



Overview of Safety, Compliance, NCR & NIT

=ESS.NSS.H01.LOKI

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Instrument Hazard Analysis

ESS-1084771



The LoKI IHA identifies:

33 radiation hazards

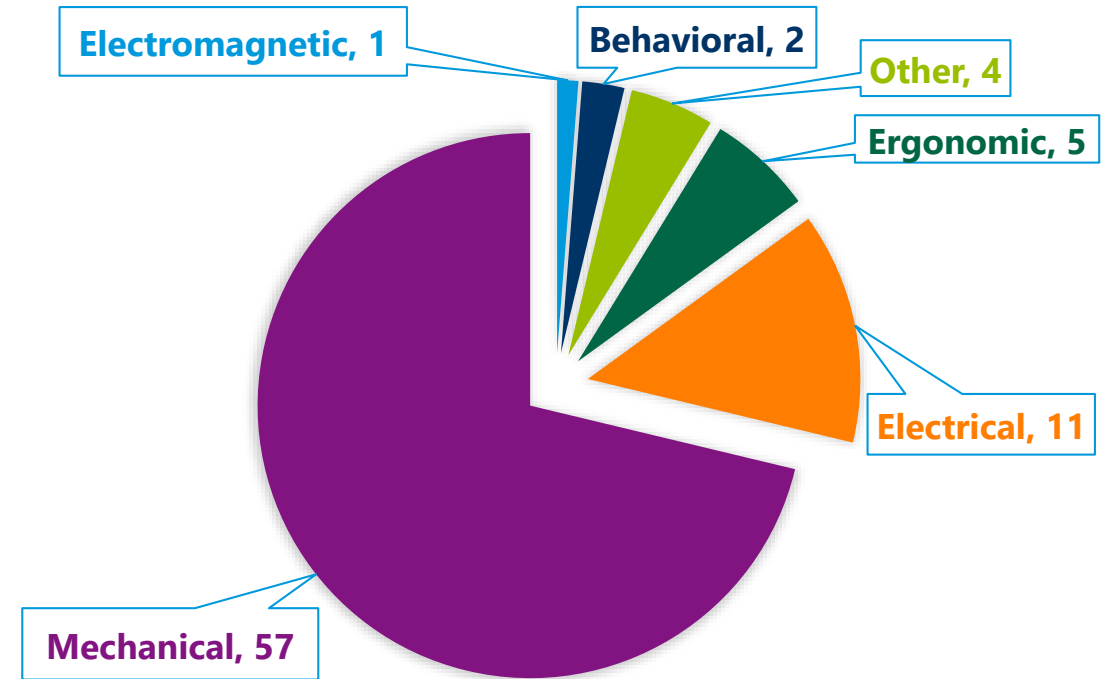
88 conventional hazards, of which

- 41 are hazards in normal operation
- 47 are hazards in maintenance

The Instrument Hazard Analysis (IHA) identifies hazards and assesses risk before and after mitigation. Equipment supplied with CE marking is supplied with operational instructions clearly stating intended use and hazards of operation and is not included in the IHA.

The IHA records any residual risks identified in equipment design risk assessments that require further mitigation.

The IHA includes risks that are not included in the design risk assessments and result from integration of the equipment or use of equipment outside its intended use.



Review of IHA for SAR has highlighted missing confirmation of implementation of mitigations. These **shall** be addressed for the iSRR

Compliance Summary

Key Systems



Equipment	FBS	Reference	Document Type
Chopper 1 (BWC)	=ESS.NSS.H01.LOKI.A01.R01.R01	ESS-3832266	DRA/Hazid
Chopper 2 (FOC)	=ESS.NSS.H01.LOKI.A01.R01.R03	ESS-3832267	DRA/Hazid
Guide System	=ESS.NSS.H01.LOKI.A01.W01.WH01	ESS-5261151	DRA/Hazid
Instrument Shutter	=ESS.NSS.H01.LOKI.A01.R03.R01	ESS-4170570	DRA/Hazid
Collimation System	=ESS.NSS.H01.LOKI.A01.R02.R01	ESS-4752105	DRA/Hazid
Slits Sets	=ESS.NSS.H01.LOKI.A01.R02.R01.R03	ESS-4913722	Declaration of Conformity
	=ESS.NSS.H01.LOKI.A01.R02.R01.R04		
	=ESS.NSS.H01.LOKI.A01.R02.R01.R05		
Collimation Vessel	=ESS.NSS.H01.LOKI.A01.R02.R01.C01	ESS-4752177	Third Party Inspection Certificate (EN13445)
Sample Snout	=ESS.NSS.H01.LOKI.A01.R02.R02	ESS-5072422	DRA/Hazid
Beam Validation System (Beam Monitors)	=ESS.NSS.H01.LOKI.A01.B01	ESS-5669206	DRA/Hazid
Sliding Door and Roof	=ESS.NSS.H01.LOKI.U01.A01	ESS-5562970	Declaration of Incorporation
	=ESS.NSS.H01.LOKI.U01.A02		
Sample Stack	=ESS.NSS.H01.LOKI.A02.W01	ESS-3972803	Declaration of Conformity
		ESS-3972802	Declaration of Incorporation
Window Safety Guard	=ESS.NSS.H01.LOKI.B01.C02.F01	ESS-5072425	DRA/Hazid
Detector Vessel	=ESS.NSS.H01.LOKI.B01.C02.C01	ESS-3524236	Third Party Inspection Certificate (EN13445)
Detector System	=ESS.NSS.H01.LOKI.B01.B01	ESS-5081613	DRA/Hazid
Detector System	=ESS.NSS.H01.LOKI.B01.B01	ESS-5485813	Safety and Compliance Report

