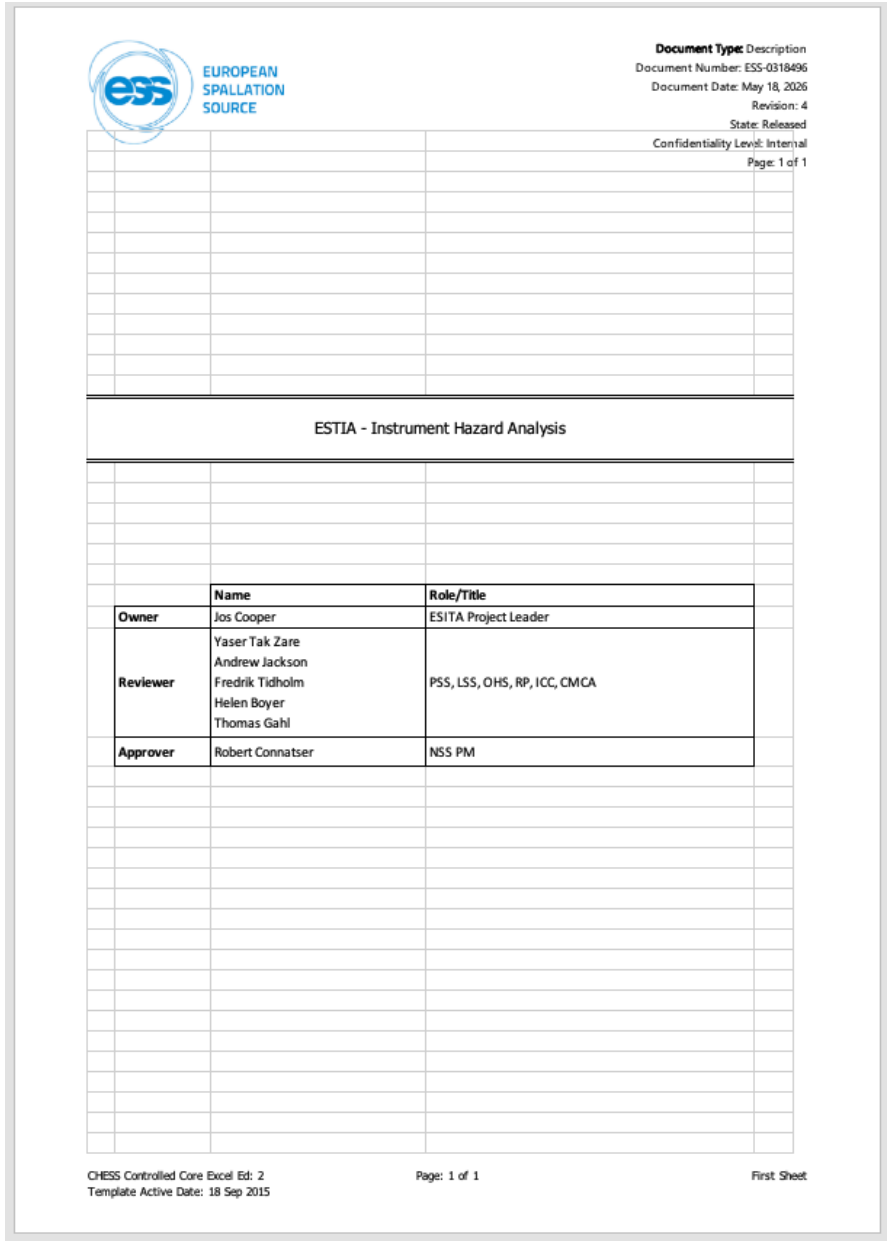
Overview of ESTIA Instrument Hazard Analysis

PRESENTED BY JOS COOPER

ESTIA IHA: ESS-0318496



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Document Type: Description
Document Number: ESS-0318496
Document Date: May 18, 2026
Revision: 4
State: Released
Confidentiality Level: Internal
Page: 1 of 1

ESTIA - Instrument Hazard Analysis

	Name	Role/Title
Owner	Jos Cooper	ESITA Project Leader
Reviewer	Yaser Tak Zare Andrew Jackson Fredrik Tidholm Helen Boyer Thomas Gahl	PSS, LSS, OHS, RP, ICC, CMCA
Approver	Robert Connatser	NSS PM

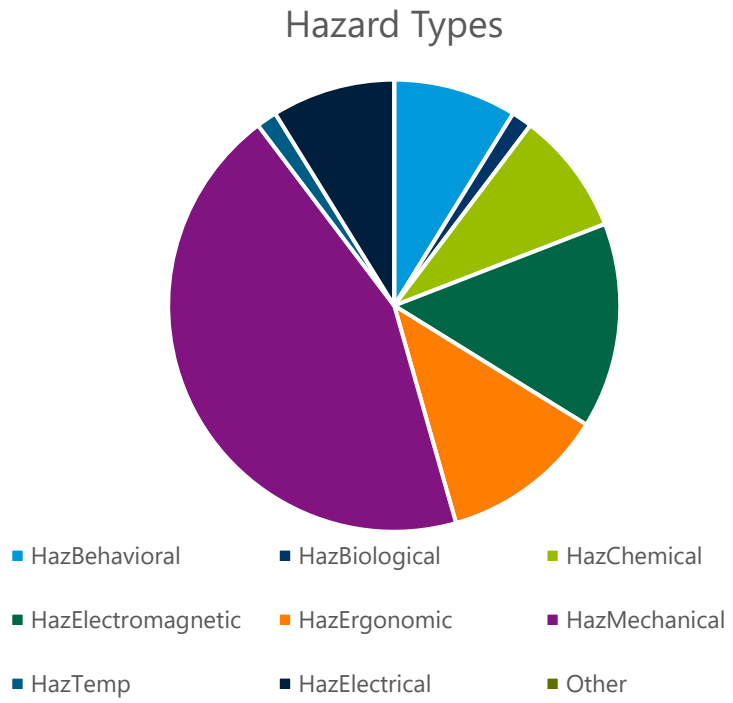
CHESS Controlled Core Excel Ed: 2
Template Active Date: 18 Sep 2015

Page: 1 of 1

First Sheet

IHA Overview

- 71 Conventional hazards
  - After mitigation:
    - Acceptable: 44
    - Tolerable: 27



- 42 Radiation hazards
  - Risk estimates:
    - H1: 22
    - H2: 10
    - H3: 7
    - H4: 3

