, Bark & Coal**

**Case 5: HMZ OFA, Bark Only, Low Excess Air**

**Case 6: HMZ OFA, Max. Bark, Low Excess Air**

**Case 7: HMZ OFA, Max. Bark & Coal, Low Excess Air**

**Case 8: Same as Case 7 Except with 50% Moisture Bark**

**Note: All cases are with 39.5% moisture bark except Case 8**

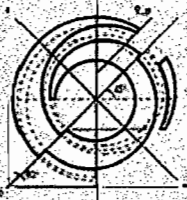
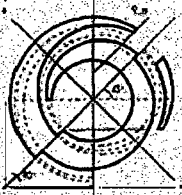


Figure 4

# Flow Conditions



		Baseline		Retrofit		Retrofit, low excess air			
		bark	bark & coal	bark	bark & coal	bark	max. bark	bark & coal	50% moisture bark & coal
INPUTS:	Case #	1	2	3	4	5	6	7	8
Steam Flow	Lbs/hr	138,000	267,000	138,000	267,000	138,000	221,000	300,000	300,000
Wood Steam Flow	Lbs/hr	138,000	85,000	138,000	84,500	138,000	221,000	180,000	180,000
Coal Steam Flow	Lbs/hr	0	182,000	0	182,500	0	0	120,000	120,000
Bark Fuel Flow	Lbs/hr	45,150	26,600	45,150	26,380	45,150	69,720	56,770	65,200
Bark Moist. Content	% m.c.	39.5	39.5	39.5	39.5	39.5	39.5	39.5	50.0
Coal Fuel Flow	Lbs/hr	0	22,000	0	22,000	0	0	14,625	13,720
Total Combustion Air	Lbs/hr	354,150	388,650	354,150	379,500	252,100	382,420	442,400	439,000
Total Burner Air	Lbs/hr	109,000	168,000	24,000	239,100	24,000	24,000	158,900	171,000
UGA + OFA	Lbs/hr	203,000	179,000	330,150	121,400	228,100	358,420	261,400	246,050
UGA	Lbs/hr	174,670	150,670	144,375	46,530	107,400	138,530	109,530	114,925
OFA	Lbs/hr	20,230	20,230	165,075	66,770	100,000	192,670	143,770	123,025
OFA / UGA split	% / %	10 / 90	10 / 90	50 / 50	55 / 45	44 / 56	55 / 45	55 / 45	50 / 50
Cinder Reinjection Air	Lbs/hr	8,100	8,100	8,100	8,100	8,100	8,100	8,100	8,100
Coal Transport Air	Lbs/hr	0	41,000	0	36,000	0	0	36,000	36,000
Leakage Air	Lbs/hr	42,150	41,650	12,600	19,000	12,600	19,120	22,100	21,950
Gross Heat Input	MBtu/hr	235.9	401.1	235.9	401.1	235.9	369.2	474.7	488.1
Grate Heat Rate	Btu/hr-ft <sup>2</sup>	776,650	452,400	776,650	454,100	776,650	1,200,000	976,900	1,012,000

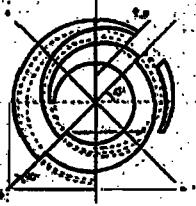


# Fuel Compositions

**ALSTOM**

Fuel for Cases 1 - 7			Fuel for Case 8		
	Bark	Coal		Bark	Coal
%H <sub>2</sub> O	39.5	9.2	%H <sub>2</sub> O	50	5
%C	31.07	66.18	%C	25.98	72.33
%H	3.42	4.39	%H	2.92	6.17
%S	0.01	1.11	%S	0.01	0.67
%N	0.15	1.34	%N	0.02	1.55
%O	22.79	6.85	%O	20.78	6.89
%Ash	3.06	10.93	%Ash	0.29	7.39
HHV (BTU/lb)	5296	11906	HHV (BTU/lb)	4774	12888



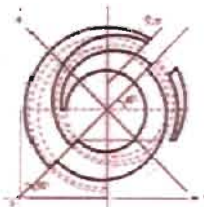


# CFD Results Summary

Figure 6

# ALSTOM

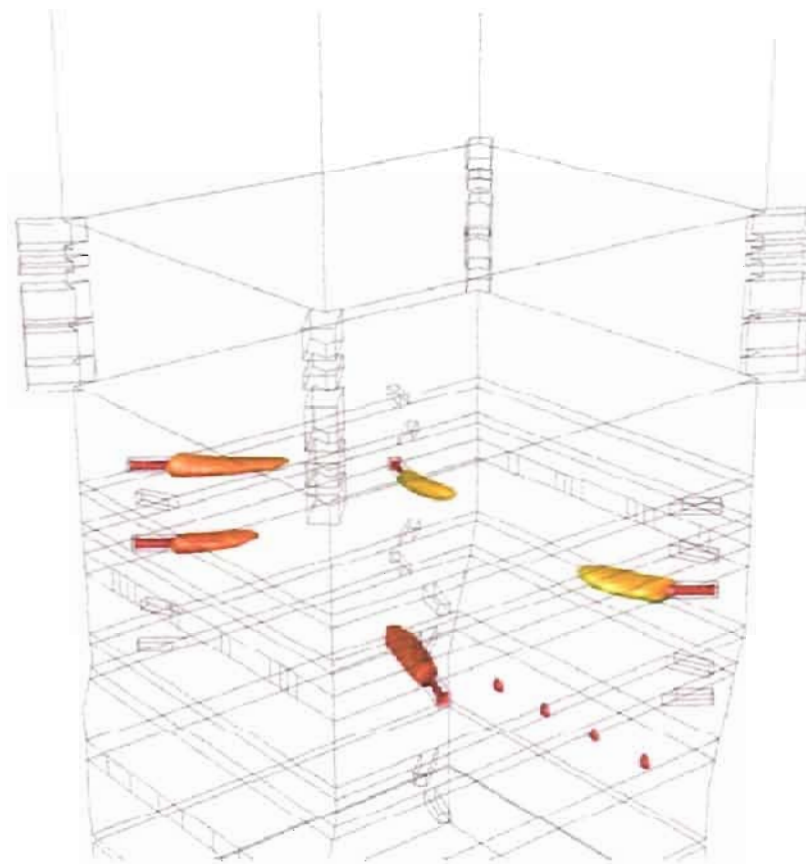
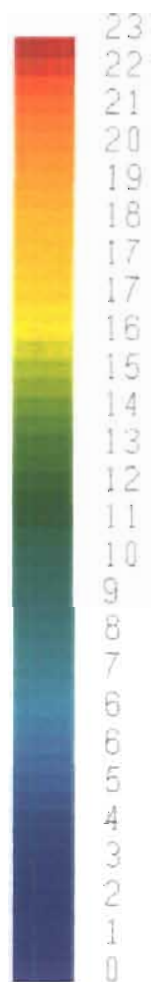
		existing		retrofit		retrofit, low excess air			
		bark	bark & coal	bark	bark & coal	bark	max. bark	bark & coal	50% moisture bark & coal
	Case #	1	2	3	4	5	6	7	8
CO at exit of ECON	ppm, dry	1,430	270	575	314	986	1,234	500	302
CO at exit of ECON	Lbs/Mbtu	2.05	0.25	0.83	0.28	1.01	1.23	0.44	0.25
O2 at exit of ECON	%, dry	10.4	3.9	10.3	3.3	5.8	5.9	3.9	6.2
O2 at nose of arch	%, dry	10.8	4.6	10.4	3.9	6.0	6.3	4.4	6.8
Average Temperature at nose of arch	F	1,670	2,268	1,541	2,219	1,590	1,825	2,134	2,023
Carbon Loss	%	3.4	1.0	1.7	0.3	1.6	4.2	3.3	2.6
% Carbon Loss on Heat Input Basis	%	1.7	0.6	0.9	0.2	0.8	2.1	1.9	1.3



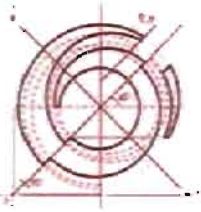
# Iso-Surface of Velocity = 50 fps



Oxygen  
%dry



Case 1

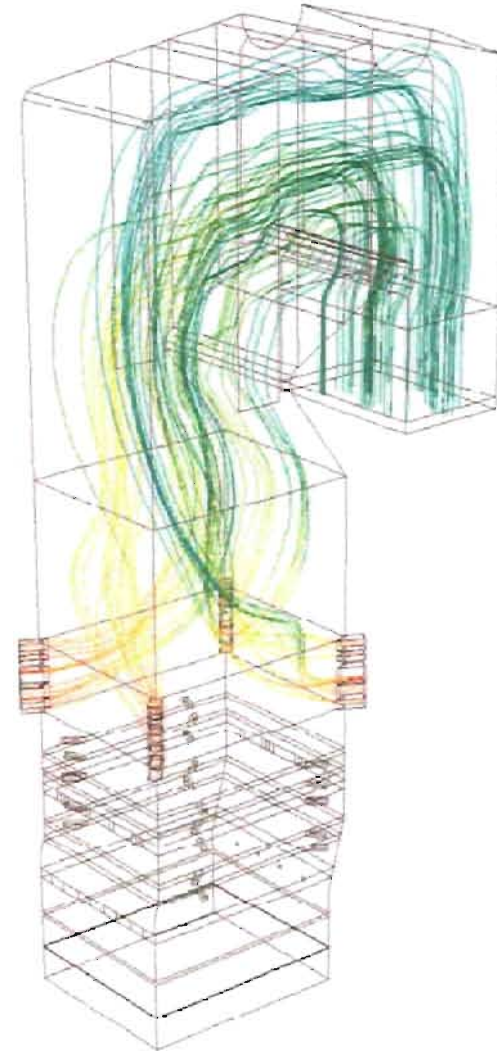
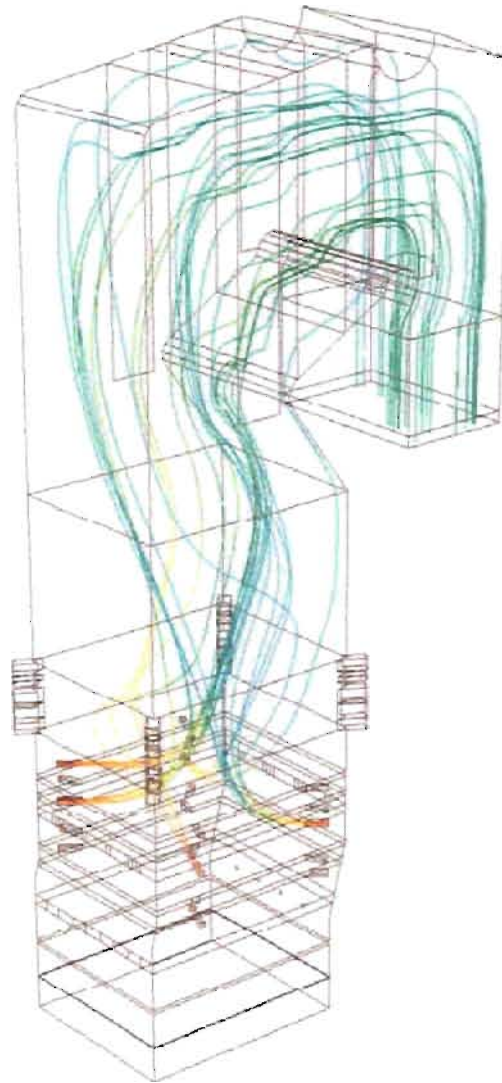


# Gas Path Lines

Figure 8



Oxygen  
%dry

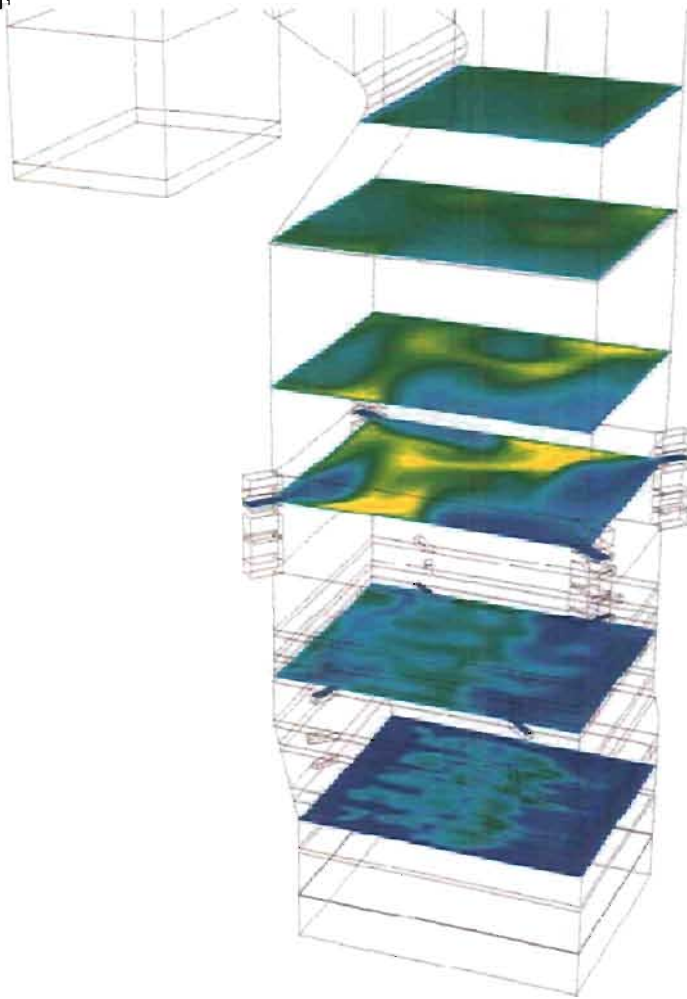


Case 1



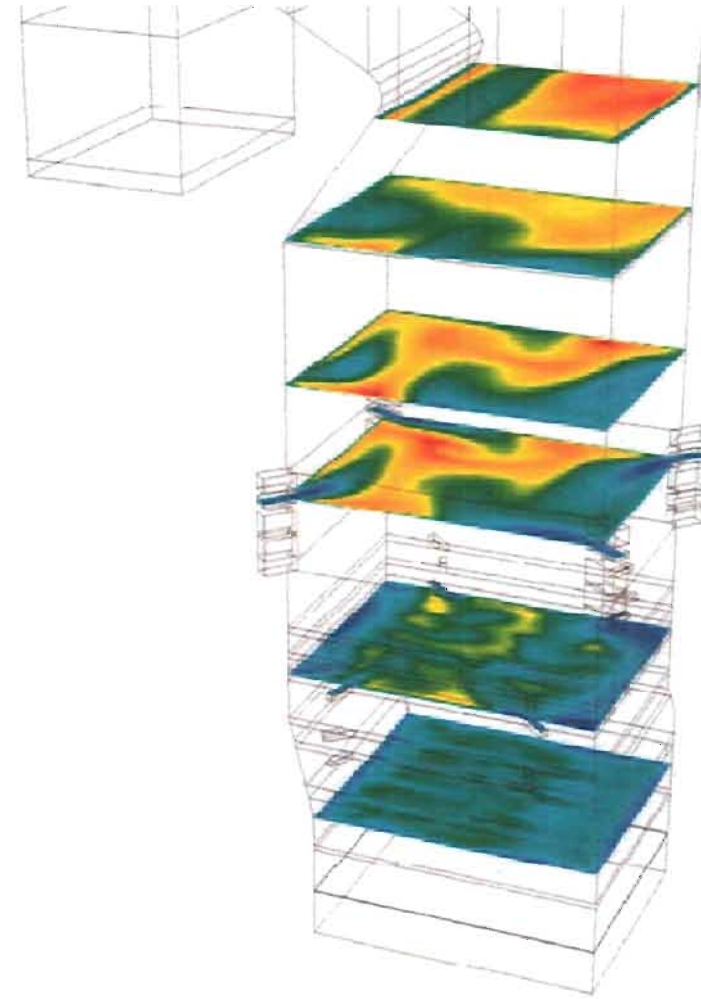
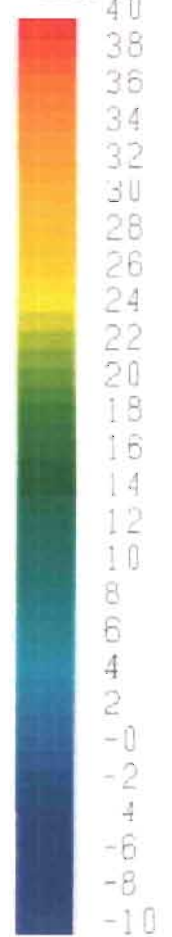
# Temperature & Velocity Contours **ALSTOM**

