**Annex C**

**Factsheet on TR 80 : 2020 on *Meter verification using master mass flow meter***

**What is TR 80 and what does it cover?**

TR 80 covers:

1. Terms and definitions used in the standard

2. The criteria and metrological requirements for qualifying a master meter and the maintenance of its master meter status

3. The requirements and procedures for meter verification using master mass flow meter to verify and check the stability and performance of a duty meter installed on a bunker tanker or at an oil terminal

4. The output of the meter verification which is a meter verification report

5. The meter verification process that is undertaken by an authorised party as defined in the standard

**How does TR 80 help and benefit the shipping and bunkering industry?**

1. When undertaken by an authorised party, meter verification using master mass flow meter is a more efficient and less costly process that independently monitors and checks if a duty meter performance meets the requirements of SS 648 or SS 660 (as the case may be) during its commercial lifespan.

   This standard supports the application of the new SS 660 *Code of practice for bunker cargo delivery from oil terminal to bunker tanker using mass flow meter* and SS 648 *Code of practice for bunker mass flow metering*, which respectively apply at the start of the bunker supply chain (i.e. bunker loading at terminals) to final delivery of bunker to ships. Singapore delivers some 50 million tonnes of bunkers worth about USD 20 billion (or S$27.2 billion[1]) to international shipping every year[2].

2. Enhances Singapore's bunkering hub status

   This TR is a world first standard for the bunkering industry. The development of this standard relied on the collective expertise of the working group members to establish and lay down bunkering specific requirements and procedures that also drew upon international guidelines, OIML R117 and API MPMS 4.8 as well as meter verification results obtained from local trials using a master MFM.

   This TR also supports the global bunkering industry and will be useful in helping ports all over the world to transition to MFM bunkering. This standard will be an important reference for the potential development of a new ISO standard that can be used with ISO 22192 *Bunkering of marine fuel using the Coriolis mass flow meter (MFM) system* and ISO 21562 *Bunker fuel mass flow meters on receiving vessel — Requirements* for verification of mass flow meter (duty meter) installed on bunker tanker or receiving vessel.

[1] Converted from USD at an exchange rate of S$1.36/USD
[2] Source: https://shipandbunker.com/prices

This standard aims to build trust and confidence under fair trade principles, promote growth, and improve industry and business sustainability for the benefit of all stakeholders in the Singapore bunkering industry.

**Who would use TR 80?**

Users of this standard include oil terminals, vendors of Coriolis mass flow meters, bunker suppliers, surveyors, meter verification service providers, bunker tanker owners and operators, shipowners/buyers and relevant authorities.

**Who developed TR 80?**

Under CSC, the Technical Committee (TC) on Bunkering appointed a Working Group (WG) to develop and draft a new code of practice for meter verification using master mass flow meter (MFM) under the Singapore standardisation programme, which is administered by Enterprise Singapore. Since April 2011, Enterprise Singapore has appointed the Singapore Chemical Industry Council Limited to manage the Chemical Standards Committee and its committees, including the TC for Bunkering.

The WG consists of expert members from oil terminals, oil traders, bunker suppliers, bunker tanker operators, testing laboratories, bunker surveying companies, measuring instruments calibration/verification companies, meter vendors, National Metrology Centre, Enterprise Singapore and Maritime and Port Authority of Singapore.

**What is the process of developing TR 80?**

From August 2019, the WG prepared the framework of the draft TR with reference to international guidelines. The requirements and meter verification procedures in the draft TR were validated with results obtained from local trials using a master MFM. The draft TR was approved by the multi-stakeholder TC for Bunkering with incorporation of feedback from members. The final draft TR was then approved by the Chemical Standards Committee under the Singapore Standards Council.

**Purchase of TR 80**

TR 80 can be purchased at Toppan Leefung:

**Toppan Leefung Pte Ltd**
1 Kim Seng Promenade #18-01
Great World City East Tower
Singapore 237994

Tel: (65) 6826 9691
Email: singaporestandardseshop@toppanleefung.com
Website: www.singaporestandardseshop.sg

Price of TR 80 : 2020 is $ 25.90 (before GST).