H1 target risks all 1x10^-2

Area Risk Assessment

ESTIA Area Risk Assessment

EUROPEAN SPALLATION SOURCE

Document Type: Risk Assessment
Document Number: ESS-6037140
Document Date: Apr 15, 2026
Revision: 1
State: Released
Confidentiality Level: Internal
Page: 1 of 1

ESTIA Area Risk assessment

	Name	Role/Title
Owner	Felipe Lopes da Silva	ESTIA Instrument Operations Engineer
Reviewer	Tim Birkin	OHS Officer
	Grace Causer	ESTIA Instrument Scientist
	Joshaniel Cooper	ESTIA Instrument Scientist
Approver	Andrew Jackson	Head of Large Scale Structures Division

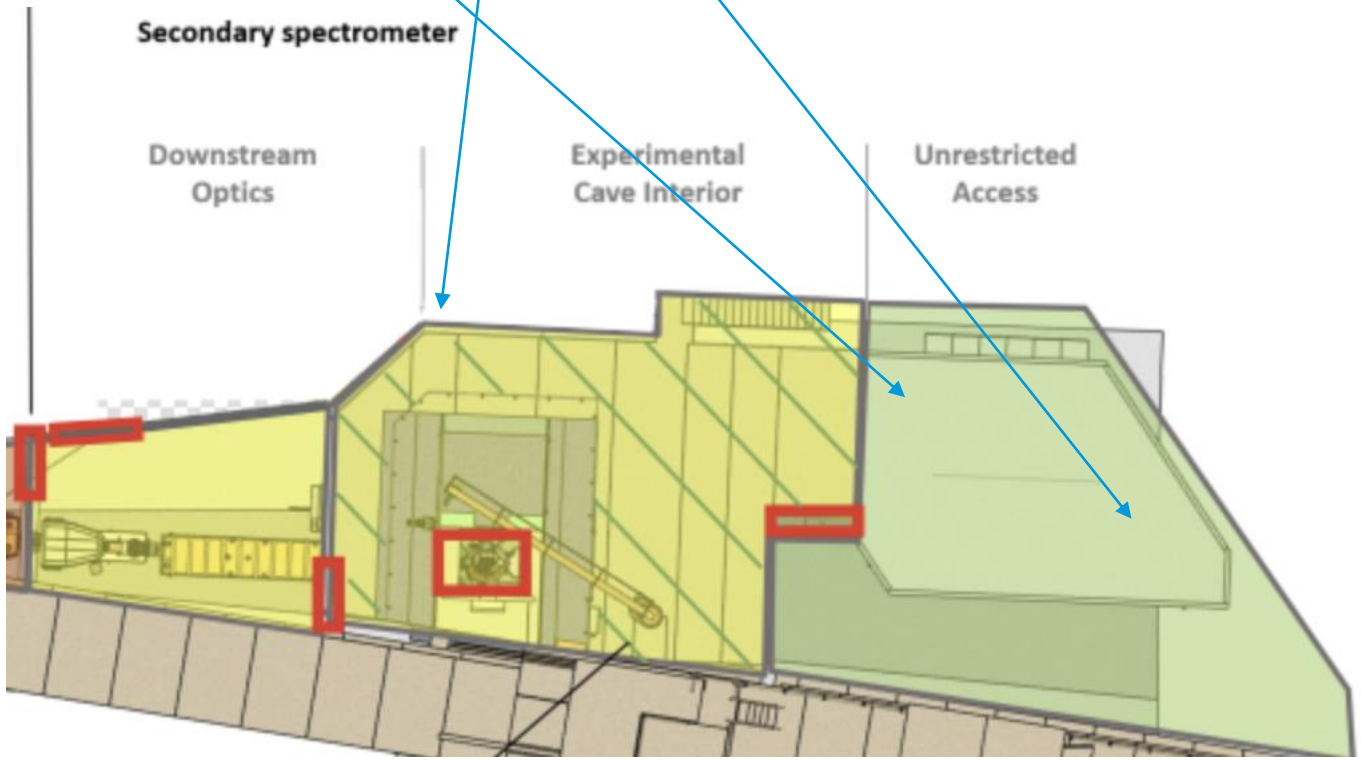
Chess Core Template Excel Rev: 5
Template Active Date: Feb 25, 2020

Page: 1 of 1

First Sheet

Considering the risks in the different areas of the instrument:

- Experimental area
- Sample preparation area
- Control hutch



Experimental Areas

ESTIA User Experimental Areas Risk Assessment

Area Classification: Laboratory

LBS: ESTIA cave area: D01.100.5312, ESTIA Cave roof: D01.110.5312, ESTIA cave entrance area: D01.100.5317, ESTIA bunker rack area: D01.100.5315, EST

HazId No.	Hazard Type	Is hazard present in the area?	Hazard description	What are the possible Consequence?	Initial rating			
					Severity	Likelihood	Risk H, M , L, A	
1	Electrical safety							
1.1	Is there any electrical equipment?	X	Electrical hazards are present due to energized instrument racks and control electronics, cable trays and cabling, motors, electrical outlets, and other energized sub-systems in the ESTIA cave, bunker rack area, cave wall rack area and on the roof of the cave.	Electric shock, burns, or fire on contact with live parts during maintenance, installation or alignment tasks. Faulty or damaged cabling leading to short circuits, sparking, or fire. Accidental activation of motors or other subsystems while personnel are working nearby.	4	3	H	Only quali procedure needed. F
1.2	Is there any residual voltage > 60 V, more than 1 second after switching off?	X	UPS present on PSS rack, detector rack, BM racks and roof hatch cabinet.	Electric shock, burns, or fire on contact with live parts during maintenance, installation or alignment tasks. Faulty or damaged cabling leading to short circuits, sparking, or fire. Accidental activation of motors or other subsystems while personnel are working nearby.	4	3	H	Only quali procedure needed. F
2	Fire & Chemical safety							
2.3	Flammable? (ie. Liquids, gases or dust)	X	Cleaning and maintenance fluids (IPA, glycol).	Skin/eye irritation, fire risk	3	2	L	Chemical h available; the drain,
2.3	Flammable?	X	Chemical Spill / Vapor: Spillage of IPA or	Spils, irritation, fumes	3	2	L	Spill kit av

Acceptable(A)	7
Low (L) Risk (Green)	15
Medium (M) Risk (Orange) Mitagation needed	16

