

## Flare Load Minimization of the Naptha Splitter based on Real-time Load Estimation using Dynamic Simulation

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Flare system design is crucial to chemical plant safety. Especially, Flare load evaluation dominates the whole system design in that it determines the size and number of PRVs (Pressure Relief Valves), pipelines, KO drums and stack. Therefore over-estimation of flare load would cause unnecessarily large flare system, and it results in tremendous industrial material and energy loss and high capital cost. API and several EPC companies have recommended a conservative methods of evaluating the relief load, but their basic assumptions lead to such excessive flaring.

In this study, the flare loads are mitigated through dynamic simulation for a multiple tower system and compared to conventional steady-state calculation method. Unlike a single tower system, multiple system requires time varying load estimation for each directly connected tower and followed by summation of each estimated load from a properly selected scenario. Through this procedure flare load can be minimized considering the basic control system and it can lead to appropriate design of the whole flare system.