



# BIFROST SAR Documentation Status

05<sup>th</sup> September 2025

**PRESENTED BY: RAVEESH KHEMA**

# SAR documentation



## Green documents

- Concept of Operations
- Requirements specifications
- P&ID
- System Design Descriptions

## Orange documents

- Risk Assessment
- Radiation safety reports
- O&M manuals
- V&V plans

## Red documents

- FATs or equivalent
- SATs/Local testing
- Integrated testing reports

### SAR overview Green docs-BIFROST

Created by Rawesh Khanna, last modified just a moment ago

Concept of Operations, 1 document per instrument	Type of the document	Status
ESS-0135282		CHESS released Rev 3

Requirements specification - System Requirements, 1 document per instrument	Type of the document	Status
ESS-0135231		CHESS Rev 2 RELEASED

Architecture description (e.g. P&ID) 1 document per instrument	Type of the document	Status
ESS-5265737		CHESS released Rev 2

Design descriptions (as installed state) - System design description (per large sub-systems)					
Level	Tag	Description	Classification	Document - number, type	Actions/comments
0	=ESS.NSS.H01.BIFRO	BIFROST	BIFROST	ESS-1138675 (BIFROST SDD)	CHESS RELEASED REV 3
1	=ESS.NSS.H01.BIFRO.A01	Beam Transport and Conditioning (BIFROST)	Infrastructure System	ESS-1075014 (BT&C SDD)	CHESS RELEASED REV 3
2	=ESS.NSS.H01.BIFRO.A01.B01	Beam Validation	Beam Validation System	Included in ESS-1075014 (BT&C SDD) listed above	
2	=ESS.NSS.H01.BIFRO.A01.F01	Shielding	Shielding System	Included in ESS-1075014 (BT&C SDD) listed above	
2	=ESS.NSS.H01.BIFRO.A01.R01	Neutron Chopper System	Chopper System	Included in ESS-1075014 (BT&C SDD) listed above	
2	=ESS.NSS.H01.BIFRO.A01.R02	Beam Geometry Conditioning	Beam Geometry Conditioning System	Included in ESS-1075014 (BT&C SDD) listed above	
3	=ESS.NSS.H01.BIFRO.A01.R02.R01	Sit Collimation System	Beam Collimation System	Included in ESS-1075014 (BT&C SDD) listed above	

### SAR overview Red docs BIFROST

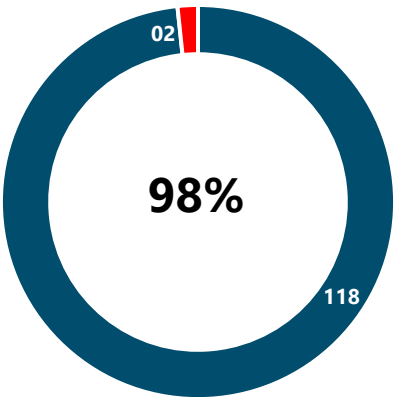
Created by Rawesh Khanna, last modified 45 minutes ago

