



ICD-R: Casks and Associated Handling Devices – Target Systems

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SUMMARY

This document describes the interface requirements between the Casks and Associated Handling Devices and the Target System Sub-Systems. The purpose of this document is to collect the interface parameters that are required in order to ensure the Casks and Associated Handling Devices possibility to collect, shield and transport the Target Systems components to Active Cells facility.

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1. INTRODUCTION

The Interface Requirements Document (ICD-R) exhaustively lists the interfaces requirements between the Remote Handling Systems sub-system WBS 12.6.4 Casks and Associated Handling Devices and the Target Systems 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 control. As such, it is managed in accordance with the ESS Change Control Process [1] and the ESS Configuration Management Plan [2].

In **Error! Reference source not found.**, interfaces between the Remote Handling sub-system Casks and Associated Handling Devices 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 Casks and Associated Handling Devices 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.

1.1 Interface overview

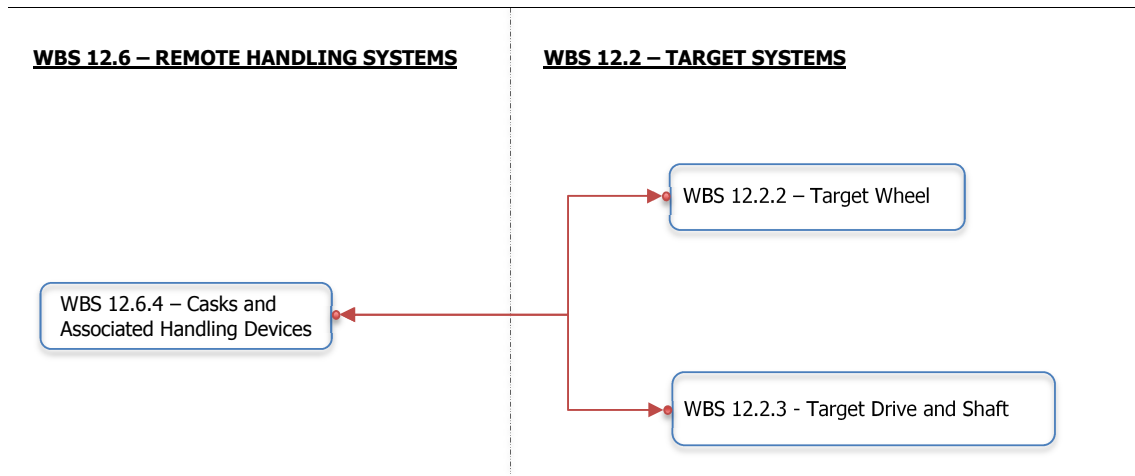


Figure 1 - Interface between Casks and Associated Handling Devices and TS sub-systems

2. INTERFACE AGREEMENT

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

For example, reference to the first interface no. between RHS sub-system WBS 12.6.4 Casks and Associated Handling Devices and Target Systems components (Target Wheel and Shaft) would be done to Interface ESS-0030245 interface ID 1.1.

Note!

Functional interfaces are also included.

2.1 Casks and Associated Handling Devices – Target Systems

Table 1 - Interface requirements between Casks and Associated Handling Devices – Target Systems

ID	Casks1.1	Positioning			
Requirement	The Target Systems shall provide positioning information of its components				
		Part	Coordinate *)	[X,Y] direction tolerance	[z] direction tolerance
		Wheel and Shaft Interface position	[TBD, TBD, TBD]	+/- 5,5 [mm]	+/- 1 mm
	*) Coordinates according to Target Coordinate System (TCS)				
Rationale/Reference	To enable handling				

ID	Casks1.2	Dimensions
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Requirement Weight and structural dimension of Target Rotor

Part	Material	Dimension	Weight	Drawing
Spallation Material	Tungsten	10x30x80 [mm] Total 6696 bricks	0,4632 [kg]	[TBD]
Cassette	316L	130x505x220x100 [mm]	20 [kg]	ESS-0040883
Cassette including bricks	316L / Tungsten	130x505x220x100 [mm]	110 [kg]	N/A
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	Casks1.3	Radiation, activation and contamination
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Requirement Target System Components Heat load, radiation level and decay information.

Part	Material	Volumetric Activity ¹⁾	Heat Decay/year	Gamma Decay/ Year
Spallation Material	Tungsten	4*10 ¹⁷ 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.

Requirement Specification
Document Number ESS-0030245
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Rationale/Reference To enable handling

ID	Casks1.4	General condition
Requirement	The Target Systems shall provide condition information about its components (Target Wheel and Shaft).	
Rationale/Reference	To enable handling	

3. REFERENCES

- [1] Change Control Process, ESS-0001879
- [2] Configuration Management Plan, ESS-0003688

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	<ul style="list-style-type: none">▪ Authoring instruction box removed.▪ ID 1.1 removed.▪ ID 1.3, and ID 1.4 is combined.▪ ID 1.5 and 1.7 is combined.	2015-09-10
