Digital Applications for high-performance hydrogen production via Steam Methane Reforming

Steve Hall[†]
Siemens Process Systems Engineering
(s.hall@psenterprise.com[†])

This presentation describes how SPSE has deployed a digital twin for an SMR reactor using its gPROMS Process tool and then deployed it using its gPROMS Digital Applications Platform. The high-fidelity model of the reactor fully describes its behavior and allows it to be accurately modelled, with the reactor operating conditions being optimized to maximize production. The resulting digital twin of the reactor links to live plant data systems, autotuning and updating itself through machine-learning capabilities, validating actual performance, providing soft-sensed information on internal conditions and continually calculating optimal operating conditions to maximize hydrogen production. H2 production rate and purity increases are highlighted in dashboards in real time, giving operators greater insight and confidence to run the process safely at the optimum point. Operator actions can be taken quickly with confidence, leading to improved hydrogen production