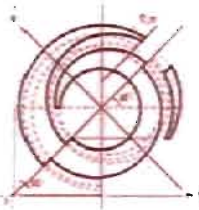
Temp, F



Case 1

Vertical Velocity  
ft/s

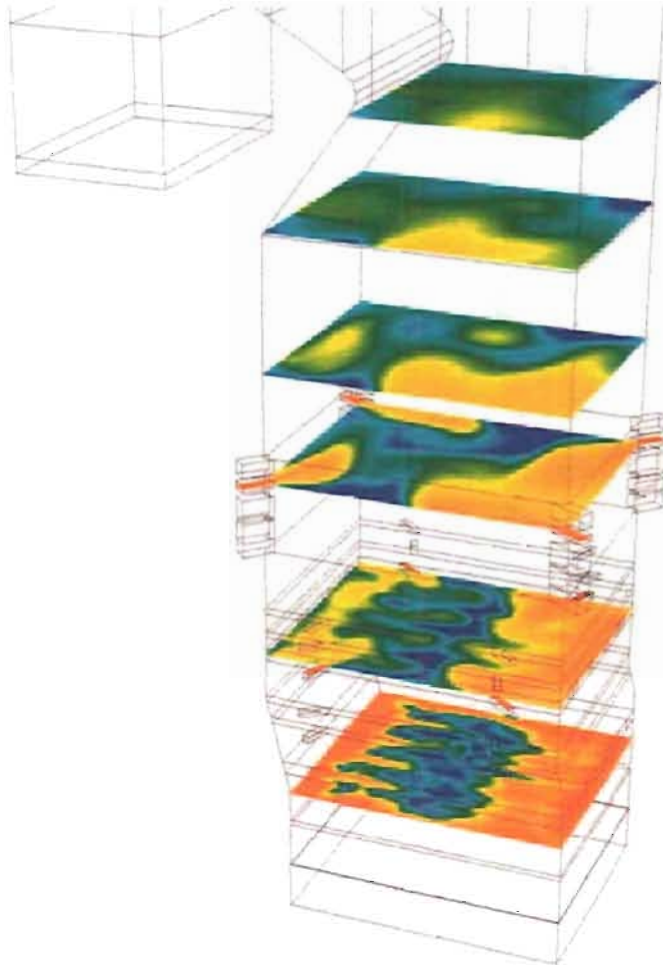




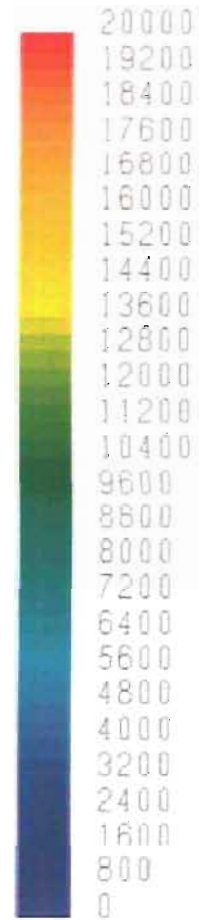
# O<sub>2</sub> & CO Concentrations



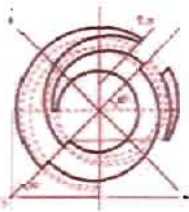
Oxygen  
%dry



Co-ppm  
dry



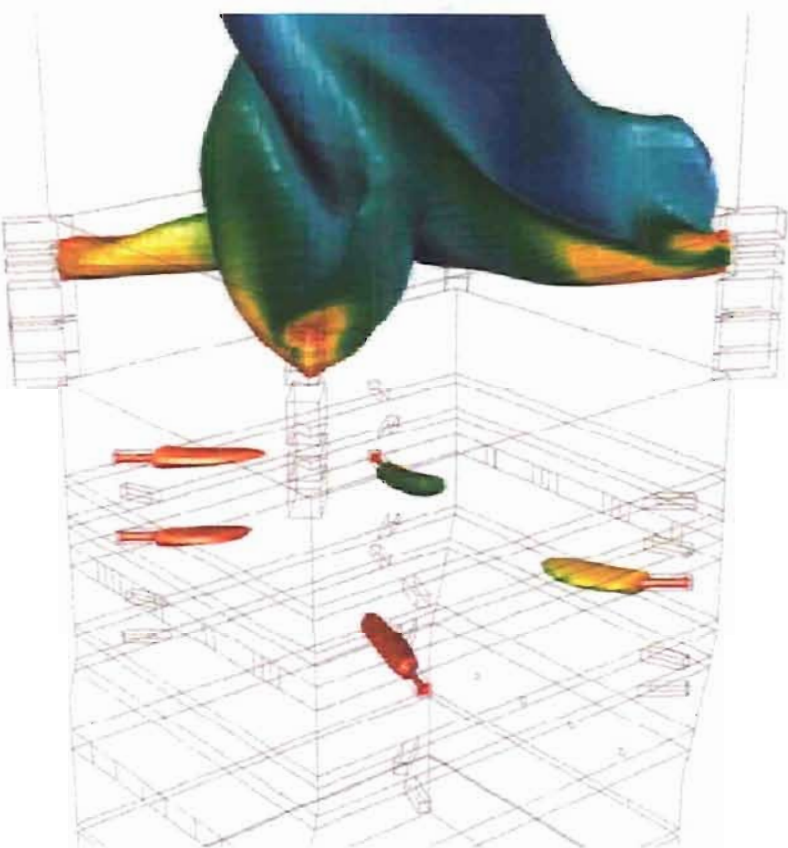
Case 1



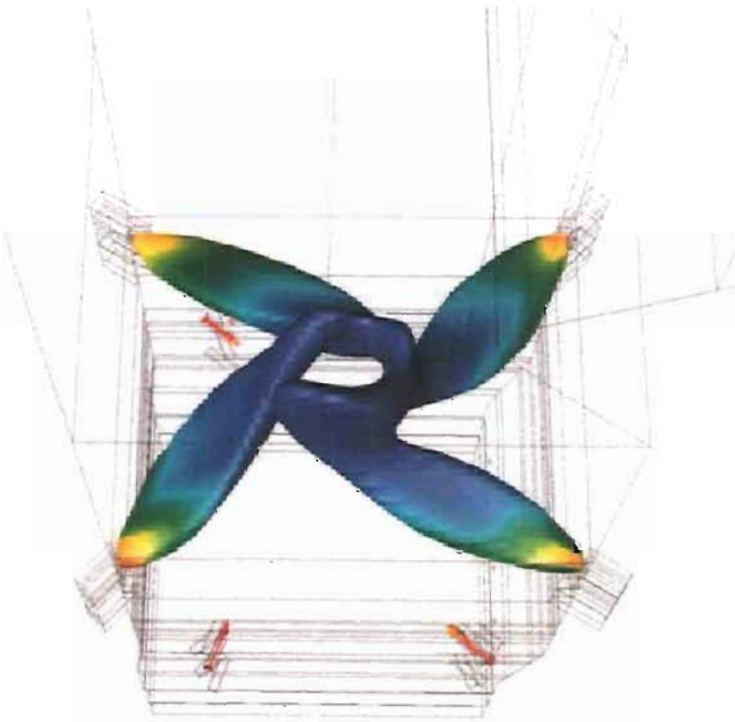
# Iso-Surface of Velocity



Oxygen  
%dry

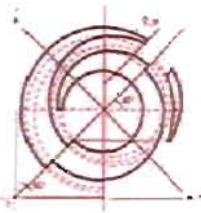


V=50 fps



V=100 fps

Case 2

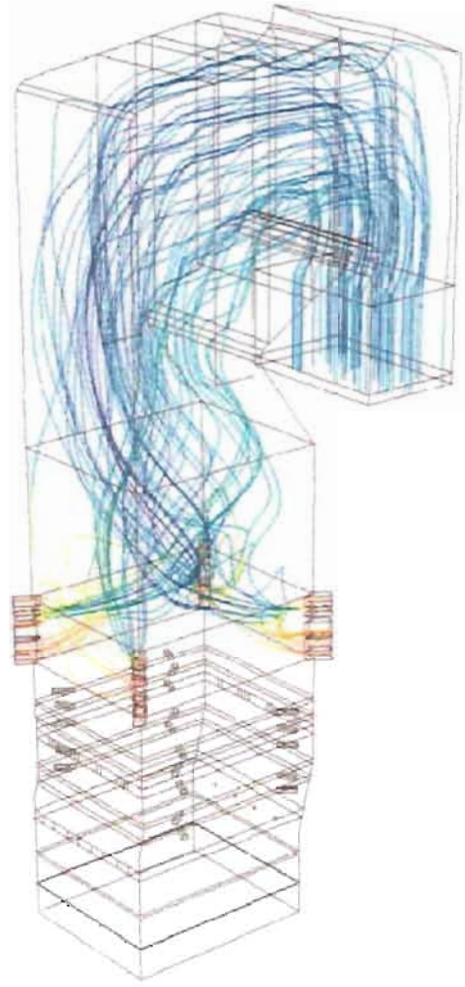
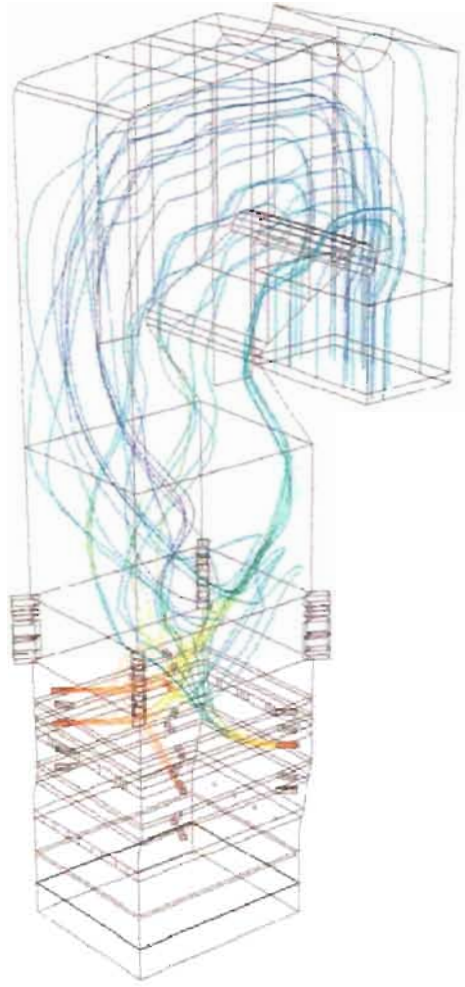


# Gas Path Lines

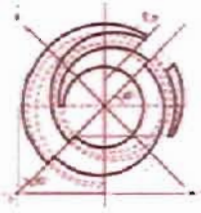
Figure 12



Oxygen  
%dry

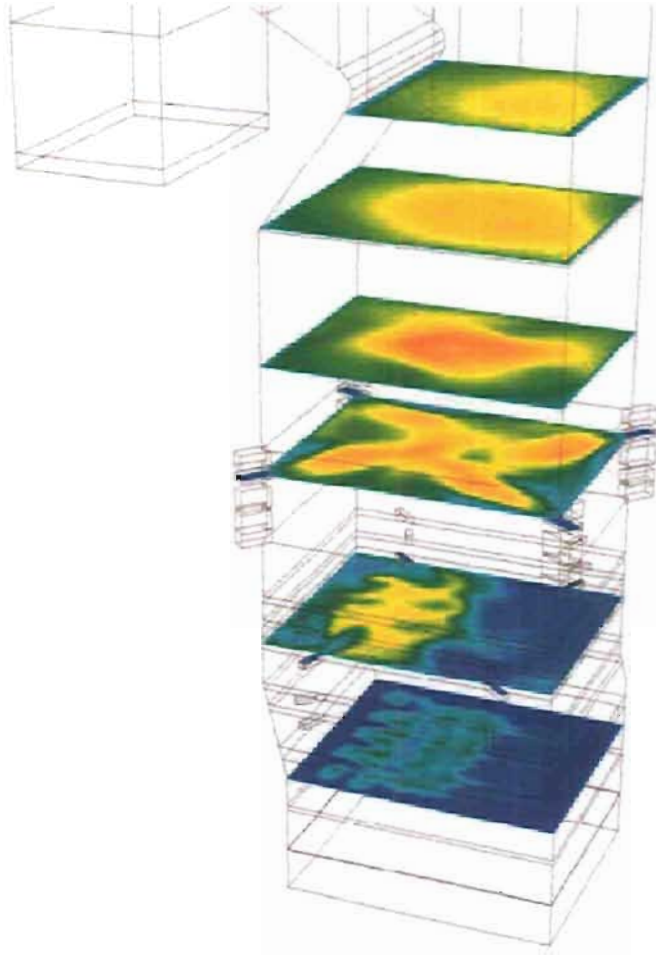
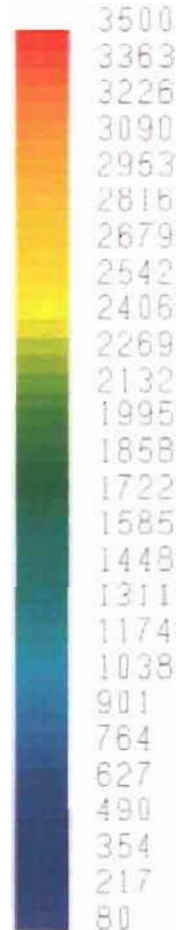


Case 2

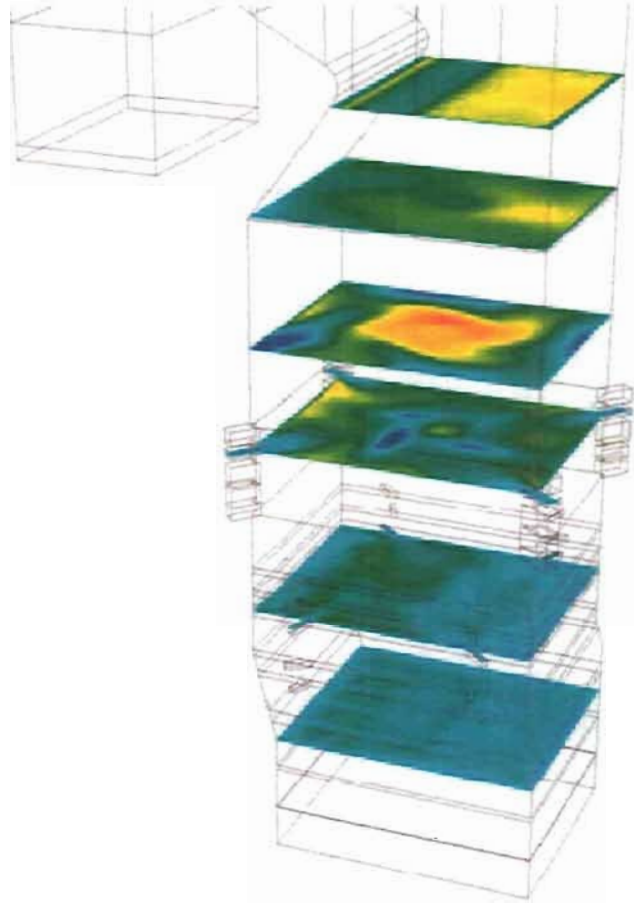
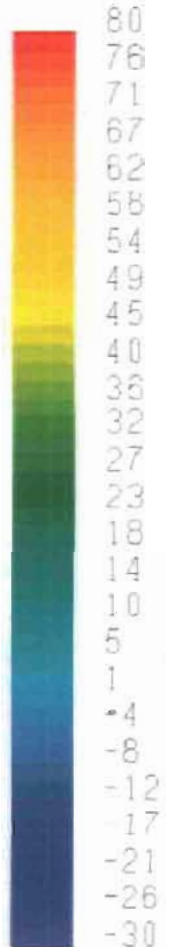


# Temperature & Velocity Contours

Temp, F

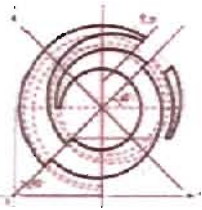


Vertical Velocity ft/s



Case 2

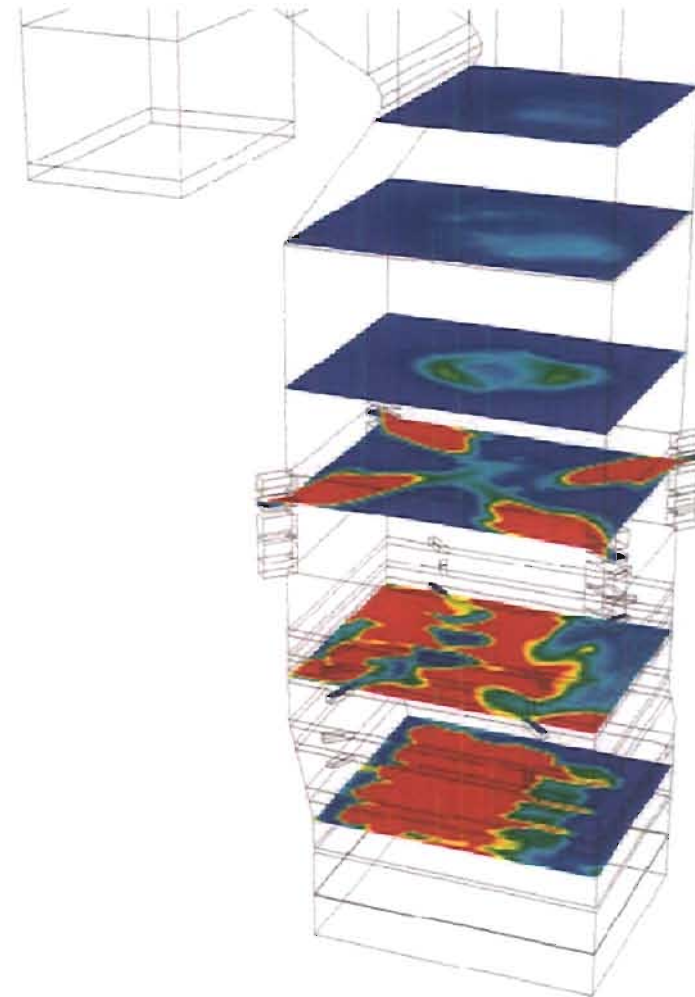
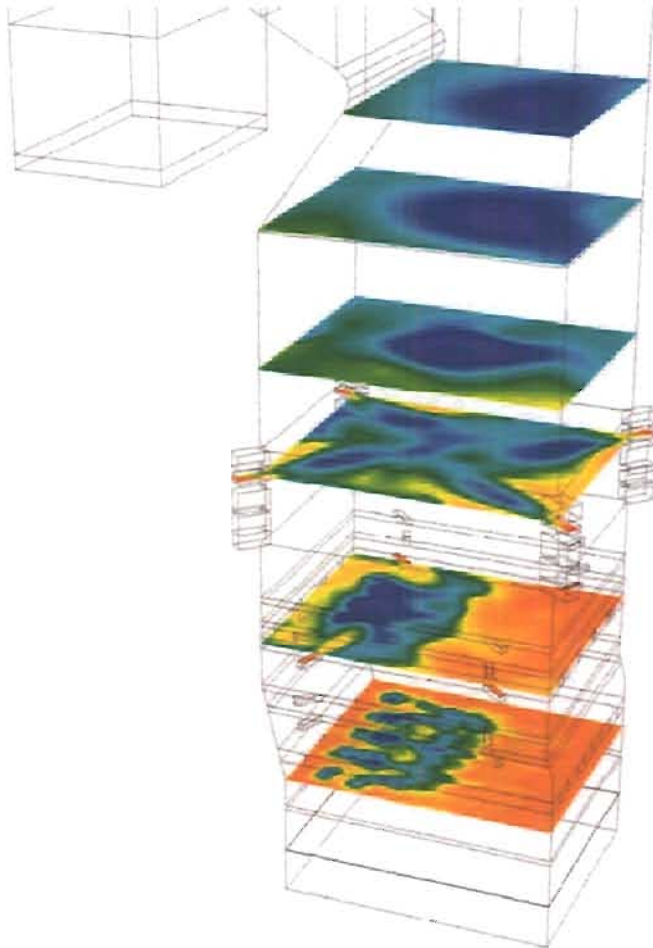
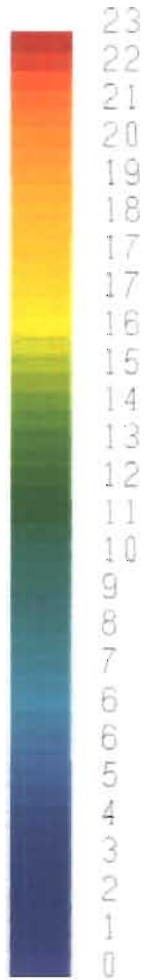




