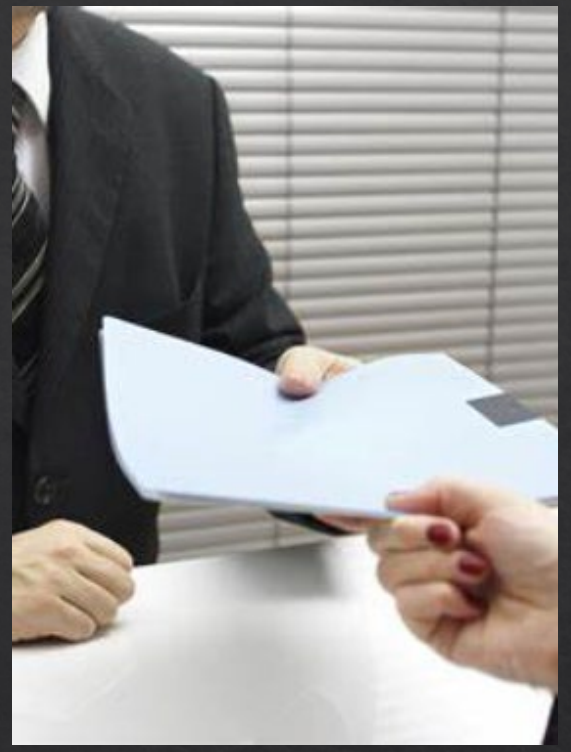
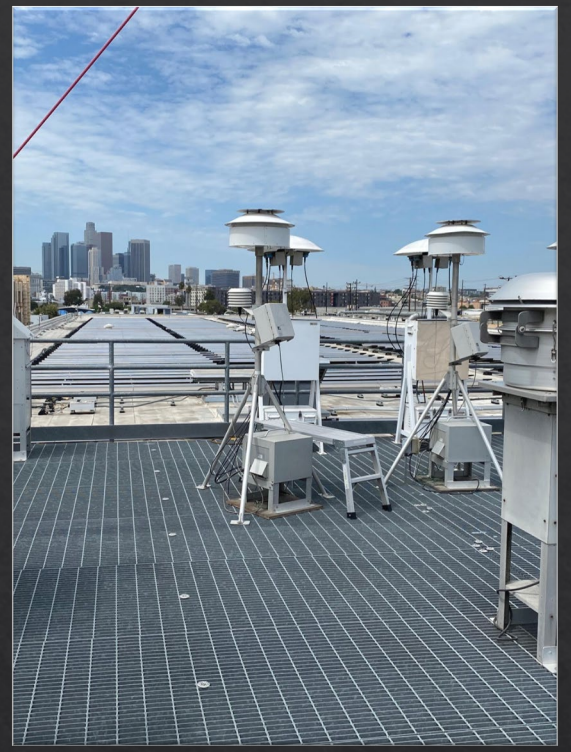
South Coast AQMD

Station Operations by the Numbers

Prepared by: Annie Shin - Air Quality Instrument Specialist II

Presented by: Juan Garcia – Senior Air Quality Instrument Specialist

Ricardo Morales - Air Quality Instrument Specialist II

What is the purpose of a Station Operator?

Outline

1. Purpose of a station operator
2. Level 1 Data Validation
3. How do operators ensure instruments are operating properly, producing high quality data?
   - Daily QC checks: precision, zero and span checks
   - Instrument diagnostics
   - Preventative maintenance
   - Data pattern/trends
   - Documentation: downtime, station status, unusual activities

Purpose of a Station Operator

- Goal: healthy instruments⇒ quality and defensible data
- Data used for policy making, public advisory, health of residents
- Operator is the most familiar with day-to-day monitoring operations
- Level 1 Data Validation

4-Level Data Review Validation Process

- Level 0: Automated Machine Level
- Level 1: Station Operator -> MOST IMPORTANT
- Level 2: Data Validation by Lead Staff
- Level 3: Senior AQIS in Data Management

Level 0: Automated Machine Level Screening

- Done by Data Management System (DMS)
- Auto-flag:
  - Automated zero, precision, span checks
  - Rate of change (hourly)
  - Sticking or repeating values
  - Suspect data
  - Shelter temperature exceedance
  - Severe negative values

Level 1 Data Validation: Station Operator

- Most important step in the review process
- Review auto-flagged data, missing data, max and min values
- Be familiar with normal data vs anomalies,
  - Is it normally a windy site? High PM site? High vehicle traffic?
- Minute data: review daily, record in downtime log and report to Senior Staff (do not flag at Level1) or marked as "Reviewed" weekly
- Hourly data: end of the month, use downtime log, apply null codes to invalid data
- Monthly maintenance packet completeness is imperative to ensure documented conditions are communicated to data validation staff

Typical Null Codes for Hourly Data

Appendix A1 – Level 1 – Null Code Quick Reference

Event	Recommended Null Code
• Power failure	AV – Power Failure
• Calibration • O_3 Generator re-certification • As-is calibration check • Environics certification	AT – Calibration
• BAM flow check	AZ – QC Audit
• Weekly maintenance • Analog Output test • Zero check • Manifold Cleaning • Non-calibration related diagnostic tests	BA – Maintenance/Routine Repairs
• Instrument disabled due to flowrate error	AH – Sample Flow rate Out of Limits

SOP00083 Appendix A1

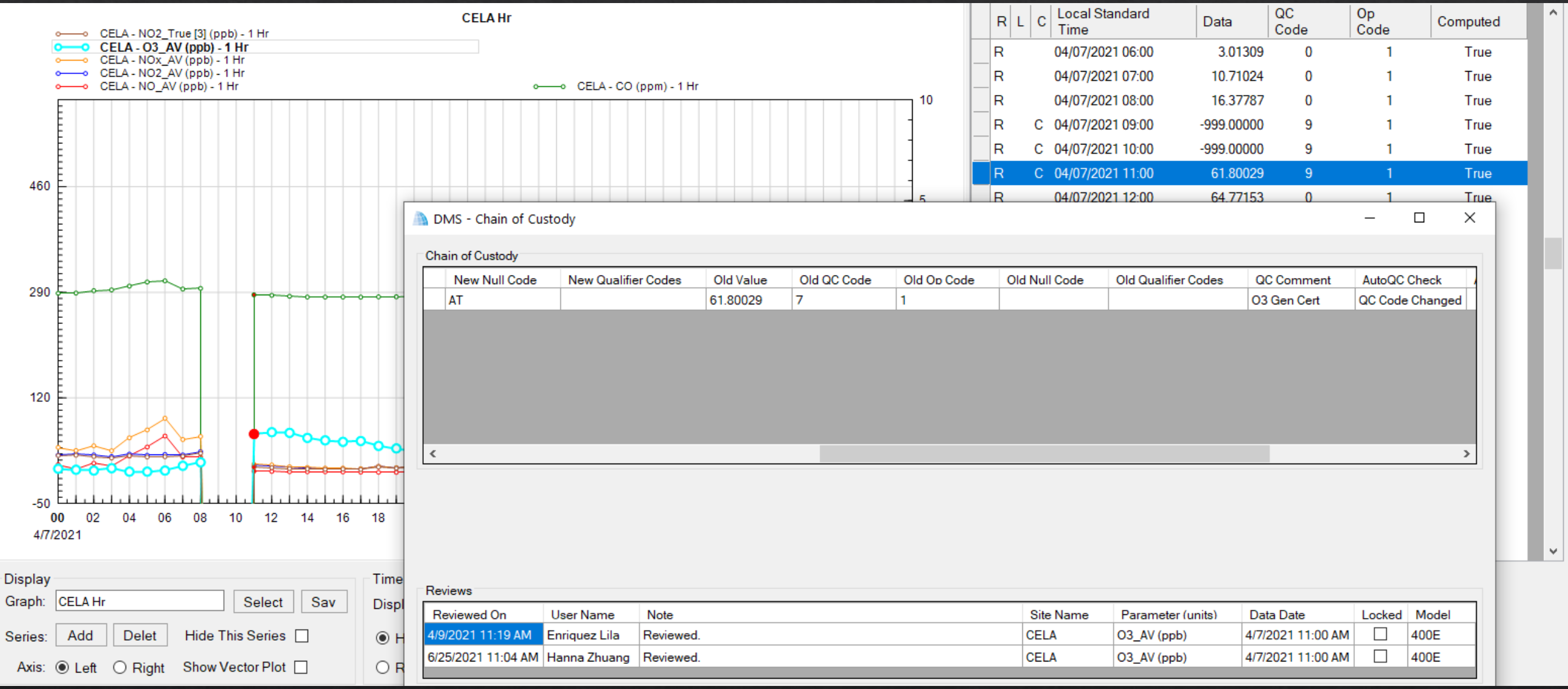
SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT
MONTHLY DOWNTIME LOG

