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PUBLIC UTILITY COMMISSION
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RULEMAKING REGARDING DEMAND §
RESPONSE IN THE ELECTRIC §
RELIABILITY COUNCIL (ERCOT) §
TEXAS MARKET §
§

PUBLIC UTILITY COMMISSION
OF TEXAS

ERCOT STEEL MILLS REPLY COMMENTS

TO THE HONORABLE COMMISSIONERS:

NOW COMES, Gerdau Long Steel North America, Nucor Steel – Texas and CMC Steel Texas (collectively the “ERCOT Steel Mills”) and files these Reply Comments.

I. Demand Response (DR) in Connection with Resource Adequacy

All market participants who filed comments in this rulemaking agree on one point - - vibrant demand response is essential to the resolution of resource adequacy concerns within ERCOT. Irrespective of the market construct this Commission chooses to implement, that market construct cannot succeed without additional and significant DR penetration within ERCOT. A great deal of additional active DR penetration is possible within ERCOT, but not without recognition of some fundamental realities. The level of active DR within ERCOT is at present miniscule in comparison to its potential. One reason for this is the erroneous assumption, fueled primarily by the generator market segment, that loads can and must be treated in a manner identical to generation. Loads possess an almost infinite diversity of operational characteristics, but almost none can operate exactly like generation. Almost all can, however, contribute to the objective of eliminating ERCOT’s current resource adequacy concerns provided this Commission is willing to pursue policies that permit loads to fully actualize their active DR potential.

Loads and generation are very different. To force participating loads to fit the mold of generation is a recipe for disaster for the future of active DR within ERCOT. The performance requirements for loads and generation providing Responsive Reserve Service (“RRS”), for example, are different because the two types of resources have very different characteristics as is

recognized in the ERCOT Protocols.¹ Similarly, the Protocols recognize and account for the inability of loads providing ERS to mimic the performance characteristics of generation.² Since the inception of the use of loads to provide reliability services, the Protocols have appropriately recognized the inherent performance differential between the two types of resources. The important point is that the provisioning of these reliability services by these very different types of resources results in combined performance that is superior to that provided by either type of resource alone, to the substantial benefit of overall grid reliability.

Similarly, the diversity in operational characteristics between different types of loads results in the inability of all loads to provide active DR in an identical manner. That is one of the principal reasons why Emergency Response Service (“ERS,” previously referred to as “EILS”) was created by this Commission. The vast majority of ERCOT loads cannot meet the performance parameters of load-provided RRS but can nonetheless make a huge contribution to resource adequacy and ERCOT system reliability. Batch process loads, for instance, due to their operational characteristics, are not allowed to participate in RRS. Since their operational characteristics are such that they cannot maintain the same constancy of demand throughout the clock hour as can chlorine and air separator loads participating in RRS, the enormous amount of demand response that batch process loads can provide for system reliability purposes must be measured using their average demand over a broader time horizon. That is why ERS contains an alternate base line designed to measure performance in this manner. The structure of the existing ERS service enables these types of loads, as well as large aggregations of small loads, to provide active DR which would not otherwise be available for system reliability purposes within ERCOT. Again, the point is that RRS and ERS together provide far greater system reliability support than either of the two alone, and in far larger quantity than either of the two alone.

This Commission has a variety of policy options it can pursue in attempting to achieve an increase in DR penetration within ERCOT, and in attempting to better integrate DR into the current market, but it must recognize that these two objectives are not necessarily complementary. If care is not taken, furtherance of one will be at the expense of the other.

Given current resource adequacy concerns, this Commission’s priority should be first and foremost to increase active DR penetration within ERCOT and secondarily to better integrate DR into the current market, but only to the extent that it can be done without impairing the growth of

¹ e.g., Section 8.1.1.4.2, Responsive Reserve Service Energy Deployment Criteria.

² e.g., Section 3.14.3.3(e), Emergency Response Service Provision and Technical Requirements.

DR penetration or losing DR penetration that has been gained to date. That which has been achieved to date in terms of active DR penetration is the product of years of hard work by this Commission, ERCOT staff and market participants with a common objective of increasing active DR opportunities. However, the active DR penetration that has been achieved to date can be lost overnight by future policy decisions which may represent well-intentioned efforts to fully integrate DR into the market price formation process, but which may inadvertently decimate the ability of most loads currently engaged in active DR to continue to do so.

