

164d Dynamic Modeling of PEM Fuel Cell Power Plant

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System level dynamic models can be used in various stages of fuel cell power plant development activities to help guide plant and control design studies. To facilitate this, UTC Power has developed system level dynamic models for a number of its fuel cell power plants using equation-based simulation package gPROMS. A dynamic fuel cell stack model is at the core of these power plant models. The stack model includes kinetics and transport phenomenon that have a significant impact on overall system performance. It also has the flexibility to accommodate different configurations of fuel cell stack designs. This paper discusses the models, approaches to increasing model robustness, importance of model validation and examples from our development efforts illustrating the use of such models to characterize and refine plant & control system performance.