System Acceptance Review - Bifrost

Bifrost – NCRs and NITs
=ESS.NSS.H01.BIFRO

PRESENTED BY LIAM WHITELEGG

Agenda

1. Open NCRs
2. Open NITs
3. Closed and Old NCRs (BACKUP)

Open NCRs and NITs – Breakdown

Breakdown

- **Total Number of Open NITs = 82**
- **Total Number of Open NCRs = 1**

Presented NITs

• Core team	42
• Choppers	2
• Shielding	2
• Detectors	6
• Beam Monitors	24
• Motion Control	8
Total	**84**

Focus is on NITs related to SAR

"To be resolved by SAR" means that it is scope that ideally, should be fixed before completing the SAR process

Open NCRs

NCR – 10525 (& NIT-155)

Update:

- All documents required for CE marking available in preliminary form
- Following TBL Shutter Process
- ESS decision whether to CE mark or not

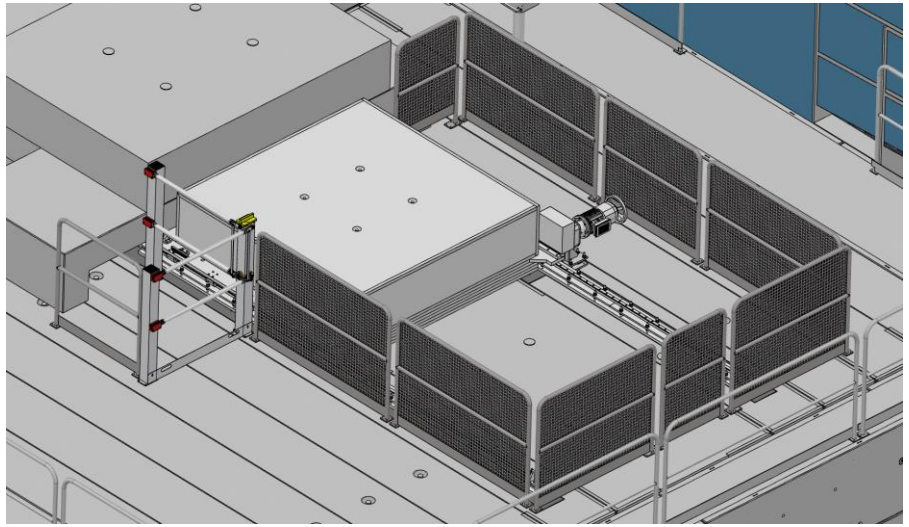
Heavy Shutter			
ESS-5112462	1	✔	Bifrost - Sub-System Design Description – Safety Shutter
ESS-5818026	1		Hazard Analysis for BIFROST Safety Shutter Mechanics
ESS-5818235	1		Signature card for EU Declaration of Incorporation for BIFROST Safety Shutter
ESS-5818237	1		EU Declaration of Incorporation - BIFROST Safety Shutter

Nonconformity:	10525	Absence of CE marking, or related documentation
Nonconformity Details		
Equipment:	BIFRO.A01.R03.R01	1.5.1 Thermal shutter
Location:		
Department:	TD-NSS	
Type:	NCT_0005	Deviation from Technical Documentation
Note:	Absence of CE-marking on equipment or an agreed plan for CE-marking to be conducted in situ and relevant documentation. Owner:Gabor Lazlo Ref doc: ESS-5617654 Instrument shutter test report	
Status:	In Progress	
Severity:	Minor	
Priority:		
Permanent NCR:	☐	
Permanent NCR CHESS No.:		
NCR Owner:	GABORLASZLO	
Related to Radiation Protection/Radiation Safety:	☐	
Related to Security:	☐	
Related to Information Security:	☐	
Audit:	☐	
Related to Conventional Safety:		

Open NITs

Related to CAVE (9)

