**Project no. 48540**

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| **REVIEW OF REAL-TIME CO-OPTIMIZATION IN THE ERCOT MARKET** | **§****§****§** | **Public utility commission** **Of texas** |

**INITIAL COMMENTS OF TEXAS COMPETITIVE POWER ADVOCATES (TCPA)**

Texas Competitive Power Advocates (TCPA) is a trade association representing power generation companies, wholesale power marketers, and retail electric providers with investments in Texas and the Electric Reliability Council of Texas (ERCOT) wholesale electric market. TCPA members and their affiliates provide a wide range of important market functions and services in ERCOT, including the development, operation, and management of power generation assets, the scheduling and marketing of power, the provision of energy management services, and the sales of competitive electric service to consumers. TCPA members provide approximately sixty percent (60%) of the total net operable electric generating capacity in ERCOT, representing billions of dollars of investment in the state, and employing thousands of Texans. TCPA appreciates the opportunity to provide comments in response to the request by Public Utility Commission of Texas (Commission) Staff.[[1]](#footnote-1)

As detailed below, TCPA recommends that the Commission establish the relevant parameters for real-time co-optimization (RTC)—including, but not limited to, the system-wide offer cap (SWOC), value of lost load (VOLL), Power Balance Penalty Cap[[2]](#footnote-2) (PBPC), and ancillary service demand curves (ASDCs):

* In a manner that will not degrade the expected market equilibrium reserve margin (MERM) associated with current scarcity pricing policies reflected in the Operating Reserve Demand Curve (ORDC), which were recently adopted by the Commission following years of careful deliberation and extensive engagement with stakeholders, ERCOT, the Independent Market Monitor (IMM), and independent consultants.[[3]](#footnote-3)
* Following review and analysis by an independent consultant of potential impacts of a range of RTC parameter options on MERM expectations.

The RTC concept will replace the ORDC price adder that is relied upon today to promote resource adequacy in ERCOT. In other words, RTC becomes the new resource adequacy mechanism for the ERCOT energy-only market. Therefore, as a threshold matter, the implementation of RTC should at minimum do no harm to resource adequacy—which is especially important at a time when the planning reserve margin for the upcoming summer is at an all-time low of approximately 7.5 percent and is projected to average at less than 10 percent over the next five years.[[4]](#footnote-4)

**I. Response to Questions**

1. **Upon implementation of real-time co-optimization (RTC) in the ERCOT region, what value should the commission establish as the system-wide offer cap (SWOC)? Why?**
2. **Upon implementation of RTC in the ERCOT region, what value should the commission establish as the value of lost load (VOLL)? Why?**
3. **What parameters, if any, should the commission consider when determining the SWOC and VOLL?**

TCPA responds to the first three questions together. As explained by ERCOT in an RTC concept paper,[[5]](#footnote-5) under RTC, the values of SWOC, the ASDC maximum (which will be triggered when reserves drop to the minimum contingency level (MCL) and will effectively replace the maximum ORDC price adder in today’s market), and the PBPC[[6]](#footnote-6) must all be coordinated for RTC to properly function. In the RTC construct, while the VOLL has no direct connection to any of the primary RTC variables and will not directly determine scarcity pricing (as explained below), the Commission should still decide on a value for VOLL and approve an RTC design that will result in prices at the desired VOLL under the same circumstances as today. The interplay of SWOC, ASDCs, and the PBPC will fundamentally influence price formation (including by dictating whether prices will actually reach the desired VOLL during scarcity conditions) and must be carefully understood and designed to not undermine the Commission’s clear intent to allow for sufficient price formation and resource adequacy policy decisions, including the recent decision to shift the loss of load probability (LOLP) curve of the ORDC to more accurately reflect reliability risk in scarcity prices.[[7]](#footnote-7) TCPA believes it is premature for the Commission to decide on the key RTC variables without the aid of an independent consultant to inform the Commission of the trade-offs inherent in those decisions. The selection of the RTC variables will unquestionably have an impact on resource adequacy and should be carefully analyzed. Ultimately, the values chosen by the Commission should at a minimum maintain the status quo and allow for both market participant offers and ASDCs to contribute to price formation, though TCPA expects ASDCs to be the primary driver for scarcity price formation.

