

## EnerNOC, Inc. Responses to Comments Regarding the Baseline Methodology in NYISO's Special Case Resource Program: APMD vs. CBL

EnerNOC, Inc. welcomes the opportunity to respond to the arguments made by the Commenting Responsible Interface Parties (Commenting RIPs). It is only through a vigorous debate of this and other issues that the NYISO demand response programs can continue to evolve in a manner that meets the needs of both the NYISO and participants in the programs.

### Introduction

It should first be made clear that EnerNOC does not accuse any RIP of violating the NYISO market rules. It is the responsibility of companies, including the Commenting RIPs and EnerNOC, to maximize the financial value of their efforts and investments within the bounds established by the NYISO. This does not, however, absolve RIPs (including EnerNOC) or the NYISO of the responsibility to change the market rules should the existing rules result in consequences that are inconsistent with their intent.

EnerNOC is one of the largest RIPs in the SCR program. Some of our assets will experience a decrease in measured performance under a CBL-type approach. Nevertheless, we are advocating abandoning the APMD for a CBL approach because a well-designed CBL approach will more accurately reflect the actual load reductions achieved by any asset when called upon and, when combined with a reasonable approach to aggregation, will enable an overall portfolio of resources to meet committed reduction targets..

The primary reason for employing a CBL approach is the one reason that the Commenting RIPs did not, and indeed could not, respond to. ***Simply put, the existing program design utilizing APMD ensures that the interests of RIPs and system operators are not aligned and, as a result, the NYISO and its customers often end up paying something for nothing.***

Below, we show through a point-by-point refutation of the Commenting RIPs' arguments that no evidence has been presented to suggest that the benefits of the status quo outweigh the costs. Accordingly, the NYISO should, at the bare minimum, analyze the performance of all SCR resources on a CBL and APMD basis and determine the extent to which one approach or the other provides a better indicator of the value provided by demand response resources at the time those resources are called upon.

### Arguments

1. *Predictability, the ability for customers to know the baseline before committing to a particular curtailment amount and event. The APMD provides a firm commitment level that each resource knows that they must get down to or below during a called event. They can set their automated control systems at this kW threshold, industrials can plan ahead of time based on the production lines and equipment they would be running on the following day, etc. APMD is extremely predictable for a resource. APMD leads to a reliable resource. The CBL is less predictable for a resource than the APMD and, in turn, is less reliable.*

We disagree that the level of actual load reduction that the NYISO can expect is any less predictable under a CBL than under an APMD approach. Both require an estimate of the load reductions possible on the day of the event. APMD does provide a more tangible target for each load to achieve, however our contention is that that target is fatally divorced from any metric of value to system operators. Customers in many other jurisdictions have proven that they are able to both comprehend and effectively respond under a CBL-type approach. It is the responsibility of

the RIPs to educate customers and manage their participation so that they can provide the needed critical resources when called upon.

2. *Simplicity, including ease of use, ease of understanding, and low cost for participant, the NYISO and market participants to implement. The CBL is complicated and not easy to explain. In order to be as reliable a resource as would be expected in a successful DR program, the APMD is preferred by Market participants as well as by most resources. A resource would have to incur expense ensuring that their systems and implementation plan is updated daily to match up with an ever-changing CBL baseline; many resources would not incur this expense. The APMD method on the other hand is very simple and minimal additional costs are typically required to utilize for most resources and market participants.*

The APMD was originally chosen, in part, because of its simplicity. When stakeholders were first designing the demand response programs a conscious effort was made to facilitate participation by Aggregators, consistent with the goal of “getting what we paid for.” The intent was to create a new demand response industry and in this respect the programs succeeded beyond our wildest expectations. There are now over forty Aggregators and 1,600 MW of enrolled capacity.

