

Pneumatic Vent Gas Measurement Article

Air emission inventories are becoming an increasingly important method of monitoring and reporting on industry emissions, for the public, governments and individual companies. Governments are using emission inventories to negotiate international treaties, establish air emissions policy measures and targets and develop emission forecasts. It is important that upstream oil and gas operators have access to effective emission monitoring technologies and, more importantly, emissions factors obtained from adequate quantity and duration field measurements. Reported facility emission reductions are more realistic when tracked using standardized methodologies and accurate emission factors with low uncertainty. Inaccurate emission factors can result in an imprecise portrayal of the emission profile of pneumatic devices used in the oil and gas industry. Pneumatic efficiency is a key focus area specific to chemical injection pumps and instruments used at upstream oil and gas sites. Clear targets and means of de-risking expected emission reductions with equipment retrofits are key to enabling vented methane reductions in the field.

Pneumatic device (pump and instrument) retrofits are a key means of achieving a 45 percent methane (25x Global Warming Potential) reduction by 2025 in Canada

(Environment Canada and Climate Change Canada, 2017). Confidence in current published methane vent rates from pneumatic devices, including the reduction and associated carbon dioxide equivalent (CO₂e) after retrofit, are key to determining the available opportunity for reducing methane emissions in upstream oil and gas operations.

The goal of this study was to establish more accurate and repeatable means for determining emissions from pneumatic devices including chemical injection pumps and instruments. This study provided much insight on pneumatic devices and their operating vent rates.

Key tangible outcomes or learnings include:

1. Manufacturer published steady state vent rates are not the best predictor of emissions for dynamically active control loops.
2. Level controllers that dump more frequently than once every 15 minutes are a key focus area to improve field instrument pneumatic efficiency.
3. Using a low vent level controller that eliminates transition vent is a key means of improving field instrument pneumatic efficiency.
4. Measured volumes supplied to pneumatic devices are higher than measured volumes vented from them.

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