CIDL - "As Verified" Baseline		
Status		To be released for i-SRR

Level	Tag	Description	Classification	All Verification report/-s (or equivalent from FAT/DAT)	Actions/comments	All Validation report/-s (or equivalent from SSAR/SAT/Local testing)
				Document number		Document number
0	=ESS.NSS.H01.BIFRO	BIFROST	BIFROST			
1	=ESS.NSS.H01.BIFRO.A01	Beam Transport and Conditioning (BIFROST)	Infrastructure System		Covered in the sub-nodes below	
2	=ESS.NSS.H01.BIFRO.A01.B01	Beam Validation	Beam Validation System	ESS-5472460 (FAT IBM BIFROST) ESS-5485346: (LND test sheet and compliance) ESS-5546615: Cascade monitor FAT test	ESS-5472460: CHESS RELEASED REV1 ESS-5485346: CHESS RELEASED REV1 ESS-5546615: CHESS RELEASED REV1	ESS-5774690 (Local SAT)  CHESS RELEASED REV1
2	=ESS.NSS.H01.BIFRO.A01.F01	Shielding	Shielding System	ESS-3218932: QA dossier in shielding LOT1 (BIFROST)	CHESS RELEASED REV1	ESS-5774942 (Guide shielding SAT)  CHESS RELEASED REV1
2	=ESS.NSS.H01.BIFRO.A01.R01	Neutron Chopper System	Chopper System	ESS-4227826: BIFROST BWC FAT	ESS-4227826: CHESS RELEASED REV2	ESS-4227827: BIFROST BWC System SAT  ESS-4227822: CHESS RELEASED REV2
2	=ESS.NSS.H01.BIFRO.A01.R02	Beam Geometry Conditioning	Beam Geometry Conditioning System		Covered in the sub-nodes below	Covered in the sub-nodes below

