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## Value Engineering in System of Cryoline and Cryodistribution for ITER: In-kind Contribution from India

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System of cryoline and cryodistribution for ITER has matured to a stage of preliminary design phase with the advent of industrial associates. Starting from the cold power source, the system of cryoline and cryodistribution transfers the controlled cold power through a large network to the superconducting magnets and cryopumps. The functional responsibility also includes very high reliability and availability with respect to the operation of the ITER machine.

Following the completion of conceptual design, it was necessary to perform a detailed engineering study of the complete network of distribution system in totality, before entering in to the industrial phase. This is to ensure the functional responsibility of the system. Industrial contracts have been established for the system of cryoline and cryodistribution with the objective to enter into the detailed design and construction phase of the overall systems. Value engineering in the area of distribution boxes including interfacing cryolines has been performed in order to access the integrated reliable performance with respect to the overall cryogenic system, reducing the risk transferred to the industrial partners. These include technical risk assessment, analysis, mitigation plan and implementation with the industrial partners. The paper will describe the methodology of technical risk management, value engineering performed to ensure fulfilment of licensing and regulatory obligations, functional reliability as well as testing and manufacturability by standard industrial processes, so that highly reliable integrated distribution system is delivered for the project.

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