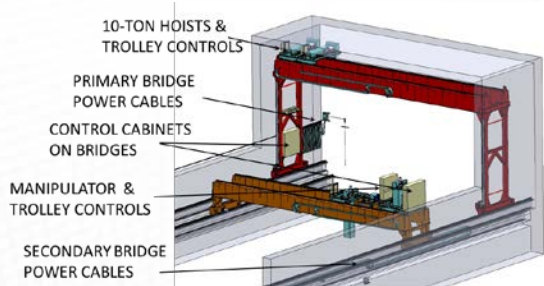


Robotics and Systems Development Center

7603 Highbay is a multi-user facility mainly used by two directorates— Nuclear Science and Engineering, and Neutron Science. With 50ft high ceilings, two 10T hoists on a 20T crane, 3 bridges, and a 30ft pit area, it accommodates the needs of many large experiments that cannot be accommodated elsewhere. The Highbay is 130 ft. x 60 ft. in dimension with added capability to lower equipment to the basement that is 2 floors below.

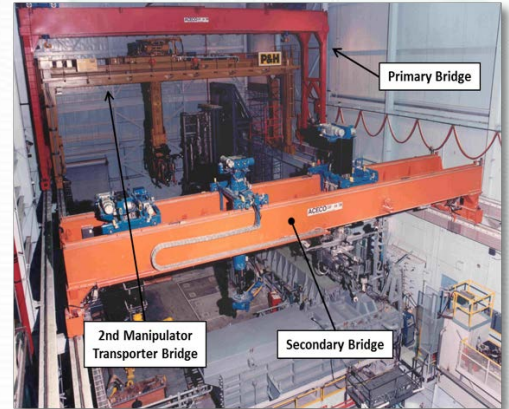
Current Upgrade

Crane and manipulator bridges were installed in the early 1980's using late 1970's controls technology. The bridge crane system at the facility is being upgraded by replacing all electronics and motor drives. With this upgrade, the wired pendant control will be replaced by a wireless console for the control of the trolleys and bridges. The upgrade is being performed for both the primary and secondary bridges.



Highbay Capability

- Highbay is a multiuser experimental facility.
- Highbay has two 10 Ton hoists on a bridge crane spanning the entire width and length of the highbay.
- There is a secondary bridge housing a Camera trolley, and PaR Power Manipulator Arm.
- A third bridge crane with a 1/2ton hoist is not currently in use.
- Houses large test equipment that can be repositioned easily for different experimental set-up.
- Waste casks, Portal monitors, Stack Characterization equipment are some of the largest pieces of equipment housed in highbay currently.



Spallation Neutron Source

The 7603 facility houses the Target Test Facility (TTF) for Spallation Neutron Source which is a cold mock-up of the actual mercury loop used at SNS. The TTF loop containing 400 gallons of mercury weighing 40,000 lbs. It was extremely useful during the early design phase to ensure that remote target change out was possible using MSM manipulators, and the mercury pump could also be remotely maintained. Currently TTF is being used to study the power upgrade at SNS from 1.4 MW to 2 MW. Injecting Helium bubbles into the Mercury to mitigate cavitation is being studied on a modified target design. Once confirmed, this could result in a newer target design for higher power SNS targets.

Along with Mercury based first target, a second rotating target using tungsten is being proposed. A prototype of the Second Target Station (STS) is located in the pit area of Highbay. Once the design of the STS becomes more mature, discrete testing of components are envisioned in 7603 highbay.



Target Test Facility

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Second Target Station

Hot Cell Design Support

ORNL has many hot cells for processing nuclear materials. When components are being designed for these hot cells, they need to be tested for operational readiness. If functional testing is not performed prior to placement inside a hot cell, it might be too costly to make modifications to the design afterwards. Hence, most of the equipment for Hot cells go through extensive cold testing. 7603 Highbay is used for testing many of the equipment designs that go into hot cells in 7920, 7930, 3525, 3047, and 3025E buildings. Using Model F and Model 8 MSM manipulators in 7603, operations are tested, design improvements are made, and operator training is conducted before equipment is introduced into the hot cell.

Portal Monitor Testing

Nuclear Security and Isotope Technology Division conducts testing of Neutron and Gamma detectors to improve the sensitivity of detection. They also test the detectors made by many commercial vendors including international and also certify the sensitivity of detection.



MSM Test Stand



Portal Monitor Testing Facility

Date: April 2017