



Air Hygiene University

Testing Knowledge for a Better World
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CISCO CEMS USER GROUP

Keys to a Successful RATA

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Objectives

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

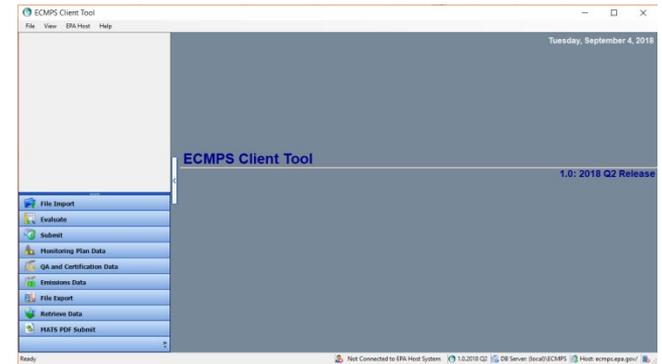


Checklist

- 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	2 nd 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
 - NO_x
 - How does the NO compare
 - Now does the NO₂ compare
 - Run a CEMS NO₂ 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

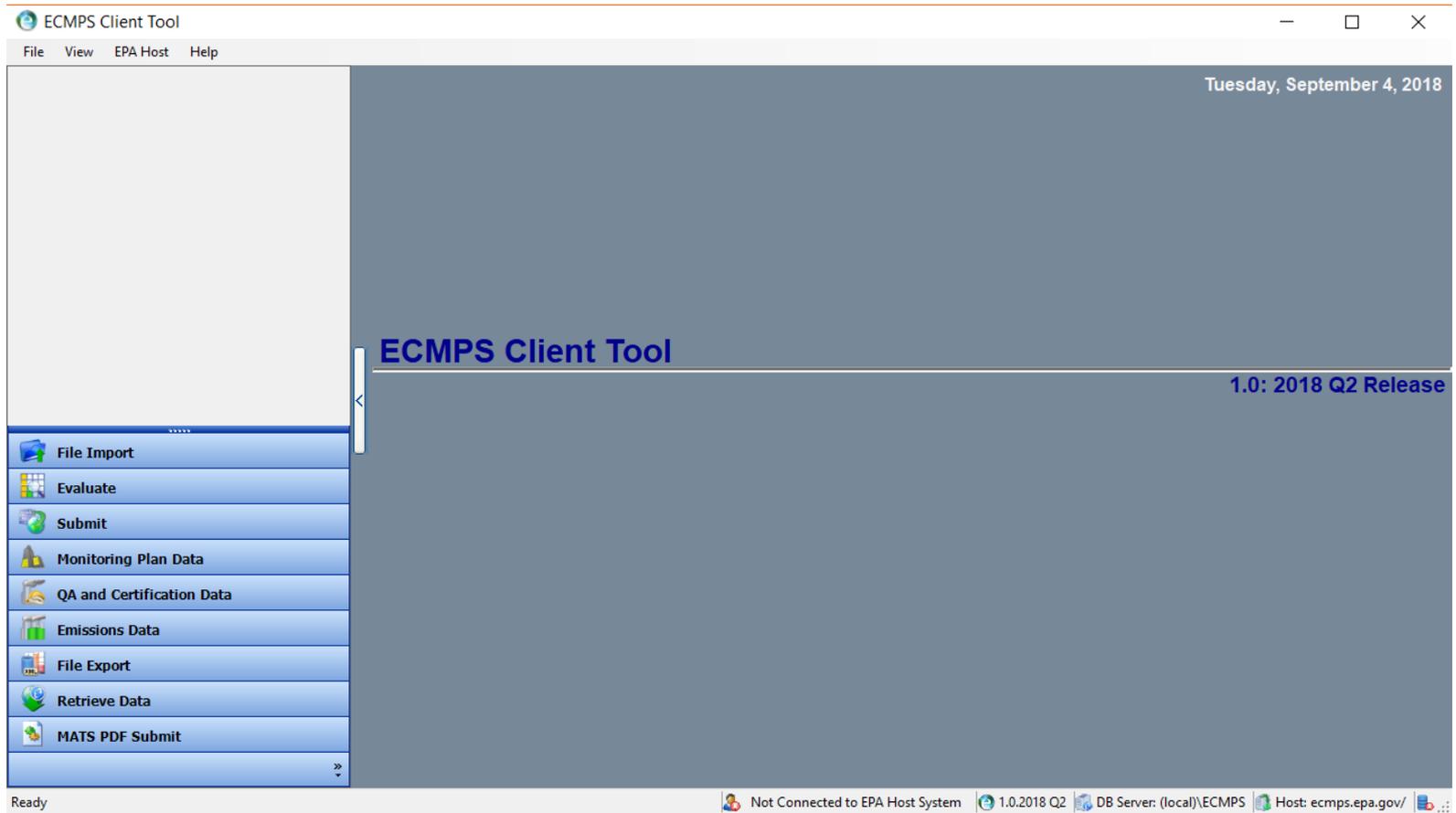
- Load
 - Stable / Normal / Sec. Normal
- Primary fuel combusted?
- Correct point or points [Strat]
- NO₂ Conv efficiency $\geq 90\%$
- Did the RATA pass
- Is there a BAF
- Was the tester a QI / QSTI
- Was the company an AETB

