CiSCO CEMS USER GROUP

Keys to a Successful RATA

Paul Little
Director of Customer Service
(918) 289-6378
plittle@airhygiene.com

Air Hygiene International, Inc.
1600 W Tacoma Street
Broken Arrow, Oklahoma
(918) 307-8865

Objectives

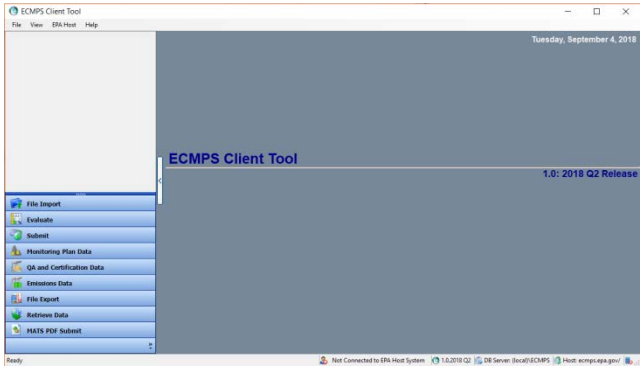
- Share a Written Standard
- Present Air Hygiene's approach to Relative Accuracy Test Audits (RATAs)
- Discuss Services and Options (that could be advantageous)

Checklist

- ❑ Pre-mob
- ❑ Setup
- ❑ Test Day
- ❑ Post Test / Before Demobilization
- ❑ Report Review

Before we Mobilize

- ❑ Protocol
- ❑ Unit specific info



- **ten-18-kiamichi.ok-rata#1 Whisenhunt, Michael (IP) 05/23/18 2 Kiamichi Power Plant Kiowa (1) OK**
  - There is always the possibility that load boundaries or normal/secondary ranges have changed in their Monitoring Plan, but here's what I can find from the ECMPS
  - ORIS: 55501

Designator	Target	Monitoring System ID	Upper Boundary	Lower Boundary	Normal Load Range	2nd Normal Load Range
CTG1	LOAD		401	108	H	M
	NOx	N10				
CTG2	LOAD		401	108	H	M
	NOx	N20				

What does “Normal” mean?

Indicate normal and secondary normal loads with dropdowns	RATA Load Calculator		
	Upper Boundary =		401.0
	Lower Boundary =		108.0
	S =	UB - LB =	293.0
	High Range =	UB - 40%S =	283.8
	Mid Range =	HR - 30%S =	195.9
	Low Range =	MR - 30%S =	108.0
	High Load = HR to UB		
Normal	283.8	to	401.0
	Mid Load = MR to HR		
Sec Normal	195.9	to	283.8
	Low Load = LR to MR		
	108.0	to	195.9

Setup

- Time Synchronization
- CEMS makes, models, serial numbers

- How long is it going to take?
- Are we going to pass?

What if we don’t agree?

- Work systematically
- Work from least to most evasive
  - Stack inspection
    - Is the CEMS probe there?
    - Is the RM probe off-gassing?
  - Sample lines
    - Are all lines heating
    - To what temperature(s)
  - Leak checks

What if we don't agree?
(continued)

- Re-calibrations
  - Try system mode for RM?
- What's the parameter
  - NOx
    - How does the NO compare
    - How does the NO_2 compare
    - Run a CEMS NO_2 conv. check
- Re-calibrations with shared gases
- Tap into each others sample lines

Test Day

- CEMS Calibration

- How long is it going to take?
- Are we going to pass?
  - Stratification test can confirm

- Everything included in a post-test review is something you'll wish you would have asked pre-test

