



EUROPEAN
SPALLATION
SOURCE



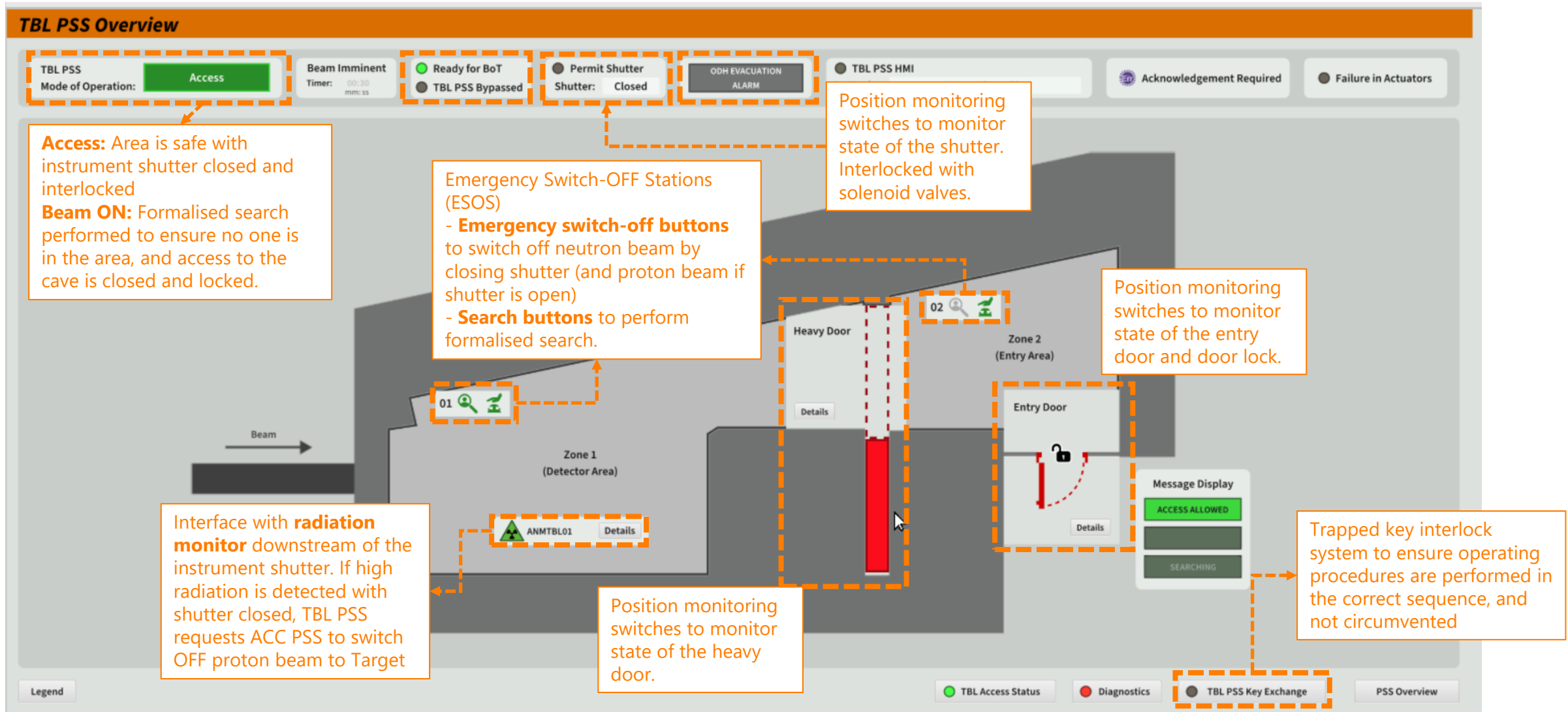
TBL Personnel Safety System

Instrument Safety Readiness Review for TBL

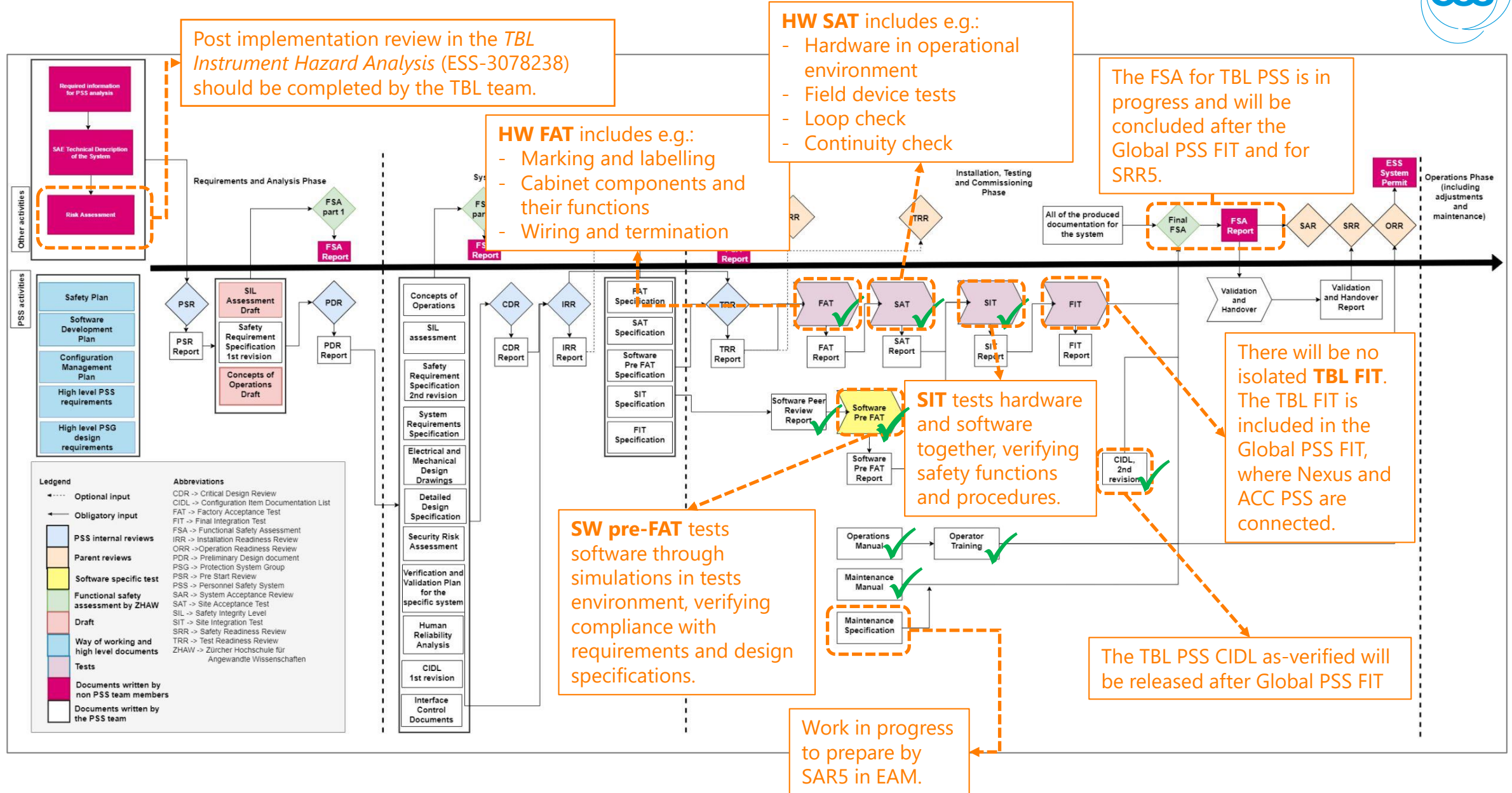
PRESENTED BY JESSICA LASTOW

2025-10-10

TBL PSS Overview



Current Status of TBL PSS



Non-Compliance Report for TBL PSS



A non-compliance report (NCR) was created to keep track of the remaining open punch list items.

These punch list items are **minor** items that do not affect the functionality of TBL PSS.

Document Type Non-Conformity Report
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Revision 1

Date Oct 1, 2025
State Released
Confidentiality Level Internal

1. NON-COMPLIANCE - FORM FOR ESS FACILITY CONFIGURATION CHANGES

ESS Handbook for Engineering Management of Personnel Safety Systems (ESS-0469185) [1] provides guidance about the procedure and usage of this form.

2. DESCRIPTION OF NON-COMPLIANCE

Reporter	Jessica Lastow
Report date	2025-09-25
Affected system(s) and project(s)	TBL PSS
Name of non-compliance leader	Jessica Lastow
Details	This Non-Compliance Report (NCR) is created to keep track of the remaining open punch list items that occurred during the commissioning phase of TBL PSS. Note that these punch items are minor items that do not affect the functionality of TBL PSS. This NCR consists of : • Non-compliance items from the TBL PSS Site Acceptance Test (Appendix A). • Non-compliance items from the TBL PSS Software Pre-Factory Acceptance Test (Appendix B) • Non-compliance items from the TBL PSS Site Integration Test (Appendix C) The test reports are available for reference: • ESS-5648036 – Site Acceptance Test Report for TBL PSS • ESS-5770915 - Software Pre-FAT Test Report for TBL Personnel Safety System • ESS-5770914 - Site Integration Test Report for TBL Personnel Safety System
Supportive information	ICSPSS-6268

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Hardware Site Acceptance Test (HW SAT)



From *Non-compliance report for TBL PSS* ([ESS-5661542](#))

