OAK RIDGE National Laboratory

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Second Target Station (STS) Project Design Deliverables by Project Phase Matrix

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Change Log

Revision	State	Date	Change Description
1	Published	04/02/2025	
0	Superseded	04/02/2025	
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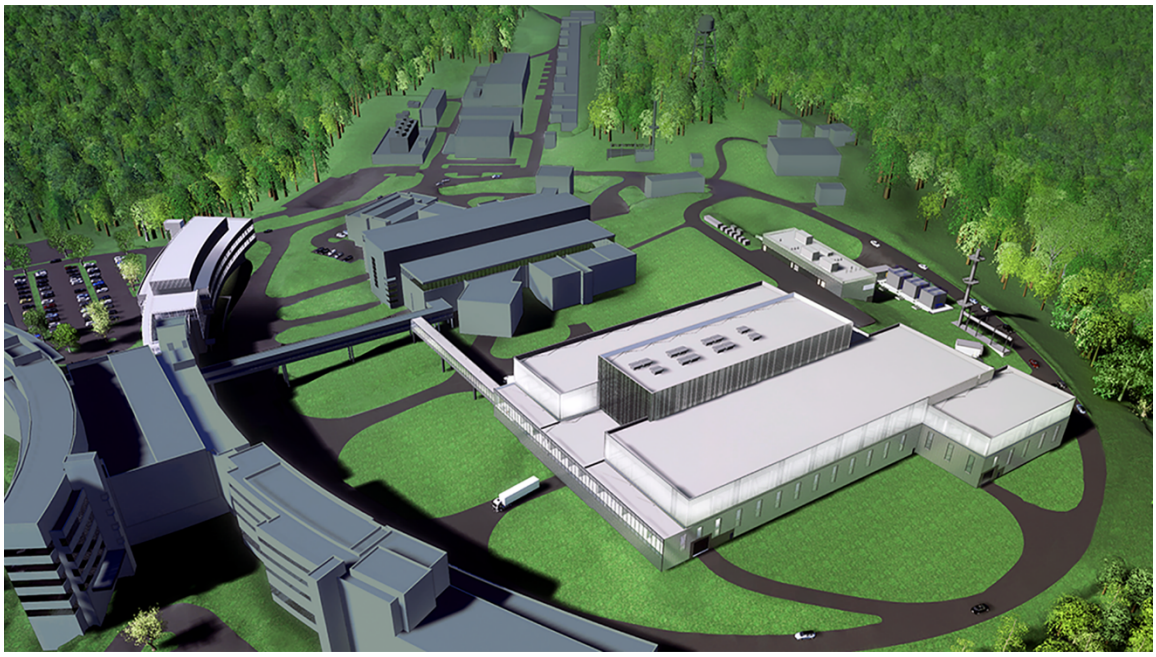

March 2025

OAK RIDGE National Laboratory

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S01020500-PCD10000

Second Target Station (STS) Project

Design Deliverables by Project Phase Matrix

Author(s)

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	Signature / Date					
	Rev. 00	Date	Rev. 01	Date		
STS Project Director	Graeme Murdoch		Graeme Murdoch	Revision 1 approvals obtained through EDRM		
	/s/ Graeme Murdoch	2/25/22				
STS Project Manager			Duke Hughes			
STS Technical Director			Kenneth Herwig			
STS Systems Engineering and Integration	David Anderson		David Anderson			
	/s/ David Anderson	2/17/22				
Accelerator Systems	Michael Allitt		Michael Allitt			
	/s/ Michael Allitt	2/18/22				
Target Systems	Peter Rosenblad		Peter Rosenblad			
	/s/ Peter Rosenblad	2/17/22				
Instrument Systems	Ken Herwig		Leighton Coates			
	/s/ Kenneth Herwig	2/24/22				
Conventional Facilities	Gary Bloom		Gary Bloom			
	/s/ Gary Bloom	2/25/22				
Integrated Control Systems	Steven Hartman		Steven Hartman			
	/s/ Steven Hartman	2/17/22				
ESH&Q	Steven Trotter		Steven Trotter			
	/s/ Steven Trotter	2/18/22				

Revision	Description
00	Initial Release
01	Moved drawings, technical specifications and Acceptance Criteria Lists from Final Design Review deliverables to begin fab/procure deliverables

ACRONYMS

ACL = Acceptance Criteria Listing
ALD = Associate Laboratory Director
AM = Area Manager
ARR = Accelerator Readiness Review
CA = STS Configuration Authority
CAD = Computer Aided Design
CCM = STS Configuration Control Manager
CD-4 = Critical Decision 4, end of project
CEC = Credited Engineered Control
DAC = Design Analysis Calculation
DWA = Division Work Authority
ESH&Q = Environment, Safety, Health and Quality
GAC = Gravimetric Air Content
IRR = Instrument Readiness Review
L2 = STS Level 2 WBS Manager
LE = Lead Engineer
NM = STS Neutronics Manager
NScD = Neutron Sciences Directorate
MIP = Manufacturing Inspection Plan
PE = (Licensed) Professional Engineer
P&ID = Process and Instrumentation Diagram
QA = STS Quality Assurance Representative
RPC = Review Panel Chair
RSC = Radiation Safety Committee Chair
SEIL = Systems Engineering and Integration Lead
STS = Second Target Station
TN = Tennessee
TTOP = Transition to Operations Plan

1. SCOPE

This document contains a list of deliverables to be produced by the STS Project's design organizations for each phase of the project. This matrix is intended to be comprehensive, but realistically likely has omissions. As omissions are found, they will be added to the matrix and the document will be revised. Furthermore, although the design development process is the same for all, each design organization within the STS project has minor variations in business practices that are required to manage their disparate deliverables. For these reasons, this matrix is not meant to be prescriptive, but instead should be used as a guide to assist the user in understanding the project's expectations with regard to deliverables.

