Reference Grid Model for TE Simulation

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Goal

To develop a common system design and interoperability requirements

to in turn allow testing of different TE approaches in different grid simulation environments

while producing comparable results for a set of agreed on scenarios.

Challenges

- Need a common corpus of data and scenarios to allow comparisons among different simulators and simulation configurations
- Need a co-simulation environment that allows diverse simulation systems to work together

Plan

1. Develop/agree on one or more baseline distribution grid topologies (substations, feeders, loads, DER, market)
2. Develop/agree on baseline scenario: ordinary, uneventful day. Define base case load schedules. Agree on control approach (probably common to today without any TE).
3. Develop/agree on data exchange and report formats and metrics to evaluate results (e.g. PSSE for topologies)

This should allow individual teams to try out their simulations independently and to compare results

Plan (continued)

4. Add some transactive approach and run the baseline scenario again to demonstrate a working model
5. Develop scenarios which add complexity and exercise the model over a range of grid challenges
    a. Peak management on transmission grid level
    b. Distribution system DER voltage control, adding storage as needed
    c. Distribution system dynamic instabilities
    d. Other scenarios as agreed

Plan (continued)

In parallel with the above steps:

6. Develop and deploy a co-simulation architecture & platform
7. Repeat independent simulations in the co-simulation environment

The Simulated Grid