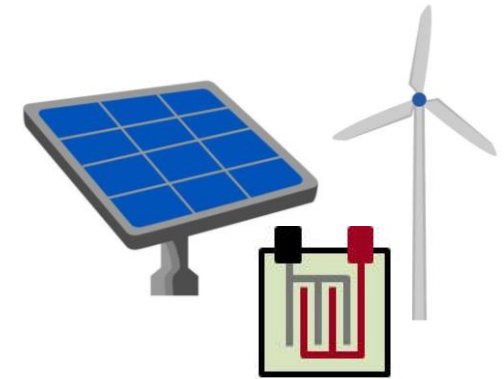
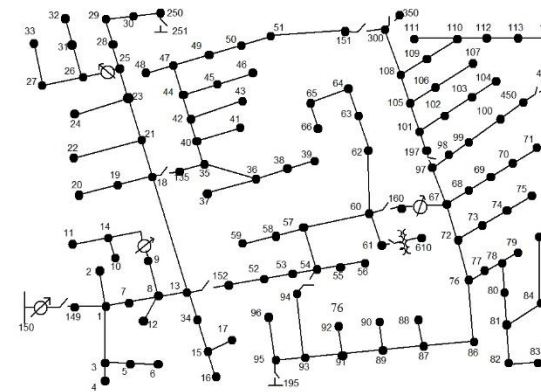
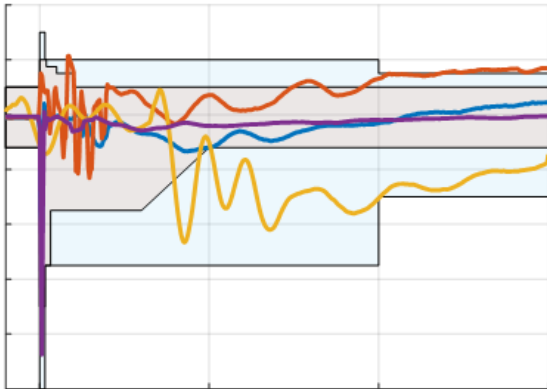


