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C2Po1B-03: Design of the Tunnel Transfer line of PIP-II Cryogenic Distribution System

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The Cryogenic Distribution System (CDS) of PIP-II will distribute cryogenic helium from Cryoplant (CP) to the 23 SRF cryomodules for supporting various operating modes of the PIP-II accelerator. The CDS is being designed as a collaborative effort of Fermilab, USA and Wroclaw University of Science and Technology (WUST), Poland. The largest section of the CDS is the Tunnel Transfer Line (TTL) comprising a string of segment modules running parallel to the cryomodule string. Each TTL Module interfaces with the corresponding cryomodule and houses adequate control valves (cryogenic and room temperature), instrumentation, relief lines, and u-tubes for supply/recovery of cryogenic helium. The design of TTL is marked with unique challenges arising from space availability and installation constraints in the accelerator tunnel. The Fermilab and WUST teams have completed the technical design of the TTL while meeting these challenges. This contribution will highlight these challenges and present an overview of the process design, analysis, fabrication and installation plan of the Tunnel Transfer line.

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