Shielding and Safety SAR

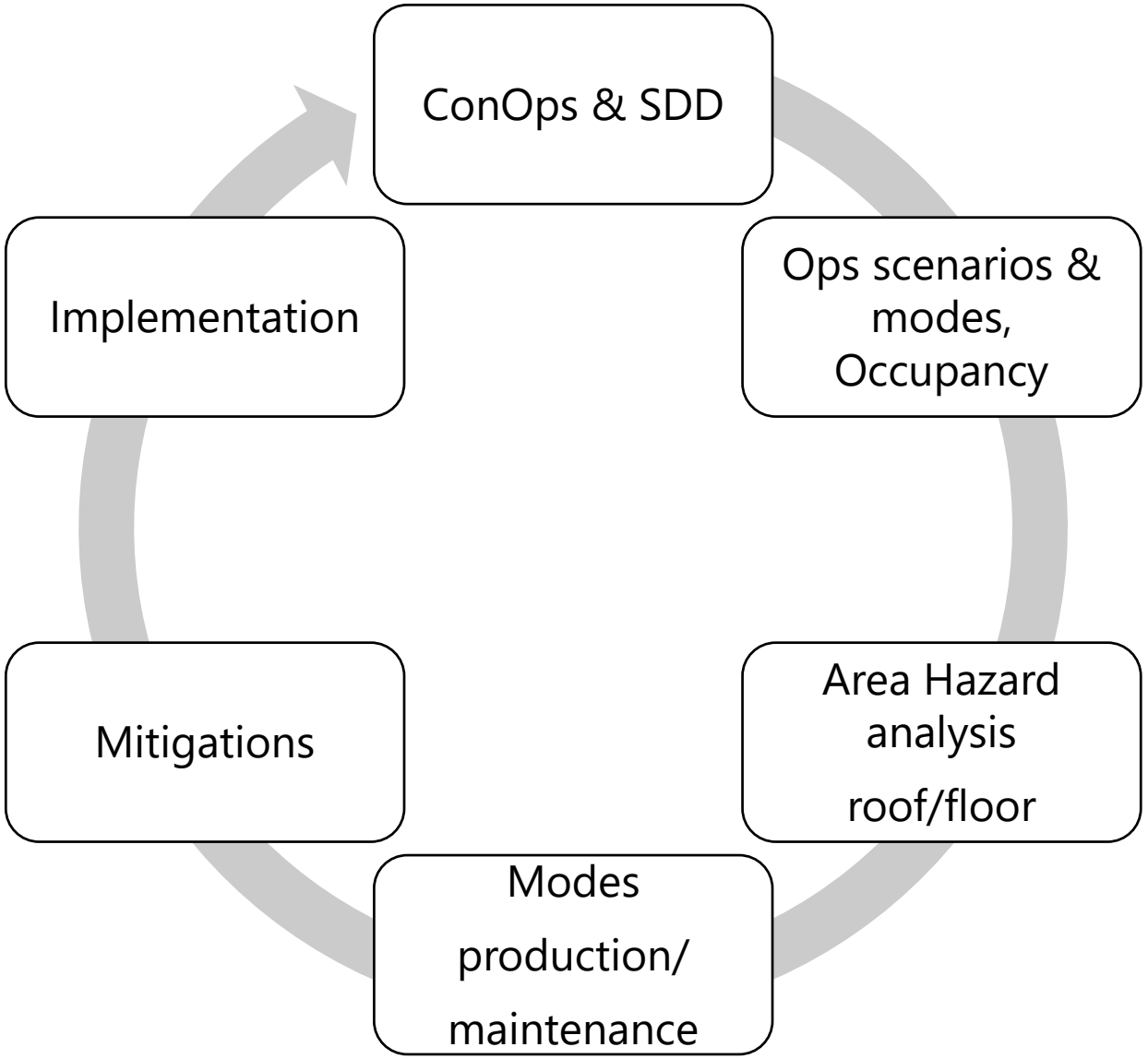
Conventional Safety

PRESENTED BY IAIN SUTTON

12/11/2025

Agenda

Methodology



Work Areas

Area Risk Assessment

Bunker Area Risk Assessment – ESS-5891887

Risks in operation

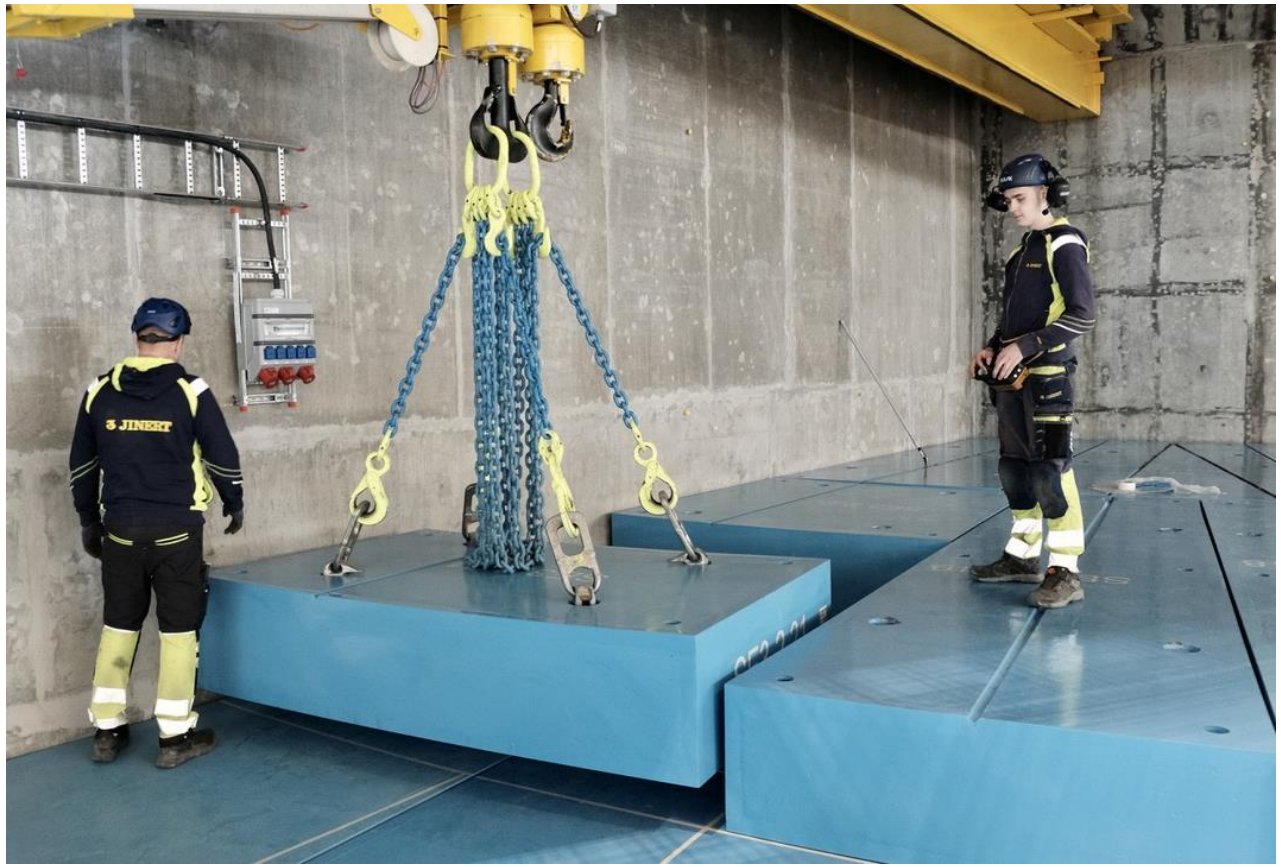
4 areas, 5 scenarios

1. Inside the bunker
2. On the bunker (with roof open)
3. On the bunker (roof closed)
4. Outside the bunker
5. On top of the shielding

Area I - Bunker roof (closed)

High Risk Hazards (before mitigation)

- Ionising radiation – see radiological safety talk
- Lifting – use of crane
  - Rigging and Lifting Handbook ESS-0402063
- Fall off edge of shielding
  - Fencing around bunker edge



Area I - bunker roof (open)

