

SECOND TARGET STATION (STS) PROJECT

Interface Sheet for Moderator Reflector Assembly and Remote Handling



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7/17/2026

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1. INTRODUCTION

This document defines the interfaces between Moderator Reflector Assembly and Remote Handling. Remote Handling is responsible for process planning and associated tooling required for remote activities related to installation, removal, and preparation for disposal of the Moderator Reflector Assembly. The Moderator Reflector Assembly is responsible for ensuring that the related remote activities are accommodated by the MRA design.

2. SCOPE

The scope of this document is the interface between Moderator Reflector Assembly and Remote Handling. No parent Interface Control Document exists since both systems are within Target Systems. This document describes pertinent information to remote handling of the Moderator Reflector Assembly.

The hands-on installation and removal of the MRA utility connections (water and hydrogen transfer line) are outside the scope of this document. MRA scope includes analysis to show that the predicted dose rates around these utility connections support hands-on work in these areas.

3. ACRONYMS AND DEFINITIONS

IS	Interface Sheet
MRA	Moderator Reflector Assembly
RH	Remote Handling
SSC	Structure, System or Component
STS	Second Target Station

4. REFERENCES

4.1 DOCUMENTS APPLICABLE TO THE INTERFACING SSCS

Ref	Document Titles	Document Control System Location
[1]	S03040000-SR0001 System Requirements Document for MRA	/Neutron Sciences/Second Target Station (STS)/S03 – Target Systems/S0304 – Moderator Reflector Assembly
[2]	S03100000-SR0001 System Requirements Document for Remote Handling	/Neutron Sciences/Second Target Station (STS)/S03 – Target Systems/S0310 – Remote Handling

5. INTERFACE DEFINITION

5.1 MODERATOR REFLECTOR ASSEMBLY CONFIGURATION

The MRA will weigh 1910 kg. The total dimension of the MRA are 628 mm x 971 mm x 4642 mm. The MRA will feature a 1.5"-8 UN threaded stud with minimum 100 mm clear length intended for remote lifting of the MRA located over the MRA CG at -107 mm, 1392 mm, 8 mm in the global coordinate system. The stud should have a safety factor of 3 against all failure modes.

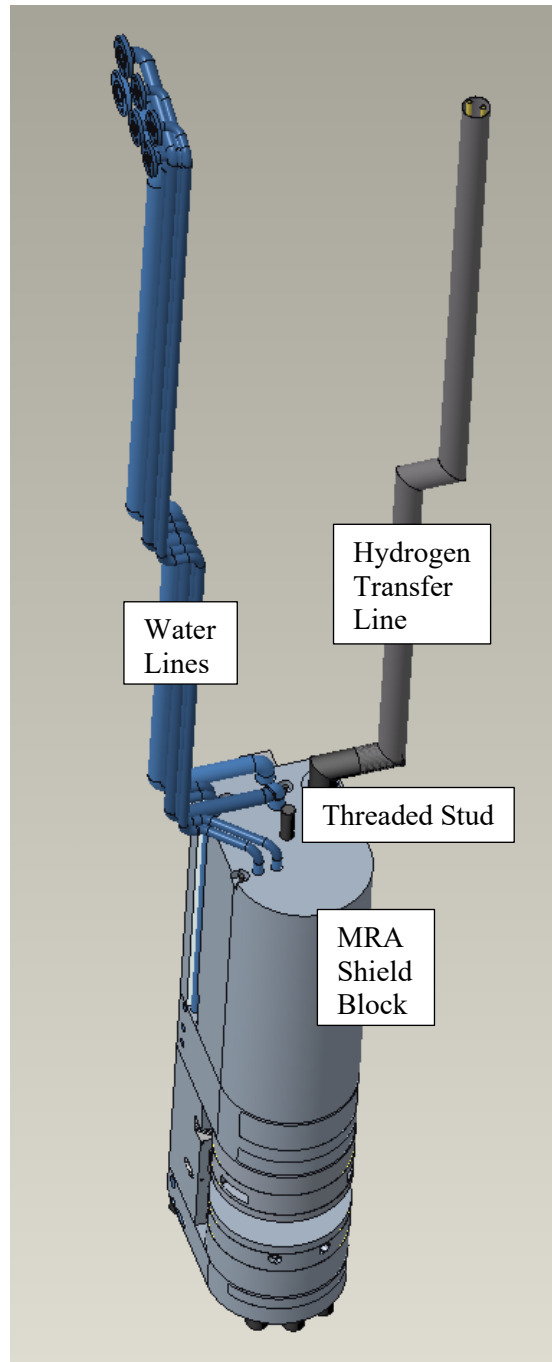


Figure 1. Moderator Reflector Assembly Configuration

5.2 MODERATOR REFLECTOR ASSEMBLY INSTALLATION

The MRA is intended to be installed fully remotely. The MRA is sized for vertical installation after removal of 3 Target Assembly Segments. The MRA must be installed with all MRA utility lines in place. The MRA has a nominal gap of 10 mm to the surrounding core vessel shielding. The MRA and top edges of the surrounding core vessel shielding included ramped guiding features to allow for guiding of the MRA into the MRA location in the core vessel shielding. The MRA final alignment features include ramps for guiding the MRA onto the core vessel MRA alignment pins.

