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C1Po1E-05 [32]: Conceptual design of the CFETR cryogenic system

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The “CFETR integration engineering design” project and the program to develop an “integrated research facility for key systems of fusion reactor” have been granted by China in 2017. For the CFETR cryogenic system, an engineering conceptual design will be accomplished in 2020. The cryogenic system heat load is being calculated basing on the updated parameters of CFETR: a major and minor radius of 7.2 and 2.2 m, a fusion power of 200 to 1500 MW, a toroidal field of 6.5 T and a plasma current of 10 to 14 MA. Special attention will be addressed to the heat loads of the magnet system consisted of both HTS and LTS superconductor, the tritium separation system, and the cryopumps working at atmospheric pressure due to the D-T reaction. After the average heat load is determined, the function breakdown analysis and operation mode analysis of the cryogenic system will be performed. Finally, a reference PFD design will be proposed.

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