Under the ORDC (which would be replaced by multiple individual ASDCs in the RTC construct), prices reach today’s $9,000/MWh VOLL when reserves drop below the current MCL of 2,000 MW. Directionally, this general outcome should continue to occur following the implementation of RTC, and RTC should not degrade the expected MERM of 11 percent following the implementation of the 0.5 LOLP shift:[[8]](#footnote-8)

The MERM describes the reserve margin that the market can be expected to support in equilibrium, as investment in new supply resources responds to expected market conditions. This concept is relevant in ERCOT because, unlike all other electricity systems in North America, ERCOT does not have a resource adequacy reliability standard or reserve margin requirement. In ERCOT, the reserve margin is ultimately determined by suppliers’ costs and willingness to invest based on market prices, where prices are determined by market fundamentals and by the administratively-determined … ORDC during tight market conditions. This approach creates a supply response to changes in energy market prices towards a “market equilibrium”; low reserve margins cause high energy and ancillary service (A/S) prices and attract investment in new resources, and investment will continue until high reserve margins result in prices too low to support further investment.[[9]](#footnote-9)

The market is not currently in equilibrium, with planning reserve margins this summer in the 7.5 percent range,[[10]](#footnote-10) and movement toward equilibrium will take some time, as the Commission’s recent decisions to improve scarcity price formation have only recently (and partially) gone into effect. The market uncertainty created by the looming RTC implementation also further complicates capital-intensive and long-lasting generation investment considerations. The Commission should not adopt RTC parameters that will harm the pricing signals that are necessary for the market to move towards equilibrium.

TCPA provides a couple of examples to help illustrate the challenge of establishing the “right” RTC parameters to achieve the “do no harm to resource adequacy” objective that should inform the Commission’s decisions on the major RTC design elements. To set the framework for these examples, it is useful to briefly describe the interaction among some of the key RTC variables and the role they play in this construct as compared to today. In the RTC construct, the price just before involuntary load shed will be the ASDC maximum plus the marginal energy offer that is converting ancillary service reserves into energy (at an energy price of up to but not more than the SWOC), the sum of which may be a value less than today’s VOLL of $9,000. That is because the maximum value on the ASDC curve(s) will be reached only when reserves are nearing depletion and RTC is designed to prioritize the dispatch of energy to meet inflexible system demand in real-time over the reservation of capacity for ancillary services—meaning that the ASDC maximum will be reached only when load shed is imminent (similar to reaching the MCL in the ORDC construct).[[11]](#footnote-11) The difference from today is that under the RTC construct, the ASDCs will create scarcity pricing as reserves deplete, and the price just before load shed will equal the ASDC maximum plus the marginal energy offer (and, depending on the RTC design and specific offers at that time, that price may or may not reach the VOLL set by the Commission).[[12]](#footnote-12) Then only after all available supply (energy and reserves) is exhausted, which TCPA does not believe to be a realistic scenario as discussed further below, the PBPC would set the price for the next MW (i.e., of uncontrolled load shed).[[13]](#footnote-13) Therefore, it is important to note that the ASDC maximum is much more likely (if not certain) to set scarcity prices rather than the PBPC.

With this background as a reference, TCPA walks through two examples of RTC parameters. The first comes from ERCOT’s RTC concept paper, as well as its presentation at the recent March 6, 2019 workshop regarding RTC, at which ERCOT provided a spreadsheet example of an RTC design with a $2,000 SWOC, a $7,000.99 ASDC maximum, and a $9,001 PBPC value.[[14]](#footnote-14) ERCOT has represented that a $2,000 SWOC would cover most competitive offers, and the $9,001 PBPC was based on today’s VOLL plus $1.[[15]](#footnote-15) The $7,000.99 ASDC maximum was ostensibly selected to ensure that the SWOC plus the ASDC maximum would be coordinated with (and not exceed) the PBPC maximum under the most extreme scenario.[[16]](#footnote-16) Under this example (using ERCOT’s spreadsheet model to calculate potential RTC outcomes), prices would reach $9,000 in extremely rare instances when a substantial amount of energy offers cleared at $2,000/MWh (i.e., at the SWOC) *and* reserves were significantly diminished, driving the ASDC to the maximum of $7,000.99/MW, or if the PBPC set the price due to total demand exceeding all available supply (again, a highly unlikely practical outcome). That would represent a significant departure from the current ORDC design, where prices reach $9,000 (with the ORDC adder) any time the available operating reserves dip below the MCL of 2,000 MW. In ERCOT’s example spreadsheet, if you set the demand such that the system is 1 MW short of running out of all energy and reserves (i.e., if you set the demand parameter in ERCOT’s spreadsheet to 57,999 MW[[17]](#footnote-17)), energy prices clear only at $7,060.99 with those parameters.[[18]](#footnote-18) In other words, under this example, the ERCOT grid would already be shedding firm load,[[19]](#footnote-19) and yet energy prices would be well below the current $9,000 VOLL.

Another example, suggested by ERCOT in certain publications,[[20]](#footnote-20) would be to set the SWOC at $2,000, the ASDC maximum at $9,000, and the PBPC value at $11,001. In this example, prices would reach (or exceed) $9,000 as soon as reserves were depleted to the point that the ASDC maximum value was reached. With these parameters, there would be rare instances where actual prices would exceed the current VOLL of $9,000/MWh, because the energy price in times of scarcity would equal the ASDC maximum plus the marginal energy offer, which theoretically could be as high as the SWOC. This potential occurrence, while rare, could be addressed by imposing an effective price cap of $9,000. However, capping prices could result in unhedgeable uplift.[[21]](#footnote-21)

These examples also demonstrate the difficulty of defining VOLL in the RTC construct – e.g., in these examples, VOLL could be characterized as the sum of the ASDC maximum and the SWOC, the ASDC maximum, or any applicable effective price cap. These examples are also intended to be purely illustrative to demonstrate the inherent complexities of the RTC market design and the challenge of designing RTC in an optimal manner that will do no harm to resource adequacy and thereby to underscore the need for additional independent analysis before deciding upon the key RTC parameters.

