

# Petroleum and Petrochemical Bulletin

## Fullness of Pipelines Between Marine Vessels and Shore Facilities

**Bulletin 14-02  
Rev. 1-1**

### Introduction

TIC Council members would like to draw attention to the limitations regarding the determination of pipeline fullness and API MPMS Chapter 17.6 / EI HM 70 Guidelines for Determining the Fullness of Pipelines Between Marine Vessels and Shore Facilities (3<sup>rd</sup> Edition – September 2022).

The standard identifies five procedures for verification of pipeline fullness; specifically:

- High point bleed method
- Internal circulation method
- Line displacement method
- Line press / Line Pack Method
- Pigging method

The standard does not recommend any particular method and states that terminal personnel shall designate a tank(s), pipeline systems (including meters, if used), and the method(s) that are available for line verification.

However, no criteria for assessing the effectiveness of the methods are given and terminals do not generally have documentation to support the method(s) which they use.

### Line Displacement Method and Agreed Tolerance

Probably the most common of the five methods recommended in the standard is line displacement, which compares a volume delivered against a volume received, when loading a vessel from a shore tank(s), discharging a vessel to a shore tank(s), or when transferring product from one shore tank to another.

For line displacements, a measurement tolerance agreement should be established between the commercial parties, prior to the commencement of the operation. This measurement tolerance is the permitted measured difference between the two measurements.

In the absence of such agreement between the commercial parties, API MPMS Chapter 17.6 / EI HM 70 states that the tolerance shall be the total volume represented by twice the measurement range of the delivered and receiving tanks (as stated in API MPMS Ch 3.1A/HM 4 and API MPMS Ch. 3.1B).

#### Revisions/Reaffirmations

Rev. 0    Dec 2014  
Reaff.    June 2019  
Rev. 1    November 2023

The standard states that Total Observed Volume [TOV] is normally used to compare the delivered and received volumes: however, Total Calculated Volume [TCV] can be used if it has been historically demonstrated to be appropriate for the pipeline size, distance between vessel and shore, and/or temperature difference between vessel, pipelines, and tanks, or by commercial agreement.

Nevertheless, if a void in a pipeline is determined using TOV no guidance is given on how to convert this observed volume to standard volume, i.e., how to determine what density and temperature to use in the calculation process.

Furthermore, the standard does not address the topic of adjusting the shore figure because of indicated pipeline voids. Therefore, adjustments to custody transfer quantities can only be made if TIC member companies receive written confirmation of this from all commercial parties involved in the transaction.

### **Additional Issues**

While the standard recommends that line fullness verification is performed after cargo transfer (in addition to before the transfer) it is noted that operational restrictions may prevent line fullness from being performed. If line fullness is not able to be determined at the end of the transfer, it can influence the overall custody transfer volume, which in theory, could be up to the capacity of the line.

Section 5.2 of the standard covers considerations for selecting a method, and states numerous factors when selecting a method(s) for line verification before the transfer begins. Nonetheless, there is no guidance given on which parties should select the method for line verification, which presumably would be the involved commercial parties, but where third-party terminals are involved, it is likely that their representatives will also want to be part of these discussions.

### **Conclusion**

While API MPMS Chapter 17.6 / EI HM 70 may well represent the best that a consensus standard can achieve on such a complex subject it is mostly a listing of possible methods. TIC Council Member companies strongly recommend that its clients make themselves familiar with the limitations of this standard and agree with their trading partners how the determination of line fullness is to be addressed for specific transactions. General statements to inspection companies, such as, “conduct the inspection according to API standards” will not provide sufficient detail.

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