Location: CELA 70087
Reviewed by:

Month/Year: June/2020
Technician: Annie Shin
Page: 1 of

QC	Pollutant	Event	Date & Time From	Date & Time To	COMMENTS	Initials
AT	All Gas	Cal	6/2/20 8:04	6/2/20 12:22	Nox final Calibration	JK
✓	ALL Gases	Maint	6/3/20 0746	6/3/20 0807	Weekly Maint.	AS
AT	All Gases	CAL	6/5/20 1013	1449	TNO_2 FINAL CAL	KS
BA	Met	Maint	6/9/20 919	6/9/20 105	drop tower to lube / check wirings	JK
AT	All Gases	CAL	6/9/20 1050	1357	TNO_2 ADJUSTMENT	KS
	UVR	Disabled	6/9/20 1253	→	Disabled channel due to erratic reading since 5/28/20 @1247	AS
AT	All Gases	CAL	6/10/20 1250	1249	TNO_2 FINAL CAL AGAIN	KS
✓	All Gases	Maint.	6/11/20 0846	6/11/20 0909	Weekly Maintenance	AS
✓	All Gases	Maint.	6/16/20 0747	6/16/20 0803	Weekly Maint.	AS

Apply Null Code to Hourly Data



R	L	C	Local Standard Time	Data	QC Code	Op Code	Computed
R			04/07/2021 06:00	3.01309	0	1	True
R			04/07/2021 07:00	10.71024	0	1	True
R			04/07/2021 08:00	16.37787	0	1	True
R		C	04/07/2021 09:00	-999.00000	9	1	True
R		C	04/07/2021 10:00	-999.00000	9	1	True
R		C	04/07/2021 11:00	61.80029	9	1	True
R			04/07/2021 12:00	64.77153	0	1	True

DMS - Chain of Custody

Chain of Custody

New Null Code	New Qualifier Codes	Old Value	Old QC Code	Old Op Code	Old Null Code	Old Qualifier Codes	QC Comment	AutoQC Check
AT		61.80029	7	1			O3 Gen Cert	QC Code Changed

Reviews

Reviewed On	User Name	Note	Site Name	Parameter (units)	Data Date	Locked	Model
4/9/2021 11:19 AM	Enriquez Lila	Reviewed.	CELA	O3_AV (ppb)	4/7/2021 11:00 AM	☐	400E
6/25/2021 11:04 AM	Hanna Zhuang	Reviewed.	CELA	O3_AV (ppb)	4/7/2021 11:00 AM	☐	400E

4-Level Data Review Process

- Level 0: Automated
- Level 1: Station Operator
- Level 2: Data Validation Staff
  - Verifies the work performed by level 1 reviewer
  - Verifies data meets requirements outlined in the Code of Federal Regulations (40 CFR 58 App. A and QA HB Vol II, App. D)
  - Focuses on diurnal and seasonal trends surrounding high/low values & exceedances
- Level 3: Senior AQIS in Data Management
  - Final ensures all data has been reviewed, validated and locked in the data system

Data Validation Criteria

- Code of Federal Regulations (40 CFR 58 App. A)
- EPA QA Handbook Vol II (App. D)
- SOP & QAPP’s
- Instrument Operating Manuals

Critical Data Validation Criteria (red) - Operations: QC check daily

AQMD Daily (Exceeds)

Ozone Validation Template

1) Requirement (O_3)	2) Frequency	3) Acceptance Criteria	Information /Action
CRITICAL CRITERIA-OZONE			
Monitor	NA	***Meets requirements listed in FRM/FEM designation***	1) 40 CFR Part 58 App C Sec. 2.1 2) NA 3) 40 CFR Part 53 & FRM/FEM method list
One Point QC Check Single analyzer	***Every 14 days***	< ±7.1% (percent difference) or < ±1.5 ppb difference whichever is greater	1 and 2) 40 CFR Part 58 App A Sec. 3.1 3) Recommendation based on DQO in 40 CFR Part 58 App A Sec. 2.3.1.2. QC Check Conc range 0.005 - 0.08 ppm and 05/05/2016 Technical Note on AMTIC
Zero/span check	Every 14 days	Zero drift < ± 3.1 ppb (24 hr) < ± 5.1 ppb (>24hr-14 day) Span drift < ± 7.1 %	1 and 2) QA Handbook Volume 2 Sec. 12.3 3) Recommendation and related to DQO

Operational Criteria (yellow) – Support: Calibration every 6 months

Verification/Calibration	Upon receipt/adjustment/repair/ installation/moving and repair and recalibration of standard of higher level Every 182 day and 2/ calendar year if manual zero/span performed biweekly Every 365 day and 1/ calendar year if continuous zero/span performed daily	All points < ± 2.1 % or ≤ ±1.5 ppb difference of best-fit straight line whichever is greater and Slope 1 ± .05	1) 40 CFR Part 50 App D 2) Recommendation 3) 40 CFR Part 50 App D Sec 4.5.5.6 Multi-point calibration (0 and 4 upscale points) Slope criteria is a recommendation
Zero Air/Zero Air Check	Every 365 days and 1/calendar year	Concentrations below LDL	1) 40 CFR Part 50 App D Sec. 4.1 2 and 3) Recommendation

Systematic Criteria (green) – Operations: Semiannual manifold cleaning and residence time verification

Sample Residence Time Verification	Every 365 days and 1/calendar year	***≤ 20 Seconds***	1) 40 CFR Part 58 App E, Sec. 9 (c) 2) Recommendation

U.S. EPA QA Handbook Vol II Criteria Gas Tolerances, Appendix D

How do operators perform daily QC?

Daily Precision Checks (% out) for: 2021/08/06

Data displayed is the most recent of last 24 hours.

	O3	NO	NO2	NOx	NO2_T	NOy	CO	CO_TL	SO2	H2S
Warning:	(5%)	(10%)	(10%)	(10%)	(10%)	(10%)	(7%)	(7%)	(7%)	(10%)
Invalid:	(7%)	(15%)	(15%)	(15%)	(15%)	(15%)	(10%)	(10%)	(10%)	(15%)
60NR		-3.76	-2.34	-3.73						
AHNR		-4.78	-1.41	-4.59			-1.35			
ANAH	-0.13	-7.65	-1.64	-8.03			-0.21			
AZUS	0.10	-99.76	-101.05	-100.36			-6.12			
BNAP	2.67	-2.98	-0.38	-3.60						
CELA	-2.57	-2.70	3.36	-1.78	0.78	****	-1.36	-2.41	0.69	
CMPT	-0.57	-5.21	-2.97	-5.09			-0.21			
CRES	-0.88									
ELSI	-2.14	-6.00	-5.05	-4.92			-1.52			

Daily Zero Checks (abs val) for: 2021/08/06

Data displayed is the most recent of last 24 hours.

	O3	NO	NO2	NOx	NO2_T	NOy	CO	CO_TL	SO2	H2S
Invalid:	(3)	(3)	(3)	(3)	(3)	(2)	(0.4)	(50)	(3)	(3)
60NR		-0.03	1.04	1.01						
AHNR		0.18	0.97	1.15			0.07			
ANAH	0.54	0.59	0.33	0.93			-0.01			
AZUS	0.85	15.33	-0.66	14.67			0.04			
BNAP	-0.96	-0.88	0.20	-0.68						
CELA	0.34	-0.06	0.13	0.07	0.33	****	0.01	4.87	0.43	
CMPT	0.59	-0.19	0.45	0.25			0.00			
CRES	-0.84									
ELSI	0.31	0.66	0.09	0.74			0.00			

Daily precision, zero report across all stations

Weekly Span Report

Weekly Span Checks (% out) for: 2021/08/06

Data displayed is the most recent of last 7 days.

