

supernemo



# LSM Anti-Rn Facility (ARF)

Bratislava collaboration meeting – 30 July 2026

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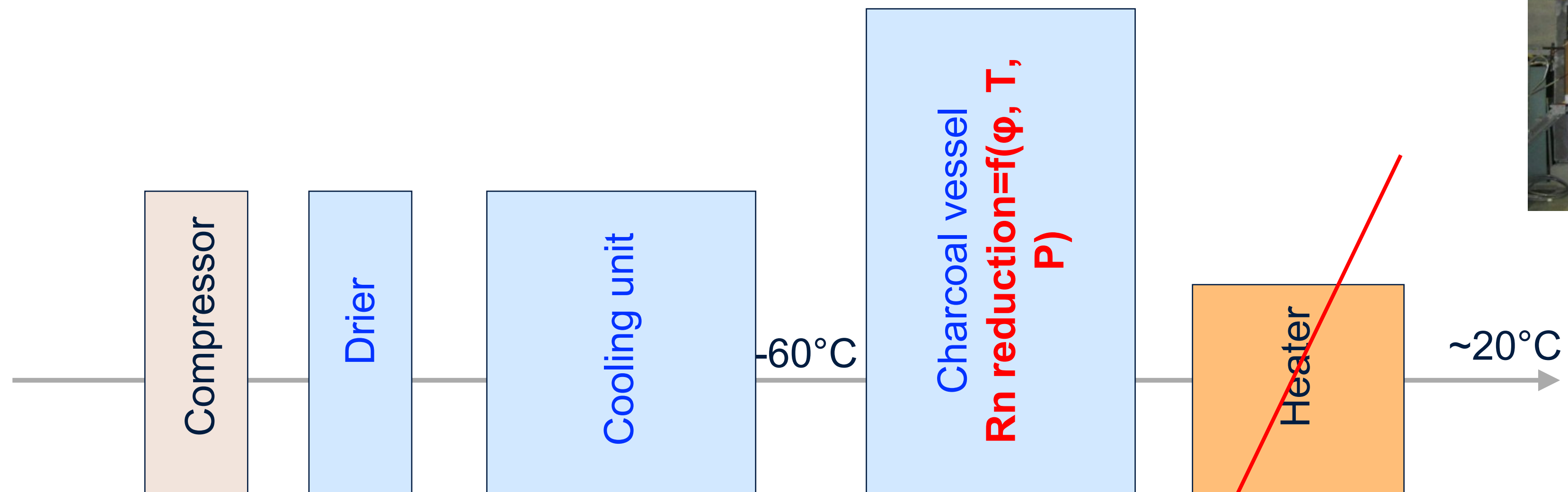
# The facility (ARF)

The facility has been **developed, tested** and is **operated** by **LSM**.

3 parts of the facility have been bought by SuperNEMO to the world leading Cie ATEKO (Cz):

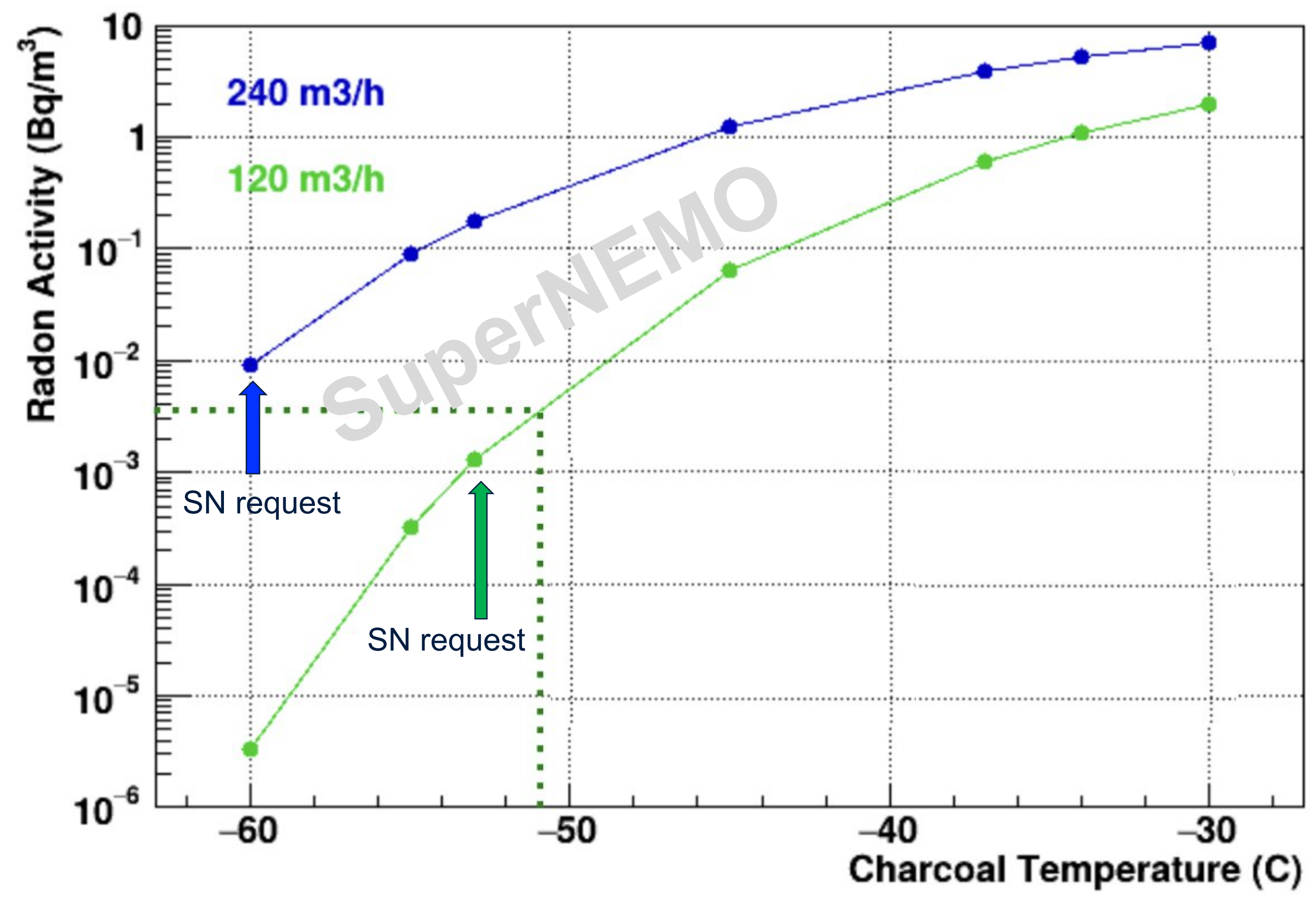
- the **drier system** to dry the air before cooling it
- the **cooling unit** to send  $-60^{\circ}\text{C}$  air inside the Rn retention vessel
- the **charcoal vessel** for Rn retention

