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Filing Date - 2023-09-12 02:38:25 PM

Control Number - 53377

Item Number - 374

SOAH DOCKET NO. 473-23-04518
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COMPLAINT OF ENGIE ENERGY MARKETING NA, INC. AND VIRIDITY ENERGY SOLUTIONS, INC. AGAINST THE ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.	**§**	**BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS**

REBUTTAL TESTIMONY

OF

MICHAEL PAVO

ON BEHALF OF
VIRIDITY ENERGY SOLUTIONS, INC.

September 12, 2023

SOAH DOCKET NO. 473-23-04518
PUC DOCKET NO. 53377

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DIRECT TESTIMONY OF MICHAEL PAVO ON BEHALF OF VIRIDITY ENERGY SOLUTIONS, INC.

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REBUTTAL TESTIMONY OF MICHAEL PAVO
ON BEHALF OF VIRIDITY ENERGY SOLUTIONS, INC.

I. EXECUTIVE SUMMARY

My direct testimony explained how during 2021's Winter Storm Uri Viridity Load Resources helped stabilize Texas' electrical grid by providing RRS[1] – quickly interrupting load (that is, stop using power) – to maintain the frequency of the electric grid and thereby helping to prevent potential electrical system blackouts for the entire state of Texas. In response to ERCOT's instructions, Viridity Load Resources provided 78 MW of RRS from February 15-19, 2021, including 27 MW of the BASA Load Resources for ENGIE. Although Viridity, BASA, and ENGIE provided this 78 MW of RRS as instructed by ERCOT for the entirety of the five-day EEA3 event, ERCOT only properly credited Viridity and ENGIE for RRS service provided for the first of those five days – February 15.

The Viridity Load Resources provided RRS service and should be compensated for providing RRS service. ERCOT acknowledges that the Viridity Load Resources were under a continuing obligation to provide RRS, which is termed an Ancillary

[1] Capitalized terms and acronyms, to the extent not defined herein, have the meaning assigned under ERCOT Protocol 2 (Definitions and Acronyms). "RRS" is an acronym for Responsive Reserve Service.

Service Resource Responsibility. There has been no testimony contradicting the fact that the RRS was physically provided by the Viridity Load Resources curtailing 78 MW of Load on February 15, 2021, and remaining deployed under the Protocols until recalled on February 19, 2021, pursuant to ERCOT's Dispatch Instruction.[2] The RRS was provided during the worst electric crisis in Texas history and there is no dispute that the market benefitted from the RRS provided. Compensation may be made directly to Viridity as the QSE representing the Load Resources under the Protocols or, in the case of ENGIE, may be credited to ENGIE as an offset to its Ancillary Service Obligation, which is how ERCOT credited the provision of RRS for the February 15, 2021, Operating Day. Failing to compensate for the RRS provided, besides violating Commission Rules, would undermine customer confidence that is crucial to the operation of the RRS program for Load Resources in emergency conditions.

ERCOT and Staff testimony maintain that all Load Resources, including those represented by Viridity, should have been re-offered or re-traded for each successive Operating Day of the energy emergency level 3 ("EEA3") event. However, ERCOT and Staff overlook that deployed Load Resources did not have capacity—which is a prerequisite for offering or trading RRS. ERCOT's expert witness on ERCOT's wholesale market design and operations, David Maggio, testifies clearly that the Load Resources did not have capacity, either in real-time or forward looking. I am not aware of any ERCOT Protocol that permits a Load Resource under a continued deployment to again offer or trade such capacity despite the fact that is not available to curtail Load. ERCOT has preliminarily drafted a nodal Protocol revision request ("NPRR") to permit

[2] *See generally*, Direct testimony of Kenan Ogelman and Direct Testimony of Wen Zhang.

Load Resources that lack capacity to be offered or traded when they are under a continuing deployment but ERCOT may not substitute the draft for the current requirement.

In the event that the Commission determines that the Load Resources should have been offered or traded for each subsequent Operating Day in order to receive compensation or credit, then the Commission should grant a good cause exception in this proceeding for ENGIE and Viridity's compliance because such compliance would be contradictory to the Protocol requirement that the Load Resources have, or expect to have, capacity available to support an offer or trade.