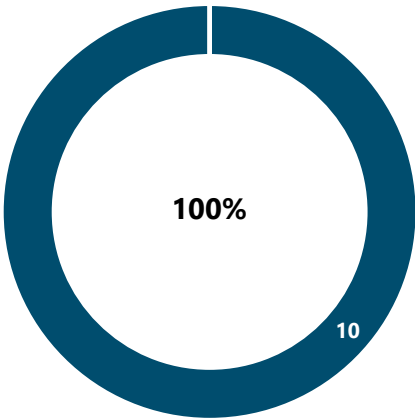


# Overall documentation Status

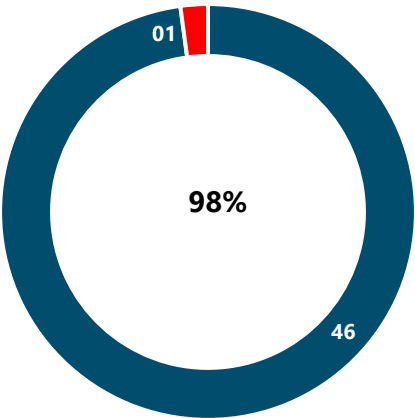


■ CHES released   ■ Under CHES review

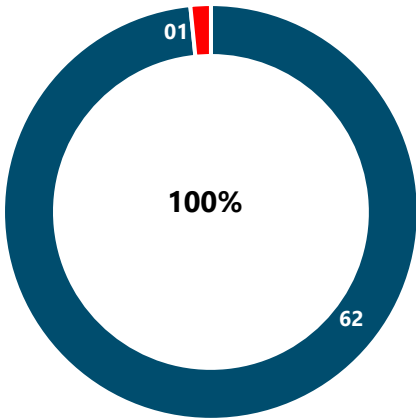
Green documents



Orange documents

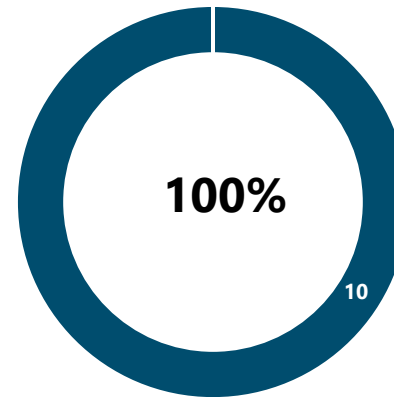


Red documents



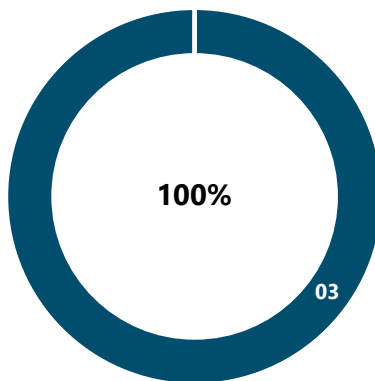


## Green documentation Status

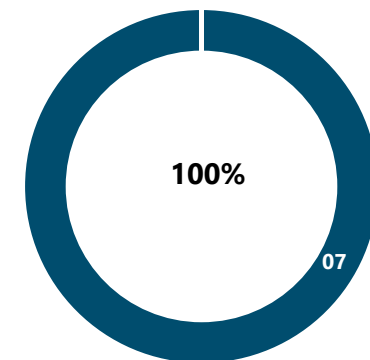


■ CHES released    ■ Under CHES review

ConOps/System reqmts spec  
/P&ID

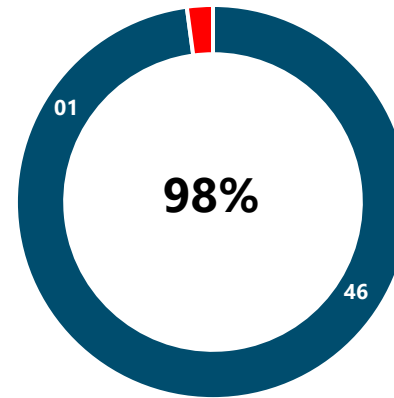


System design descriptions/  
equivalent



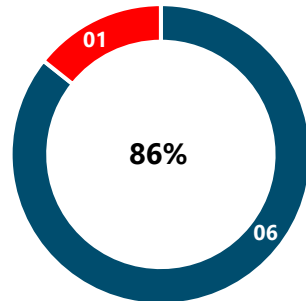


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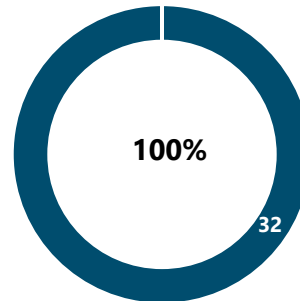


■ CHES released ■ Under CHES review

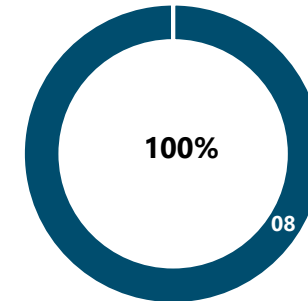
IHA, Radiation safety, Comprehensive radiation safety



