

ON THE PERSPECTIVE OF FUSION - FISSION HYBRIDS

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Fusion - fission hybrid allows considerable relaxation of demands on fusion part of the system, which can operate below the Lawson limit. Hybrid would operate in conjunction with the conventional fission reactors supplying them with fissile material produced by conversion of U-238 or Th-232. Although their function would primarily be in conversion of fertile into fissile materials using neutrons from fusion reaction, they can be also viewed as a development stage to pure fusion reactor.

An objection to fusion - fission hybrid is not infrequently stated, to the effect that it would combine the worst features of fusion and fission, i.e., complexity of fusion with the fission products inventory and the associated hazards.

Arguments are presented to show that with realistic assumptions on accident mechanism hazards from the fusion - fission hybrid is not essentially higher than of the pure fusion system. This could be assured by keeping fertile blanket sufficiently subcritical, and with power densities low enough so as to make sure that no radioactivity release can take place in the loss of coolant accident (LOCA) in the fission part of the system. As various project studies show, there is no problem in fulfilling these conditions. It should be concluded that fusion - fission hybrid offers the possibility of U-238 and Th-232 utilisation, i.e., the release of practically unlimited amount of fission energy, but without the risks associated with the very high power density of critical core of fast breeder reactors.