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# Second Target Station (STS) Project Interface Control Document for Target Systems and Conventional Facilities

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S01020500-IC0006 R01

# SECOND TARGET STATION (STS) PROJECT
# Interface Control Document for Target Systems and Conventional Facilities

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Mike Strong

**March 2025**

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

**S01020500-IC0006 R01**

SECOND TARGET STATION (STS) PROJECT

# Interface Control Document for Target Systems and Conventional Facilities

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# 1. PURPOSE

This purpose of this document is to control and coordinate the release of Interface Sheets documenting interfaces existing between SSCs in Target Systems and SSCs in Conventional Facilities . This Interface Control Document (ICD) ensures:

- Each Structure, System or Component (SSC) within Target Systems that has an interface with an SSC in Conventional Facilities has all necessary design input data from its corresponding SSC, and vice versa, when it is needed
- Each SSC from Target Systems and Conventional Facilities that contains an interface with an SSC from the other knows what data is needed by the other SSC and when it is needed
- That each interface is completely defined

# 2. SCOPE

The scope of this document is to provide a complete listing of all interfaces between Target Systems and Conventional Facilities .

# 3. ACRONYMS AND DEFINITIONS

ICD Interface Control Document
IS Interface Sheet
SSC Structure, System or Component
WBS Work Breakdown Structure

# 4. REFERENCES

## 4.1 DOCUMENTS APPLICABLE TO THE INTERFACING SSCS

| Ref | Document Titles | Document Control System Location |
|---|---|---|
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| | | |
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| | | |
| | | |

## 5. LIST OF INTERFACE SHEETS BETWEEN TARGET SYSTEMS AND CONVENTIONAL FACILTIES

*Forecasted Interface Sheets are listed in this table, including relevant information to be included in the Interface Sheet.*

| Interface Sheet | | Target | Conventional Facilities | Interface Points | Interface Steps | Responsible |
|---|---|---|---|---|---|---|
| number | title | subsystems | subsystems | expected data | step listing | |
| S01020500 -IST10061 | Interface Sheet for the Cryogenic Moderator Systems and Conventional Facilities | Cryogenic Moderator System (CMS) | Target Building Hydrogen Utility Room and Exhaust System<br><br>Target Building MEP Systems<br><br>Target Building High Bay<br><br>Target Drive Room<br><br>Tower Water System and Distribution<br><br>Target Building Helium Compressor Room<br><br>Target Building Helium Refrigeration Room | Hydrogen Utility Room (HUR) layout and equipment locations<br><br>Helium Refrigeration and Compressor Room layout and equipment locations<br><br>Exterior gas storage<br><br>Equipment utility connections<br><br>Equipment anchoring<br><br>Helium Refrigeration and Compressor Room monorail and hoist<br><br>Piping, supports, and protection<br><br>Pipe penetrations<br><br>Hydrogen transfer line trench<br><br>HUR ventilation and hydrogen vent | Determine Hydrogen Utility Room equipment and Helium Compressor and Refrigerator Room equipment<br><br>Perform room and equipment layouts<br><br>Locate Exterior Gas Equipment<br><br>Develop MEP requirements and routing<br><br>Identify and address hydrogen safety hazards | Jim Janney (TS)<br><br>Matt Ladenburger (CF) |

| Interface Sheet | | Target | Conventional Facilities | Interface Points | Interface Steps | Responsible |
|---|---|---|---|---|---|---|
| number | title | subsystems | subsystems | expected data | step listing | |
| S01020500-IST10062 | Interface Sheet for the AIC Proton Beam Tube Assembly and Conventional Facilities | Accelerator Interface Components (AIC) Proton Beam Tube Assembly (PBTA) | Target Building Monolith/Bunker Structure<br><br>Accelerator Tunnel and Shielding within the Target Building | Monolith/Bunker Wall structural penetration<br><br>PBTA guide tube cast-in-place liner | Design and locate PBTA guide tube<br><br>Determine interface of guide tube and cast-in-place concrete from the end of the RTST into the Target monolith<br><br>Specify liner requirements | Neelam Pradhan (TS)<br><br>Mark Stidham (CF) |
| S01020500-IST10063 | Interface Sheet for the AIC Target Viewing Periscope and Conventional Facilities | Accelerator Interface Components (AIC) Target Viewing Periscope (TVP) | Target Building Target Drive Room<br><br>Target Building TVP Equipment Room<br><br>Target Building Electrical System | Target Drive Room and Bunker wall penetration, embed, and pit<br><br>TVP Equipment Room<br><br>Equipment utility connections<br><br>Equipment anchorage | Determine size and routing of TVP from the core vessel to the TVP Equipment Room<br><br>Design structural penetrations/embed<br><br>Design optics pit and associated shielding<br><br>Develop TVP Equipment Room layout<br><br>Determine TVP Equipment Room utility needs | Neelam Pradhan (TS)<br><br>Mark Stidham (CF) |

