

# **Measurement Compliance Dashboard: *Simulated EPAP Audit Using AER Facility Data***

## **1 Objective**

This project was developed to simulate the responsibilities of an Analyst, Measurement at Plains Midstream Canada. It models the Enhanced Production Audit Program (EPAP) by using real-world oil and gas facility data from the Alberta Energy Regulator (AER). The goal was to recreate core tasks involved in EPAP auditing, such as identifying deficiencies, tracking remediation progress, analyzing vent volumes, and generating KPI-based reports and trend visualizations.

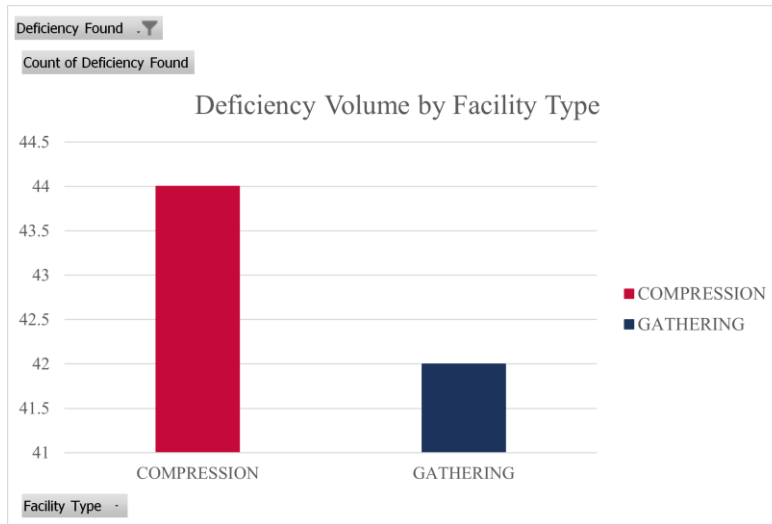
## **2 Methodology**

The Alberta Energy Regulator's (AER) Facility Cost Centre Listing provided the real facility metadata for this project, which was extracted and sliced (rows 3389 – 3579) to simulate active pipelines, terminals, and gas plants. Key operational audit fields such as *Deficiency Found*, *Issue Type*, *Remediation Status*, *Last Proving Date*, and *Vent Volume* were simulated using randomized Excel formulas.

In order to identify trends across facility types and time periods, I created pivot tables and visualizations. These included bar charts, pie charts, and conditional formatting tools to highlight operational and compliance risks like high venting volumes or overdue calibrations. All charts and graphs were styled using Plains Midstream Canada's core brand colors to enhance visual clarity and align with professional branding.

