KPIs on Process Safety in a chemical production environment

Most chemical reactions have an exothermal potential that can lead to increased temperature and pressure. In the past incidents happened that had catastrophic consequences. In Process Safety nearly everybody knows these locations:

Seveso, Italy (10.07.1976)

Bhopal, India (03.12.1984)

Toulouse, France (21.09.2001)

With detailed knowledge about the process and the behavior if “something goes wrong”, it is possible to develop a set of KPIs to establish a safe process setup. Basically we need to know how much energy is stored within the system and how long it will last until this energy is released.

The following KPIs and the consequences for a safe process setup will be discussed:

Tp (process temperature)

MTSR (maximum temperature of synthesis reaction)

Tad (temperature increase under adiabatic conditions)

TMRad (time to maximum rate under adiabatic conditions)

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