	O3	NO	NO2	NOx	NO2_T	NOy	CO	CO_TL	SO2	H2S
Warning:	(5%)	(7%)	(7%)	(7%)	(7%)	(7%)	(7%)	(7%)	(7%)	(10%)
Invalid:	(7%)	(10%)	(10%)	(10%)	(10%)	(10%)	(10%)	(10%)	(10%)	(15%)
60NR		-1.74	-6.77	-2.56						
AHNR		-2.73	-5.13	-4.05			-1.25			
ANAH	-0.41	-6.44	-2.40	-6.95			0.66			
AZUS	-0.72	-0.02	-1.33	0.11			-6.75			
BNAP	4.99	-2.99	-0.17	-4.19						
CELA	-3.63	-0.75	-2.08	-0.85	-5.69	****	-3.53	-1.80	0.16	
CMPT	-0.36	-4.41	-3.34	-4.27			1.21			
CRES	1.08									
ELSI	-1.34	-5.84	-4.44	-5.19			-0.44			

Look at Daily Report

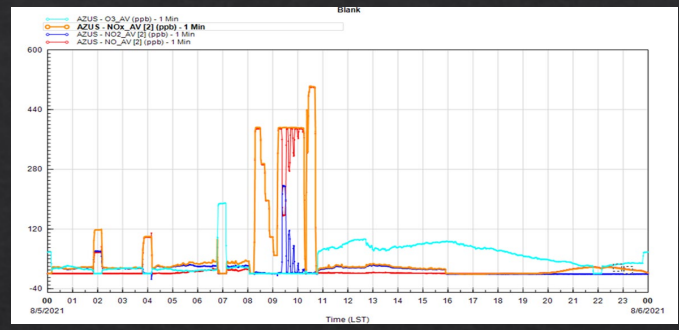
- Daily report on instrument precision checks, zeros and weekly spans sent at 6:40 AM

Daily Precision Checks (% out) for: 2021/08/06
Data displayed is the most recent of last 24 hours.

	O3	NO	NO2	NOx	NO2_T	NOy	CO
Warning:	(5%)	(10%)	(10%)	(10%)	(10%)	(10%)	(7%)
Invalid:	(7%)	(15%)	(15%)	(15%)	(15%)	(15%)	(10%)
60NR		-3.76	-2.34	-3.73			
AHNR		-4.78	-1.41	-4.59			-1.35
ANAH	-0.13	-7.65	-1.64	-8.03			-0.21
AZUS	0.10	-99.76	-101.05	-100.36			-6.12
BNAP	2.67	-2.98	-0.38	-3.60			
CELA	-2.57	-2.70	3.36	-1.78	0.78	****	-1.36
CMPT	-0.57	-5.21	-2.97	-5.09			-0.21
CRES	-0.88						
ELSI	-2.14	-6.00	-5.05	-4.92			-1.52

Investigation

- Investigate values in warning and out of tolerance:
  - DMS: review last 24 Hr. data
  - On site: power failure? Instrument alerts? flow error?
  - Remotely: access instrument parameters



Report to Senior Staff

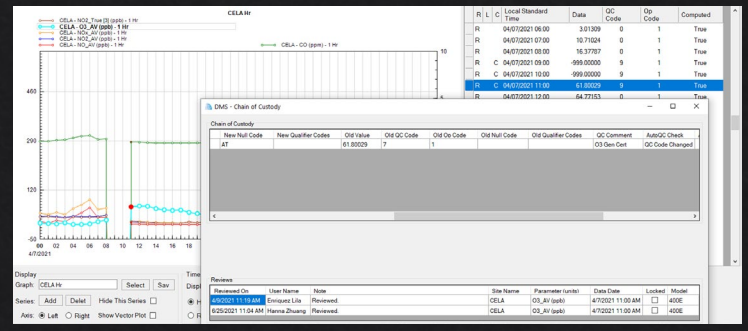
- Report findings to senior staff and request work order if necessary

Record in logbook/ downtime log/ maint sheet

- Record event and actions taken in Monthly QC Checks, instrument logbook, downtime log, maintenance sheet

Monthly: Apply null codes

- End of the month, apply appropriate Null codes to hourly data affected



What to look for in Daily QC Check?

1. Out of tolerance
2. In warning
3. Trends: PCs drifting "out of tolerance"

Daily Precision Checks (% out) for: 2021/08/06

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AZUS	0.10	-99.76	-101.05	-100.36			-6.12			
BNAP	2.67	-2.98	-0.38	-3.60						
CELA	-2.57	-2.70	3.36	-1.78	0.78	****	-1.36	-2.41	0.69	
CMPT	-0.57	-5.21	-2.97	-5.09			-0.21			
CRES	-0.88									
ELSI	-2.14	-6.00	-5.05	-4.92			-1.52			
FONT	-1.96	-4.52	-0.72	-4.71			-5.23		3.19	
GLEN	0.54	-5.98	-0.54	-4.95			1.75			
INDI	-3.37									
LAHB	0.22	-8.76	3.76	-6.00			0.65			
TAYH	0.95	-5.00	-3.99	-5.93			0.25		-3.35	
17	0.97	-3.72	-6.48	-4.92	-2.09	5.20	-0.41	7.65	-1.86	-1.76
18	1.37	-4.32	-7.14	-5.08	-1.51	5.39	-0.39	8.49	-1.92	-2.32
19	1.77	-3.59	-8.05	-5.05	-1.17	4.33	0.77	9.97	-2.23	-1.86	-2.17
20	1.41	-4.24	-10.81	-6.08	-1.70	2.34	0.12	7.97	-1.83	-2.07
21	1.32	-6.72	-10.46	-7.91	-1.45	4.44	-0.69	8.54	-1.91	-2.24
22	1.58	-6.71	-9.80	-7.68	-1.14	4.91	1.52	8.33	-1.52	-0.90
23	1.24	-7.86	-10.90	-8.49	-1.87	4.91	-0.52	-5.40	-2.31	-0.90
24	-0.14	-8.26	-10.96	-8.84	-2.48	4.53	1.49	0.22	-2.64	-1.32
25	0.64	-5.67	-6.64	-4.78	-2.09	2.09	0.80	-2.62	-2.62	-0.93
26	0.57	-6.14	-5.98	-4.75	-2.12	2.92	1.06	-2.49	-0.75	-3.15	-1.94

Example: Daily QC check

Daily Precision Checks (% out) for: 2021/08/06

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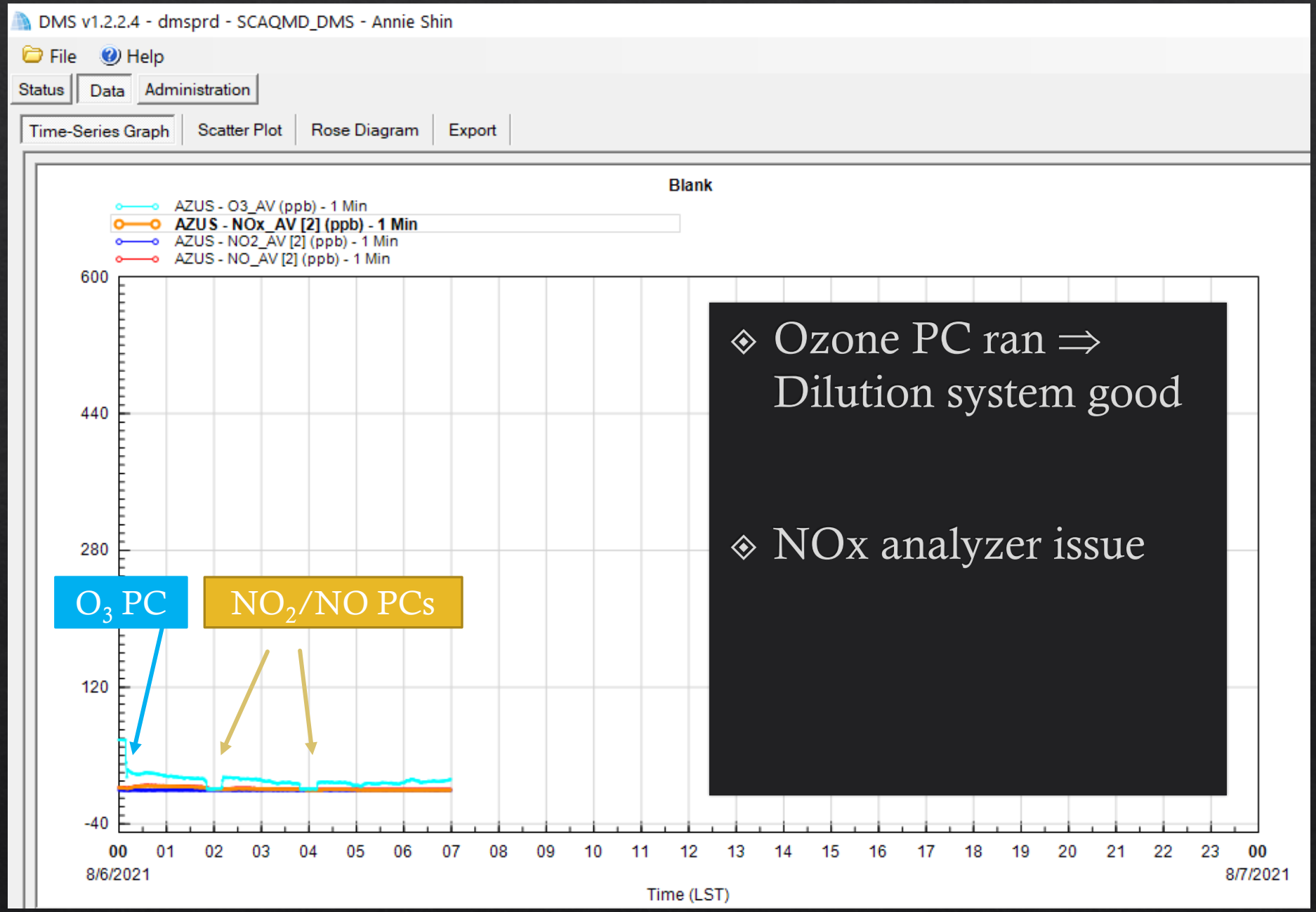
	O3	NO	NO2	NOx	NO2_T	NOy	CO	CO_TL	SO2	H2S
Warning:	(5%)	(10%)	(10%)	(10%)	(10%)	(10%)	(7%)	(7%)	(7%)	(10%)
Invalid:	(7%)	(15%)	(15%)	(15%)	(15%)	(15%)	(10%)	(10%)	(10%)	(15%)
60NR		-3.76	-2.34	-3.73						
AHNR		-4.78	-1.41	-4.59			-1.35			
ANAH	-0.13	-7.65	-1.64	-8.03			-0.21			
AZUS	0.10	-99.76	-101.05	-100.36			-6.12			
BNAP	2.67	-2.98	-0.38	-3.60						
CELA	-2.57	-2.70	3.36	-1.78	0.78	****	-1.36	-2.41	0.69	
CMPT	-0.57	-5.21	-2.97	-5.09			-0.21			
CRES	-0.88									
ELSI	-2.14	-6.00	-5.05	-4.92			-1.52			
FONT	-1.96	-4.52	-0.72	-4.71			-5.23		3.19	
GLEN	0.54	-5.98	-0.54	-4.95			1.75			
INDI	-3.37									
LAHB	0.22	-8.76	3.76	-6.00			0.65			
LAXH	4.85	-5.00	-3.99	-5.93			0.25		-3.35	
LBSH	-1.77	-2.08	-5.99	-2.98			-39.39		1.79	
MLVB	0.12	-3.69	-2.41	-6.32			-3.36			
MSVJ	0.85						0.96			
NOHO	1.08	-7.25	0.61	-6.88						
ONNR		-2.40	0.18	-2.43			-2.29			
PASA	-3.03	-2.29	-5.45	-3.10			-1.31			
PERI	2.41									
PICO	2.83	-6.98	-3.21	-7.31			-3.85			
PLSP	-3.27	-2.23	-2.96	-3.87			2.01			
POMA	-1.80	-7.62	3.49	-3.32			-2.35			
RDLD	0.51									
RESE	-1.82	-3.15	4.05	-3.17			-0.21			

