



KEEPING THINGS GOING

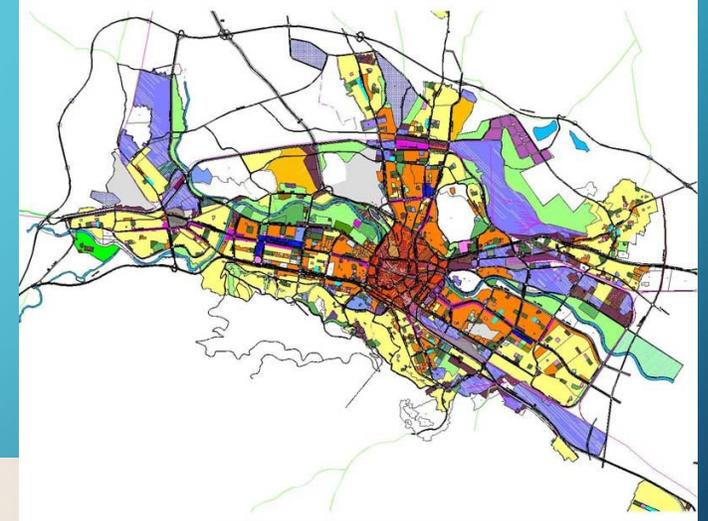
PREVENTATIVE MAINTENANCE, INSTRUMENT REPAIR AND TROUBLESHOOTING

PQAO TRAINING 2019

MATT RAZAVI, CARB

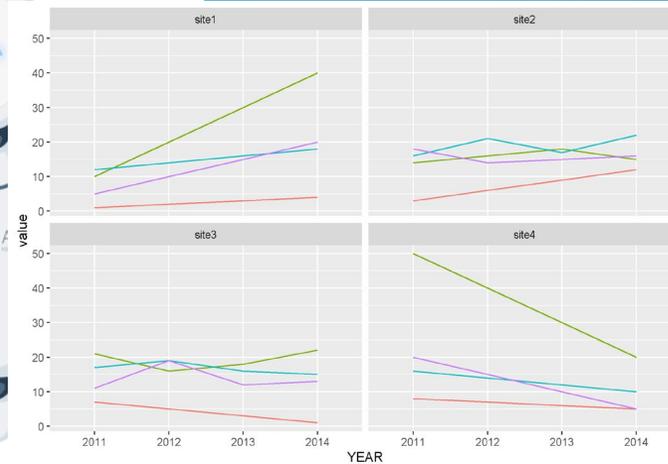
INSTRUMENT TECHNICIAN

WHAT DO THESE HAVE IN COMMON?