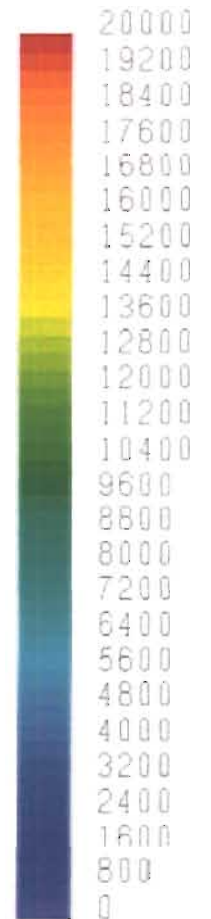
# O<sub>2</sub> & CO Concentrations



Oxygen  
%dry



Co-ppm  
dry



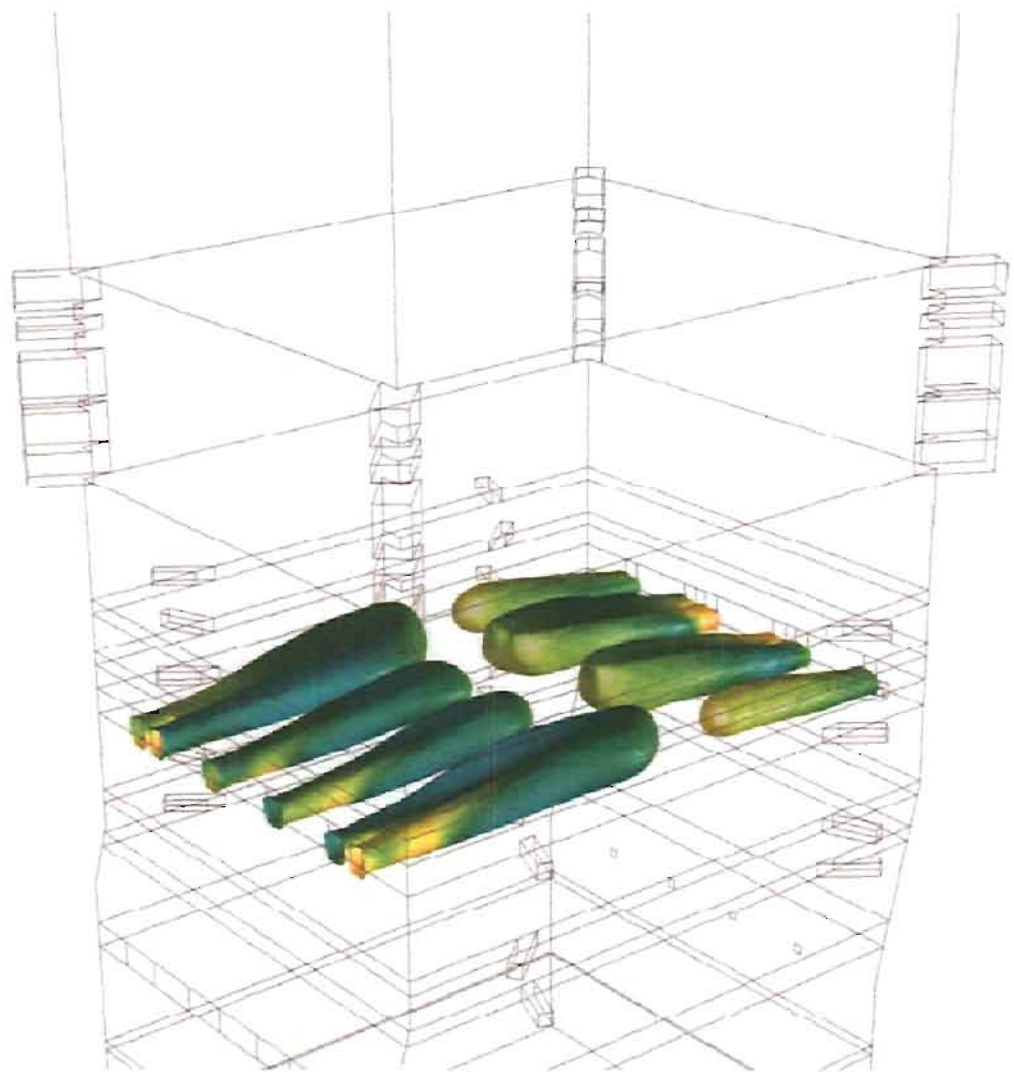
Case 2



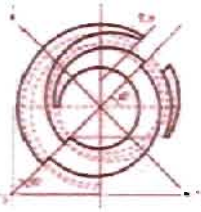
# Iso-Surface of Velocity = 100 fps



Oxygen  
%dry



Case 3

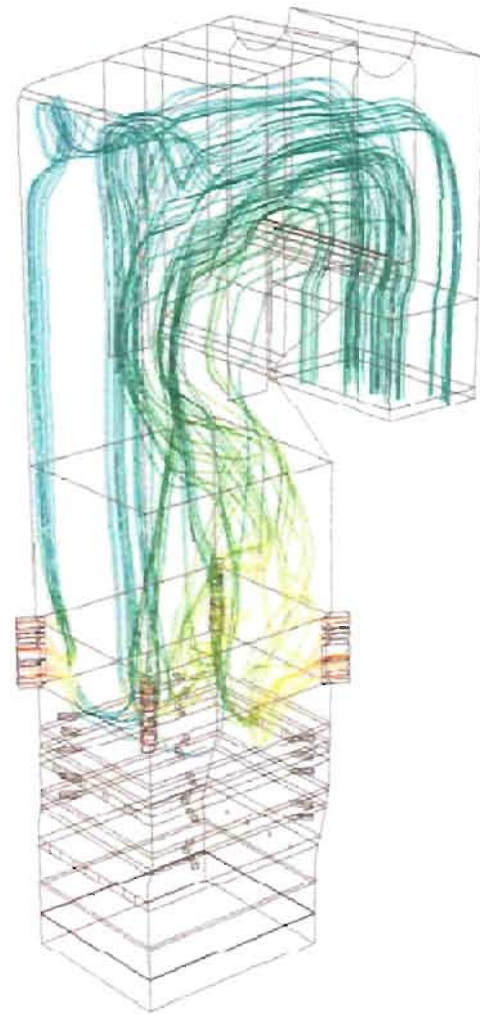
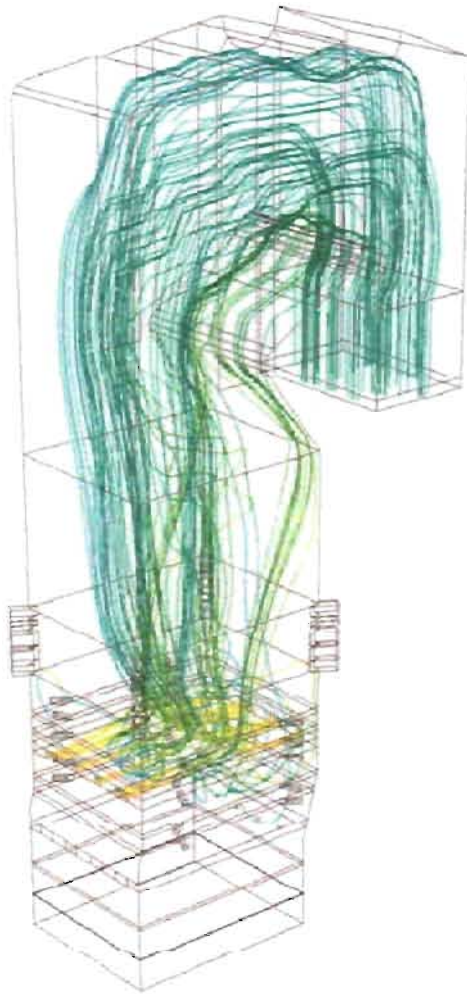


# Gas Path Lines

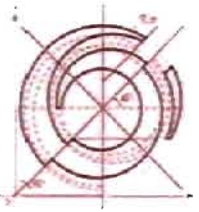
Figure 16



Oxygen  
%dry

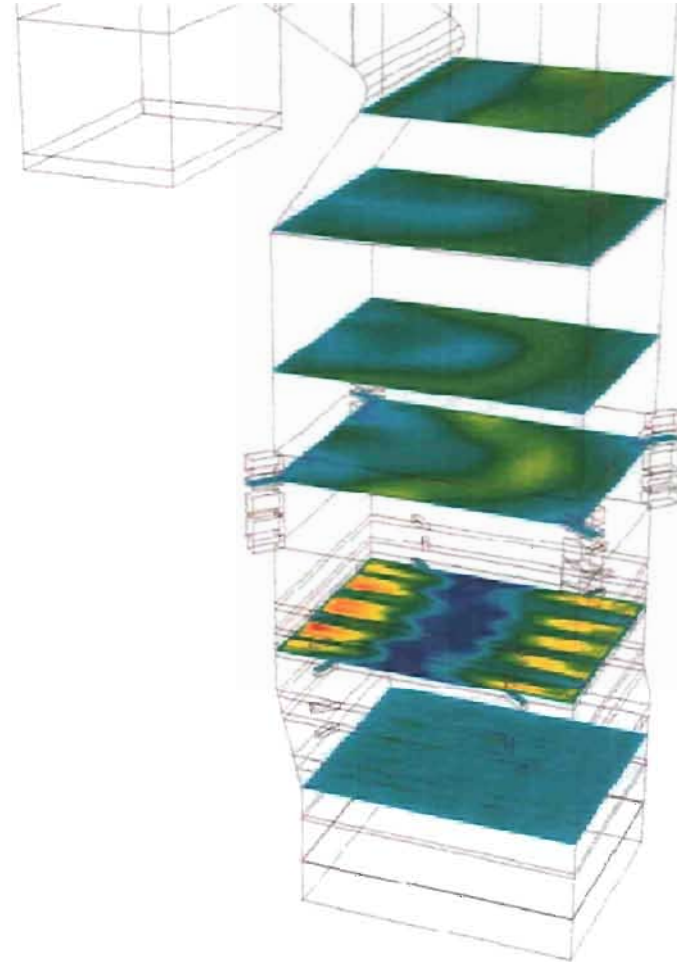
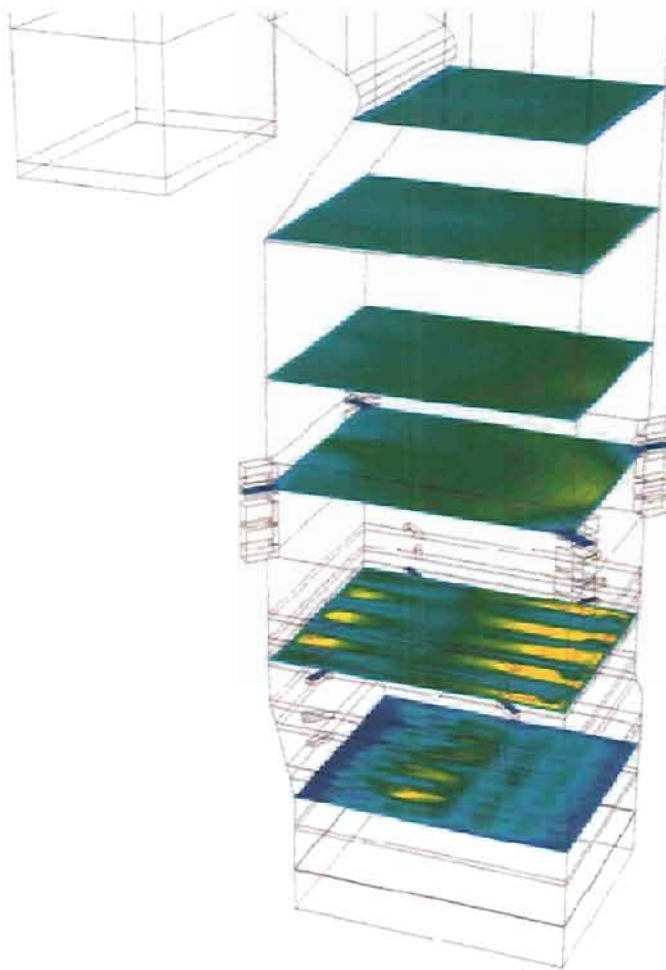


Case 3



# Temperature & Velocity Contours **ALSTOM**

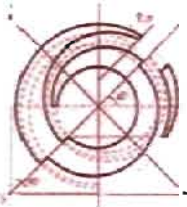
Temp, F



Vertical Velocity ft/s



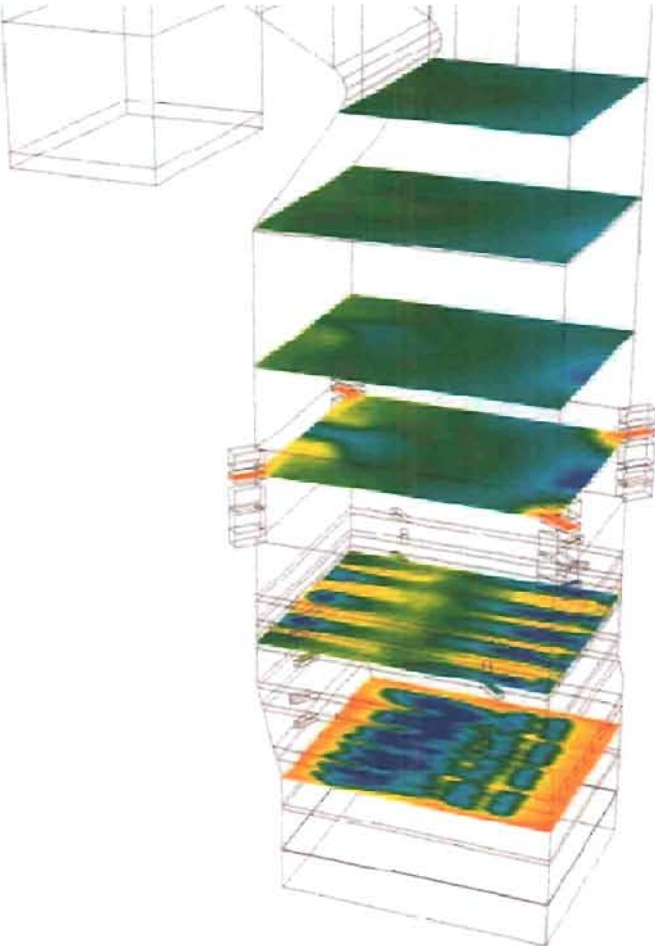
Case 3



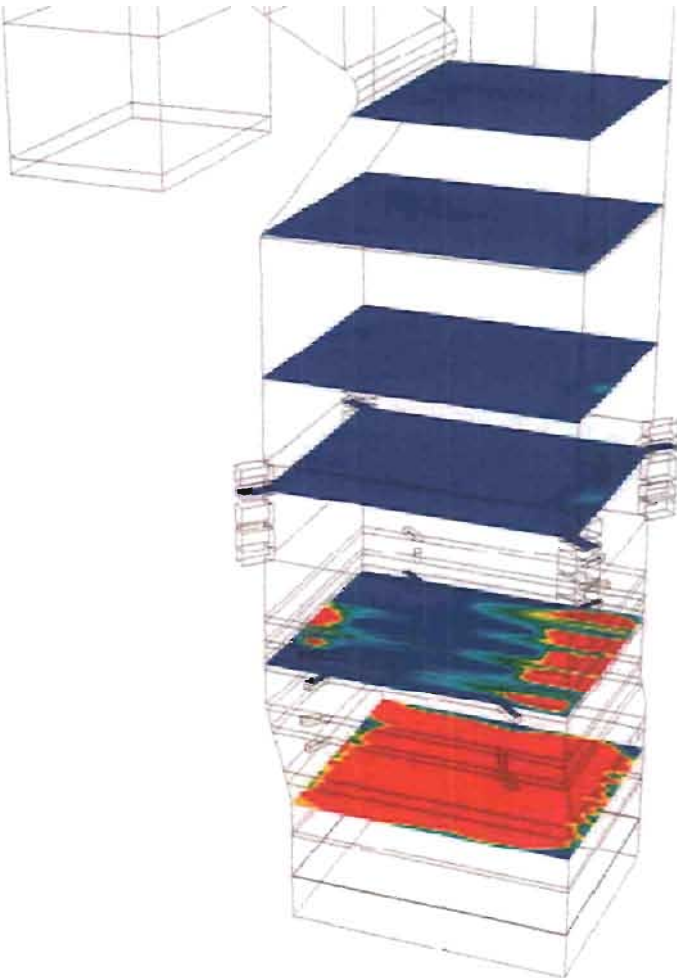
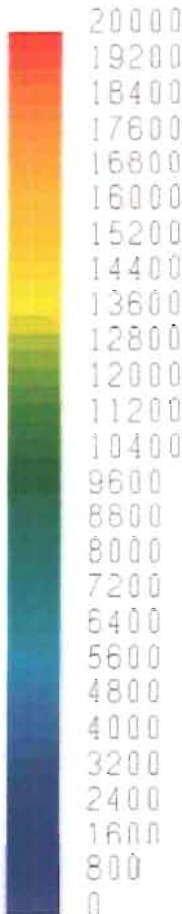
# O2 & CO Concentrations



