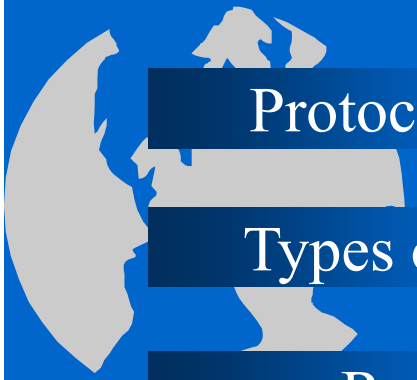
Emissions Testing - Protocols and Observations

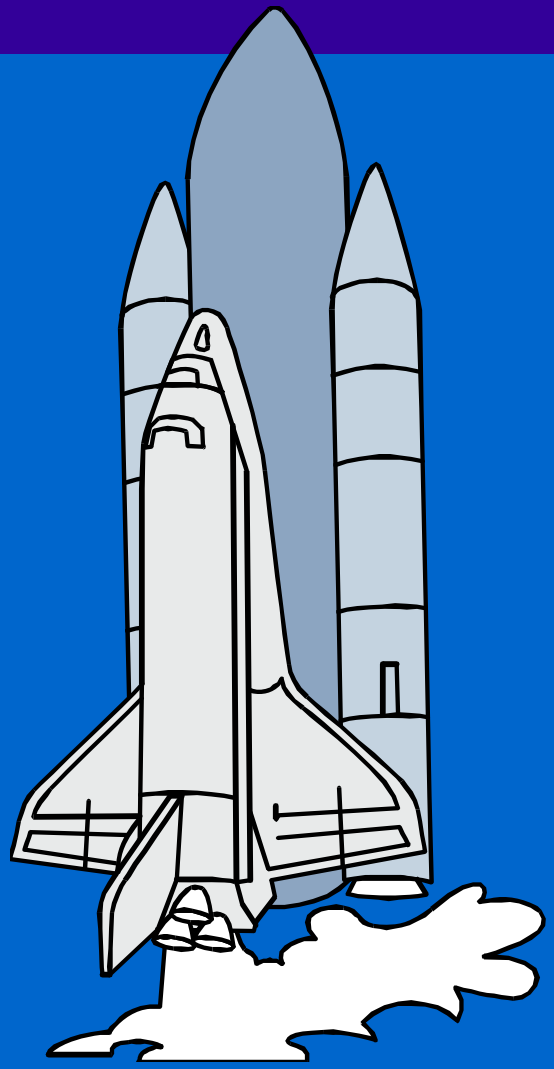
NJDEP- Bureau of Technical Services (BTS)
Fred Ballay

Overview



- Protocols & Observations
- Types of Problems Found
- Real World Issues
- Setup Issues
- Safety Concerns
- Frequency of Problems
- Solutions?
- Contact info & Web Site

Protocols & Observations



This isn't rocket science!

Protocols & Observations

Why is testing Required?

- Regulation
- Permit condition
- Enforcement Settlement

Protocols & Observations (cont.)

Stack Testing Process

- Test required
- Protocol submitted
  - often without pre-site survey
- Reviewed / comments issued
  - NODs for method choices or procedure

Protocols & Observations (cont.)

Stack Testing Process (cont.)

- Protocol eventually approved
- Mutually acceptable test date established
  - only after protocol approval
- Testing conducted
  - problems often discovered
- Report submitted for review

Protocols

Protocols

- Goal - To minimize problems in the field
- Identify required sampling train components & procedures.
  - Filters, Nozzles, Purges, etc.
- Ensure method is properly **tuned** for the source.
  - Detection Limits, Interferences, etc.

Protocols (cont.)

Protocol - Introduction

- Each protocol is source specific.
  - applicable methods vary source to source
  - Few exceptions (NOx RACT, Asphalt plants)
- Testing procedures must be approved by BTS.

Protocols (cont.)

Protocol - Introduction (cont.)

- Protocol spells out the procedures to be followed by tuning the methods.
  - Analyzer ranges
  - Detection limits
  - Sampling times
  - etc.

Protocols (cont.)

Protocol - Introduction (cont.)

- Testing must be conducted in accordance with the approved protocol and methods.
- Deviations from the protocol and methods require specific approval.
- Outlines the contents of the subsequent report submittal.

Protocols (cont.)

Protocol Information & Development

- Source information
- Sampling locations
- Proposed test methods and summaries
- Sampling, recovery and analytical procedures

Protocols (cont.)

Protocol Information & Development (cont.)

- Method specific tuning information
- Production Information
- Final report preparation details
- QA/QC Procedures

Protocols (cont.)

Sampling Locations

- Internal stack diameter
- Sampling port location(s)
  - diagram required
- Location(s) relative to disturbances
  - must meet minimum requirements
  - If not > 3D traverse required

Protocols (cont.)

Sampling Locations (cont.)

- Required # of sampling points
  - based on disturbance locations and stack diameter
- Approximate stack conditions
  - needed for preliminary calculations
- Pre-site survey should be conducted
  - We believe they're rarely done!

Protocols (cont.)

Test Methods

- Name and source of proposed Method(s)
- In-stack detection limits vs methods
  - metals, analyzers, GCs, particulate, etc.
- Description of sampling trains
  - include unusual items
    - nozzles, frits, filters, thermocouples, etc.

Protocols (cont.)

Test Methods (cont.)

- Analyzer ranges and calibration gases
  - range based on allowable
  - gases based on range
  - do not deviate on test day
  - frequent problem causing delays

Protocols (cont.)

Test Methods (cont.)

- Equipment calibration procedures
- Sample recovery procedures
- Holding times
- QA/QC
- Proposed deviations and Justification

Protocols (cont.)

Production Data

- Reflect regulations and permit
- Raw material information
- Control equipment parameters
- Fuel usage rates
- Production output
- Other pertinent information

Protocols (cont.)