SIP
is an acronym for
State Implementation
Plan

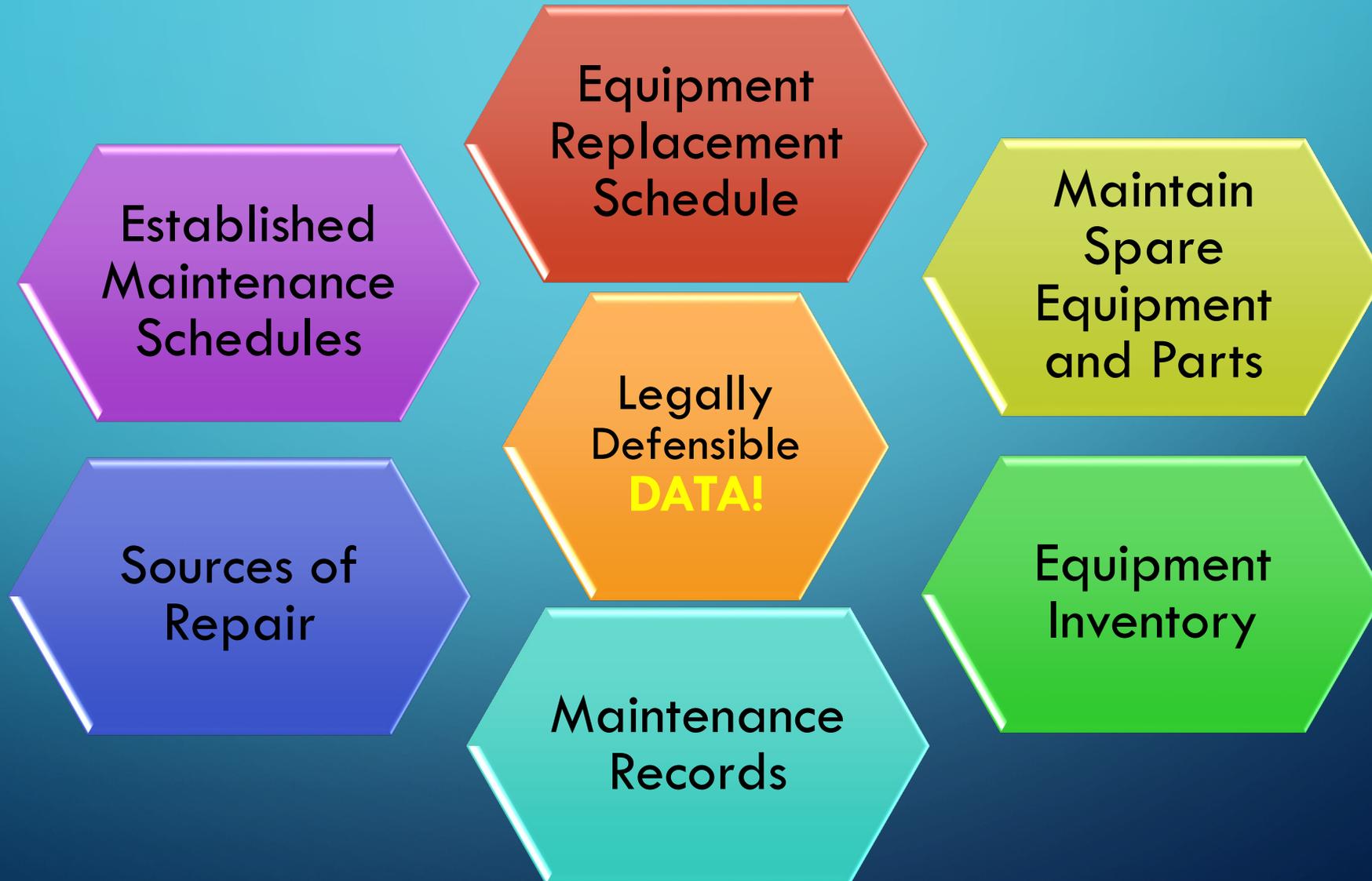
by allacronyms.com



OVERVIEW

- Elements of an Effective Maintenance Program
- Preventative Maintenance
- Instrument Repair
- Equipment Replacement
- Troubleshooting
- Instrument Repair (PROTIPS)
- Takeaways!
- Exercises

ELEMENTS OF AN EFFECTIVE MAINTENANCE PROGRAM



PREVENTATIVE MAINTENANCE

- What is PM?
- Ongoing Element of QC
- Scheduled Activities
- Every Organization
- Review and Update



INSTRUMENT REPAIR

- Repair/test facilities
- Equipped to test, repair and troubleshoot
- Dedicated area to repair/test
- No modification of equipment
- In-house repair vs service agreements



EQUIPMENT REPLACEMENT

- Life Span
- Old/Outdated equipment
 - Performance quality
 - Too costly to maintain
 - Potential loss of **DATA**
 - No support
- New equipment features



TROUBLESHOOTING

- Instrument manuals
- Remote monitoring
- Vendor provided support
- Contact SME's

INSTRUMENT REPAIR (PROTIPS)

➤ **Power**

➤ **EASY** ▶▶ **HARD**

➤ Other instruments

➤ **Configuration**

➤ **Diagnostic values**

➤ **Operating Principle**

➤ **Error and Warning**

➤ *Power Outage*

➤ **Who to Contact**

➤ **Maintenance RECORDS**

TAKEAWAYS!!

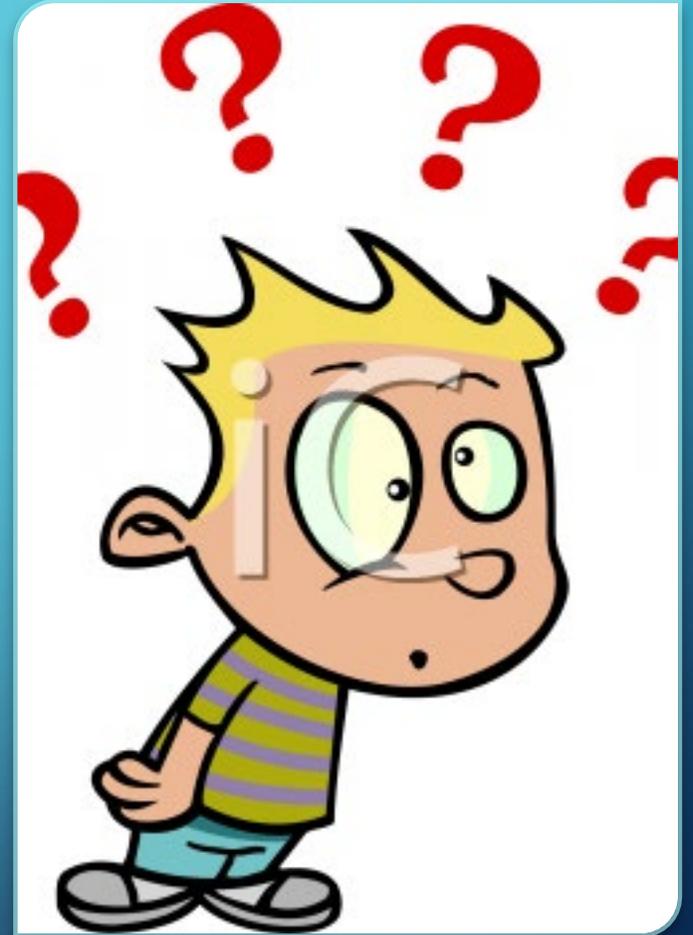
- HOW IS OUR AGENCIES PM PROGRAM?
- IS IT ADEQUATE?
- WHAT CHANGES DO WE NEED TO MAKE?



