Revised SCR Study Scope Based 6/29/11 ICS Meeting

NYISO Proposed Scope of Work to Evaluate the Performance and Contribution to Resource Adequacy of Special Case Resources

In its letter to Dr. Henry Chao dated May 14, 2010, the Executive Committee of the New York State Reliability Council (NYSRC) raised a concern regarding the rapid growth in the megawatts of demand response, in particular Special Case Resources (SCR), as a significant supply-side resource for the New York Control Area (NYCA) power system. This growth has resulted in an increasing reliance on this resource in the NYSRC installed reserve margin studies to meet NYSRC Rule AR-1 (NYCA Installed Reserve Margin Requirement). This increasing reliance on the SCR resources in conjunction with the NYISO's limited operating experience with these resources has resulted in the question as to whether their contribution to reliability is being adequately reflected in the technical studies.

In its letter, the NYSRC is recommending that the NYISO perform an evaluation of SCR resources. In particular, the study should evaluate the performance and persistence of SCRs including appropriate peak period discount factors for the diverse constituents comprising the SCR program. This assessment should also determine whether there is a limit to the portion of the NYISO resource mix that can be comprised by SCR resources without compromising either the operational flexibility of the NYISO or the likelihood of the NYISO being able to meet Rule AR-1.

To address the concerns raised by the NYSRC, the NYISO is proposing a two track effort. This would consist of: 1) Evaluate the Performance and Persistence of SCRs; and 2) Evaluate the Capacity Value or Contribution to Resource Adequacy of SCRs. The NYISO has targeted the first quarter of 2012 as the completion date for this analysis but will provide feedback and results as the study progresses. The scope of the results that can be provided before next year will be a function of the availability of resources and the challenges that are confronted as this study process moves forward.

1. Evaluate the Performance and Persistence of SCR's

Study Approach

The NYISO proposes to evaluate its own experience with SCRs as well as conduct a search of other regions' experience with demand response resources. The NYISO has been regularly reporting to the NYSRC, Federal Energy Regulatory Commission and its Market Participants the performance of SCRs. These reports have been the basis for the performance factors that have been used in the NYSRC's technical studies. Evaluating the issue of persistence, which is a measure of the sustainability of the performance of the SCRs poses many challenges.

Ideally, the evaluation of the persistence should be based on the analysis of empirical data collected from the operation of SCRs during periods where the resources were required to sustain their performance over long periods of time. Currently, the NYISO SCRs can be used daily subject to the market rules governing their operations, which require the resource to perform for a minimum of 4 hours. Historically, there have been few system wide calls with the maximum amount occurring for 20 hours over 3 days in 2006 (3 calls). Since 2006 summer weather conditions up until the summer of 2010 have been cooler than normal, this in conjunction with installed resources well above minimum requirements plus the slow down in the economy has resulted in less usage of SCRs than 2006. Thus, the NYISO believes its existing empirical data will be of limited value in evaluating the persistence of SCR performance.

The NYISO recommendation regarding the persistence issue is to continue to monitor and evaluate the performance of its existing program and provide performance information to the NYSRC on an ongoing basis.

2. Evaluate the Capacity Value or Contribution to Resource Adequacy of SCRs

Study Approach

Just as with thermal units, the reliability impacts of demand response programs depend on a variety of factors. Thermal units with higher forced outage rates naturally contribute less to reliability than do units with smaller forced outage rates. Moreover, large thermal units contribute less to reliability on a MW per MW basis than smaller units with the same forced outage rate. One of the key factors in evaluating demand response is not only its performance but the overall program design, such as how often it can be called and its expected duration of its performance. As noted above, the NYISO has placed no limit on the number of calls and requires the SCRs to perform a minimum of 4 hours.

The work of Edward Kahn et al (See Measuring the Capacity Impacts of Demand Response[1]) based on California data suggest that there are diminishing returns to scale of the increasing penetration of demand response as well as the need to address the issue of "demand response fangs". The NYISO proposes to evaluate the capacity impact or value of SCRs by measuring the effective load carrying capacity (ELCC) of SCRs. ELCC is defined as the amount of new load that can be added to a system at the

[1] http://www.analysisgroup.com/uploadedFiles/Publishing/Articles/Measuring_the_Capacity_Impacts_of_Demand_Response.pdf

required loss-of-load-expectation (LOLE) of not more than once in ten years after a new MW of SCRs is added. This would be done as a function of increasing demand response penetration and differing performance scenarios for SCRs. ELCC was used to evaluate the capacity value of wind resources and would provide insights as to whether the capacity value of SCRs varies as function of SCR penetration and performance. Subject to the extent information is available and confidentiality limitations, the NYISO will categorize the results by the various types of resources that comprise the NYISO SCR program (e.g. backup diesels, production process/load, etc.).

This evaluation would be conducted with General Electric's Multi-Area Reliability Simulation (MARS) model. However, this analysis would require the model to be run in the 8760 hour mode to evaluate the impact of the 4 hour minimum performance requirement for the SCRs. Also, SCRs would have to be modeled as load modifiers and not as the first EOP step. In addition to providing information on the ELCC capability of SCRs, the study should also provide insights based on the study assumptions as to whether the current SCR class coincident load impact factor used for the IRM assumptions (~75%) adequately accounts for the Equivalent Load Carrying Capability.

Given the limitations of the MARS modeling, optimizing the performance of SCR is beyond the scope of the modeling capabilities of the MARS model. However, the NYISO believes that modeling the SCR resource deterministically under varying sensitivities in MARS simulations will provide valuable insights into the impact of the performance of SCRs under various conditions. For example, modeling SCRs as a DSM resource in the model allows an hourly expression of the available SCR MWs based on the total installed base and the resources unforced capability. Using the 8760 hour run and controlling the application of the SCRs over different assumption changes will show the effectiveness of the program as both the MW value increases and the number of calls increase.

Running MARS in the 8760 hour mode is generally not done because it requires extremely long run times and experience has shown that the differences in the LOLE results have been extremely small. However, the 8760 mode would be necessary for this analysis.