Renewable Grid Integration Studies

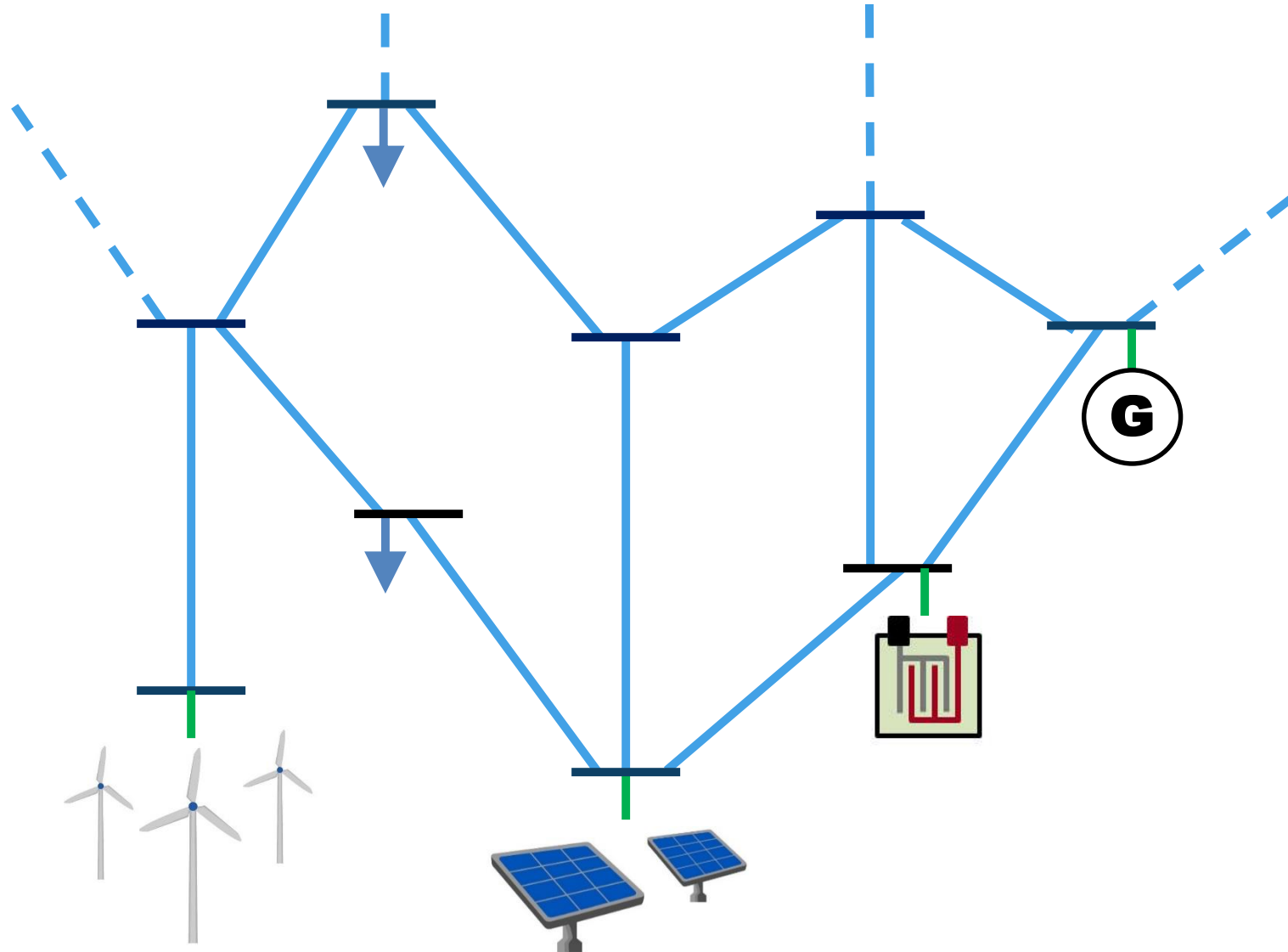
Using MATLAB and Simscape Electrical



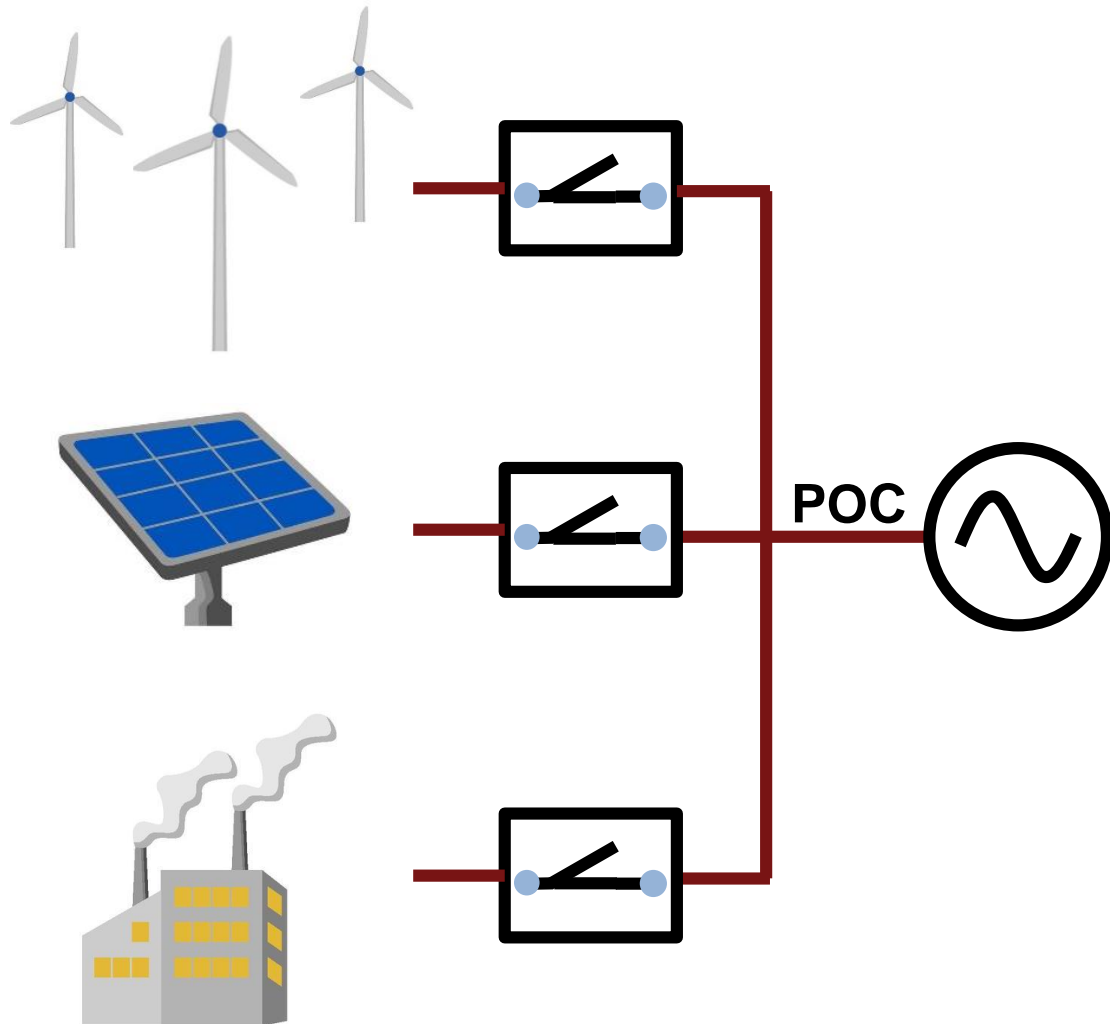
Jonathan LeSage, PhD