Sample Preparation Area

ESTIA Sample Preparation Area Risk Assessment

Area Classification: Laboratory

LBS: D01.100.5311

HazId No.	Hazard Type	Is hazard present in the area?	Hazard description	What are the possible Consequence?	Initial rating			
					Severity	Likelihood	Risk H, M , L, A	
1	Electrical safety							
1.1	Is there any electrical equipment?	X	Energized equipment	Electric shock, burns, or fire	4	3	H	Only qualifie inspection, ap scheme.
2	Fire & Chemical safety							
2.1	Are there any substances that are toxic, oxidising, irritant, harmful, corrosive (if so, state which)	X	Sample cross-contamination or biological hazard	Invalid results, health hazard, equipment hazard, environmental hazard	3	2	L	Gloves, lab co the experime components u
2.3	Flammable? (ie. Liquids, gases or dust)	X	Cleaning and maintenance fluids (IPA, glycol).	Skin/eye irritation, fire risk	3	2	L	Chemical han available; suit
2.5	Dangerous for the environment?	X	Disposal of rags, cleaning solvents, and packaging	Contamination of environment, slip hazards	3	2	L	Segregated w
9	Hazard due to cold/heat/fire							
9.2	Are there any hot surfaces?	X	Wire bonder contains heating surface. Vacum pump might get hot	Injury, burn on hands	3	2	L	Warning sign

Acceptable(A)	3
Low (L) Risk (Green)	7
Medium (M) Risk (Orange) Mitagation needed	3

Control Hutch

ESTIA Control Hutch Area Risk Assessment

Area Classification: Office Space

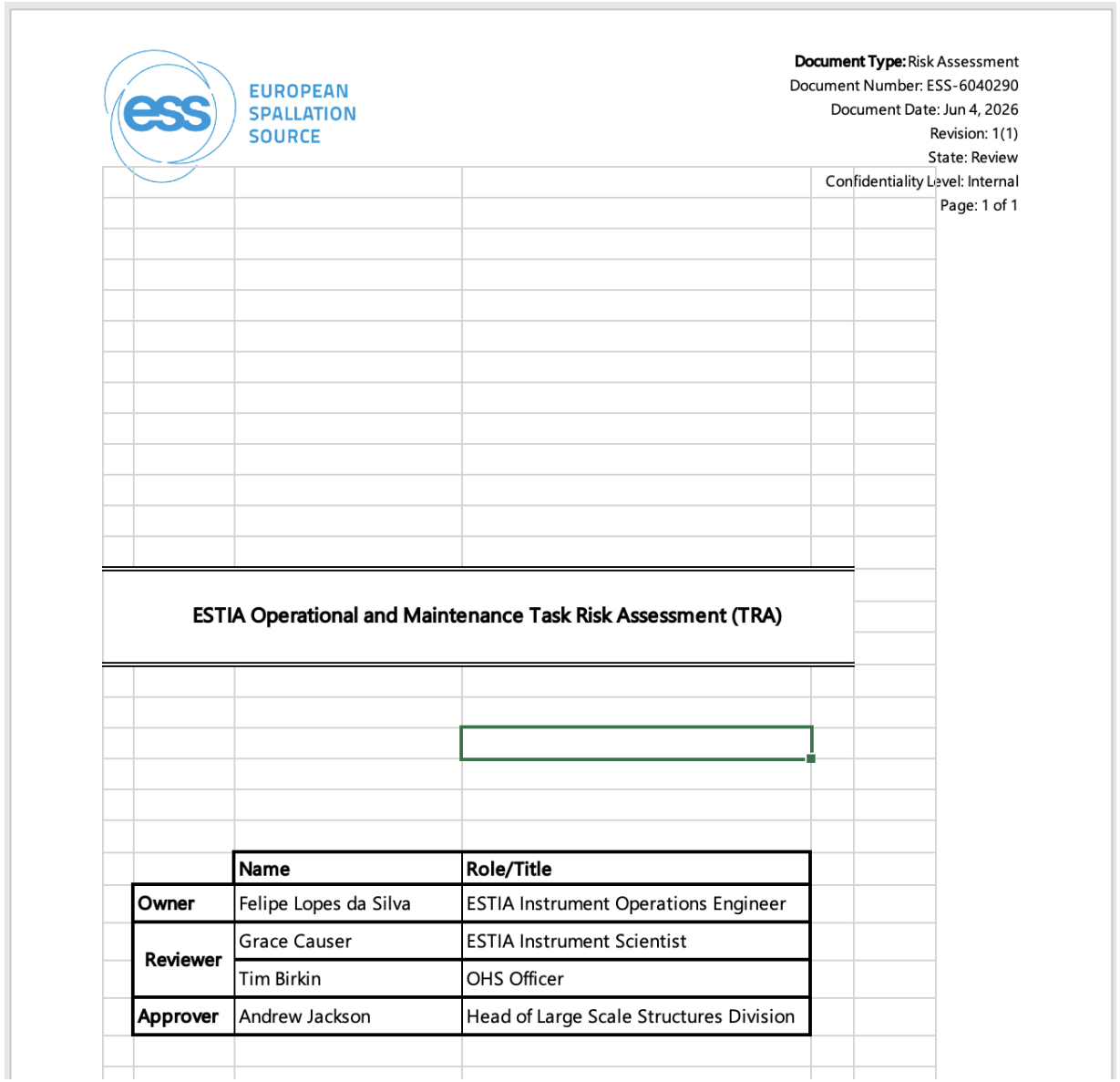
LBS: D01.100.5310

HazId No.	Hazard Type	Is hazard present in the area?	Hazard description	What are the possible Consequence?	Initial rating			
					Severity	Likelihood	Risk H, M , L, A	
1	Electrical safety							
1.1	Is there any electrical equipment?	X	Electrical equipment includes devices that operate using electricity, such as computers, monitors, TVs, network equipment, and other office electronics.	Risk of electric shock, overheating, or fire from computers, heaters, and network equipment	3	3	M	Ensure all de overloading s electrical sel
5	Ionizing radiation							
5.3	Activated or contaminated material?	X	Radiation (Controlled Area Context) - Activation of materials	Exposure to ionizing radiation	5	2	H	Area classifie
14	Workplace safety							
14.2	Is there any risk that limits evacuation?	X	Emergency Evacuation	Personnel may not respond appropriately, access doors blocked	4	3	H	Display emer clear access
14.5	Is there any risk of falling on the same level? (E.g. tripping, slipping)	X	Trip Hazards - Cables, bags, or equipment may obstruct walkways	Slips, trips, or falls leading to injuries such as sprains, fractures, or bruises, as well as potential damage to equipment.	3	4	M	Maintain clea covers; keep
14.7	Is there any noise emission?	X	Phone use or conversations, equipment from sample prep area or SKADI pump/compressor on the corridor outside	Phone use or conversations could affect concentration. Hearing damage (prolonged)	2	3	L	Keep noise to norms. meas