Failure to properly balance the respective goals of increasing active DR penetration and better integrating DR into the price formation process will do significant harm to the Texas economy by forcing industrial loads for whom active DR participation is essential to their ability to produce goods at an economically competitive cost to shift production and jobs to facilities in other states where active DR participation is encouraged and facilitated. A specific example of how this balance would not be achieved is the Luminant proposal, which is discussed in detail later in these reply comments.

II. The Potential Impact of Demand Response (DR)

As discussed above and in the initial comments filed by the individual steel mills, a substantial increase in active DR penetration within ERCOT is possible and can play a highly meaningful role in alleviating the Commission's current resource reliability concerns. Rather than again discussing the potential avenues for expanding active DR penetration set forth in our initial comments, the steel mills would simply refer back to those comments.

Some parties commented in their initial comments on the negative impact which active DR has on occasion had on energy price formation within the ERCOT market and on the occurrences of price reversals that have occurred in the past due to the deployment by ERCOT of DR reliability services, in particular RRS and ERS. With respect to "price reversal" in general, it is imperative that the Commission distinguish between price reversals caused by out-of-market administrative actions as opposed to reductions in price attributable to the normal forces of supply and demand. In this regard, all of the participants on the first panel at the Commission's recent DR workshop agreed, as stated by Eric Goff with Citigroup Energy Inc., in his summary of points upon which all panelists agreed, that reduction in demand attributable to voluntary

price response by loads does not constitute “price reversal” and should not be mitigated by administrative action.

That said, price reversals resulting from ERCOT RRS and ERS dispatch actions in response to scarcity and/or emergency conditions should be properly addressed and resolved. ERCOT has already implemented a variety of Protocol changes which dramatically reduce the possibility that price reversals attributable to deployment of these services can occur. In addition, there are two overlapping NPRRs pending at ERCOT that, if either were adopted, would completely eliminate any possibility that these price reversals could occur. There are two reasons why neither of those NPRRs has been adopted to date. The first is the Commission’s ongoing examination of variants of Professor Hogan’s operating reserves curve scarcity pricing proposal. Commission action on that proposal would likely obviate the need for any further NPRRs addressing price reversal and may in fact require the undoing of some of the Protocol changes already adopted. Second, the NPRRs that are currently pending have not been adopted to date by ERCOT because of concern that they over-reach, containing mechanisms within them that go beyond the specific issue of eliminating price reversals attributable to ERCOT administrative actions under scarcity and emergency conditions. Were those NPRRs limited in scope solely to the price reversal issue, they would no longer be a subject of controversy and would be approved expeditiously by market participants.

In short, price reversal concerns associated with ERCOT’s existing DR services have been greatly mitigated to date and market participants are currently actively working to resolve any remaining possibilities that price reversals could occur due to ERCOT deployment of DR reliability services. Consequently, price reversal concerns do not provide a reasonable basis for seeking implementation of radical changes to the design of those existing reliability services.

The Commission needs more DR penetration, not less, if it wants DR to play a meaningful role in alleviating resource adequacy concerns. However the Commission chooses to encourage increased active DR penetration within ERCOT, it should not take action which will have the effect of eliminating the DR services already in place or fundamentally altering them in a way that will preclude continued participation in those services by current DR providers. The steel mills believe that expansion of the existing ERS program would be beneficial to ERCOT system reliability and provide concrete resource adequacy benefits and that this can be done without fear that inappropriate price reversals will result. But, above all else, first do no harm.

Based upon the Commission’s consistent track record of strongly promoting the

continued growth of ERS, as evidenced mostly recently in the ERS rulemaking just last year, the steel mills are confident that the Commission continues to value ERS highly and fully recognizes its contribution to ERCOT system reliability. The extent to which and speed with which the Commission chooses to expand ERS in the future is a policy decision as to which the Commission must undoubtedly take numerous factors into account in reaching an optimal decision. However, the Commission must take extraordinary care not to take actions that will have the inadvertent effect of destroying the current DR reliability resource base already provided by existing RRS and ERS program participants.