Another parameter that the Commission should consider is whether the low system-wide offer cap (LCAP) is still needed in the RTC construct. In Project No. 48721, TCPA has advocated eliminating the LCAP even in the current market construct because the LCAP is conceptually inconsistent with an energy-only market design. If the Commission designs the RTC in a manner that relies primarily on the ASDC, rather than energy offers, to establish scarcity pricing, then there will be even less of a need for the LCAP. The current LCAP is $2,000/MWh, which, as noted above, is the same value that ERCOT has used as the sample SWOC in its RTC concept paper and spreadsheet. While TCPA is not prepared yet to support a specific value for the SWOC for purposes of the RTC design, TCPA notes this connection because the Commission will need to coordinate its decisions in Project No. 48721 with RTC implementation decisions in this project. If the Commission does wish to retain LCAP or some other Peaker Net Margin (PNM)-driven limit on scarcity pricing, then that issue should be revisited after the RTC parameters are decided because such a mechanism would be much more complicated in RTC, presumably requiring coordinated adjustments among SWOC, ASDCs, and the PBPC (and possibly other parameters).

The Commission also will need to consider whether the SWOC in the Day-Ahead Market (DAM) should be the same or a different value than the SWOC in the Real-Time Market (RTM). That will depend, in part, on whether the DAM incorporates the ASDCs and whether DAM continues to operate as it does today as a voluntary market. While TCPA believes that DAM should remain a voluntary market, TCPA takes no position on the ASDCs in the DAM issue at this time, but simply points out that the SWOC value in the DAM may need to differ from the SWOC in the RTM for there to be appropriate convergence between the DAM and RTM and for the DAM to reflect the full price risk that would exist in the RTM. For example, if a $2,000 SWOC was imposed in both the DAM and RTM, then offer-based prices would be capped at $2,000 in the DAM,[[22]](#footnote-22) even though they could reach a much higher level (e.g., $9,000) in the RTM.

An additional parameter that may warrant revisiting in the RTC construct is the MCL. While the MCL, itself, will no longer be a specific parameter in the RTC construct unless the Commission decides to make it one, the concept will still be highly relevant as the ASDCs should be designed at a minimum to replicate it. Specifically, the Commission will need to evaluate the level of reserves at which the ASDCs should reach their maximum value, and as discussed above, that evaluation should be undertaken with the goal of doing no harm to resource adequacy. In the current market design, the MCL is 2,000 MW, which was a compromise decision by the Commission when originally adopting the ORDC. In the RTC construct, it may be appropriate for the ASDC maximums to be reached at a higher level of reserves, such as 2,300 MW, which is the trigger for ERCOT to begin taking out-of-market actions for reliability.[[23]](#footnote-23) Increasing MCL would also be one way to help mitigate negative reserve margin implications if the Commission were to direct implementation of RTC in a way that reverses the current policy of valuing all operating reserves – not only those that are awarded ancillary services obligations (see discussion under Question 5).

In sum, the Commission should carefully deliberate with the aid of an independent consultant the appropriate values of SWOC, ASDC maximums, VOLL, PBPC, MCL, and the other key RTC parameters, and ultimately should adopt RTC design parameters that will achieve the goal of doing no harm to resource adequacy and producing scarcity pricing outcomes that are at least consistent with the current ORDC design and the expected MERM following the ORDC reforms to be fully implemented in March of 2020.

1. **Should the values for SWOC and VOLL be codified in the commission’s rules, set by commission order, or established through some other method?**

The key RTC parameters, such as SWOC, ASDC maximums, VOLL, and possibly even PBPC and MCL should be codified in the Commission’s rules to give stakeholders sufficient regulatory certainty regarding the values and an opportunity, in the future, for notice and comment under the Administrative Procedure Act[[24]](#footnote-24) before those values are changed. As discussed above, the key RTC parameters will have a significant impact on scarcity pricing and resource adequacy in ERCOT, and, thus, it is critical to supporting regulatory certainty in the RTC market design so that stakeholders can rely on the values that the Commission adopts and can be confident that those values will not change without appropriate notice and input from stakeholders.