Acceptable(A)	2
Low (L) Risk (Green)	5
Medium (M) Risk (Orange) Mitagation needed	2

Task Risk Assessments

Operational and Maintenance TRA



EUROPEAN SPALLATION SOURCE

Document Type: Risk Assessment
Document Number: ESS-6040290
Document Date: Jun 4, 2026
Revision: 1(1)
State: Review
Confidentiality Level: Internal
Page: 1 of 1

ESTIA Operational and Maintenance Task Risk Assessment (TRA)

	Name	Role/Title
Owner	Felipe Lopes da Silva	ESTIA Instrument Operations Engineer
Reviewer	Grace Causer	ESTIA Instrument Scientist
	Tim Birkin	OHS Officer
Approver	Andrew Jackson	Head of Large Scale Structures Division

- This Task Risk Assessment (TRA) covers all general operational, maintenance, handling, and support activities performed on the ESTIA instrument.

- The TRA includes hazards associated with mechanical equipment, lifting operations, electrical systems, radiation protection, compressed air, thermal systems, hand tools, facility infrastructure, and general sample handling activities. The document shall be ready in parallel with the ESTIA Operational Area Risk Assessment (ESS-6037140).

Operational and Maintenance TRA

Task Risk Assessment (TRA)

Work package, Project or System: ESTIA Instrument (ESS.NSS.H01.ESTIA)
Area Coordinator (AC): Felipe Lopes da Silva
Responsible Manager (RM): Andrew Jackson

Ref. no	Location	What is the Task or Activity?	What is the Hazard?	What are the possible Consequence?	Who is affected?	Initial rating			Mitigations to control risk	Residual rating			F
						Severity	Likelihood	Risk H, M, L, VL		Severity	Likelihood	Risk H, M, L, VL	
1	D01 ESTIA	Moving around instrument, general access	Slips, trips, uneven floor, opened false-floor panels	Minor injury, sprain, fall	All personnel	3	3	M	Maintain clear walkways; secure false-floor panels; highlight open panels; good housekeeping. Refer to Area Risk Assessment (ESS-6037140), Access procedures in ESTIA O&M Manual (ESS-0318498) and ESTIA Local Rules for Safety (ESS-6037144)	3	1	L	
2	D01 ESTIA Control Hutch	Normal office work (documentation, planning, phone/email)	Ergonomic hazards; slips/trips; eye strain	Musculoskeletal discomfort; minor slips/trips; eye fatigue	All personnel working in control hutch	2	2	VL	Maintain good posture at workstation: use ergonomic chairs and desk setup; keep floor area clear; take periodic breaks from screen; ensure adequate lighting; Refer to Area Risk Assessment (ESS-6037140).	2	1	VL	
4	D01 ESTIA Control Hutch	Operating computers / instrument control systems (NICOS, Phoebus GUI, EPICS)	Ergonomic hazards; electrical hazards; repetitive strain; eye strain	Musculoskeletal discomfort; minor electric shock; eye fatigue; minor strain injuries	Authorized operators, ESTIA team personnel	2	2	VL	Use ergonomic workstation setup; maintain proper posture; take regular screen breaks; ensure computers and cables are properly installed and grounded; follow electrical safety rules. Refer to Area Risk Assessment (ESS-6037140)	2	1	VL	
5	D01 ESTIA	Manual handling of tools, small components, sample environments, samples, different equipment.	Strain, dropped object	Strain injury, minor cuts, damage to tools, samples, and sample environment	All authorized personnel	3	2	L	Workers must have received manual handling training and must follow best practice. Use proper lifting technique; ask for assistance with awkward loads; use gloves if needed	3	1	L	
6	D01 ESTIA	Use of standard hand tools (hex keys, spanners, screwdrivers)	Cuts, pinches, dropped tools	Minor injuries, tool damage	All authorized personnel	3	3	M	Inspect tools before use; wear appropriate PPE; store tools safely; avoid confined-space tool use	3	1	L	
7	D01 ESTIA	Operating instrument systems remotely (motion systems, detector arm, sample stage, etc.)	Unexpected motion; collision with components	Component damage	All authorized personnel	2	3	L	Use webcams to verify clearance; enable button with operator stop when moving systems from inside the cave, check Motion safety instructons: trained operators only; refer to ESTIA O&M Manual (ESS-0318498) and SOP (TBD)	2	3	L	
8	D01 ESTIA	Operating detector arm from within the cave	Unexpected motion; collision with components	Crush hazards, Pinch injuries, component damage	All authorized personnel	3	3	M	Hard stops to be implemented to avoid crushing hazard and machine damage (TBD). Motion area clearly marked on the floor with yellow and black tape. When moving systems from inside the cave, motion pendant must be removed from its location to enable the motion. Operator is responsible for ensuring the motion area is free from other people and motion is allowed. Check Motion safety instructons (TBD): trained operators only; refer to ESTIA O&M Manual (ESS-0318498) and SOP (TBD)	3	3	M	
9	D01 ESTIA	Operating sample stage from within the cave	Unexpected motion; collision with components	Pinch injuries, component damage	All authorized personnel	3	3	M	Enable button with operator stop required for when moving systems from inside the cave. Check Motion safety instructons (TBD): trained operators	3	3	M	

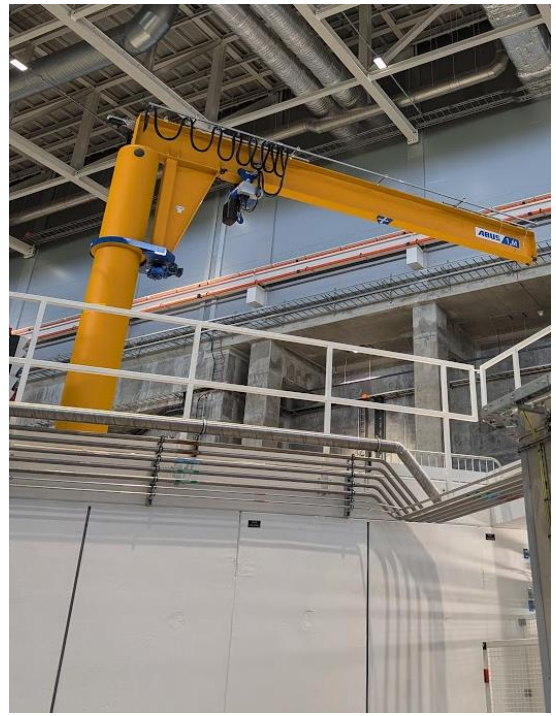
VL	2
L	15
M	4

Lifting Plan for Sample Environments

Task Risk Assessment (TRA)