Oxygen  
%dry



Co-ppm  
dry



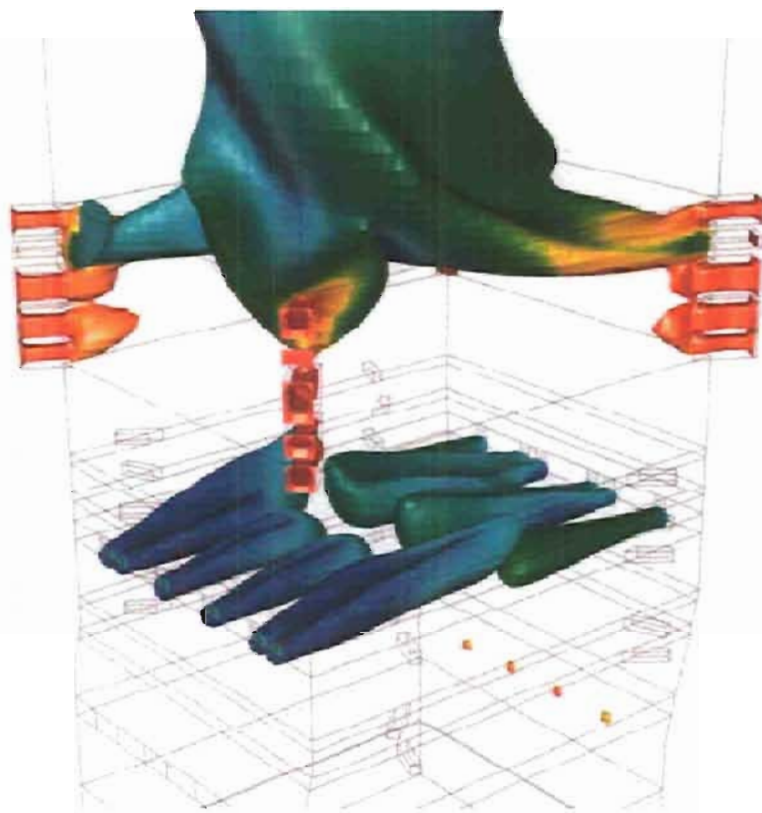
Case 3



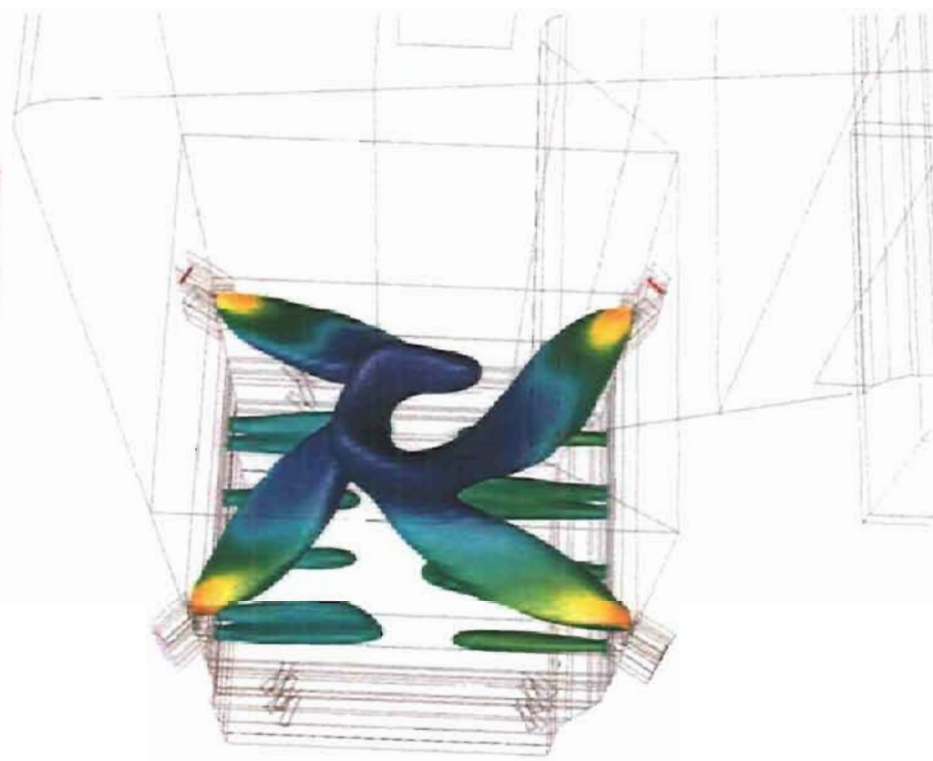
# Iso-Surface of Velocity



Oxygen  
%dry



V=50 fps



V=100 fps

Case 4

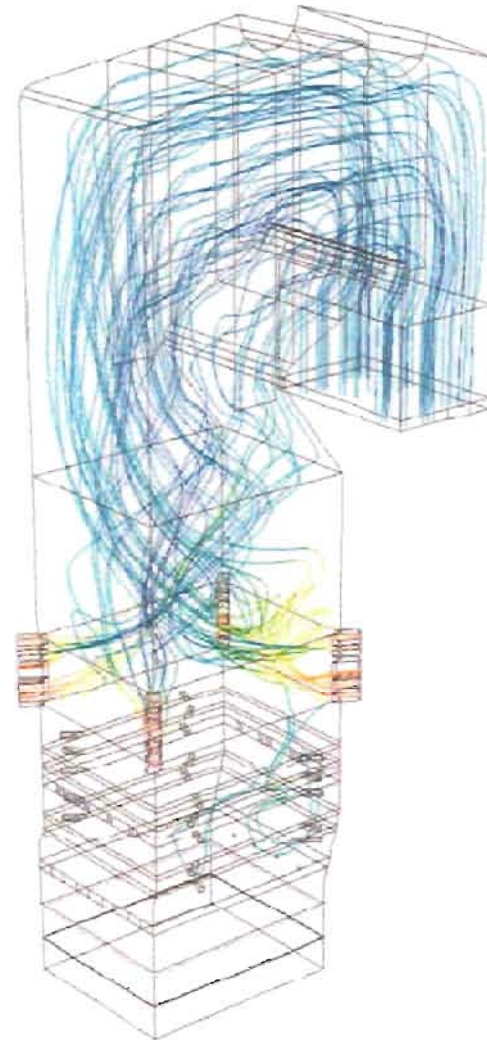
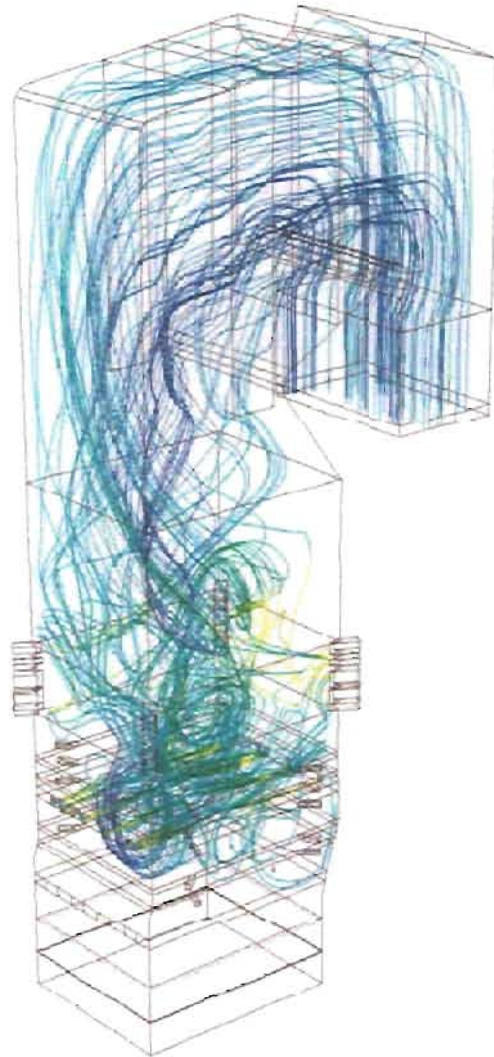


# Gas Path Lines

Figure 20



Oxygen  
%dry



Case 4

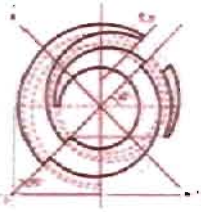
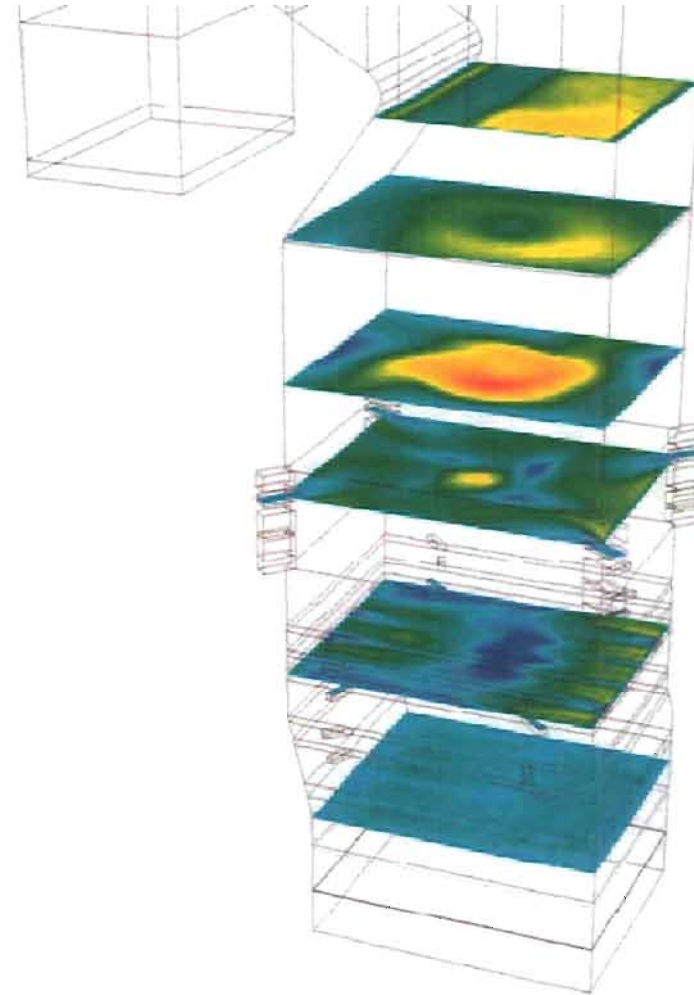
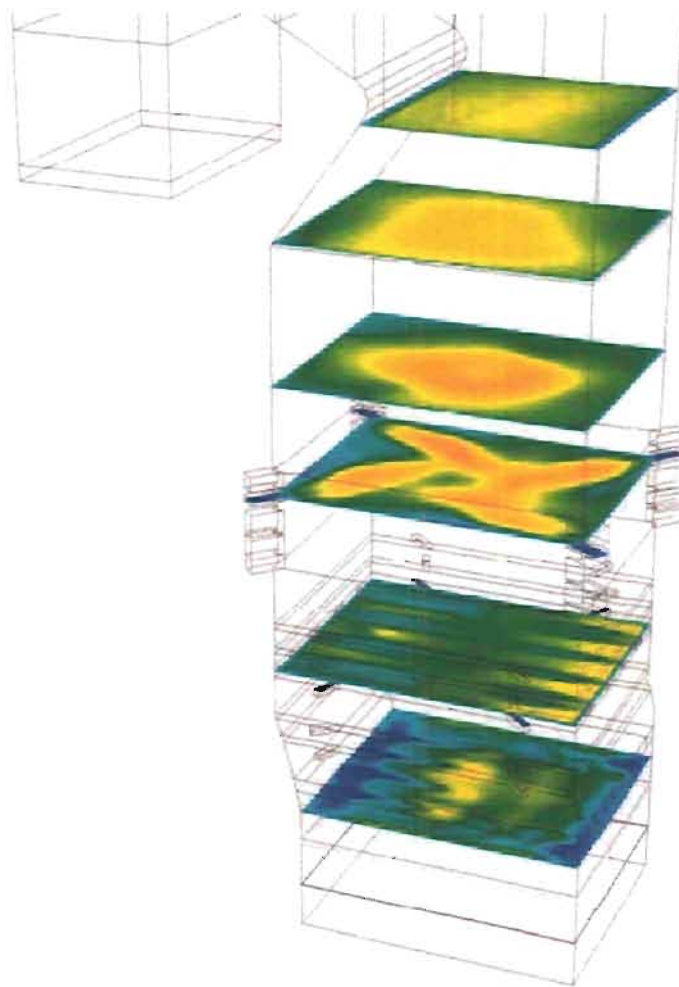
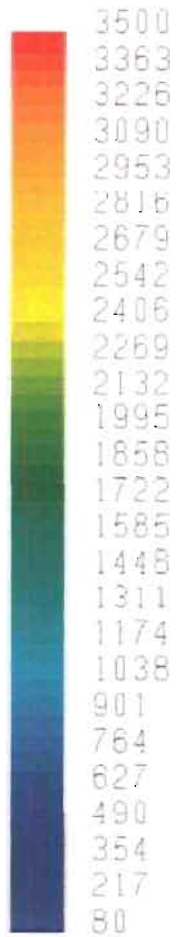


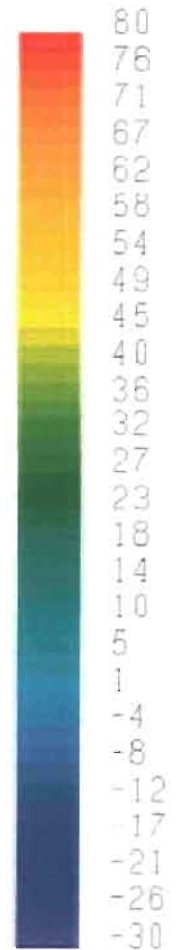
Figure 21

# Temperature & Velocity Contours **ALSTOM**

Temp, F

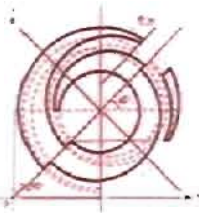


Vertical Velocity  
ft/s



Case 4

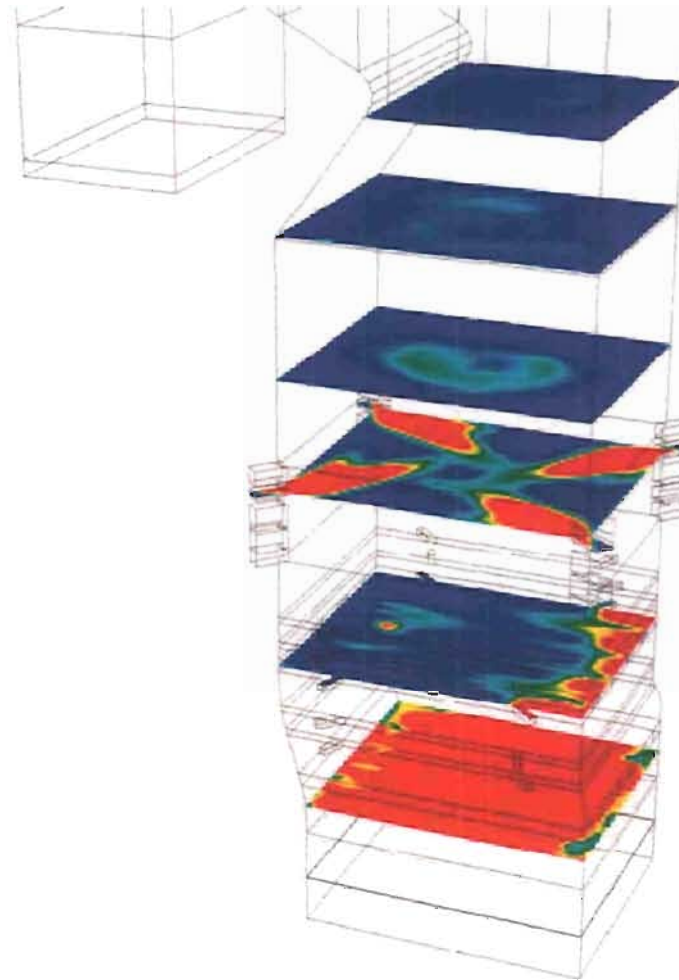
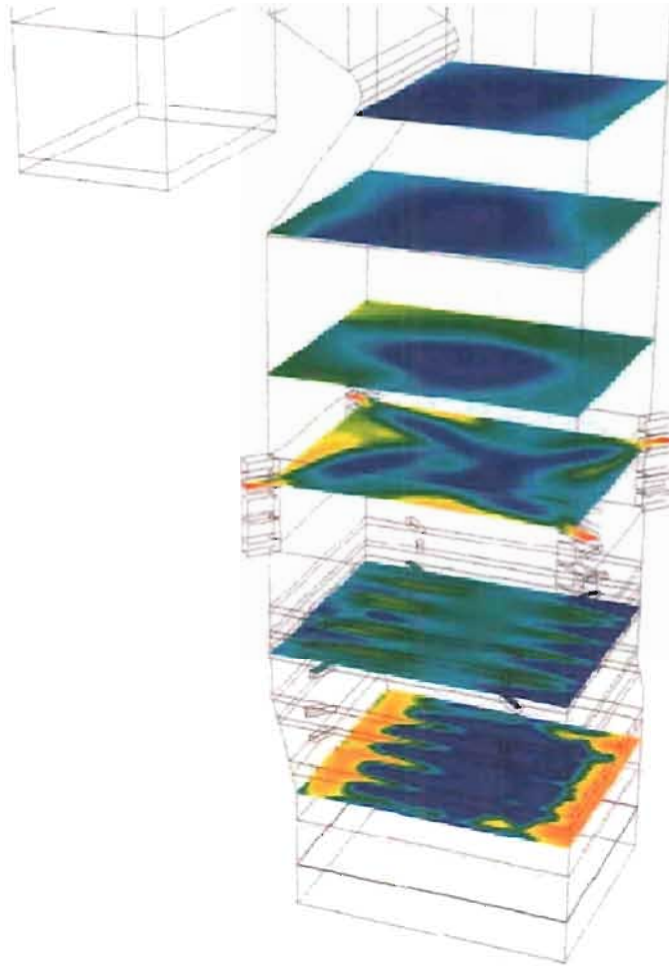