That said, stakeholders struck a compromise between accuracy and simplicity in order to attract initial participation and to spur the development of a healthy demand response industry. The costs of reduced accuracy were judged to be outweighed by the benefits of creating this new industry. EnerNOC agrees with that decision. Now, after seven years, the demand response industry has matured to the point where an Internet account, an Excel spreadsheet, and access to a customer’s utility account are no longer sufficient to meet the needs of the NYISO. In order to effectively manage the grid, the NYISO should have a more accurate measure of the actual demand response providing grid relief during an event. This is not only possible, but a proven successful approach for ISOs and LSEs throughout the country.

As far as the need for daily attention goes, a well-designed CBL represents a customer’s average load; the customer simply needs to take curtailment action that reduces their usage (by a committed amount) below their average load. Electricity usage frequently varies on an hourly, daily, weekly or seasonal basis – therefore, even with the APMD the “implementation plan” must be “...updated daily.”

As to being “low cost for participant”, this comes at the price of being “high cost” to those other NYISO customers who are often not getting full value for what they are paying.

3. *Accuracy, including lack of bias (i.e. no systematic tendency to over-or under-state reductions), appropriate handling of weather-sensitive accounts, and verifiability. The undersigned participants believe that the APMD methodology is a very accurate predictor of the Capacity of Demand Response. It is very similar to the DMNC methodology utilized by the NYISO for generators. There is no evidence to suggest that the CBL is any more accurate than the APMD methodology. In fact, in many cases (significant A/C based loads for example), the CBL method is extremely inaccurate. One study concluded that weather adjustments do not improve accuracy of the CBL whatsoever. NYISO significantly reduced the “inaccuracy” potential with the APMD approach when it included an APMD window of between 12 pm and 8 pm.*

There are several widely-cited industry and academic studies published that discuss the accuracy and bias of CBL approaches and several more under development.<sup>1</sup> EnerNOC recognizes that

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1 / See, for example, the following:

some CBL approaches may not provide an accurate reflection of customers' load reductions and therefore almost by definition would not qualify as a "well-designed" CBL. However, the research available today has found that a CBL using a combination of load data prior to a demand response event (e.g. 10 days, 3 highest days of prior 10, etc), when combined with a day-of adjustment factor, can result in a very accurate measurement of a customer's actual load reductions. These studies do not evaluate the APMD approach and one could argue that the APMD approach was not evaluated due to its inherent inability to accurately reflect the actual load reductions of a customer during an event. If the Commenting RIPs have data to substantiate the claim of APMD accuracy, this should be provided.

The comparison of the APMD approach to DMNC testing requirements is inapposite. DMNC represents a best, weather-adjusted guess as to how much capacity a generating facility will be capable of providing at any given time. Given that generators are generally either available or not available, and given the profit motives driving high availabilities during the times when a demand response event is most likely to be called, the NYISO can generally count on a generator either being available at its DMNC level or being forced out of service and producing nothing.

Where a demand response resource is large, has not grown or shrunk in the last year, and its reduction is based on the curtailment of relatively steady processes that are not sensitive to temperature, the APMD approach might be said to be similar to DMNC. Unfortunately, these criteria usually do not apply.

All too often, the APMD is based on stale load data that is drawn from hours that show little coincidence with the times that events are called and temperature conditions that can differ greatly from those present during an event. In these cases, APMD becomes a far worse predictor of performance than DMNC.

On a case-by-case basis, CBLs may be as inaccurate (or more inaccurate) than an APMD, especially for weather-sensitive loads. However, as noted earlier, EnerNOC believes that a CBL such as that used by NYISO to measure EDRP performance can adequately address temperature dependence through a well-designed weather adjustment.

4. *Minimization of gaming by customers. Again, when NYISO modified the APMD approach to include a specific window from 12 pm to 8 pm it significantly reduced any notion of*

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- KEMA-XENERGY, 2003. Protocol Development for Demand Response Calculation — Findings and Recommendations, California Energy Commission.

- Quantum Consulting and Summit Blue, 2006. Evaluation of 2005 Statewide Large Nonresidential Day-Ahead and Reliability Demand Response Programs, Southern California Edison.

