

APSU SCU CDB UTILIZATION



G. Avellar†, E. Anliker, J. Lerch, J. Saliba, M. Szubert

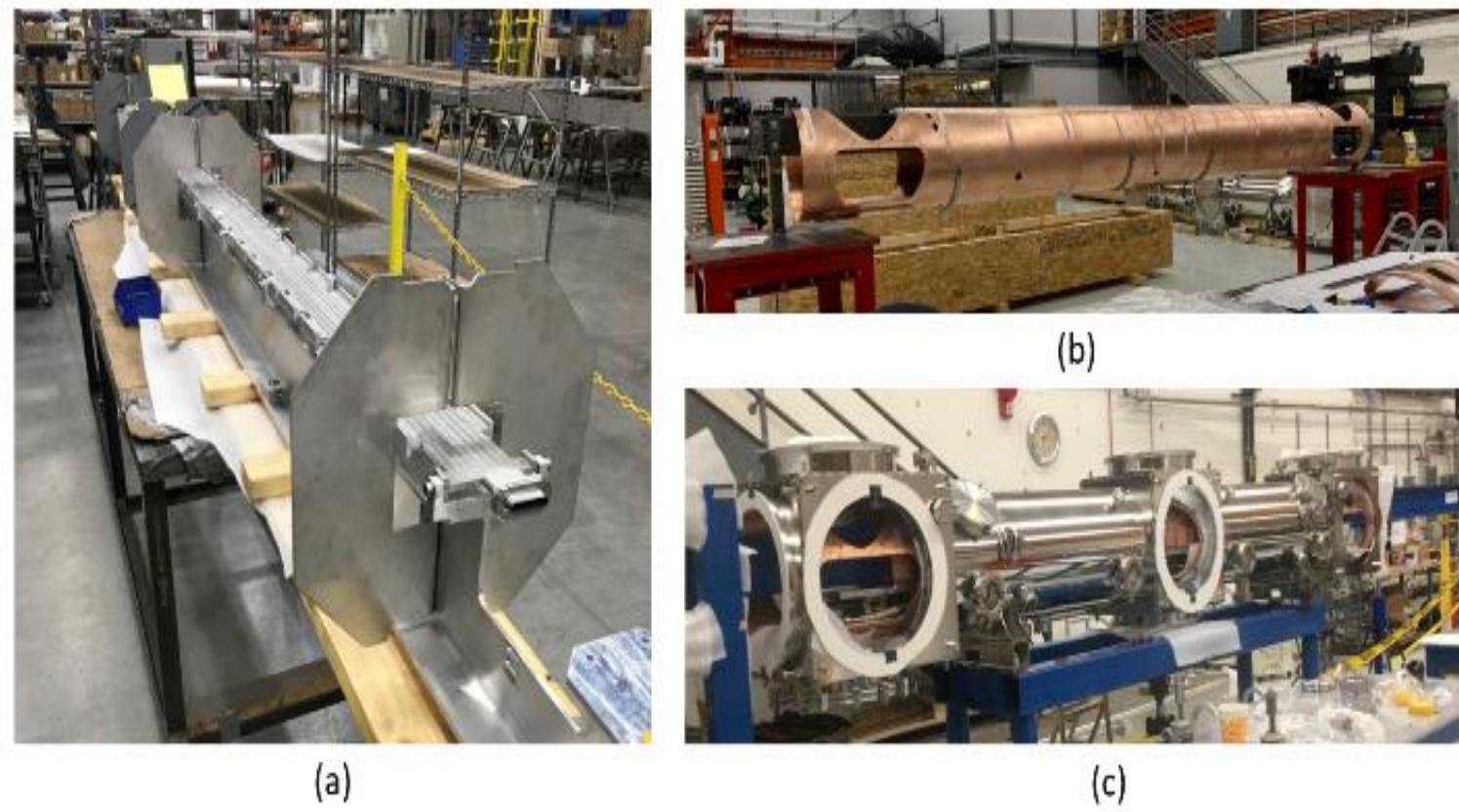
The Advanced Photon Source Upgrade (APSU) Project will replace the current storage ring with a combination of new and refurbished components. The result will be a new machine producing X-rays up to 500 times brighter than the current device. Four of the Insertion Device (ID) straight sections will be equipped with new 4.8-meter long Superconducting Undulators (SCUs) of various magnetic periods, which accommodate canted and inline configurations. These complex devices produce photons at different energies to be used by the ID beamline users. The Component Database (CDB) is a document management platform created for the use of the Advanced Photon Source Upgrade (APSU) Project. The CDB plays a vital role in simplifying and optimizing the transition of the SCU from an R&D unit to a production scope, from procurement to inspection, assembly and installation, and throughout the lifespan of machine maintenance.

