



# iSRR BIFROST – Radiological and Environmental Monitoring Systems (REMS)

PRESENTED BY ANA CINTAS

2025-12-02

# Agenda

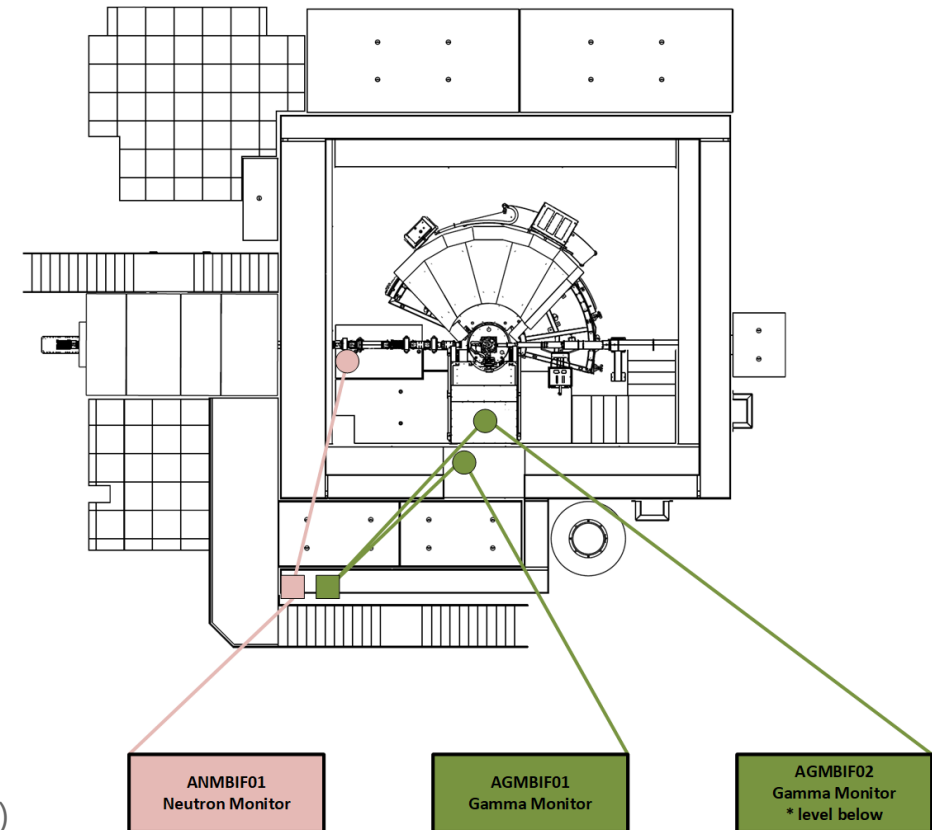


- 1 Brief scope description
- 2 Brief status of the systems
- 3 Status of documentation (CIDL)
- 4 Known issues deemed OK to proceed
- 5 Are there any NCRs related to the system(s)?
- 6 Does the system have any SSCI2S (rad safety) function?
- 7 Applicable codes and compliance (e.g required periodic inspections)
- 8 Describe briefly any tests needed with beam (and point to plan)
- 9 Have start up checklist been performed? Any issues found?
- 10 Have all recommendations from previous reviews been addressed?

# 1. Brief scope description

- Area Neutron Monitor (ANMBIF01) installed downstream of the instrument shutter inside the instrument cave close to the beamline to measure the neutron flux level. This monitor is linked to PSS<sup>1,2,3</sup>.
- Access doors to the cave are linked to PSS<sup>2</sup>.
- Area Gamma Monitors (AGMBIF01/02) in the cave verifies dose rate levels before entering.
  - Access monitor
  - Sample monitor