III. Further Integration of this Resource into the ERCOT Market

The steel mills do not oppose the goal of further integration of active DR into the ERCOT market, but how that goal is accomplished is critically important. With respect to Loads in SCED, we believe the design and implementation costs will be quite substantial and that the design and implementation processes will take years to complete. We are also concerned that Loads in SCED would fail an objective cost/benefit test. Very few industrial loads will have an interest in providing active DR in SCED for two principal reasons. First, most loads lack the operational ability to follow SCED deployment and recall instructions in a manner similar to generation. Second, industrial loads can by bilateral arrangement with their REP and QSE obtain the same financial benefit without the performance risks and penalties that would attend participation in Loads in SCED. Ontario's experience with Loads in SCED is worth noting in this regard. The Ontario IESO implemented Loads in SCED at very substantial cost a number of years ago but to date only ten loads participate. We believe this lackluster level of participation is illustrative of what the Commission might expect to achieve within ERCOT.

If the Commission is strongly interested in implementing Loads in SCED, we would advise the Commission to first direct ERCOT to undertake a survey of potential load participants to gain a detailed understanding of the true extent to which loads would find Loads in SCED worth participating in. ERCOT must define the value proposition for potential loads to be solely dispatched by SCED in a clear and concise product description, and then and only then ask relevant questions regarding participation in such a product. The result of such a survey would provide the Commission better information on which to make a decision based on the cost and benefits of implementing Loads in SCED.

If the intent of Loads in SCED is to increase generator revenues by incorporating participating loads into the price formation process, there are easier ways of increasing generator revenues that are far more practical and less costly and time consuming to implement. If the intent is to increase active DR opportunities within ERCOT, then the cost benefit analysis discussed above is necessary in order to determine whether a meaningful number of loads would even be willing to participate in Loads in SCED. If the objective of Loads in SCED is to better incorporate the price responsiveness of loads into ERCOT operational planning, the steel mills believe that objective can be met in an even better way by focusing on the gathering and analysis of price response data by ERCOT load analysts. CMC Steel Texas in its initial comments in this project floated a concept for facilitating the gathering of such data by ERCOT. Additionally, ERCOT staff stated at the DR workshop that they believe that the Commission's substantive rules already give ERCOT the requisite authority to require load serving entities to gather and supply the price response data.

The SCED price forecast (look-ahead) which ERCOT implemented last summer is however, critical to price transparency within the ERCOT market and has become an integral and very necessary part of DR in the ERCOT markets today. The ERCOT steel mills have integrated those price forecasts into their real-time and hourly decision making processes, as undoubtedly have many other industrial loads, given the criticality of those price projections to the ability to timely and effectively adjust load in response to anticipated real-time prices.

There is an NPRR (532) sponsored by CPS Energy that is currently pending at ERCOT which, if adopted, would facilitate the ability of aggregated loads to provide Non-Spin Response Service ("NSRS"). This would be a very positive integration of DR into the market for ancillary services and should be encouraged.

IV. Specific Proposals Presented at the Workshop

Two concepts in particular, were discussed at length at the Commission's DR workshop. While both may be philosophically intriguing, neither are practical, and accordingly, neither should be implemented.

The first is the proposal by Luminant to abolish RRS, Non-Spin Reserve Service ("NSRS") and ERS and replace them with an expanded set of five categories of ERCOT reserves, all of which would require participating loads to be dispatched through SCED. While

pitched by Luminant in an undoubtedly well-intentioned way as an out of the box approach to creating DR markets that are seamlessly integrated into the current energy-only market structure, the unfortunate reality is that the proposal would decimate active DR within ERCOT and virtually assure the loss of much of the core DR in ERCOT that has taken years to develop.

The Luminant proposal heavily favors generation resources over load resources in the provisioning of ancillary services and would effectively preclude many loads which currently provide RRS and ERS from competing for the provisioning of the RRS and ERS equivalent services envisioned by Luminant. Luminant's proposal also expands the amount of reserves to be purchased for every hour well beyond that which is required by the ERCOT reliability needs as outlined in the current approved Ancillary Services Plan. The reserve requirements in this plan have proven to be adequate to support the ERCOT system for over 25 years with only a few tweaks to the amounts of reserves. Before embarking on an expansion of operating reserves this large, the Commission should be very concerned about the potential costs and benefits of doing so.

