Scope

MODELING OF EMERGENCY ASSISTANCE TO THE NEW YORK CONTROL AREA IN NYSRC IRM STUDIES

Background

NYSRC IRM studies include an Outside World Model representation that consists of four interconnected external control areas contiguous with NYCA: Ontario, Quebec, New England, and the PJM Interconnection (PJM). These interconnections provide emergency assistance (EA[1]) to NYCA for avoiding load shedding, thereby reducing NYCA IRM requirements. Over the past ten years, NYSRC IRM studies (2007 - 2016 IRM Studies) show that the average EA reserve benefit[2] from neighboring control areas has increased from a low of 3.8% in 2007 to a high of 10.1% in 2011[3]. Over the last five years (2012 - 2016 Studies), the EA reserve benefit has averaged **8.5%**. This compares to average EA reserve benefits of **5.8% and 1.7%** for New England and the PJM RTO, respectively, for the same time period (*see* Table-1 below). In consideration of these ranges of EA reserve benefits and the concern as to whether NYSRC studies presently overstate EA reserve benefits, the Executive Committee has requested ICS to conduct an analysis to determine whether the EA levels presently relied upon in NYCA IRM studies may be excessive, considering operating conditions or other system considerations that may not be recognized in the present GE-MARS model, and to recommend an IRM study modeling change if appropriate.

Table-1

Comparison of Average Emergency Assistance (EA) Reserve Benefits (% of the Forecast Peak Load)					
	2012/13	2013/14	2014/15	2015/16	2016/17
ISONE	6.3%	5.8%	5.2%	5.7%	6.4%
PJM RTO	1.2%	1.9%	1.8%	1.8%	1.9%
NYISO	8.6%	7.7%	8.9%	8.7%	8.5%

Present Emergency Assistance Model

The present IRM model in GE-MARS is based upon performing a series of probabilistic Monte Carlo simulations to determine whether, after accounting for unit outages and transmission capability there is sufficient capacity to meet the modeled load. In the Monte Carlo analysis, when the NYCA has

[1] Emergency assistance, as used here, does not include contracted capacity from external control areas.
[2] For the purposes of this scope, "EA reserve benefit" is defined as the NYCA IRM reduction due to emergency assistance from neighboring control areas.
[3] The emergency assistance benefit of 10.1% occurred in 2011 and corresponded with one of the lowest IRM levels of 15.5%. Based on the 2011 observation, a total NYCA imports interface grouping was placed in the model to better monitor and understand emergency assistance reserve benefit.

insufficient available generation, the GE-MARS model determines whether any of its neighbors has more generation available than is necessary to meet their own loads, and if so, allows that excess generation to meet the remaining NYCA load to the degree that there is available modeled transmission capability to deliver the neighboring area's excess energy.

In performing the analysis, GE-MARS tests all neighboring system generation to determine their availability to provide excess generation (*i.e.,* not projected to be on an outage). Any excess generation from a neighboring system would be committed if called upon by NYCA. However, GE-MARS does not account for the fact that, even though a unit is available to be committed, neighboring systems may not be willing or be able to timely commit their excess generation to supply EA should the NYCA be short of resources. As a result, the GE-MARS model, as presently applied, may overstate EA levels, causing NYSRC IRM studies to determine excessive EA reserve benefits. Given these concerns, it is therefore prudent that ICS evaluate the extent to which NYCA should be dependent on EA reserve benefits from neighboring areas.

Purpose of Study

The purpose of this study is to analyze the maximum amount of EA that NYCA can reliably depend upon from our neighbors for application in IRM studies, considering the above-referenced EA modeling issues and other NYISO operating constraints and considerations not presently considered in the GE-MARS model. Based upon this analysis, ICS will develop modeling changes as appropriate for future IRM studies. The analysis will be completed by September 2016, which will permit a sensitivity case for the 2017-18 IRM Study report. The EA model change, following modifications as appropriate, will be incorporated in the 2018-19 IRM Study. A white paper will be prepared.

Scope

- From the preliminary 2017 IRM Study base case, identify the maximum EA level for a simultaneous NYCA grouped import interface ("NYCA Grouped Import Interface") as well as for individual import interconnection interfaces. Plot the distributions of EA levels for all identified interconnection interfaces.
- Observe the inflection points and confer with NYISO Operations to determine reasonable levels of EA to use as interconnection interface caps (*e.g.,* 90% of the probabilistic draws to avoid the excessive EA draws in the last 10%). These interface caps can be converted to MW values.
- Run cases whereby the maximum EA level of the NYCA Grouped Import Interface is capped at certain MW levels and determine the impact to the NYCA IRM using a Tan 45 analysis. Depending on the above results, run analyses, as warranted, for evaluating the need for additional individual interconnection interface caps. These cases are intended to determine the impact to IRM outcomes of simulating certain limitations in the maximum values of EA reserve benefits. .