**BIFROST experimental station**

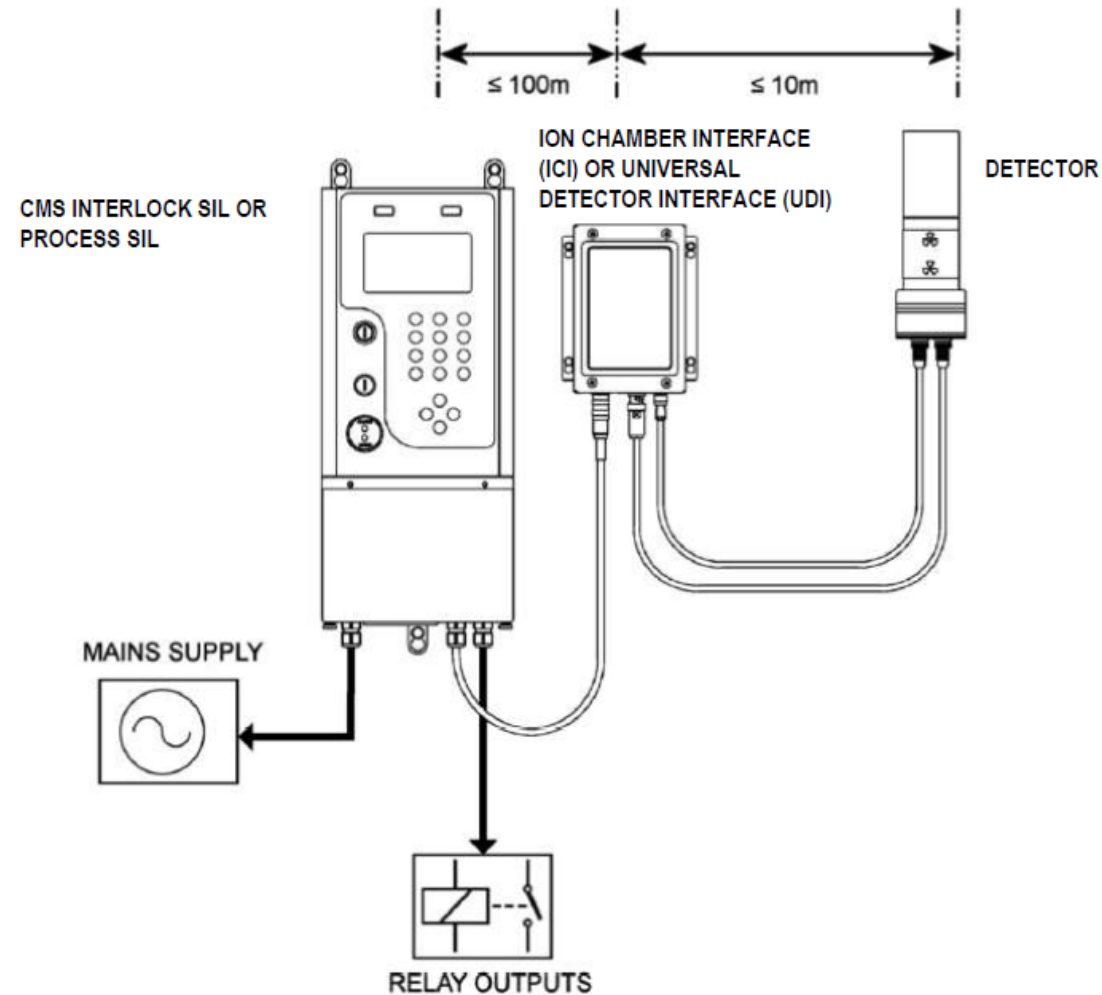


<sup>1</sup> General specification of radiation monitors for instrument shutters (ESS-5312605)

<sup>2</sup> Concepts of Operations for BIFROST Personnel Safety System (ESS-4007029)

<sup>3</sup> Radiation monitoring for ESS experimental halls and laboratories (ESS-5118446)

# Schematics of the monitoring system connections



# Radiation monitoring for BIFROST

- ANM detector: Proportional counter tube ( $^3\text{He}$ ). Range: 100 to  $1\text{E}+07$  n/cm<sup>2</sup> s
- AGM detectors: GM tube. Range: 0.1  $\mu\text{Sv/h}$  - 40 mSv/h