Summary	Issue key	To be resolved by	Notes
Bifrost Cave SAT - Roof Beam Gaps	NIT-226	ORR	To be highlighted as hotspot to RP
Bifrost Cave SAT - Roof Handrails	**NIT-227**	**SAR**	**Most have arrived. Installation ongoing and awaiting final pieces**
Bifrost Cave SAT - Lead Chimneys	**NIT-228**	**SAR**	**One almost complete. One lead chimney to be built. One heavy concrete chimney ordered**
Installation of Borated Poly Plug in Cave Wall	NIT-251	ORR	Ordered. Delivery Week 40
Bifrost False Floor North Completion	NIT-263	SRR	Awaiting access to bandsaw
Installation of borated lining in service feedthroughs	**NIT-264**	**SAR**	**Material on site. Awaiting installation**
Enlarge Radius on Beam Stop Borated Aluminium Sheet	**NIT-303**	**SAR**	**Ordered. Delivery Week 40**
Change thrust screw to non-magnetic - Bifrost	NIT-21	ORR	Small screws were labelled non-magnetic but clearly aren't
Bifrost BM4 - Magnetism	NIT-82	ORR	Multiple items on BM4 are magnetic. Some have changed, others need further investigation



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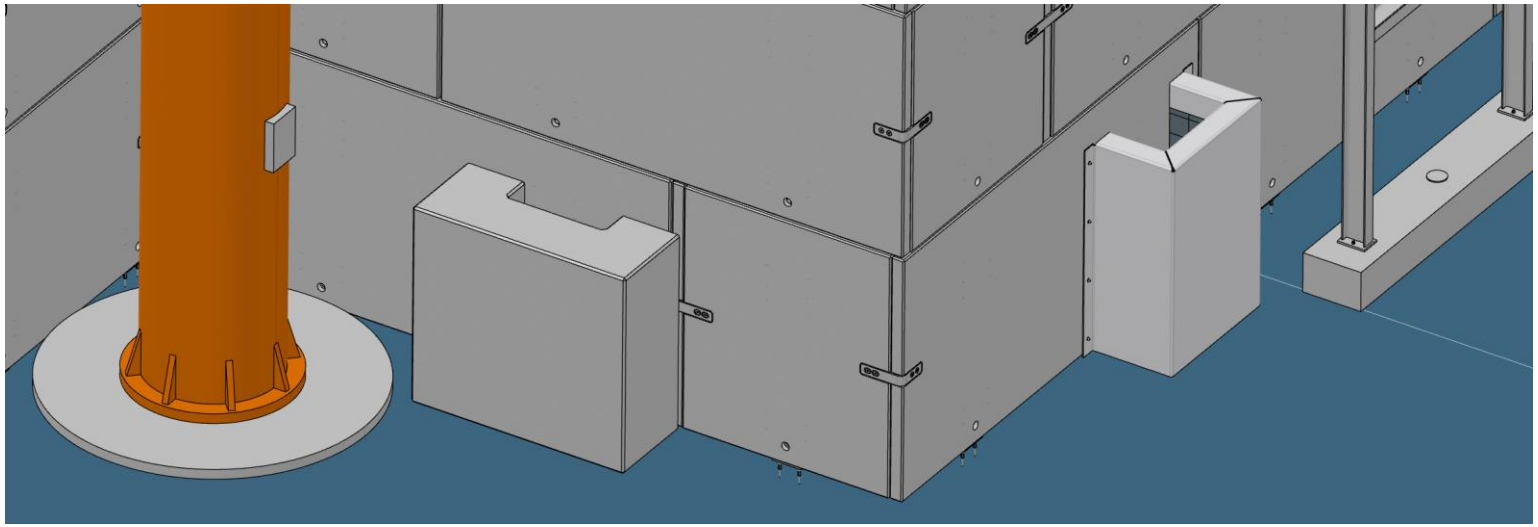