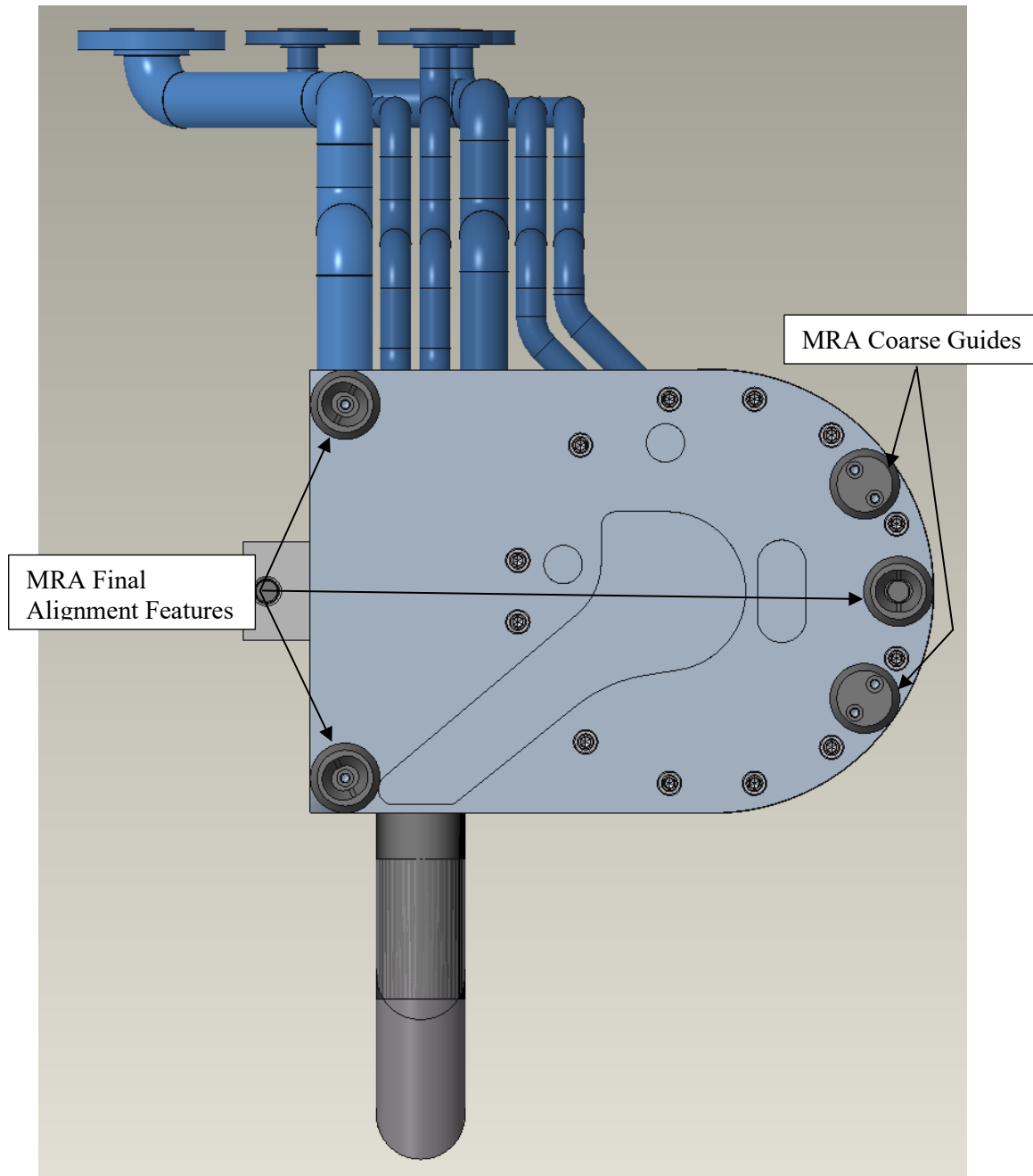


Figure 2. MRA Alignment Features and Coarse Guides

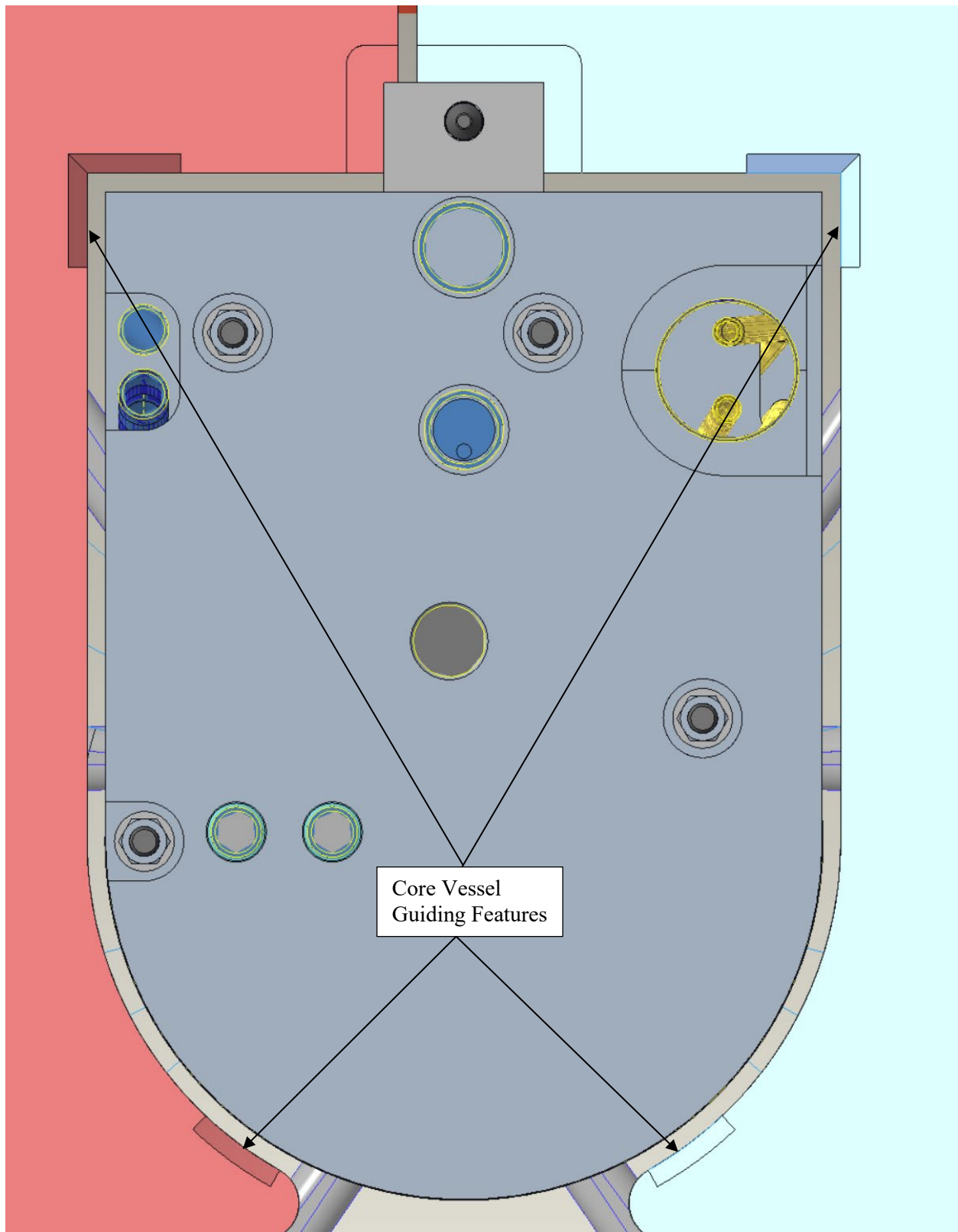


Figure 3. MRA Core Vessel Guiding Features

5.3 MODERATOR REFLECTOR ASSEMBLY REMOVAL

The MRA will require significant preparation for removal, including remote cutting of MRA utility piping above the MRA shield block to allow reasonable sizing of MRA handling casks. Before cutting of piping can occur, the MRA hydrogen will be vented and the MRA water passages will be blown down to lower the MRA water level below the cutting locations. The MRA shield block has been sized to reduce dose rates to allow for cutting of MRA piping with long handled tooling. The MRA piping layout on top of the MRA shield block has been designed to allow for sequential cutting of the MRA utilities. The lines to be cut are qty:4 ¾" sch. 40 316L pipes, 1-¼" sch. 40 316L pipe, 1-½" sch. 40 316L pipe, and 3" OD x 0.065" wall 316L tube surrounding qty:2 0.625" x 0.035" wall Invar 36 tubes.