Work package, Project or System: Installation of ESTIA Sample Environment Systems
Area Coordinator (AC): Felipe Lopes da Silva
Responsible Manager (RM): Andrew Jackson

Ref. no	Location	What is the Task or Activity?	What is the Hazard?	What are the possible Consequence?	Who is affected?	Initial rating			Mitigations to control risk	Residual rating			Fur
						Severity	Likelihood	Risk H, M, L, VL		Severity	Likelihood	Risk H, M, L, VL	
1	D01 ESTIA	Lifting sample environment and ancillary equipment from ground level to roof level within the designated lifting area (between SKADI Cave and ESTIA Hutch) using the ESTIA Instrument Crane.	Dropped load. Swinging load. Load collision. Lifting failure.	Severe injury, fatality, equipment damage	Authorized Crane Operators (ESTIA IOE & ESTIA IS & Rigging Team), nearby personnel	4	3	H	Follow Rigging Handbook guidelines; use certified lifting equipment; check load weight and condition of rigging equipment prior to lift; only trained & authorized operators; inform personnel inside ESTIA Cave of a lift taking place; establish and maintain an exclusion zone at the designated lifting area during the lift using the physical barrier; monitor and maintain sufficient distance of the load to supply/return pipes identified by hazard tape; disable crane once lift is completed; consult Rigging Team for infrequent lifts.	4	1	M	
2	D01 ESTIA	Transporting sample environment and ancillary equipment across the ESTIA Cave Roof using the ESTIA Instrument Crane.	Dropped load. Swinging load. Load collision. Lifting failure. Pinch points.	Severe injury, fatality, equipment damage, loss of alignment and/or calibration. Finger and or hand injury.	Authorized Crane Operators (ESTIA IOE & ESTIA IS & Rigging Team), nearby personnel	4	3	H	Follow Rigging Handbook guidelines; use certified lifting equipment; check load weight and condition of rigging equipment prior to lift; only trained & authorized operators; monitor and maintain sufficient load distance to facility and ancillary equipment stored on the ESTIA Cave Roof; disable crane once lift is completed; consult Rigging Team for infrequent lifts.	4	1	M	
									Follow Rigging Handbook guidelines; use certified lifting equipment; check load weight and condition of rigging equipment prior to lift; only trained & authorized operators;				



VL	0
L	5
M	7

Task Risk Assessments for Sample Holder

Task Risk Assessment (TRA)

Work package, Project or System: Single sample holder
Area Coordinator (AC): Felipe Lopes da Silva
Responsible Manager (RM): Andrew Jackson

Ref. no	Location	What is the Task or Activity?	What is the Hazard?	What are the possible Consequence?	Who is affected?	Initial rating			Mitigations to control risk	Residual rating		
						Severity	Likelihood	Risk H, M, L, VL		Severity	Likelihood	Risk H, M, L, VL
Installation of Single Sample Holder in ESTIA Cave manually (with assistance of a wheeled cart)												
1	D01 ESTIA	Moving sample holder system using wheeled cart	Loss of control; unstable load; uneven floor; tipping	Foot injuries, crush injury, equipment damage	Operators/ESTIA IOE & scientists	3	3	M	Ensure load is stable and centered; check wheeled cart condition; use slow controlled movements; maintain clear path; use spotter in narrow areas	3	1	L
2	D01 ESTIA	Moving wheeled cart over cable covers, thresholds, or uneven surfaces	Load shifting; sudden stop; pallet truck tipping	Equipment damage, loss of load, operator injury	Operators/ESTIA IOE & scientists	3	2	L	Inspect route beforehand; avoid transitions where possible; use ramps; push rather than pull; use slow controlled movements;	3	1	L
3	D01 ESTIA Cave	Steering or positioning wheeled cart in tight area in sample cave	Pinch points between sample table and objects/utilities in area	Equipment damage, loss of alignment/calibration, injury to personnel	Operators/ESTIA IOE & scientists	3	3	M	use slow controlled movements; maintain distance from walls/obstacles; awareness training; use guides/markings on the floor as visual aids	3	1	L
4	D01 ESTIA	Parking loaded wheeled cart in work/maintenance area	Wheeled cart rolling; obstruction causing trip	Trip hazard, equipment impact	Operators/ESTIA IOE & scientists	2	3	L	Only park the cart in the designated area; engage the brakes on the cart when parked	2	1	VL
5	D01 ESTIA Cave	Lifiting Single sample holder and connecting to the KIPP mounts on ESTIA sample stage	Loss of control, drop of loads, pinch points between single sample holder and sample stage	Equipment damage, Foot injuries, crush injury	Operators/ESTIA IOE & scientists	3	3	M	Less than 20 Kg load. Two people needed to perform the procedure: to lift the single sample holder and lock the KIPP mounts on sample stage.	3	1	L
Installation of Single sample Holder Auxiliary Equipment in Sample Cave												
	D01	Moving and connecting vacuum pump	Placement of the vacuum pump on its defined						Install vacuum pump on its pre-defined location, ensure connection is properly secured with vacuum pump/single sample			

