



Operations and Maintenance Documents Status

LOKI Instrument Safety Readiness Review Meeting

PRESENTED BY HANNAH BURRALL

2025-12-05

Overview



1. Maintenance Documentation
2. LoKI System Operation and Maintenance Manual
3. Maintenance Schedule & Log

2

Maintenance Documentation



Maintenance Documentation at SAR



ID	Title	Status
ESS-1108652	LoKI System Operation and Maintenance Manual	V1 Released V2 In Progress
ESS-3821018	LoKI Chopper Assembly & Maintenance Manual	Released
ESS-4170571	LoKI Heavy Shutter Operation and Maintenance Manual	Released
ESS-4751917	LoKI Collimator Selector Operation & Maintenance Manual	Released
ESS-4913707	Instruction Manual Loki Slits V2 221222	Released
ESS-5072417	Loki Snout System Operational Manual	Released
ESS-3861017	User manual 19113 Loki sample stack v2.pdf	Released
ESS-5072439	LoKI Window Guard operation & Maintenance Manual	Released
ESS-3475711	LoKI Detection Vessel Assembly & Maintenance Plan	Released
ESS-5081614	LoKI Detector System Operation & Maintenance Manual	Released
ESS-4771879	Operation and Maintenance manual -Goods lift - LoKI	Released
CHESS Folder	Local Crane LoKI Manuals	Released

The V2 system operation and maintenance manual is currently in progress and is regularly updated as additional systems are brought online, ensuring guidance remains current and comprehensive.

Maintenance Documentation at iSRR



ID	Title	Status
ESS-1108652	LoKI System Operation and Maintenance Manual	Released
ESS-3821018	LoKI Chopper Assembly & Maintenance Manual	Released
ESS-4170571	LoKI Heavy Shutter Operation and Maintenance Manual	Released
ESS-4751917	LoKI Collimator Selector Operation & Maintenance Manual	Released
ESS-4752107	Loki Collimation Vessel Assembly & Maintenance	Released
ESS-4913707	Instruction Manual Loki Slits V2 221222	Released
ESS-5072417	Loki Snout System Operational Manual	Released
ESS-3861017	User manual 19113 Loki sample stack v2.pdf	Released
ESS-5072439	LoKI Window Guard operation & Maintenance Manual	Released
ESS-3475711	LoKI Detection Vessel Assembly & Maintenance Plan	Released
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ESS-4771879	Operation and Maintenance manual -Goods lift - LoKI	Released
CHESS Folder	Local Crane LoKI Manuals	Released
ESS-5617311	Loki M0 M1 beam monitor Operational Manual	Preliminary

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LoKI System Operation and Maintenance Manual






LoKI: System Operation and Maintenance Manual

ESS-1108652


- Top-level descriptions for the safe operation and maintenance of LoKI
- A living document with relevant procedures updated as they are developed during cold- and hot-commissioning
- Intended for ESS staff and NOT external users
- All maintenance tasks must be carried out by qualified personnel following instructions within the relevant sub-system maintenance manuals and a specific Task Risk Assessment (TRA)



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LOKI: SYSTEM OPERATION AND MAINTENANCE MANUAL



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Note: This document release workflow focuses specifically on Sections 1–4. A subsequent review of the entire System Operation and Maintenance Manual will be conducted, including all relevant reviewers listed above.

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Template: Maintenance Manual (ESS-3585736 Rev. 1, Active date: Sep 13, 2021)


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- Version 2 release focused on Instructions for Operation (Sections 1-4) for iSRR
- Subsequence review to follow including all reviewers

Note: This document release workflow focuses specifically on Sections 1–4. A subsequent review of the entire System Operation and Maintenance Manual will be conducted, including all relevant reviewers listed above.


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1. SCOPE OF THIS DOCUMENT

This document contains top-level description of the instrument, together with links to relevant documents. The document is intended to be a living document developed during cold- and hot-commissioning.

