AP42 Section 1.5
4/93
Reference 1

National PROPANE GAS Association
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File: E-23

Mr. Joseph A. McSorley
Work Assignment Manager, Chapter 1
Emission Factor and Methodologies Section
Emission Inventory Branch (MD-14)
Research Triangle Park, NC 27711

Dear Mr. McSorley:

This is in reference to Mr. Daniel N. Myers' July 20 letter to you, advising that NPGA was preparing comments on the update of *Compilation of Air Pollutant Emission Factors (AP-42)*.

We do not have sufficient knowledge to comment on the contents of *Chapter 1 - Introduction*. The enclosed comments are directed at the remaining chapters enclosed with your July 17 letter. On the whole, we found the draft text to be in good order to the best of our knowledge and belief.

Mr. Myers has asked me to convey our concern, however, that with very few exceptions, the authorities cited in this document are companies, associations or individuals with little or no connection to the LP-gas industry. Please be advised that NPGA is the trade association representing all aspects of the industry, from production to equipment manufacturer to marketer. Any report or study of this industry should commence with contact with NPGA. Moreover, the Gas Processors Association (GPA), headquartered in Tulsa, Oklahoma, represents gas processing companies and can provide valuable scientific and technical data. Please be advised that we and the GPA are willing to assist at any time in these or other studies of the LP-gas industry.

We would be glad to discuss these comments further at your convenience.

Sincerely,

W H Butterbaugh

W. H. Butterbaugh, CAE
Assistant Vice President
Technical Services

Enclosures

NPGA Comments
on
Compilation of Air Pollutant Emission Factors (AP-42).

1. 2.1 - paragraph 1, page 3

The major source of supply of the LP-gases (65-70 percent) is part of the stream coming out of a natural gas well. About 5 percent of that stream is natural gas liquids (also called NGLs) of which propane is the predominant component. The balance of our supply is a by-product of various refinery operations.

Also, ethane and ethane-propane mixtures are NGLs but are not LP-gases. LP-Gas/Liquefied Petroleum Gas by definition is composed of propane, propylene, butane and butylenes.

We believe that the statement that "The main disadvantages are cost and potential safety hazards in the event of leaks arising from the fact that LPG is heavier than air and will settle in explosive pockets.", is misleading. It is true that propane costs more than natural gas but it is also sold in a substantially different manner. Natural gas is sold by regulated, public utilities. Propane is sold in a free and open market subject to all the laws of supply and demand and competition. Even so, it costs over twice as much to heat a house with electric resistance heat or heat pumps than it does to heat the same house with propane. As an engine fuel, propane is generally competitive with gasoline or nearly so, depending upon local market conditions for the two respective fuels.

Likewise, it is true that LP-gas vapor is heavier than air -- but that distinction is really significant only in a laboratory situation. As a domestic heating fuel, LP-gas installations are subject to exactly the same conditions and requirements as are provided for natural gas in NFPA 54. NFPA 54, "National Fuel Gas Code", is an American National Standard published by the National Fire Protection Association and is used as the basis of regulation in most of the states and by the model code organizations for propane and natural gas piping systems in homes and many commercial installations. It does not distinguish between the two fuels in its provisions -- it treats them equally from a safety hazard standpoint. Only in laboratory conditions do you have propane vapor behaving in the manner described in your Section 2.1. If there is any air movement at all in the area of a leak, the LP-gas vapor will disperse evenly just as would happen with a similar natural gas leak.

We do not wish to turn this response into a soap box for the virtues of LP-gas, but we feel that the publication at this point does not truly reflect the very significant safety experience of LP-gas systems installed in compliance with the provisions of NFPA 54 and with NFPA 58 in those instances no covered by NFPA 54. NFPA 58 "Storage & Handling of Liquefied Petroleum Gases" also is an American National Standard also published by the National Fire Protection Association. NFPA 58 is used as the basis of regulation by virtually all of the states.

