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Reverse Engineering, a key and challenging step before the integration studies for old accelerators at CERN

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The accelerators constituting the LHC injectors chain have been gradually built and commissioned since the CERN foundation in the fifties. The operation of the Proton Synchrotron, the Proton Synchrotron Booster and the Super Proton Synchrotron started in 1959, 1972 and 1976 respectively. During the Long Shutdown 2 (LS2) of the CERN accelerator complex in 2019 and 2020, a large upgrade of these machines has been performed in the context of the LHC Injector Upgrade (LIU) Project and consolidation programme. This paper presents the process of reverse engineering performed by the Integration Office within 3D CAD environment during the preparation phase of the LS2 to allow the spatial integration studies of the upgrades and ensure the reliability of the installations. It describes the methodologies and technologies used from 2D drawings to 3D models and data consistency check processes in accordance with reality. Process remains ongoing to treat the enormous quantity of data.

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Footnotes

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