II. WITNESS QUALIFICATIONS AND BACKGROUND

Q. ARE YOU THE SAME MICHAEL PAVO THAT PROVIDED DIRECT TESTIMONY IN THIS CASE?

A. Yes. My credentials and background information can be found in my previously filed direct testimony.

III. PURPOSE OF TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my rebuttal testimony is to respond to testimony by ERCOT and Staff in opposing the complaint and appeal brought by ENGIE and Viridity (collectively, "Complainants") against ERCOT for failing to compensate or credit them for ancillary services provided during the EEA3 event caused by Winter Storm Uri and for erroneously assessing charges against ENGIE. To this end, my testimony will:

- Provide the core facts of this case, which are not disputed by ERCOT or Staff, and are:

- The Viridity Load Resources were under a continuing obligation to provide RRS over Disputed Payment Period, from February 16 until recalled by ERCOT on February 19.
- The Viridity Load Resources physically provided RRS by interrupting 78 MW of Load as instructed by ERCOT from February 15 until recalled on February 19, 2021.
- The value of that RRS is $140.6 million.

- Rebut certain peripheral contentions made by ERCOT or Staff testimony; and
- Explain, as an alternative, why good cause exists to waive application of the Protocols to the extent they would otherwise be interpreted contrary to the Protocols in place throughout Winter Storm Uri and to fail to compensate the Viridity Load Resources for providing RRS.

IV. DISCUSSION

Q. DO YOU AGREE WITH KENAN OGELMAN ON WHAT IT MEANS TO PROVIDE RRS?

A. Mr. Ogelman testifies that "RRS is an Ancillary Service that is intended to resolve frequency decay or deviation . . . and provide energy or continued Load interruption during an Energy Emergency Alert."[3] I agree with him on this point. Under the Protocols, non-controllable Load Resources can provide RRS by interruptible load that is available for deployment on ten minutes' notice.[4] That is exactly what the Viridity Load Resources did during Winter Storm Uri. They provided capacity by shutting off load. By remaining

[3] Direct Testimony of Kenan Ogelman at 17:13-16 (July 11, 2023).

[4] ERCOT Nodal Protocols § 3.17.2, Responsive Reserve Service (Feb. 1, 2021) ("RRS may be used to provide energy during the implementation of an EEA. Under the EEA, RRS provides . . . interruptible Load available for deployment on ten minutes' notice.").

deployed, the resources effectively provided energy back to the grid that they otherwise would have been consuming.

As the term denotes, non-controllable Load Resources are not controllable to regulate Load up and down. It is effectively an emergency "shut-off" button. When deployed, Load Resources cannot be further interrupted or redeployed until load is restored. Once recalled, the non-controllable Load Resources are required to restore their Load within three hours. However, that restoration process is not a market mechanism to "resolve frequency decay or deviation" as Mr. Ogelman seems to allude.[5] It merely allows a Load Resource to restore Load.

A. VIRIDITY LOAD RESOURCES HELPED SAVE THE TEXAS ENERGY GRID FROM COLLAPSE BY PROVIDING 78 MW OF RRS CONTINUOUSLY FOR ALL FIVE DAYS OF WINTER STORM URI AND SHOULD BE COMPENSATED APPROPRIATELY FOR SAME.

Q. WHAT FACTS INDICATE THAT THE VIRIDITY LOAD RESOURCES PROVIDED RRS DURING THE DISPUTED PAYMENT PERIOD?

A. The facts that indicate that the Viridity Load Resources provided RRS during the Disputed Payment Period are the obligations to provide RRS arising from the initial trades and ERCOT's Dispatch Instructions during an energy emergency and the combined Load response of each Viridity Load Resource deployed by ERCOT on February 15, 2021, until recalled on February 19, 2021. As a result of providing the RRS, Viridity should be paid for the RRS.

[5] *See* Direct Testimony of Kenan Ogelman at 55—58 (July 11, 2023).