Operation: The procedures listed in this document do not include standard ESS procedures described in detail elsewhere. Where appropriate, links are included.

Maintenance: All maintenance tasks must be described in the relevant sub-system manual of the Bunker (1) and a specific Task Manual.

2. SYSTEM CHARACTERISTICS AND INSTRUMENT

2.1. The top-level FBS for the instrument: The Instrument top level Facility Breakdown is the systems covered by this document.

Table 1: FBS for LoKI

FBS	
ESS.NSS.H01.LOKI	Lc
.G01	Me
.F01	Pe
.A01	Be
.F01	Sf
.R03	B4
.R01	Ni
.W02	B4
.R02	B4
.R02.R01	Cx
.R02.R02	Py
.B01	Be
.W01	Be
.W01.WH01	Ni
.W01.WH01.WH03	Gi
.W01.WH01.WH01	In
.W01.WH01.WH02	Bl
.W01.U01	Gi
.B01	Be
.B01	Ni
.C01	Ni
.C02	Ni
.A04	Si

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.A01	
.GM01	
.F01	
.G01	
.A02	
.W01	
.AS01	
.K01	
.U01	
.F01	
.JU01	
.A01	
.A02	
.K01	
.ND01	
.K02	

2.2. Overall documentation for the beam

Document Type
System Design Description (overall instrument)
CATIA Model in EPL
Table of Motion
PI&D
Radiation Safety Report
Instrument Hazard Analysis
CIDL

2.3. General relevant documentation

Document Type
Instrument User guide
NICOS User guide
Scipp general documentation
VISA user guide

3. PHYSICAL LOCATION

LoKI is located on port N7. The LBS is illustrated in Figure 1.

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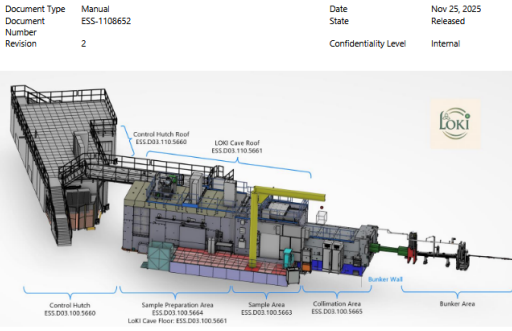


Figure 1: LoKI Layout and LBS IDs.

4. INSTRUCTIONS FOR OPERATION

Operation: The procedures listed in this document are intended for ESS staff and not external users. It does not include standard ESS procedures that are common across multiple instruments or are described in detail elsewhere. Where appropriate links to these standard procedures can be included.

For standard procedures see:

- ESS Handbook for Engineering Management of Personnel Safety Systems ([ESS-0469185](#)) [13]
- ESS Handbook for Radiation Protection Chapter 4. Work with Ionising Radiation ([ESS-0239720](#)) [14]
- Utilities maintenance ([ESS-5030639](#)) [15]
- Lifting plans general crane operations ([ESS-0402063](#)) [16]

4.1. Overall Instrument Safety

All sample and sample environment specific safety considerations should be covered by an experimental safety document controlled through the user access system (see [ESS-0024112](#) sample handling procedure [17]).

The Instrument Hazard Analysis – IHA [8] details all the safety risks for the instrument and the implemented controls and mitigation measures.

This section covers only detail that is instrument specific and not covered in the general ESS procedures listed above.

4.1.1. LoKI PSS System

The detailed design specifications for the LoKI Personal Safety System (PSS) are described in [ESS-4077557](#) [18] and the Interface Control Document, [ESS-2443067](#) [19]. A practical summary of system operations for LoKI personnel is provided in the Operations Manual, [ESS-5914785](#) [20].