Electrical Energisation



LoKI Racks

	LOKI
Detector	1(1)
CBMP	0
Chopper	2(2)
CUP	0
MCA	6(6)
Vacuum	5(5)
ICS network	3(3)
ICS PSG	2(3)
Instrument	1(1)
Sum(excl. CEP)	20(21)

95%

Missing PSS ODHDS Cabinet to be installed in 2027

Standalone ODH system is in place

Distribution board	Racks	Installed	Energized
Bunker distribution Board	Bunker distribution Board	yes	yes
Bunker distribution Board	Rack 1	yes	yes
Bunker distribution Board	Rack 2	n/a	n/a
Bunker distribution Board	VACUUM	yes	yes
Bunker distribution Board	MCC 1	yes	yes
Bunker distribution Board	ICS/IT RACK 1	yes	yes
Bunker distribution Board	PSS RIO ICC	yes	yes
Instrument Distribution Board	Instrument Distribution Board	yes	yes
Instrument Distribution Board	MCC 4	yes	yes
Instrument Distribution Board	Power door & roof	yes	yes
Instrument Distribution Board	socket box	yes	yes
Instrument Distribution Board	socket box	yes	yes
Instrument Distribution Board	socket box	yes	yes
Instrument Distribution Board	socket box	yes	yes
Instrument Distribution Board	socket box	yes	yes
Instrument Distribution Board	socket box	yes	yes
Instrument Distribution Board	socket box	yes	yes
Instrument Distribution Board	MCC 2	yes	yes
Instrument Distribution Board	MCC 3	yes	yes
Instrument Distribution Board	MCC 5	yes	yes
Instrument Distribution Board	Rack 3	yes	yes
Instrument Distribution Board	Detector Master rack(including 4 slaves)	yes	yes
Instrument Distribution Board	Hutch	yes	yes
Instrument Distribution Board	Vacuum Rack 2	yes	yes
Instrument Distribution Board	Socket box	yes	yes
Instrument Distribution Board	Jib crane	yes	yes
Instrument Distribution Board	Instrument goods lift	yes	yes
Instrument Distribution Board	socket box	yes	yes
Instrument Distribution Board	socket box	yes	yes
Instrument Distribution Board	socket box	yes	yes
Instrument Distribution Board	socket box	yes	yes
Instrument Distribution Board	socket box	yes	yes
Instrument Distribution Board	Vacuum Pumps	yes	yes
Instrument Distribution Board	Beam Monitor 1	yes	yes
Instrument Distribution Board	ICS/IT Rack 2	yes	yes
Instrument Distribution Board	Shutter Operator panel	yes	yes
Instrument Distribution Board	ICS/IT Rack 3	yes	yes
Instrument Distribution Board	REMS radiation monitor	yes	yes
Instrument Distribution Board	PSS PLC RACK	yes	yes
Instrument Distribution Board	PSS ODHDS RIO cabinet	no	no
Instrument Distribution Board	Skid HVAC Hutch	yes	yes
Instrument Distribution Board	Vac Pump 2	yes	yes
Instrument Distribution Board	Vac Pump 3	yes	yes
Instrument Distribution Board	Sample Area lighting	yes	yes
Instrument Distribution Board	Detector Vessel lighting	yes	yes

