

THE DEC POLICY SYSTEM



New York State
Department of Environmental Conservation

PROGRAM POLICY

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Title: Fuel Mixture Provisions

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Abstract:

This policy explains the use of the fuel mixture variance provisions of Subpart 225-1.

Related References:

All applicable rules, regulations and requirements are listed in DAR-4.

I. PURPOSE

Subpart 225-1 "Fuel Composition and Use - Sulfur Limitations" regulates the sulfur content of fuels which are sold, offered for sale, purchased, or used in New York State. Subdivision 225-1.5(a) of Subpart 225-1 provides for a variance from the sulfur in fuel limitations for certain fuel mixtures. This policy is intended to explain the use of the fuel mixture variance provisions.

II. BACKGROUND

This policy clearly delineates for source owners the provisions of the above noted Subpart.

III. POLICY

The use of this policy enables a source owner, who has the capability to burn two or more different fuels simultaneously, to minimize fuel costs, to the extent that the sulfur content affects costs, by using non-conforming fuels along with fuels that have a sulfur content lower than required by regulation.

IV. RESPONSIBILITY

The source owners are responsible to insure that fuel mixtures used comply with sulfur in fuel limitations.

V. PROCEDURE

This policy was previously issued as Air Guide-24. No changes have been made to this document.

THE FUEL MIXTURE PROVISIONS IN SUBPART 225-1

Subpart 225-1, "Fuel Composition and Use - Sulfur Limitations," regulates the sulfur content of fuels which are sold, offered for sale, purchased, or used in New York State. Subdivision 225-1.5(a) of Subpart 225-1 provides for a variance from the sulfur in fuel limitations for certain fuel mixtures. This policy is intended to explain the use of the fuel mixture variance provisions. Subdivision 225-1.5(a) reads as follows:

"(a) Fuel mixtures. Fuels with a sulfur content greater than that allowed by this Subpart may be used when the source owner can demonstrate that sulfur dioxide emissions do not exceed the value for S calculated by the following equation:

$$S = \frac{1.1 AM + 2 BT}{M + T}$$

- Where:
- S = Allowable sulfur dioxide emission (in pounds per million Btu)
 - A = Sulfur in oil allowed by Table 1 or Table 2 of this Subpart (in percent by weight)
 - B = Average sulfur in solid fuel allowed by Table 1 or Table 2 of this Subpart (in pounds of sulfur per million Btu gross heat content)
 - M = Percent of total heat input from oil
 - T = Percent of total heat input from solid fuel (including coal, coke, wood, wood waste, and refuse derived fuel)

This general variance for fuel mixtures only applies to processes or stationary combustion installations. Compliance will be based on the total heat input from all fuels burned, including gaseous fuels. Any source owner who chooses to burn a fuel mixture pursuant to this subdivision is subject to the emission and fuel monitoring requirements of section 225-1.7."

The use of the fuel mixture formula enables a source owner, who has the capability to burn two or more different fuels simultaneously, to minimize fuel costs, to the extent that the sulfur content affects costs, by using non-conforming fuels along with fuels that have a sulfur content lower than required by regulation. Also, the fuel mixture formula enables a source owner to blend non-conforming fuels with low sulfur fuels of the same type.

The fuel mixture provision also provides a benefit to source owners who burn a low sulfur solid fuel such as wood or refuse derived fuel simultaneously with a higher sulfur content fossil fuel. Similarly, source owners who use gas with either coal or oil may use a cheaper and more readily available high sulfur content coal or oil with virtually sulfur free gas.

The five examples which follow illustrate the proper application of the fuel mixture equation.

Example 1

Stationary combustion installation:

	Oil	Coal	Gas
Heat Input	50%	50%	0%
Sulfur Std	1.5	1.7	-

- a. What is allowable SO₂ emission rate?

$$S = \frac{1.1 AM + 2 BT}{M + T}$$

$$S = \frac{1.1 (1.5) (50) + 2 (1.7) (50)}{50 + 50}$$

$$S = 2.525 \text{ lbs SO}_2/10^6 \text{ Btu}$$

- b. Source owner wants to use coal with 2.0 lb sulfur/million Btu gross heat content. What must sulfur content of oil be to allow use of this non-conforming coal?

$$2.525 = \frac{1.1A(50) + 2(2.0)(50)}{50 + 50}$$

$$A = (252.5 - 200)/55$$

$$A = 0.95\%$$

Example 2

Stationary combustion installation:

	Oil	Coal	Gas
Heat Input	70%	0%	30%
Sulfur Std	1.5	1.7	-

- a. What is allowable SO₂ emission rate?

$$S = \frac{1.1 AM + 2 BT}{M + T}$$

$$S = \frac{1.1(1.5)(70) + 0}{70 + 0}$$

$S = 1.65 \text{ lb SO}_2/10^6 \text{ Btu}$ (Note: This is allowable rate for all oil and gas mixtures)

- b. What is maximum allowable sulfur content of oil in this mixture? (Assume gas contains no sulfur)

$$A = \frac{\text{(Sulfur in fuel standard for oil)}}{\text{(Decimal fraction of heat input from oil)}}$$

$$A = \frac{1.5}{.7}$$

$$A = 2.14\%$$

Example 3

Stationary combustion installation:

	Oil	Coal	Gas
Heat Input	0%	70%	30%
Sulfur Std	1.5	1.7	-

- a. What is allowable SO₂ emission rate?