Punch Ref No.	Test Case	Test case Description	Note	Status	Solution
5	4.1.11	Verify that there is a ESOS green signage with the image of a pushbutton installed on the top of the ESOS and that there is a Printed action label (defining that is affected when pushing the ESOS) installed next to each ESOS.	no ESOS green signage installed yet.	Not Closed	ESOS green sign to be installed and Red sign explaining what happens when ESB is pressed are still to be installed.
7	4.2.11	Verify that there is a ESOS green signage with the image of a pushbutton installed on the top of the ESOS and that there is a Printed action label (defining that is affected when pushing the ESOS) installed next to each ESOS.	no ESOS green signage installed yet.	Not Closed	ESOS green sign to be installed and Red sign explaining what happens when ESB is pressed are still to be installed.
27	9.2	Verify that the Key Bolt interlock module (=ESS.NSS.H01.TBL.F01.F03.FQ01) is marked with a function (FBS) label according to label list.	Mechanical Lock Module not installed	Not Closed	Label to be placed next to mechanical lock module.
28	9.3	Take SCMK1 from the TBL PSS KEU and verify the Key slot / Key engraving and the serial number of the Key, see table below:	Mechanical Lock Module not installed	Not Closed	Test still to be performed.
29	9.4	Verify that the SCMK1 can be used to unlock and lock the Key Bolt interlock module (=ESS.NSS.H01.TBL.F01.F03.FQ01).	Mechanical Lock Module not installed	Not Closed	Test still to be performed.
30	9.5	Verify that SCMK1 is trapped in the Key Bolt interlock module when the tongue is removed from the lock and that the SCMK1 can only be removed when the tongue is back in place and the Key Bolt interlock module is locked.	Mechanical Lock Module not installed	Not Closed	Test still to be performed.
31	9.6	Verify that the master key can be used to unlock and lock the Key Bolt interlock module (=ESS.NSS.H01.TBL.F01.F03.FQ01).	Mechanical Lock Module not installed	Not Closed	Test still to be performed.

