

Development of Novel Method to Detect and Locate Fugitive Emissions

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GL 910351

Eliminating fugitive emissions in the oil and gas industry requires detailed knowledge of leak sources among the innumerable flanges, fittings, valves, and other equipment infrastructure within complex facilities. In most industrial facilities, fugitive emissions are extremely difficult and labour intensive to detect and locate. Furthermore, once a source of fugitive emissions has been identified and repaired, it is also very difficult to confirm on an on going basis that emissions are not reoccurring from the same location or that new sources of emissions are not appearing. A variety of approaches are currently used to identify fugitive emissions in industrial settings, however most involve deploying teams of personnel with infrared cameras or other hand-held gas detection devices to manually search through a plant environment and detect leaks/emissions. This type of approach has the obvious disadvantages of being labour intensive, costly, and time-consuming, and in particular, is not well suited for continuous monitoring. Other approaches involve using laser-based

optical methods at plant boundaries to quantify or estimate total fugitive emissions crossing plant borders. In addition to being costly, these approaches do not offer a way to precisely locate sources of emissions within the plant environment, but rather give a broad estimate of what emissions are generally leaving the plant site. To tap the significant emissions reduction potential known to exist in the petroleum industry, it is essential to develop innovative approaches for fugitive emissions detection at the facility level that can provide engineers and plant personnel with timely and specific information necessary to enable specific reduction measures. The project is broken down into three interrelated component projects, that are introduced below and discussed in the Chapters that follow.

Report