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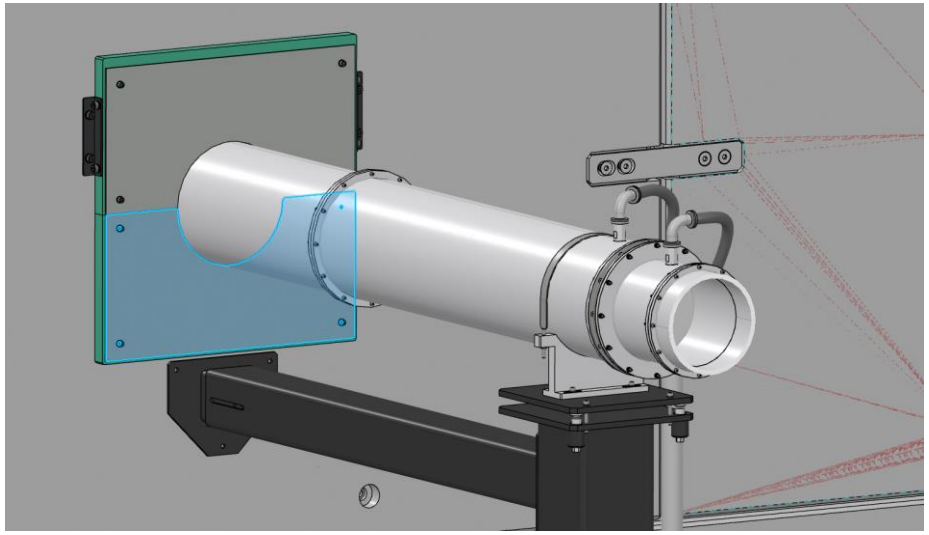
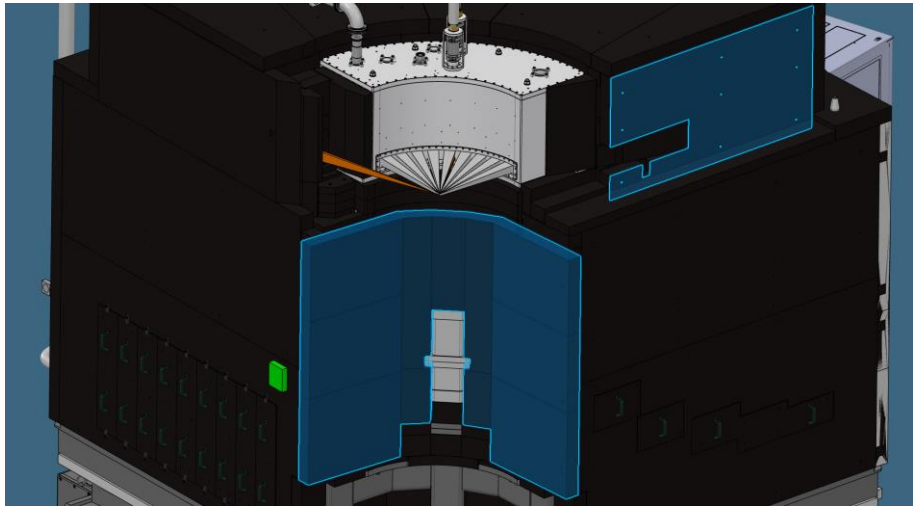


Open NITs

Related to Secondary Spectrometer (10)

Summary	Issue key	To be resolved by	Notes
Bifrost Analyser - Performance Check	NIT-224	ORR	NIT used to highlight a potential future weakness
Bifrost Spectrometer Polyethyelene	**NIT-230**	**SAR**	**Material ordered. Delivery Week 40**
Modify hard stop on the Bifrost tank	**NIT-252**	**SAR**	**Changed during commissioning. Design ongoing.**
Stainless steel parts on BE filter	NIT-29	ORR	Only problematic when/if polarisation upgrade comes in
Bifrost - Beryllium Filter Adjustment System Amendments	NIT-231	ORR	At high end of adjustment range. Harder to align than necessary.
BIFROST - implement warning in NICOS for low LN2 level in filter	**NIT-254**	**SAR**	**ECDC – Unable to finalise tests due to concurrent work**
BIFROST - implement NICOS warning beryllium filter temperature	**NIT-255**	**SAR**	**ECDC – Unable to finalise tests due to concurrent work**
BIFROST - Integrate tank vacuum pressure gauge level in NICOS	**NIT-256**	**SAR**	**ECDC – Unable to finalise tests due to concurrent work**
BIFROST - Integrate filter vacuum gauge level in NICOS	**NIT-257**	**SAR**	**ECDC – Unable to finalise tests due to concurrent work**
Creation of NICOS warnings for filter vacuum	**NIT-306**	**SAR**	**ECDC – Need to discuss, implement and test alarm**