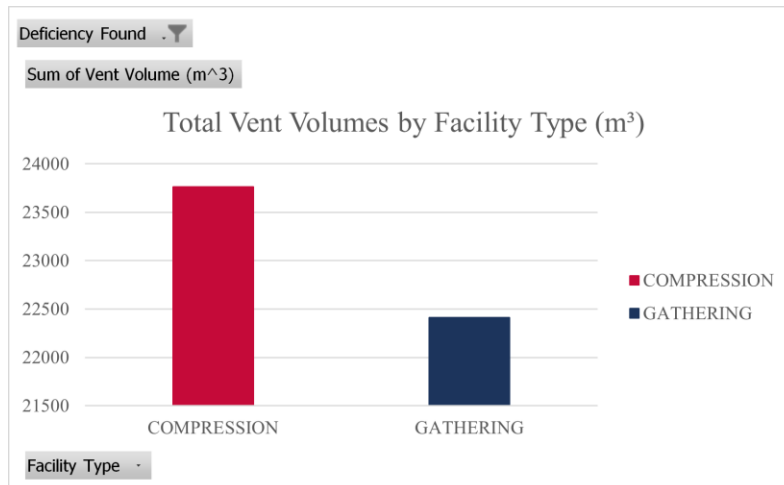
### 3 Key Findings

#### 3.1 Facility-Level Trends



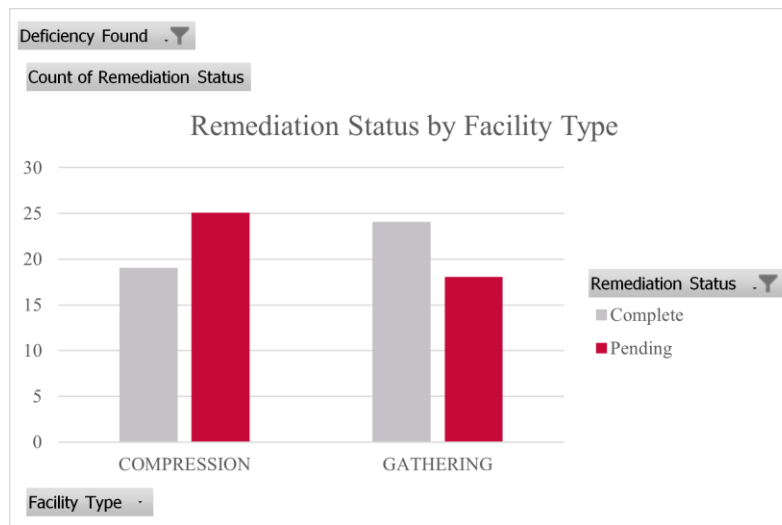
Compression facilities had a slightly higher number of confirmed deficiencies (44) compared to Gathering facilities (42). The gap is small, however, it could be attributed to the nature of compression infrastructure. Larger machinery and pressurized systems are more prone to opportunities for mechanical or measurement-related issues.

#### 3.2 Vent Volume Insights



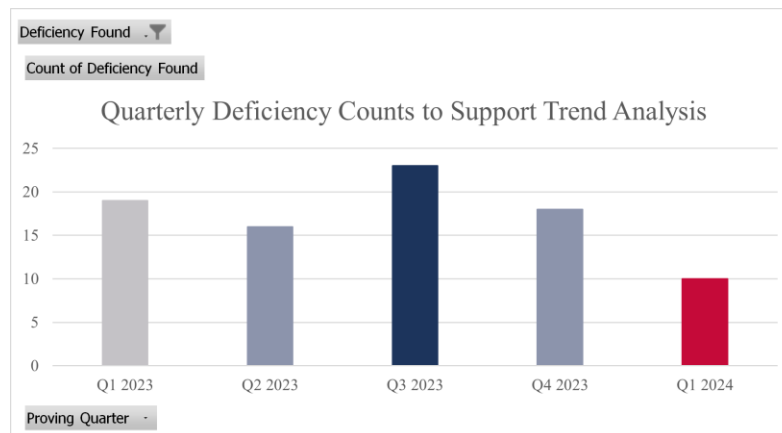
Compression sites also recorded a higher total vent volume, exceeding 23,700 m<sup>3</sup>. This suggests they may contribute more significantly to environmental emissions than Gathering sites. The combination of higher deficiencies and higher venting could imply a need for more monitoring of compression equipment and processes.