Luminant's proposal would exclusively use ERCOT's Security Constrained Economic Dispatch system to deploy reserves from capacity purchased in the Day Ahead Market from generators and loads. In oral discussions at the Commission's DR workshop held on March 14th in this project, Eric Goff with Citigroup Energy Inc., and Jay Zarnikau with Frontier Associates LLC, both stated that many loads cannot participate in SCED. If a load is incapable for operational reasons of following SCED deployment and recall instructions, it would be effectively barred from the markets for RRS and ERS under the Luminant proposal even though it historically was a highly reliable provider of those services. Luminant mentioned at the DR workshop that relaxation of performance requirements would be one way of accommodating loads in SCED. However, that relaxation would have potentially significant skewing effects on energy prices being set by the SCED algorithm, defeating a principal purpose of putting Loads in SCED in the first place. The trade-off between the benefits to price formation of incorporating Loads into SCED and the detriment to SCED pricing accuracy resulting from the inability of loads to closely follow SCED dispatch instructions renders Luminant's proposal to force all load-provided reserves into SCED highly questionable at best.

When a generation resource receives a base point from SCED it moves its generation output according to the pricing solution from SCED. Generation facilities can do this as they operate solely to produce electricity and have been built to move incrementally according to the

desires of the operator. However, Load Resources are loads whose purpose of consumption of electricity is to make end-use products or products that are incorporated by other manufacturers into end-use products. The manufacturing processes for these loads are therefore designed to manufacture their respective core products as efficiently as possible, not to facilitate the ability to consume and curtail electrical consumption in a manner that mimics in mirror image the start-up, ramping and shut-down capabilities of generation facilities.

These loads typically don't have ramping capability and can only be turned on or off with little or no variability. Furthermore, while some may be capable of rapid response to a dispatch instruction to curtail load, most cannot respond to a recall instruction when and as required by a SCED Dispatch. Loads must take many and various steps to resolve and clear all of the consequences of initial interruption to all of the affected sequential manufacturing processes in the plant and prepare the equipment for the manufacturing process to restart. A few loads may be able to respond to variable dispatch signals from SCED, but those types of loads are very rare in the current market. It is one thing to implement a Loads in SCED option for interested loads, but it is quite another to require loads to participate in SCED as a pre-condition to being able to participate in any market for the provisioning of RRS, NSRS and ERS-equivalent services or for the new market reserves envisioned by Luminant. The obligatory participation in the SCED process by any load wishing to provide active reliability or economic DR within ERCOT constitutes the fundamental and lethal flaw in Luminant's operating reserves restructuring proposal.

While the Luminant comments seem to suggest that it would be a simple matter for Loads currently providing ERS to transition to the provisioning of an equivalent of the service that would be dispatched by SCED, Luminant does not mention that this Commission designed and implemented ERS for the purpose of allowing batch process loads as well as other loads that could not meet the operational requirements of RRS to nonetheless still actively assist ERCOT in meeting its grid reliability needs. Nor does Luminant mention that most of the loads that currently provide ERS, including all of the ERCOT steel mills, would be incapable of providing an ERS-type service dispatched through SCED. The mere placement of ERS into SCED changes the performance requirements in a radical manner that would effectively extinguish the ERS program, eliminating the future ability of current ERS participants to provide ERCOT reliability services.

Similarly, most of the loads currently providing RRS would not be able to continue to provide RRS under the Luminant proposal due to their inability to follow SCED dispatch instructions. Virtually every load capable of providing RRS is participating in the current RRS market. Consequently, adoption of Luminant's proposal would effectively bar most of those loads from participation, not only in traditional reliability based DR services, but in any form of active DR.

The assumption that there are large quantities of load not already providing active DR in the ERCOT market that would be stimulated to participate in SCED-only active DR markets as envisioned by Luminant is false. Therefore this assumption should not constitute a basis for this Commission to endorse the Luminant proposal. The Luminant proposal, if adopted, would result in the loss of far more active DR than could be hoped to be gained under that proposal.

