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MARICOPA COUNTY AIR QUALITY PERFORMANCE TEST NOTES & TIPS

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I. PERFORMANCE TEST QUESTIONS

1. **What is considered a performance test?**
   Maricopa County considers all of the following performance tests; source test, stack test, compliance test and relative accuracy test audits (RATAs). It is a physical measurement of the emissions from a control device, process equipment or to verify the accuracy of a continuouse emission monitoring system (CEMS).

2. **Why is testing required?**
   A performance test demonstrates that a control device, process equipment or CEMS is properly installed and operated and in compliance with emission limits in permit conditions and applicable regulations.

3. **Who needs to conduct a performance test?**
   Performance tests are required for a wide variety of industries and equipment. The most common equipment requiring testing includes scrubbers, catalytic or thermal oxidizers, turbines, baghouses, VOC abatement systems, boilers, flares and continuous emission monitors. Permit conditions and applicable regulations will provide specific requirements for a facility.

4. **How frequently must testing be conducted?**
   Non-Title V facilities are generally required to test equipment at least once during the lifetime of a permit which is generally five years. Testing shall occur within 60 days of permit issuance or initial start-up of the equipment but may be extended up to 180 days with approval. Please note that the 180 day deadline applies to the compliance demonstration and test report submittal. Title V facilities generally require more frequent testing that could even occur on an annual basis. Permit conditions and applicable regulations will provide specific requirements for a facility. The Control Officer may require additional testing when considered necessary.

5. **What pollutants are included in testing?**
   A wide variety of pollutants, most commonly particulate matter (PM and PM_{10}), volatile organic compounds (VOC's), oxides of nitrogen (NO_X), carbon monoxide (CO), sulfur oxides (SOx), ammonia (NH3) and acids such as hydrogen chloride (HCl) and hydrogen fluoride (HF), may be included in testing. The requirements vary depending on the process(es) and equipment involved. Specific requirements will be included in permit conditions and applicable federal regulations and county rules. The Control Officer may require testing of additional pollutants when considered necessary.

6. **Where in our rules is testing discussed?**
   Rule 270 discusses testing generalities applicable to all tests such as when a test shall be conducted, operating conditions during testing, number of test runs, Department notification, etc. Industry- or pollutant-specific rules discuss testing details that include test requirements and applicable test methods.

7. **What are the benefits of conducting a performance test?**
   Besides complying with applicable regulations and permit conditions, a performance test ensures a facility that the equipment is functioning properly. Test results may challenge the manufacturer's guarantee providing the opportunity for adjustments that may improve the equipment's operation and efficiency. For combustion devices such as catalytic or thermal oxidizers, boilers and flares, testing assures proper tuning of the device for efficient operation resulting in lower emissions and fuel usage. For facilities required to submit emissions inventory reports, test results are preferable to AP-42 emission factors which usually results in lower reported annual emissions.

8. **Are performance test guidelines available?**
   The Department has prepared the Air Quality Performance Test Guidelines to assist with performance test execution and the preparation of the test protocol and test report. The guidelines also include two forms: the Performance Test Protocol Submittal Form and the Performance Test Report Submittal Form. Each form shall be completed and submitted with the applicable document. The guidelines and submittal forms are available on the Air Quality Webpage found at the link below:

   http://www.maricopa.gov/2313/Performance-Test-Guidance-Documents-Form

   The Air Quality Performance Test Notes & Tips document, which provides answers to common questions along with useful tips to assist in the performance testing process, is found at the same location.