- Coughlin, Katie, "Estimating DR Load Impacts: Evaluation of baseline load models for commercial buildings in California", Preliminary Results, Lawrence Berkeley National Laboratory, July 9, 2007.

- Goldberg, Miriam L. and G. Kennedy Agnew 2003. *Protocol Development for Demand-Response calculations: Findings and Recommendations*. Prepared for the California Energy Commission by KEMA-Xenergy. CEC 400-02-017F.

- *Working Group 2 Demand Response Program Evaluation – Program Year 2004 Final Report*. Prepared for the Working Group 2 Measurement and Evaluation Committee, by Quantum Consulting Inc. and Summit Blue Consulting, LLC, 2004.

*Evaluation of 2005 Statewide Large Nonresidential Day-ahead and Reliability Demand Response Programs*. Prepared for Southern California Edison and the Working Group 2 Measurement and Evaluation Committee, by Quantum Consulting Inc. and Summit Blue Consulting, LLC, 2006.

*gaming that would have previously existed. No longer can off peak loads take capacity credit for doing nothing.*

While NYISO did improve the accuracy of the APMD by excluding morning- and night-peaking loads, it is still true that 8:00 pm is well past the time that system operators are likely to need demand response the most. The window should have been further narrowed, as the NYISO first suggested, to 6:00 pm, if not earlier.

EnerNOC believes that the analysis of the load data submitted this year that is now being conducted by the NYISO will demonstrate that many loads peaking late in the day continue to effectively take capacity credit for doing nothing.

Surely, receiving hundreds of thousands of dollars for going out of business qualifies as “gaming,” and yet that is exactly what the APMD allows (and has allowed) every time a RIP has been paid for a large load that went out of business or moved to another state.

5. *Consistency with other ISO methods. DR is considered capacity. Capacity is measured by utilizing prior year's information. The APMD is consistent with other evaluations of capacity in NYISO's markets.*

Other markets/utilities do measure capacity (for LSEs) based on prior year's information. Other markets/utilities do consider demand response as capacity. However, the observations are fundamentally unrelated, as there is no linkage between the two.

The argument is only half right: capacity requirements are predicted (in any event, not measured) using prior year's information for LSE's and that is only because the past continues to be the best predictor of the future as far as aggregated electrical loads are concerned. But, on an individual load basis, which has to be the basis for any baseline approach, the distant past is NOT as good an indicator of the present load as compared to a recent average. The DMNC capability of generators, as the Commenting RIPs point out, is based on actual tests and variations due to temperature are predictable.

6. *Consistency with other NYS Curtailment Programs should be noted. In a filing to NYS PSC concerning the Con Ed Rider U program dated July 31, 2007, most New York CSP's stated "...settlements under both programs (NYISO SCR and Con ED Rider U) are based upon customer baseline determinations of what customer demands would otherwise be without curtailment efforts. This is important because customer specific baseline determinations are intelligent estimates of what customer demand would be without curtailment efforts. While the baseline determination is a carefully developed protocol designed to ensure accuracy and eliminate potential for gaming, it is an estimate of customer demand." Thus, as of just a few months ago most of the demand response providers agreed that the APMD was a carefully developed methodology. Similarly NYPA's and LIPA's Capacity determinations are based on the APMD methodology.*

Many RIPs did agree in the discussions regarding Rider U that APMD was carefully developed. This is true. The intent of EnerNOC's comments are not to show that the APMD approach was designed on an arbitrary basis, rather, we simply believe that a CBL-type approach is a far more accurate measure of demand response performance (and therefore, more valuable to system operators).

Indeed, EnerNOC went to great lengths to convince ConEd and the PSC that this was the case, even after the tariff was filed. In relevant part, EnerNOC stated:

"The purpose of the Rider U program is to reduce load on the local network at the time of the emergency, not with reference to last year's system peak. A resource whose load during an event is half what it was during the previous year's peak, but is the same as it was before it was activated provides no value whatsoever to the system operator. The calculations used by the NYISO for SCR capacity performance have no place in such a program.<sup>2</sup>

The Company and PSC staff have subsequently indicated that the analysis of the program that is due in January, 2008 will address the issue of which baseline is appropriate. To be absolutely clear, EnerNOC has never been in favor of the APMD approach unless the alternative was no approach at all.

