

### Dynamic simulation for security assessment of cumene production process

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The security in operation of reaction system remains as a sensitive issue when the treatment of hazardous substance and exothermic reaction are conducted. Especially, the entire process consisted of various units becomes more complicated due to chain effect. Dynamic simulation is able to estimate the transient response from disturbance as well as the parametric sensitivity analysis in the entire process containing recycle stream. For this reason, dynamic simulation is utilized to perform security assessment of cumene (isopropylbenzene) production process including PFTR (plug flow tubular reactor) operated under high temperature and pressure. Two aspects of the inherent thermal hazard from reaction kinetics and the thermal runaway criteria are introduced to identify the reasonable operating condition. By simulating process behavior under various conditions, these results are used to find the proper operational range of reactor.