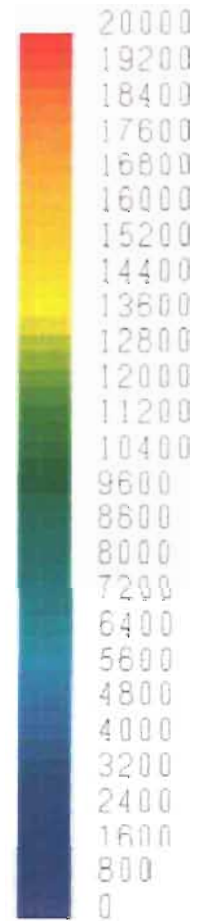
# O<sub>2</sub> & CO Concentrations



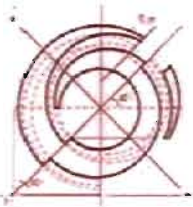
Oxygen  
%dry



Co-ppm  
dry



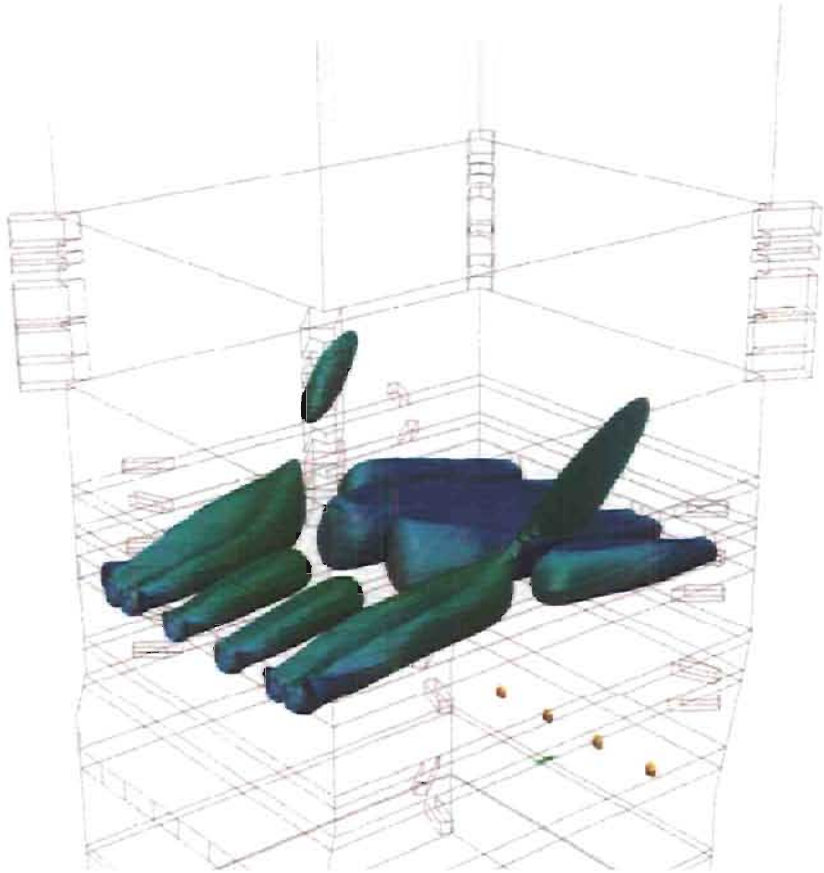
Case 4



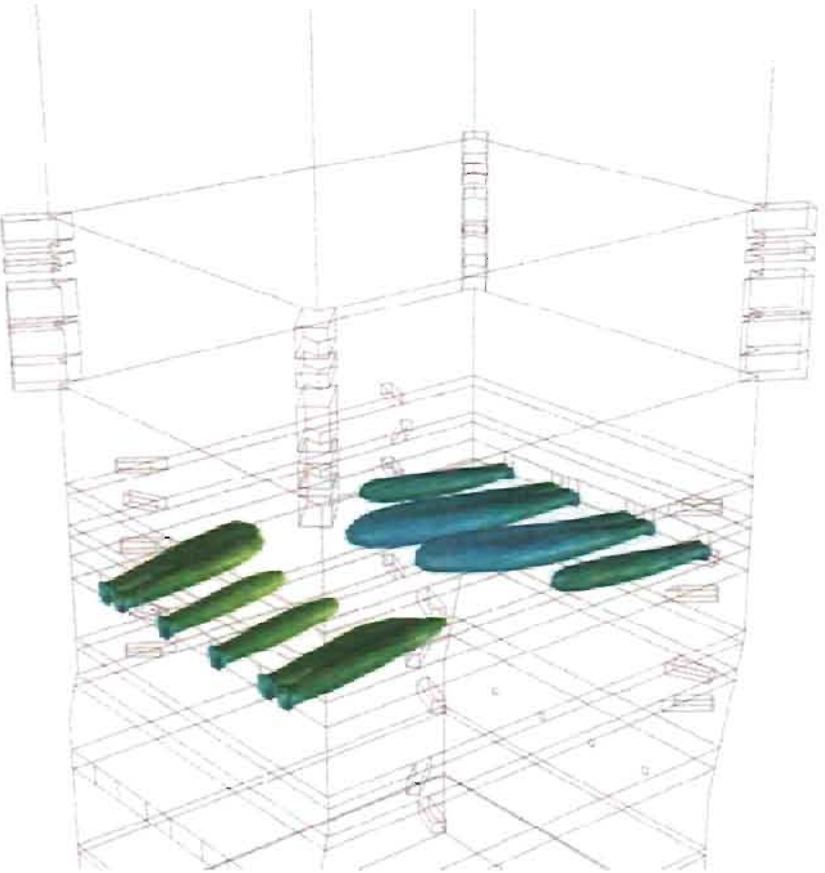
# Iso-Surface of Velocity



Oxygen  
%dry

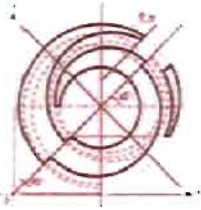


V=50 fps



V=100 fps

Case 5

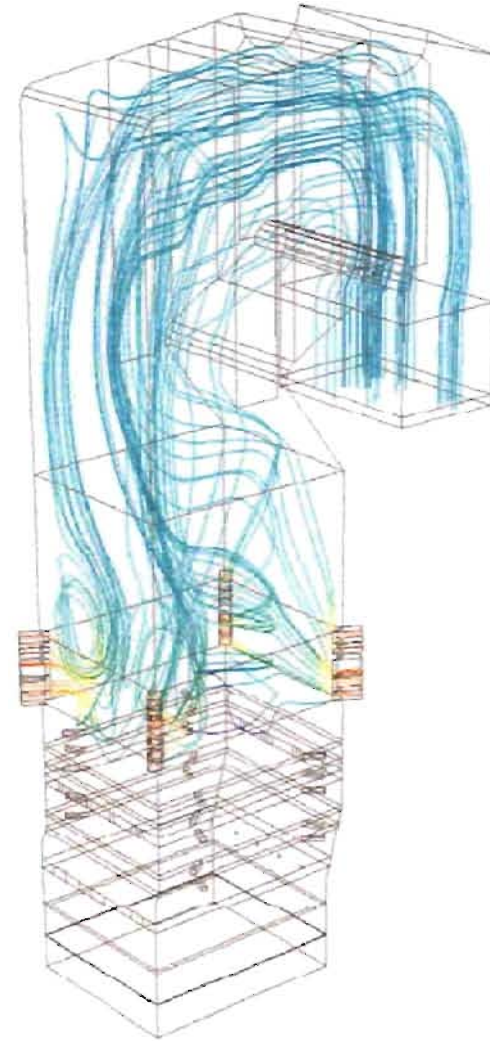
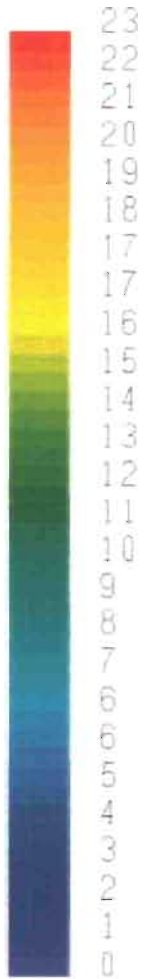


# Gas Path Lines

Figure 24



Oxygen  
%dry

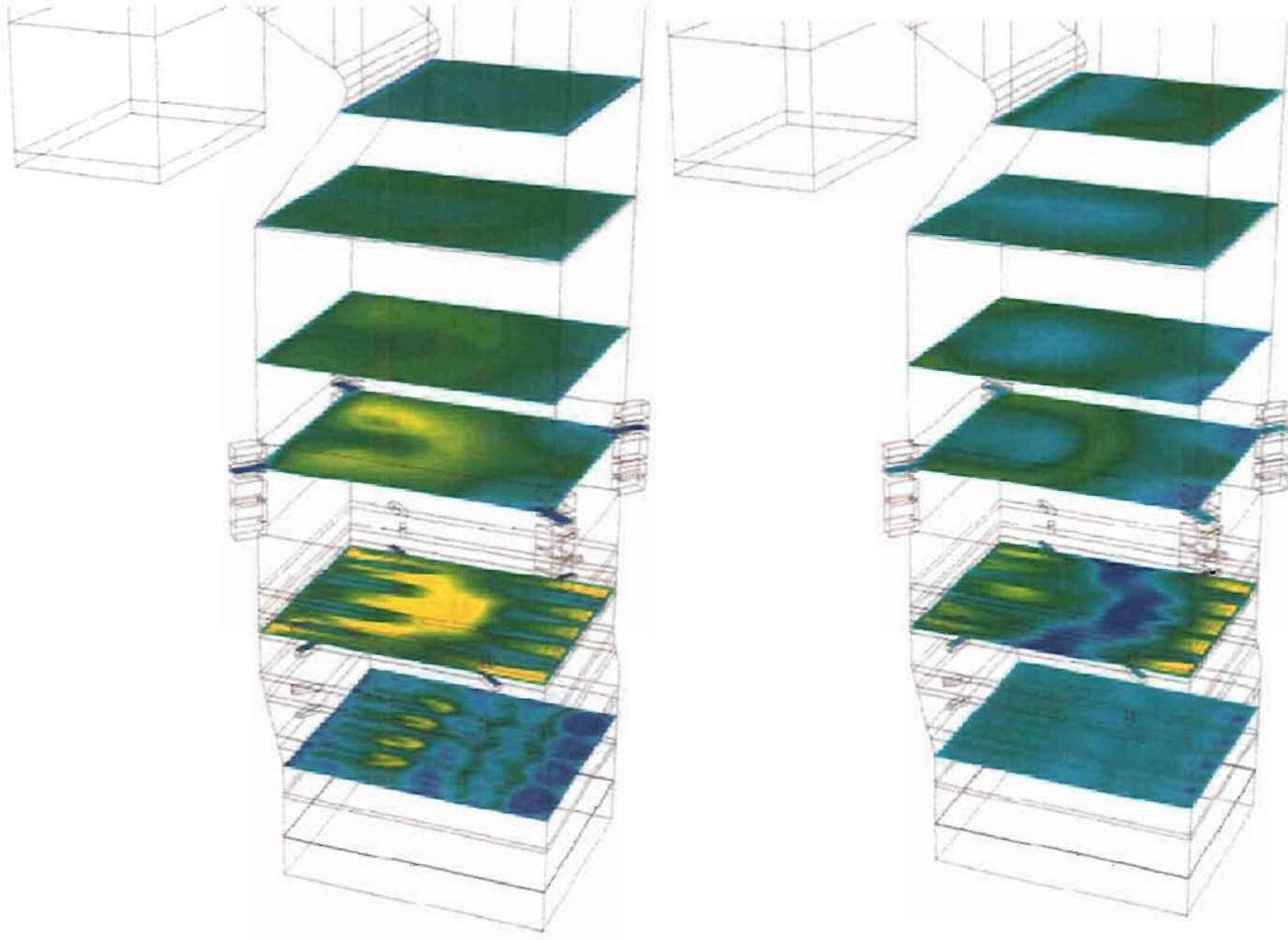
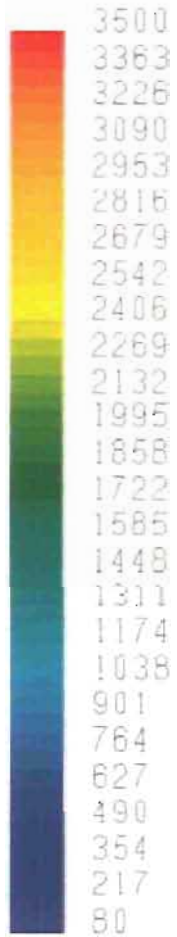


Case 5



# Temperature & Velocity Contours **ALSTOM**

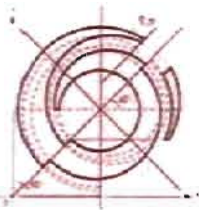
Temp, F



Vertical Velocity ft/s



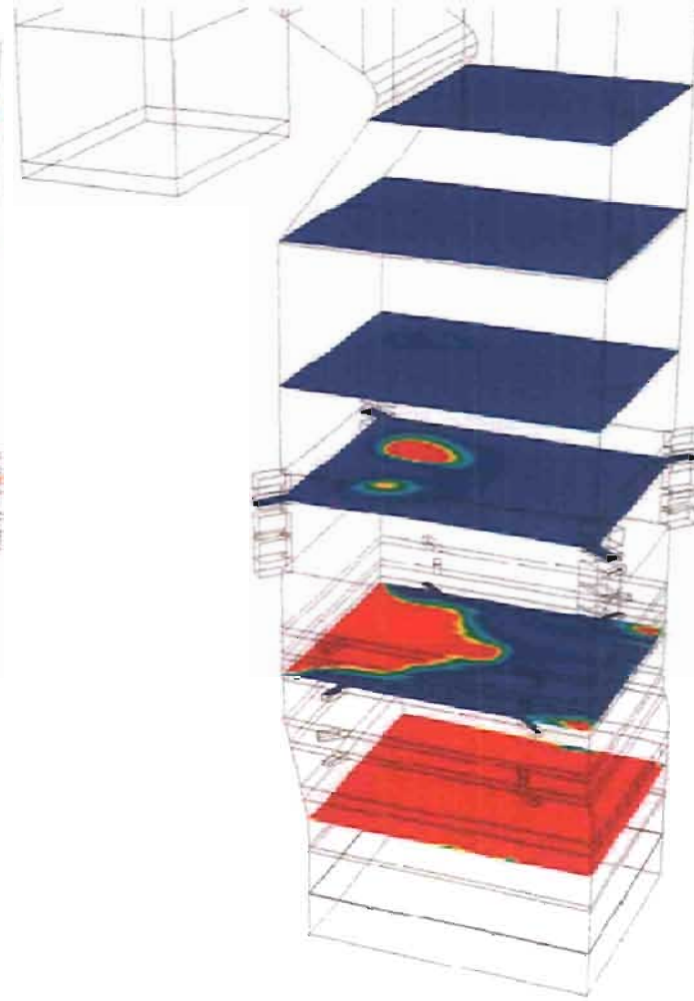
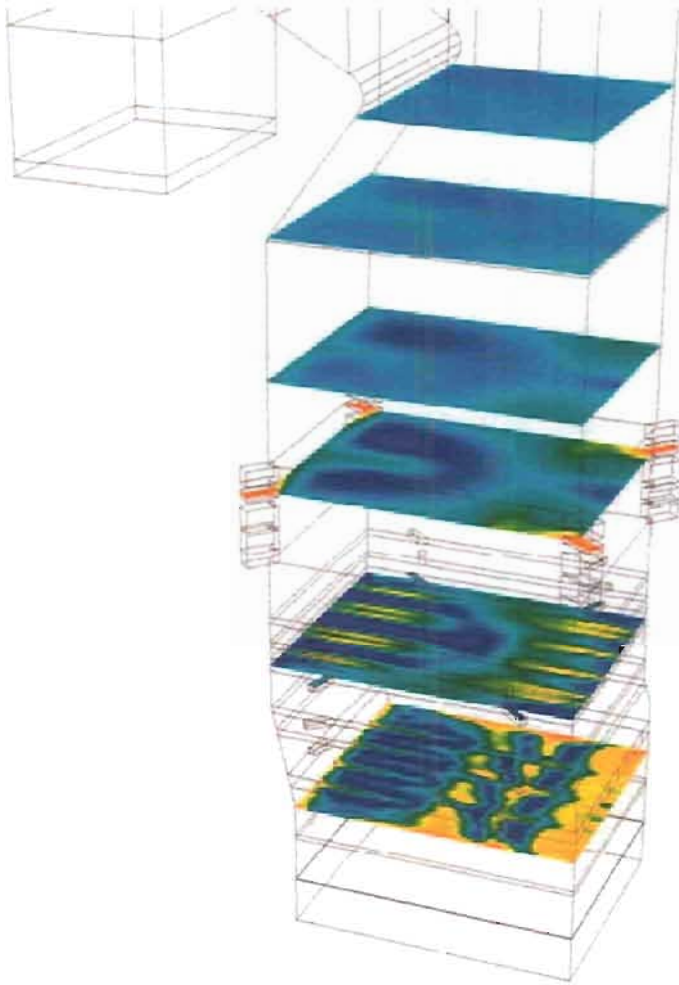
Case 5



