

7.7 Hypothetical Accident Analyses for FBRs

Even though the possibility of an energetic fuel/coolant interaction can be essentially (though not completely) eliminated in the analyses of hypothetical accident analyses in a liquid sodium cooled LMFBR, there still remain the questions of how the reactor core meltdown would proceed, of whether the containment would be breached, of whether radioactive materials could be released into the surroundings and how the heat generated in the disassembled core would be dissipated (Wilson 1977). Studies and experiments on the core meltdown show that the resulting sodium/uranium mix in the reactor contains sufficient sodium to take away the decay heat by boiling for many hours while the decay heat declines. In this regard the pool-type reactors are superior to the loop-type (see section 4.8) since they contain more sodium. Moreover, large scale experiments have shown that mixtures of boiling sodium and molten fuel and cladding can coexist for many hours without energetic interactions. Despite these reassuring studies, even the most remote possibilities must be explored to allay public fears regarding fast breeder reactors.