



## Article: MFM Fuel Delivery Monitoring

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25th August 2017

Recent events in Singapore have seen the Maritime Port Authority (MPA) take strong action against a fuel supplier by revoking their licence, following checks which uncovered unauthorised alterations made to the pipelines on-board a number of the supplier's bunker tankers between the Mass Flow Meter (MFM) and the flow boom. Such alterations had allowed bunker fuel measured by the MFM to be siphoned out and undermine the accuracy of the readings from the MFM system.

Such alterations and actions prove there are still individuals within the region who are prepared to risk unauthorised practices in relation to fuel delivery. This is despite the commendable efforts of the MPA to introduce a technology which aims to assist in placing Singapore at the forefront as a transparent, efficient and ethical port in which to deliver and receive bunker fuel.

The above issues also prove that the MFM is not a simple "plug & play" device, but is an integral part of the wider fuel delivery system. On its own, the MFM is not the sole resolution to past problems, however a greater understanding of the MFM technology, linked to a comprehensive understanding of marine fuel delivery, will certainly ensure best practice can be monitored and reported.

Therefore the role and value of the Bunker Quantity Surveyor has in fact increased within Singapore, rather than the pre-MFM-implementation perception that such a role may diminish.

Within the TR48 technical reference document for bunkering via mass flow meters, the BQS surveyor is highlighted on over 90 occasions, specifically:

- Clause 10.1.5 – mandatory documents to be issued by Surveyor.
- Clause 10.3 – Pre-delivery
- Clause 10.3.6 – Sampling
- Clause 10.4 – Bunkering operation
- Clause 10.5 – Post-delivery Checks and Documentation
- Clause 10.7.1. Metering Stoppage/Failure – 10.7.1.2 – back to manual measurement.
- Clause 10.7.6.1 – Quantity Dispute
- Annex A – Safety Health and the Environment

The role of the surveyor in relation to monitoring fuel deliveries via MFM includes:

- Checking :
  - MFM' approval for 'use in trade', Meter calibration record, Meter zero verification report, Bunker tanker's meter totalizer log, System seals.
- Witness setting of meter reading to zero, Monitor whether stripping is done, Witness meter reading at the end of the bunkering. Obtain copy of Metering Ticket.
- Ascertain vessel's received quantity. Calculate and report vessel's R.O.B.
- Ensure proper sampling is done at the correct location by all concerned and seal numbers recorded on the BDN.
- Quantity differences (+/-) reported, Quantity difference investigated and necessary documents obtained.
- Bunker/Meter Profile obtained – When agreed between both parties.



Since 2015, VPS Surveyors have been monitoring MFM fuel delivery in Singapore, comparing the vessels manual measurements versus the bunker tanker's MFM measurements. Results recorded between 2015-2016, showed 45% of deliveries agreed within 0.5% of each other and 70% of deliveries within 1% of each other. However, the first six months of 2017 has shown a slight improvement, with 51% of deliveries having a volume agreement between vessel manual measurements and bunker tanker MFM measurement of within +/- 0.5%. The remaining 49% is equally split between apparent gain or loss, to the vessel. This would suggest that in approximately 25% of cases, the vessel is likely to claim a shortage.

The introduction of MFM, as an almost "black-box" technology, was of course always going to be subject to a potential degree of scepticism from crew inexperienced with such technology. Therefore VPS' employment of an expert flow-technologist and the introduction of services, MFM Quick-Screen and MFM-Full Investigation, were introduced in early 2017 to protect the interest of the fuel purchaser and the crew on-board the receiving vessel.

With respect to the MFM Quick-Screen service, VPS have customers who require field assessment of the MFM profile. This service sees the Surveyor collect and check MFM field documents including pictures of the Meter profile. Our MFM Technologist, then reviews each case for 23 parameters, highlighting which, if any, could potentially be in breach TR48 and gives a 'PASS' or 'FAIL' rating relative to TR48 requirements.

VPS MFM Quick-Screen data has shown a number of deliveries failing to comply with TR48 due to parameters such as Tank Stripping, Line Clearing, Low Cut-off Values (LFC), the minimum measured quantity (MMQ), Minimum Mass flow Rate (Qmin), Zero Verification and meter totalizer log.

Following a MFM Quick-Screen "Fail" VPS can provide a more detailed MFM investigation to comprehensively prove the initial findings, including analysis of the MFM Profile ASCII file and transmitter configuration report.

So the first few months following mandatory MFM fuel delivery in Singapore, has shown the whole fuel delivery system, including MFM technology requires expert performance monitoring and assessment, along with the detailed checking of the relevant documentation. As such, guided by the MPA and TR48 requirements, VPS MFM-Screening and Investigation Services, plus experienced BQS Surveyors, can provide the expertise to assist in ensuring receipt of compliant and full fuel deliveries.