1. **What set of ancillary services should be used in developing ancillary service demand curves for use in the implementation of RTC? Please consider the implementation of Nodal Protocol Revision Request (NPRR) 863, *Creation of ERCOT Contingency Reserve Service and Revisions to Responsive Reserve*, in your response.**

TCPA recommends that the suite of ancillary services effective after the implementation of NPRR 863 be the foundation for developing ASDCs; however, further technical evaluation should be done by ERCOT and its stakeholders to consider how operating reserves (i.e., online and offline reserves in excess of the required quantities of ancillary services) be incorporated, as they are with today’s ORDC. There are a number of ways that online and offline reserves could continue to be valued as they are under the current ORDC design, and significant analysis and discussion at ERCOT will need to occur before any particular option is chosen. With that said, TCPA respectfully requests that the Commission direct stakeholders to design the ancillary services set and their accompanying ASDCs in a manner that will continue to value online and offline reserves in a similar manner as occurs today. [[25]](#footnote-25)

1. **Should the demand curves for each of the ancillary services be developed independently, based on the reliability benefit provided by each service for any given level of available operating reserves? Why or why not?**
2. **If the answer to Question 6 is no, what methodology or parameters should be used to develop the demand curves for each of the ancillary services?**

As discussed above under Questions 1 through 3, it is premature to decide the specific design features of the ASDCs without additional analysis (preferably by an independent consultant) regarding the potential impact to resource adequacy, but there are general principles that should guide the decision-making process. The ASDCs should reflect the reliability value of the various ancillary services and operating reserves, while also preserving the scarcity pricing outcomes and reserve margin expectations that are at least consistent with those expected under the ORDC (including with the recent decisions regarding LOLP). As discussed above, the Commission carefully deliberated over several years in making the design decisions for today’s ORDC mechanism, and the implementation of RTC should not backtrack on, nor become a venue to reargue, those important policy decisions. The establishment of ASDCs, including the maximum ASDC values and their shapes as well as the market utilization of the ASDCs, is a critical design decision that will strongly influence scarcity pricing and the continued success of the ERCOT market. TCPA recommends independent analysis by a third-party consultant to inform a careful deliberation by stakeholders, ERCOT, the IMM, and the Commission before major design decisions are made for the ASDCs.

TCPA summarizes the key principles that should guide the development of the ASDCs below:

* The ASDCs (as coordinated with the other RTC parameters) should be structured to achieve at least the same MERM expectations implied by current scarcity pricing policies.
* ASDCs should incorporate the MCL component of the ORDC, by ensuring that energy prices will at a minimum reach VOLL when reserves deplete to the MCL level (be it the current MCL of 2,000 MW or another reasonable threshold, as discussed under Questions 1-3).
* Clear processes should exist for proposing and evaluating changes to ASDCs, with key RTC parameters established in the Commission’s rules and specific ASDC shapes established by the ERCOT stakeholder process.
* If other RTC design decisions will reduce MERM expectations compared to the status quo, then the ASDCs should be adjusted accordingly to reflect that increased reliability risk.
* ASDCs should continue to price operating reserves similar to the way they are priced today, where the price paid for the reserve asymptotically approaches zero as the LOLP diminishes.
1. **Should offers for the provision of ancillary services in the Day-Ahead Market continue to be physically binding after implementation of RTC, or should the trading of ancillary services in the Day-Ahead Market become financial-only? Why or why not?**

With ancillary services shifting to real-time procurement in RTC, TCPA strongly believes that the DAM should be a fully financial and voluntary market for both ancillary services and energy. The ERCOT nodal market has always supported hedging in the RTM with a voluntary, financial-only DAM for energy; however, today, ancillary services awards in the DAM are generally binding in the RTM (absent infeasibility or some other basis to move the obligation to another resource). In the RTC construct, there would be no need to require designation of physical resources in the DAM, because regardless of any ancillary service awards made in the DAM, ERCOT will decide every five minutes in the RTM which resources will actually be physically reserved for ancillary services. ERCOT market participants have successfully participated in financial (i.e., virtual) energy sales and purchases in the DAM since its existence, which has aided in convergence of DAM and RTM prices. This convergence enables the DAM to become a contracting and hedging tool for both resources and load serving entities. Allowing for financial, or virtual, ancillary service transactions should create similar efficiencies.

In short, TCPA has not identified any reasons to make ancillary services in the DAM anything more than financial-only and supports keeping the DAM a purely voluntary market of willing buyers and sellers. However, TCPA is open to considering any arguments that other parties may bring forward for physically binding DAM awards or qualifications on offering ancillary services in the DAM to address deliverability concerns. While the details of implementing a fully financial and voluntary post-RTC DAM can be worked out in the stakeholder process, policy direction from the Commission on this high-level decision point will help simplify and accelerate implementation discussions at ERCOT.

1. **Which market rules established in the commission’s rules and in ERCOT protocols, such as prohibitions on withholding of capacity or the “small fish” rule, should apply to the offer of ancillary services in the Real-Time Market? Why or why not?**
2. **Should other market rules specific to ancillary services be established?**
3. **Should all online capacity be required to have an offer curve for each ancillary service for which a resource is qualified? Why or why not?**

TCPA responds to Questions 9 and 11 together and has no comments at this time regarding Question 10.