The latter point is simply circular, ConEd, NYPA and LIPA all use APMD because the NYISO does. Were the latter to move to a more accurate CBL approach, it is likely that ConEd, NYPA, and LIPA would switch as well. Those parties are free to differ if this is not the case.

7. *Repeatability and Understanding by Resources. The CBL is complicated and not widely understood. The key component of a successful demand response program is to have resources that understand their baseline. In the CBL methodology a new baseline is created every single day. In the APMD approach there is a firm commitment level that the facility knows they have to get below when an event is called, whenever that event is called. This creates certainty in the minds of the participating facility because they know precisely what they have to get down to and what they have to shut off to get down to their firm commitment level. This is contrary to a CBL methodology which may change a facility's curtailment strategy each and every day, thus creating a reduced reliability of that resource. Thus, CBL leads to a less reliable resource.*

(See Response #1)

8. *Marketability of a DR Program. A market utilizing a CBL methodology will find that the marketability of the program is significantly damaged. Resources that are in the program will opt out and prospects for the program will decide not to join because of the uncertainty associated with it. In our experience the APMD methodology is one of the single most important reasons for the success of the NYISO's DR programs. There is no evidence to suggest that in other markets CBL methodology has worked better. What other markets are more successful regarding Demand Response than NYISO, in terms of participating MW and reliability of those MW's? In Summer 2006 ~ 90% performance on an individual resource basis (likely > 100% on aggregate basis).*

First, EnerNOC believes the premise of this argument is flawed. EnerNOC's extensive experience in regions where a CBL-type baseline is used gives us confidence that there is absolutely no inherent difference in the marketability of a program based on whether it uses CBL or APMD. There is simply no evidence that a CBL program is more difficult to market to end-use customers, while there is ample evidence to show that programs using CBL baselines can be successfully marketed. We need look no further than the ISO-NE Real-Time Demand Response Program and the first ISO-NE Forward Capacity Auction. Both rely on a CBL approach. Yes, New York's experience demonstrates that APMD sells. Nevertheless, between the two, it is simply not possible to credibly argue that APMD is superior from an operations standpoint.

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2 / Supplemental Comments by EnerNOC, Inc., Case 97-E-0392 at 6. In fact, EnerNOC believes that they have no place in the SCR program either, for exactly the same reason.

Second, even if it were accurate that CBL is more difficult to market, this should not be a reason to jeopardize the value of the program to the NYISO. It is the RIPS' job to translate complicated rules (including, in EnerNOC's experience, the APMD) into simple product offerings for end-users.

The latter point is circular. Many resources perform well *because* of the performance baseline methodology. It is easy to construct a baseline methodology that will show *measured* performance of greater than 100% for resources that initiate no load-reductions.

9. *In accordance with NYISO rules, because DR curtailment is considered Capacity, one must look to the capacity rules in determining and measuring the amount of capacity. In New York it is based on the prior year's peaks and this is simply how capacity is calculated. Capacity cannot be calculated on the "if come" on a daily basis. The NYISO has repeatedly stated this fact. The use of APMD in NYISO's markets prevents under/over selling as the ICAP calculation is based on actual peak usage. Again, it is easy to calculate and not error prone due to lack of understanding or bad calculations.*

(See Response #5)

10. *An all-inclusive CBL methodology for determining ICAP will have an adverse affect of minimizing the overall DR portfolio in that certain types of load will be shunned in CSP marketing efforts (A/C loads) which is contrary to the program efforts.*

This comment appears to reflect the misconception that EnerNOC is proposing a non-weather adjusted CBL. As noted previously, this is not the case. A weather-adjusted CBL approach is actually much more favorable to things like A/C loads than is APMD, which is blind to temperature effects.

