

Redesign of Monochromator Shielding of Cold Neutron Triple-Axis Spectrometer at HANARO

Friday, 1 December 2017 12:00 (20 minutes)

A Cold Neutron Triple-Axis Spectrometer (Cold-TAS) was initially installed in the guide hall of HANARO's cold neutron research facility in 2012. Owing to frequent mechanical troubles, simplification of the sample table and the analyzer took place in 2013. And the instrument was licensed for normal operation in 2014. Soon after, however, HANARO was shut down because of the reinforcement activity of the outer walls of the reactor building to enhance the seismic stability. Taking this opportunity, we decided to redesign and reconstruct the monochromator shielding of the Cold-TAS because serious deformations were found in it in 2015. The entire shielding structure was redesigned to stack horizontally to support the larger weight with little deformation. During the redesign process, we evaluated the shielding performance for radiation using MCNP. Shielding blocks were filled with mixed concrete with lead balls and boron powder. The concrete had different densities depending on their strategic location in the shielding structure. To fasten the bottom shielding block with bolts, stainless steel plates with tapped holes were installed on the concrete floor. After the installation of the redesigned shielding, we polished the surface of the dance floor to ensure smooth operation of the sample and the analyzer tables. All of the above activities were finished by the end of 2016. Now the instrument control system is under stress testing because it has not been used for a long time. Once the reactor resumes operation, we will measure the performance of the redesigned shielding.

Formal Invitation Letter Required

No

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