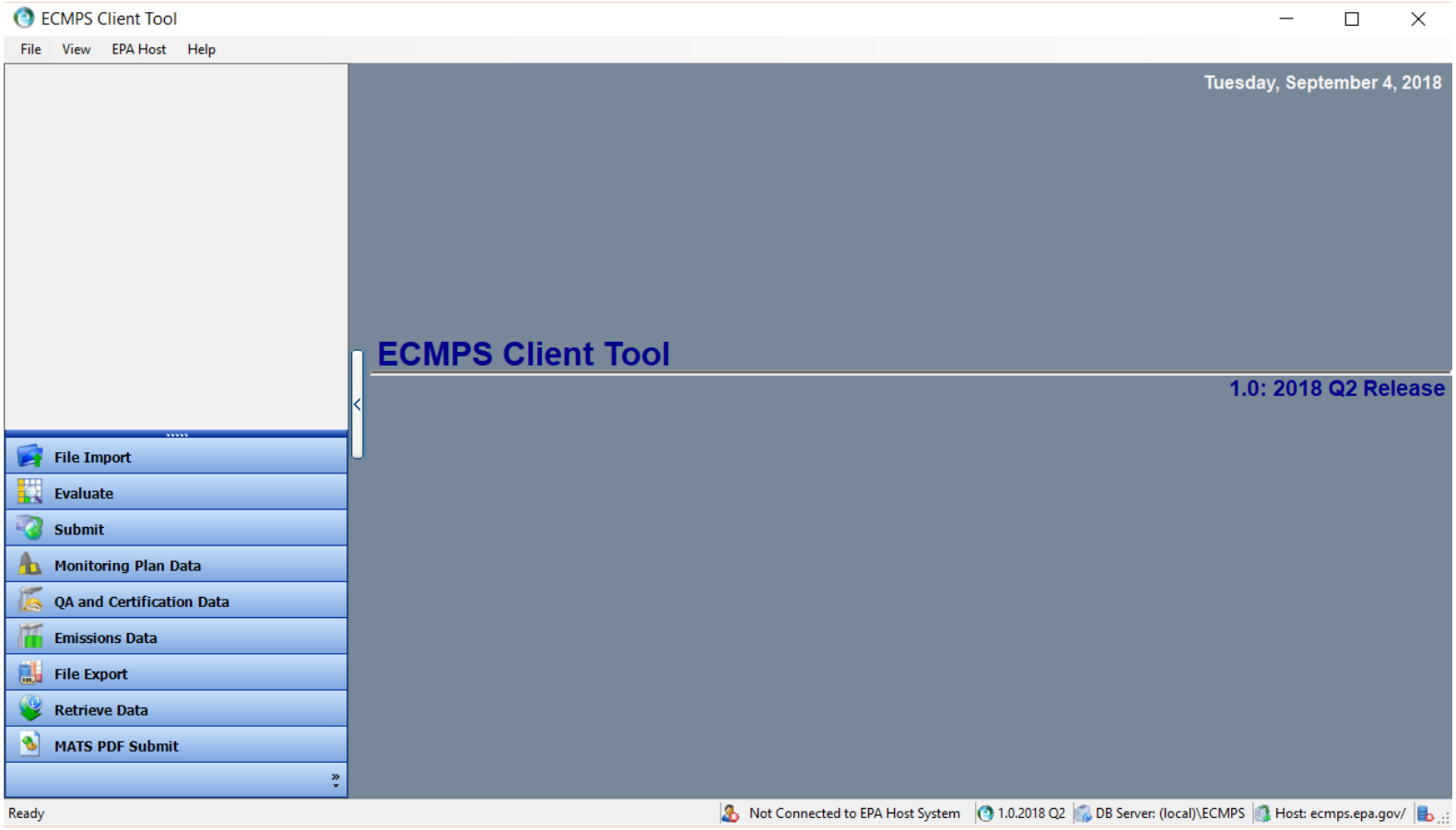
Questions to Ask

- Load
  - Stable / Normal / Sec. Normal
- Primary fuel combusted?
- Correct point or points [Strat]
- NO_2 Conv efficiency ≥90%
- Did the RATA pass
- Is there a BAF
- Was the tester a QI / QSTI
- Was the company an AETB

Questions to Ask
(continued)

