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## Review of failure rate input parameters to risk analysis of cryogenic systems

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To mitigate the results of potential failures of cryogenic systems a risk analysis should be performed during the system design phase. The risk analysis output is sensitive to input parameters reflecting failure rates of the system elements like welds, pipes, valves, bellows and others. Big helium cryogenic systems are relatively rare and they do not allow to create a data base allowing estimation of the probability of the system elements failure. It is necessary to transfer the data from other domains, like nuclear industry, chemical industry, power engineering and LNG installations. Paper provides review of available data bases containing probabilities of the system elements failures. Exemplary calculations of cryogenic systems cumulative failure rates are given. The results are compared with the experience gathered during the LHC accelerator up to now exploitation. The recommendations concerning input parameters to risk and reliability analysis of helium cryogenic systems are formulated.

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