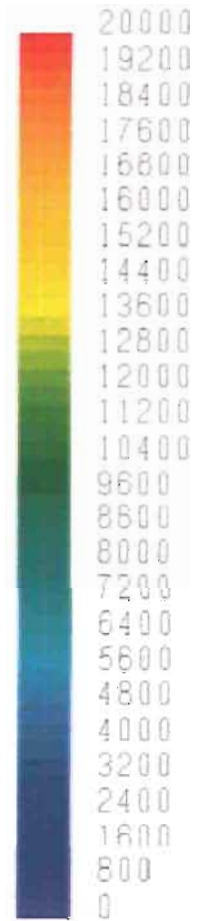
# O<sub>2</sub> & CO Concentrations



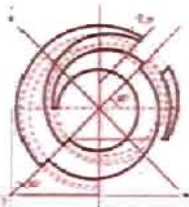
Oxygen  
%dry



Co-ppm  
dry



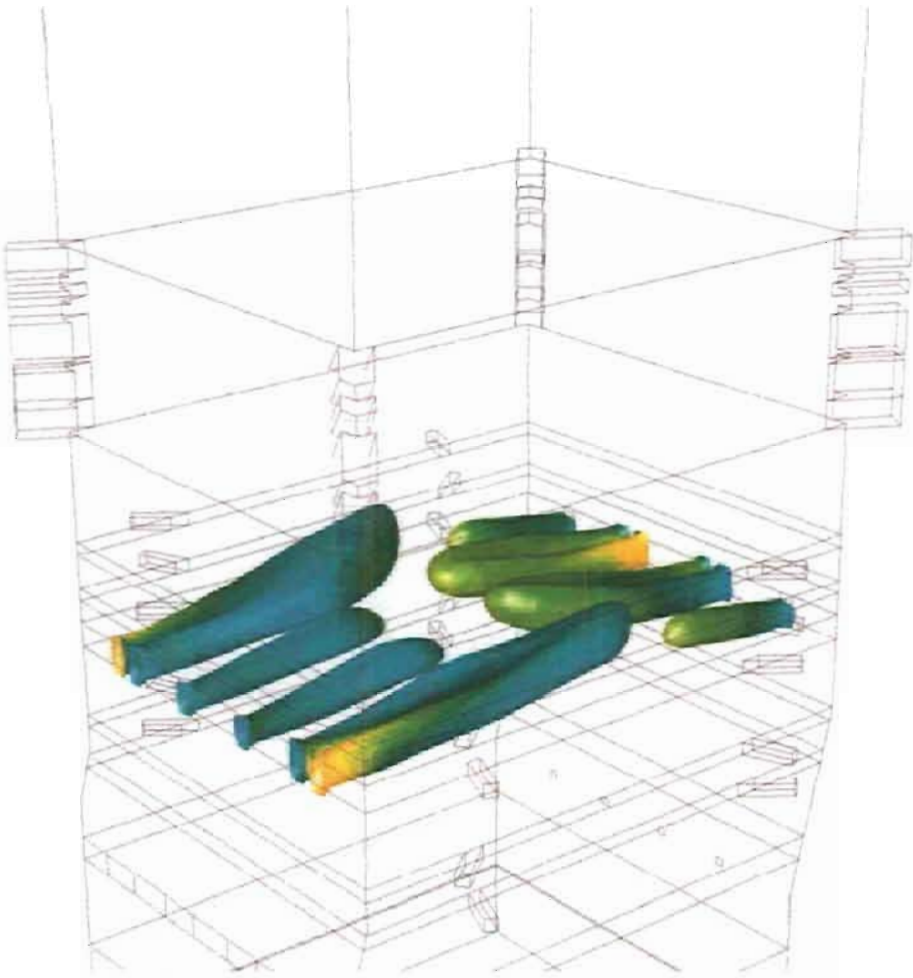
Case 5



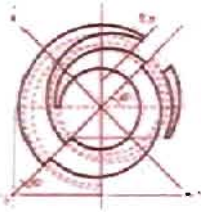
# Iso-Surface of Velocity = 100 fps



Oxygen  
%dry



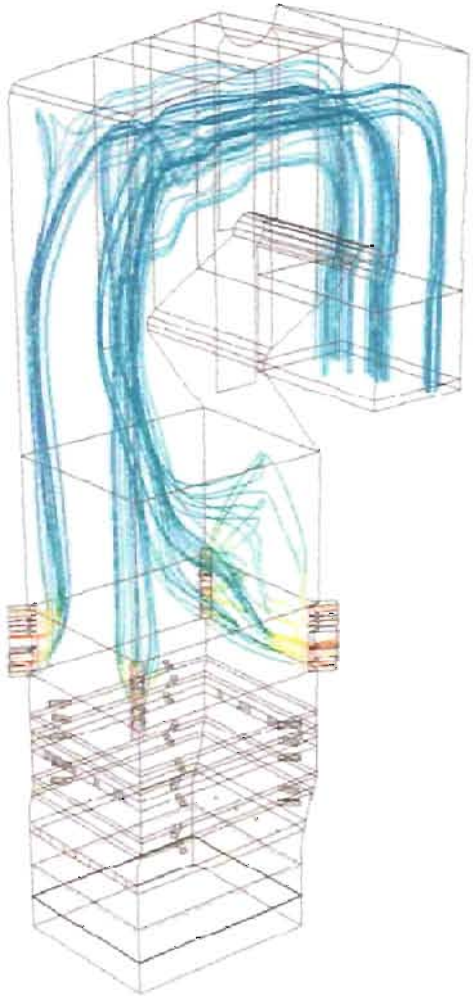
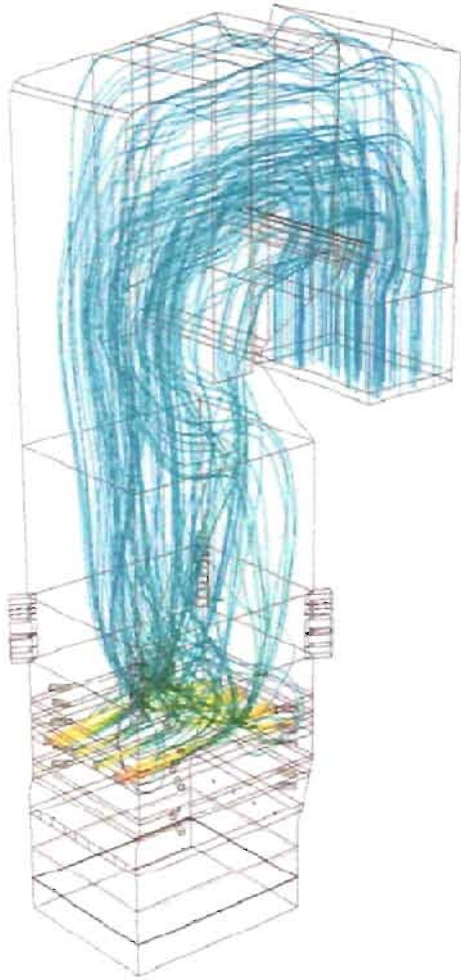
Case 6



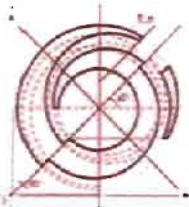
# Gas Path Lines



Oxygen  
%dry

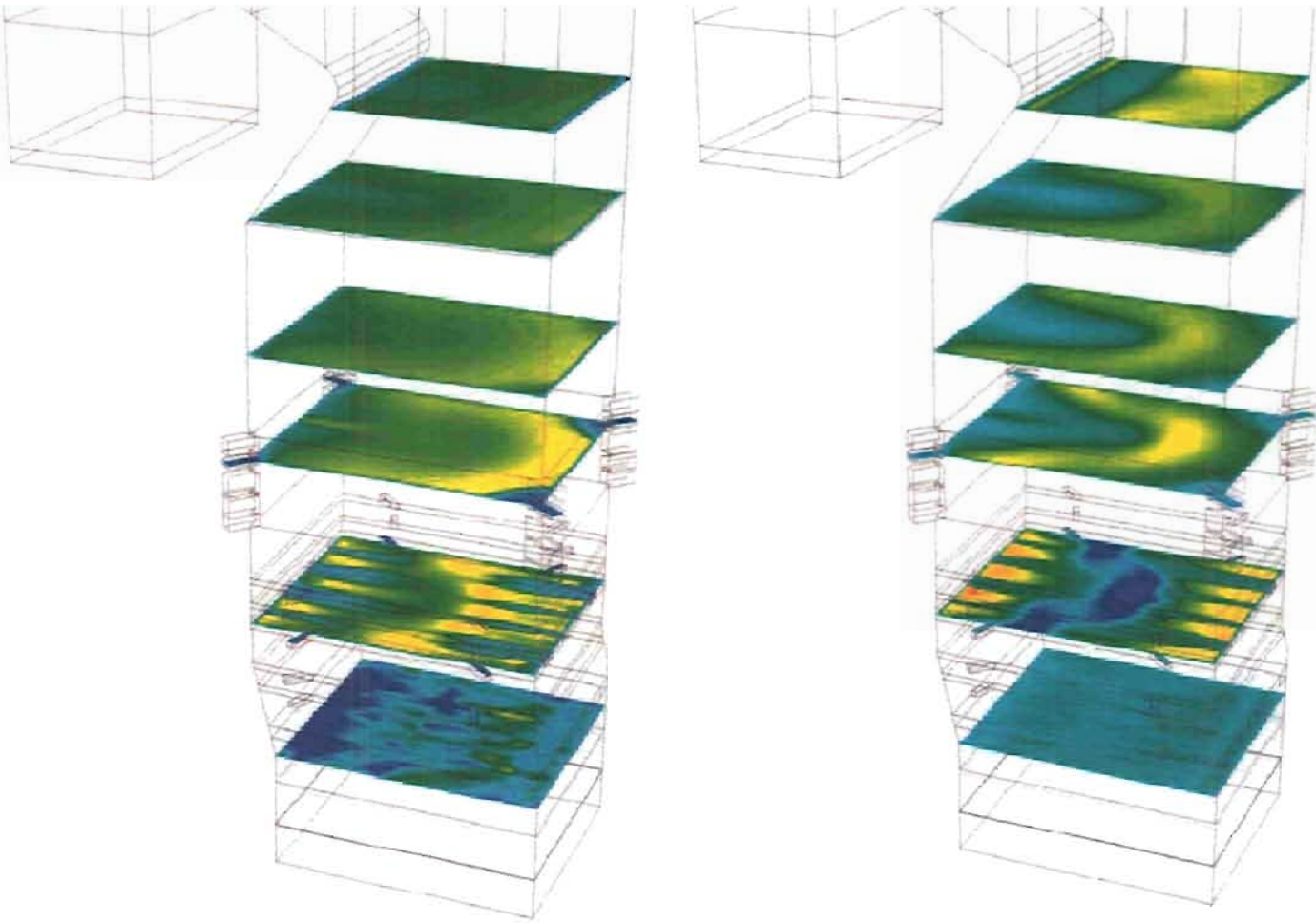
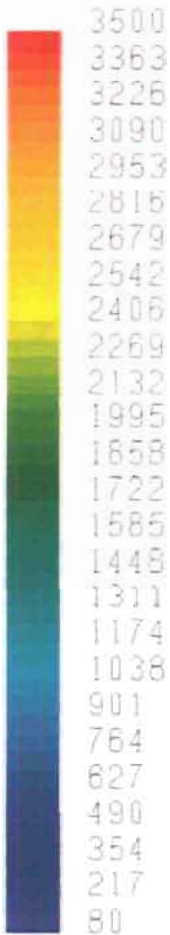


Case 6



# Temperature & Velocity Contours **ALSTOM**

Temp, F

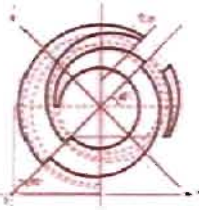


Vertical Velocity ft/s



Case 6

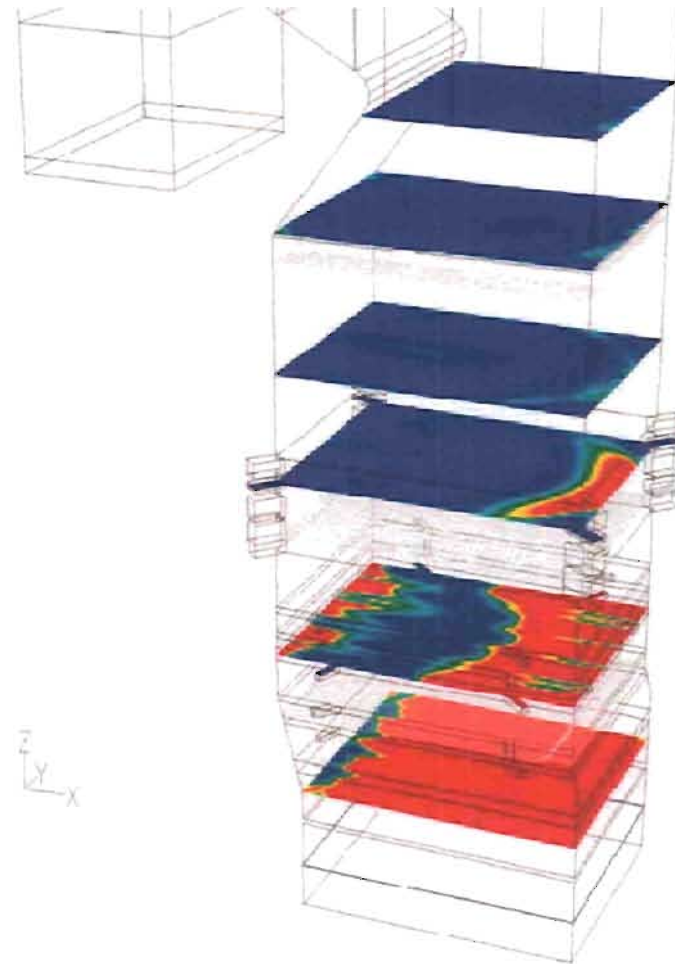
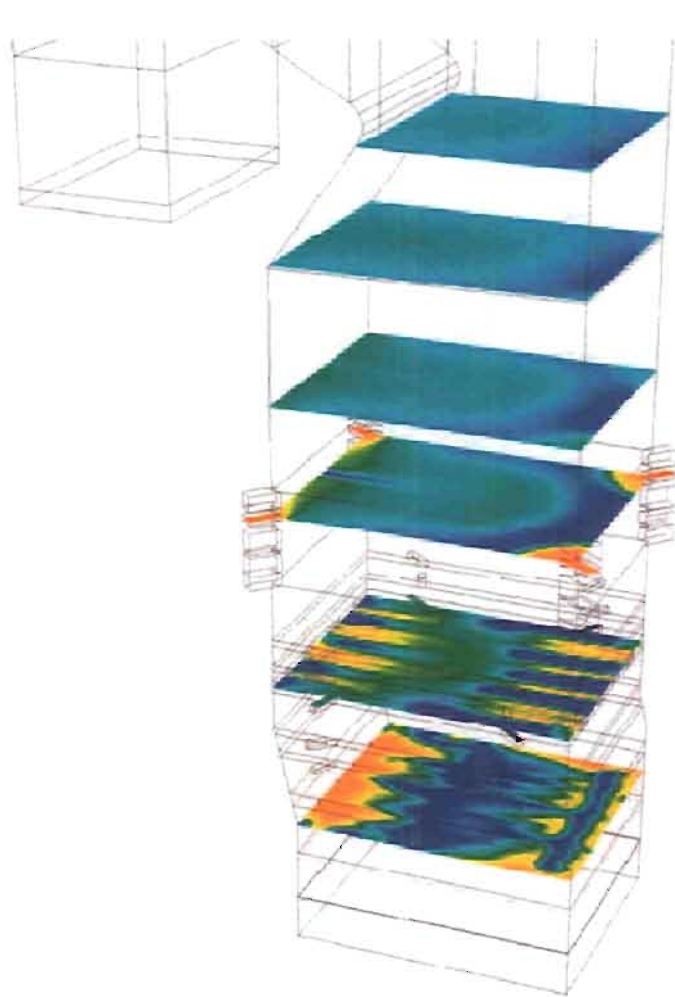




