



Detection and measurement of the emission of natural gas from the gas transmission system

Objective

- The objective of the work was to find the best available devices on the market for detecting and measuring fugitive emissions from natural gas transmission infrastructure, and then to verify their performance through laboratory and field tests. After analysis, 5 methane detection devices were selected with 2 of them allowing mission measurement.

Participating companies:

- GAZ-SYSTEM – Leader
- Enagas
- Gasunie
- Snam
- Fluxys
- GRT Gaz

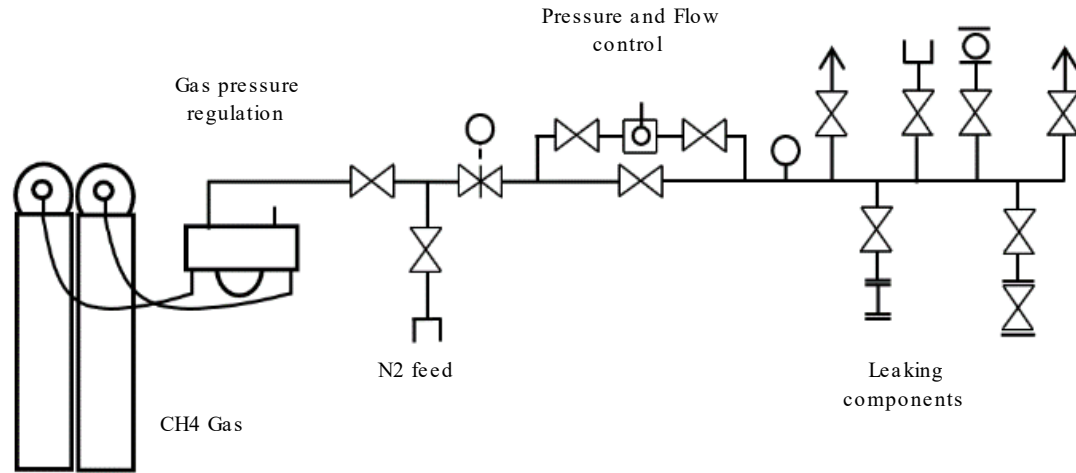
The following parameters were evaluated for each of the five (5) leak detection technologies

- Ease-of-Use
- Speed of operation
- Long term stability
- Range of operation
- Error of sniffer instruments
- Path length concentration results
- Accuracy of flowrate measurements
- Leaking components (instrument qualitative approach)
- Repeatability
- Meteorological conditions and other aspects
- Safety certifications
- Instrument cost of acquisition

Main conclusions

- Since the use of more than two instruments seems not to be economically feasible, any combination of the measurement instruments and another detection unit may be a good option to reduce constraints from single instruments.
- The combination of two instruments implies that either, one instrument will be the main “surveyor” and the other will complement the first one (for leak confirmation or quantification), or both instruments need to be used at the same time.
- The combination of expensive technologies that also require more than one surveyor will become less attractive.
- The main factors influencing company's decisions for LDAR combination are: the companies’ needs and objectives for LDAR, the frequency of surveys and other cost-effective factors.

Test bench and example results



MAPEGAZ (DN150, PN100) valve. Upper stem damaged gasket.



Flange on spool (DN100, PN100). Damaged gasket.



DATE	TIME	GAS CONCENT. (%)	FLOW RATE (L/min)	LEAKING COMPONENT	SYSTEM PRESSURE (bar)	TEST RESULT (% vol)	Ambient temp. /wind speed
03.03.2020	09:35	50	3,32	V	12	42,6	7,8°/0,5m/s
	09:43		3,37			37,0	8,5°/0,1m/s
03.03.2020	10:06	50	1,8	F	31,7	6,5	8,5°/0,4m/s
	10:11		1,89			10,5	8,8°/0,4m/s
03.03.2020	10:20	50	1,94	C	31,6	36,3	8,9°/0,4m/s
	10:29		1,81			46,4	9,0°/0,3m/s
03.03.2020	10:35	50	2,27	OEL	1,0	59,5	9,4°/0,3m/s
	10:42		2,27			59,0	9,6°/0,4m/s
03.03.2020	10:47	50	11,34	OEL	1,1	54,7	10,0°/0,3m/s
	10:57		11,34			53,7	10,4°/0,4m/s



THANK YOU!