TECHNICAL UTILIZATION

- Information storage is customizable for the varying types of data files that come with each component.
- Being able to pinpoint a failure point is critical for a successful project, so the ability to reference this data in the future is essential.

PROCUREMENT TRACKING

- Argonne's Procurement And Requisition Integrated System gets linked to inventory items in the CDB.
- Employees can easily reference the requisition and contractual information.
- The SCU procurements are well underway. The Vacuum Chamber (Fig. a), Thermal Shield (Fig. b), and Cryostat (Fig. c) first articles are all on site.
- Information captured in the CDB includes the location, status, date received, purchase requisition, and links to vendor documentation.



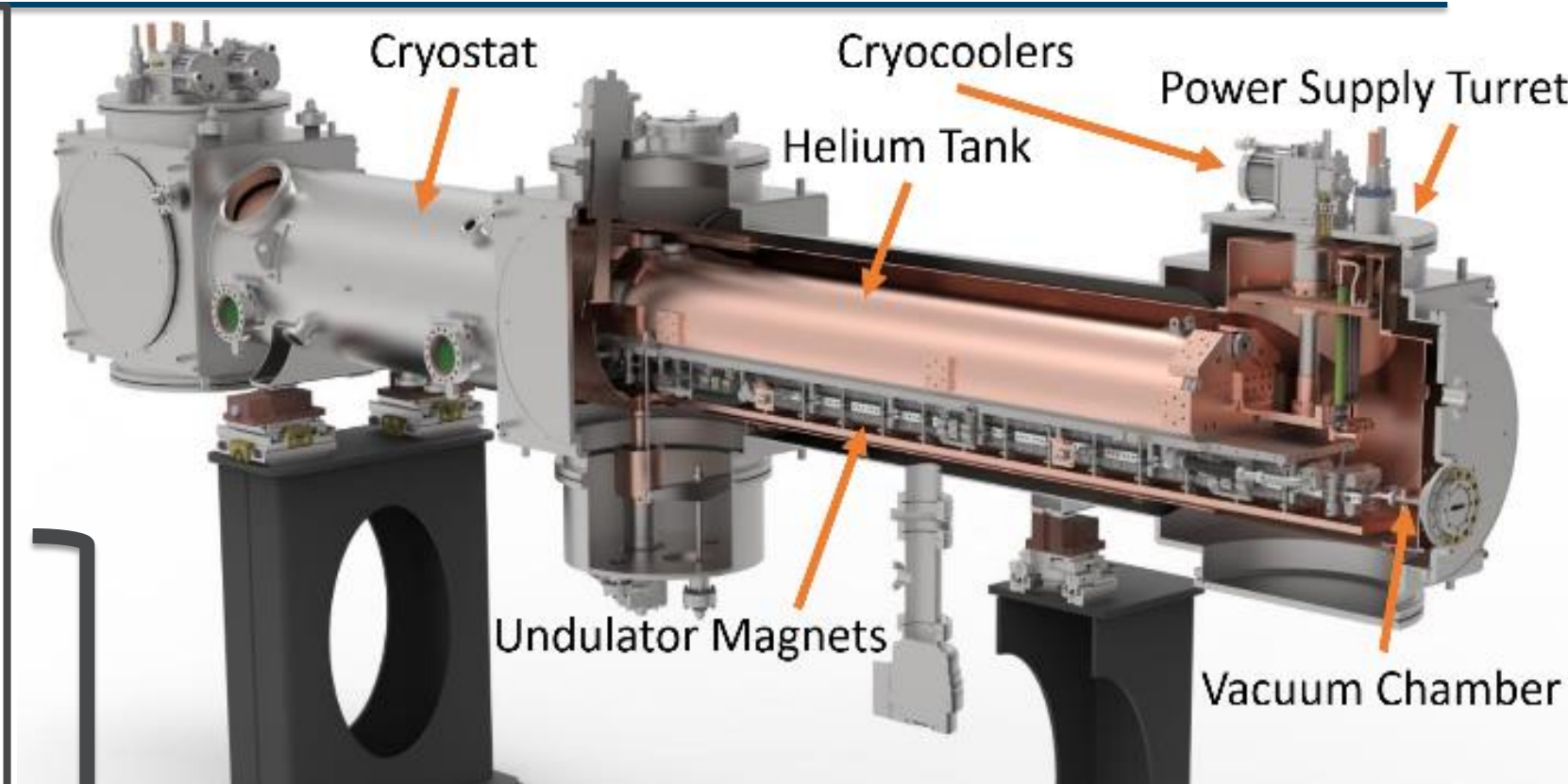
COMMUNICATION

- Communication is a critical component of a project of this scale and duration.
- Information must be accessible in a centralized database for future APSU SCU team members to reference.