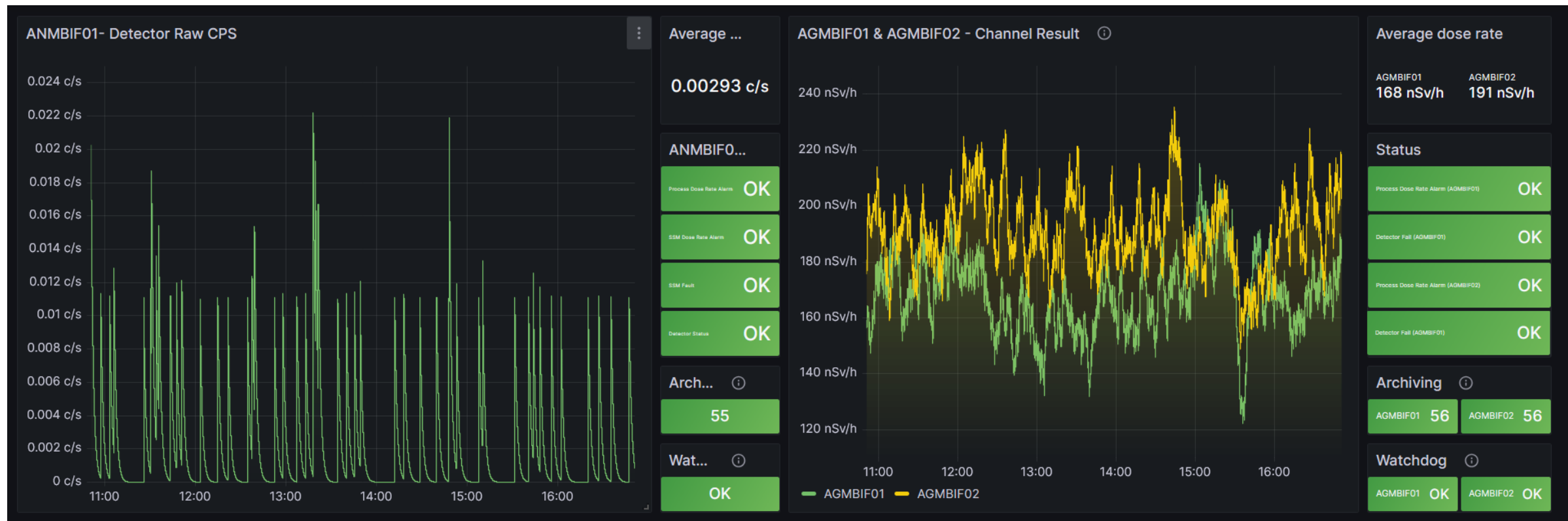




## 2. Brief status of the systems

The ANM and AGM for BIFROST have been commissioned and are operational.

The final PSS validation with ANM is done.





# 3. Status of documentation

## REMS CIDL

- ❖ The released CIDL corresponds to "As-Operated" status for Accelerator, Target, NSS Tranche-1, and INFRA (i.e. H09 and ESS site wide where applicable) scope.
- ❖ REMS CIDL OS-0000028 7 Released (27/11/2025)
- ❖ REMS - Area Monitoring Commissioning for NSS [ESS-5840424](#)

Documentation scope	Doc Nr	Doc Title
Scope and Requirements	ESS-0051197	Environmental Monitoring Plan
	ESS-0239723	ESS Handbook for Radiation Protection Chapter 7. Radiation Monitoring
	ESS-0517371	TS2 PSS and TS2 Radiation Monitors Interface Control Document
	ESS-1157543	REMS - Maintenance and Operations Concept
	ESS-1418699	ESS Procedure for Requesting Radiation Monitoring for Radiation Protection and Radiation Safety
	ESS-2501090	Framework Agreement - Lund University
	ESS-3723671	Radiation Monitoring Plan for the Radioactive Waste Treatment Facility H09
	ESS-4246185	Interface Control Document for PSS and REMS