Protocol Review & Approval

- Minimum of 3 valid test runs
- 60 min./run or batch step (whichever is longer)
  - DLs may require longer test runs
- Existing promulgated methods considered FIRST
- Mutually acceptable test date(s)
  - Generally 30-45 days from request

Protocols (cont.)

Report Preparation & Review

Report should Include:

- Proper facility information
- Source description & actual site info.
- Summary of results
- Production data

Protocols (cont.)

Report Preparation & Review (cont.)

- Copies of all raw lab & field data
- Sample calculations
- All calibration data
- Required certifications (P.E. or C.I.H & N.J.A.C. 7:27-1.39

Observations

Frequency of Field Problems

Internal Audit

- **47%** of the test observations resulted in significant corrections by BTS.

Frequency of Problems (cont.)

EPA Inspector General Audit

- Test Observations –NJDEP made significant corrections in **57 %** of the test programs.
- Test Protocols - NJDEP found **86 %** of the protocols to be deficient.
- Testing Programs - NJDEP required **28 %** of the test programs to be repeated for at least one parameter.
- Test Reports - **26 %** of the reports required significant correction, clarification or were rejected by NJDEP.

And they know we're looking!!!

Observations

Observations

- If detailed protocols were not submitted and approved……You need to go through the process!
- Review the methods with source specific issues in mind.
- Basically - Review a protocol!

General Facility Information

Facility Name:	Gerdau Ameristeel			TST No.:	050001
Program Interest No.:	18045	PCP No.:		BOP No.:	040002
Operating Scenerio:	U1 - EAF	DRE ?:		CE?:	
NSPS?:		NESHAPS?:		MACT?:	Other?:

Outlet Stack and Flow Rate Information

Stack Diameter Dimensions (inches) ☐ Rectangular ☑ Round

Moisture % @ Saturation 40.78%

Round (")	Length (")	Width (")	Temp. (°F)	ACFM	SCFM	Assumed Moisture %	DSCFM @ Saturation	@ Assumed DSCFM
240			170	772000	649460	2.6	384610	632574

Inlet Stack and Flow Rate Information

Stack Diameter Dimensions (inches) ☐ Rectangular ☐ Round

Moisture % @ Saturation

Round (")	Length (")	Width (")	Temp. (°F)	ACFM	SCFM	Assumed Moisture %	DSCFM @ Saturation	@ Assumed DSCFM
					0			0

Outlet Traverse Details

☐ Non-Particulate Traverse	Inches	Distance " TO " Disturbance Upstream (")	Downstream (")
Diameter or Equivalent	240.0	548.0	135.0
Diameters to Distrubance		2.28	0.56
Required Traverse/Flow Methods		EPA Methods 1 & 2	
Traverse Point Calculation		24	24

Inlet Traverse Details

☐ Non-Particulate Traverse	Inches	Distance " TO " Disturbance Upstream (")	Downstream (")
Diameter or Equivalent	Rnd or Sqr ?		
Diameters to Distrubance			
Required Traverse/Flow Methods			
Traverse Point Calculation			

Parameters of Interest (outlet only)

grains * 64.799 = mgs	Lb/Hr Limit	mg/30cf	EPA Method 25 vs 25A Inlet VOC lbs	% Carbon	% Production	CE	DE	Outlet ppm
Particulate	20	7.17						
PM-10	20	7.17		60	95	100	95	
PM-2.5								

Metals (outlet only)

Front Half Sample Volume (mls) 300 — 150 Back Half Sample Volume (mls)

Run Duration (Hrs) 4

	Lb/Hr Limit	ug/train	ICAP	AAS/CVAAS	GFAAS	ICPMS	Anal. ug/ml	
Arsenic	0.001	2.11	1.13E-02	4.26E-04	2.13E-04	8.52E-05	0.01408	Green is
Cadmium	0.008	16.89	8.52E-04	1.07E-03	2.13E-05	1.49E-05	0.11261	Acceptable
Lead	0.215	453.98	8.95E-03	2.13E-02	2.13E-04	4.26E-06	3.02650	
Manganese	0.526	1110.66	4.26E-04	2.13E-03	4.26E-05	8.52E-06	7.40437	Yellow is only
Mercury	0.0251	53.00		2.65E-04			0.35333	Acceptable
								with proper
								Precautions
								Red is not
								Acceptable

Organics & Gases (outlet only)

0 Impinger Start Volume (mls)

Sample Volume (L) 60

	Lb/Hr Limit	MW	~ ppm Limit	Solubility(g/100g)	Boiling Pt. (°C)	Polar?	~ ug/Train	Imp ugs (10% of sol)
Benzene	0.01	78.1	0.0013	0.17	80	NO	0.25	198.075
Nitrogen Oxides	24	46.0	5.32	N/A	0	N/A	607.74	
THC as Methane	6	16.0	3.81	N/A	0	N/A	151.93	
Sulfur Dioxide	18	64.1	2.86	N/A	0	N/A	455.80	

General Facility Information

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Program Interest No.:	18045	PCP No.:		BOP No.:	040002
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NSPS?:		NESHAPS?:		MACT?:	Other?:

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Diameter or Equivalent	Rnd or Sqr ?		
Diameters to Distrubance			
Required Traverse/Flow Methods			
Traverse Point Calculation			

Parameters of Interest (outlet only)

*grains * 64.799 = mgs*	Lb/Hr Limit	mg/30cf	EPA Method 25 vs 25A: Inlet VOC lbs	% Carbon	% Production	CE	DE	Outlet ppm
Particulate	20	7.17						
PM-10	20	7.17		60	95	100	95	
PM-2.5								

Observations (cont.)

Observations

- Do your homework
- Be familiar with the methods
- Prepare forms/checklists
- Understand source allowable structures vs Method detection limits.