VL	3
L	10
M	0

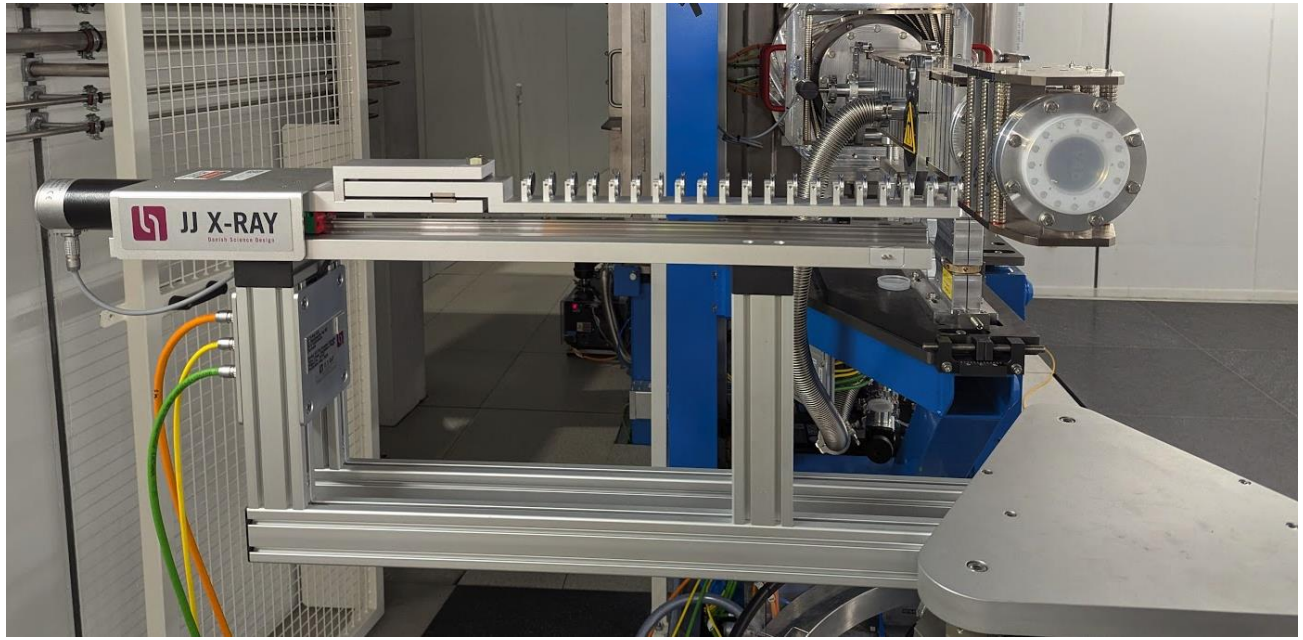
Task Risk Assessments for Sample Changer

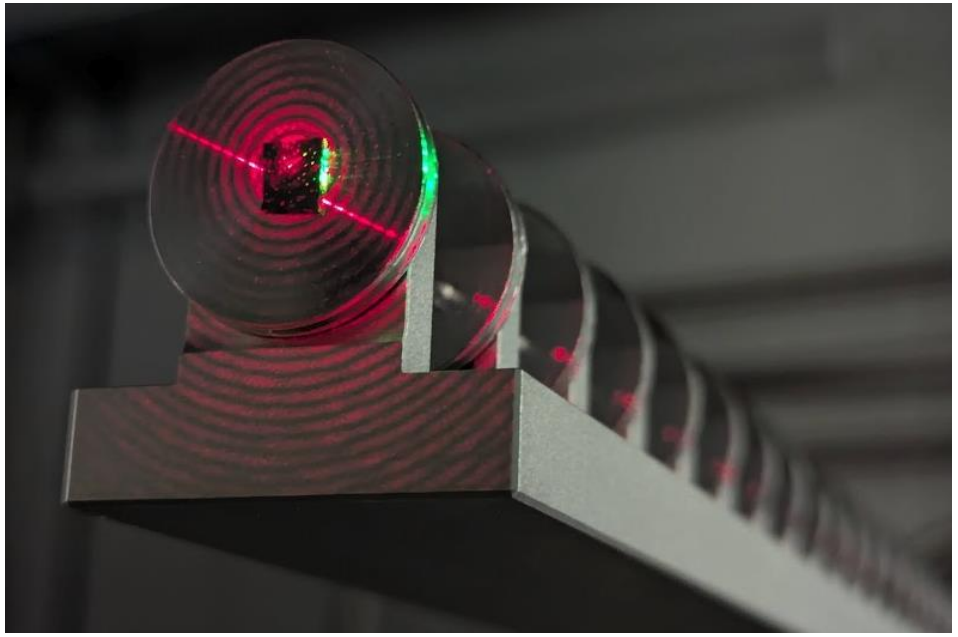
Task Risk Assessment (TRA)

Work package, Project or System: Room temperature (RT) sample charger
Area Coordinator (AC): Felipe Lopes da Silva
Responsible Manager (RM): Andrew Jackson

Ref. no	Location	What is the Task or Activity?	What is the Hazard?	What are the possible Consequence?	Who is affected?	Initial rating			Mitigations to control risk	Residual rating		
						Severity	Likelihood	Risk H, M, L, VL		Severity	Likelihood	Risk H, M, L, VL
Installation of Room temperature Sample changer in ESTIA Cave manually (with assistance of a wheeled cart)												
1	D01 ESTIA	Moving sample changer system using wheeled cart	Loss of control; unstable load; uneven floor; tipping	Foot injuries, crush injury, equipment damage	Operators/ESTIA IOE & scientists	3	3	M	Ensure load is stable and centered; check wheeled cart condition; use slow controlled movements; maintain clear path; use spotter in narrow areas	3	1	L
2	D01 ESTIA	Moving wheeled cart over cable covers, thresholds, or uneven surfaces	Load shifting; sudden stop; pallet truck tipping	Equipment damage, loss of load, operator injury	Operators/ESTIA IOE & scientists	3	2	L	Inspect route beforehand; avoid transitions where possible; use ramps; push rather than pull; use spotter; reduce speed	3	1	L
3	D01 ESTIA Cave	Steering or positioning wheeled cart in tight area in sample cave	Pinch points between sample table and objects/utilities in area	Equipment damage, loss of alignment/calibration, injury to personnel	Operators/ESTIA IOE & scientists	3	3	M	Operate slowly; maintain distance from walls/obstacles; awareness training; use guides/markings on the floor as visual aids	3	1	L
4	D01 ESTIA	Parking loaded wheeled cart in work/maintenance area	Wheeled cart rolling; obstruction causing trip	Trip hazard, equipment impact	Operators/ESTIA IOE & scientists	2	3	L	park in designated area; keep away from walkways	2	1	VL

VL	5
L	14
M	0





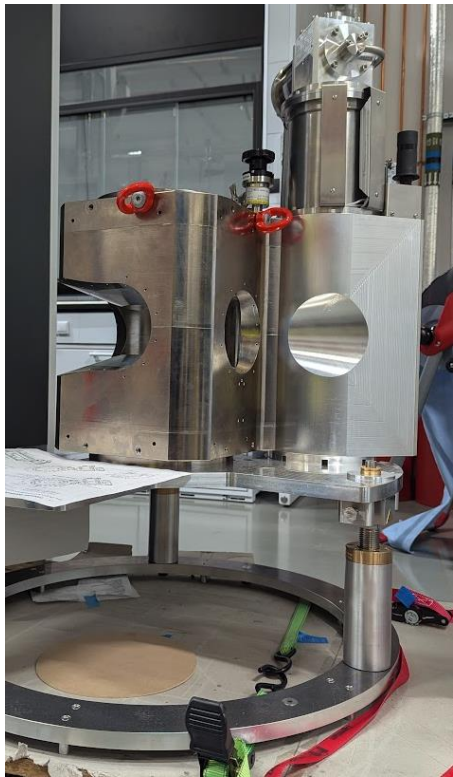
Task Risk Assessments for Magnet and Cryostat

