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SECOND TARGET STATION (STS) PROJECT

Interface Sheet for Target Assembly, Moderator Reflector Assembly, and Vessel Systems

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3/15/2024

OAK RIDGE NATIONAL LABORATORY
MANAGED BY UT-BATTELLE FOR THE US DEPARTMENT OF ENERGY

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Approvals

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00	Initial Release

TABLE OF CONTENTS

1. PURPOSE

This document defines the interface between Target Assembly, Moderator Reflector Assembly, and Vessel Systems. This document sets a strategy for ensuring the integrity of the MRA hydrogen boundary is not damaged under any anticipated loading conditions. An interface drawing is then referenced which implements the described strategy. The interface described in this document will provide guidance to the design of the Target Assembly, Moderator Reflector Assembly, and Vessel Systems.

2. SCOPE

The scope of this document is the interface between Target Assembly, Moderator Reflector Assembly, and Vessel Systems. No parent Interface Control Document exists since all systems are within Target Systems. This interface sheet describes the basis and strategy for the interface and references an interface drawing for describing the nominal boundary geometry as well as the tolerance allowance for each component.

2.1 INTERFACING PARTS OR COMPONENTS

No.	Components	
	Name	Functional reference Number
1	Target Assembly	S03020000-M8U-8800-A10000
2	Moderator Reflector Assembly	S03040000-M8U-8800-A10000
3	Vessel Systems	S03060000-M8U-8800-A10000

3. ACRONYMS AND DEFINITIONS

ICD Interface Control Document
IS Interface Sheet
MRA Moderator Reflector Assembly
PHAR Preliminary Hazard Analysis Report
STS Second Target Station

4. REFERENCES

4.1 DOCUMENTS APPLICABLE TO THE INTERFACING SSCS

Ref	Document Titles	Document Control System Location
[1]	S03020000-SR0001-R00 System Requirements Document for Target Assembly	/Neutron Sciences/Second Target Station (STS)/S03 – Target Systems/S0302 – Target Assembly
[2]	S03040000-SR0001-R00 System Requirements Document for MRA	/Neutron Sciences/Second Target Station (STS)/S03 – Target Systems/S0304 – Moderator Reflector Assembly
[3]	S03060000-SR0001-R00 System Requirements Document for Vessel Systems	/Neutron Sciences/Second Target Station (STS)/S03 – Target Systems/S0306 – Vessel Systems
[4]	Preliminary Hazard Analysis Report	/Neutron Sciences/Second Target Station (STS)/S01 – Project Management/S0103 – ES&H - QA

5. INTERFACE DEFINITION

5.1 TECHNICAL DESCRIPTION OF THE INTERFACE

As required in the Second Target Station (STS) Preliminary Hazard Analysis (PHAR) [4], the hydrogen vessel and hydrogen transfer lines of the MRA are credited to prevent the release of hydrogen during a design basis earthquake. While unwanted contact between adjacent components would not inherently cause a boundary failure, contact would cause additional loads with a high degree of uncertainty. Rather than attempt to define uncertain interactions, we will instead choose to prevent the contact interactions with the MRA from occurring. Note that we also choose to prevent contact between the Target Assembly and the Vessel Systems components, as such contact could cause subsequent contact between the Target Assembly and the MRA. In the referenced interface drawing, the nominal boundary geometry is described as well as the tolerance allowance for each component in order to prevent contact under all loading conditions while still maintaining adequate prevention of streaming to ensure radiation safety.

The interface drawing will describe the nominal boundary geometry of the Target Assembly, Moderator Reflector Assembly, and Vessel Systems where they are adjacent to one another, the nominal gaps between the nominal geometry, and the allotment of the nominal gap reserved for each assembly. Each system will be required not to deviate from their allotment of the nominal gap under all loading and alignment conditions, such that the allotment covers the maximum possible deviation from nominal condition from causes including profile tolerance, installation tolerance, seismic deflections, thermal deflections, pressure driven deflections, and all other anticipated conditions. Note that the nominal gap and system allotment vary in the horizontal and vertical direction and based on location in the system. Note that both the Target Assembly and Moderator Reflector Assembly are supported by the Vessel Systems and these physical interfaces are described in this interface drawing to clarify the load paths for the systems.

5.2 INTERFACE DATA

Reference interface drawing S03000000-M8U-8800-A10001.