9. **How can a source find a legitimate test company?**
   The Department does not have a certification program for test companies nor can we make any recommendations for or against any test company. Any test company is allowed to conduct performance tests in Maricopa County. To provide assistance locating a test company, the Air Quality Performance Test Guidelines contain a link to the Source Evaluation Society's list of stack testing companies. The link is also provided below:

   http://www.sesnews.org/?q=Stack

10. **Who can I contact with performance test questions?**
    Contact the Performance Testing Supervisor at (602)372-1341 or any Testing Engineer of the Performance Test Evaluation Section listed in the Permit Division Contacts at link below via email or phone:

    https://www.maricopa.gov/4284/Permit-Engineering-Contacts

II. THE PERFORMANCE TEST PROCESS

1. **Identify the requirement(s) for a test.**
   This information is available in the air permit conditions and applicable regulations.
2. **Define objectives based on permit conditions and applicable regulations.**
   The objectives include determining what equipment requires testing, what operating conditions are necessary, what types of pollutants are to be sampled for and what results must be demonstrated such as emission rates and/or control efficiencies.
3. **Select a stack testing company.**
   Some states will accredite stack testing companies, however, the State of Arizona is not an accrediting body. Maricopa County does not endorse any stack testing company. Selecting a stack testing company for contract work is up to the facility. For a list of stack testing companies, the Source Evaluation Society (SES) has compiled a list of companies for reference at the link below:

   http://sesnews.org/?q=Stack
4. **Submit a separate test protocol for each piece of equipment to be tested to the Department at least 30 days prior to testing.**
   The test protocol is prepared by the test company and includes a detailed plan of action for the performance test that includes information on the facility, test company, test methods, emission points, control equipment, process equipment and quality control measures. The proposed test must satisfy all permit and applicable regulation requirements. Regulations for certain industries or pollutants may require a different timeframe than the 30 days.
5. **The Department will review the test protocol and issue a written response with comments and/or clarifications.**
   The test protocol is reviewed for completeness, accuracy and acceptability. The Department will address any deficiencies and changes to the test protocol in its review. It is very important to read the Department's review of the protocol in preparation for the performance test.
6. **Notify the Department of the proposed test date at least two weeks prior to testing.**
   However, it is recommended that the test date be provided with the test protocol for scheduling purposes.
7. **Conduct the performance test.**
   A Department observer is generally present to ensure that the test company is following proper procedures and methodology, to ensure that proper operation and documentation of the process and control equipment occurs and to evaluate the acceptability of the test.

8. **Submit a test report to the Department within 30 days following the test.**
   The test report is prepared by the test company following sample analyses and calculation of results. The test report is submitted by the facility or directly by the test company, but the facility is the responsible party and must ensure that the test report is delivered to the Department. Most facilities are subject to the 30 day submission deadline, however, regulations for certain industries or pollutants may require a different timeframe than the 30 days.
9. **The Department will review the test report and issue a written response with a compliance determination.**
   The test report is reviewed for completeness, accuracy and acceptability. Results are verified by performing all calculations and a compliance determination is made.

III. 13 TIPS FOR A SUCCESSFUL PERFORMANCE TEST

1. **Read and follow the Maricopa County Air Quality Performance Test Guidelines.**
   The guidelines will familiarize the facility with the process and what is expected. The guidelines also inform the test company, particularly an out-of-state company, of the Department's requirements.

2. **Plan and schedule tests early.**
   Scheduling early will allow the facility to make the necessary preparations to the production and work schedules to insure a successful test, and avoid unanticipated delays that may result in missed test deadlines and unnecessary violations. Planning early also allows time for the test company review the facility's air permit and prepare the test protocol so that it meets all regulatory requirements.

3. **Conduct an on-site pre-test survey with the test company to determine test elements.**
   The survey will identify items such as sample port locations (make sure caps are removable) or the need to install sample ports, scaffolding or lift equipment requirements for stack access and electrical power requirements (common problem). This will eliminate surprises that may delay testing or lead to rescheduling of testing.

4. **Submit a separate test protocol and test report for each piece of equipment to be tested.**
   Combining more than one piece of equipment in one test protocol or test report may lead to confusion; for example, due to different testing requirements or different situations at each equipment. Each test report should be a standalone document that can be used to determine the compliance status of a piece of equipment.