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Overall Instrument Safety

- [ESS-1084771](#): LoKI Instrument Hazard Analysis

LoKI PSS System

- [ESS-4077557](#): Detailed Design Specification for LoKI Personnel Safety System
- [ESS-2443067](#): Interface Control Document for LoKI Personnel Safety System
- [ESS-5914785](#): Operations Manual for LoKI Personnel Safety System

LoKI Motion Safety System

- [ESS-0114726](#): LoKI Table of Motion (sheet 3)

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Production Mode (General Access Allowed)

- During normal instrument operation
- General personnel access to cave is permitted
- Used for routine data collection where all safety systems are active, no hazardous innervations are planned
- Small maintenance activates are permitted in this mode (ex. opening false floor tiles, maintenance of Julabos, pumps, valves, etc.)

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Production Mode (General Access Allowed)

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4.1.2. LoKi Motion Safety System

See LoKi IHA [8] and LoKi Table of Motion (sheet 3) [4] for this version, but the final document will be published by MCA. As of now, we have Emergency Stop buttons installed for detector motion and sample area motion.

4.2. Overall Instrument Operation Procedures

This section describes the general operating modes and high-level procedures for LoKi. These guidelines support the safe, consistent, and efficient operation of the beamline and serve as a reference for instrument team personnel during routine experiments and commissioning activities. Procedures should be validated and refined during cold and hot commissioning and updated as experience with the instrument grows. It is noted that all equipment at LoKi cave (including sample table, sample environment, and samples) is not permanently installed, where dismantling and reinstallation are expected during the operation.

4.2.1. Production Mode (General Access Allowed)

LoKi is running in production mode during normal instrument operation. In this mode, general personnel access to the instrument experimental cave is permitted while the instrument is operating.

This mode is used for routine data collection where all safety systems are active, and no hazardous interventions are planned. Experimental areas, sample environments, and beamline equipment are functioning within standard operational limits, and interlocks ensure safe conditions for both staff and visitors in the cave.

Small maintenance activities are permitted in this mode, such as opening false floor tiles for equipment inspection and routine maintenance of auxiliary equipment such as Julabo water baths, pumps, valves, and other related equipment.

Maintenance of the window guard is not permitted when operating under this access mode. Refer to Section 6.2.3 of the PSS Operations Manual [20], which outlines the conditions that must be met for access to the sample area when the window guard is open: the detector vessel must be at atmospheric pressure, and the vacuum pumps must be secured against re-energisation.

When general access is allowed in Production Mode, authorized personnel should ensure that:

1. The Heavy shutter is in Closed position (see [20] and Figure 2 & Figure 4).




Figure 2: Shutter Operator Panel.

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Figure 3: Window Guard Status Readout in the (a) LoKi Instrument OPI and (b) NICOS.

3. Observe radiation monitors and the ODH monitor at the cave entrance before entering the cave (see Figure 4Error Reference source not found).

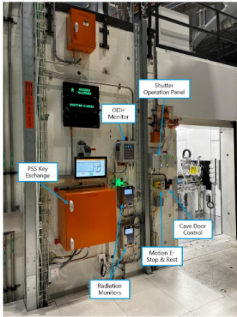


Figure 4: Entrance to LoKi Cave.

4. Motion safety systems are properly engaged (implementation and verification to be developed by MCA).

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5. In the presence of energized equipment, ensure that no electrical hazards exist on any touchable surfaces.

6. If water cooling is in use, ensure that there are no water leaks from either of the cooling water baths or the SKID, as shown in Figure 5.




Figure 5: Water cooling systems inside LoKi Sample Cave.

7. If the experiment is not compromised, turn on the lights to get clear visibility inside the cave, located to the right of the door entrance (see Figure 6).




Figure 6: LoKi Cave Light Switch.

8. The cave door shall be left open during this mode (see Figure 7).

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For the procedure to transition to Beam ON mode, refer to Section 6.1.3. of the PSS Operations Manual [20].