Front Half Sample Volume (mls) 300

Metals (outlet only)

150 Back Half Sample Volume (mls)

Run Duration (Hrs) 4

	Lb/Hr Limit	ug/train	ICAP	AAS/CVAAS	GFAAS	ICPMS	Anal. ug/ml
Arsenic	0.001	2.11	1.13E-02	4.26E-04	2.13E-04	8.52E-05	0.01408
Cadmium	0.008	16.89	8.52E-04	1.07E-03	2.13E-05	1.49E-05	0.11261
Lead	0.215	453.98	8.95E-03	2.13E-02	2.13E-04	4.26E-06	3.02650
Manganese	0.526	1110.66	4.26E-04	2.13E-03	4.26E-05	8.52E-06	7.40437
Mercury	0.0251	53.00		2.65E-04			0.35333

Green is Acceptable

Yellow is only Acceptable with proper Precautions

Red is not Acceptable

Organics & Gases (outlet only)

0 Impinger Start Volume (mls)

Sample Volume (L) 60

	Lb/Hr Limit	MW	~ ppm Limit	Solubility(g/100g)	Boiling Pt. (°C)	Polar?	~ ug/Train	Imp ugs (10% of sol)
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Nitrogen Oxides	24	46.0	5.32	N/A	0	N/A	607.74	
THC as Methane	6	16.0	3.81	N/A	0	N/A	151.93	
Sulfur Dioxide	18	64.1	2.86	N/A	0	N/A	455.80	

Observations (cont.)

- Ensure the methods and protocols are followed.
- It is the tester's responsibility to conduct the program properly. You can't see everything!
- Document what you observe and correct as necessary.
- If you're not sure, DO NOT hold up the test program until you are sure.
- Try to stay out of the way as much as possible.

Types of Problems Found

Errors Attributable to the Pre-site Survey

(or lack thereof)

- Unacceptable Sample Locations
  - Port Locations
  - Upstream & Downstream Diameters

- Equipment & Electrical Needs/Limitations
  - Equipment Clearances
  - Port Diameters
  - Traversing needs (vertical)

Types of Problems Found (cont.)

Sample Recovery and Handling Errors

- Unacceptable recovery locations
- Improper labeling and chain of custody
- Improper reagents and equipment
- Inadequate procedures
- Shipping errors

Types of Problems Found (cont.)

Equipment Errors

- Operating ranges/calibration gases
- Poor condition or not calibrated
- Incorrect train components
- Improper methods

Continuous Instrumental Test Methods (ND)

Stratification Test

Point	Reading	Point	Reading	Point	Reading	Point	Reading	Point	Reading	Point	Reading	Mean
1	22.71	3	22.45	5	21.69	7	21.36	9	20.85	11	21.6	21.62
2	22.09	4	21.23	6	21.36	8	20.85	10	21.32	12	21.96	

Acceptable Range Single Point				Reading	Result	Acceptable Range Three Points				Reading	Result
Minimum	20.54	or	21.12	20.85	PASS	Minimum	19.46	or	20.62	20.85	PASS
Maximum	22.70		22.12	22.71	FAIL	Maximum	23.78		22.62	22.71	PASS

For Oxygen and Carbon Dioxide ONLY >> Single Trav. point <0.3% 3 Trav. points <0.5%

Calibration Data

O_2 Zero / Span		Analyzer Reading	2% Error	System Reading Pre 1	5% Bias	System Reading Pre 2	5% Bias	3% Drift	System Reading Pre 3	5% Bias	3% Drift	System Reading Post 3	5% Bias	3% Drift	Final Bias Corrections	
	LOW	0	-0.05	-0.2	-0.03	0.1	-0.02	0.1	0	-0.03	0.1	0	-0.03	0.1	0	Run 1	14.72
✓	MID	12.1	12.04	-0.3	12.11	0.3	12.1	0.3	-0	12.09	0.2	0.3	12.06	0.1	-0.2	Run 2	14.69
	HIGH	21.1	21.1	0		-100		-100	0		-100	-100		-100	0	Run 3	14.70
Alternate Drift & Bias ----- 0.5%					Run 1 =	14.73			Run 2 =	14.69		Run 3 =	14.68			Average	14.70

CO_2 Zero / Span		Analyzer Reading	2% Error	System Reading Pre 1	5% Bias	System Reading Pre 2	5% Bias	3% Drift	System Reading Pre 3	5% Bias	3% Drift	System Reading Post 3	5% Bias	3% Drift	Final Bias Corrections	
	LOW	0	-0.03	-0.2	0.06	0.5	0.07	0.5	0.1	0.06	0.5	0.4	0.09	0.6	0.2	Run 1	3.59
✓	MID	9.16	9.13	-0.2	8.91	-1.2	8.94	-1	0.2	8.91	-1.2	-1.3	8.99	-0.7	0.6	Run 2	3.62
	HIGH	18.9	18.98	0.4		-100		-100	0		-100	-100		-100	0	Run 3	3.64
Alternate Drift & Bias ----- 0.5%					Run 1 =	3.54			Run 2 =	3.57		Run 3 =	3.6			Average	3.62

SO_2 Zero / Span		Analyzer Reading	2% Error	System Reading Pre 1	5% Bias	System Reading Pre 2	5% Bias	3% Drift	System Reading Pre 3	5% Bias	3% Drift	System Reading Post 3	5% Bias	3% Drift	Final Bias Corrections	
	LOW														Run 1	
	MID														Run 2	
	HIGH														Run 3	
Alternate Drift & Bias ---- 0.5 ppm					Run 1 =				Run 2 =			Run 3 =				Average	