- What happened at AZUS?
  - Operator investigates

AZUS minute data the morning of 8/6/21



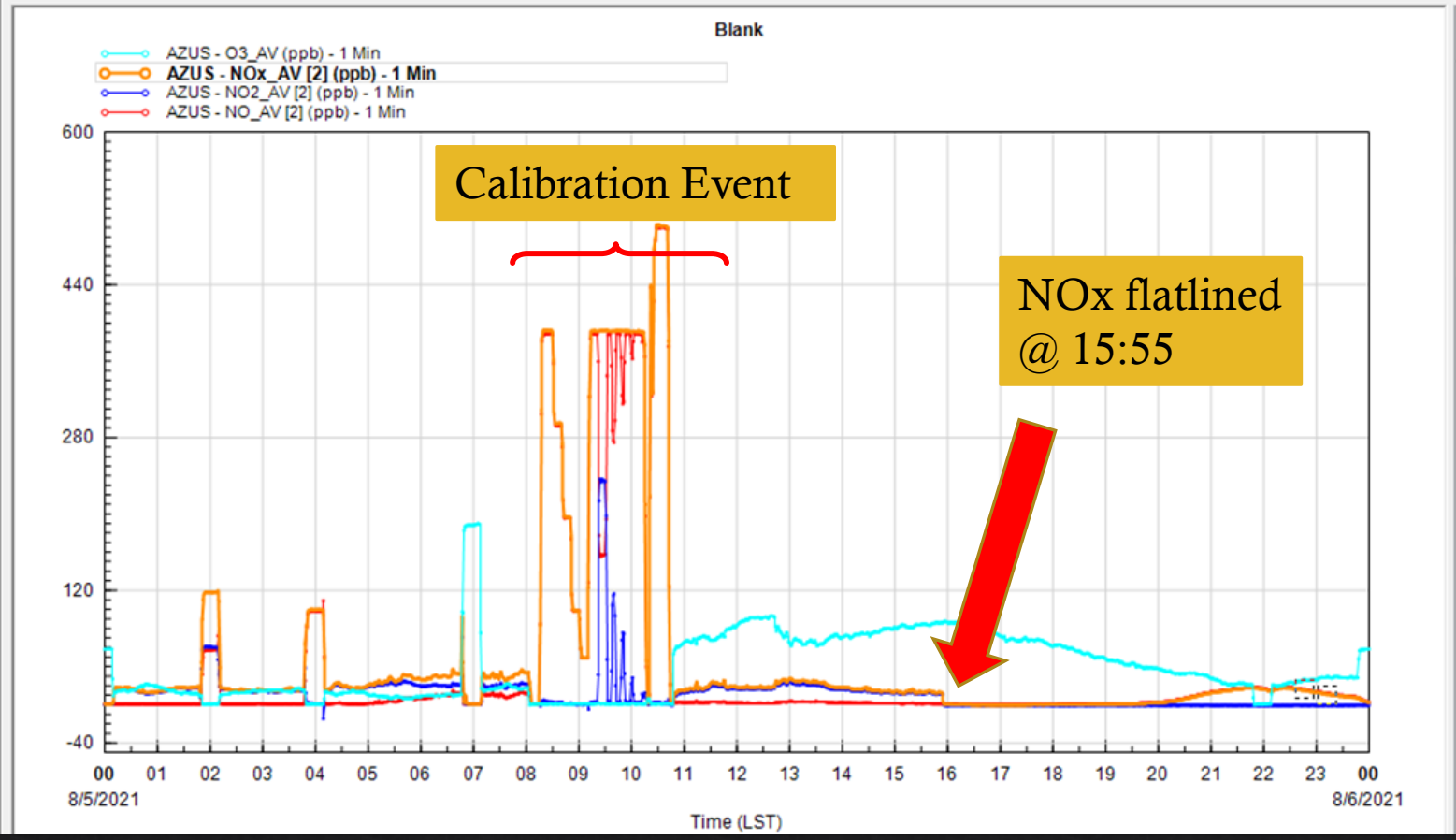
AZUS minute data previous 24hr

DMS v1.2.2.4 - dmsprd - SCAQMD_DMS - Annie Shin

File Help

Status | Data | Administration

Time-Series Graph | Scatter Plot | Rose Diagram | Export

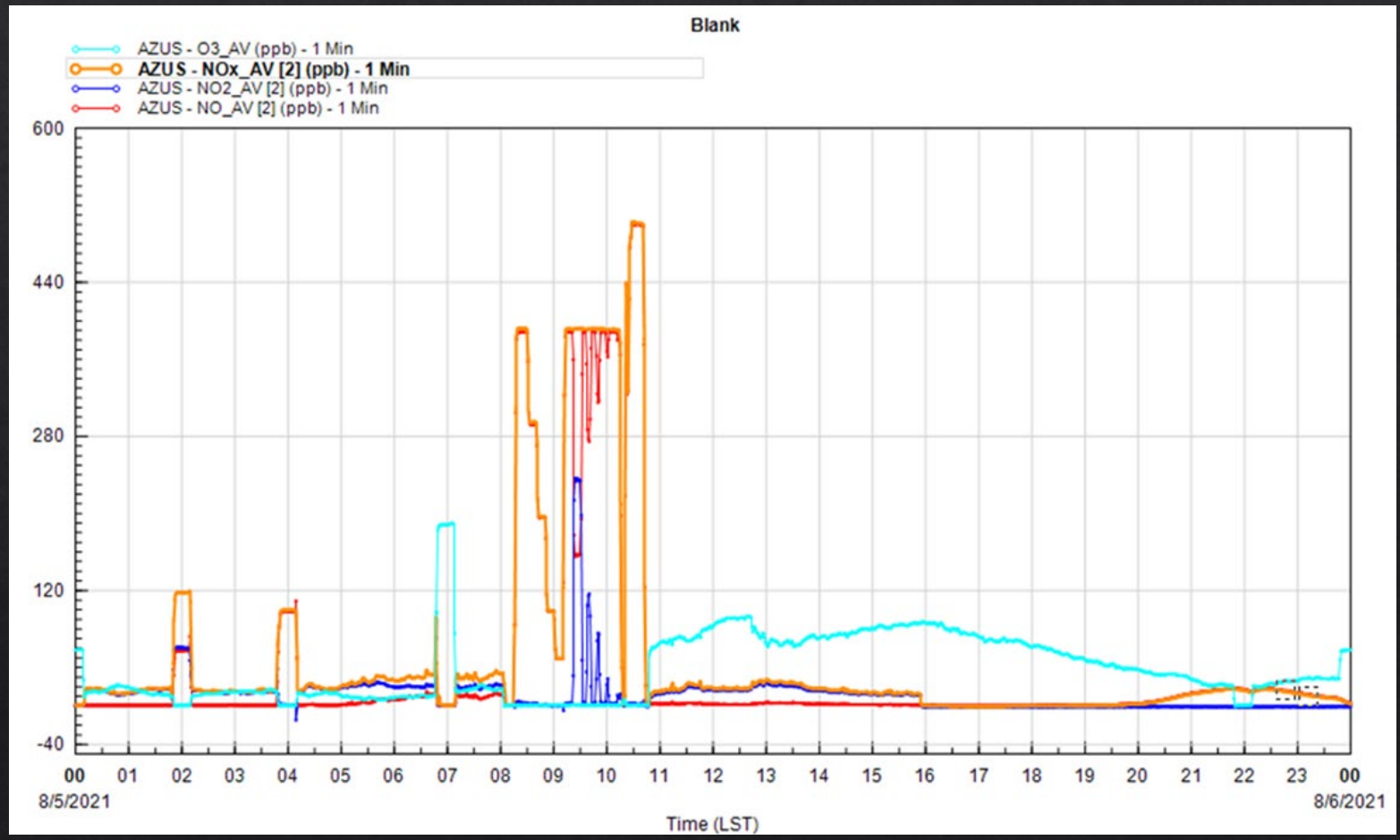


R	L	C	Local Standard Time	Data	QC Code	Op Code	Computed
			08/05/2021 15:50	13.20040	0	1	False
			08/05/2021 15:51	12.64181	0	1	False
			08/05/2021 15:52	12.43767	0	1	False
			08/05/2021 15:53	12.94026	0	1	False
			08/05/2021 15:54	12.21325	0	1	False
		C	08/05/2021 15:55	2.55724	5	5	False
		C	08/05/2021 15:56	0.13733	5	5	False
		C	08/05/2021 15:57	0.16510	5	5	False
		C	08/05/2021 15:58	0.12024	5	5	False
		C	08/05/2021 15:59	0.13724	5	5	False
		C	08/05/2021 16:00	0.13473	5	5	False
		C	08/05/2021 16:01	0.24597	5	5	False