TROUBLESHOOTING EXERCISES

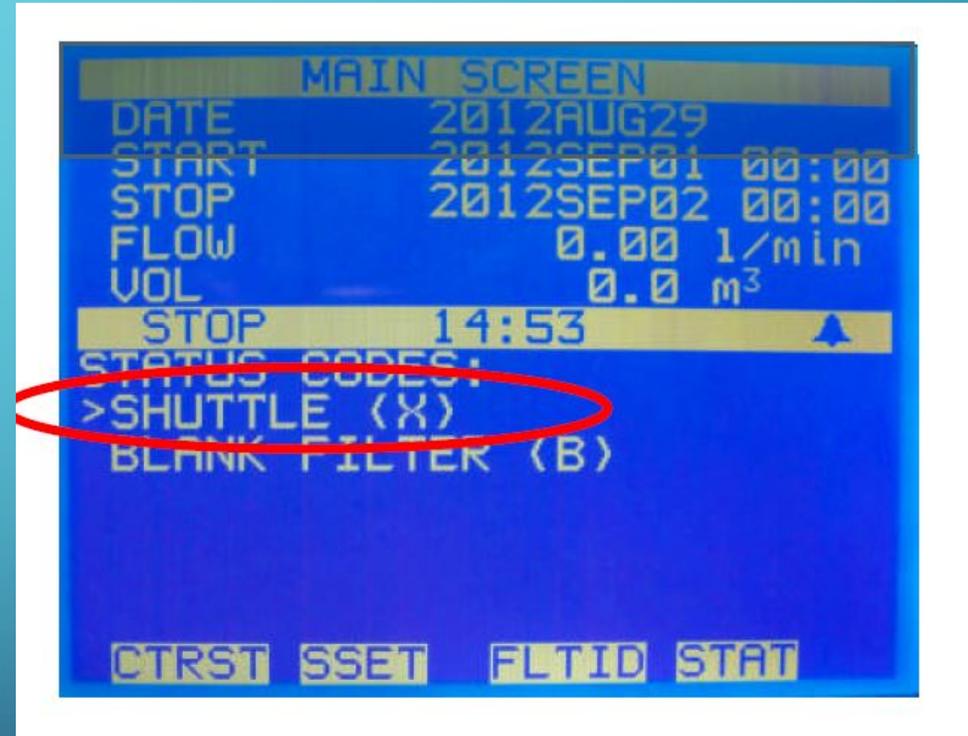
EXAMPLES

- Thermo Scientific 2025i
- TAPI 400 Ozone
- Met-One BAM 1020



THERMO 2025I

➤ Shuttle Error

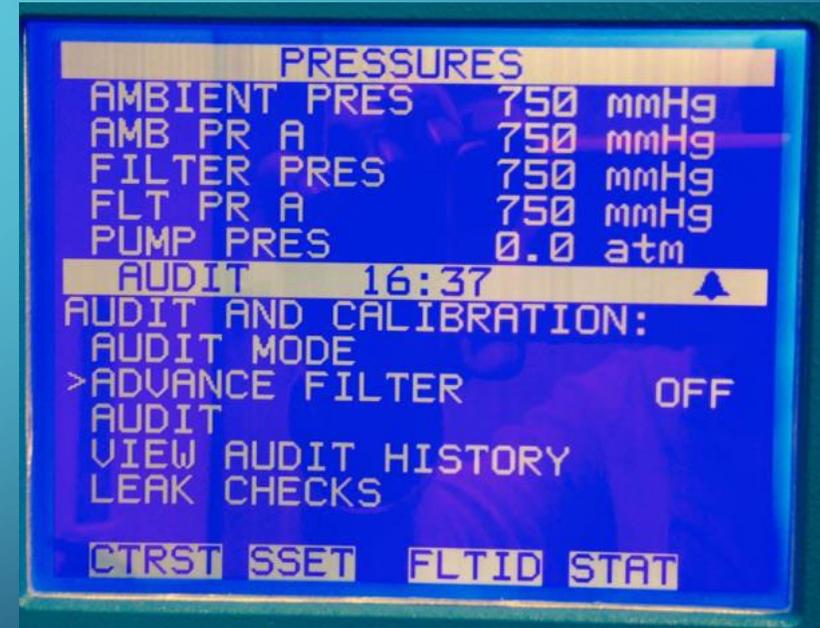


FIRST STEPS

- Do I have other issues or problems?
 - Failed Leak Check
- Are there error flags/codes?
 - Hall Sensor Error
- What does Instrument Manual state?