Task Risk Assessment (TRA)

Work package, Project or System: Cryostat and magnet sample environment
Area Coordinator (AC): Felipe Lopes da Silva
Responsible Manager (RM): Andrew Jackson

Ref. no	Location	What is the Task or Activity?	What is the Hazard?	What are the possible Consequence?	Who is affected?	Initial rating			Mitigations to control risk	Residual rating		
						Severity	Likelihood	Risk H, M, L, VL		Severity	Likelihood	Risk H, M, L, VL
Installation of magnet and magnet auxiliary euipment in ESTIA Cave/cave roof using the crane												
1	D01 ESTIA	Lifting and installing magnet via ESTIA Instrument Crane	Dropped load / lifting failure, collision with nearby equipment or instruments, pinch points, crushing.	Severe injury, fatality, equipment damage	Authorized Crane Operators (ESTIA staff, SE staff & Rigging Team)	4	3	H	If needed In-cave optics module nozzle can be removed. Protect Sapphire vacuum window with protective cover, follow SOP and the operations and maintenance (O&M) manual (ESS-0318498). Refer to lifting plan TRA (ESS-6043378). Use certified lifting equipment; trained & authorized operators and spotters; check load weight and rigging; establish exclusion zones during lifts; follow Rigging Handbook guidelines; consult Rigging Team for infrequent lifts. Check magnet manual for lifting instructions (ESS-5509454).	4	1	M
2	D01 ESTIA	Lifting and installing magnet via ESTIA Instrument Crane	Magnetic force between ESTIA permanent magnets (guide field) and Iron Yoke of the HTS 110 magnet	Severe injury, equipment damage, pinch hazard	Authorized Crane Operators (ESTIA staff, SE staff & Rigging Team)	4	3	H	Before first energisation of the magnet and after any major modification to the instrument the magnetic force field must be measured. If needed In-cave optics module nozzle can be removed. Protect Sapphire vacuum window with protective cover, follow SOP and the operations and maintenance (O&M) manual (ESS-0318498).Refer to lifting plan TRA (ESS-6043378). Use certified lifting equipment; trained & authorized operators	4	1	M

VL	12
L	10
M	7



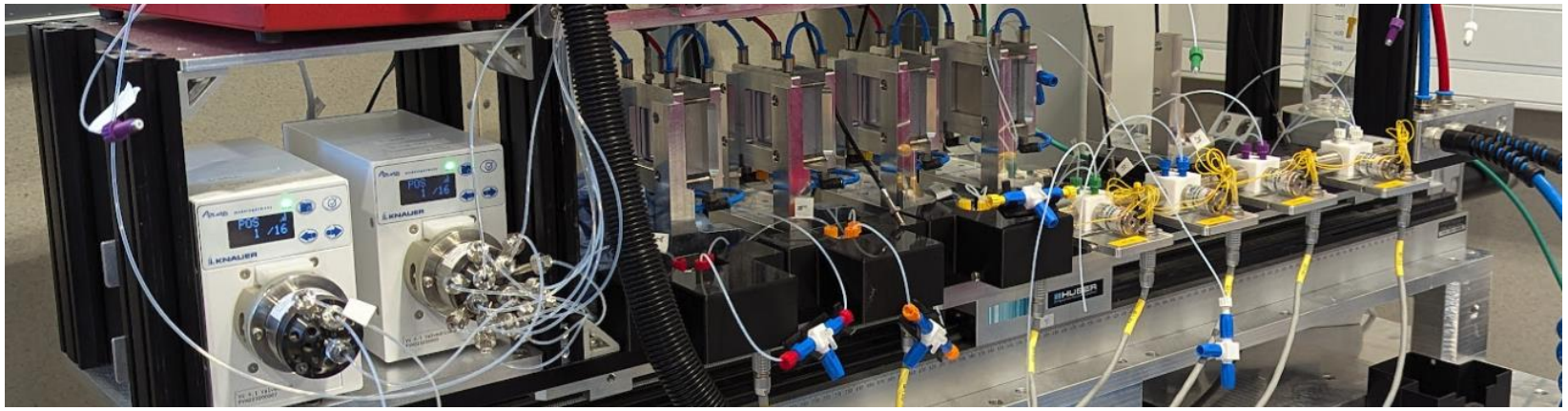
Task Risk Assessments for Solid Liquid Cell Changer

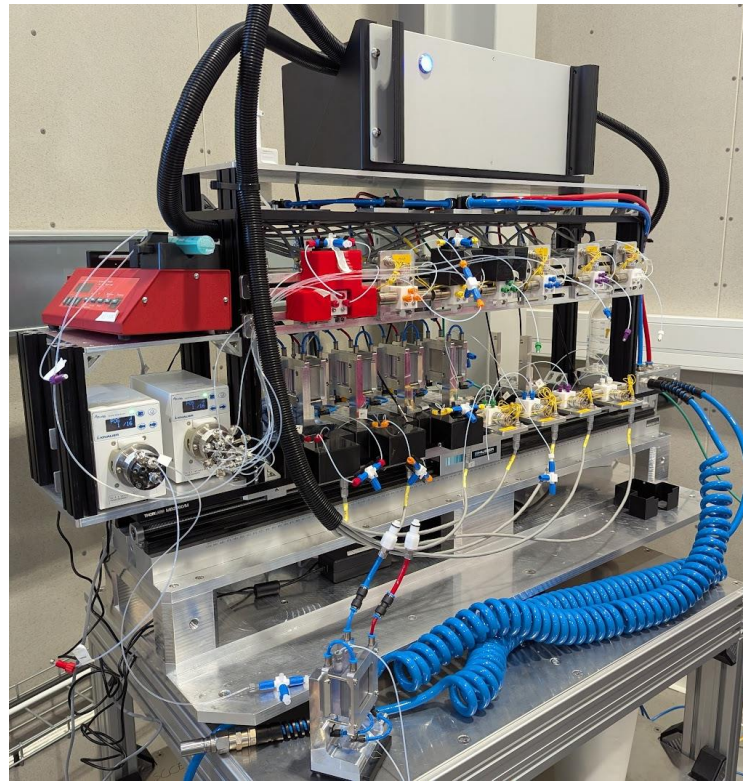
Task Risk Assessment (TRA)