4.2.2. Maintenance Mode

Maintenance Mode is used for larger maintenance activities, such as removing shielding or servicing safety systems. In this mode, Lock Out Tag Out (LOTO) is not required for the heavy shutter, as the PSS interlocks can be relied upon to secure the area. However, if maintenance is required on PSS systems, the heavy shutter must be LOTOed. The universal rules and procedures for all instrument shutters are currently under development by NSS [23].

Authorized personnel must follow the appropriate access procedures for each of the five areas identified below:

4.2.2.1 Access to Bunker Equipment

Access to components inside the Bunker (see Figure 8) shall be performed remotely and handled in accordance with NSS procedures including the maintenance manual of the Bunker [11] and a specific TRA/RAMS for the task. For equipment specific maintenance see Section In-Bunker Components5.3.




Figure 7: LoKi Cave Entrance.

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Maintenance Mode

- Used for large maintenance activities
- Five areas identified:
 1. Access to Bunker Equipment
 2. Access to Bunker to Cave Equipment
 3. Access to Experiment Cave
 4. Access to Detector Vessel
 5. Access to Detector Utility Space

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Figure 8: LoKi In-Bunker Components.

4.2.2.2 Access to Bunker to Cave Equipment

There are three primary zones of equipment access within the bunker-to-cave shielding: Frame Overlap Chopper (FOC) System (Chopper 2), Collimator Selector and Guides, and Neutron Slits, all of which are shown in Figure 9 below.

Figure 9: Section view of bunker-to-cave shielding and associated equipment.

All the above equipment is located outside the bunker, so remote handling is not required. However, access to these systems involves the removal of beamline shielding, which is configuration controlled. Clearance from Radiation Protection (RP) is required prior to any shielding removal. Removal of shielding blocks requires an approved work order and a RADWORK permit.

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For detailed instructions on obtaining RP clearance to remove instrument shielding, see ESS Handbook for Radiation Protection Chapter 9 [27].

Once RP approval is granted via work order, the PSS Bunker-to-Cave shielding keystone (see Figure 10) may be removed by following the PSS procedure outlined in Section 6.6 of the PSS Operations Manual [20].

Figure 10: PSS bunker-to-Cave shielding keystone block.

Before removing the shielding blocks, the Motion Control & Automation Group (MCAG) must apply Lock Out Tag Out (LOTO) to Motion Control Cabinet 2. Alternatively, and subject to a task risk assessment, MCAG may install a temporary safety system appropriate for the required activities. For further details, refer to the Motion Safety documentation, which is currently under development.

For sub-system-specific operation and maintenance instructions, refer to Section 5.4, 5.5, 5.6 and 5.7.

4.2.2.3 Access to Experiment Cave

Access to the experiment cave for maintenance activities that do not involve operating the Window Guard may be performed using normal operation access mode (see Section 4.2.1). Additional requirements apply for maintenance on the Window Guard, including that the detector tank is vented to atmospheric pressure and the vacuum pumps are interlocked via the PSS key exchange box (see Section 6.2.3 of the PSS Operations Manual [20]).

Additional LOTO procedures are to be applied based on the task-specific risk assessment.

For sub-system-specific operation and maintenance instructions in the experiment cave, refer to Section 5.8, 5.9, 5.10 and 5.11.

4.2.2.4 Access to Detector Vessel

The Detector Vessel can be accessed via the side door or rear end cap (see Figure 11 below). For standard maintenance and servicing activities, the side door shall be used. A manually operated shielding door must be opened before access to the detector vessel door is allowed. For the key exchange procedure required to obtain access, see Section 6.2.2 of the PSS O&M manual [20].

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Figure 11: Access to the Detector Vessel via (b) side door or (c) rear end cap.

A maximum of three personnel are allowed to work inside the detector vessel while the rear end cap is sealed. When the end cap is sealed, the vessel interior is classified as a confined space and requires adherence to the following access procedures:

1. Submission of a Work Order and TRA/RAMS via EAM.
2. Completion of the Confined Space Entry Log [28], which must be uploaded to the associated Work Order in EAM.
3. Notification of First Responders prior to entry to the vessel.
4. A watcher must be present outside the vessel whenever personnel are inside.

