



ENVIRONMENTAL SERVICES DEPARTMENT AIR QUALITY DIVISION

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OPTIONAL COMPLIANCE DEMONSTRATIONS

A GUIDELINE

FOR

SEMICONDUCTOR INDUSTRY

PART II, Procedure to Determine Requirement for Operation and Maintenance Plan Point of Use/Exhaust Conditioner Units

June 4, 2001

GENERAL

For point of use (POU) devices or exhaust conditioner (EC) units, the source shall follow the procedures outlined below to make a determination whether the subject POU or EC would be required to:

- Submit an Operation and Maintenance Plan (O&M Plan), or
- Demonstrate Adequate Maintenance and Calibration (AMC), or
- Conduct an Air Dispersion Modeling / Risk Assessment.

For the purpose of this procedure, the following definitions are provided as follows:

1. Definition: Exhaust Conditioner (EC)

In semiconductor manufacturing, a number of different process tools are used to perform the various operations needed to make the final product. Some of these tools contain devices inherent to the equipment which treat or condition, the exhaust gases as they leave the process chamber. There are a variety of such exhaust conditioners used, but the primary intents are the same in all cases:

- The exhaust conditioners remove solids from the exhaust stream, which prevents them from deposition later in the exhaust duct. Since downstream exhaust problems can actually impact the manufacturing process, these devices improve process quality and reliability.
- Use of these conditioners improves equipment uptime. Without the exhaust conditioner, process exhaust pumps will eventually fail.
- Removal of the solids reduces the amount of system maintenance needed and avoids safety hazards related to blocked exhaust ducts.

- Exhaust Conditioners (EC) are used for safety and/or industrial hygiene purposes, and are always interlocked to the process equipment and/or feed materials.

2. Definition: Point of Use (POU) Control Device

- A Point of Use (POU) Control Device is installed in close proximity to the process equipment and is installed for the purpose of abating regulated pollutants.
- Normally, a POU is not interlocked with the associated process equipment.

3. Definition: Adequate Maintenance and Calibration (AMC)

MCESD will accept “Adequate Maintenance and Calibration (AMC)” for a source with records to demonstrate that the process and/or abatement instrumentation (which include at least the sensing devices that trigger the interlock shutdown system) has been properly maintained and calibrated per manufacturer’s recommendations, or at least once a year per a written maintenance and calibration program commonly adopted by the semiconductor industry, whichever is more stringent. The records along with the maintenance and calibration program shall be available onsite upon inspection.

4. Definition: Regulated Air Pollutant (RAP)

RAP is any compound as defined in MCESD Rule 100, Section 200.90,

SPECIFIC REQUIREMENTS

1. No “Regulated Air Pollutants” (RAP) are involved

There will be no O&M Plan or AMC requirement for any POU or EC unit that controls non-RAP.

2. POU unit that is interlocked (shutdown) to the appropriate process equipment or EC unit

This is the case when an emission reduction is claimed.

- An O&M Plan is not required in this case. However, the demonstration of AMC on selected POU or EC units must be presented. This requirement may be addressed in the permit as part of the conditions. MCESD will review the final selection of EC or POU units to determine permitting requirements. For example, MCESD may require an AMC demonstration such as maintenance records (e.g. when a sensor is calibrated or changed) for an arsine hydride gas EC.
- The grouping of EC or POU units is allowed for the purpose of streamlining the AMC demonstration. See Example below.

Sample AMC for Exhaust Conditioners

Exhaust Conditioner	Interlock Triggering Parameter	Measuring Device^a	PM/Calibration Frequency
Wet Scrubber	Water Recirculation Rate, or Make-up Water Rate	Flowmeter, Rotameter	Monthly
Oxidizer	Oxidation Chamber Temperature	Thermocouple	Replaced Every Six Months ^b
Cold Bed (Adsorber/Chemisorber)	Breakthrough Sensor	Electrochemical Cell, Colorimetric Paper, FTIR Cell, Conductivity Probe	Replaced Every Six Months ^b
Hot Chemical Bed	Breakthrough Sensor	Electrochemical Cell, Colorimetric Paper, FTIR Cell, Conductivity Probe	Replaced Every Six Months ^b
Reactor Systems	Power	Wattmeter, Drantz Meter	Varies ^c
Particulate Removal	Pressure Drop	Magnehelic, Photohelic	Varies ^c

^a These only represent examples and other monitoring devices could be used.

^b Based on manufacturer's recommendations.

^c To be discussed during MCESD/Permittee meeting.

3. POU unit that is without an interlock shutdown system

When an emission reduction is claimed, an O&M Plan is required. A sample O&M Plan is attached as Attachment 1 for reference.

4. The source claims no emission reduction

This is a case for a POU or an EC unit with or without an interlock system. There will be no requirement for an O&M Plan or AMC.

Modeling/risk assessment will be done at the point(s) of discharge to the atmosphere only. Modeling /risk assessment shall demonstrate no exceedance of AAAQG threshold (May 11, 1999 version). If the subject constituent is not listed in AAAQG, threshold values from other states or air quality districts will be accepted. Threshold values of VOC from an area with an equal or more stringent non-attainment classification are preferred.