Nubo Sphere

Executive Summary

Request for Alternative Test Method Methane Detection Technology Periodic Screening

Version 1.0 from July 12th, 2024

SENSIRION
connected solutions

1 Sensirion Connected Solution Methane Alternative Test Method Request

2 Executive Summary

Request Number – ALTTECH-32
Submission Date – July 16th, 2024

Company Name	Sensirion Connected Solution AG
Submission Point of contact Name	Felix Hoehne
Product Name	Nubo Sphere
Technology Type	Stationary in-situ sensor
Target Applicability	Broadly applicable across the sector
Target Emission Leak Rate Threshold	3 Kg/h
Additional information	Spatial resolution of technology: facility level
Request Numbers of any connected submitted documents	• ALTTECH-27 • ALTTECH-28 • ALTTECH-29 • ALTTECH-30 • ALTTECH-31

3 Technical Summary of the Technology

This method is an alternative test method to measure fugitive emissions components affected facilities and compliance with periodic screening requirements for covers and closed vent systems under 40 CFR part 60.
SCS Nubo Sphere is a methane monitoring system that uses a point-sensor network combined with wind data and an inversion plume dispersion model to detect, localize and quantify methane emissions on oil and gas sites. Local methane concentrations are measured by miniaturized laser-based photoacoustic sensors. The laser is tuned to a mid-infrared methane absorption wavelength to ensure sensitive and selective methane measurements. Methane emissions on a site are detected and localized by combining methane concentration data from all sensors of the point-sensor network with atmospheric condition including wind direction and speed. Methane emission rates are determined using a human-supervised dispersion inversion algorithm. Methane emission data, atmospheric conditions and system health information are continuously recorded and provided to operators via wireless communication and a cloud-based interface. In regular intervals as determined by the screening frequency matrix, all necessary information for compliance is provided to operators as a report. The number of sensors and their placement is determined individually for each site based on the locations of potential emission sources and the prevailing wind directions using the SCS siting procedure.

3.1 Notes for the MATM Review Team

Multiple applications for Periodic Screening Solutions with different detection thresholds are being submitted (ALTTECH-27, ALTTECH-28, ALTTECH-29, ALTTECH-30, ALTTECH-31). The documentation for these different applications mostly contains similar documents. The main difference between the application is the site coverage procedure (section 9 in *CBI - SCS Nubo Sphere Alt Tech 3 Kgh - Description of Measurement Technology*)

An additional application for Continuous Monitoring technology is currently being prepared.

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3.2 Updates to the Application

None currently.

Summary of the Documents Submitted

Document Name	Description
SCS Nubo Sphere Alt Tech 3 Kgh - Description of Measurement Technology	Description of the measurement technology including scientific background, working principle, conversion of concentration data to mass emission rate, data collection, handling, and storage

Supporting Documents

Document Name	Description
SCS Nubo Sphere Alt Tech 3 Kgh - Supporting information	Overview of the supporting information documents
SCS - VITO - 17gh Test Nubo Sphere - Final Report	3rd party study small release rates
SCS Nubo Sphere Alt tech 3 Kgh - Datasheet	Nubo Sphere datasheet
SCS Nubo Sphere Alt tech 3 Kgh - User manual	Nubo Sphere user manual

Alternative Test Method

Document Name	Description
SCS Nubo Sphere Alt Tech 3 Kgh - Test Method	Alternative Technology Formatted Method Including the siting procedure

CBI Submitted Documents

Document Name	Description
CBI - SCS Nubo Sphere Alt Tech 3 Kgh - Description of Measurement Technology	CBI section of the description of measurement technology document
CBI - SCS Nubo Sphere Alt Tech 3 Kgh - Validation Data – Detection Threshold	Detection threshold validation data from 3rd-party controlled release testing
CBI - SCS Nubo Sphere Alt Tech 3 Kgh - Sensor Performance	Photoacoustic sensor performance characterization
CBI - SCS Nubo Sphere Alt Tech 3 Kgh - Validation Data - Field Data Case Studies	Field data case studies
CBI - SCS Nubo Sphere Alt tech 3 Kgh - Operating Conditions	Nubo Sphere Operating Conditions
CBI - SCS Photoacoustic Methane Sensor_Datasheet_v01	Datasheet of the photoacoustic methane sensor

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