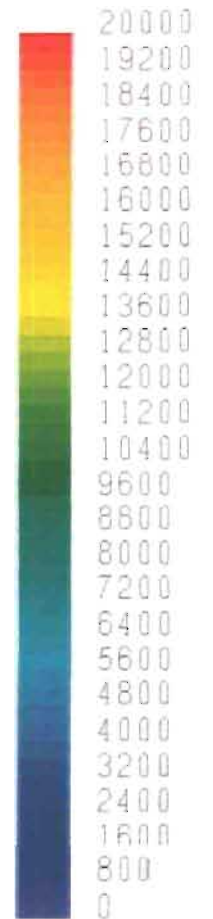
# O<sub>2</sub> & CO Concentrations



Oxygen  
%dry



Co-ppm  
dry



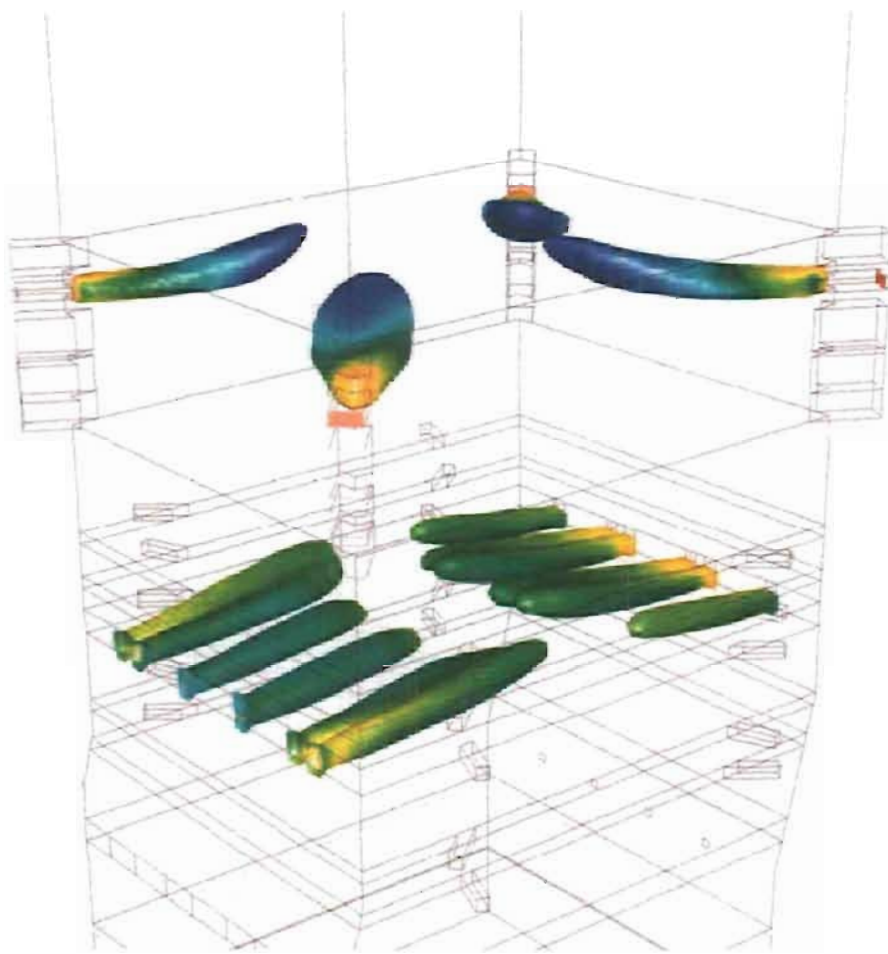
Case 6



# Iso-Surface of Velocity = 100 fps



Oxygen  
%dry



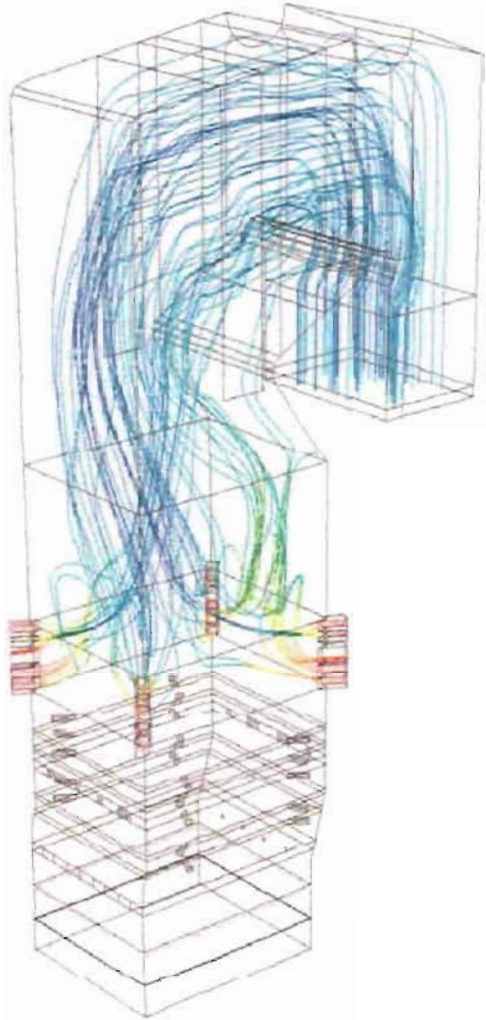
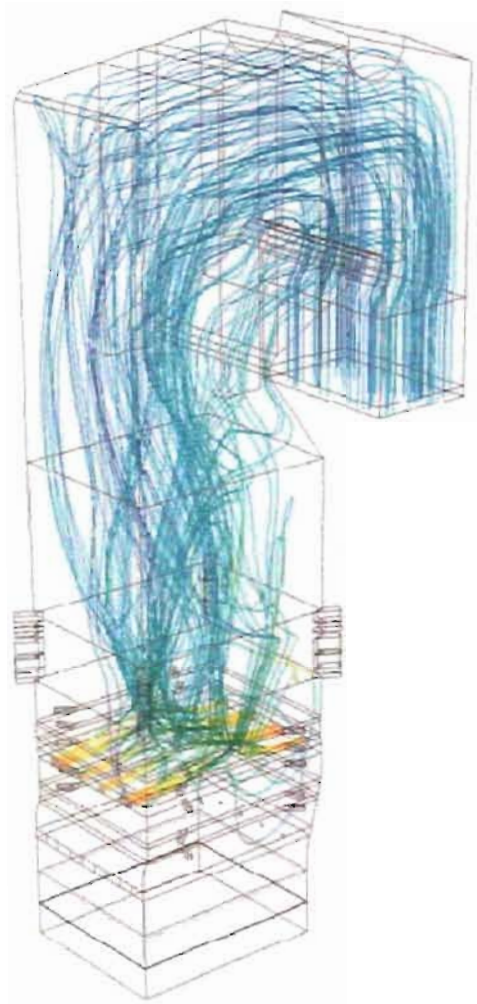
Case 7



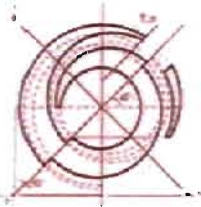
# Gas Path Lines



Oxygen  
%dry

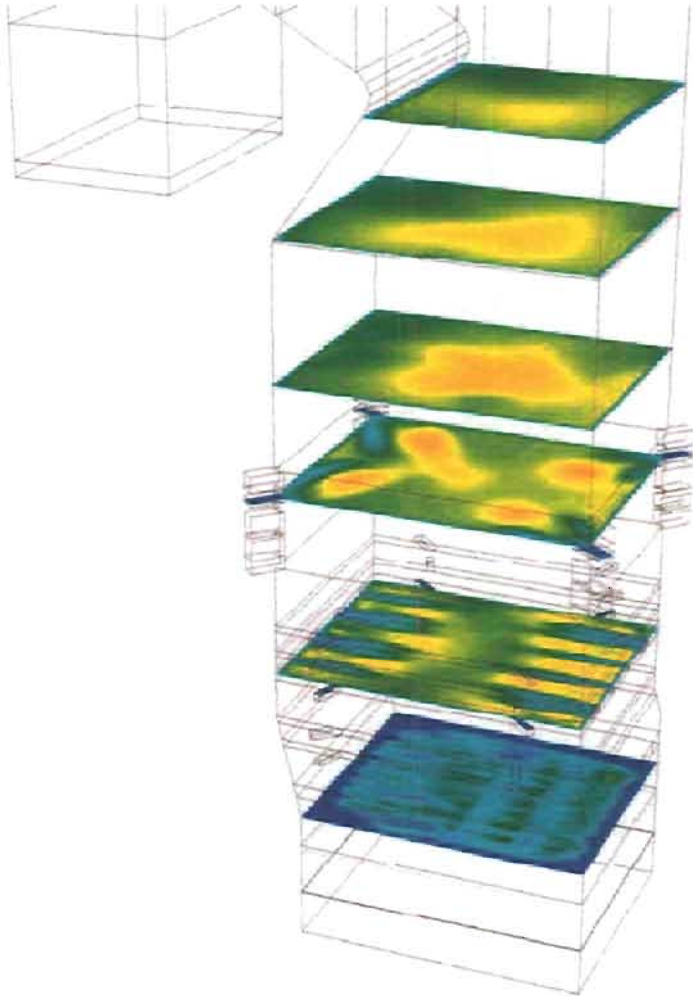
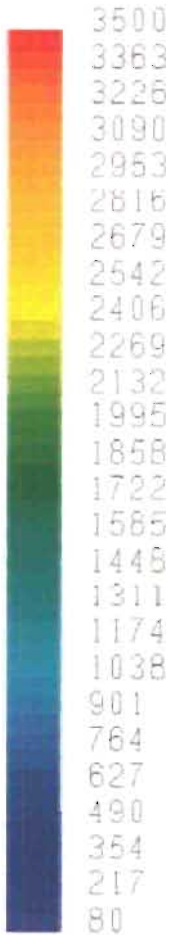


Case 7

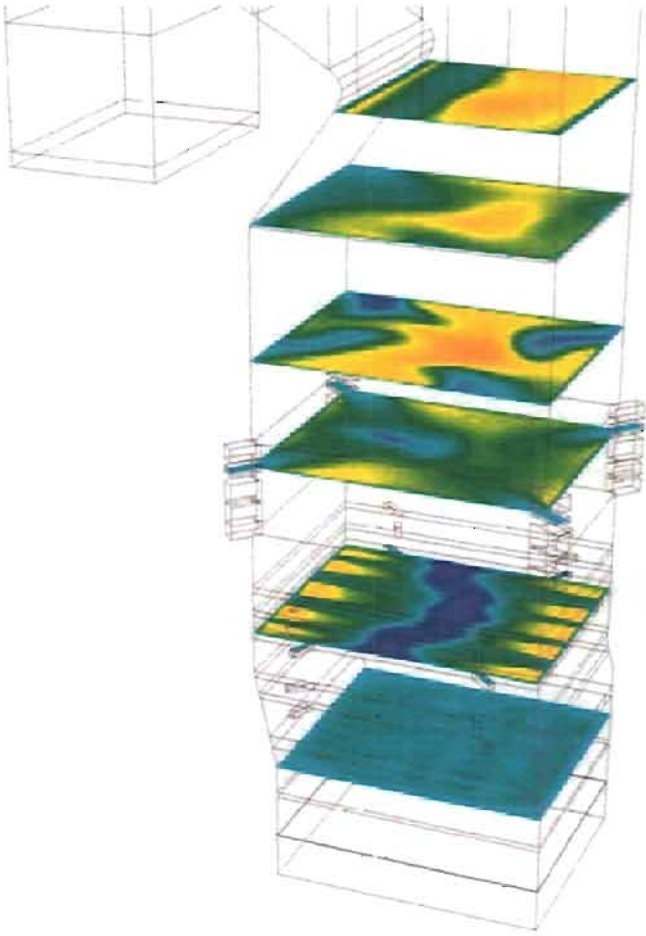
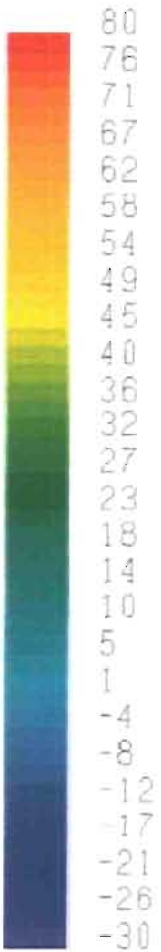