CLOSED

ESOS signs have been installed.

CLOSED

Mechanical interlock module was installed and tested.

Software pre-FAT (SW pre-FAT)

From *Non-compliance report for TBL PSS* ([ESS-5661542](#))

Punch No.	Type	Name	Test Cases	Additional information	Status	Solution
111	Logic	Sensor alarm message	Observation	Observation: 'Sensor Alarm Message on operator page: Inconsistent on which discrepancy errors create a sensor alarm message. This was not specified in the DDS. Should be decided when this message should appear.	Not Closed	Perform assessment on what to include in the "Alarm messages" window on the Operator page of the HMI. This assessment shall consider consistency with other PSS systems and be implemented.

NOT CLOSED

A very minor punch related to user experience. All expected alarms are already displayed on the HMI. The punch is related to organising alarms between pages on the HMI. A future assessment needs to be done to come to a conclusion which alarms should be displayed on the *Operator* page of the HMI, and which should be only visible on the *Messages* page.



Site Integration Test (SIT)

From *Non-compliance report for TBL PSS* ([ESS-5661542](#))

Punch No.	Type	Name	Test Cases	Additional information	Status	Solution	Comment
1	Hardware	OVK Solenoid Spring	H1	The OVK can be removed from Slot 3 even though solenoid should trap the key.	Not Closed	Replacement solenoid to be manufactured by Fortress.	Power to the solenoid was checked when unlocking through the HMI, and the solenoid was confirmed to be working properly. The lock unit was investigated mechanically and a spring was slanted compared to other units. The spring was pushed in place with a screwdriver, which locked the OVK in Slot 3. However, it is not a permanent fix. Fortress was contacted and they will manufacture a replacement solenoid, and investigate what could have caused the issue.
50	Hardware	NTP Server	G4.1	The NTP server is not installed yet, and as such the tests cannot be performed.	Not closed	The NTP server should be installed and tested at a later stage, and the tests should be performed then.	

CLOSED

A replacement solenoid was installed together with Fortress (supplier) on Thursday 2025-10-02. The solenoid is now working as expected, after repeated tests.

IN PROGRESS

The NTP time server is installed and the software configuration has been done. Initial tests have been performed and it is working as expected. Repeating tests from SIT specification remains.



Thank you for listening!



Back-up slides

Implementation of WRSFs in TBL PSS

WRSF-P-NSI-L2- 022_Grant/prevent human presence_

- The TBL PSS prevents access to the TBL PSS controlled area by interlocking the entry door in a closed position, if the instrument shutter is open.
- Prior to permitting access to the TBL PSS controlled area, a radiation monitor verifies the shielding integrity of the instrument shutter. If the radiation monitor detects elevated dose levels, the TBL PSS prevents access to the TBL PSS controlled area.