		C	08/05/2021 16:02	0.38861	5	5	False
		C	08/05/2021 16:03	0.49538	5	5	False
		C	08/05/2021 16:04	0.46813	5	5	False
		C	08/05/2021 16:05	0.31593	5	5	False
		C	08/05/2021 16:06	0.10157	5	5	False
		C	08/05/2021 16:07	0.03548	5	5	False
		C	08/05/2021 16:08	-0.02539	5	5	False
		C	08/05/2021 16:09	-0.06102	5	5	False
		C	08/05/2021 16:10	-0.10197	5	5	False

- Flatlined data ->Instrument or communication failure
- Check instrument diagnostics: Flow @ 0 LPM -> likely pump failure -> work order to repair/replace pump.

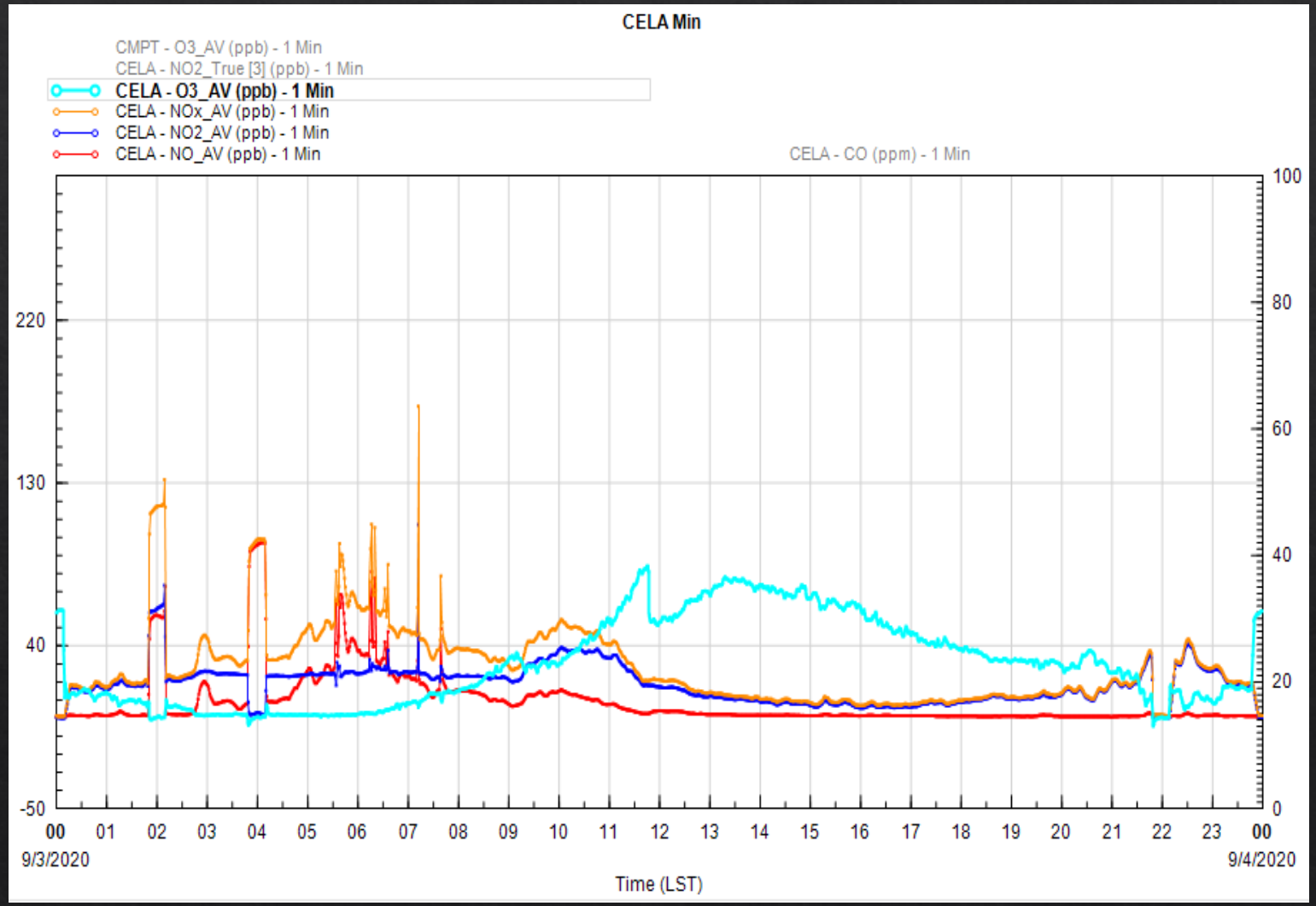
Daily DMS Data Review

- Review previous 24hr data (minute and hourly)
  - Missing data (power failures, communications failures, etc.)
  - Flags, erroneous data (instrument malfunctions)
  - High/ low values (real or not)
  - Extreme values (over range data, negative data)
  - Unusual changes (spikes, flatlined data)
  - Diurnal Trends

