Comments on the Alternative Option
for the Standard Capacity Product II Initiative Availability Standard

Department of Market Monitoring
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The ISO has presented an alternative option for calculating the availability of intermittent resources for the purpose of calculating the Standard Capacity Product (SCP) availability penalty/incentive. The ISO Department of Market Monitoring (DMM) offers the following comments regarding the proposed calculation and also offers comments on potential impacts of excluding hours with forced outages from the determination of an intermittent resource's net qualifying capacity (NQC):

- While the ISO's alternative option for calculating the availability of an intermittent resource when its actual output is nevertheless greater than its NQC during a forced outage/de-rate, we believe further modifications to the availability calculation may be appropriate to more accurately calculate a de-rate's impact on availability when the resource's output is below its NQC.

- The ISO proposes that the CPUC concurrently revise its counting conventions for the NQC of intermittent resources to remove hours with forced outages or de-rates from its calculation of intermittent resources' NQC. For wind resources, excluding hours with forced outages or de-rates from the calculation of NQC may excessively reduce the remaining hours from which the NQC can be calculated. For all intermittent resources, it may also create incentives for participants to report outages to increase a resource's NQC.

We explain these comments in more detail below and offer a further modification to the availability calculation for intermittent resources. We believe that this further modification is appropriate for at least wind and solar resources, but may still be problematic for cogeneration. It seems that extending a forced outage availability standard, originally developed for conventional dispatchable thermal generation, to intermittent resources is problematic and may require additional consideration. In addition, there may be additional factors to consider in the CPUC counting criteria for intermittent resources if a forced outage availability standard for these resources is adopted. These issues should be resolved before the ISO implements a forced outage availability standard.

Intermittent Resource Availability Calculation

The ISO's alternative option would consider an intermittent resource's NQC to be fully available if the resource's actual output is equal to or greater than the NQC when the resource's Pmax is reduced by a forced outage or de-rate. If the resource's actual output is below its NQC, the ISO's alternative option would assume the reduction to the resource's Pmax proportionally reduces its available NQC.

The ISO's alternative option can be summarized as follows:[1]

- Actual output ≥ NQC, then:

  Reduction to available NQC = 0

- Actual output < NQC, then

  Reduction to available NQC = NQC * (De-rated Pmax / Pmax)

The important difference in calculating the availability of the NQC of intermittent resources, as compared to dispatchable generation, is that the NQC of intermittent resources is based on historical l output, while the NQC of dispatchable generators are based on the unit's Pmax.[2] Consequently, the NQC of an intermittent resource can often be well below its Pmax, and an intermittent resource can have a de-rate to its Pmax, while at the same time its actual output remains above its NQC.

For cogeneration resources, considering a resource to be fully available when the resource's output is at least its NQC seems to be appropriate because, according to some market participants, a de-rate to the Pmax of some single-unit cogeneration resources may not necessarily reduce their output to the grid.

For wind and solar resources, all other things being equal, it may be appropriate to assume that a Pmax de-rate due to a forced outage proportionally reduces a resource's available NQC. For example, a 100 MW wind resource with an output that is at least 30 MW in 70 percent of hours, if de-rated by 50 percent, would subsequently have an output that is then only 15 MW or greater in 70 percent of hours. But it is likely that intermittent resources do not experience de-rates with the same frequency at all output levels, and market participants may have at least limited flexibility in the timing of taking equipment out of service in response to forced outages. For example, a market participant conceivably could delay addressing the cause of a partial forced outage of a wind resource for a few hours until winds decrease and the outage will not have as great an impact on the resource's output. Consequently, it seems appropriate to consider the actual output of wind and solar resources as part of calculating the availability of their NQC during a de-rate.

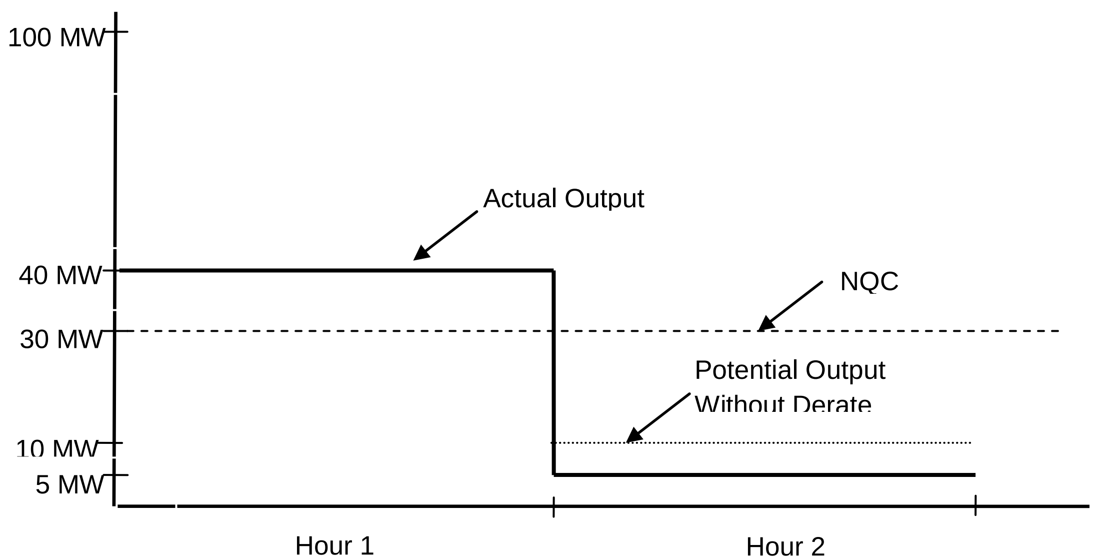
In the case that the output of a wind or solar resource is equal to or greater than the resource's NQC during a de-rate, DMM believes the ISO's alternative option appropriately considers the resource's NQC to be fully available. However, in the event a wind or solar resource's actual output is less than its NQC during a de-rate, the ISO's alternative option may overstate the

[1] While the equation presented at the bottom of page 6 in the ISO's "Alternative Options for the Availability Standard and Replacement Rule components of the Standard Capacity Product II Initiative" presents a formula for the calculation of an intermittent resource's NQC available in the event of a de-rate, the equations presented in these comments look at the amount the NQC is reduced in the event of a de-rate.