| Interface Sheet | | Target | Conventional Facilities | Interface Points | Interface Steps | Responsible |
|---|---|---|---|---|---|---|
| number | title | subsystems | subsystems | expected data | step listing | |
| S01020500 -IST10064 | Interface Sheet for the Vessel Systems and Target Station Shielding and Conventional Facilities | Vessel Systems and Target Station Shielding | Target Building Monolith Structure<br><br>Target Building Target Drive Room (TDR) Structure | Bulk Shielding Liner to Monolith cast-in-place concrete<br><br>Bulk Shielding anchoring and geometry to Monolith and TDR structure<br><br>Core Vessel anchoring and embed plate to Monolith structure<br><br>Pipe pan to TDR structure<br><br>Monolith ports | Determine bulk shield liner interfaces<br><br>Determine bulk shielding interfaces (seismic/anchoring, other)<br><br>Determine core vessel interfaces (seismic/anchoring, other)<br><br>Determine pipe pan interfaces (seismic/anchoring, other)<br><br>Locate and define monolith ports embed | Chris Anton (TS)<br><br>Devin Malone (CF) |
| S01020500 -IST10065 | Interface Sheet for the Remote Handling Conveyance Systems and Conventional Facilities | Remote Handling Conveyance Systems | Target Building Structure<br><br>Target High Bay<br><br>Target Building Material Handling Systems<br><br>Target Building Electrical Systems | High bay laydown, fixture, and tooling storage<br><br>High bay bridge cranes<br><br>Building MEP system connections as necessary | Determine Target remote handling operations<br><br>Locate remote handling equipment in high bay and building<br><br>Determine material handling and utility interfaces | Steve Schrick (TS)<br><br>Mark Stidham (CF) |

| Interface Sheet | | Target | Conventional Facilities | Interface Points | Interface Steps | Responsible |
|---|---|---|---|---|---|---|
| number | title | subsystems | subsystems | expected data | step listing | |
| S01020500 -IST10066 | Interface Sheet for the Remote Handling Mock-up Facility and Conventional Facilities | Remote Handling Mock-up Facility | Target Building High Bay<br><br>Target Building First Floor<br><br>Target Building Material Handling Systems | Mock-up to Target High Bay and first floor structures<br><br>Target building material handling coverage and interfaces<br><br>Building MEP systems as necessary to support mock-up operations | Determine overall mock-up size and location<br><br>Determine structural interfaces<br><br>Determine material handling interfaces and coverage needed to support operations<br><br>Determine MEP interfaces as applicable | Steve Schrick (TS)<br><br>Mark Stidham (CF) |

| Interface Sheet | | Target | Conventional Facilities | Interface Points | Interface Steps | Responsible |
|---|---|---|---|---|---|---|
| number | title | subsystems | subsystems | expected data | step listing | |
| S01020500 -IST10067 | Interface Sheet for the Service Cell and Conventional Facilities | Remote Handling Service Cell & PIE Systems | Service Cell with inner PIE Cell<br><br>Target High Bay<br><br>Target Basement Receiving and Shipping Cask area | Service & PIE Cell Structure and Floor Liner<br><br>Service Cell Top Hatches<br><br>Service Cell Material Handling<br><br>Service & PIE Cell MEP Systems<br><br>Service Cell Pits<br><br>Shipping cask platform<br><br>Pipe penetrations and chases | Determine Service & PIE Cell operations<br><br>Locate interior cell equipment and features<br><br>Determine and locate MEP interfaces<br><br>Determine and locate exterior supporting service cell interfaces (control room, manipulator gallery, high bay, etc.)<br><br>Design and locate penetrations and hatches | Steve Schrick (TS)<br><br>Mark Stidham (CF) |
| S01020500 -IST10068 | Interface Sheet for the Target Vacuum Systems and Conventional Facilities | Vacuum Systems | Target Building High Bay<br><br>Target Building Target Drive Room<br><br>Target Building Hot Off Gas System (HOG)<br><br>Target Building MEP Systems | Vacuum equipment locations and anchoring in high bay<br><br>Vacuum equipment utility connections<br><br>Vacuum connections to the HOG system<br><br>TDR and structural penetrations for vacuum piping | Locate vacuum equipment in the high bay<br><br>Determine vacuum equipment utility and HOG connections<br><br>Determine size and routing of vacuum piping<br><br>Design and locate vacuum piping penetrations | Mike Strong (TS)<br><br>Matt Ladenburger (CF) |