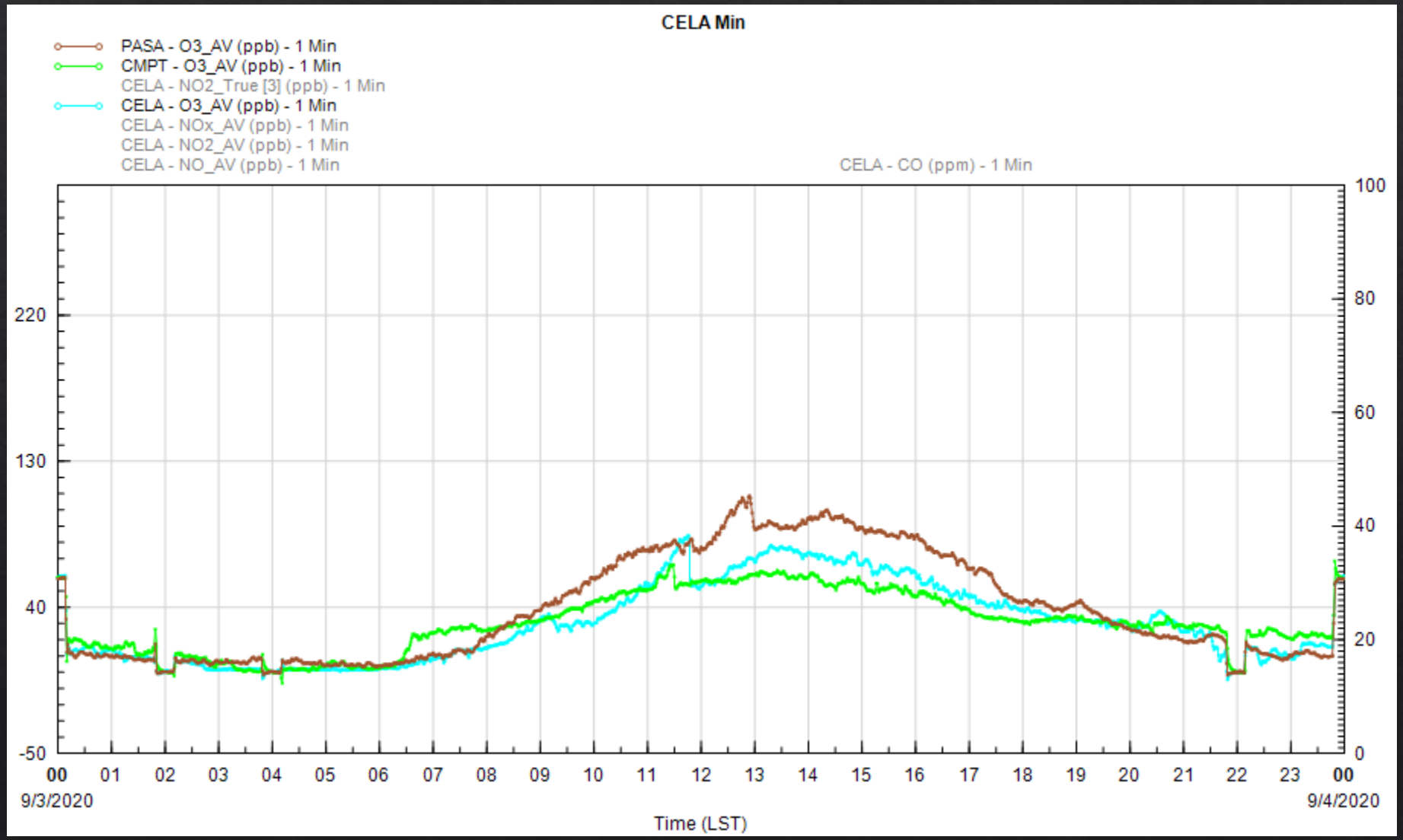


Diurnal Trends

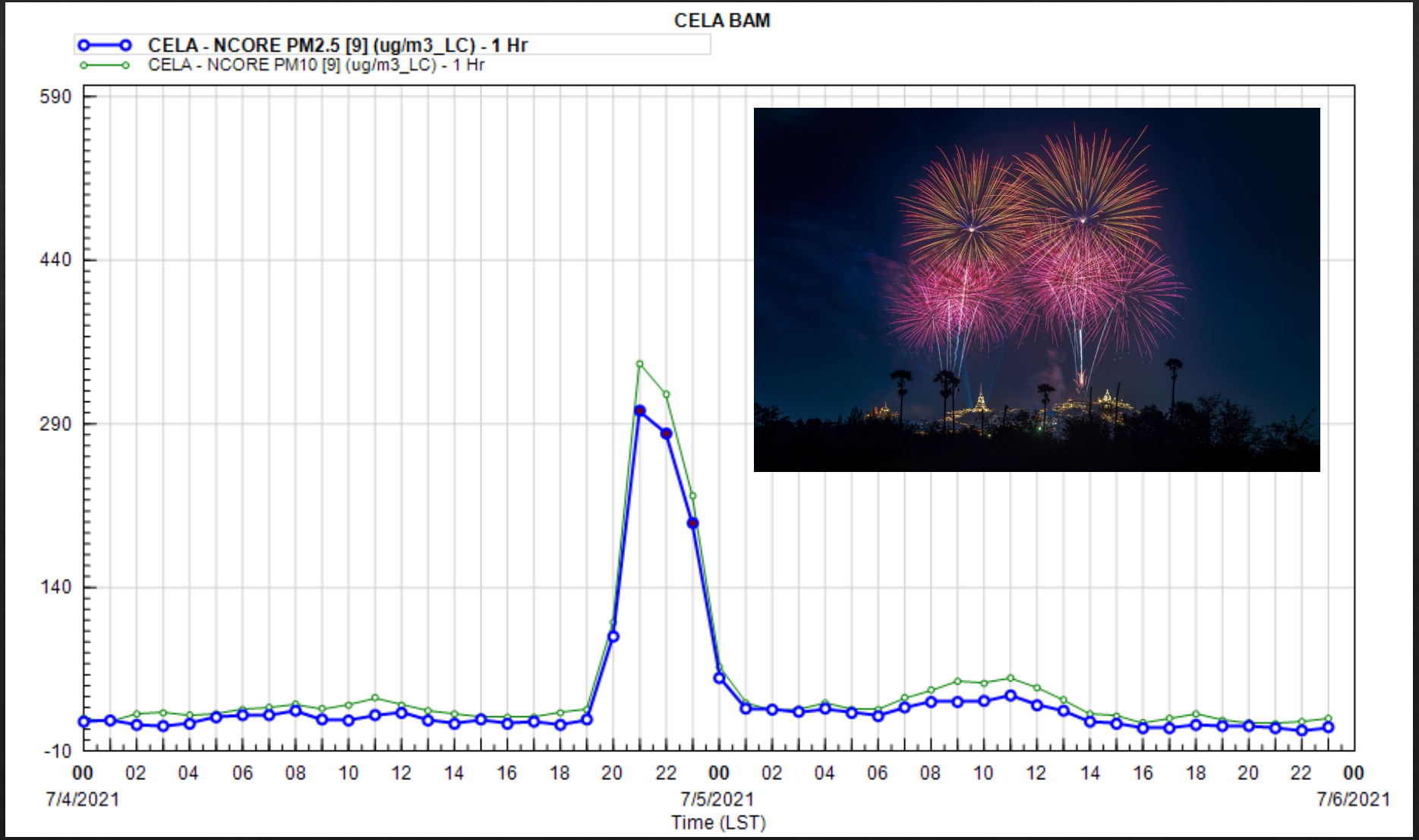
- Times at which daily max concentrations occur and the interrelationship of pollutants
  - O_3 peak starts @~10 AM-2PM
  - CO and NO usually increase and decrease together
  - NO and O_3 cannot coexist at high concentrations
- Operator is most familiar with the trends at their stations



Buddy-site Comparison



Special Occasion Trends



How do station operators ensure the quality of data?

- Follow SOPs
- Review data frequently (recommended daily)
- Document downtimes/unusual events
- Report missing or invalid data with reasons
- Routine preventative maintenance