NEMO3 ARF



**Important:** Radon reduction varies with **Temperature** and **Flux** inside the charcoal tank

# Temperature and Flux impact



**SuperNEMO request (to LSM in 2022): 200 m³/h & 10 mBq/m³ Rn or 100 m³/h & 1 mBq/m³ Rn**



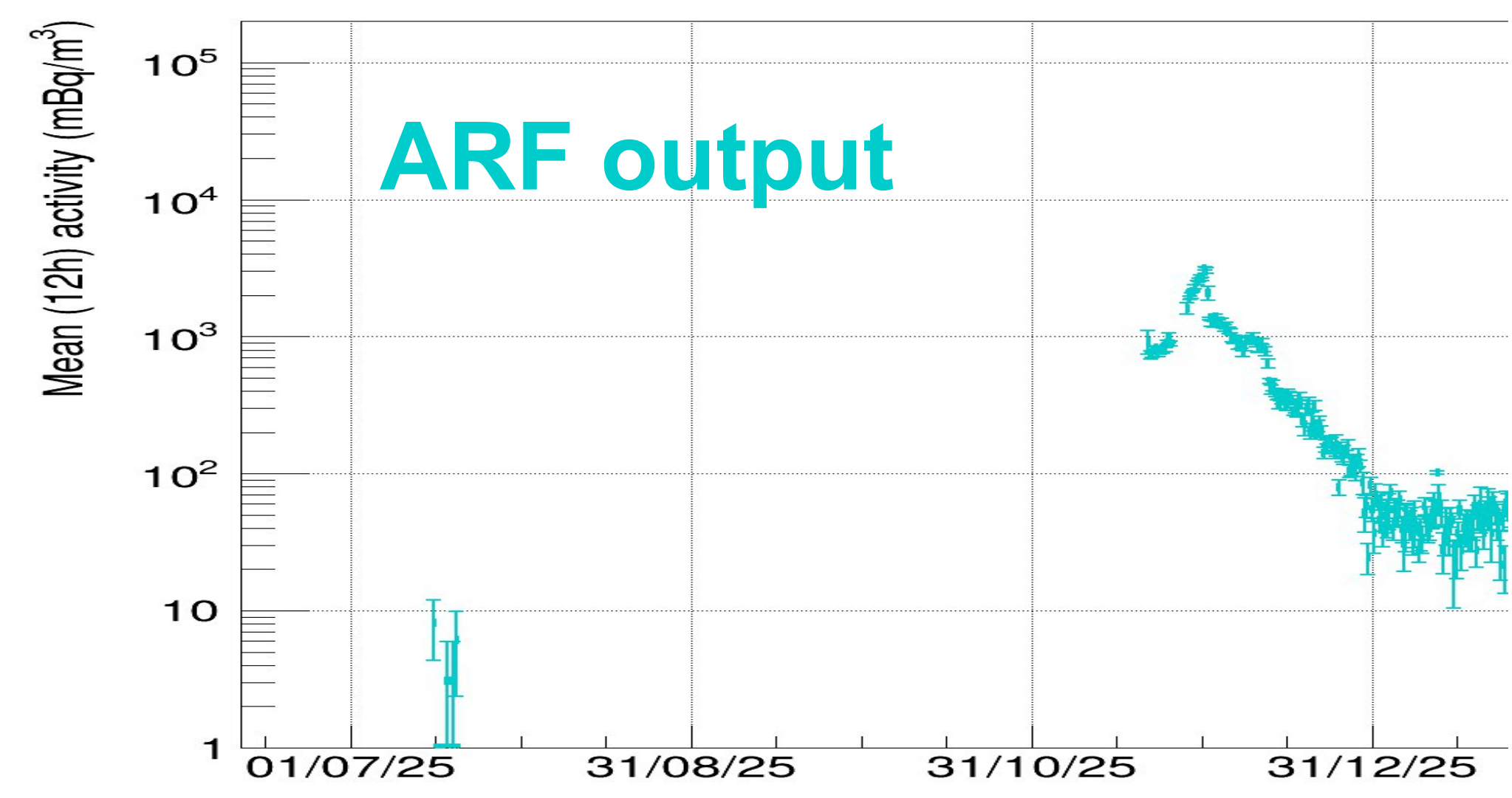
# Status Dec 2025-Jan 2026

- Dec 15:** SuperNEMO informs LSM that the ARF does not work properly  
→ LSM applies our recommendations to decrease the flux inside the ARF  
→ LSM informed ATEKO of temperature issues
- Jan 7-now** ATEKO identified the temperature cause as **non-compliance with the user manual** regarding **defrosting procedures**, despite repeated recommendations (in person and by email)  
LSM disputes ATEKO's analysis and recommendations, asking proof  
**Defrosting is still not enabled...**
- Jan 12 & 16** IN2P3 has been informed by SN of concerns regarding the cooling unit operation with potential breakdown and its potential impact on our data quality