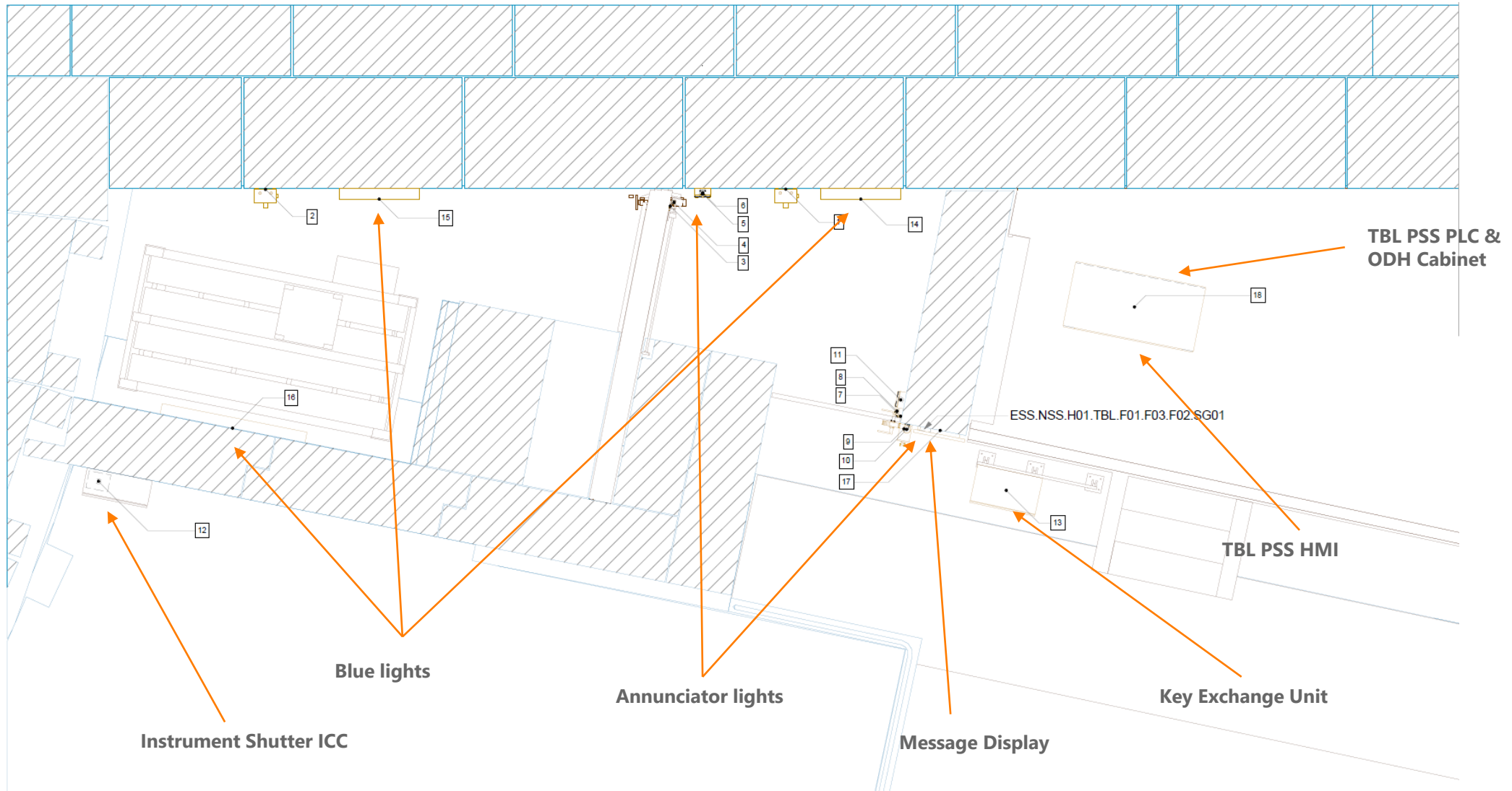
WRSFP-NSI-L2-021_Prevent flux_

- The TBL PSS prevents inadvertent opening of the instrument shutter by interlocking the instrument shutter, if the TBL PSS controlled area is not searched and locked.
- If the TBL PSS receives a high radiation alarm or fault signal from the designated the radiation monitor downstream the instrument shutter when the TBL PSS controlled area is accessible, the TBL PSS requests the Accelerator PSS to switch OFF the proton beam to Target.