Preventive Maintenance

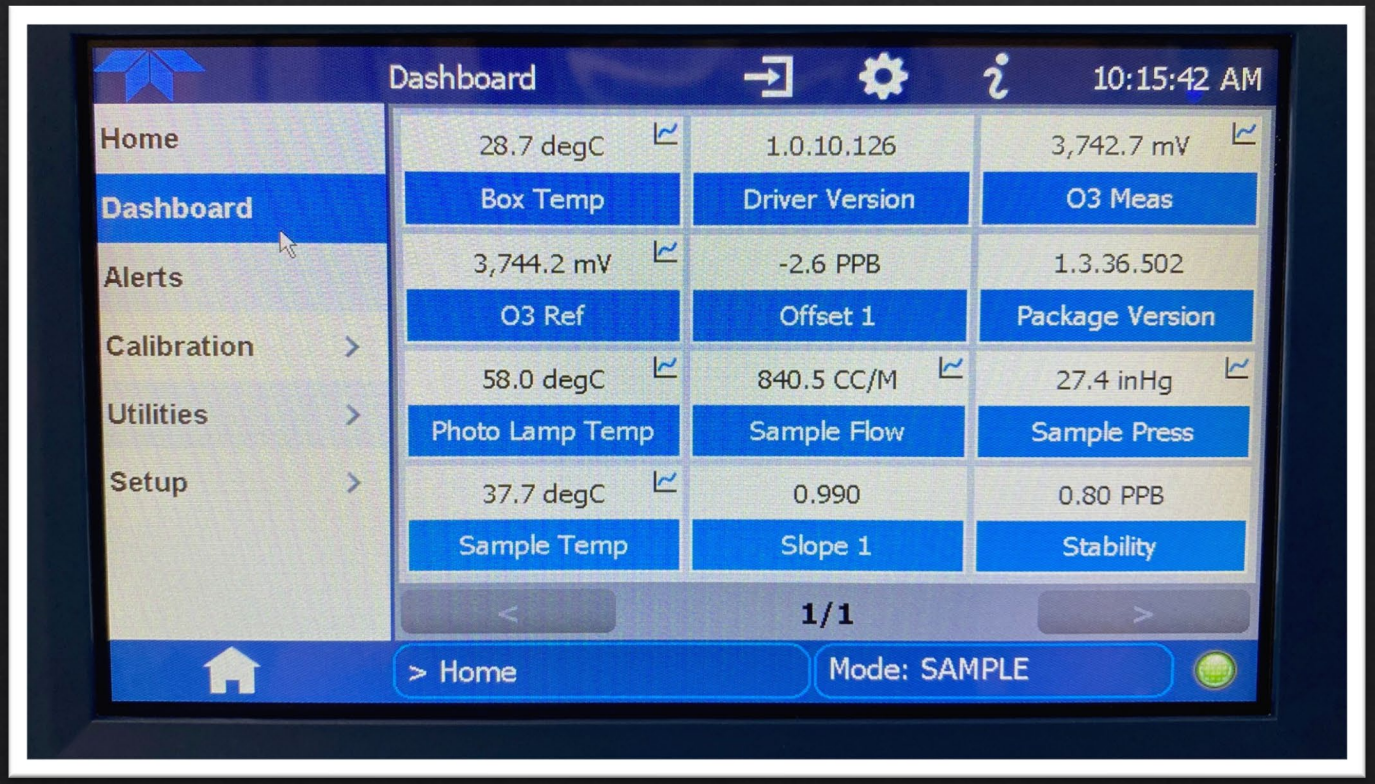
- Minimizes downtime which increases data capture
- Prevents costly repairs
- An ongoing element of Quality Control
- Performed at the “right” time
  - Top of the hour
  - Avoid peak hours especially during Ozone season or Fire Events

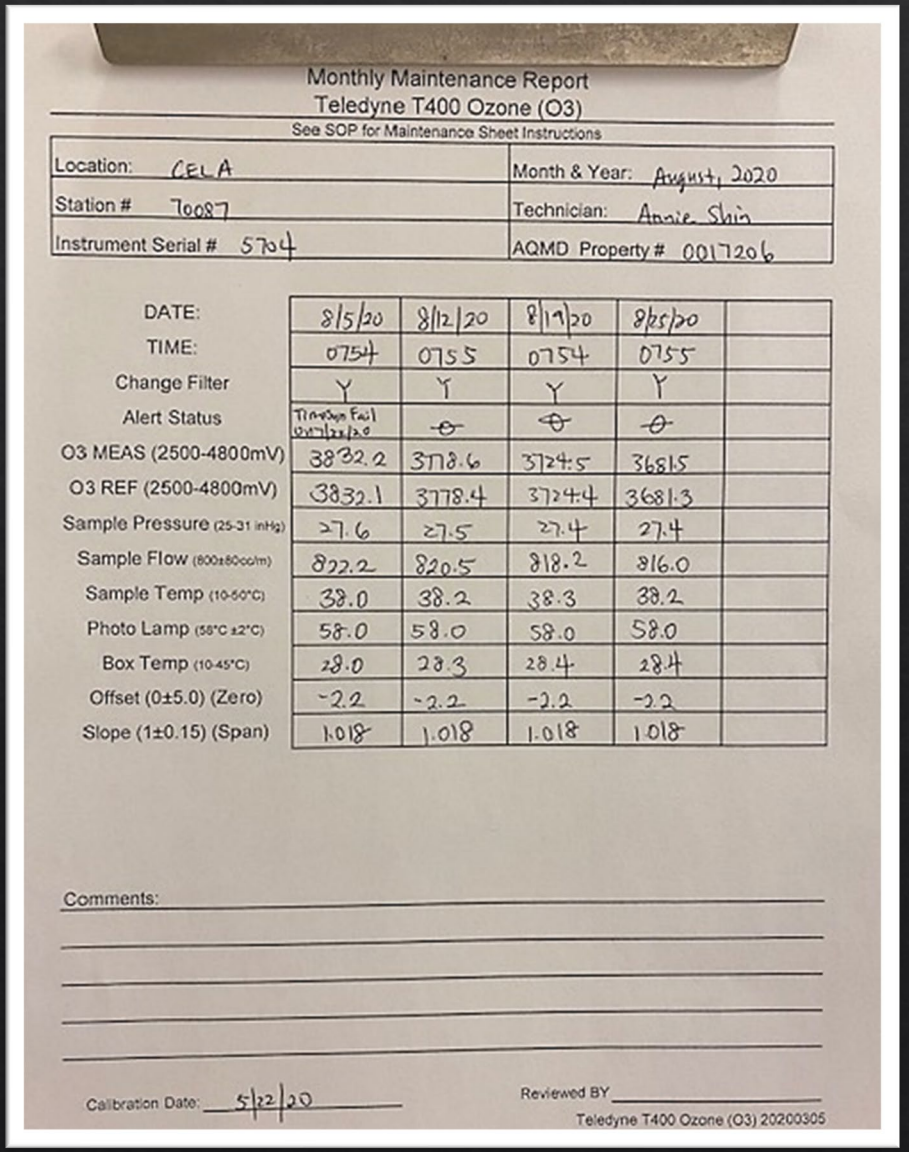
Preventative Maintenance

- Weekly: maintenance on continuous gas & PM instruments
- Monthly: flow checks, leak checks, cleaning and checking of inlets/cyclones, O-rings, etc. of PM instruments
- Semi-annually: Manifold and sample line cleaning

Continuous Gas Instruments Maintenance

- Weekly/bi-weekly filter change
- Check instrument dashboard





Monthly Maintenance Report
Teledyne T400 Ozone (O3)
See SOP for Maintenance Sheet Instructions

Location: CELA	Month & Year: August, 2020
Station # 70087	Technician: Annie Shin
Instrument Serial # 5704	AQMD Property # 0017206

DATE:	8/5/20	8/12/20	8/19/20	8/25/20	
TIME:	0754	0755	0754	0755	
Change Filter	Y	Y	Y	Y	
Alert Status	Transducer Fail Overflow	-0-	-0-	-0-	
O3 MEAS (2500-4800mV)	3832.2	3778.6	3724.5	3681.5	
O3 REF (2500-4800mV)	3832.1	3778.4	3724.4	3681.3	
Sample Pressure (25-31 inHg)	27.6	27.5	27.4	27.4	
Sample Flow (800±80cc/m)	822.2	820.5	818.2	816.0	
Sample Temp (10-50°C)	38.0	38.2	38.3	38.2	
Photo Lamp (58°C ±2°C)	58.0	58.0	58.0	58.0	
Box Temp (10-45°C)	28.0	28.3	28.4	28.4	
Offset (0±5.0) (Zero)	-2.2	-2.2	-2.2	-2.2	
Slope (1±0.15) (Span)	1.018	1.018	1.018	1.018	

Comments:

