Reactor decision support systems for operators

Sang Phil Han[†]

PSE Korea Ltd.

(s.phil.han@psenterprise.com[†])

Reactors are at the heart of the most chemical processes and usually show complex non-linear dependency on various operating and environmental conditions. Meanwhile, as common in all parts of chemical processes, data measurements are limited in number and sometimes in measurement quality. Component compositions and temperatures in various points inside and outside of the reactor are critical to make a clear decision about the status of the reactor, but usually they are available only for very limited locations inside and around the reactor. However, if a high-fidelity reactor model, with all important physics and chemistry considered to the required level of detail, can be combined with the data available even when they are limited, then enough information necessary for various operating decisions can be provided. This presentation will explain how a high-fidelity physics-based reactor model (Reactor Digital Twin) can be utilized together with the available plant data to provide unprecedented level of detailed operation decision support to the plant operators, engineers and managers, based on an industrial application case.