Senior Application Engineer - Energy and Automation

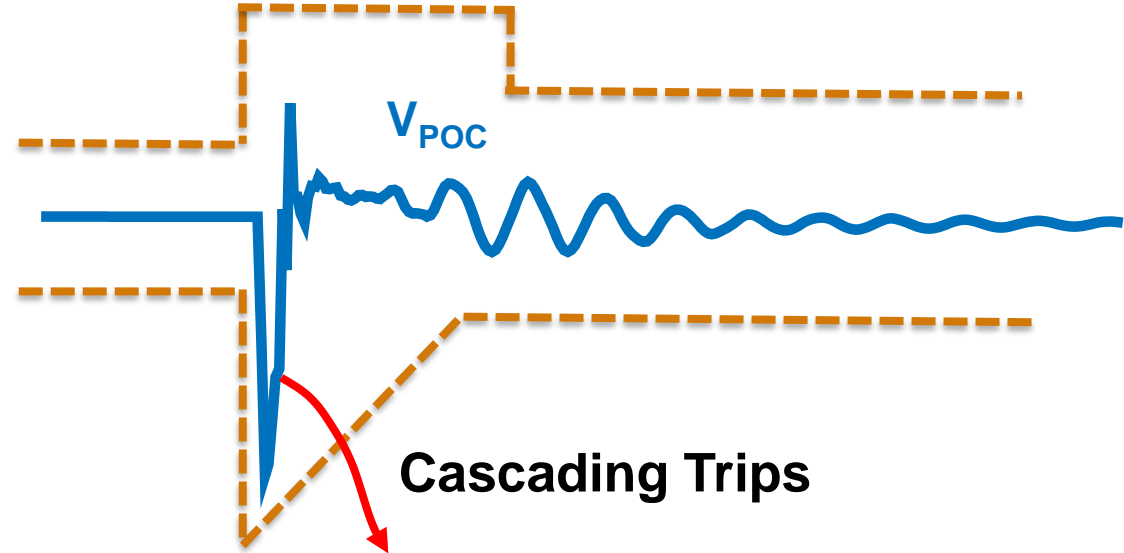
Renewable and Distributed Resource Grid Integration



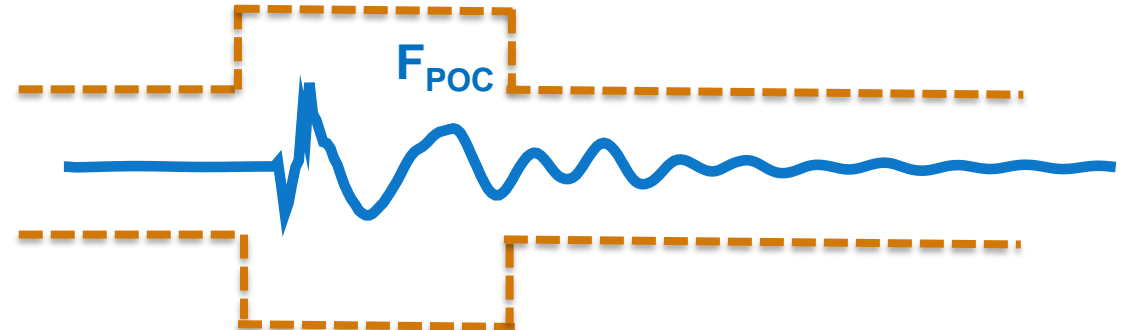
What are Grid Codes?