Non-Conformity Reports

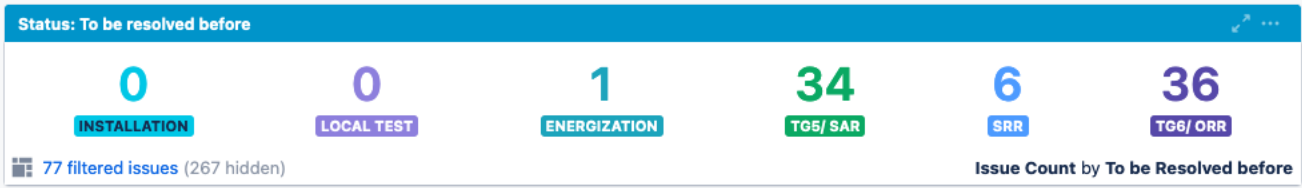


NC #	Description	Status
10567	Non compliance with ESS quality regulations General poor welding quality and lack of welding management system acc to ISO 3834.	Awaiting replacement of cooling skid/manifold
10562	The load bearing limit in the LOKI hutch should not exceed 4kn/m2. However, the electrical cupboards have a total weight of 480kgs which exceeded the limit. Further studies have been performed and it resulted that the total weight on the roof can be accepted with this deviation. However, the actions to be taken is to ensure that no extra weight should be on top of the roof. Suggested actions: Put on signs at the roof rails stating no extra load or weight to be placed.	Sign placed on roof rails. NCR Closed
10500	Documentation is missing to ensure the equipment (Sample Area) is meeting the legal requirements. The items has already been installed. Before SAT the Instrument team should ensure ISIS either provides the documentation that is missing showing they are fulfilling the electrical/ machinery safety. Or they sign a Declaration of Incorporation of the parts ESS can't themselves verify.	In discussion with Q division to obtain list of what is missing.
10482	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-5460624 Instrument shutter test report	Documentation provided. Awaiting decision.

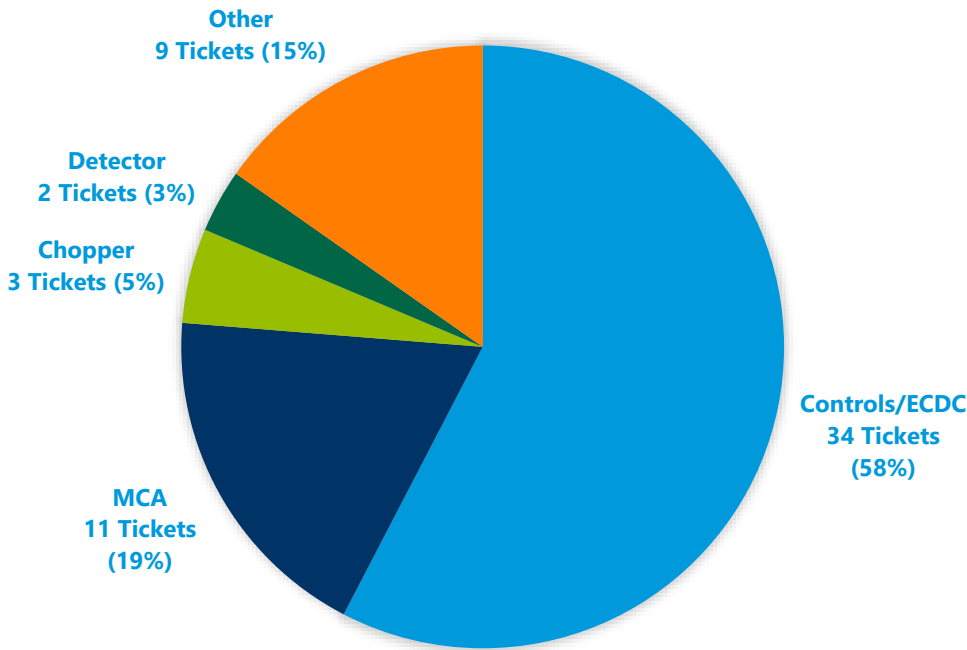
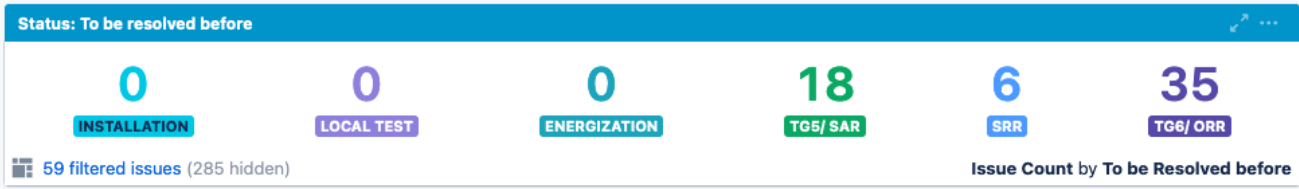


NSS Issue Tracker Tickets

77 Total Issues



59 Unresolved Issues



Majority of tickets resulted from Integrated Testing

This is where the high-level controls were first tested on LoKI

Under-specification of requirements combined with relatively recent, significant, changes in personnel in ECDC contributed to the apparently large number of issues.

However, may are small simple fixes but we did not push them “on-the-fly” in order to maintain a proper management of software testing and deployment.