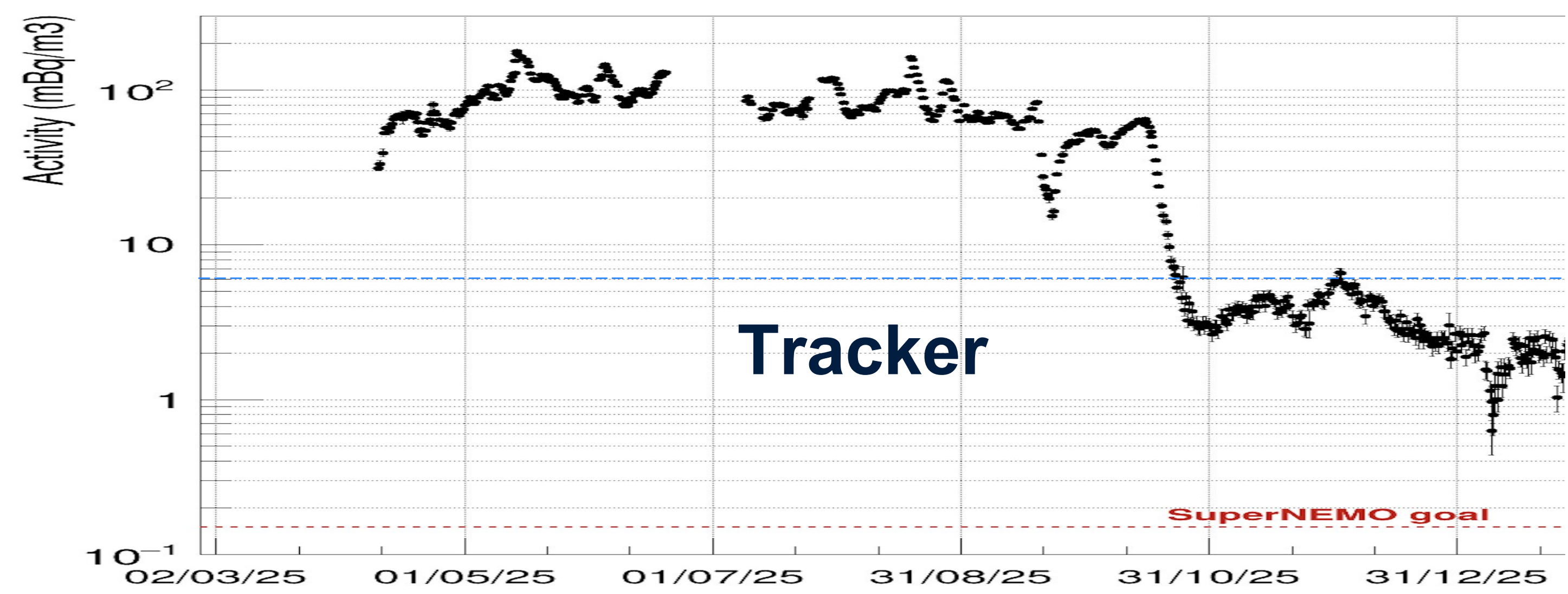
Please go see ARF status in January 2026 at Frimley meeting

[https://nile.hep.utexas.edu/DocDB/ut-nemo/docs/0061/006158/001/SuperNEMO\\_ARF\\_Frimley\\_2026.pdf](https://nile.hep.utexas.edu/DocDB/ut-nemo/docs/0061/006158/001/SuperNEMO_ARF_Frimley_2026.pdf)