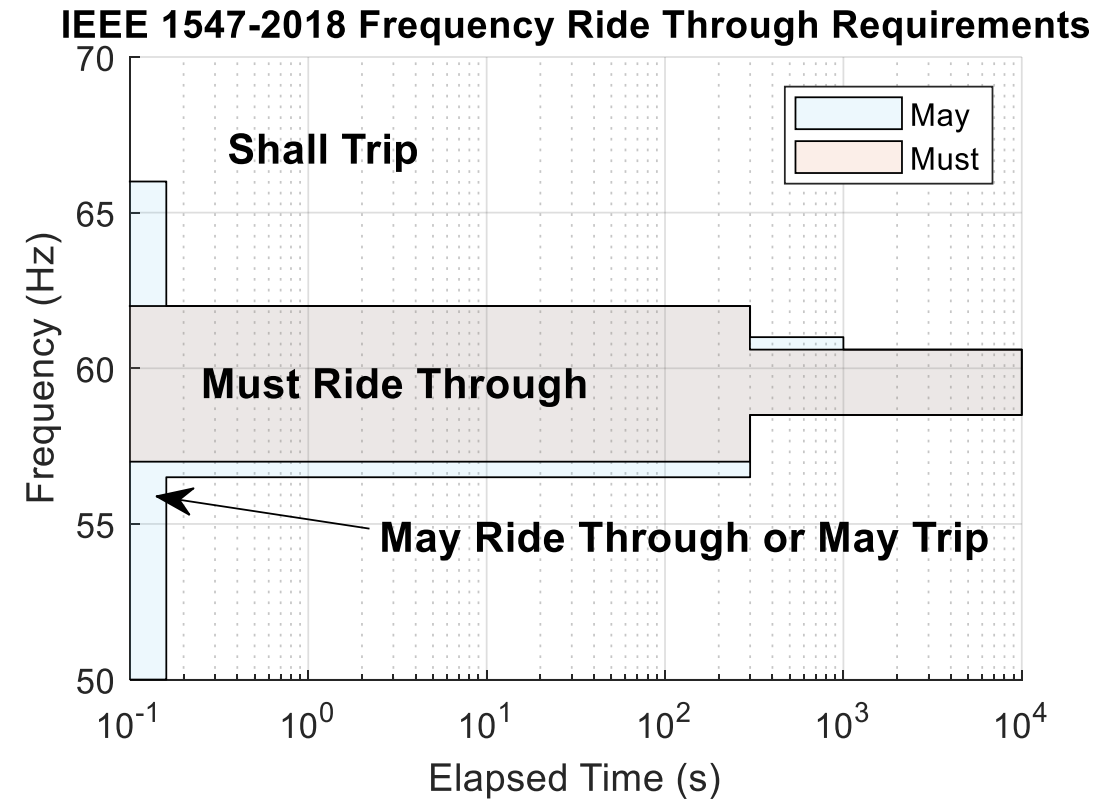
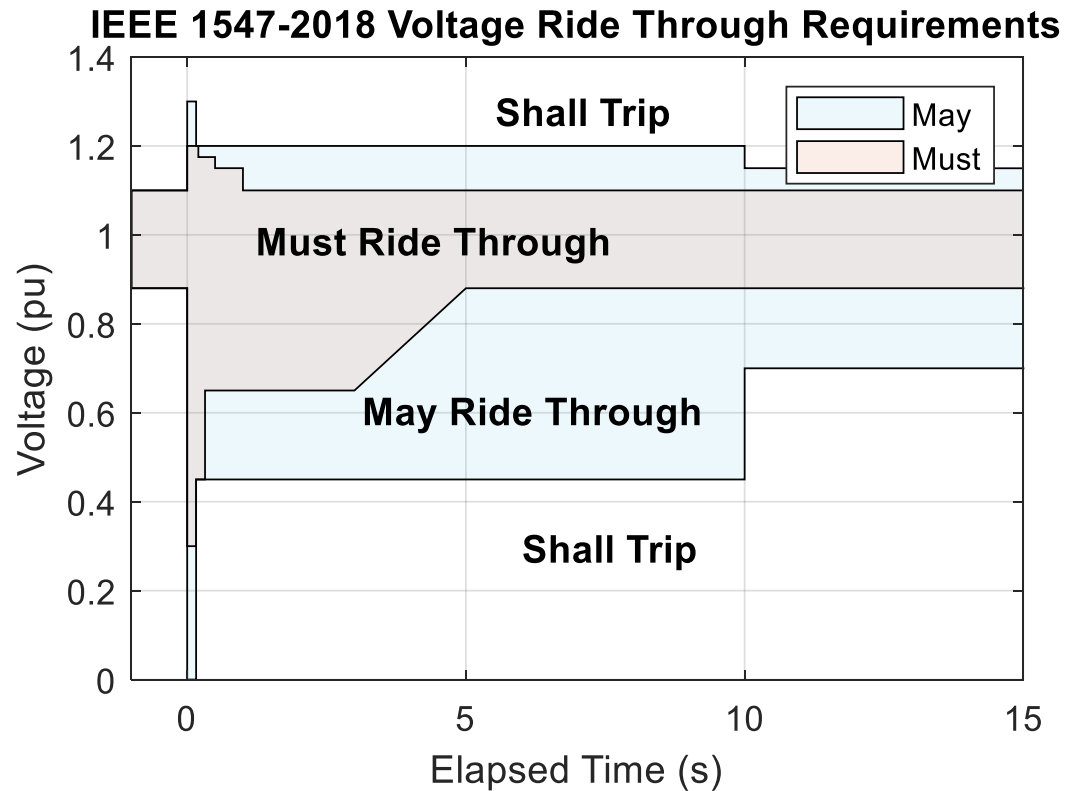
Voltage Grid Codes