Operation and Maintenance manuals/equivalent

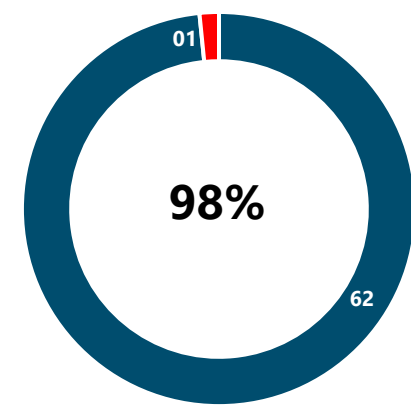


Verification and Validation plans



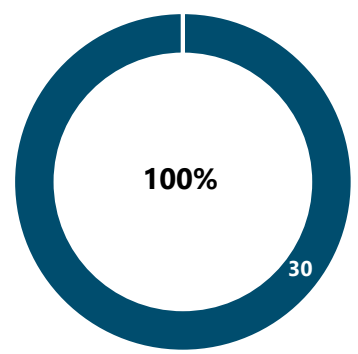


# Red documentation Status

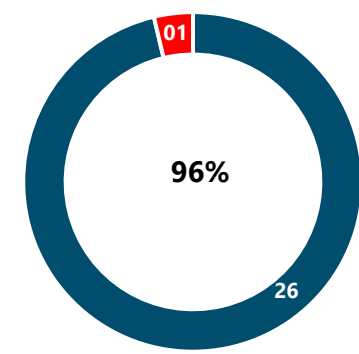


■ CHES released   ■ Under CHES review

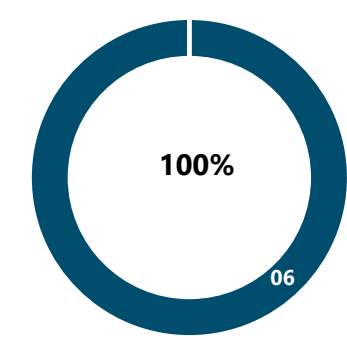
## FAT reports or equivalent



## SAT reports/Local testing



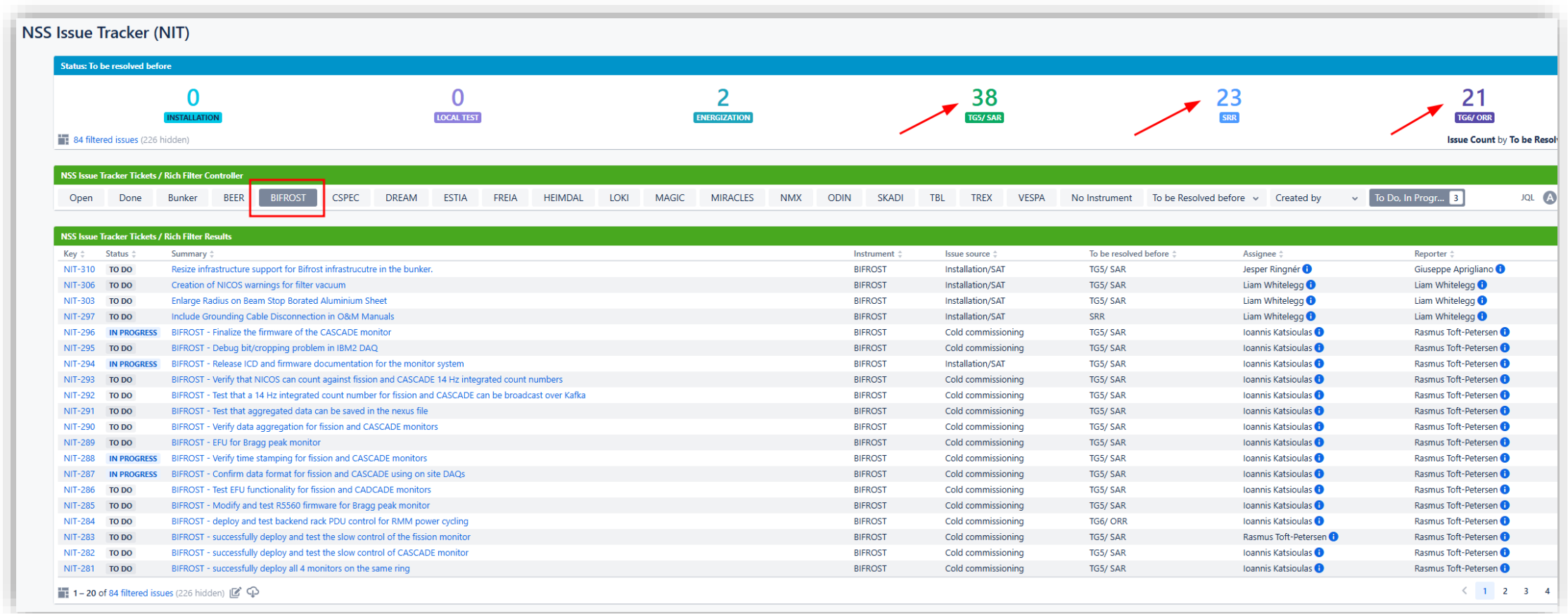
## Integrated Test reports



# NSS Issue Tracker dashboard

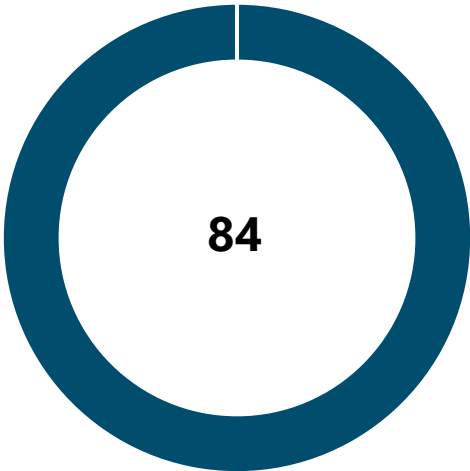


- Project Tool used by NSS to manage , track, and prioritize open issues, critical tasks, related to NSS instrument readiness
- Primary purpose is to log issues, assign responsibilities, set priorities and deadlines and monitor progress on the logged in issues.
- In the context of SAR, all open points related to the Instrument, including open punch list points from various SATs have been logged into this system

