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

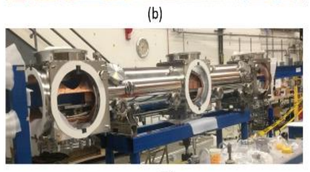
- Information storage is customizable for the varying types of data files that come with each component.
- Being able to pinpoint a failure point is critical for a successful project, so the ability to reference this data in the future is essential.

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.

(a)

(b)



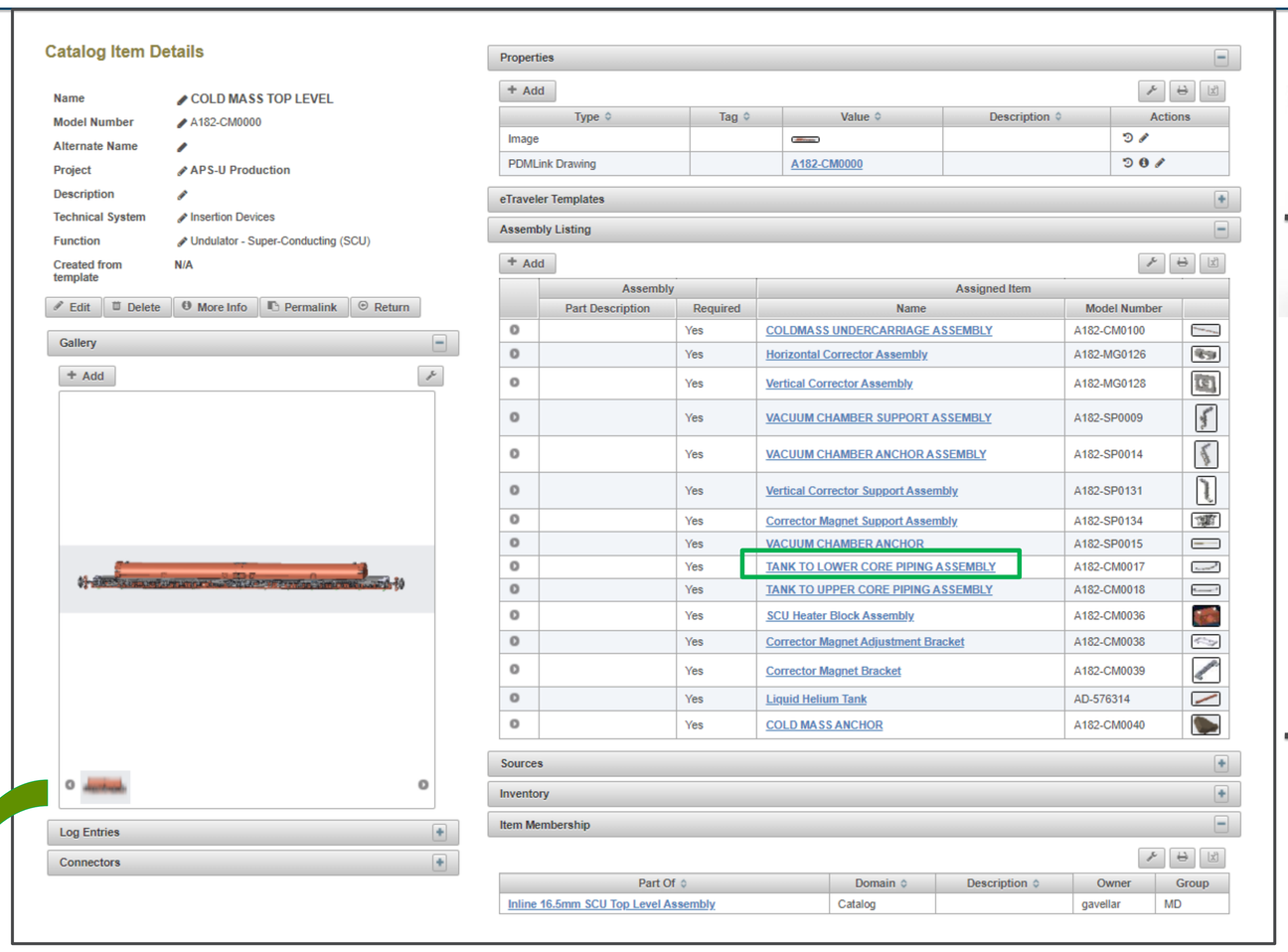
(c)