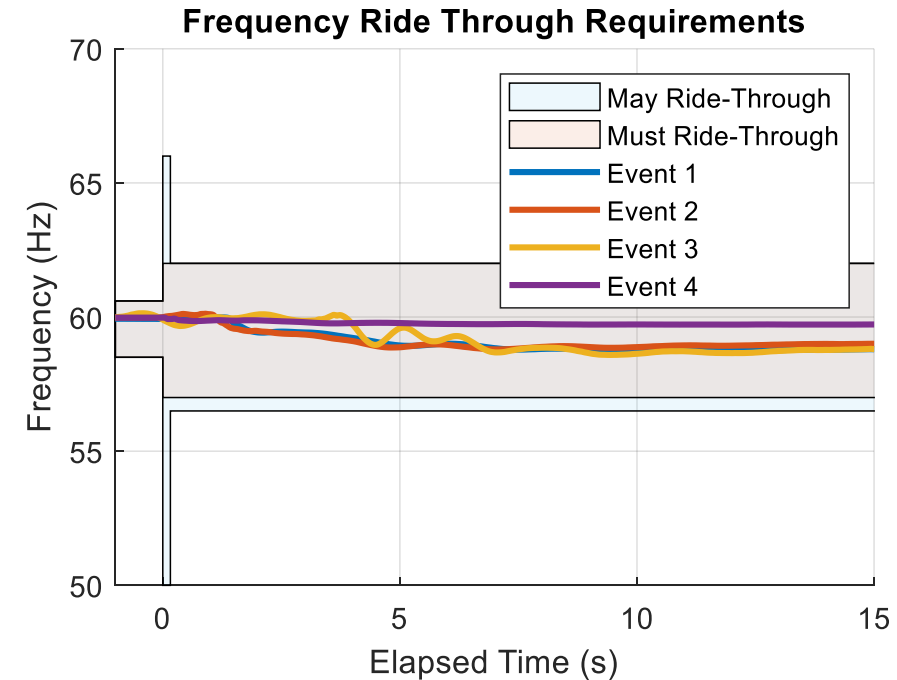
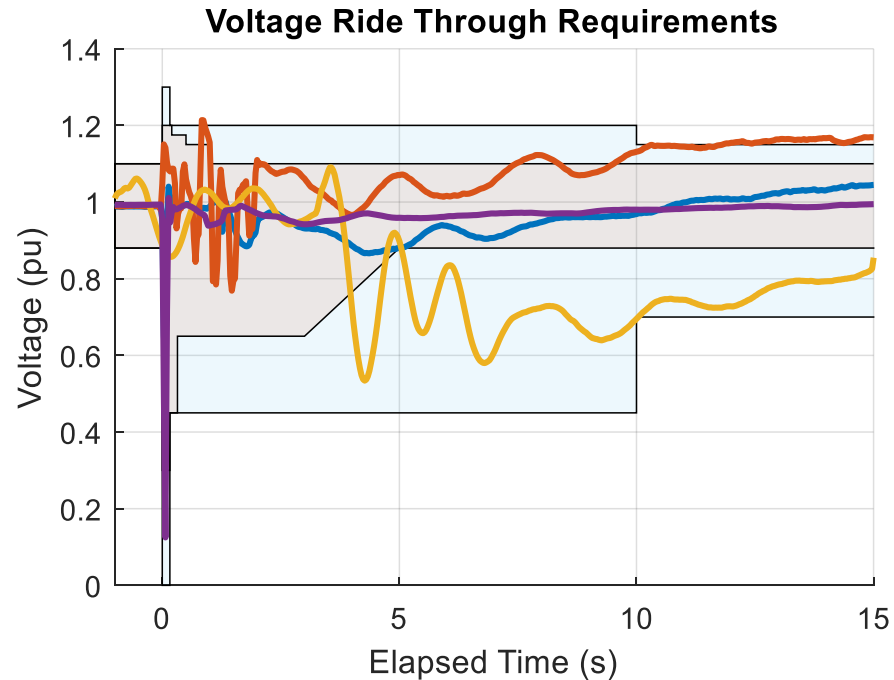
Frequency Grid Codes