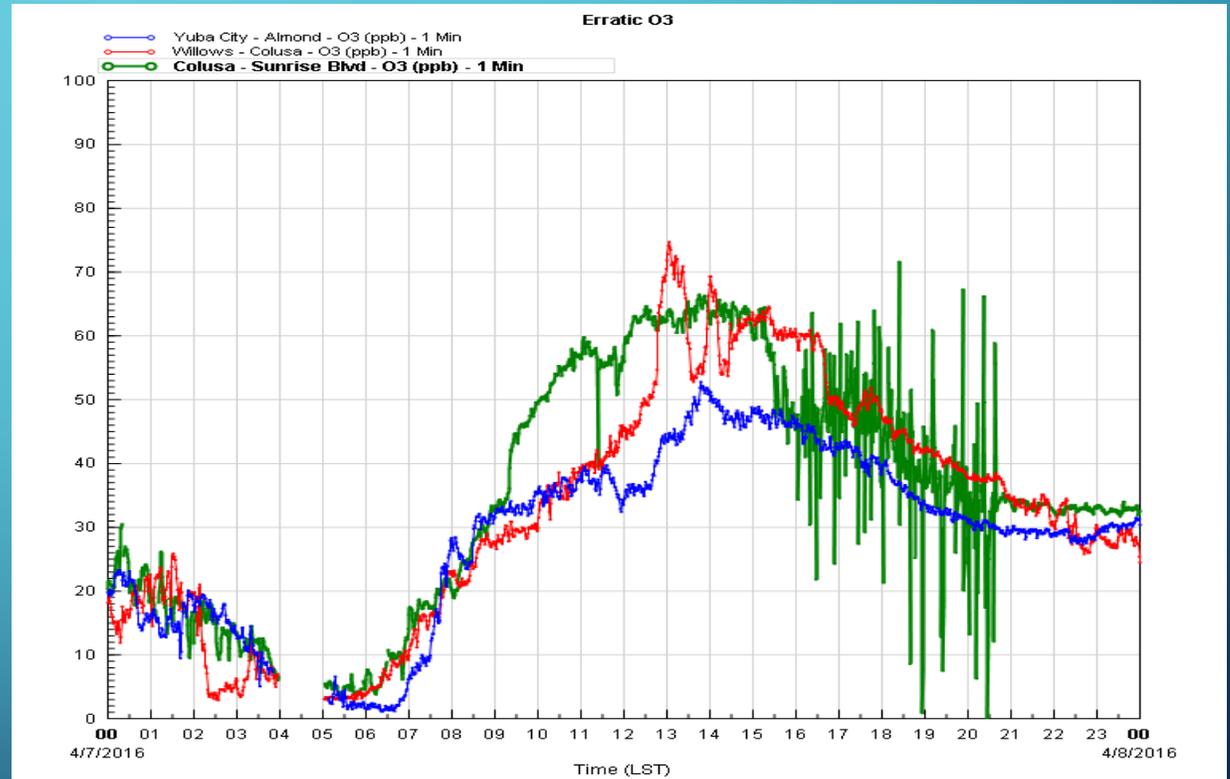
CORRECTIVE ACTIONS

- Technical Bulletins
 - Partisol iSeries Shuttle Errors initial conditions
 - TS0043 2025i Low Pump Pressure
Sintered Filter Replacement
- Better Upkeep and Maintenance



TAPI 400 OZONE ANALYZER

➤ O3 Reading Drift



FIRST STEPS

- Do I have other problems?
- Are there error flags/codes?
 - LAMP STABILITY WARN.
 - SAMPLE FLOW WARN.
- What does Instrument Manual state?

CORRECTIVE ACTIONS

- Instrument Manual Trouble Shooting
 - Sec. 12. TROUBLESHOOTING & SERVICE
- Better Upkeep and Maintenance

BAM 1020 COMMON ISSUES

- Failed Leak/Flow Check
- Membrane Errors

FIRST STEPS

- What other problems do I have?
- Are there BAM error flags/codes?
 - N-Nozzle Error,
 - F-Flow Error
 - R-Reference Membrane Error
- Maintenance/Repair history?

CORRECTIVE ACTIONS

- Instrument Manual
Troubleshooting
 - Sec. 7. Maintenance, Troubleshooting
- Better Upkeep and
Maintenance





QUESTIONS?

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