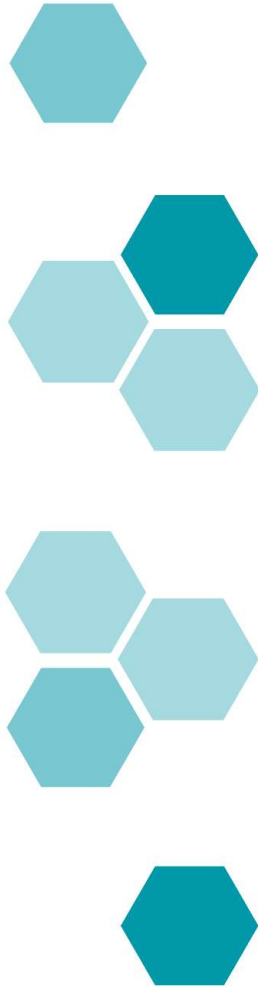


Audit procedure and plan; Round robins



Objectives of the Audit

According to the Measurement Guidelines for NO_x and VOCs“, ACTRIS (2018), section 7.2 „Audit Procedures“:

1. Check of the **conformity** of the station with the QA system of ACTRIS Measurement Guidelines.
2. Check of the **conformity** of measurement of test gases with targeted values within the **DQOs**.



Preconditions for a CiGas Audit

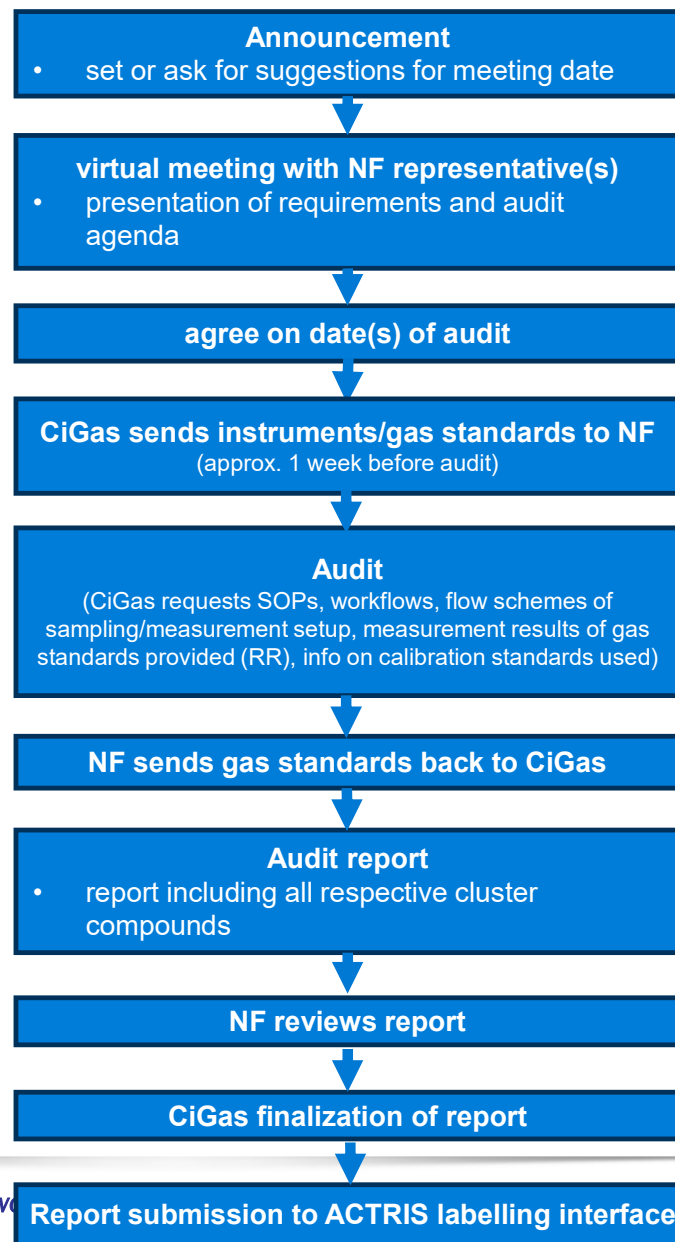
NF has successfully completed Labelling step 1a

- Conformity check of the reported instrument setup based on the questionnaire
- DG has confirmed labelling step 1a (TC recommendation, RIComm approval, provision of a commitment letter)
- Upgrades have been fully implemented
- NF submits data to the ACTRIS data base



Audit workflow

On-site audit: 3 Days



Audit procedures

- **1. Instrument and installations**

- All parts of the sampling and instrument set-up
- Calibration and zero gas systems
- Overall equipment of the station

- **2. Training and operation**

- Training of operators and instructions at the station (SOP)
- Measurement of intercomparison through RR cylinders (VOC)