High Risk Hazards (before mitigation) 2

Ionising radiation – see radiological safety talk

- Residual radiation – shine
- Lifting – use of crane
  - Rigging and Lifting Handbook ESS-0402063
- Fall off edge of bunker
  - Fencing around bunker edge
- Fall into bunker
  - Use of fall restraint
  - Temporary barriers
- Access into bunker
  - Access method to be documented

Area II Beamline shielding roof

High Risk Hazards (before mitigation)

- Ionising radiation – see radiological safety talk
- Lifting – use of crane
  - Rigging and Lifting Handbook ESS-0402063
- Fall off edge of shielding
  - Harness / fall protection

Area III - Instrument hall

High Risk Hazards (before mitigation)

- Ionising radiation – see radiological safety talk
- Lifting – use of crane
  - Rigging and Lifting Handbook ESS-0402063
- Local construction site related hazards!

Area IV Inside bunker

High Risk Hazards (before mitigation)

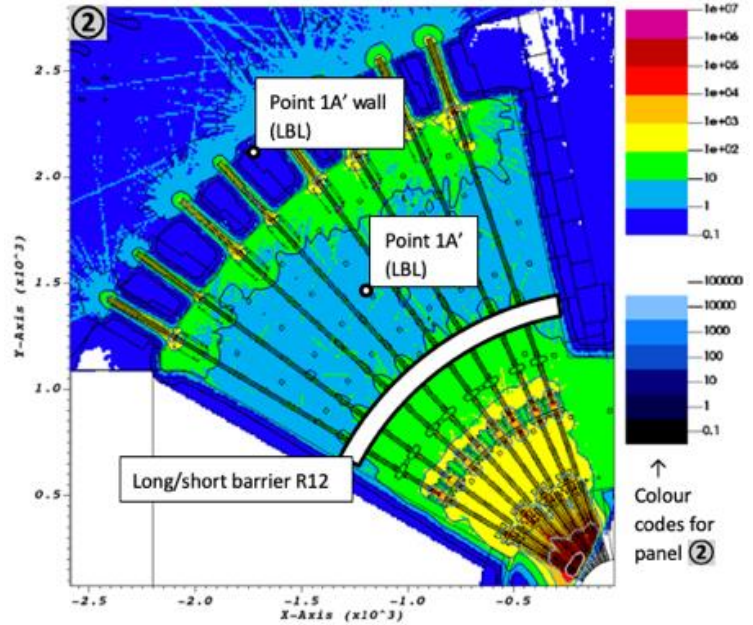
- Ionising radiation – see radiological safety talk
- Moving parts (choppers, shutters)
  - Choppers to be slowed down before entry (ESS-5864699 – local rules for SaSS)
  - Instrument Shutter lock-out
- Electrical hazards
  - Personal protective grounding
- ODH (beam monitors and NBPIs)
  - ODH analysis for NSS bunker ESS-5199475
  - Wear personal ODH
- Confined space;
  - Confined space rules – ESS-2071027
  - Rescue plan – to be prepared
- Poor lighting
- Lifting above bunker

Area IV

High Risk Hazards (Radiological)

Table 3-7 Ambient dose rates from residual radiation in Zones 1A and 1A', at specified times after shutdown (SD)

Time after SD	Dose rates at points in Figure 3-1, Figure 3-2 and Figure 3-3 (µSv/h)				
	Long beamline		Short beamline		At the LSS
	Point 1A	Point 1A'	Point $1A_{max}$	Point $1A_{min}$	Gamma beam
0 h	–	–	–	–	100-1000
2 h	–	–	–	–	10-100
6 h	400-700	10-100	100-1000	10-100	–
1 d	70-100	1-10	100-1000	10-100	–
2 d	–	–	–	–	1-10
4 d	40-70	1-10	10-100	1-10	–
7 d	40-70	1-10	10-100	1-10	–
10 d	–	–	–	–	0.1-1
30 d	40-70	1-10	10-100	1-10	–



ambient photon dose rates (µSv/h), long beamlines (LBL). From Figure

Outstanding actions

- Review Local rules
- Document the from roof access procedure
- Develop Rescue plan for inside Bunker
- Develop Familiarisation & Training material

Completion tracked with NITs

Finish presentation