

Ohio EPA

Division of Air Pollution Control

Engineering Guide #36

**Question:**

When should fuel burning equipment on a plant or premises be grouped for purposes of determining the allowable rate of particulate emissions from Figure I of OAC rule 3745-17-10?

(This question was submitted by Frank Phillips of the Portsmouth City Health Department on May 13, 1980.)

**Answer:**

OAC rule 3745-17-10, entitled "Restrictions on particulate emissions from fuel burning equipment," states the following in paragraph (B):

"...Unless otherwise specified in paragraphs (B)(1) to (B)(4) of this rule, the total heat input of all fuel burning units on a plant or premises which are united either physically or operationally shall be the total of the maximum capacities for all such units."  
(emphasis added)

Thus, two or more fuel burning units on a plant or premises must be "grouped" (i.e., the maximum heat input capacities added) whenever they are physically or operationally united. The total of the maximum capacities for all such units, unless otherwise specified in paragraphs (B)(1) through (B)(4), must then be used to determine the allowable particulate emission rate for each fuel burning unit.

The following examples illustrate when fuel burning equipment on a plant or premises should be considered to be physically or operationally united:

**"Physically United" Equipment:**

1. They are ducted to the same air pollution control system and stack.
2. They are ducted to different emission controls, but to the same stack.
3. The units use the same bottom ash removal system.
4. The equipment is under the same roof, i.e., in the same boilerhouse.
5. The equipment uses the same fuel-feeding system.
6. The equipment, boilers for instance, uses the same steam distribution system.

"Operationally United" Equipment:

1. The equipment provides the same output, such as steam, to the same process or to interdependent processes.
2. The equipment is connected to the same process control instrumentation.
3. The equipment is connected to the same steam or power distribution system.

Once a finding is made that two or more fuel burning units at a plant or premises are united either physically or operationally, the total heat input and the maximum allowable particulate emissions for each unit (per million BTU of actual heat input) must be determined in accordance with OAC rule 3745-17-10.

To clarify how such determinations are made for physically or operationally united fuel burning equipment that fall under paragraphs (B)(1) through (B)(4) of this rule, several examples are provided in this Guide. Many of these examples are based on actual situations at Ohio facilities. For simplicity, it was assumed that all fuel burning equipment in the following examples are located in counties where the allowable emission rate is specified by Curve P-1 of Figure I (if applicable), and the examples were chosen such that equation (c) [ $E = 0.8H^{0.3010}$ ] of Figure I is applicable. In this equation, "H" is the total heat input that is used, if necessary, to determine the allowable emission rate. Also, the Legend in the Appendix to this Guide explains the abbreviations used in the examples.

In reviewing the various examples provided below, it will be necessary (a) to pay close attention to the fuel type, the type of fuel burning equipment (FBE) usage, and whether or not the emissions unit is existing (installed prior to February 15, 1972) or new (i.e., installed or modified after February 15, 1972) and (b) to have a good understanding of the requirements of each of paragraphs (B)(1) through (B)(4). For example, although scenario B.6 focuses on paragraph (B)(2) and stand-by units, the requirements of paragraph (B)(4) also apply in determining the total heat input for the existing and new units. Likewise, although scenario C.6 focuses on paragraph (B)(3) and derating, the requirements of paragraph (B)(1) for #2 oil and paragraph (B)(4) for existing and new units are applicable in determining the total heat input (prior to derating).

**A. Paragraph (B)(1): Examples of new or existing fuel burning equipment which are fired only with gaseous fuels and/or #2 fuel oil and which are physically or operationally united with other fuel burning equipment on a plant or premises. Units that fire only gaseous fuels and/or #2 fuel oil are not included in determining the total heat input.**