NO_x Zero / Span ✓ Converter Check		Analyzer Reading	2% Error	System Reading Pre 1	5% Bias	System Reading Pre 2	5% Bias	3% Drift	System Reading Pre 3	5% Bias	3% Drift	System Reading Post 3	5% Bias	3% Drift	Final Bias Corrections	
	LOW	0	0.04	0.1	0.04	0	0.26	0.4	0.4	0.26	0.4	0	-0.08	-0.2	-0.2	Run 1	23.99
✓	MID	23.6	23.28	-0.6	22.96	-0.6	22.39	-1.6	-1	22.82	-0.8	0.2	22.29	-1.8	-2	Run 2	23.94
	HIGH	54.9	55.09	0.3		-100		-100	0		-100	-100		-100	0	Run 3	24.20
Alternate Drift & Bias ---- 0.5 ppm					Run 1 =	23.05			Run 2 =	22.93		Run 3 =	23.13			Average	24.05

CO Zero / Span		Analyzer Reading	2% Error	System Reading Pre 1	5% Bias	System Reading Pre 2	5% Bias	3% Drift	System Reading Pre 3	5% Bias	3% Drift	System Reading Post 3	5% Bias	3% Drift	Final Bias Corrections	
	LOW	0	0	0	0.24	2	0.14	1.2	-0.8	-0.05	-0.4	0.4	0.04	0.3	-0.1	Run 1	-0.06
✓	MID	4.92	5.08	1.3	5.05	-0.2	4.81	-2.2	-2	4.85	-1.9	0.1	4.89	-1.6	-1.7	Run 2	0.08
	HIGH	12.1	12.26	1.3		-101		-101	0		-101	-101		-101	0	Run 3	0.19
Alternate Drift & Bias ---- 0.5 ppm					Run 1 =	0.13			Run 2 =	0.12		Run 3 =	0.18			Average	0.07

THC Zero / Span		Analyzer Reading	2% Error	System Reading Pre 1	5% Error	System Reading Pre 2	5% Error	3% Drift	System Reading Pre 3	5% Error	3% Drift	System Reading Post 3	5% Error	3% Drift	Final Bias Corrections *(Not Required!)*	
	Zero	0	0.07		0.17	1.7	0.1	1	-0.7	0.11	1.1	1.8	0.07	0.7	-1.1	Span =	10
✓	LOW	3	2.98	-0.2	2.96	-0.4	3.03	0.3	0.7	2.94	-0.6	-1.3	2.97	-0.3	1	Run 1	0.48
	MID	4.94	4.92	-0.2		-49		-49	0		-49	-49		-49	0	Run 2	0.43
	HIGH	8.46	8.48	0.2		-85		-85	0		-85	-85		-85	0	Run 3	0.43
Alternate Drift & Bias ---- 0.5 ppm					Run 1 =	0.59			Run 2 =	0.52		Run 3 =	0.5			Average	0.45

Continuous Instrumental Test Methods (ND)

Stratification Test

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Maximum	22.70		22.12	22.71	FAIL

Acceptable Range Three Points				Reading	Result
Minimum	19.46	or	20.62	20.85	PASS
Maximum	23.78		22.62	22.71	PASS

For Oxygen and Carbon Dioxide ONLY >> Single Trav. point <0.3% 3 Trav. points <0.5%

Calibration Data

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LOW 0	-0.05	-0.2	-0.03	0.1	-0.02	0.1	0	-0.03	0.1	0	-0.03	0.1	0	Run 1	14.72
☑ MID 12.1	12.04	-0.3	12.11	0.3	12.1	0.3	-0	12.09	0.2	0.3	12.06	0.1	-0.2	Run 2	14.69
☐ HIGH 21.1	21.1	0		-100		-100	0		-100	-100		-100	0	Run 3	14.70
Alternate Drift & Bias ----- 0.5%				Run 1 =	14.73	Run 2 =	14.69		Run 3 =	14.68		Average			14.70

CO_2 Zero Span	Analyzer Reading	2% Error	System Reading Pre 1	5% Bias	System Reading Pre 2	5% Bias	3% Drift	System Reading Pre 3	5% Bias	3% Drift	System Reading Post 3	5% Bias	3% Drift	Final Bias Corrections	
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☐ HIGH 18.9	18.98	0.4		-100		-100	0		-100	-100		-100	0	Run 3	3.64
Alternate Drift & Bias ----- 0.5%				Run 1 =	3.54	Run 2 =	3.57		Run 3 =	3.6		Average			3.62

SO_2 Zero Span	Analyzer Reading	2% Error	System Reading Pre 1	5% Bias	System Reading Pre 2	5% Bias	3% Drift	System Reading Pre 3	5% Bias	3% Drift	System Reading Post 3	5% Bias	3% Drift	Final Bias Corrections
LOW														

Types of Problems Found (cont.)

Procedural Errors

- Cyclonic flow checks
- Leak checks
- Traverse points
- Isokinetics
- Temperatures and ice downs
- Recovery procedures

Types of Problems Found (cont.)

Inexperience or Frustration Errors

- You name it.
- End of Day Syndrome (EDS).

FTIR Observations

- 4 FTIR Source Methods
  - 318 – HCHO and Methanol @ Fiberglass
  - 320 – General FTIR method
  - 321 – HCl @ Portland Cement
  - ASTM D6348 – General FTIR Method

FTIR Observations

- Method 320 (Sec 13.0) - Validation Study
  - Necessary to validate method for specific gas matrices for all analytes
  - Dynamic spiking through entire sampling system
  - Consist of 12 spiked/unspiked “samples”
  - Spike ≤ 10 % Total Flow

FTIR Observations

- Method 318,320,321 ASTM – QA Spike
  - Necessary to check system for transport of select analytes
  - Dynamic spiking through entire sampling system
  - Consist of 12 spiked/unspiked “samples”
  - Spike ≤ 10 % Total Flow

FTIR Observation

- Temperature, Pressure, Path length of FTIR cell
- Temperature of sample delivery system
- Leak check of system
- Source of Reference Spectra
- Absorbance <~1.0

CEM General

- Calibration Gas Flow rates
  - Over pressurize monitor (bias results)
  - Over pressurize leaks in sample system
- Sample Conditioning
  - SO_2 Response Time Change?
  - Hot/Wet System – Exposed sections?