# Rn level



Situation at Frimley





# Status since Frimley: Feb 2026 - July 2026

ARF Cooling unit stop

14/02/2026 12:00

05/03/2026 23:59

ARF OFF : scheduled maintenance of the compressor and dryer

26/02/2026 13:00

Cooling unit repair

05/03/2026 0:00

05/03/2026 23:59

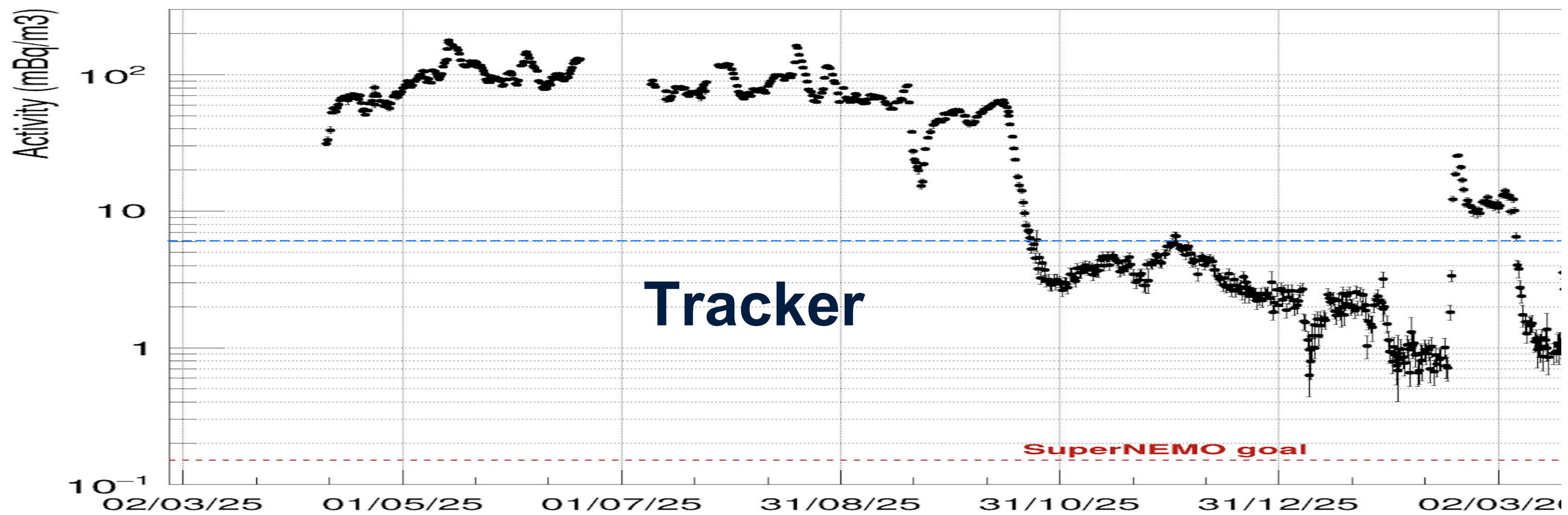
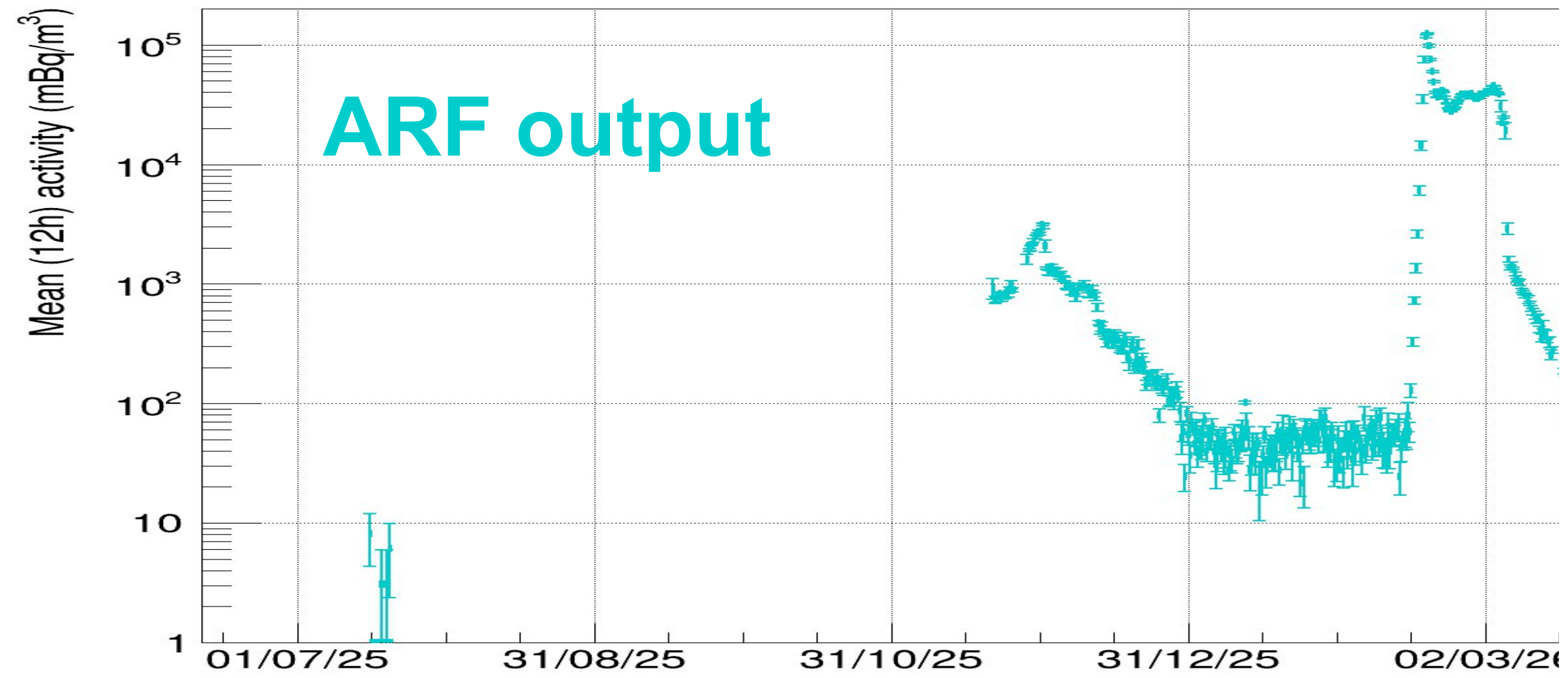
Cooling unit repair