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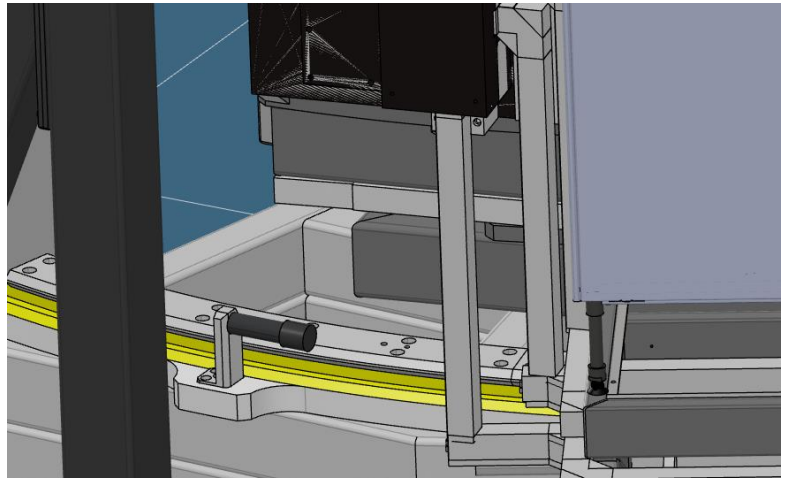
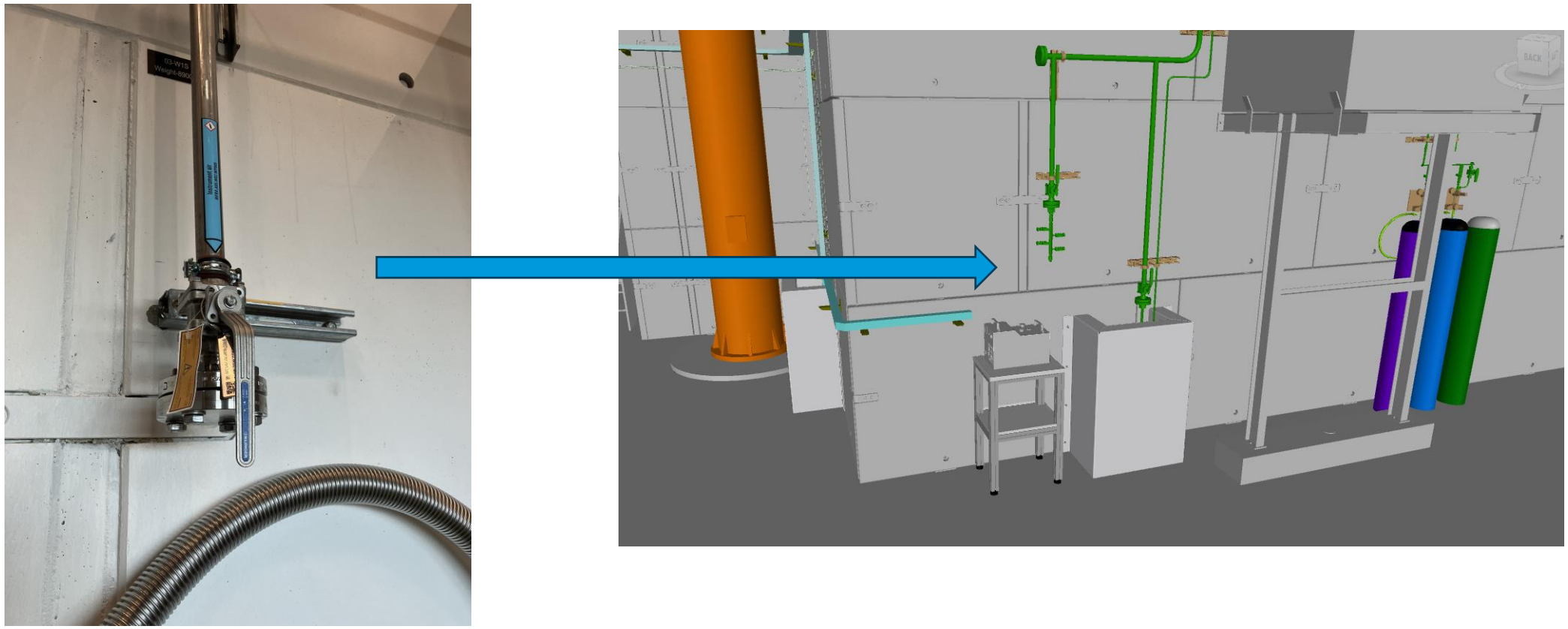


Open NITs

Related to Process Utilities and Cabling (3)