Real World Issues

Real World Issues

Leak Checks

- Past - Greater than the maximum vacuum.
- Newer impingers have O-rings in the ball joints.
- Now - No more than 1” above maximum vacuum.

SVL Caps

Part#	Description
GA-15B	Bored Cap, #15 Threads
GA-15C	Solid Cap, #15 Threads with Seal
GA-22B	Bored Cap, #22 Threads
GA-22C	Solid Cap, #22 Threads with Seal
GA-30B	Bored Cap, #30 Threads
GA-30C	Solid Cap, #30 Threads with Seal

SVL Seals

Real World Issues

Pitot Problems

- Consultant didn't do the pitot tube leak check.
- The observer requested it be conducted prior to preliminary work.
- Consultant chose to leak check after preliminary work.
- Lost 1 hour on preliminary work, 2 hours finding & fixing the leak.

Real World Issues

Another Pitot Problem

- Asphalt Plant test initially not observed.
- Consultant called and reported cyclonic flow @ 80 degrees.
- We checked prior test report for indication of cyclonic flow.
- Report indicated no sign of cyclonic flow.

Real World Issues

Another Pitot Problem

- Two of our people went to the site. Consultant claimed to be an ex-regulator.
- Pitot tube was in very poor condition.
- Very poor procedure.
- Our people determined cyclonic flow to be less than 10 degrees.


8. 3. 2000

Real World Issues

Paper Board Plant

- Protocol was approved with acceptable sampling locations.
- Three locations tested simultaneously (1 horizontal and 2 vertical)

Real World Issues

Paper Board Plant

- Protocol contained inaccurate information. The sampling locations were not acceptable and extensions were required. Testing delayed 1 week.
- The consultant was not traversing the vertical port location. Run voided. 2 hours wasted.

Real World Issues

Refinery Test

- Not observed
- Consultant believed ammonia was interfering with their NOx analyzer because their analyzer didn't agree with the facilities CEM.
- To fix the problem they placed an ammonia scrubber in-line.

Real World Issues

Refinery Test

- We identified the scrubber in the test report.
- We suspected that NOx would also be removed. Consultant disagreed.
- We conducted a converter efficiency test on our NOx analyzer while switching the same ammonia scrubber in and out.
- NOx was removed & the test was repeated.

Real World Issues

Sewage Treatment Plant Test

- H_2S test during which the consultant elected not to do the optional (but recommended) calibrations between runs.
- Consultant wanted to “save” time.
- Entire day scrapped due to failed post-calibration.

Real World Issues

Gypsum Plant Test

- Sampled while process was not operating.
- Sampling train took a dive!
- Improperly aligned probe and pitot assembly.
- Filter & impinger temps. above method criteria.
- Port locations not consistent with protocol. Tests postponed!

