DEFINING | WHAT'S NEXT

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BULLETIN: SWIFT DELIVERY LIQUID MEASURING SYSTEM NEW NMI CERTIFICATE P5/6B/232

There is a new NMI Certificate P5/6B/232 for the Swift Delivery Liquid Measuring System that applies to newly built tankers commencing 14 June 2023. Please use this NMI certificate number on new system and component data plates as appropriate.

This NMI Certificate P5/6B/232 is available for download on the NMI website:
https://www.industry.gov.au/national-measurement-institute/pattern-approval/certificates-approval/liquip-international-model-swift-delivery-liquid-measuring-system

Please refer to this certificate for the Test Procedure details used in the verification process.

On page 2 is an example of a compartment verification table that may be used in conjunction with the other certification requirements.

If you require further details, please feel free to contact us on +61 2 9725 9000 or at sales@liquip.com, and mention this bulletin.

EXAMPLE OF A COMPARTMENT VERIFICATION TABLE

The measuring system shall be verified for at an appropriate number of liquid levels across the full measuring range of the level sensor, that ensure for any combination of liquid levels in the compartment, the deliveries to or from the compartment greater than 2 x the minimum measured quantity (Vmin) are within the MPE for that delivery.

Minimum Measured Quantity (Vmin): Example 200L

Vmin is calculated from the smallest sensitivity "Litres/mm" generally at the widest part of the compartment. Verification may reveal that the sensitivity is different to that initially calculated at the widest part of the compartment, e.g. if 3L were found to exceed both absolute and relative error. To reflect the correct sensitivity in this case, the Vmin would need to increase to 300L, such that the minimum specified volume deviation (Emin) becomes 3L. More sensitive compartments with larger Vmin have larger absolute errors in measurement.

Maximum Permissible Error (MPE):

1. For transferred volumes equal to Vmin and up to 3.3 x Vmin, the minimum specified volume deviation: E_{min} = 2 x 0.5% x Vmin = 2L
2. For transferred volumes greater than 3.3 x Vmin: maximum permissible error: 0.3%

No. of measurements	Compartment contents before measurement (L)	**DFV** (as total delivery, L)	**Master Meter** (as total delivery, L)	**Error of total measurement**		**DFV** (as separate deliveries, L)	**Master Meter** (as separate deliveries, L)	**Error of separate delivery measurement**		**DFV** (as sum of two separate delivery measurements, L)	**Master Meter** (as sum of two separate delivery measurements, L)	**Error of sum of two separate delivery measurements**	
				Absolute (L)	Relative (%)			Absolute (L)	Relative (%)			Absolute (L)	Relative (%)
1	4250	448	450	**2**	**0.44**	448	450	2	0.44				
2	3802	1040	1041	1	0.10	592	591	-1	-0.17	1040	1041	1	0.10
3	3210	2251	2250	-1	-0.04	1211	1209	-2	-0.17	1803	1800	**-3**	**-0.17**
4	1999	3248	3248	0	0.00	997	998	1	0.10	2208	2207	-1	-0.05
5	1002	3649	3648	-1	-0.03	401	400	-1	-0.25	1398	1398	0	0.00
6	601	4049	4050	1	0.02	400	402	2	0.50	801	802	1	0.12
				Check: values shall be ≤ 2L **OR** ≤0.3%				Check: values shall be ≤ 2L **OR** ≤0.3%				Check: values shall be ≤ 2L **OR** ≤0.3%	

Notes:

The relative error determined for measurement No. 1 (error for total measurement) is 0.44% but the 2L absolute error is within the minimum specified volume deviation, $E_{min,}$ and is therefore a pass.

The absolute error determined for measurements No. 3 (error from sum of two separate delivery measurements) exceeds the minimum specified volume deviation, $E_{min,}$ but the relative error is within the maximum permissible error and is therefore a pass.