Summary	Issue key	To be resolved by	Notes
CUP Installation of IA Manifold	NIT-232	SAR	Wrong interface installed initially for one pump. New part arrives in October
BM1 Patch Panel and RH	NIT-320	SAR	Potential improvement to the RH accessibility in the bunker
Pipework over Bifrost FOC1	NIT-328	SAR	Pipelines obstructing removal of FOC-1



Open NITs

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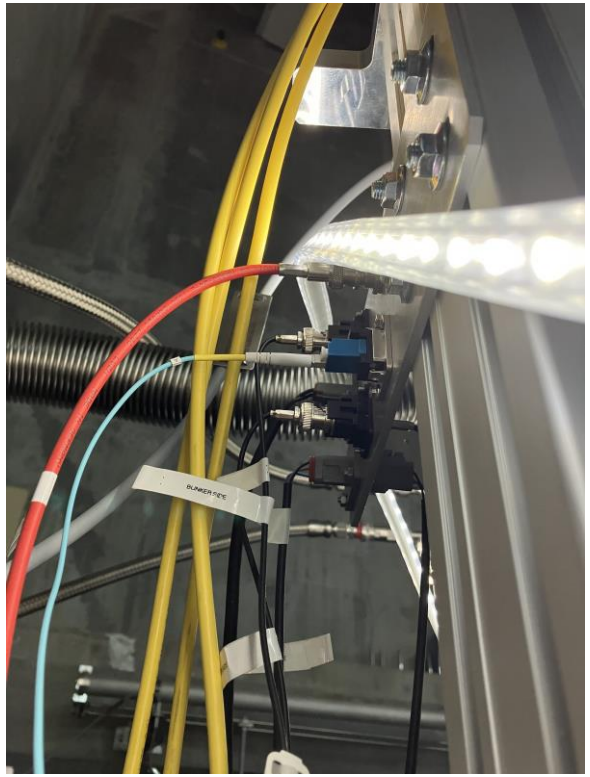