The second concept floated at the DR workshop that the steel mills wish to address is Commissioner Anderson's suggestion that it might be beneficial to ERCOT and ERS participants to replace the current four month ERS contracts with a day-ahead market for the procurement of ERS on an hourly basis. The steel mills appreciate that this concept has been put on the table by Commissioner Anderson at least in part in response to the steel mills' comments concerning the difficulties faced by ERS bidders who must forecast their expected load levels up to five months into the future in order to formulate and submit their ERS offers in the ERS procurement process. While we can see why one might think at first blush this concept would be appealing, the fact of the matter is this is not a good idea. It would not solve the load forecasting issues faced by ERS participants. Instead, it would replace the four-month-ahead load forecasting dilemma for ERS participants, which is a barrier to entry but one that can be lived with if necessary, with a day-ahead hourly load forecasting dilemma that is far worse and potentially totally unmanageable. Restructuring the ERS procurement process to a day-ahead hourly procurement format would inadvertently result in the inability of the majority of loads participating in ERS to continue to provide the service. It would also have the inadvertent effect of greatly lessening the value of ERS to ERCOT as a reliability resource.

Many of the loads participating in ERS exhibit significant and unpredictable fluctuations in demand from one demand interval to the next for a variety of reasons, the most common being that they are batch process loads. Steel mill arc furnace loads are but one of many types of batch process loads but they are illustrative of why batch process loads cannot participate effectively in

an hourly ERS market procured on a day-ahead basis absent design parameters that would measure performance over a time horizon significantly greater than an hour.

Arc furnace loads are either on or off. They can be turned on almost instantly and they can be turned off almost instantly but how long they will be on or off is not predictable enough to be able to participate with any reasonable degree of accuracy in an hourly market. The arc furnace is off while the melt ladle is being loaded with scrap steel and the loading time is not always constant, nor is the type of metals being loaded consistent with one another. The arc furnace is then on for the duration of the needed melt cycle and the length of the melt cycle is not necessarily constant from one melt cycle to the next, for a variety of reasons. The arc furnace is then off while the melt ladle is emptied and the length of time required to empty the ladle is not always constant. Also, during this batch process cycle there are a variety of steel melting problems or issues that can and do crop up which cause part of the process to be delayed. In addition, for those steel mills that operate multiple arc furnaces, the production cycle for one furnace is necessarily independent of the production cycles of the other furnaces in the facility. At any given point, two furnaces could be off for 15 minutes and one on. In the next 15 minutes all of the arc furnaces could be on and in the next 15 minutes two furnaces could be on and one off, and in the next 15 minutes all of the arc furnaces could be off.

This makes it difficult if not impossible to predict energy consumption from hour to hour, or interval to interval. Furthermore, this operational variability does not correlate to the standard clock hour used for hourly market purposes. The loads of the individual arc furnaces are not identical and the cycling of the independently operated furnaces are sufficiently variable that it is almost impossible to predict how much aggregated arc furnace load will be on for any given hour. For this reason it would not be possible to offer these loads into a Day Ahead ERS market in hourly increments with any reasonable degree of accuracy. Over a much broader time horizon however, the loads are predictable and are capable of being offered into the current ERS market on a reasonably quantifiable basis.

Despite the lack of ability to predict the hourly demand of arc furnace loads, the loads are extraordinarily valuable for emergency DR capability because each arc furnace represents a huge amount of load that can be brought off line quickly and held off line when an emergency condition arises. In an emergency situation, if an arc furnace is on line, taking the furnace off line for the duration of the emergency can have as significant an ameliorative effect on grid stability as would bringing generating plants on line, and it can be done almost instantly. An arc

furnace can also stay off for a much longer period of time than most industrial production facilities, if that is required. On the other hand, if an arc furnace is off when a system emergency develops, the last thing ERCOT system operators want is for the furnace to return to service and begin using large amounts of power. The ability of the ERCOT system operators to hold the furnace off for the duration of the emergency prevents a bad situation from growing worse, facilitates the ability of system operators to stabilize frequency on the grid and avoids the necessity of involuntary load shedding. While we have described our furnace processes to illustrate the issues associated with batch process loads, these issues are by no means limited to the ERCOT steel mills. There are many other examples of other industries that face the same issues with respect to the provisioning of ERS due to their batch process load characteristics.