For non-standard maintenance activities or intervention requiring removal of the detector rear end cap, the rear end of the cave shielding blocks must be removed following RP procedures for shielding removal [27]. The removable rear end of the cave is described in the Sub-System Design Description of the End Station [29]. Once the end cap is removed, the vessel interior is classified as a restricted space, and the following access procedures must be adhered to:

1. Notification of First Responders prior to entry to the vessel.
2. A watcher must be present outside the vessel whenever personnel are inside.

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Prior to performing any maintenance activities on the detector motion systems, the Motion Control & Automation Group (MCAG) must apply Lock Out Tag Out (LOTO) to Motion Control Cabinet 5. Alternatively, and subject to a task-specific risk assessment, MCAG may install a temporary safety system appropriate for the required activities. For further details, refer to the Motion Safety documentation, which is currently under development.

4.2.2.5 Access to Detector Utility Space

Access to the vacuum feedthrough ports and detector patch panels in the detector utility space — located between the vessel exterior and the cave shielding (Figure 12) — requires removal of the rear end of the cave shielding blocks. The same procedure for removal of these blocks shall be applied as described in Section 4.2.2.4 Access to Detector Vessel.

Figure 12: (a) Detector Utility Space, outlined in red between the vessel exterior and cave shielding, provides access to (b) vacuum feedthrough ports and detector patch panels.

The utility space is classified as a restricted space and is subject to the same restricted space procedures outlined in Section 4.2.2.4 Access to Detector Vessel.

4.2.3. Sample & Sample Environment Installation and Removal

This procedure for the installation of the sample trolley on the sample stack is outlined in the SSDD of the Sample Exposure System [25]. Note that the Standard Operating Procedure (SOP) for operating the stack with the trolley is under development, as an additional motion enable switch is likely required. For all other activities involving specific Sample Environment Systems (SES), including lifting, installation, or removal, refer to the standing lifting procedure and the corresponding lifting plan for each SES.

1. Move sample stack to the "Equipment loading" position [26] (see Figure 13):
 - a. Move SampleStackX to 2,000 mm
 - b. Move SampleStackY to 198,000 mm
 - c. SampleStackZ to 53,750 mm

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Sample & Sample Environment Installation and Removal

- Procedure for installation of the sample trolley on the sample stack

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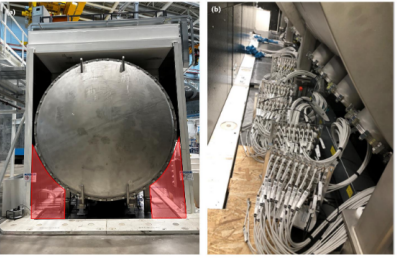


Figure 12: (a) Detector Utility Space, outlined in red between the vessel exterior and cave shielding, provides access to (b) vacuum feedthrough ports and detector patch panels.

The utility space is classified as a restricted space and is subject to the same restricted space procedures outlined in Section 4.2.2.4 *Access to Detector Vessel*.

4.2.3. Sample & Sample Environment Installation and Removal

This procedure for the installation of the sample trolley on the sample stack is outlined in the SSDD of the Sample Exposure System [25]. Note that the Standard Operating Procedure (SOP) for operating the stack with the trolley is under development, as an additional motion enable switch is likely required. For all other activities involving specific Sample Environment Systems (SES), including lifting, installation, or removal, refer to the standing lifting procedure and the corresponding lifting plan for each SES.