Real World Issues

RRF Test

- HCl inlet & outlet.
- PM-10
- Metals
- Particulate

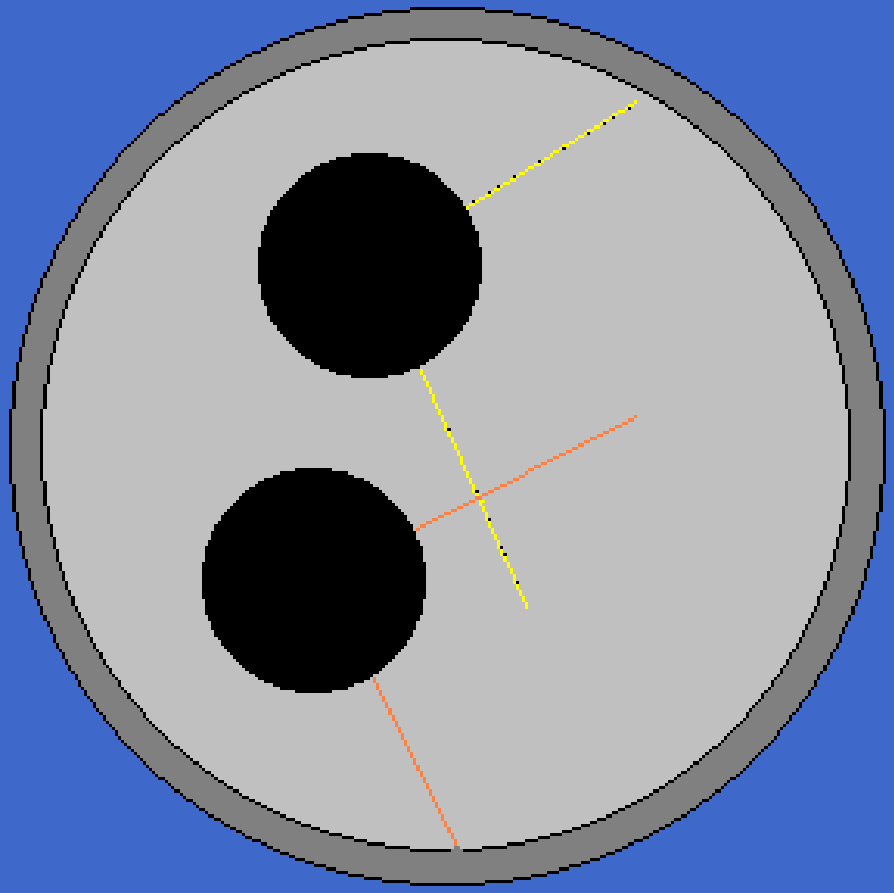
Real World Issues

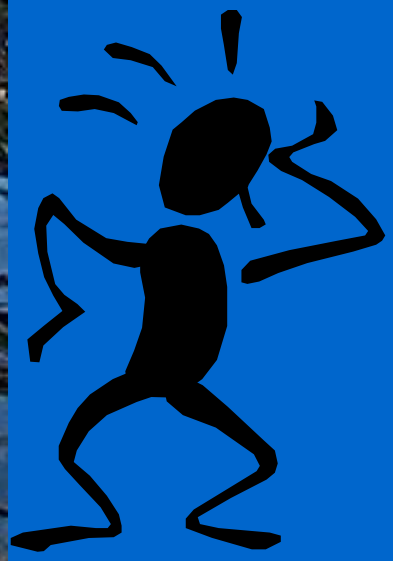
RRF Test

- Incorrect impinger solutions for the HCl trains.
- Cascade impactor instead of cyclone for PM-10.
- Glass filter support when teflon was required for the Metals train.
- Particulate train was traversed incorrectly.