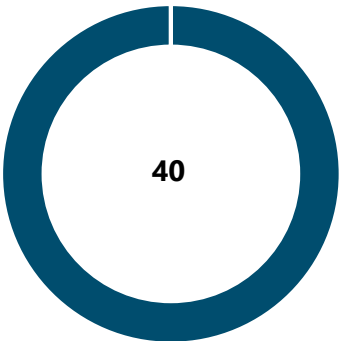




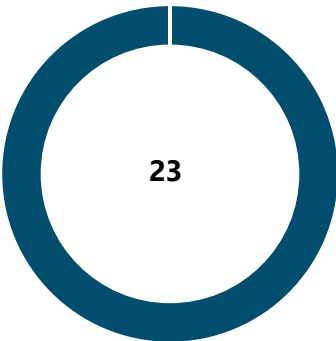
Overall Status of unresolved NITs



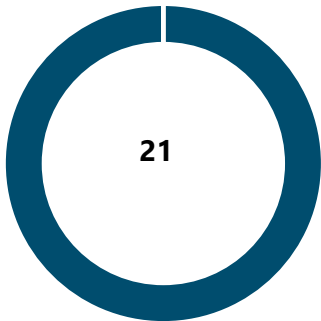
To be resolved before **SAR**



To be resolved before **SRR**



To be resolved before **ORR**





## List of NITs to be resolved before TG5/SAR

NSS Issue Tracker Tickets / Rich Filter Controller					
Open	Done	Bunker	BEER	<b>BIFROST</b>	CSPEC
				DREAM	ESTIA
				FREIA	HEIMDAL
				LOKI	MAGIC
				MIRACLES	NMX
				ODIN	SKADI
				TBL	TREX
				VESPA	No Instrument
				Install	
NSS Issue Tracker Tickets / Rich Filter Results					
Key	Status	Summary	Instrument	Issue source	To be resolved before
NIT-310	TO DO	Resize infrastructure support for Bifrost infrastrucutre in the bunker.	BIFROST	Installation/SAT	TG5/ SAR
NIT-306	TO DO	Creation of NICOS warnings for filter vacuum	BIFROST	Installation/SAT	TG5/ SAR
NIT-303	TO DO	Enlarge Radius on Beam Stop Borated Aluminium Sheet	BIFROST	Installation/SAT	TG5/ SAR
NIT-296	IN PROGRESS	BIFROST - Finalize the firmware of the CASCADE monitor	BIFROST	Cold commissioning	TG5/ SAR
NIT-295	TO DO	BIFROST - Debug bit/cropping problem in IBM2 DAQ	BIFROST	Cold commissioning	TG5/ SAR
NIT-294	IN PROGRESS	BIFROST - Release ICD and firmware documentation for the monitor system	BIFROST	Installation/SAT	TG5/ SAR
NIT-293	TO DO	BIFROST - Verify that NICOS can count against fission and CASCADE 14 Hz integrated count numbers	BIFROST	Cold commissioning	TG5/ SAR
NIT-292	TO DO	BIFROST - Test that a 14 Hz integrated count number for fission and CASCADE can be broadcast over Kafka	BIFROST	Cold commissioning	TG5/ SAR
NIT-291	TO DO	BIFROST - Test that aggregated data can be saved in the nexus file	BIFROST	Cold commissioning	TG5/ SAR
NIT-290	TO DO	BIFROST - Verify data aggregation for fission and CASCADE monitors	BIFROST	Cold commissioning	TG5/ SAR
NIT-289	TO DO	BIFROST - EFU for Bragg peak monitor	BIFROST	Cold commissioning	TG5/ SAR
NIT-288	IN PROGRESS	BIFROST - Verify time stamping for fission and CASCADE monitors	BIFROST	Cold commissioning	TG5/ SAR
NIT-287	IN PROGRESS	BIFROST - Confirm data format for fission and CASCADE using on site DAQs	BIFROST	Cold commissioning	TG5/ SAR
NIT-286	TO DO	BIFROST - Test EFU functionality for fission and CADCADE monitors	BIFROST	Cold commissioning	TG5/ SAR
NIT-285	TO DO	BIFROST - Modify and test R5560 firmware for Bragg peak monitor	BIFROST	Cold commissioning	TG5/ SAR
NIT-283	TO DO	BIFROST - successfully deploy and test the slow control of the fission monitor	BIFROST	Cold commissioning	TG5/ SAR
NIT-282	TO DO	BIFROST - successfully deploy and test the slow control of CASCADE monitor	BIFROST	Cold commissioning	TG5/ SAR
NIT-281	TO DO	BIFROST - successfully deploy all 4 monitors on the same ring	BIFROST	Cold commissioning	TG5/ SAR
NIT-280	TO DO	BIFROST - Complete monitor gas system	BIFROST	Installation/SAT	TG5/ SAR
NIT-278	TO DO	BIFROST - resolve 1 Ohm connection error on beam monitors	BIFROST	Other	TG5/ SAR