1. Move sample stack to the "Equipment loading" position [26] (see Figure 13):
 - a. Move SampleStackX to 2.000 mm
 - b. Move SampleStackY to 198.000 mm
 - c. SampleStackZ to 53.750 mm

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SampleStackZ		SampleStackX		SampleStackY	
Longitudinal Control		Cross-Sectional Control		Cross-Sectional Control	
Status	Not Moving No Alarm	Status	Not Moving No Alarm	Status	Not Moving No Alarm
RVV	53.750 mm	RVV	2.000 mm	RVV	198.000 mm
Target	53.750 mm	Target	2.000 mm	Target	198.000 mm
Step Ctrl	1.000 mm	Step Ctrl	3.000 mm	Step Ctrl	3.000 mm
User Limit	5.000 mm 290.000	User Limit	2.000 mm 120.000	User Limit	2.000 mm 198.000
Mag	None	Mag	None	Mag	None
STOP		STOP		STOP	

Figure 13: LoKI-MC4 OPI Display for Sample Stack X, Y, and Z Axes.

2. Lower ramp attached to the top plate of the sample stack (see Figure 14).

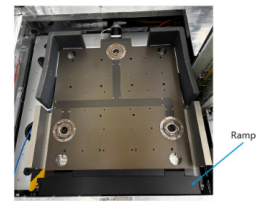


Figure 14: LoKI Sample Stack in Equipment Loading Position with Ramp Lowered.

3. Open the pneumatically actuated Kipp components by turning the IAR valve located to the left of the cave entrance (see Figure 15 and Figure 16).

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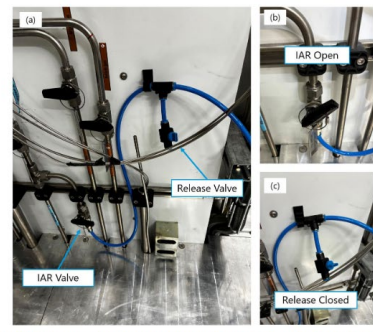


Figure 15: (a) Instrument air connections to Sample Stack Kipp components. To operate the Kippis: (b) open the IAR valve, and (c) close the release valve. Once the Kippis are open, turn off the air supply by closing the IAR valve.

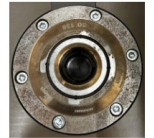


Figure 16: Sample Stack Kipp component open.

4. Wheel the trolley onto the top of the sample stack using the mini-pallet truck (see Figure 17).

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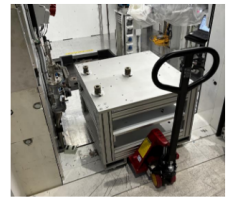


Figure 17: Sample Trolley installation Using Mini-Pallet Truck.

5. Once the trolley is lowered into place on the sample stack, release the air in the Kipp components to lock the alignment pins (see Figure 18). Note: Ear protection is recommended when releasing compressed air.



Figure 18: Open Release Valve to Sample Stack Kipp components to engage position locks.

6. With the trolley installed on the stack, raise the ramp and move the stack to the "Center Position" [26] for sample environment installation using standard lifting procedures through the roof hatch.
 - a. Move SampleStackX to 2.000 mm
 - b. Move SampleStackY to 100.000 mm
 - c. SampleStackZ to 53.750 mm
7. To remove the sample trolley, move the stack back to the "Equipment Loading" position [26] (see Figure 13), open the Kipp components to unlock the alignment pins, lower the ramp, and wheel the trolley out using the mini-pallet truck.

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Regular Alignment, Calibration and Data Reduction Procedures