| Interface Sheet | | Target | Conventional Facilities | Interface Points | Interface Steps | Responsible |
|---|---|---|---|---|---|---|
| number | title | subsystems | subsystems | expected data | step listing | |
| S01020500 -IST10069 | Interface Sheet for the Target Assembly and Conventional Facilities | Target Assembly | Target Drive Room (TDR)<br><br>Target High Bay | Electrical penetration/s in the TDR and high bay concrete structures to route cabling for the Target Assembly to the associated Target drive and control cabinets | Determine cabling requirements<br><br>Locate Target Assembly drive and control cabinets<br><br>Size and route penetrations from cabinets into the TDR | Aaron Jacques (TS)<br><br>Mark Stidham (CF) |
| S01020500 -IST10070 | Interface Sheet for the Process Systems and Conventional Facilities | Process Systems Activated Cooling Loops 1 & 2, Process Leak Collection, and Low Level Liquid Waste Collection | Facility Chilled Water and Tower Water Systems and Distribution<br><br>Target Building Hot Process Vault (HPV)<br><br>Target Building Pipe Chases and Structural Penetrations<br><br>Target Building MEP Systems<br><br>Target Building Hot Off Gas System (HOG)<br><br>Target Building DI Make-up Water | Equipment locations and anchoring in the HPV, Delay & GLS Vaults<br><br>Pipe penetrations and chases<br><br>Chilled Water to Condenser/s connections<br><br>DI Make-up water connections<br><br>Compressed Air and MEP connections<br><br>Mechanical piping and supports<br><br>Tower Water connections to heat exchangers<br><br>Hot Off Gas connections | Determine and locate process systems equipment in the HPV, GLS, and Delay Vault<br><br>Route associated piping and locate tie-in points and piping supports<br><br>Design and locate piping and valve operator penetrations, hand-wheel mounts<br><br>Determine cooling loop MEP interfaces | Don Montierth (TS)<br><br>Matt Ladenburger (CF) |

| Interface Sheet | | Target | Conventional Facilities | Interface Points | Interface Steps | Responsible |
|---|---|---|---|---|---|---|
| number | title | subsystems | subsystems | expected data | step listing | |
| S01020500-IST10075 | Interface Sheet for the Process Systems Helium Distribution System and Conventional Facilities | Process Systems Helium Gas Distribution System | Target Building MEP Systems<br><br>Target Building Pipe Routing, Penetrations, and Supports | Mechanical piping and supports<br><br>Exterior space and connections for Helium Tube Trailer<br><br>Equipment MEP connections<br><br>Pipe penetrations and chases | Determine helium distribution system scope<br><br>Locate system equipment<br><br>Determine and locate tie-points<br><br>Determine and locate system utility connections as applicable<br><br>Design and locate piping penetrations as applicable | Don Montierth (TS)<br><br>Matt Ladenburger (CF) |
| S01020500-IST10076 | Interface Sheet for the Process Systems Nitrogen Distribution System and Conventional Facilities | Process Systems Nitrogen Gas Distribution System | Target Building MEP Systems<br><br>Target Building Pipe Routing, Penetrations, and Supports | Mechanical piping and supports<br><br>Exterior space and connections for tank<br><br>Equipment MEP connections<br><br>Vaporizer & Controls<br><br>Pipe penetrations and chases | Determine nitrogen distribution system scope<br><br>Locate system equipment<br><br>Determine and locate tie-points<br><br>Determine and locate system utility connections as applicable<br><br>Design and locate piping penetrations as applicable | Don Montierth (TS)<br><br>Matt Ladenburger (CF) |

| Interface Sheet | | Target | Conventional Facilities | Interface Points | Interface Steps | Responsible |
|---|---|---|---|---|---|---|
| number | title | subsystems | subsystems | expected data | step listing | |
| S01020500 -IST10077 | Interface Sheet for the Process Systems and the Conventional Facilities DI Make-up Water System | Target Process Systems | Facility DI Make-up System<br><br>Target Building MEP Systems<br><br>Hot Process Vault<br><br>Target Building Mechanical Room | DI Make-up system connections to the activated cooling loops, and low level liquid waste system | Locate associated equipment on floor plans<br><br>Route DI Make-up piping and identify interface connection tie-points | Don Montierth (TS)<br><br>Matt Ladenburger (CF) |
| S01020500 -IST10078 | Interface Sheet for the Target Systems and the Conventional Facilities Ground Network | Target Systems | Target Building Grounding Systems | Target equipment connections to the facility ground network | Determine Target equipment grounding requirements<br><br>Locate equipment on floor plans<br><br>Design grounding interfaces to support equipment needs | Mike Strong (TS)<br><br>Mark Stidham (CF) |
| S01020500 -IST10208 | Interface Sheet for Target Assembly Remote Handling | Target Assembly | Target Drive Room<br><br>Target Drive Room Utilities<br><br>Target High Bay Crane<br><br>Target Drive Room Jib Crane | Target Assembly utility needs for service and maintenance<br><br>Target Assembly material handling requires for installation, service, and maintenance | Determine and locate utility needs in the TDR<br><br>Determine coverage and capacity requirements for cranes<br><br>Determine physical space requirement for service and maintenance activities | Aaron Jacques (TS)<br><br>Steve Schrick (TS)<br><br>Mark Stidham (CF) |

| Interface Sheet | | Target | Conventional Facilities | Interface Points | Interface Steps | Responsible |
|---|---|---|---|---|---|---|
| number | title | subsystems | subsystems | expected data | step listing | |
| S01020500 -IST10060 | *Reserved for future use* | | | | | |
| S01020500 -IST10071 | *Reserved for future use* | | | | | |
| S01020500 -IST10072 | *Reserved for future use* | | | | | |
| S01020500 -IST10073 | *Reserved for future use* | | | | | |
| S01020500 -IST10074 | *Reserved for future use* | | | | | |