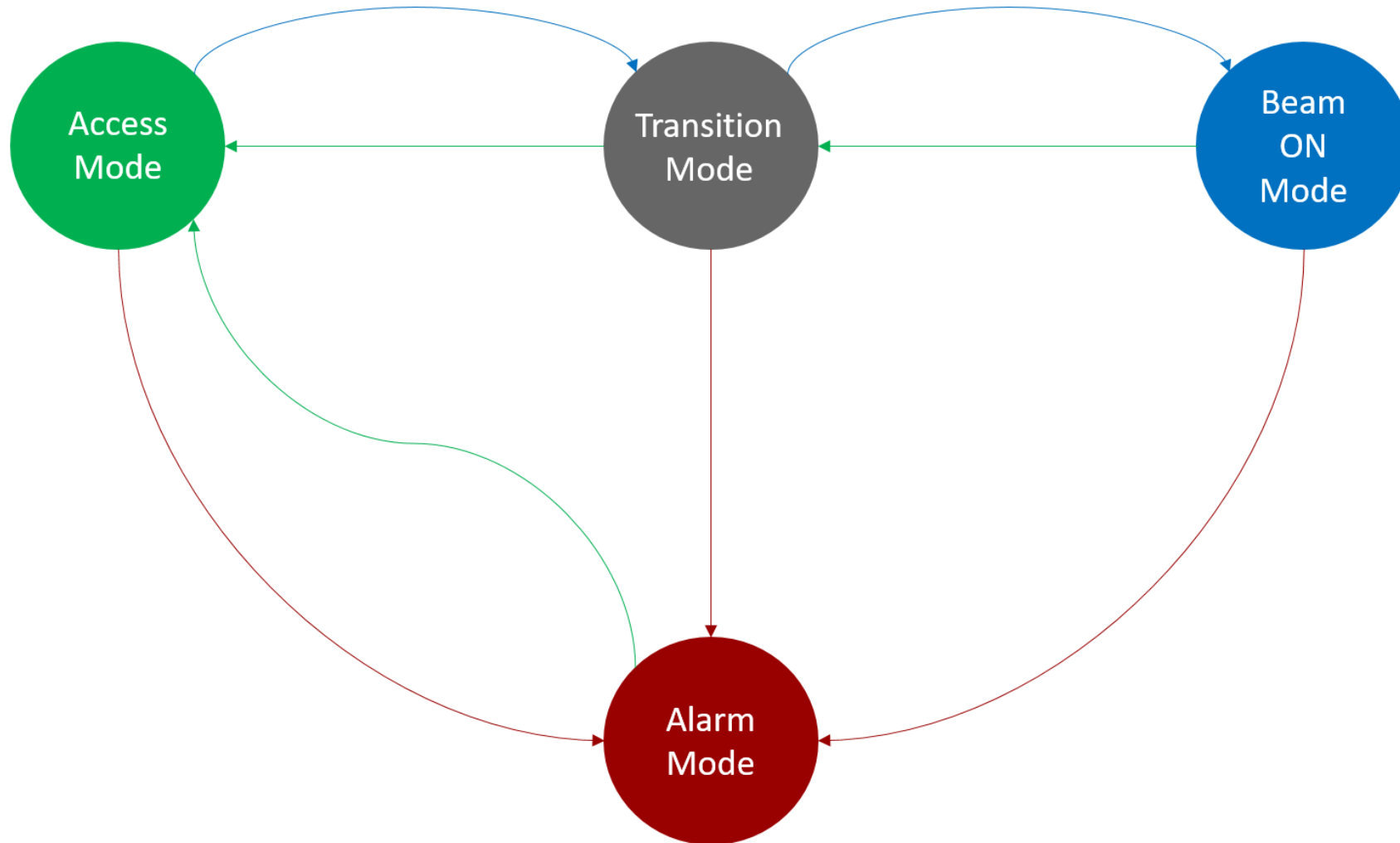
WRSFP-NSI-L3-024_Stop flux

- If any ESOB is pressed, the TBL PSS interlocks the instrument shutter. The TBL PSS also requests ACC PSS to switch OFF the proton beam to Target, if the instrument shutter is not already closed.
- If an intrusion into the TBL PSS controlled area is detected through the entry door or heavy door, the instrument shutter is closed. The TBL PSS also requests ACC PSS to switch OFF the proton beam to Target, if the instrument shutter is not detected closed within the designated time upon intrusion through the heavy door.