1 - 20 of 40 filtered issues (270 hidden)

## List of NITs to be resolved before TG5/SAR

NSS Issue Tracker Tickets / Rich Filter Controller

Open

Done

Bunker

BEER

BIFROST

CSPEC

DREAM

ESTIA

FREIA

HEIMDAL

LOKI

MAGIC

MIRACLES

NMX

ODIN

SKADI

TBL

TREX

VESPA

No Instrument

NSS Issue Tracker Tickets / Rich Filter Results

Key	Status	Summary	Instrument	Issue source	To be resolved before
NIT-277	TO DO	BIFROST - mark all monitor components with the correct FBS tags	BIFROST	Cold commissioning	TG5/ SAR
NIT-264	TO DO	Installation of borated lining in service feedthroughs	BIFROST	Installation/SAT	TG5/ SAR
NIT-257	TO DO	BIFROST - Integrate filter vacuum gauge level in NICOS	BIFROST	Cold commissioning	TG5/ SAR
NIT-256	TO DO	BIFROST - Integrate tank vacuum pressure gauge level in NICOS	BIFROST	Cold commissioning	TG5/ SAR
NIT-255	IN REVIEW	BIFROST - implement NICOS warning beryllium filter temperature	BIFROST	Cold commissioning	TG5/ SAR
NIT-254	IN REVIEW	BIFROST - implement warning in NICOS for low LN2 level in beryllium filter	BIFROST	Cold commissioning	TG5/ SAR
NIT-252	TO DO	Modify hard stop on the Bifrost tank	BIFROST	Installation/SAT	TG5/ SAR
NIT-248	TO DO	Bifrost Cave Hatch Cabinet - Energisation	BIFROST	Installation/SAT	TG5/ SAR
NIT-247	TO DO	ToM is missing some LBS	BIFROST	CDR/TG3	TG5/ SAR
NIT-244	TO DO	Install BIFROST Side Block in E2	BIFROST	Installation/SAT	TG5/ SAR
NIT-241	TO DO	Grounding of Components in the Bunker	BIFROST	Installation/SAT	TG5/ SAR
NIT-230	TO DO	Bifrost Spectrometer Polyethyelene	BIFROST	Installation/SAT	TG5/ SAR
NIT-228	TO DO	Bifrost Cave SAT - Lead Chimneys	BIFROST	Installation/SAT	TG5/ SAR
NIT-227	TO DO	Bifrost Cave SAT - Roof Handrails	BIFROST	Installation/SAT	TG5/ SAR
NIT-155	TO DO	Bifrost shutter Absence of CE-marking on equipment or an agreed plan for CE-marking	BIFROST	Q-gate/FAT	TG5/ SAR
NIT-70	TO DO	BIFROST: BM (Cascade) Pressure	BIFROST	Q-gate/FAT	Energization
NIT-46	TO DO	BIFROST: BM (Fission) Email Manufacturer Electrical	BIFROST	Q-gate/FAT	TG5/ SAR
NIT-45	TO DO	BIFROST: BM (Fission) Purpose Made Electrical	BIFROST	Q-gate/FAT	Energization
NIT-31	TO DO	BIFROST Instrument Earthing System	BIFROST	Other	TG5/ SAR
NIT-6	TO DO	BM gas lines in bunker	BIFROST		TG5/ SAR