Table 1. Design Deliverables by Project Phase Matrix

System / Subsystem Deliverable	Conceptual Design Review	Preliminary Design Review	Final Design Review	Begin Fab / procure	Completed Fab / procure	Begin Installation	Completed installation	Begin System Testing	Completed System Testing	Begin Integrated Systems Testing	Completed Integrated Systems Testing	Radiological Safety Review	ARR or IRR	Commissioning	(CD-4)	Approver	Radiation Safety Committee	Lead Engineer	designer	Configuration Control Manager	L2 WBS manager	Quality Assurance	Neutronics	Radiation Safety Officer	Installation Manager	SEIL	ESH&Q	Independent TN PE	Supplier	Process Systems Lead Engineer	Lead Vacuum Engineer	PPS Manager	drawing checker	peer review
CAD models, sketches and other design expression tools	N	N	U		U		U		U		U			U					X														
related items on risk registry*	N	U	U		U		U		U		U	U				L2																	
Interface Control Documents / Interface Sheets		N	U		U		U		U		U		F	U		CCM		X		X**						opt	opt						
System Requirements Document		N	U		U		U		U		U		F	U		L2***		X		X		X	opt	opt	opt	X	X	opt	opt				
Design Description Document		N	U		U		U		U		U		F	U		L2***		X		X		X	opt	opt	opt	X	X	opt	opt				
configuration level determination		N	U													CCM						X	opt	opt			X						
QA Level Determination Form		N	U		U		U		U		U					QA		X		X	opt		opt	opt		X	X						
System Safety Classification†		N	U													ESH&Q		X		X	X	X	opt	opt							opt		
Design Analysis Calculations (DACs)‡		N	N		U				U		U		F	U		CCM		X			opt		opt	opt			opt	opt	opt				X
Safety Assessment Document‡‡		N	U		U		U		U		U	U	F			ESH&Q					X										X		
acquisition strategy*		N	U			U		U		U						CCM		X			X	X					X		opt				
manufacturing / fabrication strategy*		N	U			U		U		U						CCM		X			X	X			opt				opt	opt	opt		
installation plan*		N	U			U		U		U						CCM					X			opt	X					opt	opt		
System Verification Plan†††		N	U	U			U		U		U					CCM		X			opt	X	opt	opt		X	opt		opt				
Drawings				F	U		U		U		U		F	U		CCM		X	X		opt	X	opt	opt			opt	opt	opt		opt		
Technical Specifications				F												CCM	opt	X			X	X	opt	opt	opt		X		opt	opt	opt			opt
P&ID			N		U		U		U		U			U		CCM		X			X	X							X	opt	opt			
Acceptance Criteria List				F	U		U									QA		X		X							opt							

Legend N = New U - Updated, if needed F = Final

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System / Subsystem Deliverable	Conceptual Design Review	Preliminary Design Review	Final Design Review	Begin Fab / procure	Completed Fab / procure	Begin Installation	Completed installation	Begin System Testing	Completed System Testing	Begin Integrated Systems Testing	Completed Integrated Systems Testing	Radiological Safety Review	ARR or IRR	Commissioning	(CD-4)	Approver	Radiation Safety Committee	Lead Engineer	designer	Configuration Control Manager	L2 WBS manager	Quality Assurance	Neutronics	Radiation Safety Officer	Installation Manager	SEIL	ESH&Q	Independent TN PE	Supplier	Process Systems Lead Engineer	Lead Vacuum Engineer	PPS Manager	drawing checker	peer review
Statements of Work				N	F											L2		X		X		X	opt	opt			opt		opt						
Manufacturing and Inspection Plans (MIP)					F											lead eng		X			opt	X							opt					
Manufacturing Verification Reports‡‡‡					N		U		U		U		F	U		CCM		X			opt	X							opt					
Installation verification reports ††							N									supplier						opt			opt									
System Verification Reports									N		U		F			CCM		X			opt	X	opt	opt		X	opt		opt					
System Operation and Maintenance Manuals									N		U		F	U		ops mgr		opt		opt	opt	X	opt	opt			X		opt					
Radiation Safety Committee Recommendation													F			RSC	X																	
Review Committee Report	N	N	N		opt		opt		opt		opt		N		N	RPC																		
Responses to Review Committee Recommendations	N	N	N		N		N		N		N		N	N		LE																		

notes:
Many of these deliverables will be different for Conventional Facilities and must be mapped to this matrix. A written plan from CF addressing this is recommended but not required.
X indicates that this group typically reviews the document
CCM approver is CA if system is a Configuration Managed Structure System or Component
opt = optional, depending on type of system
* May be a formal report or a section in review power point, per CCM discretion
** CCMs for both interfacing systems are required to approve
*** SEIL approval required for L2 systems
† *this is not a standalone document, but is instead an activity that feeds a section of the proton facility SAD and the Neutron Facility SAD, the Hazard Analysis, and is an input to the quality determination and system requirements document. See the hazard analysis report for identification of credited engineering controls.*
†† Gravimetric Air Content (GAC) (slump tests, pour cards, etc). Inspections should be performed by an independent entity, not the person/company responsible for pouring the concrete, structural steel, etc.
††† it is a best practice to either write the system verification plan while writing the associated requirements document, or to at least write requirements with verification in mind, but the verification plan is not a required deliverable until there is something to verify against
‡ DACs include structural analysis, fluids analysis, heat transfer analysis, neutronics analysis, seismic analysis, below the hook calculations, etc.
‡‡ Required for Credited PPS Engineering Controls (CECs)
‡‡‡ Inspection Reports, Test Reports, Shielding Weight Reports, As-Built Drawings, etc.

Legend N = New U - Updated, if needed F = Final