TBL PSS

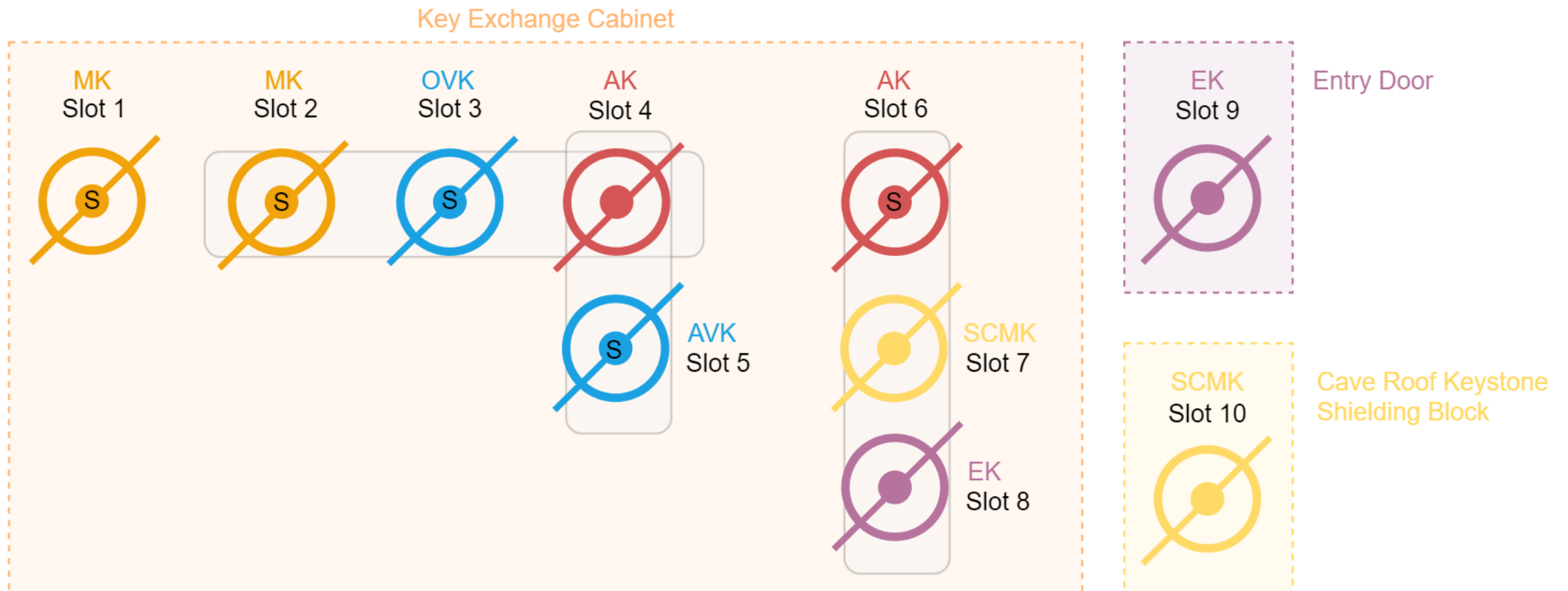


Modes of Operation



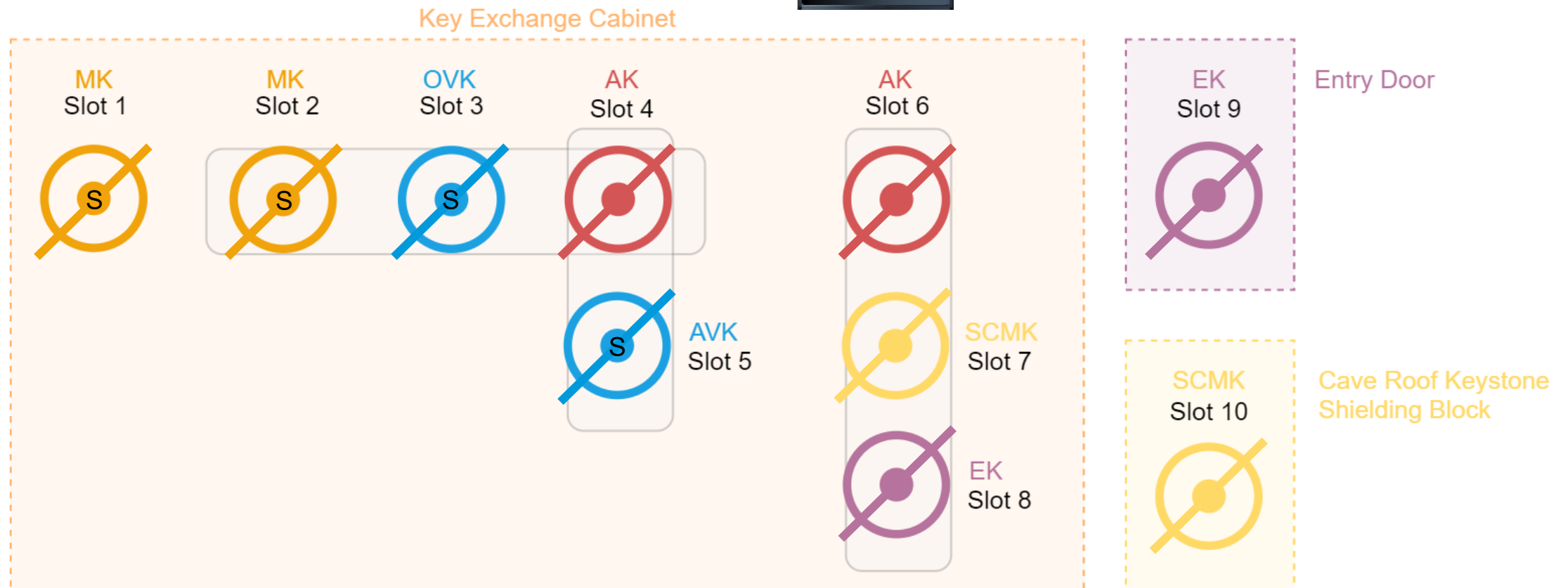
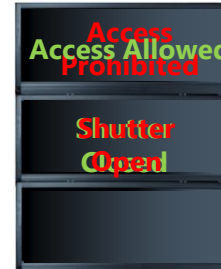
Key Exchange System

The **Key Exchange System** is a mechanically trapped key interlock system where one key may be exchanged for a number of other keys.



Granting Access to the TBL Controlled Area

Mode of Operation: Transition

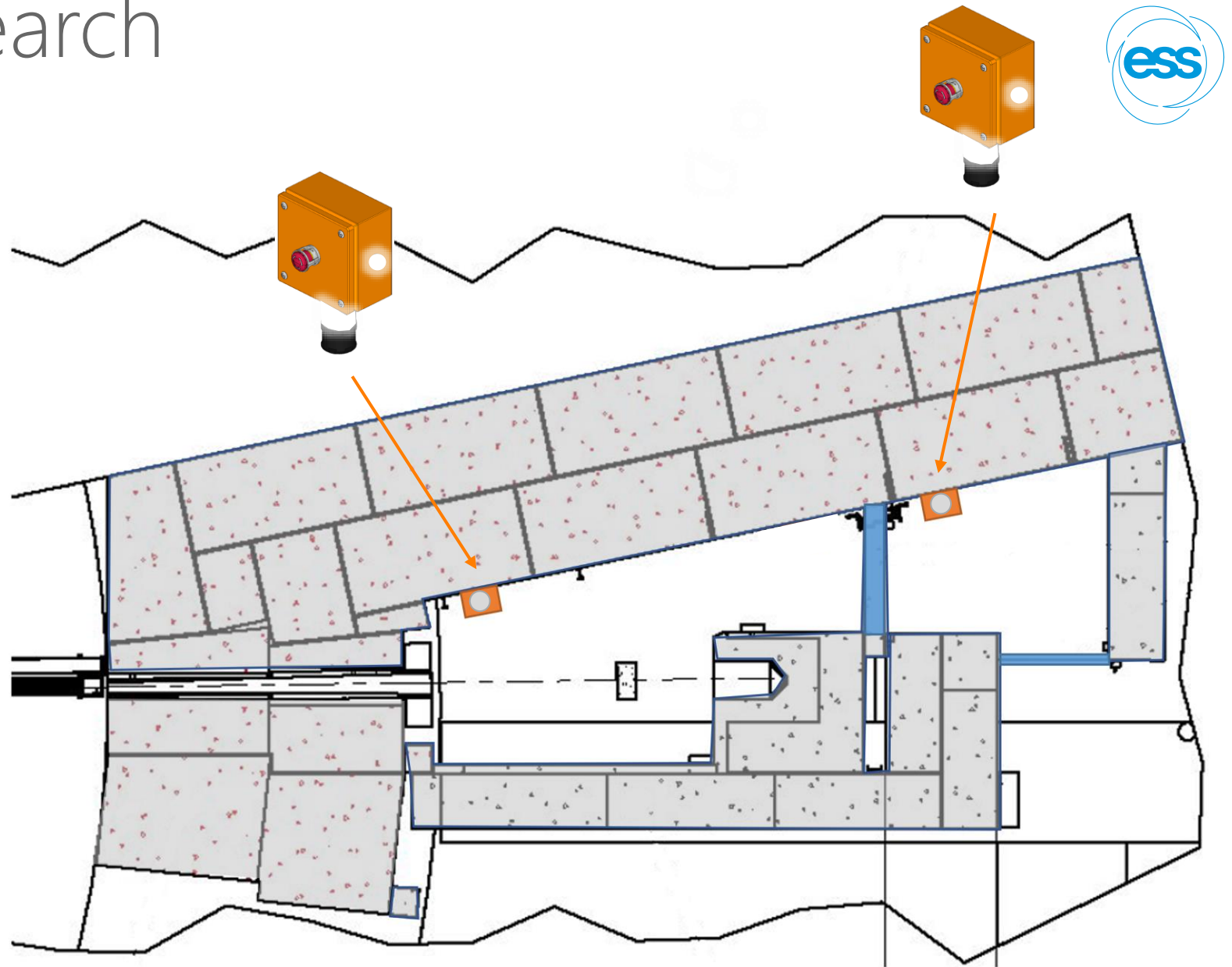


Formalised Search

The TBL PSS controlled area consists of two search zones:

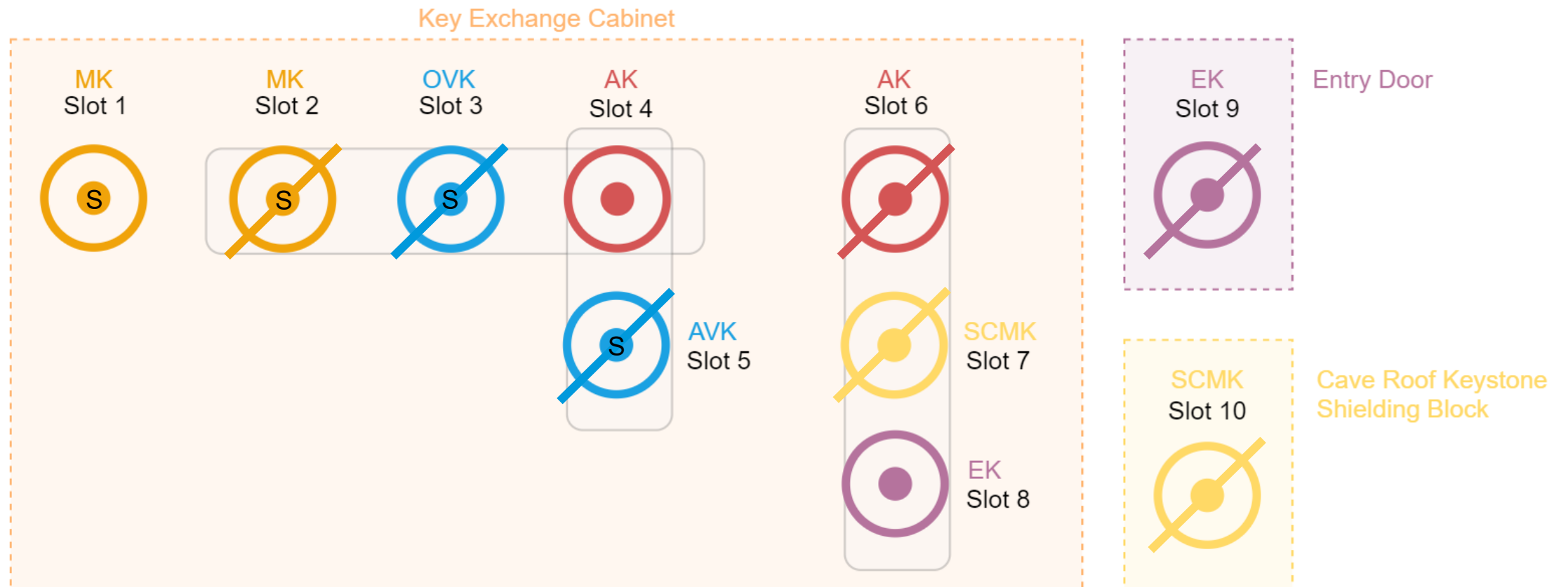
- **Zone 1:** Detector Area, including the heavy door.
- **Zone 2:** Entry Area, including the entry door.

The search is supported by search buttons that must be pressed in a predetermined sequence and within a certain time limit for TBL PSS to register a successful search.