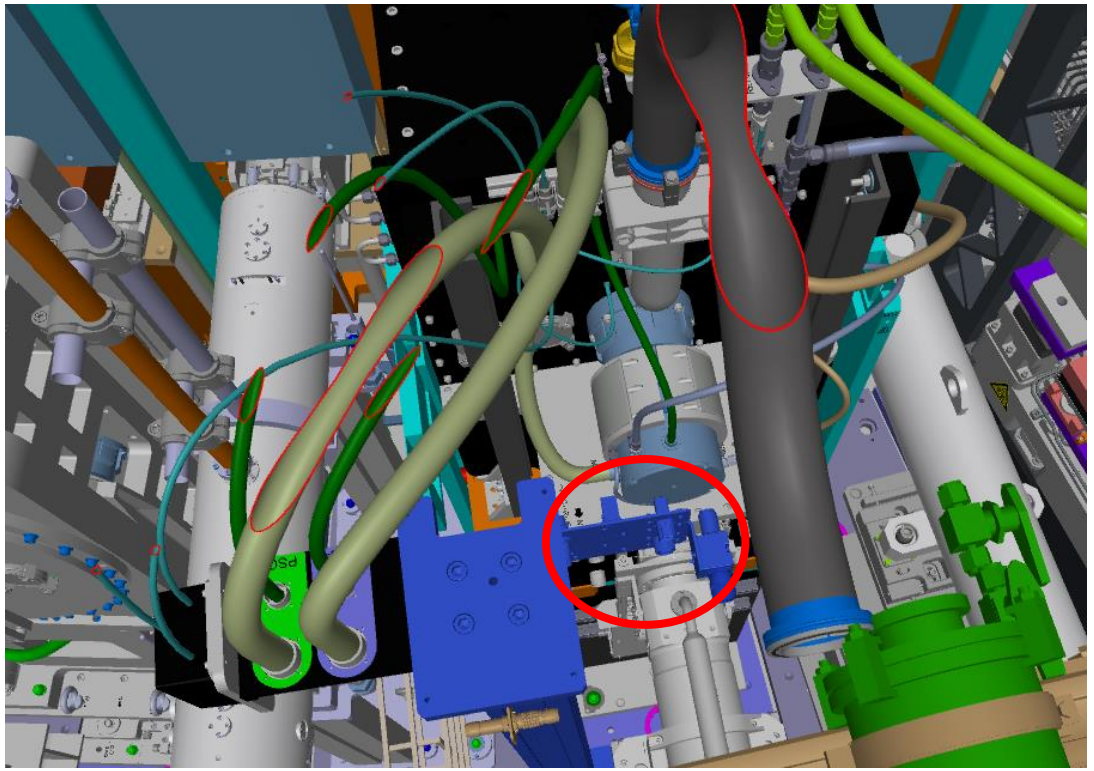

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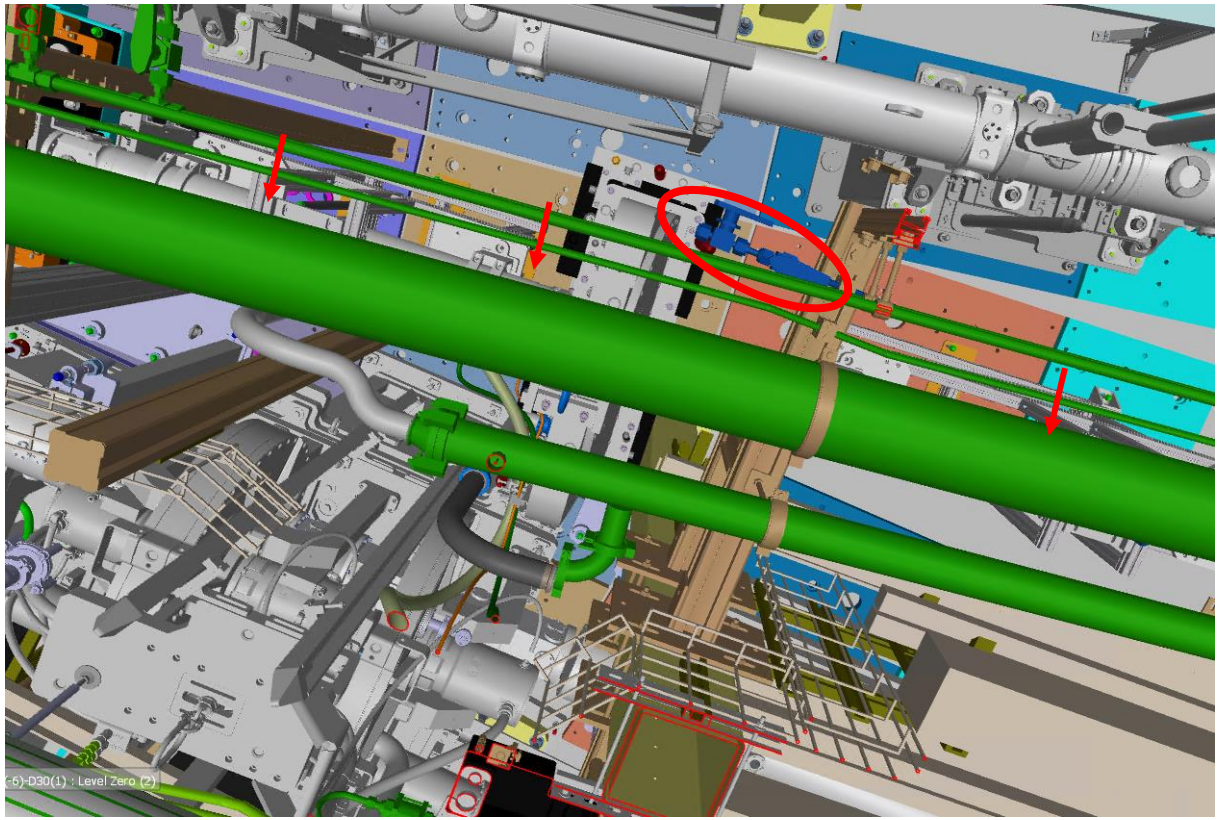