5. **Refrain from performing any non-scheduled maintenance or changes to the system for at least two weeks prior to the test (for system stabilization).**
   Last minute maintenance or changes to a system may cause operation problems that could interfere with testing. With some runtime on a system after maintenance, problems can be discovered and corrected prior to testing. Some examples of last-minute maintenance procedures that resulted in failed tests include:
   - *Pressure spraying a scrubber and mist eliminator forcing water into the fan and pressure taps*
   - *Replacing baghouse bags and having one come unseated*
   - *Improperly replacing a thermal oxidizer burner cone causing a hot spot in the unit*
   - *Replacing catalytic oxidizer catalyst and not having it seated properly*
   - *Not allowing sufficient curing time of refractory work to an incinerator that collapsed during testing*

6. **Verify in advance that all monitoring instrumentation is installed and working properly.**
   The morning of the test is no time to find out that instrumentation is missing or inoperable. This will delay testing until the instrumentation is installed and operating properly. Improperly working instrumentation may result in a violation to permit requirements, therefore instrumentation should be monitored and maintained continuously and not just prior to the performance test.

7. **Confirm duct and stack accessibility in advance by removing caps from existing sample ports.**
   Port caps can become rusted on or seized requiring additional time and equipment for removal or installation of new ports. For example, there was an instance where an incinerator stack was lined with refractory after installation of the ports; testing was delayed until the port extension could be cut off and the refractory could be removed.

8. **Review the facility's safety requirements and procedures.**
   Make sure that everyone knows of potential hazards associated with the facility or process and ensure that proper personal protection equipement are worn and appropriate safety precautions are followed.

9. **Conduct a pre-test, if desired, to verify acceptable equipment operation.**
   Some facilities prefer to ensure proper tuning and/or operation of equipment prior to the performance test; however, this does increase the cost of the test program. All pre-tests should be conducted prior to the morning of the performance test to avoid costly delays or possible rescheduling. If a Title V facility fails a test being conducted for their own benefit, the facility must report the failure and submit the relevant test data to the delegated agency pursuant to the reporting requirements of Title V.

10. **Inform all affected facility personnel of the test schedule.**
    This will eliminate problems associated with maintenance and production schedules.

11. **Coordinate testing with production.**
    Make sure that the process will be operating at the proper level and with the proper material to satisfy testing requirements. Also, make sure that the production schedule agrees with testing. If the process has any scheduled or unscheduled downtimes such as employee breaks, shift changes, product changes, malfunctions, etc., the test company needs to be notified immediately.

12. **Maintain communication between the facility and test team throughout testing.**
    The facility contact needs to be on-site and available on test day(s) to verify production, authorize changes that could affect equipment operation or emissions and answer questions. The test company also needs to be notified immediately of any process

malfunctions. For batch operations, the facility and test team personnel will need to coordinate start and stop times for each test run.

13. **Determine who will record all necessary process and/or control equipment data.**
This may be done by the facility or the test company depending on accessibility and manpower and needs to be determined prior to the start of the test.

IV. FIVE TIPS FOR SELECTING A TEST COMPANY

1. **Start the process early.**
   Testing typically requires a two- to three-month lead-time from determining the requirement for a test to actually conducting the test. The process includes researching test companies, getting bids from test companies, selecting a test company, allowing the selected test company to prepare and submit test protocol(s) at least 30 days prior to desired test date. The Source Evaluation Society (SES) has compiled a list of companies for reference at the link below:

   http://sesnews.org/?q=Stack

2. **Know what you want from the test company.**
   Review your permit to understand what testing requirements are needed. Determind if you need consulting work in addition to performance testing.

3. **Verify that the test company can meet the timeframe requirement.**
   It doesn't matter what they have to offer if they can't meet your testing deadline. It's also important that they have some flexibility in their schedule so that reschedules due to unanticipated delays won't result in missed test deadlines and unnecessary violations. This is also another good reason why it's important to start the process early.

4. **Obtain at least two or three bids and make sure that you are comparing equivalent bids.**
   Do the bids include the same components, such as:
   - *Testing for the same pollutants*
   - *Test runs that are of the same duration*
   - *Scaffolding or lift equipment, if necessary*
   - *Generator services, if available power supply is limited (common problem)*
   - *Pre-test, if desired*
   - *Consulting services, if desired*

5. **Ask for references from other sources.**
   Why did they choose one test company over another? Was the decision based solely on low bid, customer service or past experience (good or bad)?