19/03/2026 8:30

19/03/2026 18:00



# Rn level

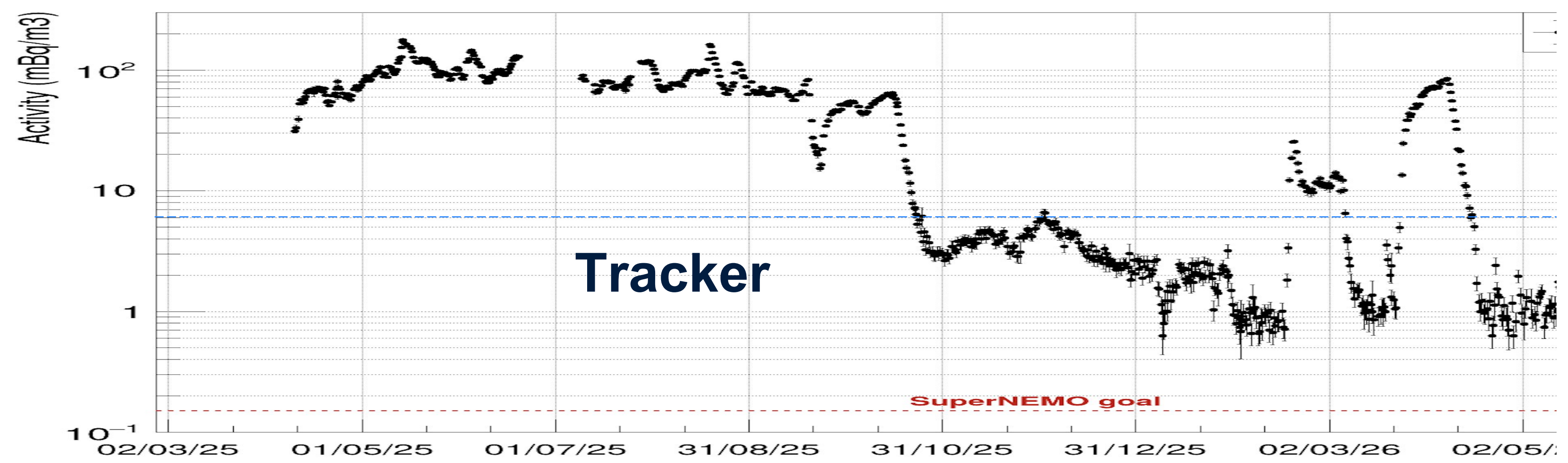
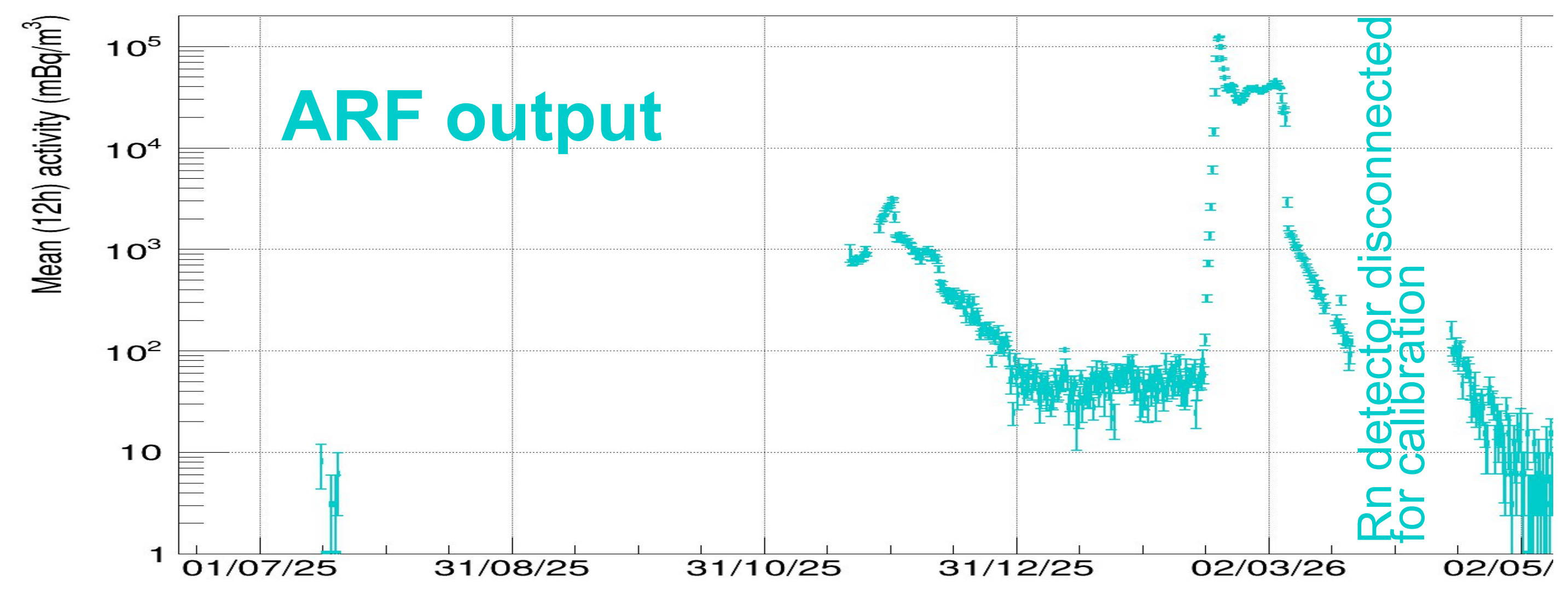




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Cooling unit repair	19/03/2026 8:30	19/03/2026 18:00
<b>ARF OFF</b>	<b>23/03/2026 10:00</b>	<b>08/04/2026 15:44</b>
<b>No air flushing around PMTs</b>	<b>23/03/2026 10:00</b>	<b>24/03/2026 9:50</b>
<b>SuperNEMO disconnected from ARF - flushing from Lab</b>	<b>24/03/2026 9:50</b>	<b>08/04/2026 15:40</b>
<b>ARF connected to SuperNEMO</b>	<b>08/04/2026 15:40</b>	<b>now</b>