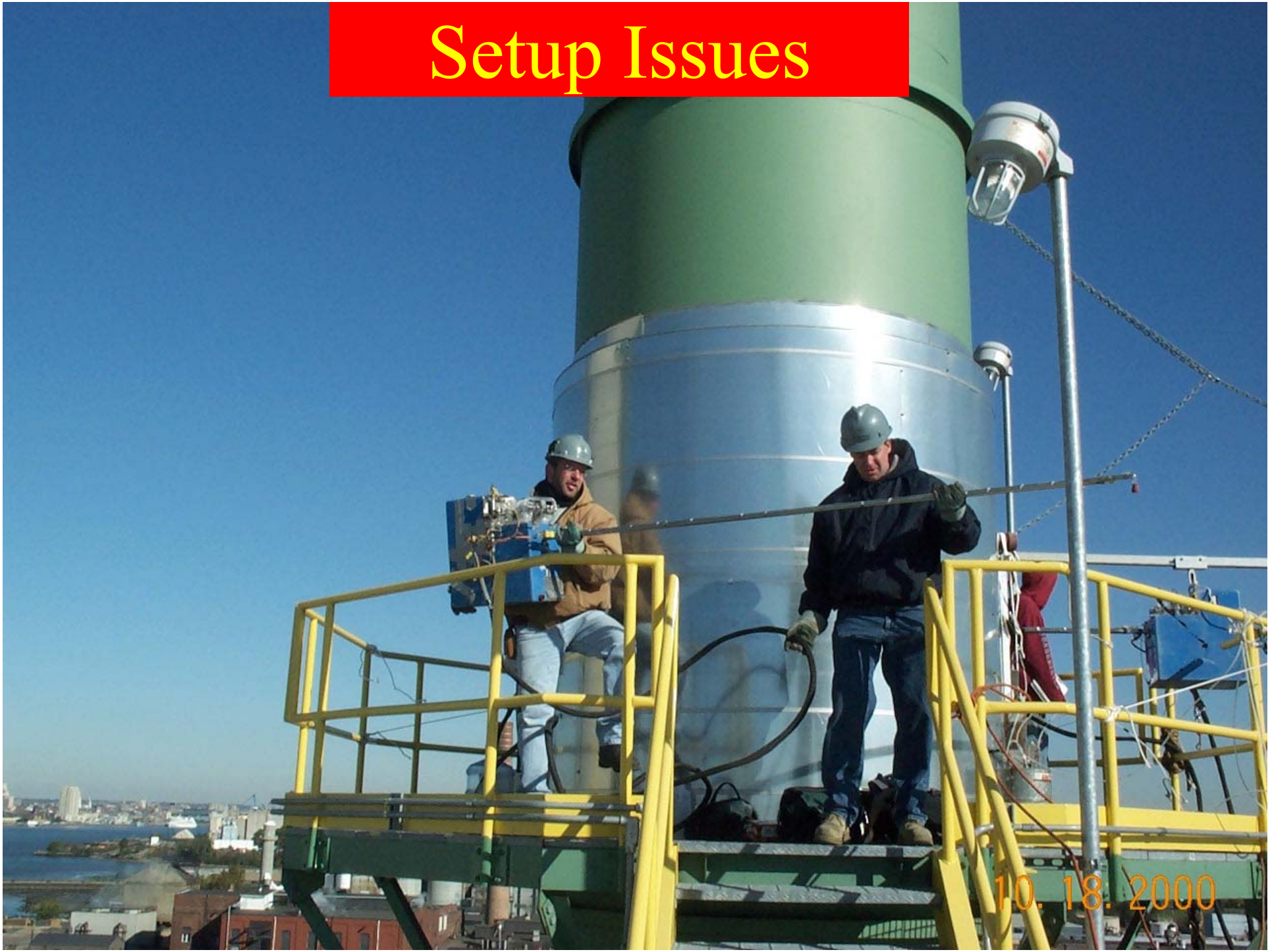
Real World Issues

RRF Test





Setup Issues




DO NOT ENTER
10. 16. 2000



9.19.2000



CAT


UNITED SCIENCES, INC.
3.6.2001


STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION & ENERGY
STACK EMISSIONS MEASUREMENT SYSTEM
SUPPORT UNIT

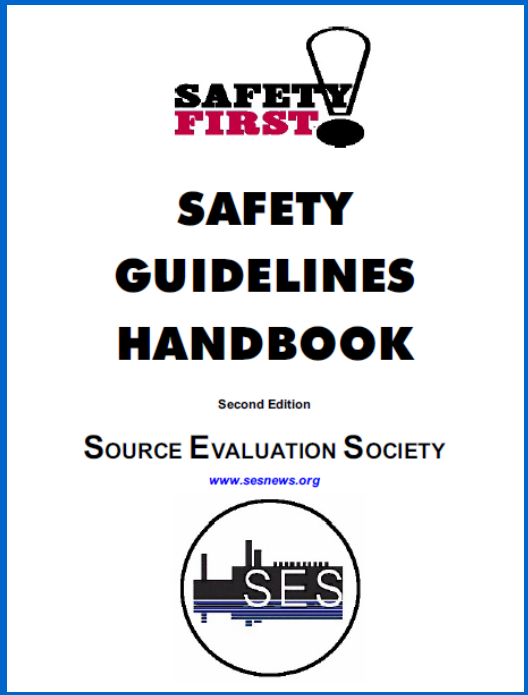

SKYJACK
SKYJACK
40
HA

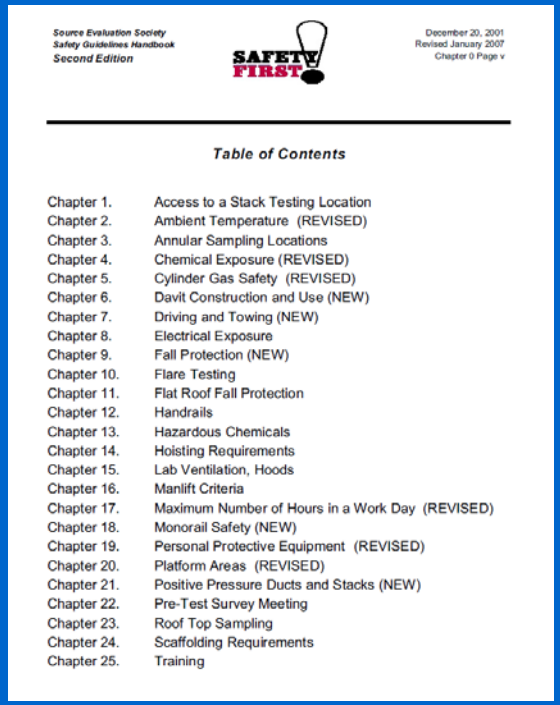
Safety Concerns

- Be aware of your surroundings
  - Falls, Trips, Slips, Shocks, Items from above
- Exposure to chemicals used for testing
  - MeCl, HCl, HNO3, KMnO4, Toulene
- Exposure to Stack Gas
  - leaking ports, sample equipment vents, etc
- Exposure to the weather

