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# SUMMARY

This document describes the interface requirements between the Target Systems and the Active Cells facility. The purpose of this document is to collect the interface parameters that are required in order to ensure the Active Cells possibility to process, inspect, treat, intermediate store and ship off-site the components that are introduced in the Active Cells facility.

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# INTRODUCTION

The Interface Requirements Document (ICD-R) exhaustively lists the interfaces requirements between the Remote Handling Systems sub-system WBS 12.6.2 Active Cells and the WBS 12.2 Target System Sub-Systems. It is an agreed specification of the interface between the two systems. It is formally approved by the two system owners and once approved, it is placed under configuration controlled. As such, it is managed in accordance with the ESS Change Control Process [1] and the ESS Configuration Management Plan [2].

In Figure 1, interfaces between the Remote Handling sub-system Active Cells and the Target Systems Sub-Systems are illustrated. It shall be noted that the Target Systems sub-systems WBS 12.2.2 and WBS 12.2.3 are handled by the Active Cells as one package (Target Wheel and Shaft without the Drive Unit). The interface agreement are consequently defined for both sub-systems of Target Systems in one table, Table 1.

## Interface overview

**WBS 12.2 – TARGET SYSTEMS**

**WBS 12.6 – REMOTE HANDLING SYSTEMS**

WBS 12.2.2 – Target Wheel

WBS 12.6.2 - Active Cells

WBS 12.2.3 - Target Drive and Shaft

Figure 1 - Interface between Active Cells and TS sub-systems

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# INTERFACE AGREEMENT

References to the interface agreement in other documents are made by listing the Document number (ESS-XXXXX) and the Interface ID#.

For example, reference to the first interface no. between the RHS sub-system WBS 12.6.2 Active Cells and the Target Systems components (Target Wheel and Shaft) would be done to Interface ESS-0030244 interface ID 1.1.

## Active Cells – Target Systems

| ID | **ActiveCells1.1** | **Dimensions** |
| --- | --- | --- |
| **Requirement** | Weight and structural dimensions of Target Wheel and Shaft   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Part** | **Material** | **Dimension** | **Weight** | **Drawing** | | Spallation Material | Tungsten | 10x30x80 [mm]  Total 6696 bricks | 0,4632 [kg] | ESS-0045967 | | Cassette | 316L | 130x505x220x100 [mm] | 20 [kg] | ESS-0040883 | | Cassette including bricks | 316L / Tungsten | 130x505x220x100 [mm] | 110 [kg] | [TBD] | | Shroud, Distributor | 316L | D 2616 x 120 [mm]  Thickness 10 [mm] | 2000 [kg] | ESS-0045967 | | Shaft | 316L | D 400 [mm]  Total length including Wheel and Shaft 6300 [mm] | 4000 [kg] | ESS-0037286 | | |

|  |  |  |
| --- | --- | --- |
| **Rationale/Reference** | To enable handling | |
| ID | **ActiveCells1.2** | **Radiation, Activation and contamination** |
| **Requirement** | Target System Components Heat load, radiation level and decay information.   |  |  |  |  |  | | --- | --- | --- | --- | --- | | **Part** | **Material** | **Volumetric Activity1)** | **Heat Decay/ year** | **Gamma Decay/ Year** | | Spallation Material | Tungsten | 4\*1017 Bq | [TBD] | [TBD] | | Cassette | 316L | [TBD] | [TBD] | [TBD] | | Shroud | 316L | [TBD] | [TBD] | [TBD] | | Shaft | 316L | Low active | Low active | Low active |   1) Total value for the whole inventory. To be completed with corresponding value in Sv. | |
| **Rationale/Reference** | To enable handling | |
| ID | **ActiveCells1.3** | **Shaft Handling** |
| **Requirement** | The shaft shall be designed with features to make sure the Active Cells crane can mate with it. | |
| **Rationale/Reference** | To enable handling | |

| ID | **ActiveCells1.4** | **Shielding inserts** |
| --- | --- | --- |
| **Requirement** | The design of the shielding inserts in the shaft shall be designed with features so that the crane can mate with them, and be designed in sections designed to fit into transport containers. | |
| **Rationale/Reference** | To enable handling | |
| ID | **ActiveCells1.5** | **Shroud fixation** |
| **Requirement** | The design of the shroud shall include features that can be used by Active Cells for tools intended to fix parts of the shroud during cutting. | |
| **Rationale/Reference** | To enable handling | |
| ID | **ActiveCells1.6** | **Rotor length** |
| **Requirement** | The total length of Target rotor including Shaft, Wheel, and central part must be less than 6300 mm. | |
| **Rationale/Reference** | To enable handling | |

# 

# REFERENCES

[1] Change Control Process, ESS-0001879

[2] Configuration Management Plan, ESS-0003688

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# LIST OF ABBREVIATIONS

| Abbreviation | Definition |
| --- | --- |
| ICD-R | Interface Requirements Document |
| TS | Target Systems |
| RHS | Remote Handling Systems |
| WBS | Work breakdown structure |
| TBD | To be determined |

# DOCUMENT REVISION HISTORY

| Version | Reason for revision | Date |
| --- | --- | --- |
| 1.0 | New document | 2015-04-01 |
| 1.1 | Updated acc. to Target System group comments. Section 2.2 removed. Requirements specified in one table. | 2015-05-28 |
| 1.2 | * Authoring instruction box removed. * ID 1.1 removed. * ID 1.8 removed. No refurbishment will be required. * ID 1.2, ID 1.3 and ID 1.7 is combined. * ID 1.4 and 1.6 is combined. | 2015-09-10 |
| 1.3 | * Reqs 1.1 and 1.2 specified. | 2015-11-23 |