# Rn level

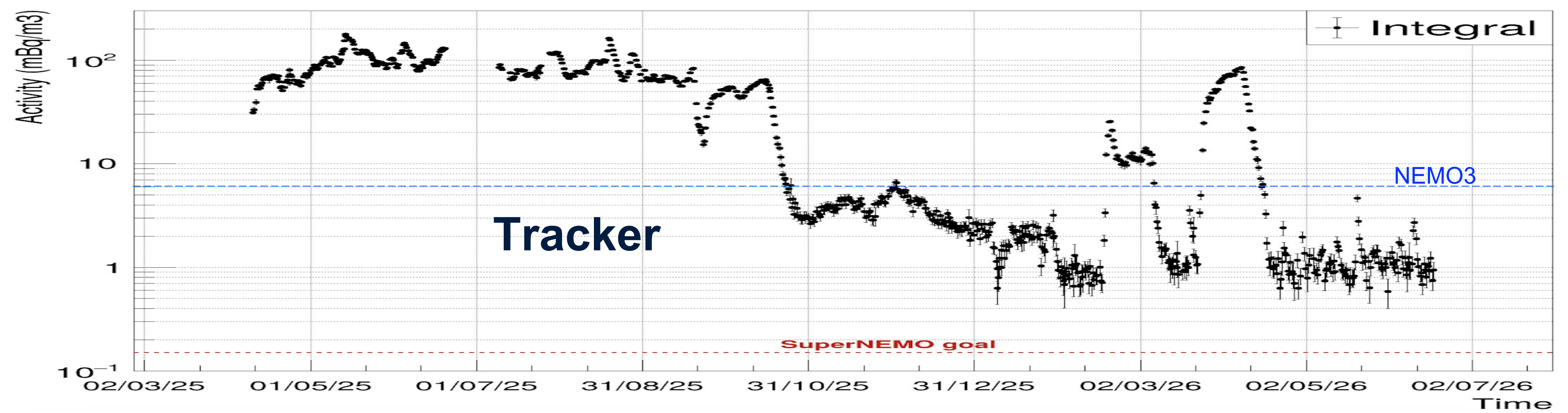
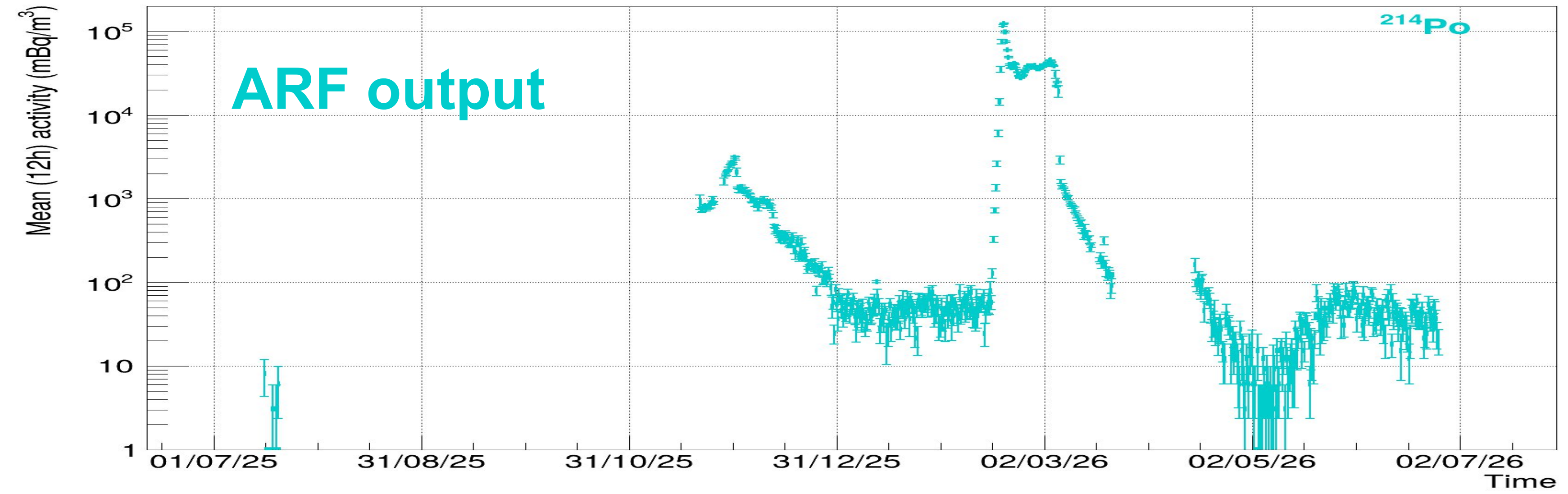