11. *Advantageous to NYS goals Neither the CBL nor APMD methodology is perfect for every type of resource. The CBL baseline is perfect for sites having on-site generation that can pick up air-conditioning load in excess of other non-a/c load. If there is no generator to offset a facility's load, the CBL has the effect of discriminating against a facility with a large a/c load that would participate in an event by shutting down that a/c load. To illustrate, in California on July 5<sup>th</sup>, PG&E called an event. That event was called after several moderate weather days and occurred on a day when the weather exceeded 100 degrees. Looking at the past 10 days was showing a baseline in some cases more than 50% lower than the demands at the facility during the event call. Sites that did not have on-site generation had to curtail a significant amount of power just to get down to their baseline level. The end result is that DR providers will specifically avoid air conditioning loads, which is contrary to the entire concept of demand response as that is precisely the type of load that would be suitable for curtailing during an event call. CBL calculations favor those who are using on-site generation as a primary means for curtailment, and hinder pure curtailers/load shedders (green customers)!*

California is an excellent example of how it is possible to design a sub-optimal CBL approach. This approach has been proven to be an inaccurate method, and the California Public Utilities Commission is currently evaluating approaches for measuring demand response load impacts in Rulemaking R.07-01-041. EnerNOC is advocating for a weather-adjusted CBL approach (along with at least one of the Commenting RIPS) in this proceeding for exactly the reasons cited in response to #10, above.

12. *Robustness. A KEMA panelist reported to the FERC that no one baseline method works well for all types of accounts. Relatively simple methods can work reasonably well for many, if not most kinds of accounts. The Regulatory Assistance Project also noted that highly successful DR programs like GPC and Duke's are using a modified APMD methodology when calculating load reductions. In a presentation given by the NYISO on SCR and EDRP performance, APMD and CBL performance calculation discrepancies were attributed to reporting differences where subsets of SCR customer energy reduction was reported, or was due to discrepancies in metered load data reported for each program, and not flawed methodology.*

We concede that no approach is perfect. Further, we would concede that APMD can work as well as CBL where large, static, temperature-independent loads are concerned. However, we defy the Commenting RIPs to cite a body of evidence that shows APMD to produce a superior result for temperature-dependent loads, or those which change from year to year. The unfortunate fact is that, until this year, it has not been possible to conduct a reasoned comparison of the APMD and CBL approaches for the simple reason that some of the Commenting RIPs (and others) have declined to provide the necessary data to the NYISO. This year, RIPs will be required to report data for all hours in both CBL and APMD formats. Unfortunately, there will only be one audit and two Targeted demand response events' worth of data to work with. Nevertheless, EnerNOC hopes that the NYISO's semi-annual filing to FERC, due in less than a month, will contain some interesting revelations concerning the two approaches.

13. *Continuing the Momentum of DR in New York. NYISO's program has been based upon the APMD since its commencement. Thousands of facilities now participate and have come to understand the particular methodology used in this program. They have established their curtailment protocols, their event response modes, etc., based upon the APMD methodology. If a change is made to a CBL methodology, NYISO would experience a significant loss of demand response resources and those resources that do remain would not be as reliable as has been the case thus far. The NYISO is considered to be one of the premiere leaders in DR markets, and the consistency the FERC is looking in respect to balancing baseline development should begin with markets that are high-functioning such as the NYISO's.*

This argument appears to be saying that even if what RIPs are doing now is wasteful and inaccurate, we should continue to do it because changing course might confuse some people. The test of an effective baseline is whether it accurately estimates what a customer would have done but for the curtailment. We submit that while CBL can fail this test, APMD always fails in certain relatively common circumstances. Under a properly designed weather-adjusted CBL the errors do not demonstrate a persistent bias for or against any type of resource. APMD, on the other hand, always unreasonably penalizes loads that grow from year to year and loads that are temperature-dependent, while it always unjustly rewards customers that go out of business or whose load decreases due to exogenous circumstances.