21 – 40 of 40 filtered issues (270 hidden)

21 - 40 of 40 filtered issues (270 hidden)



## List of NITs to be resolved before SRR

NSS Issue Tracker Tickets / Rich Filter Controller

Open

Done

Bunker

BEER

BIFROST

CSPEC

DREAM

ESTIA

FREIA

HEIMDAL

LOKI

MAGIC

MIRACLES

NMX

ODIN

SKADI

TBL

TREX

VESPA

No Instrument

SRR

NSS Issue Tracker Tickets / Rich Filter Results

Key	Status	Summary	Instrument	Issue source	To be resolved before
NIT-297	TO DO	Include Grounding Cable Disconnection in O&M Manuals	BIFROST	Installation/SAT	SRR
NIT-279	TO DO	BIFROST - BM1 resolve amplifier and LV connection issues	BIFROST	Installation/SAT	SRR
NIT-276	TO DO	BIFROST - change LV connections to BM1 and amplifier	BIFROST	Other	SRR
NIT-274	TO DO	BIFROST - test Kafka streaming for all sample environment variables in the sample environment test plan	BIFROST	Cold commissioning	SRR
NIT-273	TO DO	BIFROST - implement alarm for cryomagnet coil temperature being off target in NICOS	BIFROST	Cold commissioning	SRR
NIT-272	TO DO	BIFROST - Implement an alarm for sample environment temperature being off target in NICOS	BIFROST	Cold commissioning	SRR
NIT-271	TO DO	BIFROST - Implement alarm for low cryogen levels on sample environment in NICOS	BIFROST	Cold commissioning	SRR
NIT-270	TO DO	BIFROST - Implement needle valve and cryogen display in NICOS	BIFROST	Cold commissioning	SRR
NIT-269	TO DO	BIFROST - ramp rate, temperature curve and setpoint in NICOS (via Lakeshore)	BIFROST	Cold commissioning	SRR
NIT-268	TO DO	BIFROST - Implement Oxford cryomagnet PVs in NICOS	BIFROST	Cold commissioning	SRR
NIT-267	TO DO	BIFROST - Implement all orange cryostat PV's in NICOS	BIFROST	Cold commissioning	SRR
NIT-266	TO DO	Retest of potentiometers	BIFROST	Cold commissioning	SRR
NIT-265	TO DO	Retesting of Goniometers	BIFROST	Cold commissioning	SRR
NIT-263	TO DO	Bifrost False Floor North Completion	BIFROST	Installation/SAT	SRR
NIT-250	TO DO	Revision of O&M Manual	BIFROST	Cold commissioning	SRR
NIT-249	TO DO	Addition and amendment of motion tags in the cave	BIFROST	Other	SRR
NIT-245	TO DO	Install BIFROST Side Plates	BIFROST	Installation/SAT	SRR
NIT-234	TO DO	Bifrost pneumatics error handling	BIFROST	Installation/SAT	SRR
NIT-232	TO DO	CUP Installation of IA Manifold	BIFROST	Installation/SAT	SRR
NIT-43	TO DO	Bifrost Spectrometer - As Built	BIFROST	Installation/SAT	SRR
NIT-42	TO DO	As Built - Guide and Frame in Cave	BIFROST	Installation/SAT	SRR
NIT-30	TO DO	Goniometers C.O.G problem fix	BIFROST	Installation/SAT	SRR
NIT-18	TO DO	Update O&M manual Bifrost Beryllium filter	BIFROST	Q-gate/FAT	SRR