EILS, now ERS, was specifically designed with a lengthy contract period and an alternate baseline for the purpose of facilitating the ability of batch process loads to provide ERS. Four months ahead, the biggest problem is forecasting global market conditions that will impact energy consumption at an individual plant for the duration of an ERS contract term. This problem can be resolved by converting to an ERS procurement process under which the availability factor is replaced with an after-the fact compensation methodology under which loads only get paid for what they actually in fact provide during the contract term. On the other hand, with day-ahead hourly procurement, the biggest problem is attempting to forecast consumption in the face of the many hour to hour operational uncertainties faced by batch process loads. The conversion from a four month contract to a day ahead hourly procurement merely switches one availability problem for another, and the hourly availability issue is far more problematic for ERS participants than is the four month availability issue. The availability problem should be fixed in either case. However, rather than trying to devise a solution to the issue on the fly in this rulemaking, where there is a high potential for solutions to be accompanied by unintended consequences, the steel mills submit that this issue can be best addressed in a thorough way by the ERCOT staff with input as needed by interested ERCOT stakeholders.

Although much of the current ERS portfolio is comprised of batch process loads, another large component is comprised of aggregated loads. Based on comments made by John Dumas at the DR workshop it is clear that a day ahead hourly procurement of ERS would prove highly problematic for many aggregated loads as well. If conversion of the ERS procurement process to a hourly day-ahead construct were to occur without corresponding design changes that would be

necessary to make it work for the types of loads that currently provide ERS, the end result would be a *de minimis* level of remaining ERS load that would be insufficient to have a meaningful impact on ERCOT system reliability.

From a grid reliability standpoint, the steel mills are very concerned that changing ERS procurement to a day ahead hourly procurement process would greatly lessen the value of ERS to ERCOT as a reliability resource. Under a day ahead procurement construct ERCOT operators would not be able to rely on the knowledge that ERCOT has assured ERS availability over a longer time horizon than just a single day. Day-ahead procurement does not provide that certainty in the context of a service like ERS where a multi-day reliability event occurs that may then result in the failure of participants to offer in their loads into the next day realizing that their loads would likely be immediately deployed. The result is a *de minimis* quantity being procured on any given day from an ERCOT operations standpoint when the reliability needs of the system are at their greatest. Because the price paid for ERS is administratively determined by ERCOT when ERCOT chooses the amount of ERS to procure, it is not at all unlikely that a divergence of risk perception between ERCOT and market participants at certain times will result in sub-optimal day ahead procurement levels despite the fact that real-time conditions would warrant the availability of a much larger quantity of ERS.

In summary, while conversion of ERS procurement to a day ahead hourly procurement construct might be appealing in theory, it would not, as a practical matter, be workable. The benefit to be gained from converting to a day-ahead market is far outweighed by the risk that the continued viability of ERS would be destroyed in the process. The current ERS availability problem is not a “show stopper” from an ERS participation standpoint, although it is an impediment to further growth in the ERS program. The easiest, most equitable and most eloquent solution would be to replace the binding advance offer quantity requirement with a non-binding offer quantity correlated to historical consumption with compensation for participation paid at the end of the contract period based upon and limited to actual performance achieved during the contract term. However, the ERCOT steel mills are and will continue to work on that issue at ERCOT and would urge the Commission to let that process play out at ERCOT rather than attempting to craft a solution to that narrow issue in this rulemaking proceeding.

V. Conclusion

The ERCOT Steel Mills thank the Commission for focusing their valuable time and attention on the vitally important issues of how best to increase DR penetration within ERCOT and how and to what extent DR can be optimally structured under the current market construct. We greatly appreciate the opportunity you have provided for us to submit these Reply Comments in this DR rulemaking proceeding and pray the Commission carefully consider and ultimately concur with the opinions and recommendations set forth herein.

Respectfully submitted,

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