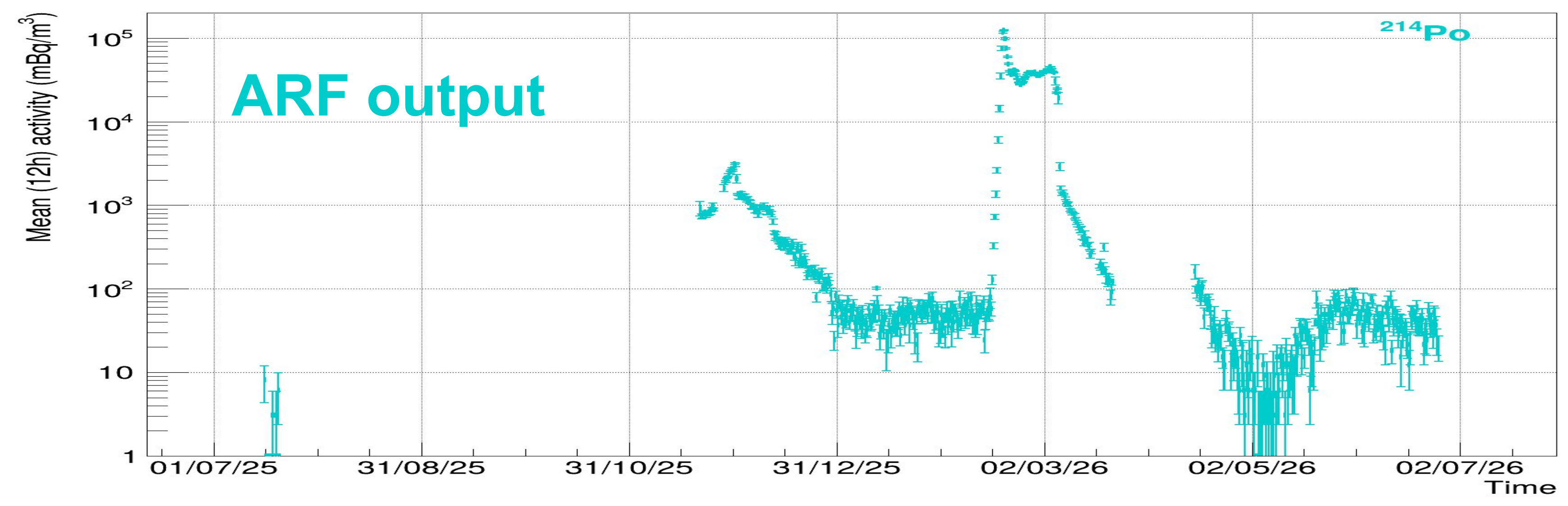
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<b>Mail from Nadine : refrigerant not in correct state and T faults They want to find a frigoriste...</b>	<b>2/06/2026</b>	