As an initial threshold matter, in an energy-only market construct where capacity is not explicitly valued, sold, and committed on a forward basis, resources should not be required to offer ancillary services in either the DAM (which, as discussed above, should be fully voluntary and financial only) or the RTM (where the available capacity must always be visible for Reliability Unit Commitment (RUC) and has every incentive to – but is not compelled to – offer its capacity).

If the ASDCs are properly designed to appropriately value ancillary services, resources will be incentivized to offer ancillary services in real-time so they have the opportunity to receive the market clearing price for capacity (MCPC), obviating any need for a “must-offer” requirement. TCPA suggests that those incentives could be fairly straightforward and consistent with the energy market today. In addition, not all resources are able to provide all ancillary services, and there are valid reasons that a resource qualified to provide ancillary services would not want to submit an ancillary service offer in the RTM at a particular time. For example, a resource may have an upcoming planned outage but is operating under certain contingency conditions and needs to operate at a certain output level (i.e., a level at which it operates more efficiently) to avoid a forced outage before the scheduled time for the planned outage. In that case, the resource might need to refrain from offering ancillary services despite its objective qualification to provide them. Put another way, imposing a must-offer requirement for ancillary services in the RTM could require resources to submit offers even though they are not able to honor those offers at that time. Moreover, while a must-offer requirement for ancillary services is not needed to realize the operational efficiencies of RTC, it will be harmful to the market (e.g., if a must-offer requirement resulted in ERCOT awarding a unit an ancillary service requirement it was not physically capable of fulfilling, this would lead to unnecessary costs uplifted to the market).

As a second general threshold matter, TCPA believes that the existing market rules established under 16 Tex. Admin. Code (TAC) §§ 25.503 and 25.504 should continue to apply generally to both energy and ancillary services, with an important exception. If there is no must-offer requirement for ancillary services in the RTC construct, then the physical and economic withholding prohibitions in 16 TAC §§ 25.503(g) and 25.504(d) would be impractical and inapplicable to offers for ancillary services. These provisions are generally ill-suited to the ancillary services market, for a number of reasons.

First, withholding (physical or economic) under §§ 25.503(g) and 25.504 requires a finding that the particular resource had market power, which §25.504 defines as the “ability to control prices or exclude competition in the relevant market.”[[26]](#footnote-26) The ancillary services quantities that ERCOT procures today, which presumably will be similar to the quantities procured under RTC, are significantly smaller than the pool of qualified resources to provide those services. For example, in ERCOT’s March 6, 2019 RTC workshop materials, the total Up Regulation Service (URS) quantity was 270 MW, the total Responsive Reserve Service (RRS) was 2,300 MW, and the total Spinning Operating Reserves (i.e., ERCOT Contingency Reserve Service (ECRS) plus Non Spinning Reserve Service (NSRS)) was 3,000 MW – a sum of 5,570 MW that pales in comparison to the amount of capacity in ERCOT. Further, with the implementation of NPRR 863, even more resources should be able to provide ancillary services, making the pool of eligible resources even larger.[[27]](#footnote-27) In other words, it seems unlikely that a resource would be able to “control prices” or “exclude competition” in an ancillary services market.

Second, economic withholding under §§ 25.503(g) and 25.504 requires a finding that a resource priced its services “substantially above its marginal cost.”[[28]](#footnote-28) It would be difficult to determine what constitutes “marginal cost” in this context. ERCOT’s March 6, 2019 workshop materials and a prior analysis by the IMM[[29]](#footnote-29) assumed that resources would offer ancillary services in the RTC construct for $0 in the RTM, based on the apparent assumption that the only cost in real-time to provide ancillary services is the lost opportunity cost, which would already be reflected in the MCPC. TCPA disagrees with this assumption, because there are real costs to making a resource ready and available to provide ancillary services in real-time and a resource will rationally reflect these costs in its RTM ancillary services offer. Furthermore, ancillary services generally receive a greater degree of regulatory scrutiny when deployed, which drives additional compliance risks and costs associated with the provision of those services. In other words, unlike in the energy context (where “marginal costs” can be generally approximated based on fuel costs, heat rates, and variable O&M), it is more difficult to accurately gauge what a resource’s marginal costs are for offering ancillary services in the RTM, making allegations of economic withholding problematic in this context.

With that said, regardless of whether the Commission concludes that the withholding prohibitions in §§ 25.503(g) and 25.504(d) should apply to RTM ancillary services offers in the RTC construct, the Commission should continue to apply the “small fish” policy in § 25.504(c), which deems generation entities that control less than 5% of the installed generation capacity in ERCOT to not have market power and in turn generally exempts them from market power abuse allegations (including withholding claims under § 25.504(d) and the more general market power abuse prohibition in 16 TAC § 25.503(g)). The “small fish” exemption should be calculated the same for energy and ancillary services as it is today, based on the total capacity controlled by a resource as compared to the total installed generation capacity in ERCOT. There does not appear to be a clear alternative – for example, basing it on whether a resource controls 5% of the relevant ancillary services market in any given five minute interval in the RTM would be practically unworkable to determine and enforce and create unnecessarily complicated compliance risk for market participants.