- To be developed during Hot Commissioning

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3

Maintenance Scheduling & Logs



Maintenance Schedule & Log



	A	B	C	D	E
1	LoKI Maintenance Master Schedule				
2	System	Subsystem / Component	Maintenance Action	Frequency	Reference
3	BWC (Chopper 1)	System health checks	See Manual	1 year	ESS-1108652
4		Gaskets	See Manual	5 years	ESS-1108652
5	Heavy Shutter	HIF-125/320 Cylinder	Check that there is no grease leakage	1 year	ESS-4170571
6		Fabreeka Shock Absorber	Checking that the piston rod resets to its fully extended position, that there is no oil leakage and that the mounting brackets are still secure and undamaged	1 year	ESS-4170571
7		Hepco Rails/Bushings	Periodic checking of the installation is recommended whether oil or grease is used, in order to check that the bushing is not running dry	Periodic	ESS-4170571
8		Lifting Eye	Follow ESS Lifting standards.		ESS-4170571
9	FOC (Chopper 2)	System health checks	See Manual	1 year	ESS-1108652
10		Gaskets	See Manual	5 years	ESS-1108652
11	Collimator Selector Vacuum Vessel	Vacuum Vessel O-ring seal	Replace as required	As required	ESS-4751917
12		6x Port cover O-ring seals	Replace as required	As required	ESS-4751917
13		2x KF 40 O-ring seals	Replace as required	As required	ESS-4751917
14		3x DN160 ISO-K Seals	Replace as required	As required	ESS-4751917
15	Collimator Selector Guide Selector Assemblies	Motor assembly ball screw	Grease the motor assembly ball screw, Dow-Corning high vacuum grease (10-8).	2 years	ESS-4751917
16		IKO carriages, Kluberalfa HX83-302	Grease translation stage IKO carriages, Kluberalfa HX83-302	2 years	ESS-4751917
17		Guide Selectors 1 & 2	Guide Selectors 1 & 2, drive the translating assemblies through full range of travel	6 months	ESS-4751917
18	Collimator Selector Neutron Slits				ESS-4913707
19	Snout System	Linear guide carriages	Check grease and reapply to manufacturer recommendations if needed	3 years	ESS-5072417
20		Snout vessel sealing ring	Check for damage or wear and replace if required	1 year	ESS-5072417
21		Translating Mirror Linear shift mechanism leadscrew	Check grease and reapply to manufacturer recommendations if needed	1000 cycles or 3 years	ESS-5072417
22		Translating Monitor Linear shift mechanism leadscrew	Check grease and reapply to manufacturer recommendations if needed	1000 cycles or 3 years	ESS-5072417
23	Sample Positioner (Stack)	Z lead screws	Lubricate with Tribol GR 4020/460-2 PD	12 months	ESS-3861017
24		Z bevel gears	Lubricate with Tribol GR 4020/460-2 PD	12 months	ESS-3861017
25		X,Y lead screws	Lubricate with Tribol GR 4020/460-2 PD	24 months	ESS-3861017
26		X,Y Encoder readheads	Cleaning by wiping with mild alcohol solution	12 months	ESS-3861017
27		Z Encoder readhead	Cleaning by wiping with mild alcohol solution	24 months	ESS-3861017
28	Window Guard	Pneumatic Cylinder – Festo DNC-32-250-PPV-A	Check that there is no grease leakage	1 year	ESS-5072439
29			Checking that the piston rod resets to its fully extended position, that there is no oil leakage and that the mounting brackets are still secure and undamaged.	1 year	ESS-5072439
30		Hepco Rails/Bearings	The bearings are supplied greased for life. Periodic checking of the installation is recommended to prevent components from ceasing.	Periodic	ESS-5072439
31	Detector Systems	Vacuum environment	Check that the detector vacuum environment is maintained.	Daily	ESS-3475711
32		Vee rail and rack section used by rear carriage's 5 m travel	Lightly grease Vee contact surfaces and the rack gear teeth located on the underside of the rail. (See section 5.1.1 Lubrication:)	1 year	ESS-3475711
33		Hepco rails and carriage bearings	Periodic checking of the installation is recommended. Check that bearings and motion run freely. Many bearings used are maintenance free. Some of the occasional (maintenance use) linear rails are run dry.	Periodic	ESS-3475711
34		Beamstop mechanism	Lightly grease vertical rails. (See section 5.1.1 Lubrication:) Visually inspect belt for wear and replace if required.	When accessible	ESS-3475711
35			Check the oil – remember the maximum volume in the tank is when the table is fully lowered. Look for any oil leakage and ensure that spilt hydraulic oil is handled as hazardous waste	Weekly	ESS-4771879
36		Pinch guard frame	During lowering, press up the pinch guard frame and the table should stop immediately...when the pinch guard frame is activated. This should be done on all sides of the lift table.	Weekly	ESS-4771879
37		Axle fastening	Check that all axles are fastened correctly. Otherwise tighten the lock screws to the axle...with thread locking, for example, Loctite	Weekly	ESS-4771879
			Axle lubrication – the lubrication of bearings in cylinders MUST be done at least every 3000		
	<div> < > Master Schedule BWC (Chopper 1) Heavy Shutter FOC (Chopper 2) Collimator Selector Snout System Sample Positioner (Stack) Window Guard Detector Systems Goods Lift Instr ... + : </div>				