# Status of documentation



Documentation scope	Doc Nr	Doc Title
Specifications and Design	ESS-0094654	Functional Specification of the Radiation Monitors for the ESS Personnel Safety System 1
	ESS-0115546	Gradual implementation of the environment monitors of radioactivity and radiation
	ESS-0460601	Interface Requirements Specification for Accelerator Power Distribution System and REMS
	ESS-0503474	Radiation Monitoring for Normal-Conducting Linac
	ESS-0513304	Concept Document for the Radiological and Environmental Monitoring System 1
	ESS-0674021	Radiation Monitoring for Test Stand 2
	ESS-4802350	Radiation monitoring for the ESS Accelerator
	ESS-5072338	Radiation monitoring for the target building (D02)
	ESS-5118446	Radiation monitoring for ESS experimental halls and laboratories
	ESS-5148169	Interface Requirements Specification for H09 Power Distribution System and REMS
	ESS-5310340	REMS System Design Description for ESS
	ESS-5312605	General specification of radiation monitors for instrument shutters
	ESS-5456994	Location of radiation monitors in the experimental stations
	ESS-5493071	Radiation monitoring of ventilation to the environment
	ESS-5494026	Interface Requirements Specification for Enviroment Power Distribution System and REMS
	ESS-5494034	Requirements Specification for Enviromental
	ESS-5541053	Interface Requirements Specification for F03, F04 Power Distribution System and REMS
	ESS-5529603	P&ID ESS.INFR.B01.P01.P11.P02



# Status of documentation



Documentation scope	Doc Nr	Doc Title
Quality records, V and V	ESS-1210606	REMS - CROME Commissioning & Acceptance
	ESS-1271214	Site Acceptance Test TS2
	ESS-2989989	Test Report - Power Distribution and Heaters for Portal Monitoring by F03
	ESS-3143465	REMS - TS2 AGMG0203 Material Access Door Commissioning
	ESS-3214102	Inspection and Test plan Internal Electrical REMS Equipment in TS2
	ESS-3214102	Inspection and Test plan Internal Electrical REMS Equipment in TS2
	ESS-3242494	Final Installation Acceptance - REMS area gamma monitor in TS2
	ESS-3263703	REMS - NCL Commissioning and Handover to RP
	ESS-5295413	Test Report ACC REMS Equipment
	ESS-5310318	Electrical inspection of REMS electrical installation in ACC
	ESS-5312771	Test Report for REMS Cabinets
	ESS-5428620	Test Report REMS G02 N11N1
	ESS-5445350	Electrical inspection REMS Outdoor
	ESS-5494021	Inspection and Test plan for low voltage power and power distribution equipment within REMS
	ESS-5528231	Equipment test report H09
	ESS-5174419	Test Report EAS1-5 ESM1-4
	ESS-5310335	Test Report REMS Feeding Cables
	ESS-5314546	Test Report REMS H09 Sytem Cables
	ESS-5428621	Test Report Deadtest Feeding Cables REMS-Labs
	ESS-5527743	Low Voltage Power and Control cables - cable and circuit test report D02
	ESS-5528230	Low Voltage Power and Control cables - cable and circuit test report ENV
	ESS-5530802	Inspection and Test plan for low voltage power and power distribution equipment within REMS
	ESS-5535506	Dead Test REMS Equipment D04
	ESS-5535507	Dead Test REMS Equipment D08
	ESS-5535508	Dead Test REMS Equipment E03
	ESS-5584791	Factory Acceptance Test Documents Stack
	ESS-5601170	Test Reports D02 Test Report

## 4. Known issues deemed OK to proceed



- No issues.

# 5. Are there any NCRs related to the system(s)?



- None

## 6. Does the system have any SSCI2S function?



- The ANM is classified as SSCI2S, see [SSC Classification Report for REMS, ESS-5313506](#).
- These monitors will be subject to annual maintenance and 3-5 yearly calibration, see [REMS – Maintenance and Operations Concept, ESS-1157543](#).
- Maintenance procedures are not yet defined within EAM, however maintenance manuals exists and annual maintenance is carried out currently using JIRA with supporting information available on Confluence.



# 7. Applicable codes and compliance

## Required periodic inspections

- All systems are CE marked including supports fabricated by ESS.
- All systems are energized according to ESS electrical design and safety rules.
- All systems require periodic maintenance and calibration in accordance, but with time intervals recommended by the supplier, see [REMS – Maintenance and Operations Concept, ESS-1157543](#).



## 8. Tests needed with beam

- The signal will be characterized across multiple beam power levels and adjusted accordingly.



# 9. Start-up checklist

## Issues found?

- This is the Hand-over and the PSS validation.

# 10. Recommendations from previous reviews



- No recommendations from previous reviews.





# Questions

2025-12-02



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