Although there should be no must-offer requirement for ancillary services in the RTC construct, TCPA recommends that ERCOT’s Protocols include provisions to make clear for both ERCOT operators and the ERCOT dispatch software (e.g., SCED, Load Frequency Control) what capacity from individual units is available to be used for which ancillary services. Specifically, qualified scheduling entities (QSEs) should be required to communicate to ERCOT in real-time their resource’s availability to provide each ancillary service for which they are qualified, in order to allow ERCOT and its systems to be aware of operational limitations (such as transitions or other operational limitations including the “limping toward a planned outage” scenario mentioned above) that may prevent access to reserves and thus ensure that ERCOT and the RTC engine will refrain from assigning ancillary services to those resources in real-time. Further, similar to energy, if ERCOT is short of ancillary services (which TCPA thinks will be unlikely for the reasons discussed above), ERCOT can use the RUC tool to cover ancillary services.

In sum, the Commission should clarify that there will be no must-offer requirement for ancillary services in the RTC construct for either the DAM or RTM, and should confirm that the provisions of 16 TAC §§ 25.503 and 25.504 apply generally to ancillary services as discussed above, including the “small fish” exemption from market power abuse allegations and the practical considerations for application of the withholding provisions as they pertain to ancillary services.

1. **How should ancillary service performance be monitored following the adoption of RTC?**

As discussed above in response to Question 8, there will no longer be a need for performance monitoring based on DAM awards if the DAM is made fully financial and voluntary, as TCPA recommends it should be. For real-time performance, ERCOT and its stakeholders should evaluate what the appropriate performance and qualification standards are for the various ancillary services. ERCOT broached this topic briefly at its April 4, 2019 RTC Task Force meeting, noting that some performance monitoring standards such as timing requirements to update unit High Ancillary Service Limits will become obsolete and other modifications will become more apparent as the RTC implementation becomes more clear.[[30]](#footnote-30) TCPA generally agrees, and as discussed above in response to Questions 9 and 11, believes that a properly designed RTC should create incentives for resources to be made available for ancillary services in real-time and to perform if called upon.

1. **Are there any other policy issues which the commission should decide before the process of RTC implementation may commence? If so, please describe the issue or issues in detail.**

In order to maintain proper price signals that allow the market design to succeed and reduce unhedgeable uplift to consumers, TCPA recommends that the Commission direct ERCOT to compensate for out-of-merit and out-of-market (OOM) actions taken by ERCOT and transmission and distribution service providers (TDSPs). Some of these actions are accounted for today in the ORDC calculation, others in the Reliability Deployment Price Adder (RDPA), and some are not accounted for at all (but should be). Examples of such OOM actions include RUC, Reliability Must Run (RMR), Emergency Response Service (ERS), emergency direct current (DC) tie curtailments and inflows, four coincident peak (4CP), TDSP load management programs (e.g., voltage reduction), load resources providing RRS on high-set under-frequency relays, low dispatch limit and high dispatch limit overrides, firm load shed, etc. This list is not intended to be all-inclusive, but is provided to illustrate the types of OOM actions that can artificially depress or reverse prices, if not corrected for in pricing. In addition, offer floors for energy (RUC, NSRS, RMR) will need to be reconsidered and their desired impacts be translated to the new design.

Possible solutions under the RTC construct include, but are not limited to:

* Shifting ASDCs to account for OOM actions.
* Retaining the RDPA’s second SCED-run approach to correct for price reversals associated with OOM actions, but potentially modifying or expanding the RDPA.
* Reconsidering ancillary service offer floors for capacity with energy offer floor requirements.

In addition, any OOM actions that cannot be captured in prices, such as the recent outage cancellation directions from ERCOT or potential limits in the RTC software, should be addressed through make-whole payments to generators. These issues warrant further in-depth discussions at ERCOT, but would benefit from high level policy direction from the Commission for ERCOT to adopt rules to compensate OOM actions taken by ERCOT and TDSPs and correct for any associated price reversal.

**II. Conclusion**

 TCPA appreciates the Commission’s consideration of its comments and requests that the Commission carefully evaluate the key RTC parameters, with the aid of an independent consultant, with the objective of doing no harm to resource adequacy.