CONCLUSIONS

The CDB plays a vital role in the success of the APSU SCU scope. The three most impactful aspects of the CDB are storing technical data, tracking procurements, and effectively communicating across all levels of the organization. An electronic platform ensures that this information will be accessible for years to come.

Part Description	Required	Name	Assigned Item	Model Number
COLDMASS UNDERCARRIAGE ASSEMBLY	Yes	COLDMASS UNDERCARRIAGE ASSEMBLY	A182-CM0100	A182-CM0100
Horizontal Corrector Assembly	Yes	Horizontal Corrector Assembly	A182-MG0126	A182-MG0126
Vertical Corrector Assembly	Yes	Vertical Corrector Assembly	A182-MG0128	A182-MG0128
VACUUM CHAMBER SUPPORT ASSEMBLY	Yes	VACUUM CHAMBER SUPPORT ASSEMBLY	A182-SP0009	A182-SP0009
VACUUM CHAMBER ANCHOR ASSEMBLY	Yes	VACUUM CHAMBER ANCHOR ASSEMBLY	A182-SP0014	A182-SP0014
Vertical Corrector Support Assembly	Yes	Vertical Corrector Support Assembly	A182-SP0131	A182-SP0131
Corrector Magnet Support Assembly	Yes	Corrector Magnet Support Assembly	A182-SP0134	A182-SP0134
VACUUM CHAMBER ANCHOR	Yes	VACUUM CHAMBER ANCHOR	A182-SP0015	A182-SP0015
TANK TO LOWER CORE PIPING ASSEMBLY	Yes	TANK TO LOWER CORE PIPING ASSEMBLY	A182-CM0017	A182-CM0017
TANK TO UPPER CORE PIPING ASSEMBLY	Yes	TANK TO UPPER CORE PIPING ASSEMBLY	A182-CM0018	A182-CM0018
SCU Heater Block Assembly	Yes	SCU Heater Block Assembly	A182-CM0036	A182-CM0036
Corrector Magnet Adjustment Bracket	Yes	Corrector Magnet Adjustment Bracket	A182-CM0038	A182-CM0038
Corrector Magnet Bracket	Yes	Corrector Magnet Bracket	A182-CM0039	A182-CM0039
Liquid Helium Tank	Yes	Liquid Helium Tank	AD-576314	AD-576314
COLD MASS ANCHOR	Yes	COLD MASS ANCHOR	A182-CM0040	A182-CM0040



Cross-section rendering of the inline 16.5mm SCU showing the cooling system, magnets, power supply turrets, and vacuum chamber.

ASSEMBLY LISTING

- Assemblies are broken down further into subassemblies.
- This helps to narrow one's search and focus on information about a particular system within the SCU.
- This breakdown of assemblies also correlates to the physical assembly process.

ITEM MEMBERSHIP

- One can use the *Item Membership* function to navigate the CDB in the opposite direction, by seeing everywhere that a subassembly or component is used.
- This is important for parts that are used in multiple designs of SCUs.

INVENTORY

- Each item ordered is listed as an *Instance* in the *Inventory* subsection.
- If selected it will display all the information collected for that item.

PROPERTIES

- Important information about inventory items is captured under properties.
- Quantity, a link to the purchase requisition, and various vendor documents are accessible to all employees.

E-TRAVELER

- Inspection directions, assembly procedurals, and safety protocols are documented in an electronic traveler which can then be attached to an item within the CDB.
- The 4.8-meter long SCUs are the first of their kind, so a straightforward process for technicians to follow reduces the risk of miscommunication and unsafe practices.

Tag	Qty	Serial Number	Primary Image	Description	Location	Housing	Status	Actions
Batch 1 qty 4	4				314		Accepted	
Batch 2 qty 4	4						Requisition Submitted	

Title	Description	Created By	Updated By	Created From Template	Estimated Progress	Version	Action
Acceptance Traveler		gavellar	dwilkin	Acceptance Traveler	100%	2	

ACKNOWLEDGEMENTS

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