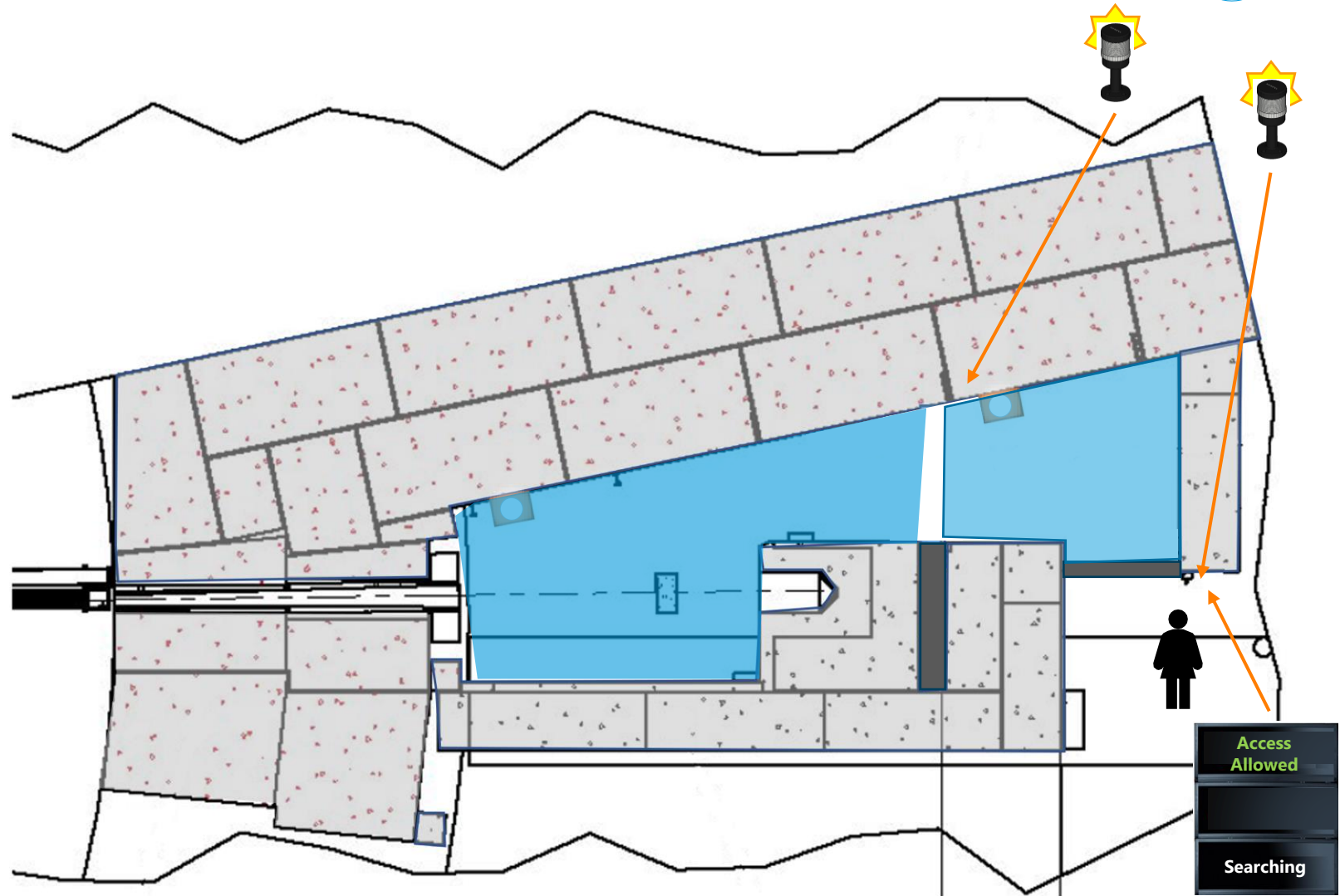
Formalised Search

Mode of Operation: Access



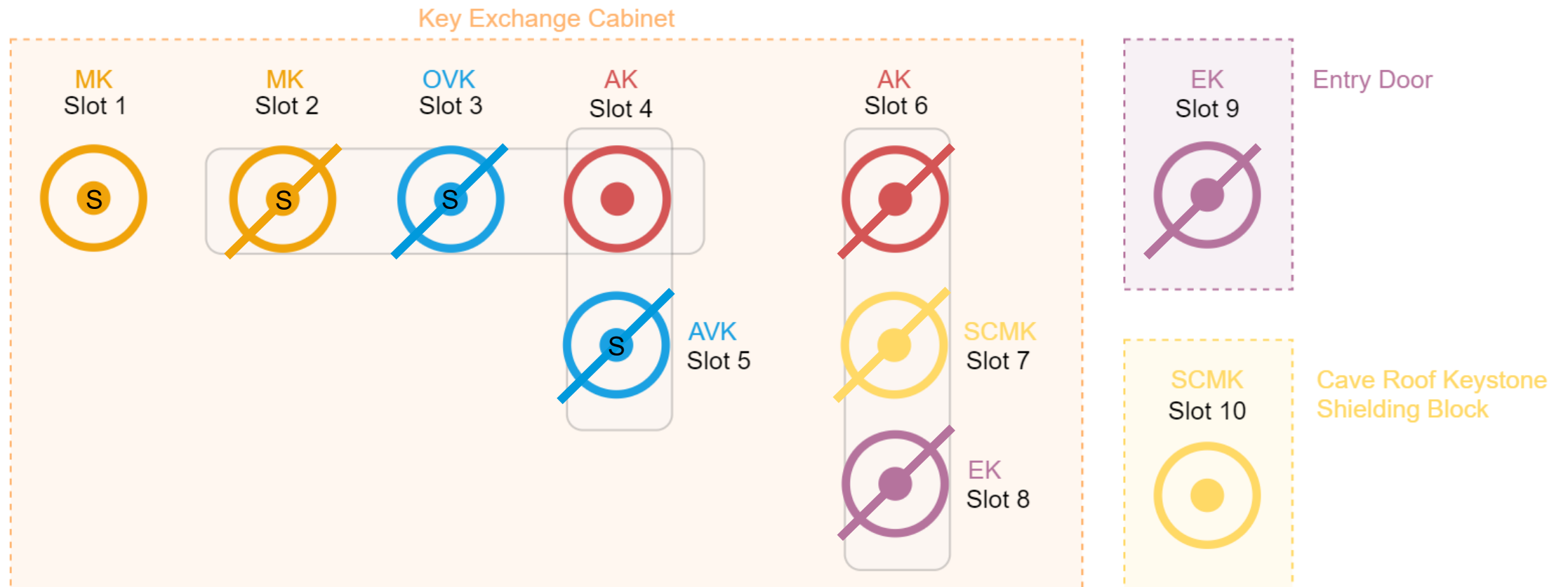
- **Zone 1:** Detector Area, including the heavy door.
- **Zone 2:** Entry Area, including the entry door.

The search is supported by search buttons that must be pressed in a predetermined sequence and within a certain time limit for TBL PSS to register a successful search.



Formalised Search

Mode of Operation: Access



Enabling the Instrument Shutter to Open

Mode of Operation: Position