- ❑ Did all systems (CEMS and RM) pass calibrations
- ❑ Did RM runs follow proper QA
- ❑ Did RATA run times match
- ❑ Were both CEMS and RM wet or dry
- ❑ Did the RATA use nine runs
- ❑ Was each RATA run 21 minutes

Let ECMPS Do It



Let ECMPS Do It

(continued)

RATARunData - Level 5

							round to	3	3	0	digits
RunNumber	BeginDate	BeginHour	BeginMinute	EndDate	EndHour	EndMinute	CEMValue	RATAReferenceValue	GrossUnitLoad	RunStatusCode	
1	5/24/2018	23	15	5/24/2018	23	35	0.027	0.027	244	RUNUSED	
2	5/24/2018	23	45	5/25/2018	0	5	0.027	0.027	245	NOTUSED	
3	5/25/2018	0	15	5/25/2018	0	35	0.026	0.026	245	RUNUSED	
4	5/25/2018	0	45	5/25/2018	1	5	0.026	0.026	245	RUNUSED	
5	5/25/2018	1	15	5/25/2018	1	35	0.026	0.026	245	RUNUSED	
6	5/25/2018	1	45	5/25/2018	2	5	0.026	0.026	245	NOTUSED	
7	5/25/2018	2	15	5/25/2018	2	35	0.026	0.026	245	RUNUSED	
8	5/25/2018	2	45	5/25/2018	3	5	0.026	0.026	245	RUNUSED	
9	5/25/2018	3	15	5/25/2018	3	35	0.026	0.026	245	RUNUSED	
10	5/25/2018	3	45	5/25/2018	4	5	0.026	0.026	245	RUNUSED	
11	5/25/2018	4	15	5/25/2018	4	35	0.026	0.026	245	RUNUSED	

RATASummaryData - Level 4

			3	3	3	3	3	3
OperatingLevelCode	AverageGrossUnitLoad	ReferenceMethodCode	MeanCEMValue	MeanRATAReference Value	MeanDifference	StandardDeviationDifference	ConfidenceCoefficient	TValue
H	245	7E,3A	0.026	0.026	0.000	0.000	0.000	2.306

Let ECMPS Do It

(continued)

RATAData - Level 3

NumberOfLoadLevels	RelativeAccuracy	RATAFrequencyCode	OverallBiasAdjustmentFactor
1	0.00	4QTRS	1.000

AirEmissionTestingData - Level 3

QILastName	QIFirstName	QIMiddleInitial	AETBName	AETBPhoneNumber	AETBEmail	ExamDate	ProviderName	ProviderEmail
Whisenhunt	Michael	R	Air Hygiene International Inc	888-461-8778	info@airhygiene.com	1/6/2018	Source Evaluation Society	qstiprogram@gmail.com

ProtocolGasData - Level 3

GasLevelCode	GasTypeCode	CylinderIdentifier	VendorIdentifier	ExpirationDate
HIGH	BALN,CO2,O2	EB00890078	G12017	9/6/2025
MID	BALN,CO2,O2	EB0072894	G12018	3/21/2026
LOW	ZERO			
HIGH	BALN,CO,NO,NOX	EB0085231	G12016	7/22/2019
MID	BALN,CO,NO,NOX	EB0027556	G12018	5/10/2021
LOW	ZERO			

Let ECMPS Do It

(continued)