Maintenance Schedule & Log

LoKI Maintenance Master Schedule				
System	Subsystem / Component	Maintenance Action	Frequency	Reference
BWC (Chopper 1)	System health checks	See Manual	1 year	ESS-1108652
	Gaskets	See Manual	5 years	ESS-1108652
Heavy Shutter	HIF-125/320 Cylinder	Check that there is no grease leakage	1 year	ESS-4170571
	Fabreeka Shock Absorber	Checking that the piston rod resets to its fully extended position, that there is no oil leakage and that the mounting brackets are still secure and undamaged	1 year	ESS-4170571
	Hepco Rails/Bushings	Periodic checking of the installation is recommended whether oil or grease is used, in order to check that the bushing is not running dry	Periodic	ESS-4170571
	Lifting Eye	Follow ESS Lifting standards.		ESS-4170571
FOC (Chopper 2)	System health checks	See Manual	1 year	ESS-1108652
	Gaskets	See Manual	5 years	ESS-1108652
Collimator Selector Vacuum Vessel	Vacuum Vessel O-ring seal	Replace as required	As required	ESS-4751917
	6x Port cover O-ring seals	Replace as required	As required	ESS-4751917
FOC (Chopper 2) Required Maintenance Schedule				
System	Subsystem / Component	Maintenance Action	Frequency	Reference
FOC (Chopper 2)	System health checks	See Manual	1 year	ESS-1108652
	Gaskets	See Manual	5 years	ESS-1108652
FOC (Chopper 2) Maintenance Log				Last Updated: 11-Sept-2025
Subsystem / Component	Maintenance Action	Date Completed	Notes/Comments	Reference(s)
Right Cassette Spindle	Replace spindle with spare	12-18 February 2025	<ul style="list-style-type: none">• Cause for replacement: Distorted position signals observed from spindle• Require 36 mm socket attachemnt for rocker screw• Use cassette vacuum housing (SI-7617-929)• See LoKI FOC Removal_12.Feb.2025.ppt	ESS-3821018 ESS-3821010 - SI-7617-929
System health checks	See Manual	TBD 2026		ESS-1108652
Gaskets	See Manual	TBD 2030		ESS-1108652
Detector Systems	Hepco rails and carriage bearings	beings used are maintenance free. Some of the occasional (maintenance use) linear rails are run dry. Lightly grease vertical rails. (See section 5.1.1 Lubrication:) Visually inspect belt for wear and replace if required.	When accessible	ESS-3475711
	Beamstop mechanism	Check the oil – remember the maximum volume in the tank is when the table is fully lowered. Look for any oil leakage and ensure that spilt hydraulic oil is handled as hazardous waste	Weekly	ESS-4771879
	Pinch guard frame	During lowering, press up the pinch guard frame and the table should stop immediately...when the pinch guard frame is activated. This should be done on all sides of the lift table.	Weekly	ESS-4771879
	Axle fastening	Check that all axles are fastened correctly. Otherwise tighten the lock screws to the axle...with thread locking, for example, Loctite Axle lubrication – the lubrication of bearings in cylinders MUST be done at least every 3000	Weekly	ESS-4771879

Thank You!