- **3. Documentation**

- QA and QC data
- Logbooks
- SOP

- **4. Evaluation of data**

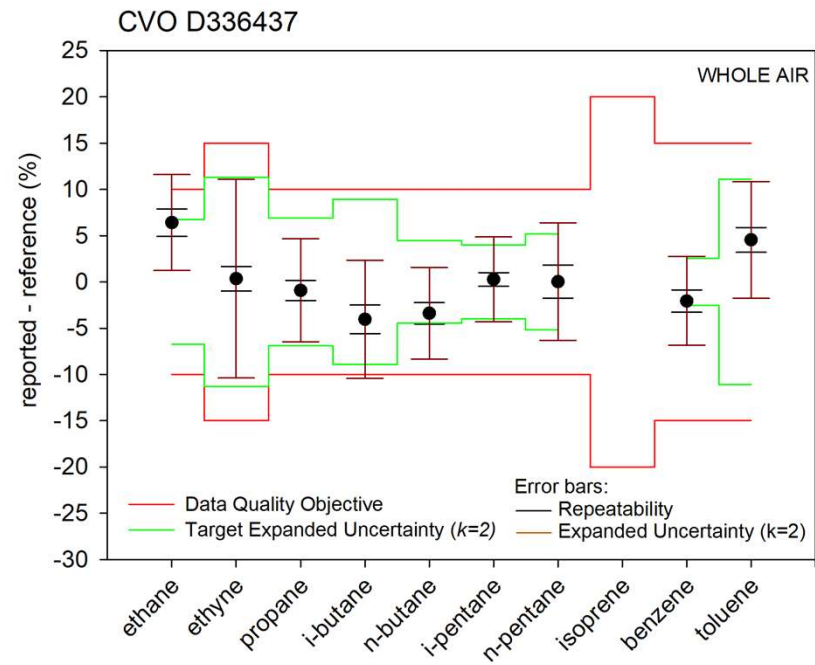
- Calibration, zero gas, target gas, and standard addition data
- Data delivery
- Results from intercomparison exercises (RR cylinders)
- Uncertainty evaluation
-



Round-Robin Procedure for NMHCs

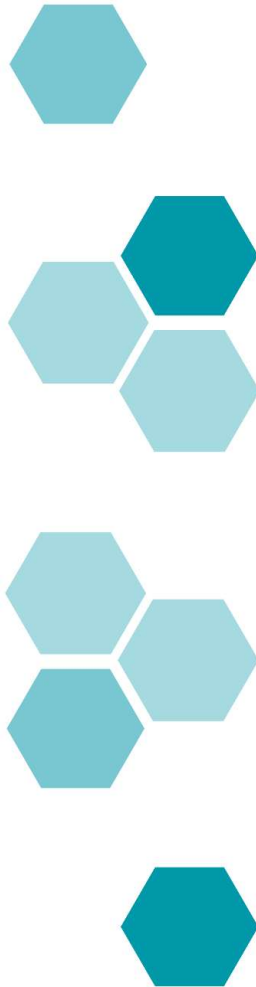


1 x NPL NMHC Standard (4 ppb in N₂)
2 x NMHC Mixtures in amb. Air



Audit for NO_x

- Zero evaluation of station instruments
- Dry calibration (40 min cycle each for zero, NO, NO₂ via GPT)
- Humid calibration (40 min cycle each for zero, NO, NO₂ via GPT)
- Humidity dependence NO+O₃ of NO_x instruments
- Influence of ozone through the inlet sampling line of the station (via NO+O₃)
- Ambient air measurement (overnight)



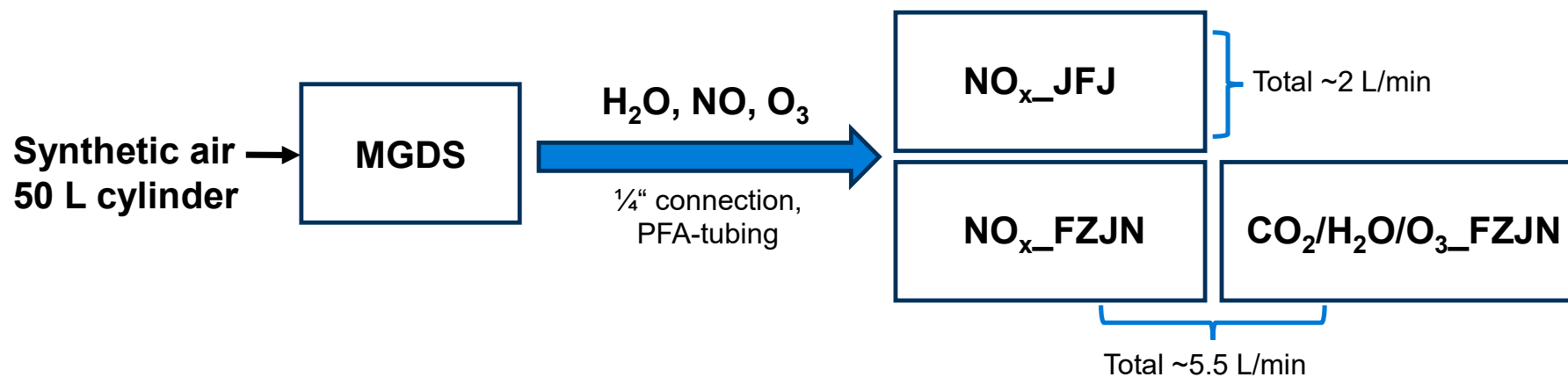
Audit for NO_x

MGDS → FZJ system to introduce dry/humidified air, calibration gas and O₃

NO_x → Airyx ICAD-NO_x monitor; Airyx ICAD-HONO/NO₂ monitor

Picarro G2301 → H₂O, CO₂

2B Tech 211 monitor → O₃



NPL D180545 NO cylinder
NO: 9.99 +- 0.10 μmol/mol
CO₂: 50.43 +- 0.25 mmol/mol

Audit plan

2024	2025	2026+
Jungfrauoch → Nov.	Pallas → Spring	6 – 8 NFs
	SMEAR II → Spring	
	SIRTA → Summer	
	NN → Autumn	