[2] The CPUC bases the NQC of wind and solar generation based on the output that they exceed in 70 percent of the applicable hours. The CPUC bases the output QF generation based on the average output during the applicable hours.

impact to the resource's ability to deliver its NQC. This is illustrated in the example shown below that assumes the following:

- Pmax = 100 MW
- De-rate to Pmax = 50 MW
- NQC = 30 MW



For hour 1, when the resource's actual output is greater than the NQC, the ISO's alternative option appropriately determines the impact of the de-rate on the resource's ability its NQC. Since the resources actual output is 40 MW, which is greater than the resource's 30 MW NQC, the ISO's alternative option considers the resource's NQC to be fully available.

For hour 2, when the resource's actual output is less than its NQC, the ISO's alternative option may overstate the de-rate's impact on the ability of the resource to deliver its NQC. This is because the alternative option assumes that the availability of a resource's NQC is reduced in proportion to the size of the de-rate, when in fact the full amount of NQC might not have been available even if the de-rate had not occurred. For hour 2, the alternative option would calculate the impact of the availability of the resource's NQC as:

Reduction to Available NQC = NQC * (De-rated Pmax / Pmax)

= 30 MW * 50 MW/100 MW

= 15 MW

This approach assumes that the full amount of the resource's NQC would have otherwise been available if the de-rate had not occurred, and that the de-rate proportionally reduced the available NQC. However, since the resource's actual output in hour 2 was only 5 MW, and the 50 percent de-rate to the resource's Pmax proportionally reduced the unit's actual output, the unit's output without the de-rate would have only been 10 MW. Thus, the de-rate may only have reduced the available NQC in hour 2 by 5 MW, rather than the 15 MW that would be calculated under the ISO's alternative option.

DMM suggests that the ISO's alternative option might be modified as follows:

- Actual output ≥ NQC, then:

  Reduction to available NQC = 0

- Actual output < NQC, then

  Reduction to available NQC = [(Pmax / De-rated Pmax) * actual output] – actual output

  Where,

  Maximum reduction to available NQC = (Pmax / de-rated Pmax) * NQC

For example, the reduction to the available NQC in hour 2 in the example shown above would be calculated as:

Reduction to available NQC = [(100 MW / 50 MW) * 5 MW] – 5 MW

= 10 MW – 5 MW = 5 MW

The maximum reduction to the available NQC that would be applicable to the resource in the example above with a 30 MW NQC, 100 MW Pmax, and a de-rated Pmax of 50 MW, would be calculated as:

Maximum reduction to available NQC = (100 MW / 50 MW) * 30 MW

= 15 MW

DMM believes that even the modification proposed above may be problematic to apply to cogeneration resources. For instance, in the example above, a cogeneration resource may have had a host steam/electric requirement such they would not have delivered more than 10 MW anyways. In this case, the de-rate may not have ultimately reduce the amount of energy provided to the ISO. In other instances, it may be reasonable to assume, as the ISO proposes, that the resources available NQC is reduced if the actual output at the time of de-rate is less than the NQC. DMM believes that the impact of Pmax derates to cogeneration units needs to be better understood, particularly since they comprise the majority of RA capacity that are considered to be intermittent resources.

Removing Hours with Forced Outages/De-rates from the Determination of Intermittents' NQC

The ISO proposes that the CPUC revise its method to calculate the NQC of intermittent resources so that an intermittent's reduced output due to a forced outage or de-rate is not incorporated in the calculation of the resource's NQC. This is to avoid penalizing a resource twice for a de-rate: once by a reduction to its future NQC, and a second time by incurring the SCP availability penalty.

The ISO proposes that the CPUC accomplish this by either: (1) not considering the hour in its calculation of the resources NQC for future years, or (2) using a proxy output value for the resource in that hour. This proxy output value would be the average of the resource's output in the same hour in the other two years used in the NQC calculation.

Based on DMM's understanding of the characteristics of wind generators, this approach may turn out to not be practical for these resources. It is our understanding that wind farms have frequent short-term outages of individual units, and that these are reportable as forced outages (particularly if FERC approves the proposed 1 MW outage reporting requirements for Eligible Intermittent Resources). Consequently, this could result in the resource's output in a large number of hours being excluded from the calculation of its NQC, and could result in non-representative NQC values.

Excluding hours with forced outages or de-rates from the calculation of an intermittent resource's NQC may also create an incentive for market participants to "under report" the frequency of outages when their output is relatively high and "over report" outages during hours when their output is relatively low in order to increase the resource's NQC. For example, if a resource is at low output, reporting even a small de-rate would exclude the resource's output in that hour from the resource's NQC calculation, while not being a large enough de-rate to significantly affect the calculation of the resource's availability in the calculation of the SCP availability incentive.

One potential way to resolve these issues would be for the CPUC (and other local regulatory agencies) to use a proxy value for the output of intermittent resources that is based on what the resource's output would have been without the de-rate. The exact methodology to use would require additional consideration. However, for wind and solar resources, this may be as simple as assuming that a de-rate to Pmax proportionally reduces a resource's output.