1 – 23 of 23 filtered issues (287 hidden)



## List of NITs to be resolved before ORR

NSS Issue Tracker Tickets / Rich Filter Controller

Open

Done

Bunker

BEER

BIFROST

CSPEC

DREAM

ESTIA

FREIA

HEIMDAL

LOKI

MAGIC

MIRACLES

NMX

ODIN

SKADI

TBL

TREX

VESPA

No Instrument

NSS Issue Tracker Tickets / Rich Filter Results

Key	Status	Summary	Instrument	Issue source	To be resolved before
NIT-284	TO DO	BIFROST - deploy and test backend rack PDU control for RMM power cycling	BIFROST	Cold commissioning	TG6/ ORR
NIT-275	TO DO	BIFROST - implement sample environment and sensor IDs to be written in the nexus file	BIFROST	Other	TG6/ ORR
NIT-262	TO DO	BIFROST - Detector: Finetune firmware registries to maximize gamma suppression and efficiency	BIFROST	Cold commissioning	TG6/ ORR
NIT-261	IN REVIEW	BIFROST - Detector group to document He-3 PSD tube firmware	BIFROST	Cold commissioning	TG6/ ORR
NIT-260	TO DO	BIFROST - Test RMM timing using general NSS method	BIFROST	Cold commissioning	TG6/ ORR
NIT-259	TO DO	BIFROST - Implement setting firmware registries on individual DAQs	BIFROST	Cold commissioning	TG6/ ORR
NIT-258	TO DO	BIFROST - replace bad resistor on 2.7 meV, 2, detector module	BIFROST	Cold commissioning	TG6/ ORR
NIT-251	TO DO	Installation of Borated Poly Plug in Cave Wall	BIFROST	Cold commissioning	TG6/ ORR
NIT-246	TO DO	Precision time stamping for motor positions	BIFROST	Cold commissioning	TG6/ ORR
NIT-243	TO DO	BIFROST Bunker chopper system Isolation not done	BIFROST	Other	TG6/ ORR
NIT-242	TO DO	BIFROST Cooling SAT document missing	BIFROST	Other	TG6/ ORR
NIT-231	TO DO	Bifrost - Beryllium Filter Adjustment System Amendments	BIFROST	Installation/SAT	TG6/ ORR
NIT-226	TO DO	Bifrost Cave SAT - Roof Beam Gaps	BIFROST	Installation/SAT	TG6/ ORR
NIT-224	TO DO	Bifrost Analyser - Performance Check	BIFROST	Installation/SAT	TG6/ ORR
NIT-144	TO DO	As-Built Drawings for MCAG Scope	BIFROST	Cold commissioning	TG6/ ORR
NIT-143	TO DO	Shutter Switch Junction Box	BIFROST	Cold commissioning	TG6/ ORR
NIT-142	TO DO	Amendment of Attenuator 1 Valve and Attenuator Tags	BIFROST	Cold commissioning	TG6/ ORR
NIT-82	TO DO	Bifrost BM4 - Magnetism	BIFROST	Installation/SAT	TG6/ ORR
NIT-35	TO DO	Change BIFROST BBGOA drawing title	BIFROST	Other	TG6/ ORR
NIT-29	TO DO	Stainless steel parts on BE filter	BIFROST	Installation/SAT	TG6/ ORR
NIT-21	TO DO	Change thrust screw to non-magnetic - Bifrost	BIFROST	Installation/SAT	TG6/ ORR

1 – 21 of 21 filtered issues (288 hidden)



Questions?