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Laser Scanning for the replacement of EVB2 in the ISIS Synchrotron

The EVB2 Magnet is a large vertical bending magnet located in the extraction line of the ISIS synchrotron.

The magnet is over 25 years old and increasingly unreliable.

Therefore a project was initiated to replace the EVB2 magnet; ISIS Survey Section was tasked with pre-aligning this replacement.

The existing magnet was aligned during the construction of the synchrotron, using optical instrumentation on a direct line of sight along the beamline. There are no fiducial marks and very limited data has been found relating to the initial installation.

The magnet is next to a high radiation area, which limits the time that can be spent close to the beamline.

We therefore decided that the best way to set up and pre-align the replacement magnet was to 'reverse engineer'the alignment.

The location, and high radiation levels, ruled out survey with a laser tracker and instead we opted to use the Trimble FX laser scanner.

Elements critical to the existing alignment were abstracted from the scan data and relative positions were then replicated in the pre-installation set-up of the replacement magnet, and referenced to fiducials on the magnet assembly.

The EVB2 magnet is scheduled for installation during June 2016.

Summary

Author: MILLINGTON, Tony (STFC Rutherford Appleton Laboratory)

Presenter: MILLINGTON, Tony (STFC Rutherford Appleton Laboratory)