

Measurement Focus Group Agenda

Welcome to The Measurement Focus Group
Wednesday, 26 June 2024

The Measurement Focus Group is supported by the UK Government's National Measurement System (NMS) and is managed by TÜV SÜD National Engineering Laboratory on its behalf as the UK's Designated Institute for Flow Measurement. The group focuses on flow measurement and flow-related issues in industry.

09:30 **Registration and networking**

10:00 **Chairperson introduction**
Chris Mills (TÜV SÜD National Engineering Laboratory)

10:10 **Reducing flare mass flow uncertainty**
Tony Skelding (ABLE)

- The effect of gas composition on Reynolds number, density, MW, and mass uncertainty.
- Zero flaring and the nitrogen distortion effect on all measurements.
- Solving Reynolds and density using improved formulas.
- Combination IR and Ultrasound for uncertainty of virtually zero.
- Auto calculation of N2 %, and C1 %, reduces uncertainty by over 100 times.

10:35 **Mitigating & eliminating flaring & venting via recompression**
Adam Wood (nZero)

- Eliminates / mitigates venting and blowdowns.
- Reduction in GHG emissions in various applications including pigging, meter maintenance / calibrations.
- Single phase or Multi Phase Compression.
- 100% HP Liquid Transfer.
- 100% Mechanical Compressor.

11:00 **Coffee and networking**

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Department for Science, Innovation & Technology



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11:30 **Venturi meter odds & ends – Miscellaneous comments on venturi meter use outside the standards range**
Richard Steven (Kelton)

- Fabricated inlet Venturi meters are attractive for large gas meter applications, but the ISO Cd is only applicable to Re < 2e6. Four blinded data sets, including that of a heavy wall 36" 0.7β meter calibrated across 1e7 ≤ Re ≤ 6e7, are shown and compared to the ISO Cd.
- The upcoming edition of the ASME's MFC 3M Venturi meter standard will include a Cd = f(Re) expression. The fabricated inlet Venturi meter data sets are compared to this expression.
- ISO 5167-1 (2022) Section 5.6.4 lists Venturi meter diagnostic methods, including 'axial pressure profile analysis'. This conventionally requires a pressure tap downstream of the Venturi diffuser. Results of using a 'downstream tap' in the diffuser, i.e. a negative distance downstream, are shown.
- There are various non-standard Venturi meter designs available. One such design is the "Universal Venturi Tube" (UVT); claimed to reduce overall length while maintaining a constant Cd and low pressure loss. Air calibration data from 16" and 12" UVTs are shown and compared to the claims.

11:55 **Performance of Adjust-Cone in wet gas flows**
Craig Marshall (GM Flow Measurement Services)

- Wet gas has always been a challenging measurement application with DP based technology a front runner.
- The high turndown of the Adjusta-Cone can provide a big advantage over traditional WGFMs.
- Testing of 3 inch multi-beta design will be shown and compared with ISO/TR 12748:2015.
- Recent flow testing at NEL (May 2024) and seal testing of new design including a more repeatable cone centralisation method will also be presented.
- Adjusta-Cone comparison to standard correlation at different betas will be discussed.

12:20 **Lunch and networking**

13:05 **Novel flowmeter for large-scale CCUS and H_2 applications**
Martin Nese (Cignus Instrument AS)

- The Novel mass-flow meter design that solves scaling challenges for traditional Coriolis technology and closing technology gaps for emerging large-scale CCUS and H_2 value chains.
- Present results from water-flow calibration demonstrating performance similar to traditional Coriolis technology.
- Present results from CO_2 test campaign demonstrating key advantages for CO_2 pipeline transport and confirming TRL6 for CCUS.
- Launching project to qualify full-size CO_2 meter for large-scale CCUS applications.



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13:30 **Using microwave resonance water cut meters for custody transfer**
Craig McWhorter (KAM Controls)

- The new API MPMS Chapter 10.10 standard emphasizes the need for accurate and reliable water cut meters for custody transfer.
- This technology is highlighted for its superior accuracy and consistent performance across various conditions and applications.
- This presentation provides performance data from internal lab tests, third-party lab tests, and field tests.
- A step-by-step analysis demonstrates how to use these meters in custody transfer applications, following the guidelines of API Chapter 10.10 and integrating them with an automatic sampling system as per API MPMS Chapter 8.2.
- Combining water cut meters with automatic sampling systems ensures real-time data, redundancy, accuracy, and effective troubleshooting, enhancing the reliability of custody transfer processes.

13:55 **Chairperson's closing remarks**
Chris Mills (TÜV SÜD National Engineering Laboratory)

Steering committee members

- Jim Barton (BP)
- Baron Bennington (SGS)
- Murdo Campbell (TAQA)
- Douglas Griffin (North Sea Transition Authority)
- Alix Mann (Shell)
- Chris Mills (TÜV SÜD National Engineering Laboratory)

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