Example 1

Stationary combustion installation:

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

a. What is allowable SO_2 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 SO_2 emission rate?

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

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

$S = 1.65$ lb $SO_2/10^6$ 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 SO_2 emission rate?

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

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

$S = 3.4$ lb $SO_2/10^6$ 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)

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

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

$B = 2.43$ lb sulfur/10^6 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 SO_2 emission rate?

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

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

$S = 2.31$ lb $SO_2/10^6$ 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)

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

$B = (231 - 82.5)/60$

$B = 2.48$ lb Sulfur/10^6 Btu gross heat content

c. If conforming coal with a sulfur content of 1.7 lb/10^6 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 SO_2 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?

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

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

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