Highlights

- Gas-fired Combustion Turbine Example (Excel XP Format, 20 kb, updated 01/2004)

Particulate Matter Speciation

Natural Gas Fired Combustion Turbines

Applicants with significant sulfur dioxide emissions should also include sulfuric acid mist emissions in visibility and sulfur deposition calculations. In future visibility analyses for Class I areas, combustion turbine applicants should apply the following recommendations:

Apportionment of PM between filterables and condensibles: 25% of PM will be assumed to be filterable, and 75% condensible.

Nature of filterables: all filterable PM will be considered Elemental Carbon.

Nature of condensibles:

- Sulfur emissions from a NG-fired combustion turbine should be estimated on a case-by-case basis.
- Ideally, the applicant would supply emission rates

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for both SO_2 and SO_4 based upon the actual sulfur content of the NG to be burned. (In this case, all condensible emissions would be assumed to be Organic Carbon.)

- If only SO_2 emission estimates are provided, for AQRV analyses, one-third of the applicant's estimated SO2 emissions would be carved-out and adjusted for differences in molecular weights to represent SO_4 emissions. Estimate the organic component of the condensibles (expressed as Organic Carbon) by subtracting the SO_4 from the condensible fraction.

Excel XP Example: see how approach would be applied to a typical gas turbine when only PM_{10} and SO_2 emissions are provided by the applicant.

Implementation: implement this guidance for gas CTs.

States/locals and turbine vendors/operators should investigate the actual nature of these emissions and provide that data to the Environmental Protection Agency and the Federal Land Managers.

The emissions modeled must ultimately be reflected in the permit.

Particle Size

Applicants with significant sulfur dioxide emissions should also include sulfuric acid mist emissions in visibility and sulfur deposition calculations. In future visibility analyses for Class I areas, combustion turbine applicants should apply the following recommendations:

It is assumed that all particles are one micron or less.

For SINGLE SPECIES, the mean and standard deviation are used to compute a deposition velocity for NINT (see group 9) size-ranges, and these are then averaged to

obtain a mean deposition velocity.

For GROUPED SPECIES, the size distribution should be explicitly specified (by the 'species' in the group), and the standard deviation for each should be entered as 0. The model will then use the deposition velocity for the stated mean diameter.

Species Name	Size Distribution (%)	Geometric Mass Mean Diameter (microns)	Geometric Std. Deviation (microns)
SO4	100	0.48	0.50
NO3	100	0.48	0.50
PM0005	15	0.05	0.00
PM0010	40	0.10	0.00
PM0015	63	0.15	0.00
PM0020	78	0.20	0.00
PM0025	89	0.25	0.00
PM0100	100	1.00	0.00

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