<u>Example Number</u>	<u>Source Nos. of P / O United FBE</u>	<u>Fuel Type</u>	<u>FBE Usage</u>	<u>New or Existing FBE</u>	<u>Max Heat Input Capacity (MMBH)</u>	<u>"H" Total Heat Input (MMBH)</u>	<u>AER<sup>a</sup> (lb/MMBTU)</u>
1	B001	NG	OP	E	100	NA	0.020
	B002	NG	OP	E	100	NA	0.020
2	B001	#2 oil	OP	E	100	NA	0.020
	B002	#2 oil	OP	E	100	NA	0.020
3	B001	NG or #2 oil	OP	E	100	NA	0.020
	B002	NG or #2 oil	OP	E	100	NA	0.020
4	B001	COG	OP	E	100	NA	0.020
	B002	BFG	OP	E	100	NA	0.040
5	B001	NG & COG	OP	E	100	NA	0.020
	B002	NG & BFG	OP	E	100	NA	0.040
6	B001	#2 oil	OP	E	100	NA	0.020
	B002	#6 oil	OP	E	100	100	0.20
7	B001	NG	OP	E	100	NA	0.020
	B002	Coal	OP	E	100	100	0.20
8	B001	Coal	OP	E	100	100	0.20
	B002	NG	OP	N	100	NA	0.020
9	B001	Coal	OP	E	100	100	0.20
	B002	#2 oil	OP	N	100	NA	0.020
	B003	#2 oil	OP	E	100	NA	0.020
	B004	#2 oil	OP	E	100	NA	0.020
10	B001	#2 oil & WO	OP	E	100	100	0.20
	B002	#2 oil	OP	E	100	NA	0.020

<sup>a</sup> Note that BAT requirements for new emissions units may result in more stringent AERs than those prescribed by OAC rule 3745-17-10.

**B. Paragraph (B)(2): Examples of stand-by fuel burning equipment which are physically or operationally united with other fuel burning equipment on a plant or premises. The total heat input for the "other" fuel burning equipment (designated as OP below) is used to determine the allowable emission rate for each emissions unit that is not subject to paragraph (B)(1).**

<u>Example Number</u>	<u>Source Nos. of P / O United FBE</u>	<u>Fuel Type</u>	<u>FBE Usage</u>	<u>New or Existing FBE</u>	<u>Max Heat Input Capacity (MMBH)</u>	<u>"H" Total Heat Input (MMBH)</u>	<u>AER<sup>a</sup> (lb/MMBTU)</u>
1	B001	Coal	OP	E	50	50	0.25
	B002	Coal	SB	E	80	50	0.25
2	B001	Coal	OP	E	50	80	0.21
	B002	Coal	SB	E	50	80	0.21
	B003	Coal	OP	E	30	80	0.21
	B004	Coal	SB	E	30	80	0.21
3	B001	NG	SB	E	40	NA	0.020
	B002	NG	OP	E	40	NA	0.020
4	B001	#2 oil	OP	E	40	NA	0.020
	B002	Coal	SB	E	50	50	0.25
5	B001	Coal	OP	E	50	100	0.20
	B002	Coal	OP	E	50	100	0.20
	B003	NG	SB	E	90	NA	0.020
	B004	#2 oil	SB	E	90	NA	0.020
6	B001	Coal	SB	E	90	90	0.21
	B002	Coal	OP	N	110	110	0.19
7	B001	Coal	OP	E	90	90	0.21
	B002	Coal	SB	N	110	90	0.21
8	B001	#6 oil	SB	E	80	100	0.20
	B002	Coal	OP	E	100	100	0.20

<sup>a</sup> Note that BAT requirements for new emissions units may result in more stringent AERs than those prescribed by OAC rule 3745-17-10.

**C. Paragraph (B)(3): Examples of derated fuel burning equipment which are physically or operationally united with other fuel burning equipment on a plant or premises. When a unit or units is/are derated, the new derated capacity is used to determine the total heat input, except for units that burn only gaseous fuels and/or #2 fuel oil.**