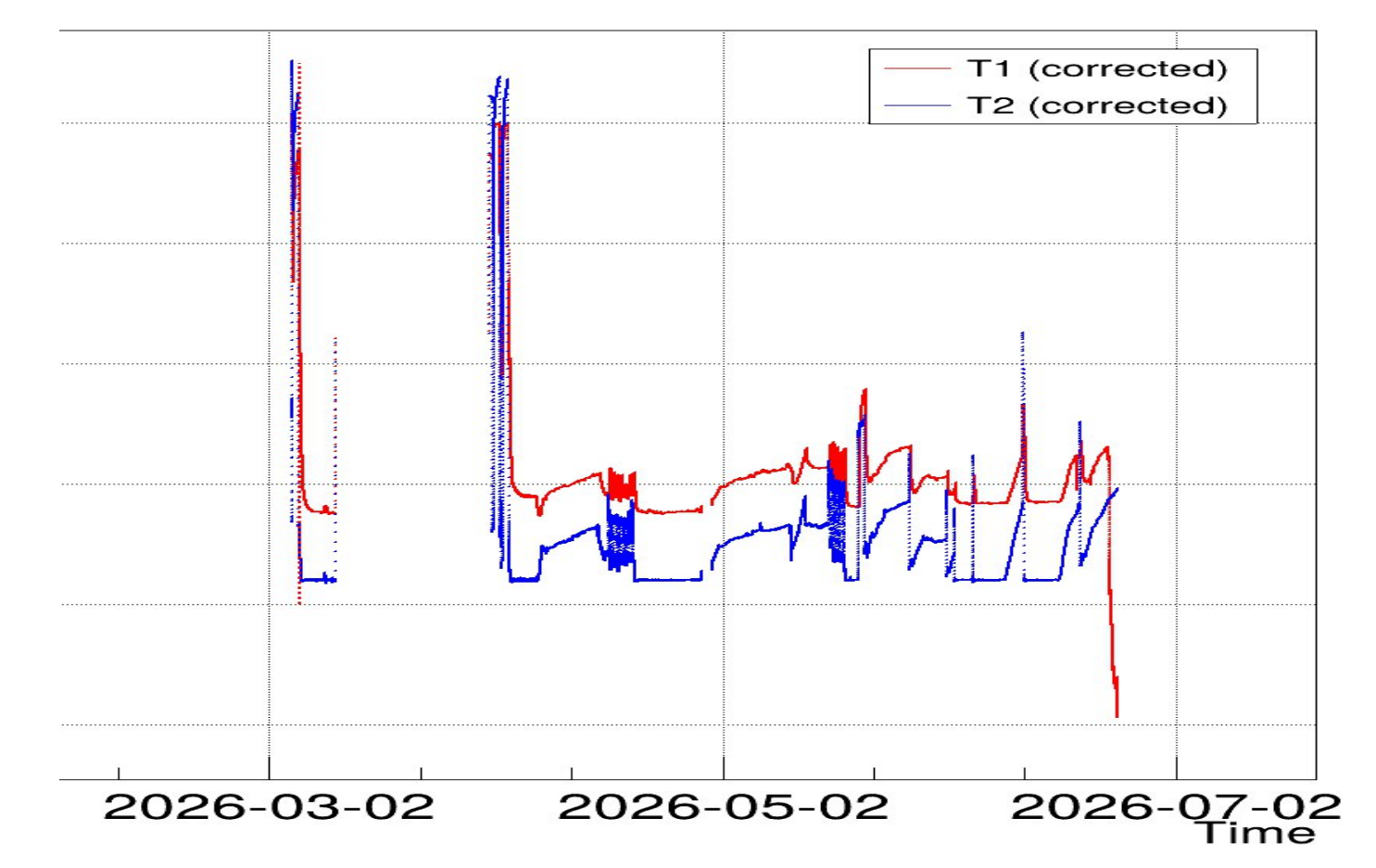
# Rn level



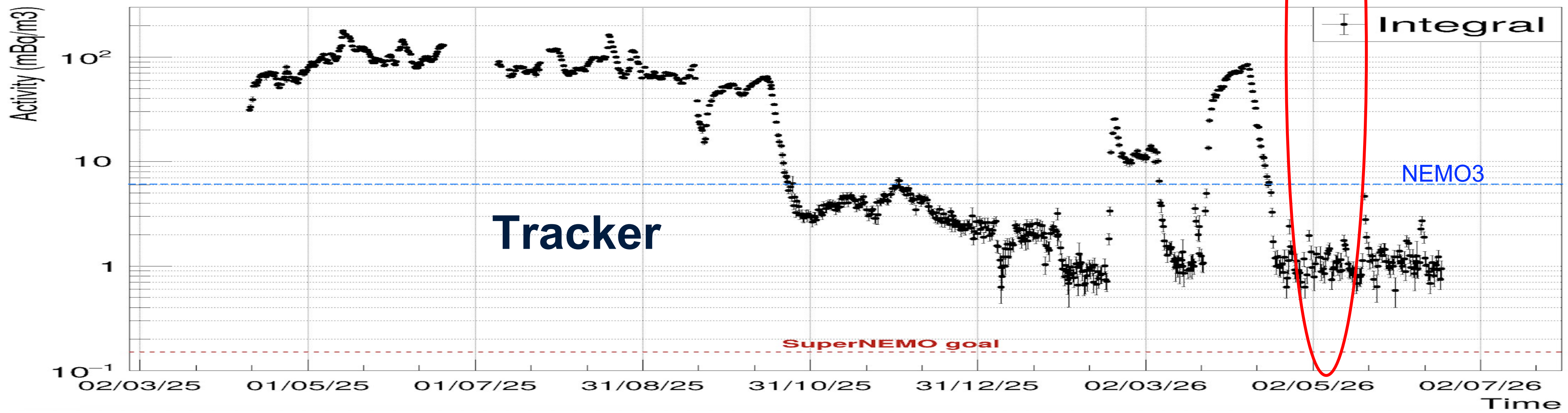
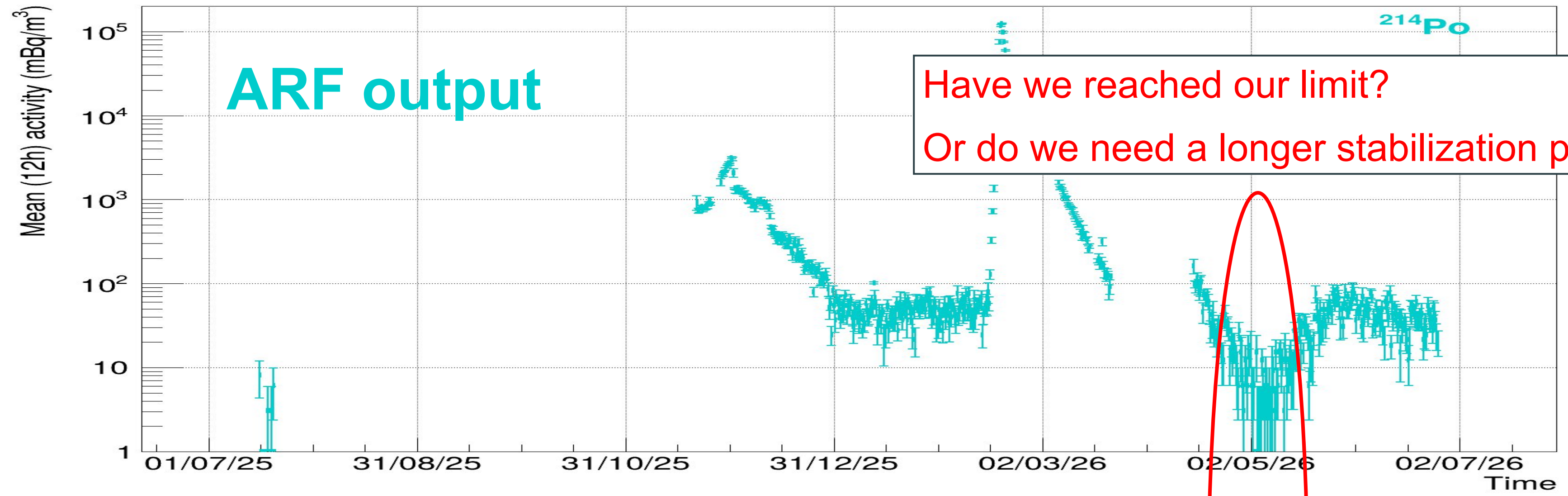
# Rn level & ARF temperature



Temperature **before** and **after** the charcoal tank:



# Rn level





# Conclusions

- Not much has changed... but slightly yes...
- On February 17: IN2P3 experiments hosted at LSM met with IN2P3 management to explain our difficulties
- => main subtle changes :
  - Less conflicting e-mails, but no answers to our list of questions
  - LSM shares cooling unit data about once a month, but only from March 2026
  - No more monthly LSM users meeting since January 29 2026