Dated: April 15, 2019

Respectfully submitted,

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1. Request for Comments (Feb. 28, 2019) (published in 44 Tex. Reg. 1481-82 (Mar. 15, 2019)). [↑](#footnote-ref-1)
2. In the RTC construct, because the PBPC would apparently only come into play in the extremely unlikely event of uncontrolled load shed (rather than to set the price when regulation service is deployed to meet transitory supply shortages), the PBPC likely would be a single value, rather than a curve as it is today. [↑](#footnote-ref-2)
3. *Review of Summer 2018 ERCOT Market Performance*, Project No. 48551, Memorandum from Chairman DeAnn T. Walker (Jan. 17, 2019). *See also infra* note [7](#Note7). [↑](#footnote-ref-3)
4. ERCOT, Report on the Capacity, Demand and Reserves (CDR) in the ERCOT Region, 2019-2028 (Dec. 4, 2018) (hereafter, ERCOT CDR, 2019-2028), *available at:* [http://www.ercot.com/content/
wcm/lists/167023/CapacityDemandandReservesReport-Dec2018.pdf](http://www.ercot.com/content/wcm/lists/167023/CapacityDemandandReservesReport-Dec2018.pdf). [↑](#footnote-ref-4)
5. ERCOT Concept Paper for Real-Time Co-Optimization of Energy and Ancillary Services at 14–15 (Draft) (Version 0.4) (Sept. 29, 2017) (hereafter, ERCOT RTC Whitepaper), *available at*: [http://www.ercot.com/content/wcm/key\_documents\_lists/131797/RT\_Co-optimization\_Scope\_UPDATED\_092920
17.docx](http://www.ercot.com/content/wcm/key_documents_lists/131797/RT_Co-optimization_Scope_UPDATED_09292017.docx). [↑](#footnote-ref-5)
6. The PBPC comes into play when all available capacity, including reserves, is depleted and demand cannot be met. It is assumed that this would be exceedingly unlikely since controlled load shed would be initiated prior to a complete exhaustion of all capacity and reserves. [↑](#footnote-ref-6)
7. It took several years and multiple rounds of comments at the Commission (with over 600 filings in three years) from the time that a former Commission initially expressed concern with resource adequacy in ERCOT leading up to the summer of 2011 to that Commission’s ultimate adoption of the current scarcity pricing mechanism in ERCOT, i.e., the ORDC; it then took another nine months or so before ERCOT stakeholders adopted and ERCOT implemented the ORDC. *See generally* Project No. 37897 (opened in May 2011, but prompted by an initial request in December 2010 by that Commission to ERCOT to study the impact of impending environmental regulations on resource adequacy in ERCOT); Project No. 40000 (opened in July 2012 and ultimately resulted in the Commission directing ERCOT to develop the ORDC at the September 12, 2013 open meeting); NPRR 568 (adopted in November 2013 and implemented in time for summer 2014). The ORDC continues to be the subject of debate and refinement, most recently with the Commission’s decision at the January 17, 2019 open meeting to adjust the loss of load probability curve in a two-step process, beginning this spring with a 0.25 shift and culminating with an additional 0.25 shift in spring 2020. [↑](#footnote-ref-7)
8. Project No. 48551, The Brattle Group, *Sensitivity of the Market Equilibrium Reserve Margin to Potential Changes in the ORDC* at 6-7 & 10 (Dec. 3, 2018), *available at*: <http://interchange.puc.texas.gov/Search/Documents?controlNumber=48551&itemNumber=54>. [↑](#footnote-ref-8)
9. The Brattle Group, *Estimation of the Market Equilibrium and Economically Optimal Reserve Margins for the ERCOT Region* at iii (Dec. 20, 2018), *available at*: [http://www.ercot.com/
content/wcm/lists/167026/2018\_12\_20\_ERCOT\_MERM\_Report\_Final.pdf](http://www.ercot.com/content/wcm/lists/167026/2018_12_20_ERCOT_MERM_Report_Final.pdf). [↑](#footnote-ref-9)
10. ERCOT’s preliminary Seasonal Assessment of Resource Adequacy (SARA) projects total resources of 78,154 MW this summer, which, based on expected firm demand of 72,674 MW (from the December CDR), results in a reserve margin of 7.5% (i.e., (78,154 MW – 72,674 MW)/72,764 MW). ERCOT, Preliminary Seasonal Assessment of Resource Adequacy, Summer 2019 (Mar. 5, 2019), *available at*: <http://www.ercot.com/content/wcm/lists/167022/SARA-PreliminarySummer2019.pdf>; ERCOT CDR 2019-2028 (Dec. 4, 2018), *available at*: <http://www.ercot.com/content/wcm/lists/167023/CapacityDemandandReservesReport-Dec2018.pdf>. [↑](#footnote-ref-10)
11. ERCOT RTC Whitepaper at 14–16 (Sept. 29, 2017). [↑](#footnote-ref-11)