14. *The argument that the APMD approach is "inherently flawed [because it] rewards RIPs for doing nothing" is simply not correct and shows a lack of understanding of NYISO's program and the rationale behind the APMD approach. NYISO went through the process of enhancing the accuracy of the APMD methodology when it changed the APMD window to a specific 8 hour window. In reality, the APMD in a large number of cases provides the resource and the RIP with less capacity than they should get credited for, not more. Virtually all summer events are called in July or August. The APMD method averages the months of June and September in its calculation, which has the effect of reducing that baseline as compared to a straight July / August average. When demands are at their highest in July and August, resources are called upon to perform, many times against a baseline which is lower (NOT higher) than the demands they are experiencing*

*at the time of the event call. The point is that there are instances on both sides that demonstrate that it's not 100% accurate, but to suggest that the APMD allows free riders, etc demonstrates a lack of understanding of the markets. The CBL on the other hand is simply not accurate, especially relative to summer loads (A/C, etc).*

In fact, EnerNOC's staff actively participated in the NYISO demand response market development and implementation, and EnerNOC fully understands the NYISO markets. We therefore understand the APMD methodology and its flaws, and recognize that that the APMD not only allows free riders, but can and does encourage them. The NYISO can and should conduct the requisite analysis and provide stakeholders with sufficient evidence on which to base a reasoned decision.

15. *The presentation before the PRLWG/ICAPWG states that "no other market or utility uses this flawed approach" in an effort to demonstrate that the APMD is not an industry standard. This is yet another misstatement of the facts. Quick research shows that many markets and utilities are selecting this approach while many others are going away from the CBL they once utilized. The trend is the use of an APMD because utilities now understand the flaws associated with the CBL approach. They are not interested in exclusively on-site generation based resources. Just a few examples of APMD (or retreat from CBL) being used currently:*

- o Kansas City Power & Light's MPower Program*
- o PG&E's BEC Program*
- o Georgia Power Corp. (no ICAP - uses a modified two-point APMD in its energy calculation)*
- o Duke Energy – (no ICAP - retreated from CBL methodology and uses monthly averages in its energy calculation)*
- o Southern California Edison's IBEC Program*

*Additionally, representatives for some IOU's in California recently expressed concern with the accuracy of the CBL for their CBP programs. The CBL significantly understated the curtailment of a large number of their participants during the summer 2007 event calls.*

First, it should go without saying (and we would hope that others would concur) that the fact that something is being done elsewhere does not necessarily mean that it is correct, or that it should be done here.

That said, the Duke and Georgia Power programs do rely on comparisons to firm service levels, but they do not use APMD as it is structured in New York.

Of all the California programs only the oldest, the BIP, uses APMD. All subsequent programs, including those which have resulted in recent contracts with third-party aggregators use a CBL-type approach. As noted previously, there are very serious problems with the California CBL approach and EnerNOC is working with other RIPS to make corrections.

IBEC does use an APMD approach but it is a 2 MW pilot, has not yet been approved, and incidentally requires real-time monitoring, another program change being advocated by EnerNOC.

Finally, it is also interesting to note that KCP&L has recently expressed concern with the APMD approach for some of its participants and has asked EnerNOC, among others, to propose alternative CBL approaches.

While our statement that APMD is not used anywhere else may have been overreaching, we stand by the fundamental point that APMD does not represent best practice in the demand response industry. To the extent that there is such a best practice or standard, it is the CBL approach.

### Conclusion

It appears that the Commenting RIPs may be under the impression that EnerNOC is focused on emergency generator-based load reductions and that our effort to replace the APMD approach reflects a strategic goal of disadvantaging our competitors. This is simply not the case

First, the majority of EnerNOC's portfolio is curtailment-based. Second, the only strategic goal that we have is to strengthen the demand response industry by advocating for market rules that better ensure that demand response program administrators "get what they pay for, and pay for what they get."

We appreciate the opportunity to respond to the concerns raised by our colleagues and look forward to continuing to improve upon the generally laudable NYISO demand response programs already in place.

Respectfully submitted by,  
EnerNOC, Inc.