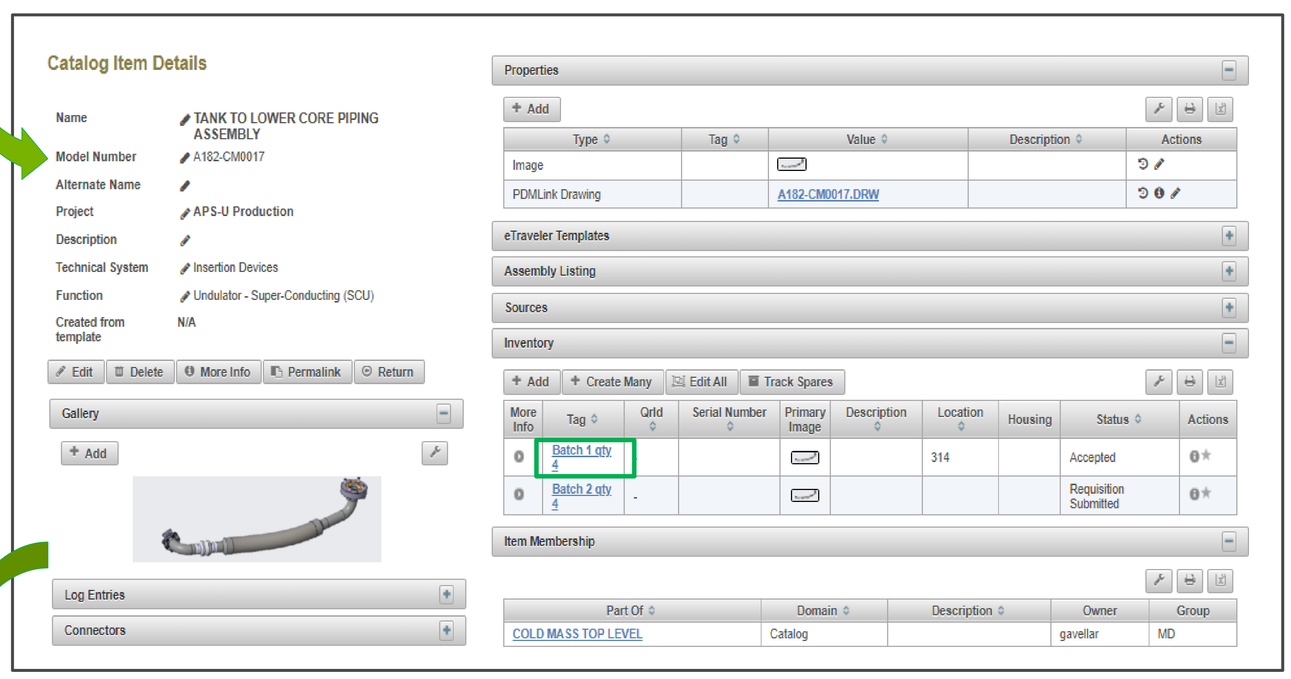
COMMUNICATION

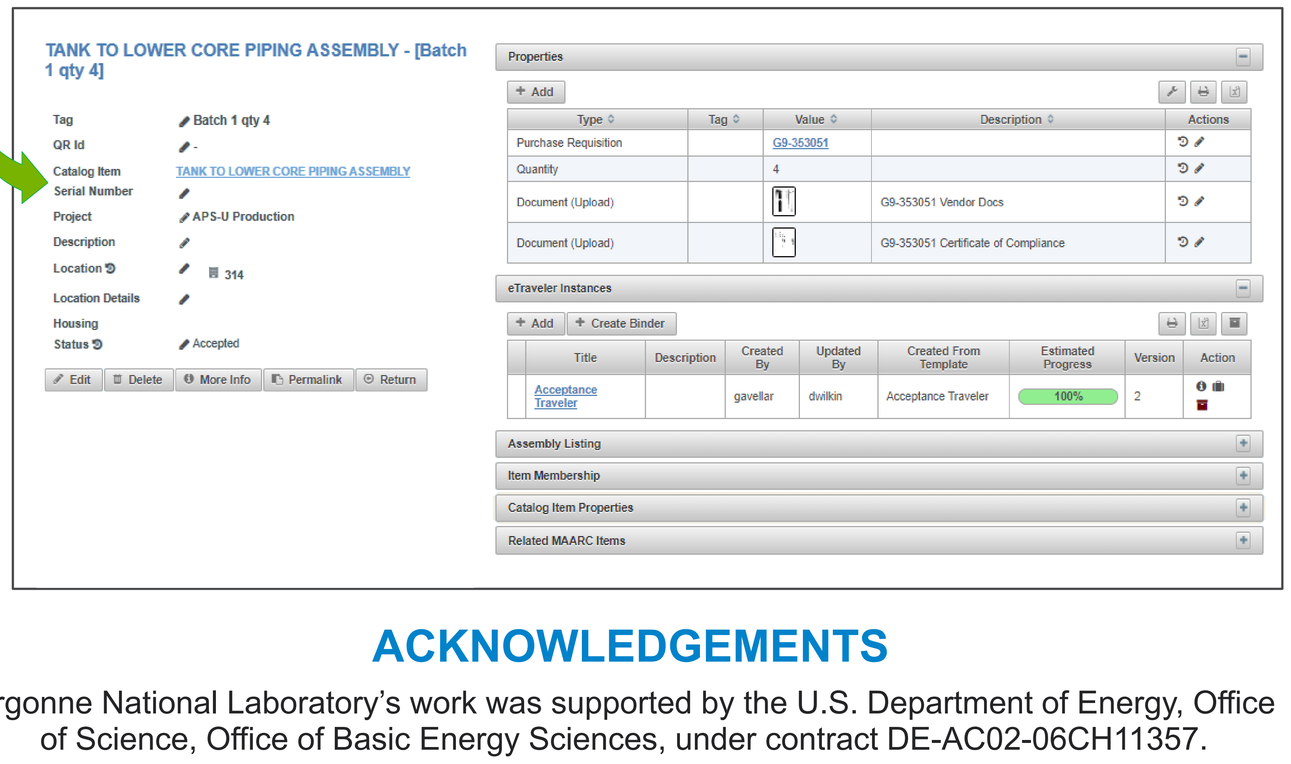
- Communication is a critical component of a project of this scale and duration.
- Information must be accessible in a centralized database for future APSU SCU team members to reference.

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.







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 in to 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.

ACKNOWLEDGEMENTS

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