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	MeanRATAReferenceValue	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

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Outcomes

- ❑ Four RATAs conducted at the wrong test loads
- ❑ Several RATAs reported at wrong load (i.e. CT plus $\frac{1}{2}$ 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		Summary Table			Accept:	The line item on the original checklist that each of these correspond to...
File name:		<i>ten-18-kiamichi.ok-rata#1-B1101.v1 1</i>						
# of comments		Reviewed:		Outcome:				
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		TOC Comparison	Good	<input type="checkbox"/>	6, 7, 8, 13			
		Parameters	Good	<input type="checkbox"/>	10, 17			
		Methods	Good	<input type="checkbox"/>	18			
		Analyzers	Good	<input type="checkbox"/>	19			
		Names/Titles	CHECK	<input type="checkbox"/>	5, 14			
		Figures & Tables	Good	<input type="checkbox"/>	16, 20, 21, 22			
		Future Tense	Good	<input type="checkbox"/>	Not on checklist			
		Air Permit Number	Good	<input type="checkbox"/>	12			
		Test Date	CHECK	<input type="checkbox"/>	Not on checklist			
		Template Versions	CHECK	<input type="checkbox"/>	27			
		Calibration Criteria	Good	<input type="checkbox"/>	26			
		Table(s)	Good	<input type="checkbox"/>	15			
		Pagination	CHECK	<input type="checkbox"/>	9			

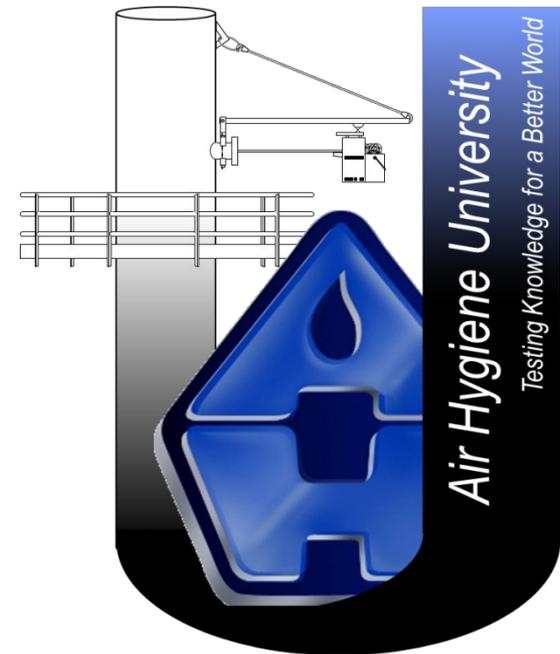
**UPLOAD &
REVIEW**
(click)

Services and Options

- ❑ Stack Testing
 - Temporary CEMS
 - Parts (i.e. Lines and Analyzers)

- ❑ Cylinder Rental

- ❑ Air Hygiene University



Questions, Comments, Concerns?