Work package, Project or System: Solid Liquid Cell (SLC) sample changer
Area Coordinator (AC): Felipe Lopes da Silva
Responsible Manager (RM): Andrew Jackson

Ref. no	Location	What is the Task or Activity?	What is the Hazard?	What are the possible Consequence?	Who is affected?	Initial rating			Mitigations to control risk	Residual rating		
						Severity	Likelihood	Risk H, M, L, VL		Severity	Likelihood	Risk H, M, L, VL
Installation of Solid-Liquid cell sample changer in ESTIA Cave using the crane												
1	D01 ESTIA	Moving SLC setup to the lifting area using the wheeled cart	Loss of control; unstable load; uneven floor; tipping	Foot injuries, crush injury, equipment damage	Operators/ESTIA staff/SE staff	2	3	L	Ensure load is stable and centered; check wheeled cart condition; ensure glassware and/or liquids are secured or removed before moving; use slow controlled movements; maintain clear path	2	1	VL
2	D01 ESTIA	Lifting and installing Solid Liquid Cell (SLC) via ESTIA Instrument Crane onto the KIPP mounts (L2) on hexapod	Dropped load / lifting failure, collision with nearby equipment or instruments, pinch points, crushing.	Severe injury, fatality, equipment damage	Authorized Crane Operators (ESTIA staff, SE staff & Rigging Team)	4	3	H	Refer to lifting plan TRA (ESS-6043378). Use certified lifting equipment; ensure glassware and/or liquids are secured or removed before lifting; trained & authorized operators and spotters; check load weight and rigging; establish exclusion zones during lifts; follow Rigging Handbook guidelines; consult Rigging Team for infrequent lifts. Check SLC manual for lifting instructions (ESS-4973471).	4	1	M
Installation of Solid-Liquid cell sample changer and ancillary equipment in ESTIA Experiment Cave												
3	D01 ESTIA	Moving SLC Ancillary equipment wheeled cart across entrance ramp into Estia Experiment Cave, or	Load shifting; unstable load; sudden stop; pallet truck tipping	Equipment damage, loss of load, operator injury	Operators/ESTIA staff/SE staff	2	2	VL	Inspect route beforehand; avoid transitions where possible; use ramps; push rather than pull; use spotter; use slow controlled movements	2	1	VL

VL	6
L	10
M	1





ESTIA Local Rules

Local Rules

The General Local Rules for the Experimental Halls apply here ESS-5666329

The Area Risk Assessment for D01+D03 Instrument Halls apply ESS-4751874

This notice identifies the local hazards present and highlights specific rules that apply to this area.

Refer also to the Experiment Safety Document (ESD) posted outside the cave.

Area	ESTIA
Area Responsible	Felipe Lopes da Silva (ESTIA IOE)
Telephone	+46 72 179 24 91
ESTIA Operational Area Risk Assessment	ESS-6037140

Hazard	Hazard Description	Specific Location & Rules
	General Danger Fara	There are multiple simultaneous operations taking place in the D01 Instrument Hall. **Remain alert and follow all posted signs.**
	Ionising Radiation Joniserande Strålning	Ionising radiation hazard may be present. **Follow access and ESS Sample Handling Procedure (ESS-0024112). Do not move or alter shielding without authorization from Radiation Protection.**
	Laser Beam Laser	A Class 3R laser is used for aligning the samples/sample environment in the experiment cave. **Follow ESS Rules for Laser Safety (ESS-0044704) and switch off when not in use.**
	Overhead Load Hängande last	The ESTIA crane, D01 overhead crane, and bunker crane are present and regularly operated in this area. **Remain aware of the cranes, keep clear of their operating zones, maintain contact with crane operators, and follow all posted safety procedures while the cranes are in use.**

Hazard	Hazard Description	Specific Location & Rules
	Oxygen Deficiency Hazard Risk för Syrebrist	Low oxygen level may occur in the experiment cave due to cryogenics. **If the Oxygen Deficiency Hazard (ODH) alarm in the experiment cave sounds, evacuate the experiment cave immediately.**
	Strong Magnetic Field Kraftigt Magnetfält	Health risks due to magnetic field (10 mT - max. 17 T) and time varying magnetic fields (~150kHz). Permanent magnets are present along the instrument inside the cave (10 mT) and on the Middle focus area (50 mT). Time varying magnetic fields (~150 kHz) are present on the Middle Fopcus area. Additional magnets may be temporarily installed (1.2 T – 17 T). **Do not enter if you have a pacemaker or other implanted Medical device (or respect the boundaries set by staff).**
	Crushing Klämrisk	Motion systems are present in the experiment cave area. The detector arm rotates on the precision floor. Risk of pinching body parts since the Sample Stage and Detector Arm axles drive into positions where confined spaces are created. **Maintain a safe distance from all motion systems and follow the guidance in the Motion Risk Assessment (ESS-5467337).**
	Low Temperature Låg Temperatur	Risk of cryogenic burns and tissue damage from liquid helium used in the cryostat sample environment may be present. **Read the user manual of the equipment used. Wear appropriate PPE including protective gloves and face masks.**
	Electrical Livsfarlig Ledning	Electrical hazards are present in the experiment cave and in the areas around control cabinets. **All electrical work must follow Rules for Co-ordination of Electrical Safety (ESS-0328120).**

Hazard	Hazard Description	Specific Location & Rules
	Moving Vehicles Fordon i rörelse	Forklifts and mobile elevated work platforms (MEWPs) may be present in the area around ESTIA. **Personnel must remain alert for forkliftsand MEWPs operating in the area.**
	Drop Fallrisk	Ground level, several false floor levels, and top of the cave. **Exercise caution and remain aware of the various working levels around the instrument area.**
	Obstacles Snubbelrisk	Trip hazards and general obstacles are present around ESTIA. **Stay aware of your surroundings and maintain good housekeeping.**
	Flammable Liquids Brandfarlig	Small quantities of flammable liquids may be present – e.g. Isopropyl alcohol (IPA). **Personnel handling chemicals must have chemical safety training. Any use requires a specific risk assessment. Keep flammables away from ignition sources.**
	Pressurized Cylinders Gasbehållare Under Tryck	Pressurized cylinders are located outside of the control hutch (under stairs near instrument racks and on the wall between ESTIA and SKADI). **Only trained and authorized personnel may handle pressurized cylinders.**

PPE					
					 PPD
State when required if not at all times	Required as per D01 ARA.	Required as per D01 ARA.	Required as per D01 ARA.	Depending on Task risk assessment	When radiation hazard is present

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