Open NITs

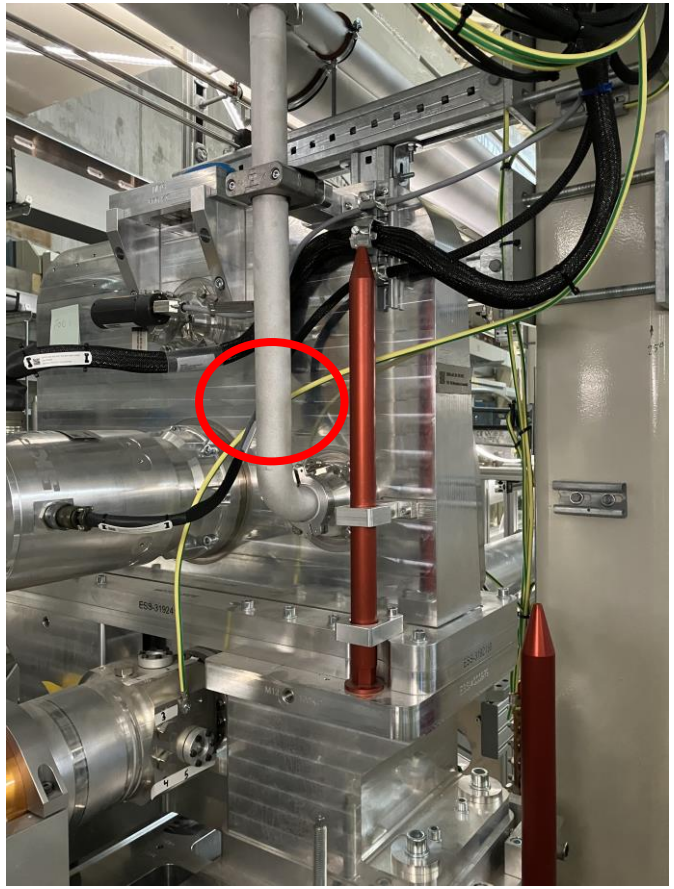
Related to Documentation (8)

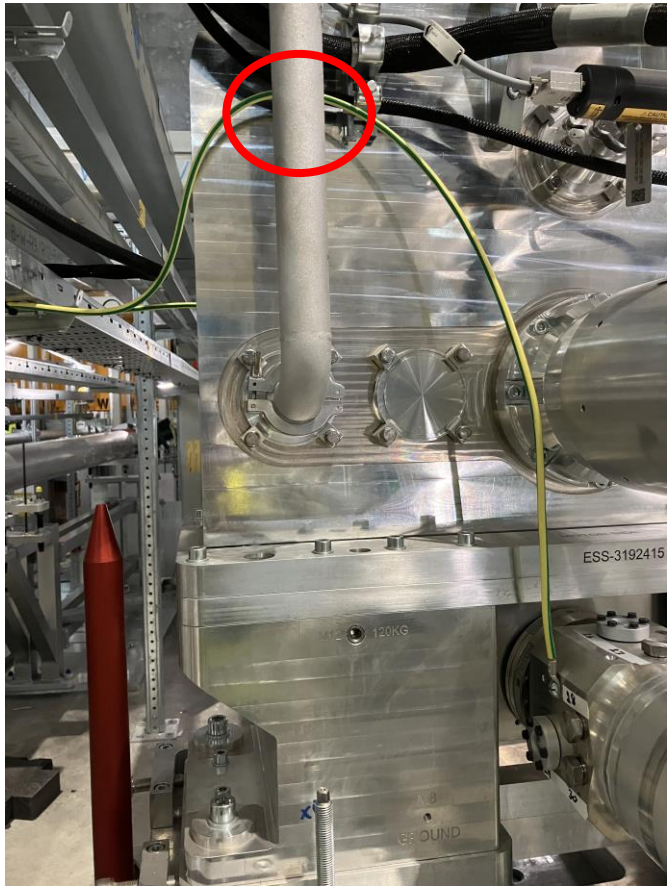
Summary	Issue key	To be resolved by	Notes
Include Grounding Cable Disconnection in O&M Manuals	NIT-297	SRR	Not yet installed. Pictures to be included
Revision of O&M Manual	NIT-250	SRR	To include comments from reviewers and Motion Safety information
Change BIFROST BBGOA drawing title	NIT-35	SSR	Legacy and overlooked item
As Built - Guide and Frame in Cave	**NIT-42**	**SAR**	**Need to check final detail. Cable trays etc.**
Goniometers C.O.G problem fix	**NIT-30**	**SAR**	**Better breakdown in EPL. Update as-built drawings to include gearboxes**
Bifrost Spectrometer - As Built	**NIT-43**	**SAR**	**Needs re-designed Hard Stop and further details**
Update O&M manual Bifrost Beryllium filter	**NIT-18**	**SAR**	**Check visible within EPL**
BIFROST Cooling SAT document missing	NIT-242	ORR	CUP document in review