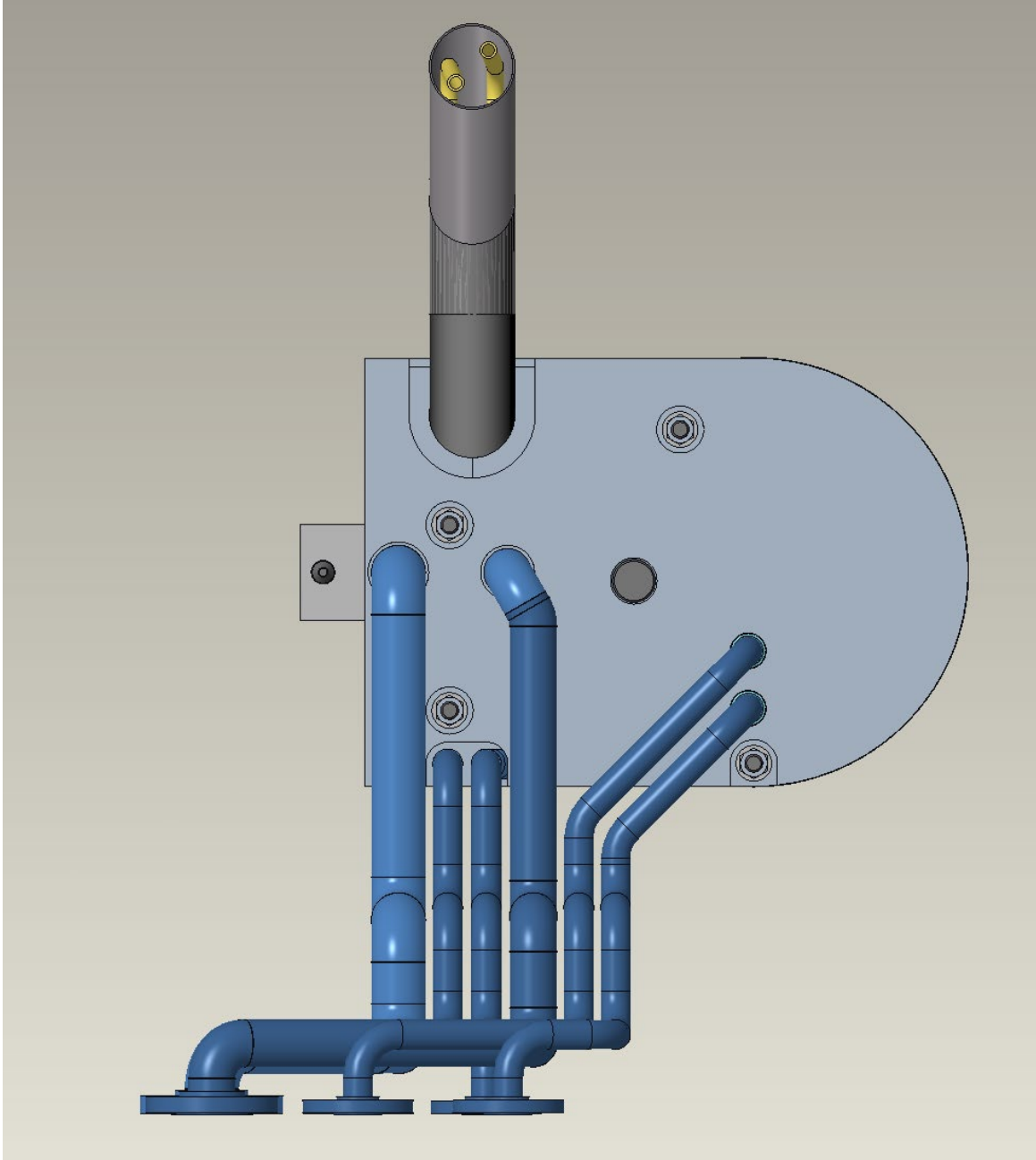


Figure 3. MRA Piping Configuration on top of the MRA Shield Block.

The MRA is intended to be removed fully remotely. The MRA is sized for vertical removal after removal of 3 Target Assembly Segments. The MRA mass is reduced to 1790 kg after removal of the utility lines. The dimensions of the MRA after piping removal are 594 mm x 381 mm x 1798 mm. Note that the width may be slightly greater than 381 mm depending on the exact location of the piping cuts.

5.4 MODERATOR REFLECTOR ASSEMBLY PREPERATION FOR DISPOSAL

The MRA is not anticipated to require any downsizing after removal from the monolith in preparation for disposal. In order to meet the requirement to have no free liquids in the MRA for disposal, vacuum drying of the MRA will be required prior to disposal to remove any free water remaining after blowdown.