In reference to the statements at the end of this paragraph regarding interruptible natural gas supplies, many commercial and industrial installations use propane as a stand-by, alternative fuel in the event that they lose their natural gas supply because of their interruptible gas service contract or for other cause. The systems typically use propane-air mixers to produce a heating fuel having much the same heating value as the natural gas it replaces. These systems can be up and running in literally a matter of seconds and operate so smoothly that the industrial process never falters nor indicates or realizes that there has been a change in fuel.

2. 2.1 - Table 2-1, page 4

We believe the first entry in this table should be "LPG" rather than "LNG". Also, we suggest that the source of your information be identified; we would have liked to independently cross check your information. That was not possible -- if we happened to use the same data sources that you did, it would hardly have been a valid confirmation.

3. 2.2 - page 4

There is no indication in the second sentence regarding the circumstances when the use of an auxiliary vaporizer would be indicated. We suggest that "An auxiliary vaporizer is used when the natural vaporization capacity of the propane storage tank is not sufficient to handle the heating load supplied by the tank." be added following the present second sentence.

The last sentence of Section 2.2 is slightly misleading. Virtually any type appliance available for natural gas is available for LP-gas. An easy way to visualize the role of LP-gas, especially for the residential market, is that LP-gas appliances provide the convenience of gas appliances beyond the natural gas mains.

4. 2.3.4 - Particulate, page 7

We have difficulty envisioning how process materials can be elutriated during combustion, given the dictionary definition of "elutriate". However, since the paragraph otherwise appears to be in order, we assume that this term has usage in your jargon beyond the dictionary definition.

5. 2.3.6 - Trace element Emissions, page 8

The end of the third sentence implies that all propane/LPG is of refinery origin; as noted in our comments on Section 2.1, 60-65 percent of our LPG supply is from the production of natural gas with the balance being a by-product of various refinery operations. The basic thrust of the sentence that there are very low concentration of trace species in LPG is correct.

6. 3.3 - Fugitive Emissions, page 16

The third sentence of the second paragraph references a Table 3-5-1; this table was not included in the text we reviewed.

7. 4.3 - Fugitives, page 23

Are the documents referenced in the first paragraph the same ones referenced in the third paragraph?

8. 5.1 - Revised Section

In the section titled *1.5 - Liquified Petroleum Gas Combustion; 1.5.1 - General*, the spelling "liquified" is considered archaic and has been discontinued in favor of the spelling "liquefied".

One way or another, there are errors throughout the present paragraph. The following is a suggested rewording.

"Liquefied petroleum gas (LPG or LP-gas) consists of propane, propylene, butane and butylenes; the product used for domestic heating is substantially propane. This gas, obtained mostly from gas wells but also to some extent as a refinery by-product, is stored as a liquid under moderate pressure. There are three grades available as heating fuels - commercial propane; engine fuel grade propane; and commercial butane. The specification provisions for these three grades are in ASTM D1835 "Standard Specification for Liquefied Petroleum (LP) Gases", published by the American Society for Testing & Materials, Philadelphia, Pennsylvania, and in GPA 2140 "Liquefied Petroleum Gas Specifications and Test Methods", published by the Gas Processors Association, Tulsa, Oklahoma. (Note in ASTM D1835, the engine fuel grade of propane is called "special duty propane"; in GPA 2140, it is called "HD-5 Propane".) In addition, there are high purity grades available for laboratory work and for use as aerosol propellants. Typical heating values for commercial propane and HD-5 propane is 91,500 BTU/gallon (after vaporization); for commercial butane, the value is 102,000 BTU/gallon. The largest market for LPG is the domestic/commercial market, followed by the chemical industry (used as a petrochemical feedstock) and agriculture. Propane is also used as an engine fuel as an alternative to gasoline and as a stand-by fuel for companies that have interruptible natural gas service contracts.

We suspect that the major problem with this paragraph is the source noted in the following page headed "References for Section 1.5" as *A Practical Guide to Liquified Petroleum Gas Utilization* by E. A. Clifford. The industry has changed significantly in many ways since Mr. Clifford's book was written. In its time, it was an excellent resource and still is, as long as one realizes that the information must be approached with caution simply because of these changes. We would be glad to comment specifically about the respective changes made to the former text if desired.