$$S = \frac{1.1 AM + 2 BT}{M + T}$$

$$S = \frac{0 + 2 (1.7)(70)}{70}$$

$S = 3.4 \text{ lb SO}_2/10^6 \text{ Btu}$ (Note: This is allowable rate for all coal and gas mixtures)

- b. What is maximum allowable sulfur content of coal in this mixture? (Assume gas contains no sulfur)

$$B = \frac{\text{(Sulfur in fuel standard for coal)}}{\text{(Decimal fraction of heat input from coal)}}$$

$$B = \frac{1.7}{.7}$$

$$B = 2.43 \text{ lb sulfur}/10^6 \text{ Btu gross heat content}$$

Example 4

Stationary combustion installation:

	Oil	Coal	Gas
Heat Input	50%	30%	20%
Sulfur Std	1.5	1.7	-

- a. What is allowable SO₂ emission rate?

$$S = \frac{1.1 AM + 2 BT}{M + T}$$

$$S = \frac{1.1(1.5)(50) + 2(1.7)(30)}{50 + 30}$$

$$S = 2.31 \text{ lb SO}_2/10^6 \text{ Btu}$$

- b. If conforming oil with a sulfur content of 1.5% is used, what is maximum allowable sulfur content of coal in this mixture? (Assume gas contains no sulfur)

$$2.31 = \frac{1.1(1.5)(50) + 2(B)(30)}{100}$$

$$B = (231 - 82.5)/60$$

$$B = 2.48 \text{ lb Sulfur}/10^6 \text{ Btu gross heat content}$$

- c. If conforming coal with a sulfur content of 1.7 lb/10⁶ Btu gross heat content is used, what is maximum allowable sulfur content of oil in this mixture? (Assume gas contains no sulfur)

$$2.31 = \frac{1.1(A)(50) + 2(1.7)(30)}{100}$$

$$A = (231 - 102)/55$$

$$A = 2.35\%$$

Example 5

Stationary combustion installation:

	Oil	Coal	RDF	Gas
Heat Input	0%	50%	50%	0%
Sulfur Std	1.5	1.7	1.7	-

- a. What is allowable SO₂ emission rate?

$$S = \frac{1.1 AM + 2 BT}{M + T}$$

$$S = \frac{0 + 2(1.7)(100)}{0 + 100}$$

$$S = 3.4 \text{ lbs SO}_2/10^6 \text{ Btu}$$

- b. Assuming refuse derived fuel (RDF) has a sulfur content of 0.15 lb/million Btu gross heat content, what is maximum allowable sulfur content of coal in this mixture?

$$3.4 = \frac{2(B)(50) + 2(.15)(50)}{100}$$

$$B = (340 - 15)/100$$

$$B = 3.25 \text{ lb sulfur}/10^6 \text{ Btu gross heat content}$$

Implementation of the Fuel Mixture Provision

The fuel mixture provisions of Subpart 225-1 are to be implemented through the addition of conditions to the Certificate to Operate for the source involved.

Since sulfur dioxide emissions from a fuel mixture which complies with Subpart 225-1 are not greater than emissions resulting from the use of fuel which complies with Table 2, there is no need to revise the State Implementation Plan before approving the mixture. Thus, no public hearings are needed.

Similarly, cumbersome mechanisms such as Commissioner's Orders are inappropriate for approving fuel mixtures. A source owner who uses this provision of Subpart 225-1 is not, as a consequence, a violator, is not subject to penalties or sanctions, and need not be placed on any schedule or timetable.

Source owners may discontinue the use of a fuel mixture at will as long as the fuel they revert to complies with Table 2 of Subpart 225-1. The Certificate to Operate conditions are to make this option clear. Subsequently, the fuel mixture may be recommended at the source owner's discretion provided that the mixture essentially conforms with the conditions originally approved and the Certificate to Operate has not been altered by removing the fuel mixture conditions.

Fuel mixture approval does not require the submittal or review of an air quality impact analysis. Once again, since SO₂ emissions do not exceed limits that would result from the use of conforming fuel, no demonstrations are needed that ambient air quality standards or PSD increment consumption are not contravened.

If a source owner requests approval of a fuel mixture where sulfur dioxide emissions would exceed the "S" value calculated by the equation, the fuel mixture provision is inappropriate. Under such circumstances, the applicant would have to comply with provisions in section 225-1.3 dealing with "impact offset plans."

Compliance Verification

"Any source owner who chooses to burn a fuel mixture pursuant to this subdivision is subject to the emission and fuel monitoring requirements of section 225-1.7."

It is a relatively simple matter to verify compliance with sulfur in fuel limitations when only one fuel is used by a specific combustion source. Compliance verification can become much more difficult when two or more fuels are used simultaneously and when their respective proportions change. Therefore, any source which operates pursuant to the fuel mixture provision must either install continuous monitoring of sulfur dioxide emissions and fuel use, or a representative and continuing program of sampling and sulfur analysis must be initiated regardless of the size of the source.

The source owner who uses a fuel mixture and who installs continuous SO₂ monitoring equipment must submit quarterly reports of exceedances to the respective regional office. The regional office may, at their discretion, request routine sampling or monitoring data.

The report of exceedances must include information about the nature and cause of the excessive sulfur dioxide emissions. If exceedances from a specific source become frequent, enforcement action should be pursued to obtain remedial action and penalties.