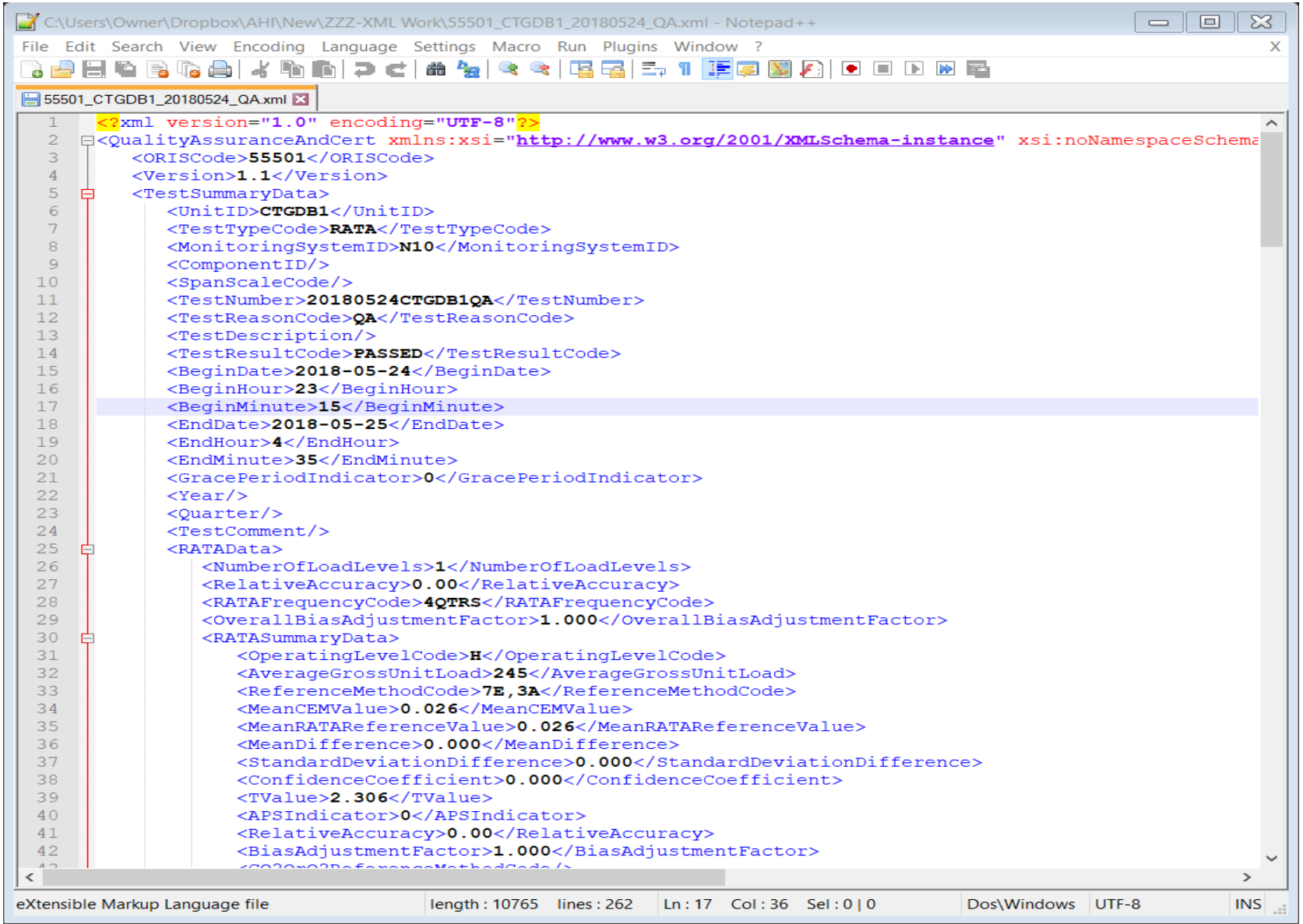
TestSummaryData - Level 2

StackPipeID	UnitID	TestTypeCode	MonitoringSystemID	TestNumber	TestReasonCode
	CTGDB1	RATA	N10	20180524CTGDB1QA	QA

QualityAssuranceAndCert - Level 1

ORISCode	Version
55501	1.1

XML Code – Import and Eval



Outcomes

- Four RATAs conducted at the wrong test loads
- Several RATAs reported at wrong load (i.e. CT plus ½ steam turbine)
- A few RATAs ±9 test runs

Advantages

- Real time feedback
- Captures our Field Manager's "in the moment"
- Corrective actions prior to demobilization