Calibration Date: 5/22/20

Reviewed BY

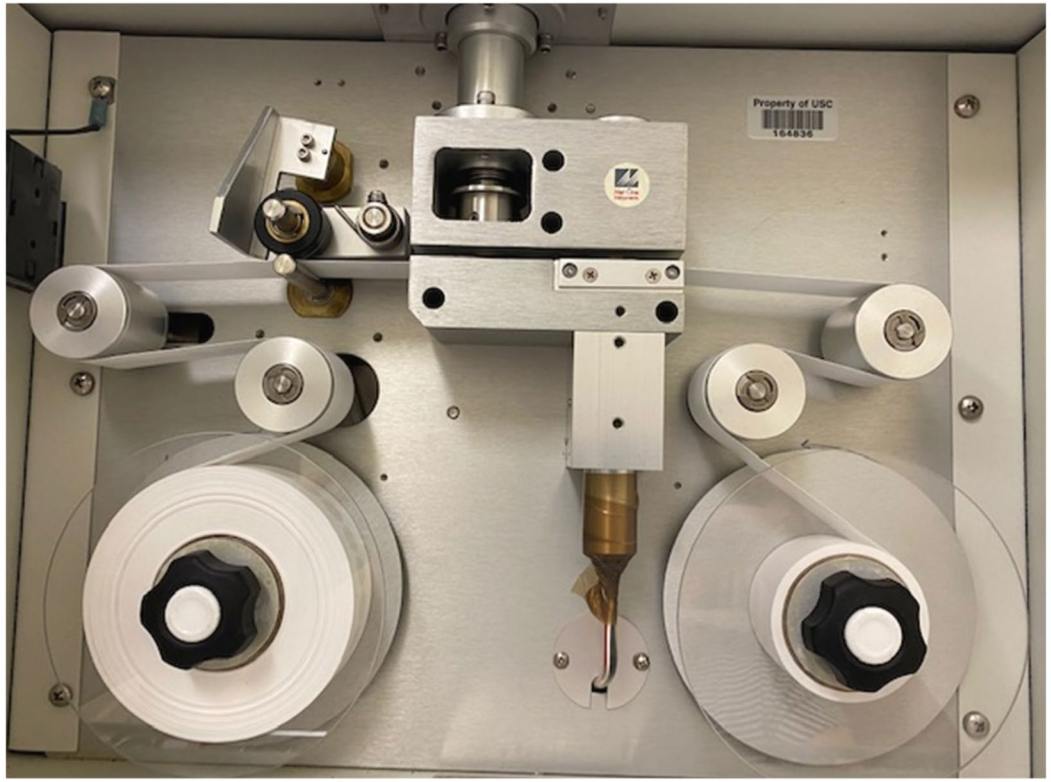
Teledyne T400 Ozone (O3) 20200305

BAM Maintenance

Table 1: Acceptable Ranges for Data Validation

Criteria	Frequency	Acceptable range
Average Flow Rate	Every Hour of Operation	Within ± 4% of 16.67
Variability of Flow rate	Every Hour of Operation	CV <= 2%
Reference Membrane Verification	Hourly	± 5% of ABS Value
One Point Flow Rate Verification	Monthly	± 4% of Transfer Standard
Leak Check	Monthly	<= 1.0 lpm
Temperature Verification	Monthly	± 2 Deg C
Pressure Verification	Monthly	± 10 mmHg

SOP00072



Daily Task/Each Site Visit:

- Visual inspection of sample tape: spot pattern, pin holes?
- Replace tape every 2 months
- Clean nozzle and vane monthly

BAM Monthly Flow Check/Maintenance

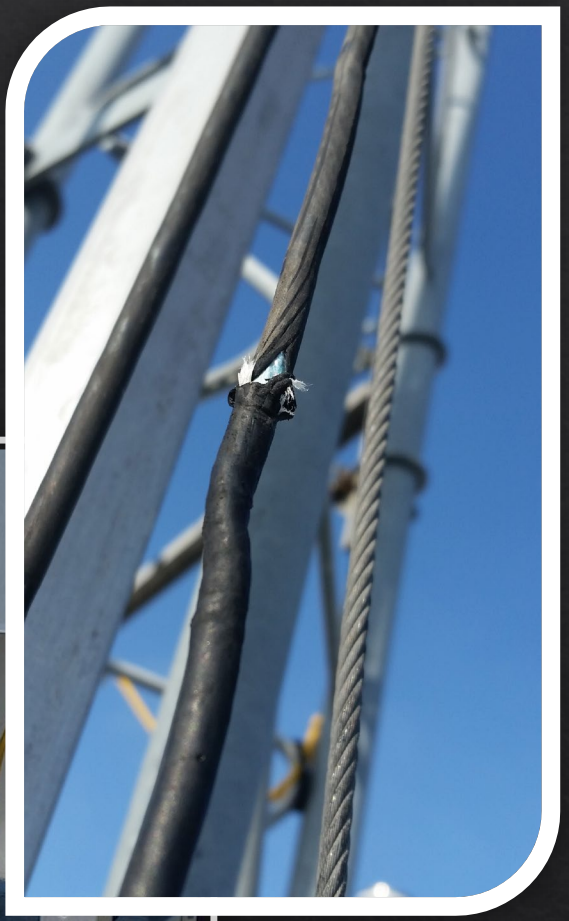
- Flow Check
- Leak Check
- Inlet, downtube, cyclone cleaning
- O-ring inspection/replacement
- Temp, press, clock verification

Routine Station Check:

- **Outside conditions**
  - Weather conditions, shelter condition, potential sources, pests…
  - E.g.: Rain, high winds, construction, fires, paint smell nearby
  - Document !!!
- **Instrument conditions**

Routine Station Check:

- **Outside conditions**
- **Instrument conditions**
  - Power on/off
  - Sample inlet line disconnected, probes damaged
  - Damaged outdoor samplers
  - Incorrect clocks and/or timers; ensure actual time is correct (PST)
- Document in instrument logbooks/downtime log !



Documentation, Documentation, Documentation

- Criteria Gas -Weekly QC Checks (daily PC)
- Criteria Gas - QC Certification Checks (last calibration, review)
- Station Gas Dilution & Ozone Calculations
- Monthly Maintenance Sheet
- Monthly Downtime Log
- Station logbook
- Instrument logbook

- Submitted to Level 2 reviewer

Overview of an Operator's Routine

- Routine Station Check (station/weather condition, AC, construction, etc.)
- Daily: QC check on gaseous instruments, data review
- Weekly: maintenance on continuous gas & PM instruments, Level 1 data Review
- Monthly: flow checks, leak checks, cleaning cyclones, O-rings, etc. Level 1 data validation on continuous instruments
- Semi-annually: Manifold cleaning, residence time verification
- **Every 3, 6, 12 days:** Loading and retrieval of filter/canister samples

Loading and Retrieval of Samples

Loading and Retrieval of Samples

- Chain of Custody
- Loading & Retrieval times
- Observations
- Apply sample flag (power failure, flow error, sample time, CV…)
- Does it match local condition?
- Some need to be transport in cooler (-4°C)

South Coast Air Quality Management District
Monitoring and Analysis Division

Field and Laboratory Chain of Custody
Version 1.3

Field and Laboratory Chain of Custody Form
PM2.5 FRM 24 Hour Filter Sampler

Site Name: CELA A
AIRS Site Number: 060371103
Field Operator: A.Shin
LIMS Sample ID:

Cassette ID Number: 8623885
Sampling Date/Port Number: 1/3/20 / FRI
Sampler ID #: 1108

☐ **Check if data WAS NOT electronically submitted to Laboratory, explain in comments.**

SAMPLE SUMMARY

Elapsed Time, hr:min: 23:59
Volume, m^3: 24.0
Average Flow, LPM: 16.7
Flow CV, %: 0.09
Start Date/Time: 2020/01/03 / 0000

Local Condition Codes: J

	Ambient Temp: (°C)	Ambient Pressure (mm Hg)
Average:	16.1	759
Minimum:	10.3	756
Maximum:	25.9	763

Sampler Flag Codes:

A. High Wind	E. Forest Fire
K. Farming Nearby	J. Construction Nearby
N. Sanding/Salting Streets	L. Highway Construction
P. Roofing Operations	Q. Prescribed Burn

FIV = Flow Variation: T
FTp = Filter Temp: T
ITp = Inactive Temp: T
Tm = Sample Time: T
Flo = Flow Out of Range: T
PF = Power Failure: T

Check Problem Type: ☐ Mechanical ☐ Software ☐ Calibration ☐ Filter ☐ Other
Operator Comments: J: Department of Water and Power (DWP) construction in front of station. QS

Chain of Custody

Action	Date	Time	Temperature < 4°C		Name
Sample Load	12/31/19	0948			A.Shin
Sample Removal	1/7/20	0913			
Sample Placed In Cooler			Yes	No	
Sample Shipped to Lab			Yes	No	
Sample Placed in Lab Fridge					
Sample Removed for Weighing					

FOR LABORATORY USE ONLY

Validation	Checked by:	Date
Step 1		
Step 2		

ab Comments:

Audits

- Semiannually- QA; particulate samplers
- Annually- QA; continuous gaseous samplers
- Annually- EPA contractor; 25% of the network each year
- Every 3 years- EPA; Technical Systems Audit

Summary

1. The purpose of a station operator is to ensure the health of instruments & quality of data
2. Level 1 data validation is the most important
3. How do we make sure instruments are operating well, producing quality data?
   - Daily QC checks
   - Data pattern/trends
   - Preventative maintenance
   - Documentation: downtime, station/instrument logbooks, notation of unusual activities
4. All the above items have contributed to increased data capture, a positive improvement in data quality over time (PC's, Spans and Zeros), and increased confidence in our data reporting.

Questions?

JGarcia@AQMD.GOV

RMorales@AQMD.GOV