Common Voltage/Frequency Grid Codes

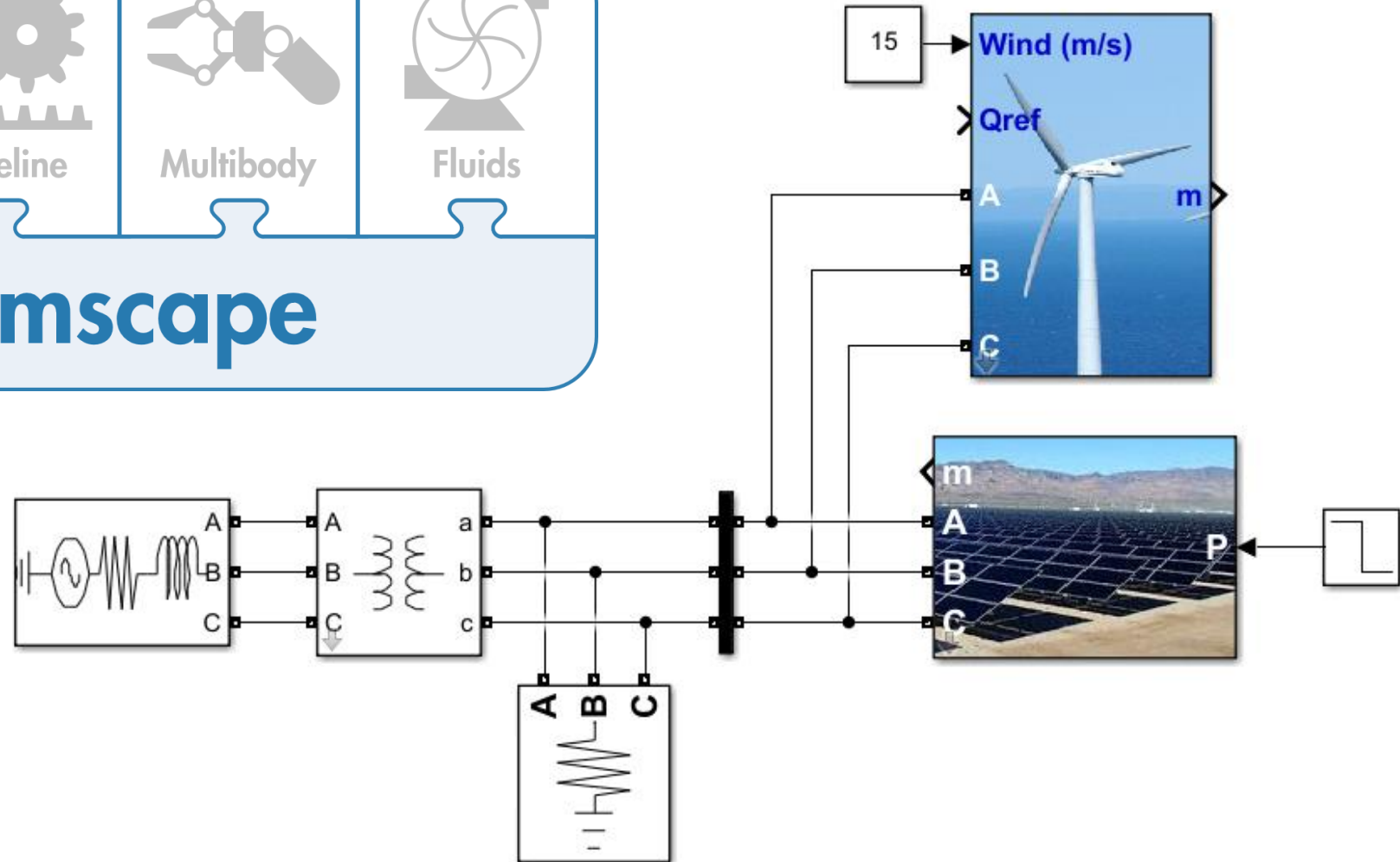
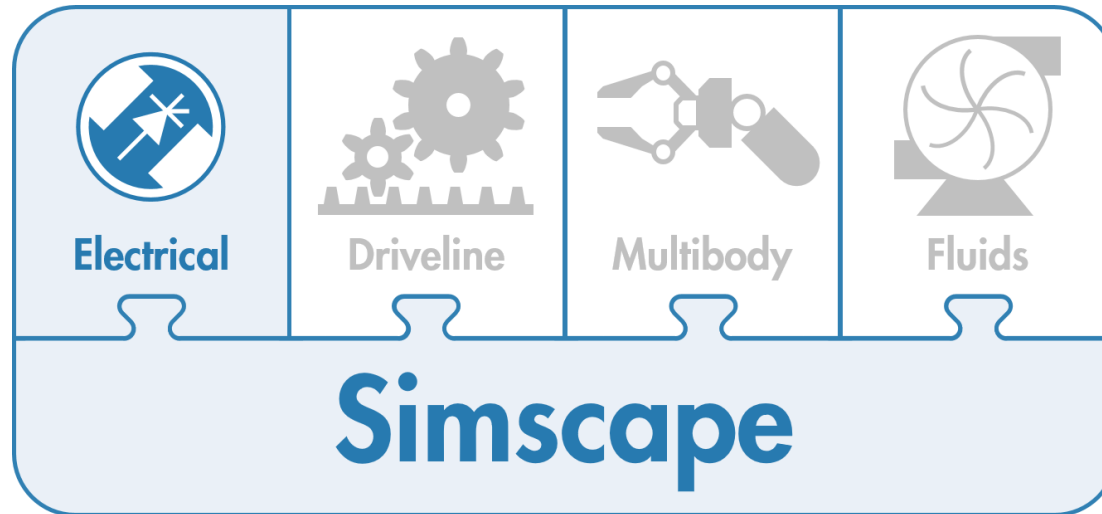


