UNACCOUNTED FOR GAS (UAF) ESTIMATES IN THE DISTRIBUTION SYSTEM

Introduction

Natural gas distribution utilities report Unaccounted-for Gas (UAF) as the difference between total gas supplied to their systems and total gas measured as delivered, consumed or otherwise accounted for. The project conducted by GTI Energy (OTD 5.23.T) evaluated data and documents from two utility service areas to identify key contributors to UAF and to develop a set of recommended practices for reducing UAF occurrences. The analysis focused on five domains:

- **Measurement:** addressing the accuracy and performance of measurement devices,
- **Accounting:** addressing gas accounting methodologies and the calculation process
- **Leakage:** addressing unintentional physical releases of gas from the distribution system
- **Operations:** addressing the use of gas through utility routine and non-routine operations
- **Theft:** addressing gas theft incidents

Methodology

Quantitative Analysis: The data was reviewed and analyzed using multiple groupings and comparisons to identify trends and estimate the relative influence of different factors on reported UAF values. Where applicable, findings were compared against commonly referenced industry benchmarks. This quantitative analysis mainly focused on meter testing results detailing meter type, meter size, meter age, and throughput.

Qualitative Analysis: Various documents were reviewed, including excerpts from internal company procedures and applicable regulatory documents across all five UAF domains. The qualitative review evaluated the documentation against three primary criteria:

- Internal consistency of procedures across related activities
- Logical sequencing and completeness of process steps relative to the stated operational objective
- Degree to which formal procedures were supported by training materials or field guidance documents

Key Findings

UAF is often assumed to reflect physical gas losses and has historically been used as a proxy for system integrity. The results of this study show that this assumption is no longer valid and demonstrate that UAF is better understood as a composite accounting metric. In summary:

- Measurement-related factors are the most significant and actionable contributors to UAF
- Accounting practices introduce persistent, structural imbalances
- Leakage, operational venting, and theft are smaller UAF contributors than commonly assumed.

Figure 1 below details the five main UAF domains and the project's assessment of their relative contribution to overall UAF and their remediation priority.

Recommendations

The project identified seven recommendations, prioritized by relative impact and implementation effort.

1. Establish and consistently apply appropriate measurement-based conditions
2. Standardize delivery pressure setpoints and FPMF (Fixed Pressure Modification Factor) approaches
3. Adopt a consistent volume-based UAF calculation methodology
4. Monitor meter and regulator performance
5. Quantify known operational gas losses
6. Leverage technology and automation solutions to reduce reliance on static correction factors and manual processes
7. Implement targeted systems improvements that address longer-term structural UAF imbalances

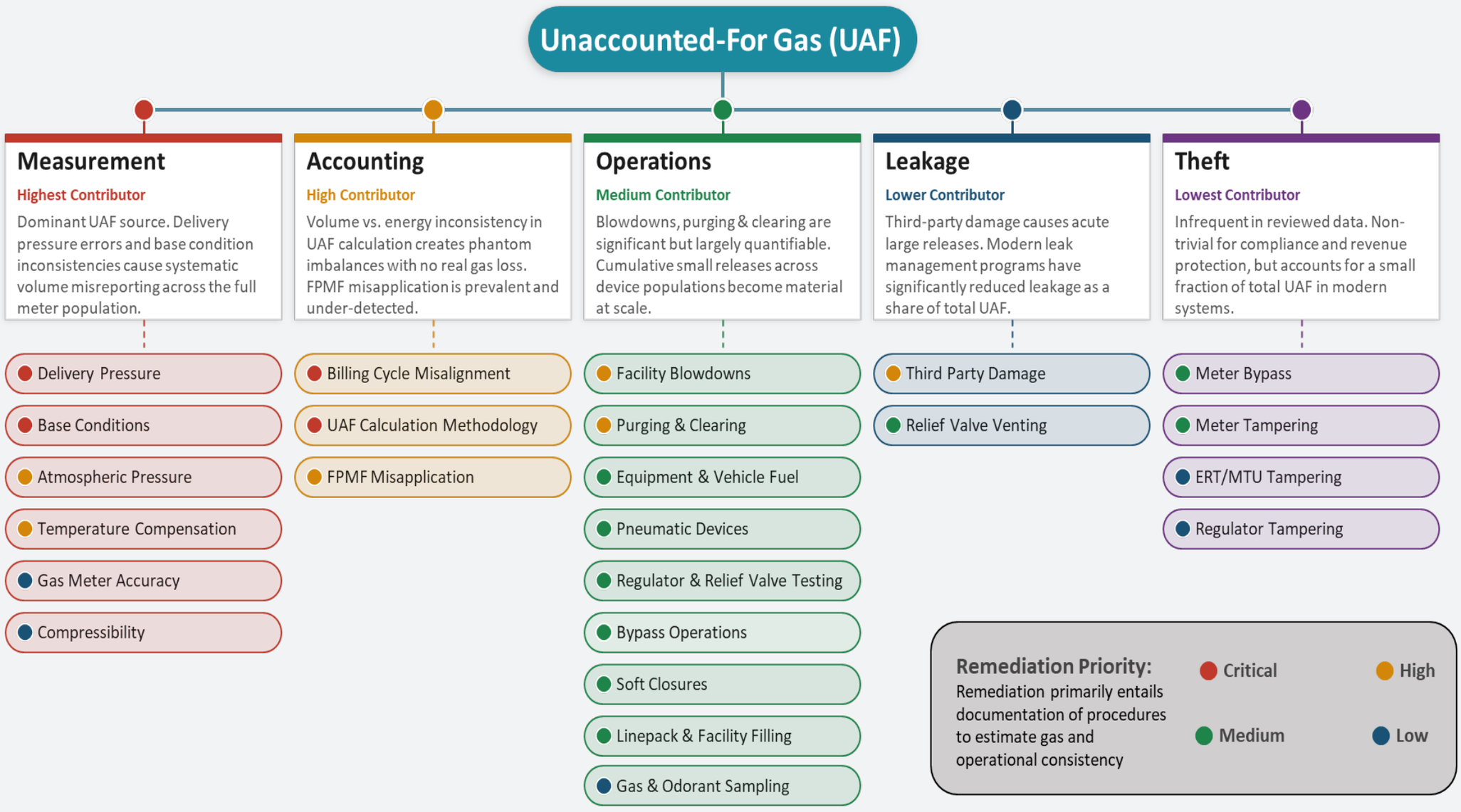

Figure 1. *Relative contribution and remediation priority for the five main UAF domains: Measurement, Accounting, Operations, Leakage, and Theft*