# Temperature & Velocity Contours **ALSTOM**

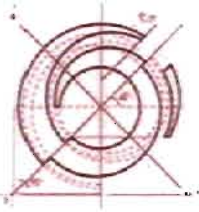
Temp, F



Vertical Velocity ft/s



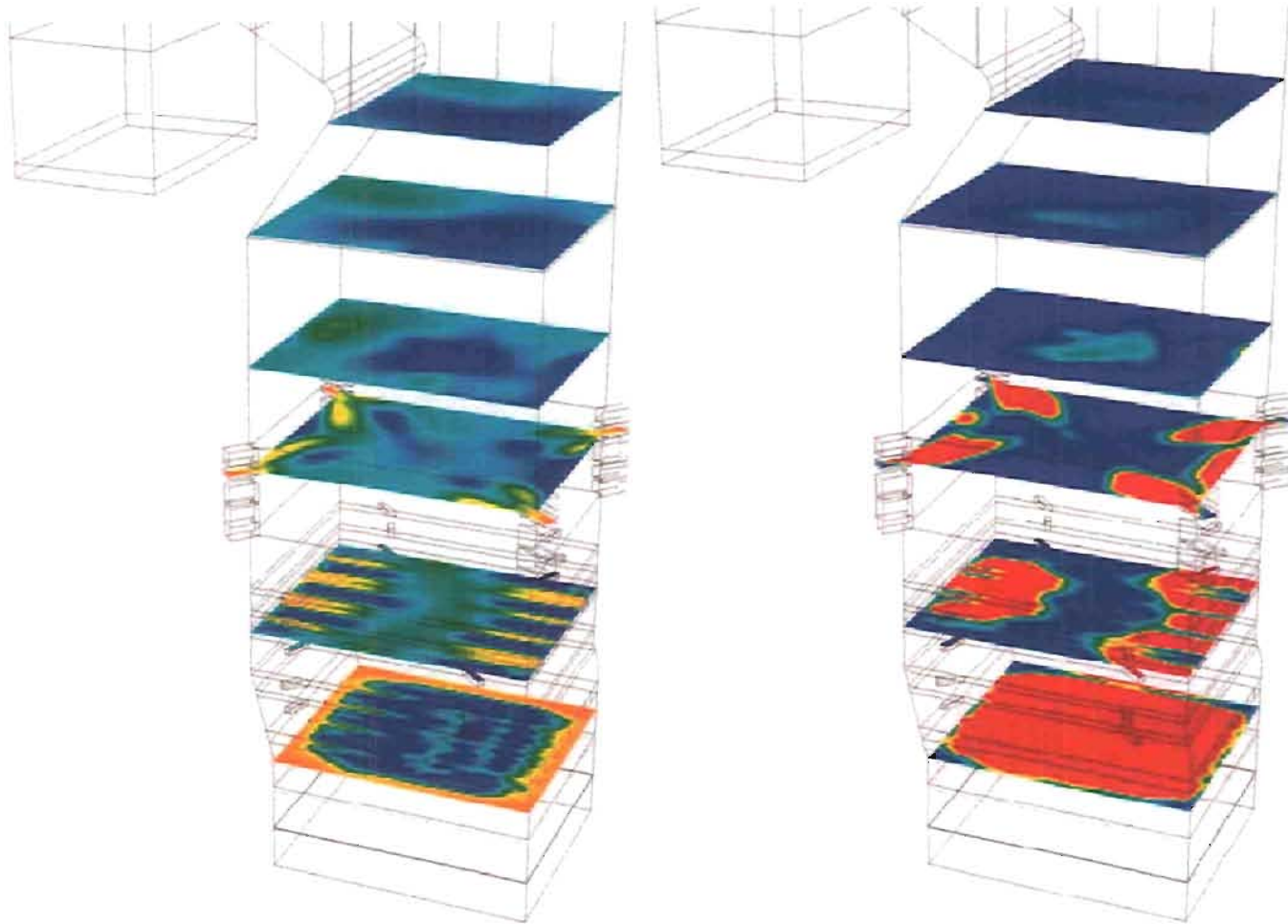
Case 7



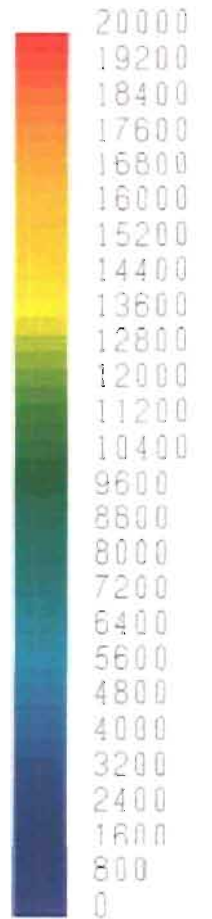
# O2 & CO Concentrations



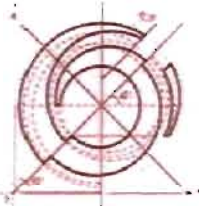
Oxygen  
%dry



Co-ppm  
dry



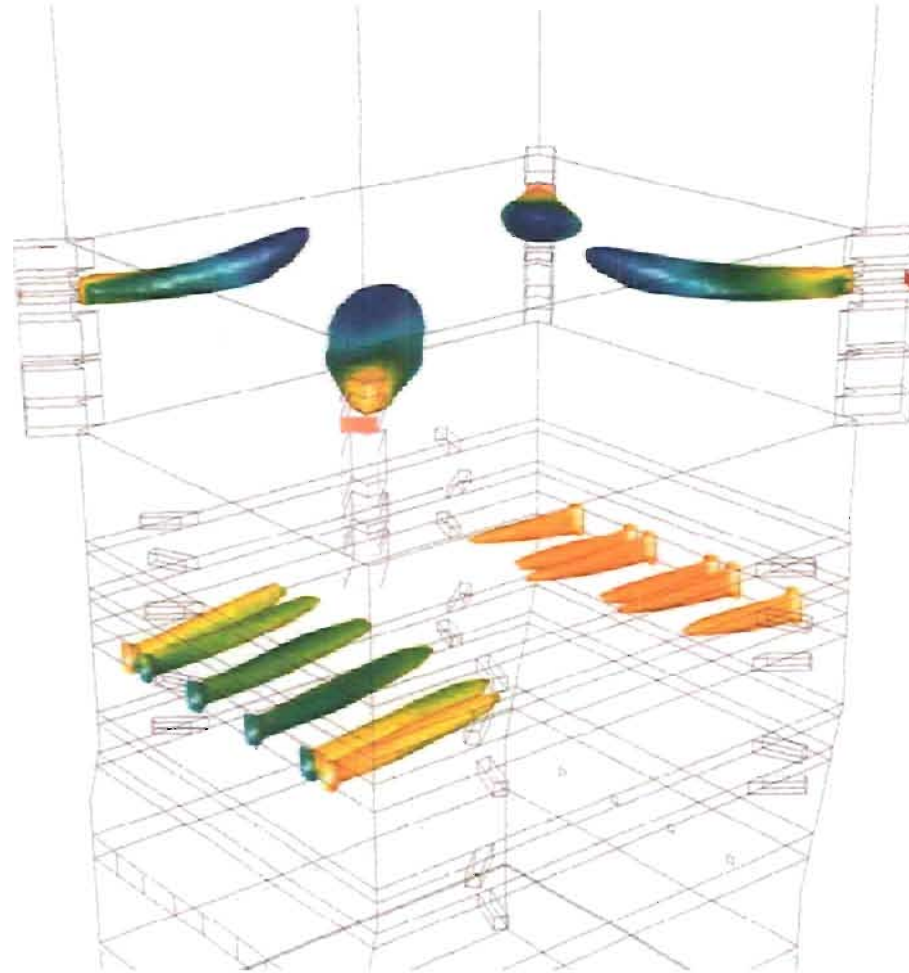
Case 7



# Iso-Surface of Velocity = 100 fps



Oxygen  
%dry



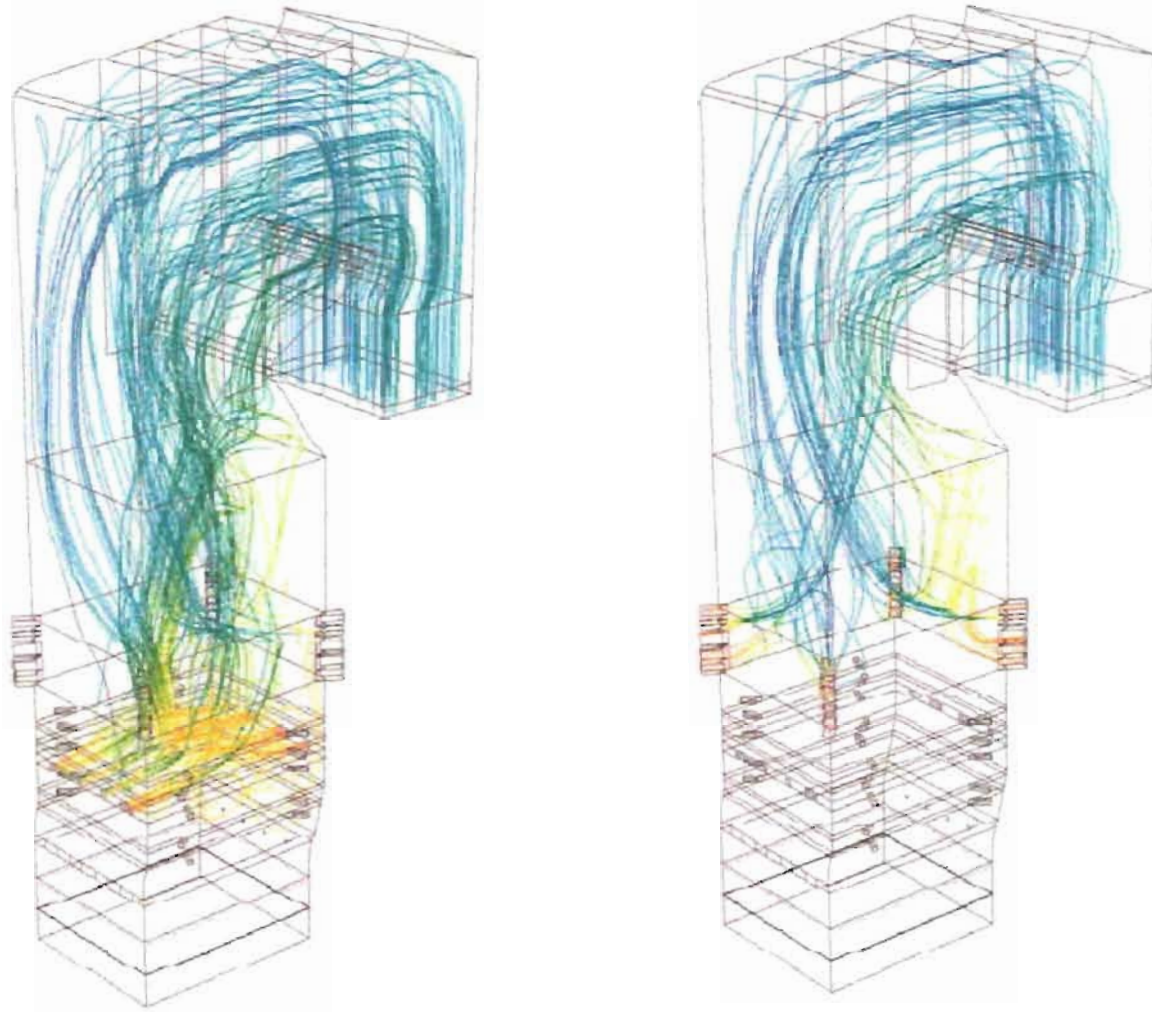
Case 8



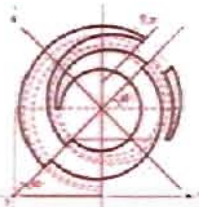
# Gas Path Lines



Oxygen  
%dry

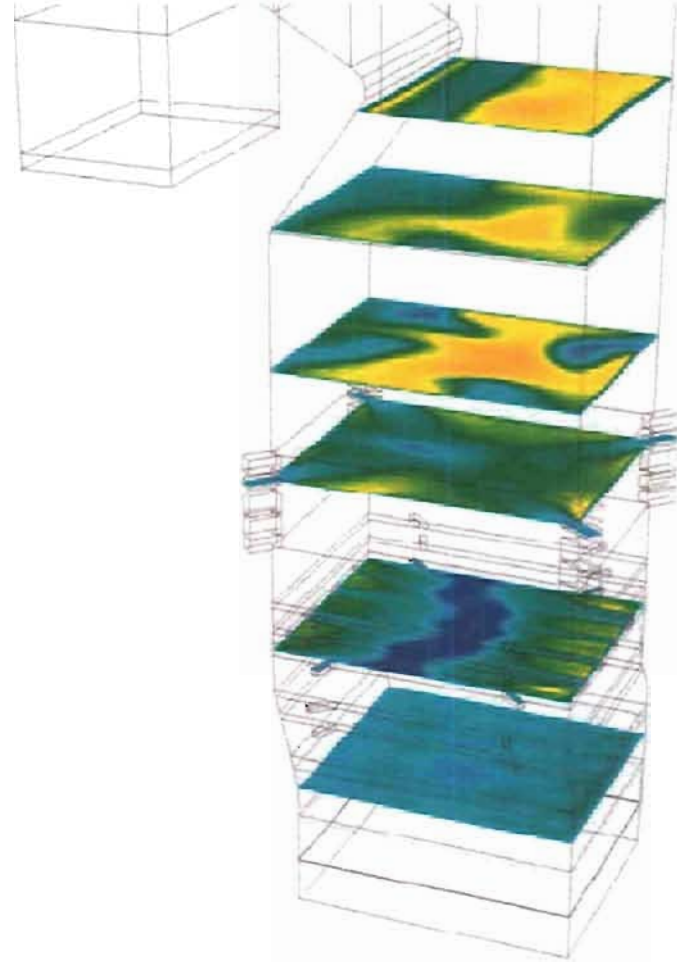
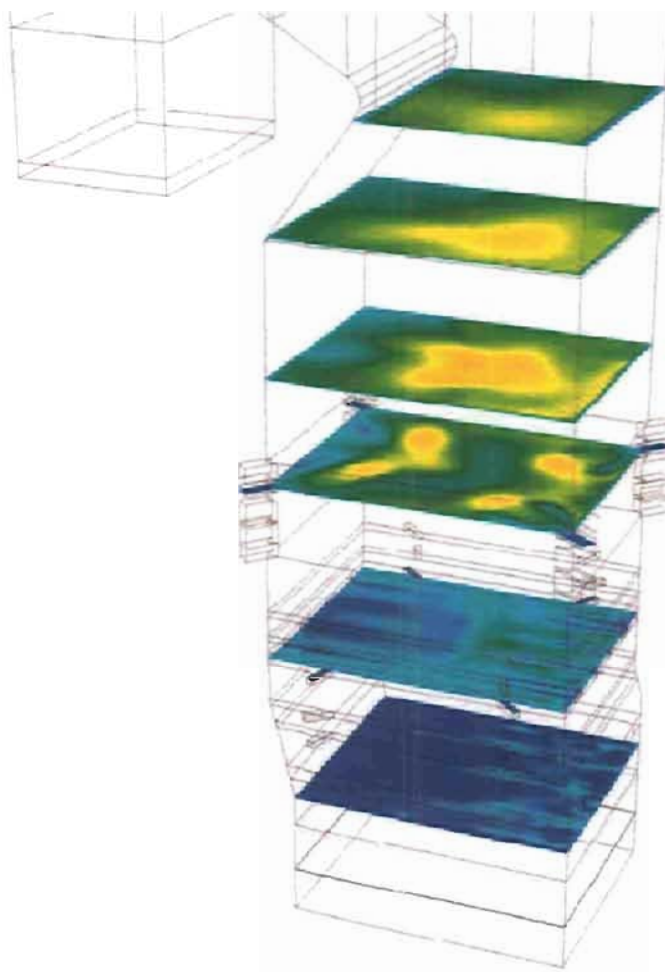
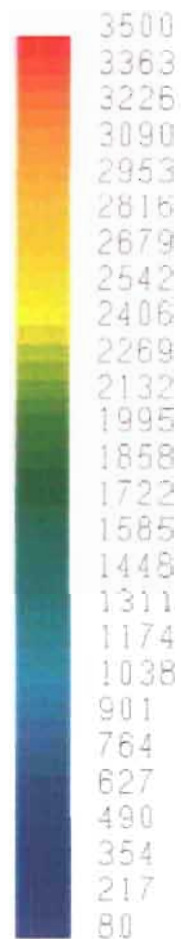


Case 8

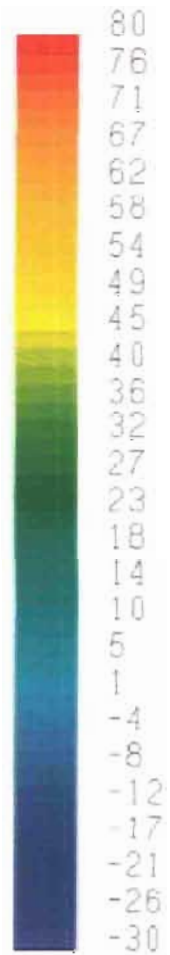


# Temperature & Velocity Contours **ALSTOM**

Temp, F

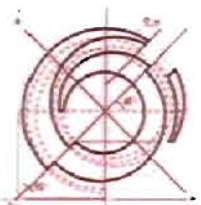


Vertical Velocity ft/s



Case 8

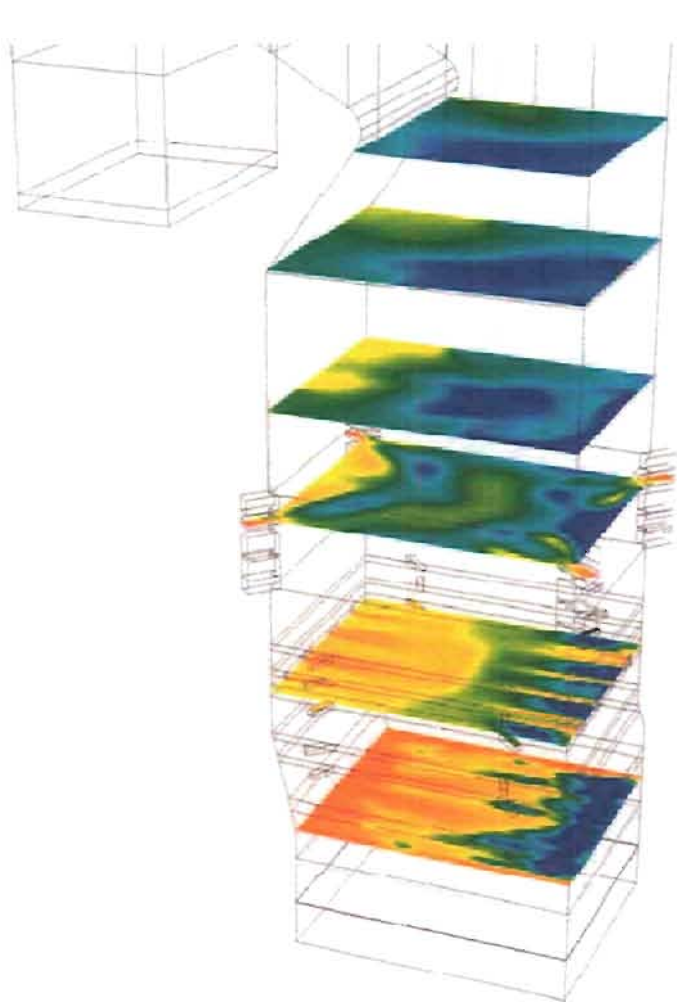




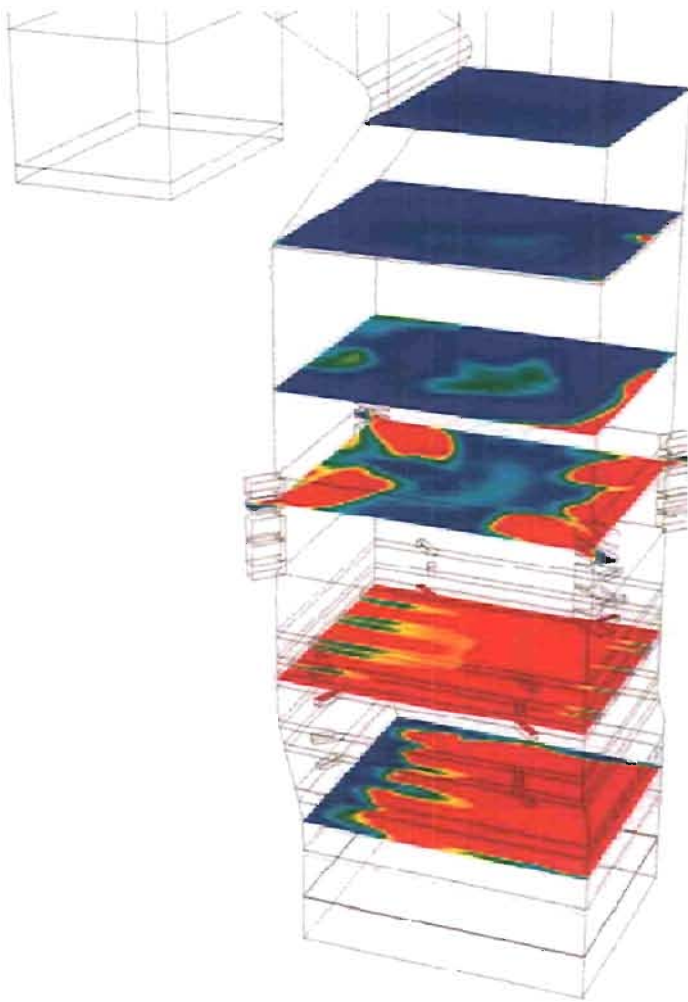
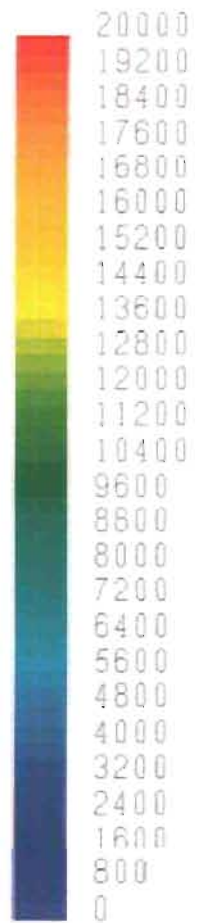
# O2 & CO Concentrations



Oxygen  
%dry



Co-ppm  
dry



Case 8