SES Safety Guidelines Handbok

- Link : http://www.sesnews.org/index.php?q=node/21





Safety Concerns


3. 6. 2001


2
18 7 2001


24 12:20PM

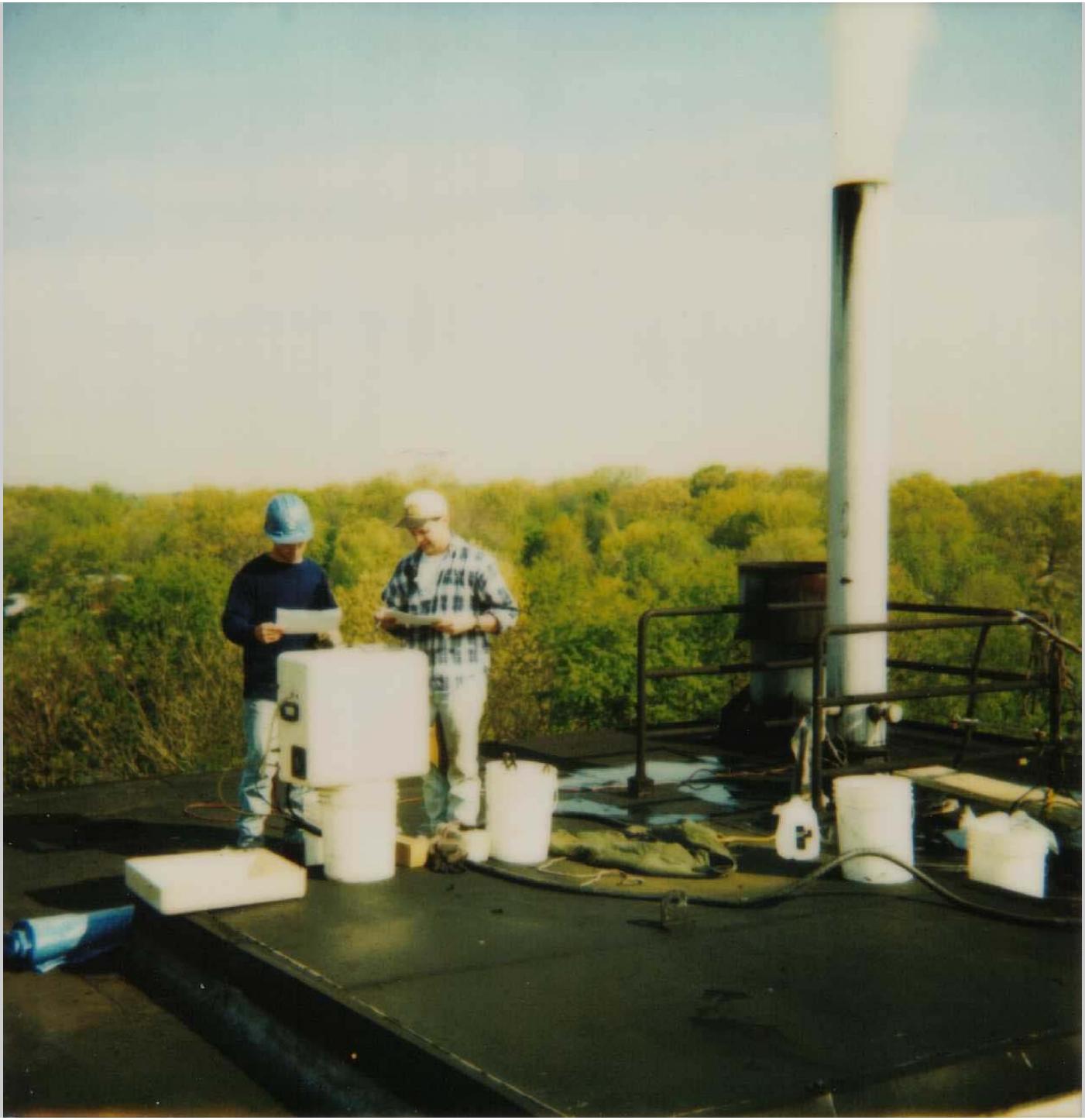

20 7:45


20 9:31

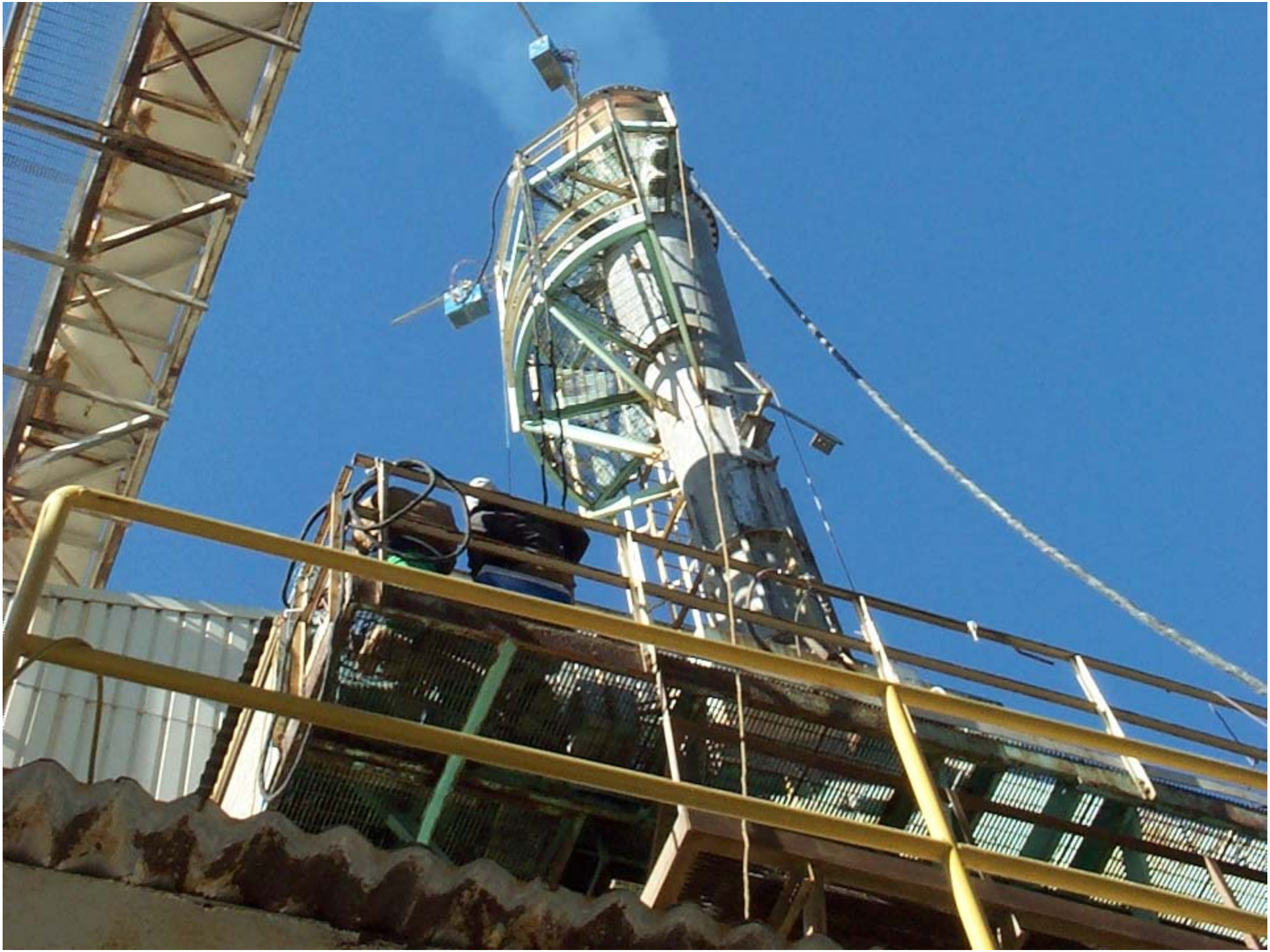

24 12:30PM
BAKER
BAKER
BAKER
REFRACTORIES


18 7 2001


7M-550 35kg
LAB
CHRYSOTILE
10 04 02 3 A




9.19.2000




APEX
INSTRUMENTS


3. 7. 2001


10. 18. 2000


4. 5. 1999


Platform Location Where Grating Collapsed
(130 Feet Above Ground Level)


Why ???

Accreditation?

Accreditation?

Certifications

- Would likely not solve the problem alone.
- Must have a significant hammer.
- Would allow companies looking for a consultant to request a minimum level of expertise on their job and in their bid.
- You must remember that there are significant dollars wrapped up in the collection of the samples.

Accreditation?

Adequate Regulatory Oversight

- What % of errors is acceptable?
- We see about 50% and they know we're coming out to observe.
- At ~ 90 % of the tests programs observed, only about 5 - 10 % of the test programs have unobserved errors. Some of those are found in the test report reviews.

BTS

Mail Code: 380-01A
Fred Ballay
NJDEP - BTS
PO Box 420
Trenton, NJ 08625-0420

609-530-4041
www.state.nj.us/dep/bts

BTS Technical Manuals

- Technical Manual 1004
  - "Guidelines for Compliance Stack Test Programs"
  - www.state.nj.us/dep/bts

    Look under Consultant Services