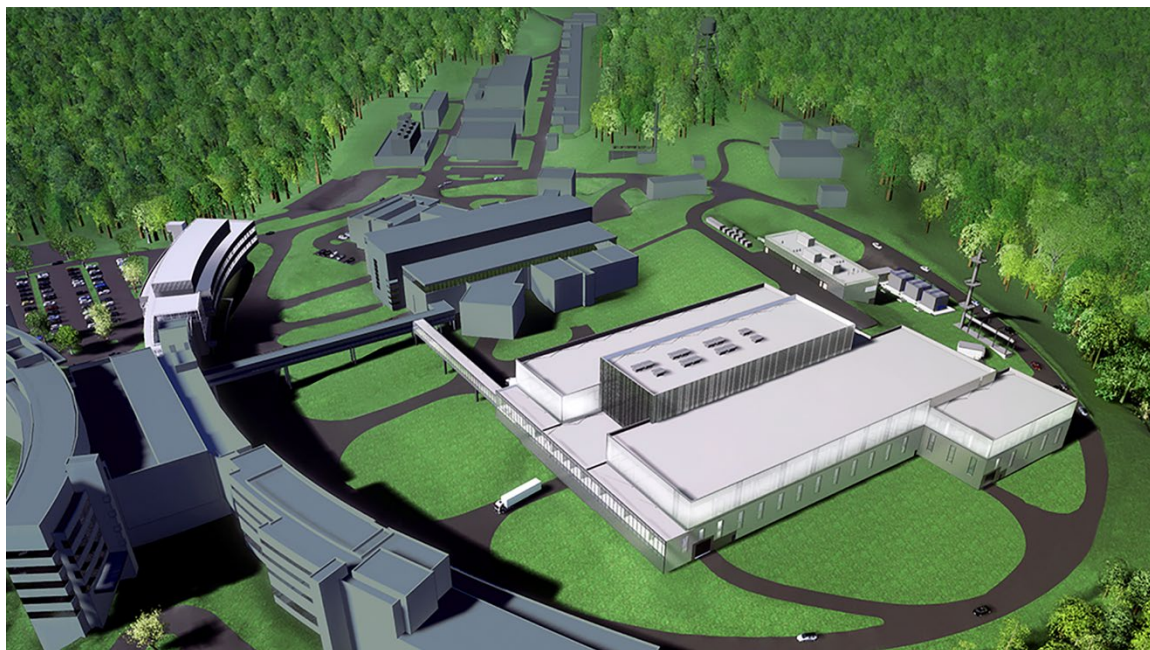


Second Target Station Project: Interface Sheet for Cryogenic Moderator System and Target Station Shielding



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March 2025



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Second Target Station Project

**INTERFACE SHEET – INTERFACE SHEET FOR CRYOGENIC MODERATOR
SYSTEM AND TARGET STATION SHIELDING**

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March 2025

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1. PURPOSE

This document defines the interface between Target System's Cryogenic Moderator System (CMS) and Target Station Shielding (TSS). Requirements derived from this document will be included in the System Design Requirements for CMS and TSS.

2. SCOPE

The scope of this document is the complete definition for the interface between CMS and VS.

1. INTERFACING PARTS OR COMPONENTS

No.	Components (CMS)		Components (TSS)	
	Name	Functional reference Number	Name	Functional reference Number
1	Cryogenic Moderator System	S03030000-M8U-8800-A10000.asm	Target Station Shielding	S03070000-M8U-8800-A10000.asm
2				
3				
4				

3. ACRONYMS AND DEFINITIONS

CMS	Cryogenic Moderator System
ICD	Interface Control Document
IS	Interface Sheet
MRA	Moderator Reflector Assembly
SSC	Structure, System or Component
STS	Second Target Station
TSS	Target Station Shielding
WBS	Work Breakdown Structure

4. DOCUMENTS APPLICABLE TO THE INTERFACING SSCS

Ref	Document Titles	Document Control System Location

5. INTERFACE DEFINITION

5.1 TECHNICAL DESCRIPTION OF THE INTERFACE

CMS consists of the Hydrogen System and the Helium Refrigeration System. TSS consists of the steel shielding surrounding the core vessel. The majority of the Hydrogen System and the entirety of the Helium Refrigeration System are located far from the monolith; however, the Hydrogen Transfer Line which transports liquid hydrogen between the Hydrogen Coldbox and the Moderator Reflector Assembly (MRA) passes through the Target Station shielding and relies on the shielding for support and protection. The function of the hydrogen transfer line is critical to the safety of the facility as the primary and secondary vent path to transport hydrogen away from the primary radionuclide inventory of the STS facility; therefore, protection of the transfer line from falling objects and seismic events is critical. The subsequent sections define the interfaces between CMS and TSS.

5.2 INTERFACE DATA

5.2.1 CMS Transfer Line Protection

The CMS Hydrogen Transfer Line will run in a trench within the Target Station Shielding. The trench shall be covered with cover plates in order to protect the transfer line from falling objects. Target Station Shielding adjacent to the hydrogen transfer line should be restrained to prevent contact with the transfer line during seismic events.

5.2.2 CMS Clearance Management

The Target Station Shielding shall maintain at least 1” nominal clearance from the CMS transfer line.

5.2.3 CMS Transfer Line Supports

It will be necessary to secure the CMS hydrogen transfer lines to the target station shielding in order to limit line deflections in a seismic event. CMS is responsible for the design, procurement and installation of the transfer line supports. Target Station Shielding is responsible for providing the necessary features in the target station shielding to allow for installation of the transfer line supports. Once the transfer line supports are designed, details will be added to this section to solidify the interface.

5.2.4 CMS Transfer Line Welding Access

Initial installation of the CMS transfer line will require field welding of transfer line segments within the target station shielding region, prior to the installation of cover plates. In general, this welding can occur above the target station shielding top elevation on stands; however, due to the geometry of the hydrogen transfer line and its penetration through the concrete shielding outside the target station shielding, the welding at the transfer line jog just inside the outer diameter of the target station shielding must be made in situ. The target station shielding shall be designed to allow access to weld the transfer line in place in this location prior to any subsequent target station shielding and cover plate installation. Note, this weld is intended to be life of the facility and is access is not anticipated to be required after installation.