12. See ERCOT’s materials for the March 6, 2019 workshop (including a power point presentation and a spreadsheet with a modifiable RTC scenario), which are available here: <http://www.ercot.com/calendar/2019/3/6/175558>. In ERCOT’s sample spreadsheet, the energy price equals the offer price of the marginal resource plus the lost opportunity cost of being deployed as energy rather than reserved for ancillary services. In times of scarcity, that lost opportunity cost will equal the ASDC maximum. [↑](#footnote-ref-12)
13. This is different than the current operation of the PBPC. Today, the PBPC is struck when there are no competitive energy offers available to meet the next MW of demand, and in those instances, ERCOT deploys regulation to meet demand. ERCOT Methodology for Setting Maximum Shadow Prices for Network and Power Balance Constraints, § 4.1 *et seq.* (Jun. 20, 2018). In the RTC construct, it appears from ERCOT’s spreadsheet example at the March 6, 2019 workshop that the PBPC will be struck when there is no available supply on the system to meet the next MW of demand (either from energy or reserves), such that striking the PBPC will correlate with uncontrolled load shed. [↑](#footnote-ref-13)
14. *Supra* note [12](#Note11). [↑](#footnote-ref-14)
15. ERCOT RTC Whitepaper at 15 (Sept. 29, 2017). [↑](#footnote-ref-15)
16. *Id.* [↑](#footnote-ref-16)
17. In ERCOT’s spreadsheet example, there are 58,000 MW of resources available on the system as either reserves or energy. *Supra* note [12](#Note11). [↑](#footnote-ref-17)
18. In ERCOT’s spreadsheet example, the highest energy offer is $800/MWh, but that resource is not eligible to provide regulation or responsive reserves. The resource with the next highest energy offer, which is eligible to provide Up Regulation Service, has a $60/MWh offer. The energy price equals the maximum $7,000.99 value on the ASDC (because reserves are almost entirely depleted, with only 1 MW of Up Regulation Service available to ERCOT, and no capacity available for Responsive Reserve Service or what the spreadsheet terms Spinning Operating Reserves), plus the $60/MW marginal energy offer. *Supra* note [12](#Note11). [↑](#footnote-ref-18)
19. In actual operations, ERCOT would implement firm load shed to maintain reserves at or above 1,000MW. *See* ERCOT Protocol § 6.5.9.4.2(3)(a). [↑](#footnote-ref-19)
20. *See* ERCOT, Real-Time Co-optimization of Energy & Ancillary Services, Co-ordination of Power Balance Penalty Curve, VOLL, SWOC for AS Demand Curves (May 8, 2017), *available at*: [http://www.ercot.com/content/wcm/key\_documents\_lists/118092/RT\_Co-Opt\_Coordination\_of\_VOLL\_SWOC\_
PBPC.pptx](http://www.ercot.com/content/wcm/key_documents_lists/118092/RT_Co-Opt_Coordination_of_VOLL_SWOC_PBPC.pptx). [↑](#footnote-ref-20)
21. ERCOT Protocol § 6.6.10. [↑](#footnote-ref-21)
22. Load bids to buy could technically set prices above $2,000 in the DAM, but generators would be limited from offering above $2,000, which in turn would limit if not eliminate any rationale for loads to bid more than $2,000 in the DAM. [↑](#footnote-ref-22)
23. ERCOT declares an Energy Emergency Alert (EEA) Level 1 when physical responsive capacity falls below 2,300 MW and is not projected to be recovered above 2,300 MW within 30 minutes without the use of the actions that ERCOT takes during an EEA 1. ERCOT Protocols § 6.5.9.4.2. [↑](#footnote-ref-23)
24. Tex. Gov’t Code, Tit. 10, Ch. 2001, Subch. B. [↑](#footnote-ref-24)
25. *See* ERCOT, Methodology for Implementing Operating Reserve Demand Curve (ORDC) to Calculate Real-Time Reserve Price Adder (Ver. 1.9) (Mar. 1, 2019), *available at*: <http://www.ercot.com/mktrules/obd/obdlist>. [↑](#footnote-ref-25)
26. 16 Tex. Admin. Code (TAC) § 25.504(b)(2). [↑](#footnote-ref-26)
27. See NPRR 863, Board Report (Feb. 12, 2019) (“By separating the 10-minute component from RRS and creating two distinct Ancillary Service products, barriers to entry are removed, market efficiencies are realized, unnecessary regulatory compliance risk is removed, Resources are appropriately compensated for the service(s) that they provide, and ERCOT is provided with more granular tools to address the changing Resource mix of the ERCOT Region.”). [↑](#footnote-ref-27)
28. 16 TAC § 25.504(d). [↑](#footnote-ref-28)
29. *Project to Assess Price-Formation Rules in ERCOT’s Energy-Only Market*,Project No. 47199, Potomac Economics, Simulation of Real-Time Co-Optimization of Energy and Ancillary Services For Operating Year 2017 at 5 (June 29, 2018) (hereafter, IMM RTC Paper). [↑](#footnote-ref-29)
30. *See* ERCOT, Approaching the RTC Elements (Apr. 4, 2019), *available at*: <http://www.ercot.com/content/wcm/key_documents_lists/178832/4._Approaching_the_RTC_Elements.pptx> [↑](#footnote-ref-30)