Open NITs

Related to Grounding (2)

Summary	Issue key	To be resolved by	Notes
Grounding of Components in the Bunker	NIT-241	SAR	Installation Ongoing. Needs amendments
BIFROST Instrument Earthing System	NIT-31	SAR	Below





Open NITs

Related to Grounding (2)

Summary	Issue key	To be resolved by	Notes
Grounding of Components in the Bunker	**NIT-241**	**SAR**	**Installation Ongoing. Needs amendments**
BIFROST Instrument Earthing System	**NIT-31**	**SAR**	**Below**

Description

The BIFROST instrument earthing system is designed to have all components in the instrument zone isolated from the building. These components are connected to the Earth bar in the BIFROST distribution board, which is then connected to the transformer's star point. But during the Detector front-end energization, it was discovered that some racks were not electrically isolated from the building, despite being installed on spacers.

A brief examination was conducted to identify the source of the issue. It was found that the racks were getting connected to the building through the BIFROST distribution board, where all the earth connections meet at the earth bar.

To find the fault location, CEP should disconnect all earth connections to the distribution board one by one, checking for impact on the isolation of the racks from the building.

While the low-resistance connection to the building provides a safe equipotential connection to the ground, its potential impact on sensitive equipment such as detectors or beam monitors should be assessed during commissioning.

- Future steps
  - Run detectors and investigate potential sources of noise
  - Unplug cables within front end cabinet and re-check isolation of modules
  - Run tests with relevant technology groups within cave area

Open NITs

Related to Sample Enviroment (9)

Summary	Issue key	To be resolved by	Notes
BIFROST - Implement all orange cryostat PV's in NICOS	NIT-267	SRR	Sample Environment Integration with ECDC. Not SAR Scope
BIFROST - Implement Oxford cryomagnet PVs in NICOS	NIT-268	SRR	Sample Environment Integration with ECDC. Not SAR Scope
BIFROST - ramp rate, temperature curve and setpoint in NICOS (via Lakeshore)	NIT-269	SRR	Sample Environment Integration with ECDC. Not SAR Scope
BIFROST - Implement needle valve and cryogen display in NICOS	NIT-270	SRR	Sample Environment Integration with ECDC. Not SAR Scope
BIFROST - Implement alarm for low cryogen levels on sample environment in NICOS	NIT-271	SRR	Sample Environment Integration with ECDC. Not SAR Scope
BIFROST - Implement an alarm for sample environment temperature being off target in NICOS	NIT-272	SRR	Sample Environment Integration with ECDC. Not SAR Scope
BIFROST - implement alarm for cryomagnet coil temperature being off target in NICOS	NIT-273	SRR	Sample Environment Integration with ECDC. Not SAR Scope
BIFROST - test Kafka streaming for all sample environment variables in the tests	NIT-274	SRR	Sample Environment Integration with ECDC. Not SAR Scope
BIFROST - implement sample environment and sensor IDs to be written in the nexus file	NIT-275	TG6/ ORR	Sample Environment Integration with ECDC. Not SAR Scope

Closed or Old NCR´s

2025-06-25

Name	Type	Rev	Description	Title	Owner	Originator
ESS-4246377	Non-Conformity Report	1	To enable a succesful leak test the NBPIw needs to be remachined	NCR 10246 Remachining of NBPI windows for BIFROST	Bengt Jönsson	Bengt Jönsson
ESS-5489421	Non-Conformity Report	1	Chopper was tested after install and does not conform to set parameters.	Non Conformity Report- Bifrost-PSC Chopper	Thomas Cornes	Thomas Cornes
ESS-5717299	Non-Conformity Report	1	This report captures all the non-compliances identified during the verification activities of Bifrost PSS	Non-compliance report for Bifrost PSS	Anton Andersson	Anton Andersson

The first NC (10246) is closed.

The second NC (10350) is closed as well. This captures CHESS document ESS-5489421 below. However, when digging more, this NC is captured in ESS-0008823 as mentioned in MFGREQ-796.

I checked ESS-5717299 and noticed that there is not document in CHESS uploaded. I tried to find the relevant NC but couldn't find it in EAM.

Regards,
Ghinwa Kellesly
Quality Assurance Officer