### 3.3 Remediation Comparison



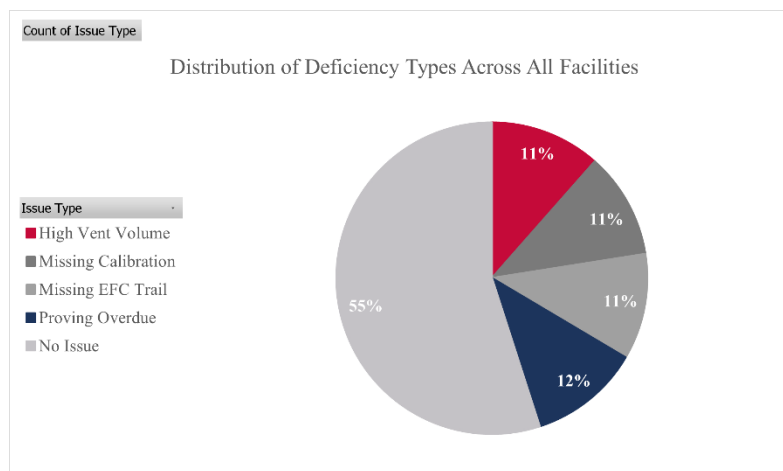
Compression facilities had more pending remediation items (25), whereas Gathering sites showed more completed remediations overall. This may suggest Gathering facilities have more efficient issue resolution, or it could point to the types of deficiencies at Compression sites being harder to address quickly.

### 3.4 Trends Over Time



Deficiencies peaked in the third quarter of 2023 and dropped to their lowest in the first quarter of 2024. Although the cause of this trend isn't certain, it could be related to seasonal operational cycles, maintenance schedules, or reporting deadlines.

### 3.5 Issue Type Takeaways



Among all identified issues, “Proving Overdue” appeared most frequently at 12%. Other common deficiencies included “Missing Calibration,” “Missing EFC Trail,” and “High Vent Volume,” which each represented around 11% of total issues. This distribution reflects operational, compliance, and environmental gaps that need crucial attention.

## 4 KPI/Trend Analysis

The dashboard focused on tracking a set of KPIs commonly used in measurement and compliance audits. These included:

- *Deficiency Count by Facility Type* – Used to identify which operational areas had more frequent non-compliance. Although the gap between Compression and Gathering was small, tracking this metric over time can reveal systemic issues or the impact of procedural changes.

- *Remediation Status Breakdown* – Visualizing completed vs. pending items helped simulate real-world backlog tracking and prioritize unresolved issues. This is especially relevant in EPAP reporting and year-end compliance summaries.
- *Vent Volume (m<sup>3</sup>) by Facility Type* – As venting ties directly to environmental compliance, this KPI was included to support operational monitoring and emissions control.
- *Deficiency Trends by Quarter and Month* – By assigning randomized “Last Proving Dates,” the dataset enabled trend analysis across time. These charts could help teams plan proactive audits around high-risk periods.
- *Deficiency Type Distribution* – Knowing which issue types appear most often supports resource planning (e.g., allocating more calibration crews or EFC data checks).

Rather than focusing on one-off results, these KPIs were chosen to reflect the kind of metrics that support long-term compliance tracking, performance benchmarking, and operational decision-making in a role like Analyst, Measurement.

## 5 Tools Used

This project was developed entirely using Microsoft Excel and its data handling, visualization, and formula capabilities to simulate and analyze facility-level audit data. Using Excel formulas such as IF, RANDBETWEEN, CHOOSE, and TEXT, audit conditions, proving dates, and deficiency types were generated across facility records. Additional columns were added to model crucial audit elements such as *Remediation Status* and *Vent Volume*.

PivotTables were utilized to produce data summaries and trend analyses by filtering facility type, deficiency category, and time period. Visualizations—including pie charts, column charts, and line graphs—were developed to communicate key trends and metrics, such as deficiency distribution, remediation performance, and venting activity. High-risk entries, like overdue proving dates and elevated vent volumes, were highlighted by using conditional formatting.

Excel was selected because of its alignment with industry-standard tools that are used in measurement and compliance auditing as well as its accessibility and flexibility for building simulation dashboards.

## **6 Conclusion**

This project simulates the responsibilities of a Measurement Analyst by modeling audit-related data and performance metrics using real facility records and randomized conditions. The dashboard highlights key risks, remediation patterns, and venting activity, which are all presented through KPIs and visual analysis aligned with EPAP standards.

While the data was simulated, the structure and approach reflect real-world practices in regulatory compliance. The project also demonstrates readiness to support measurement-focused teams through practical, data-driven analysis.