Assessing Grid Code Compliance with PMU Data

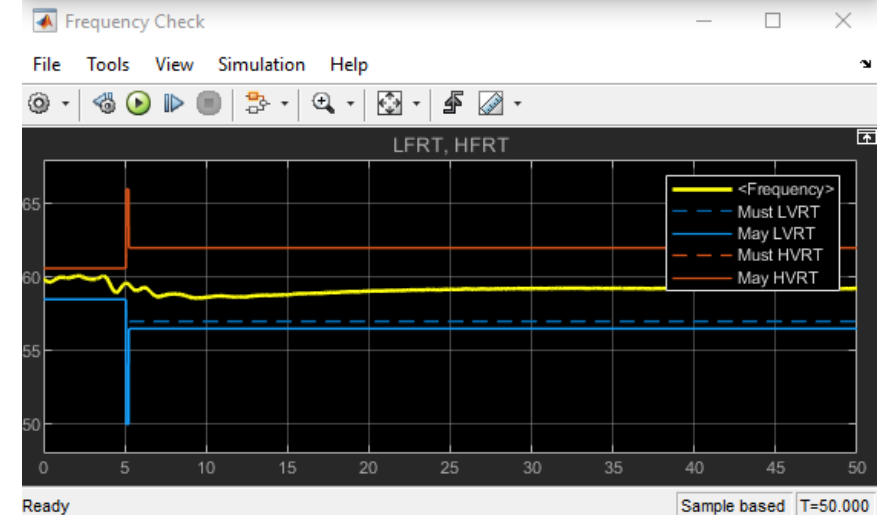
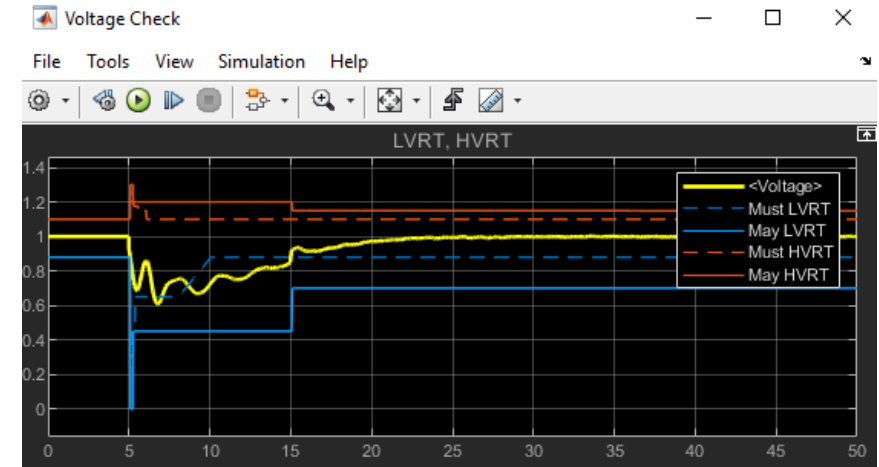
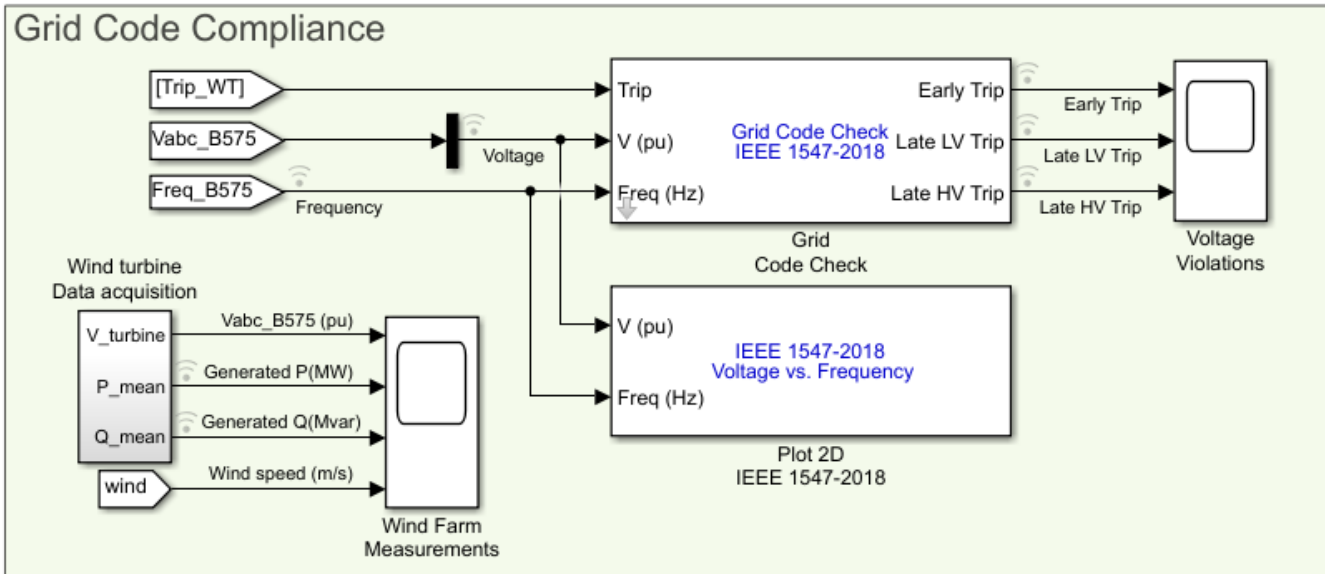
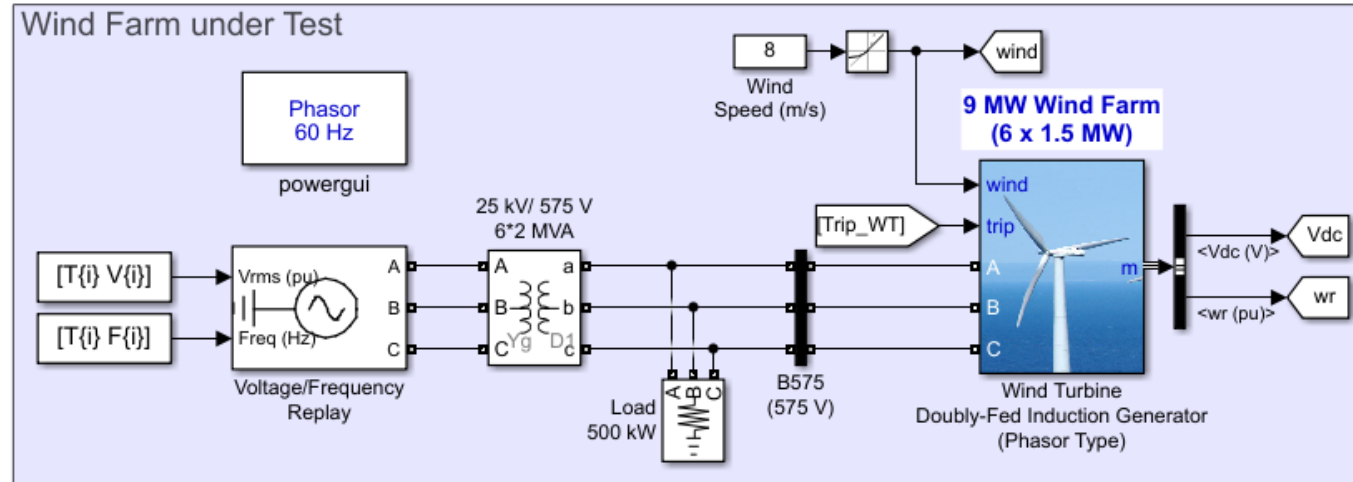


1 Event	2 TripTime	3 TripType	4 MayVoltTrip	5 MayFreqTrip
1	Inf	"None"	Inf	Inf
2	0.8333	"Voltage"	0.8333	Inf
3	10.0021	"Voltage"	4.0009	Inf
4	Inf	"None"	0.0667	Inf

Building Renewable Energy Simulations



Assessing Controls + Protection with PMU Data Replay



Assess Grid Codes in Parallel