Example Number	Source Nos. of P / O United FBE	Fuel Type	FBE Usage	New or Existing FBE	Max Heat Input Capacity (MMBH)	"H" Total Heat Input (MMBH)	AER <sup>a</sup> (lb/MMBTU)
					HI → HI <sub>D</sub>	H → H <sub>D</sub>	
1	B001	Coal	OP	E	100	200 → 150	0.18
	B002	Coal	OP	E	100 → 50	200 → 150	0.18
2	B001	Coal	OP	E	100	300 → 200	0.16
	B002	Coal	OP	E	100 → 50	300 → 200	0.16
	B003	Coal	OP	E	100 → 50	300 → 200	0.16
3	B001	Coal	OP	E	30 $\uparrow$	100 → 50	0.25
	B002	Coal	OP	E	30 → 50	100 → 50	0.25
	B003	Coal	OP	E	40 $\downarrow$	100 → 50	0.25
4	B001	NG	OP	E	50	NA	0.020
	B002	#2 oil	OP	E	80 → 50	NA	0.020
5	B001	Coal	OP	E	50 $\uparrow$	80 → 60	0.23
	B002	Coal	SB	E	50 → 60	80 → 60	0.23
	B003	Coal	OP	E	30 $\downarrow$	80 → 60	0.23
	B004	Coal	SB	E	30	80 → 60	0.23
6	B001	Coal	OP	E	40 $\uparrow$	40 → 60	0.23
	B002	#2 oil	OP	E	40 $\downarrow$	NA	0.020
	B003	#2 oil	OP	E	40 → 60	NA	0.020
	B004	Coal	OP	N	70 $\downarrow$	110 → 60	0.23
	B005	#2 oil	OP	N	70 $\downarrow$	NA	0.020
7	B001	Coal	OP	N	10 $\uparrow$	50 → 30	0.29
	B002	Coal	OP	N	10 → 30	50 → 30	0.29
	B003	Coal	OP	N	30 $\downarrow$	50 → 30	0.29

<sup>a</sup> Note that BAT requirements for new emissions units may result in more stringent AERs than those prescribed by OAC rule 3745-17-10.

**D. Paragraph (B)(4): Examples of fuel burning equipment which constitute new sources and are physically or operationally united with existing fuel burning equipment on a plant or premises. Do not include new units in determining the total heat input for existing units. Include existing units when determining the total heat input for new units.**

Example Number	Source Nos. of P / O United FBE	Fuel Type	FBE Usage	New or Existing FBE	Max Heat Input Capacity (MMBH)	"H" Total Heat Input (MMBH)	AER <sup>a</sup> (lb/MMBTU)
1	B001	Coal	OP	E	50	230	0.16
	B002	Coal	OP	E	90	230	0.16
	B003	Coal	OP	E	90	230	0.16
	B004	Coal	OP	N	90	320	0.14
2	B001	Coal	OP	N	10	50	0.25
	B002	Coal	OP	N	10	50	0.25
	B003	Coal	OP	N	30	50	0.25
3	B001	Coal	OP	E	50	120	0.19
	B002	Coal	OP	E	70	120	0.19
	B003	Coal	OP	N <sub>1</sub> <sup>b</sup>	80	200	0.16
	B004	Coal	OP	N <sub>2</sub> <sup>b</sup>	80	280	0.15
4	B001	#2 oil	OP	E	40	NA	0.020
	B002	Coal	OP	N	40	40	0.26
5	B001	Coal	OP	E	40	40	0.26
	B002	#2 oil	OP	E	40	NA	0.020
	B003	#2 oil	OP	E	40	NA	0.020
	B004	Coal	OP	N	70	110	0.19
	B005	#2 oil	OP	N	70	NA	0.020

Also refer to examples in (A)(8), (A)(9), (B)(6), (B)(7), (C)(6), and (C)(7).

<sup>a</sup> Note that BAT requirements for new emissions units may result in more stringent AERs than those prescribed by OAC rule 3745-17-10.

<sup>b</sup> B003 was installed prior to B004 under a separate PTI.

## APPENDIX

### Legend:

AER	=	allowable emission rate
BFG	=	blast furnace gas
COG	=	coke oven gas
E	=	existing (installed prior to February 15, 1972)
FBE	=	fuel burning equipment
H	=	total heat input
H <sub>D</sub>	=	derated total heat input
HI	=	heat input
HI <sub>D</sub>	=	derated heat input
MMBH	=	million BTU per hour
MMBTU	=	million BTU
N	=	new (installed or modified after February 15, 1972)
NA	=	not applicable
NG	=	natural gas
OP	=	operating
P/O	=	physically or operationally
SB	=	stand-by
WO	=	waste oil

TK/

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