The Future… is now

- Same type of “robotic” check system utilized for the report

Clear this cell to STOP	0:00:31

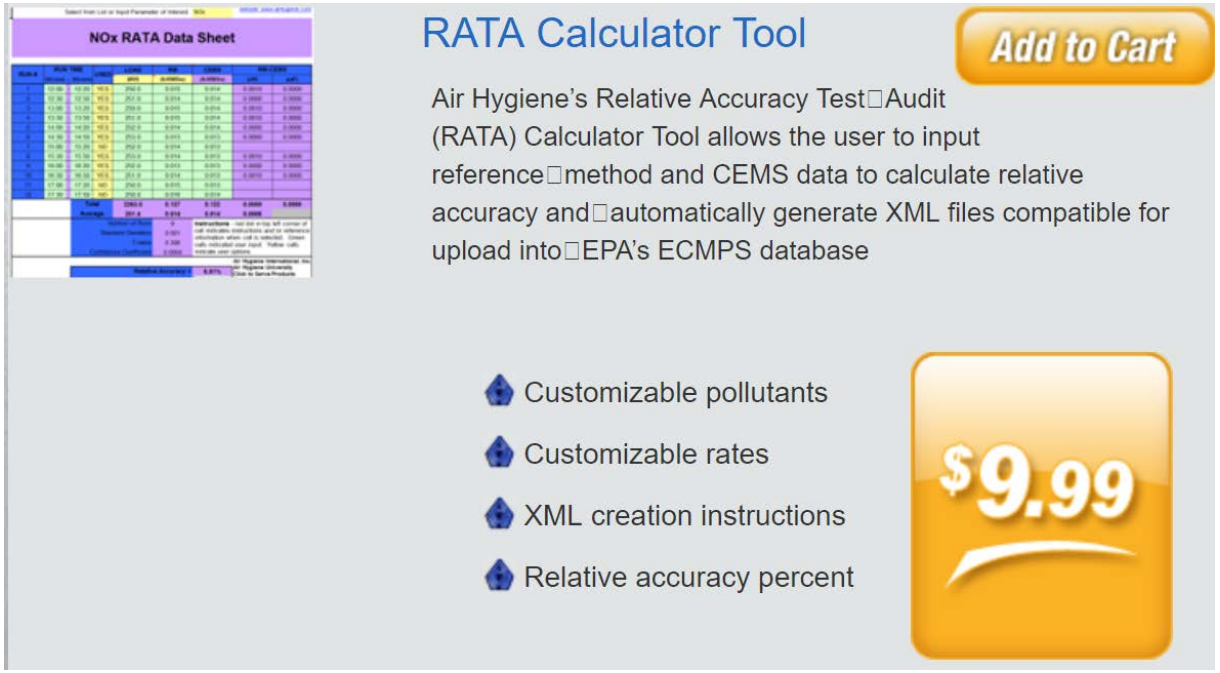
# of comments
11

UPLOAD & REVIEW (click)

Summary Table		Accept:	The line item on the original checklist that each of these correspond to…
File name:	*ten-18-kiamichi.ok-rata#1-B1101.v1 1*		
Reviewed:	*Outcome:*		
Title vs.Cover Page	Good	☐	2
TOC Comparison	Good	☐	6, 7, 8, 13
Parameters	Good	☐	10, 17
Methods	Good	☐	18
Analyzers	Good	☐	19
Names/Titles	***CHECK***	☐	5, 14
Figures & Tables	Good	☐	16, 20, 21, 22
Future Tense	Good	☐	Not on checklist
Air Permit Number	Good	☐	12
Test Date	***CHECK***	☐	Not on checklist
Template Versions	***CHECK***	☐	27
Calibration Criteria	Good	☐	26
Table(s)	Good	☐	15
Pagination	***CHECK***	☐	9

Services and Options

- XML / JSON Code
- RA Calculations
  - https://www.airhygiene.com/store/Air-Hygiene-Carbon-Emissions-Calculator-Tools.aspx



Services and Options

- Stack Testing
  - Temporary CEMS
  - Parts (i.e. Lines and Analyzers)
- Cylinder Rental
- Air Hygiene University

Questions, Comments, Concerns?