1. Viridity and Viridity Load Resources had ongoing Ancillary Service Supply and Resource Responsibilities to provide RRS from February 16 until recalled on February 19.

Q. WHY DO YOU SAY THAT VIRIDITY AND VIRIDITY LOAD RESOURCES HAD ONGOING ANCILLARY SERVICE SUPPLY AND RESOURCE RESPONSIBILITIES TO PROVIDE RRS OVER THE DISPUTED PAYMENT PERIOD?

A. The obligation to provide RRS initially arises from offers made and accepted, self-schedules, and trades.[6] The "Ancillary Service Resource Responsibility" is the capacity (in MW) a particular "Resource is ***obligated*** to provide in Real-Time" under the ERCOT Protocols.[7] The QSE representing the particular Resource has a corresponding obligation reflected in that QSE's Ancillary Service Supply Responsibility (essentially, the sum of the Ancillary Service Resource Responsibility of each of the Resources represented by that QSE).[8] Once a Load Resource is obligated to provide RRS, that obligation cannot be extinguished without going through specific procedures that are not applicable here.[9]

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[6] ERCOT Nodal Protocols § 3.9.2(3), Current Operating Plan Validation (Feb. 1, 2021) ("The Ancillary Service Supply Responsibilities as indicated in the Ancillary Service Resource Responsibility submitted immediately before the end of the Adjustment Period are physically binding commitments for each QSE for the corresponding Operating Period."); § 4.4.7.2.1, Ancillary Service Offer Criteria.

[7] ERCOT Nodal Protocols § 2.1, Definitions (Feb. 1, 2021) ("Ancillary Service Resource Responsibility - The MW of an Ancillary Service that each Resource is obligated to provide in Real-Time rounded to the nearest MW.") (emphasis added).

[8] ERCOT Nodal Protocols § 2.1, Definitions (Feb. 1, 2021) ("Ancillary Service Resource Responsibility - The net amount of Ancillary Service capacity that a Qualified Scheduling Entity (QSE) is obligated to deliver to ERCOT, by hour and service type, from Resources represented by the QSE.").

[9] *See* ERCOT Nodal Protocols § 3.9.2(3), Current Operating Plan Validation (Feb. 1, 2021) ("The Ancillary Service Supply Responsibilities as indicated in the Ancillary Service Resource Responsibility submitted immediately before the end of the Adjustment Period are physically binding commitments for each QSE for the corresponding Operating Period."); § 6.5.7.6.2.2(8), LFC Deployment ("Once RRS is deployed, the QSE's obligation to deliver RRS remains in effect until specifically instructed by ERCOT to stop providing RRS. However, except in an Emergency Condition, the QSE's obligation to deliver RRS may not exceed the period for which the service was committed.").

Protocol § 6.5.7.6.2.2(8) requires that once deployed in an emergency, "***the obligation*** to deliver RRS ***remains in effect*** until specifically instructed by ERCOT to stop providing RRS."[10] Accordingly, Viridity Load Resources' obligations to provide RRS – their Ancillary Service responsibilities – began with the trades confirmed for February 15. As a result of the deployment by ERCOT on February 15 during an Emergency Condition the Ancillary Service Responsibilities of the Viridity Load Resources were extended from February 15, 2021 and continued without interruption to February 19, 2021, when ERCOT recalled the deployment at about 9 a.m.

Q. DOES ERCOT AGREE THAT THE VIRIDITY LOAD RESOURCES HAD A CONTINUING OBLIGATION TO PROVIDE RRS OVER THE DISPUTED PAYMENT PERIOD?

A. Yes. ERCOT agrees that Viridity's Load Resources had continuing obligations to provide RRS for the Operating Day of February 15, 2021.[11]

Q. HOW DOES MR. OGELMAN DISTINGUISH THE RESOURCES' OBLIGATION TO PROVIDE RRS FROM AN ANCILLARY SERVICE RESOURCE RESPONSIBILITY?

A. He does not. Instead, Mr. Ogelman suggests that because Viridity did not confirm new trades for RRS from its Load Resources for each new day, from February 16 through February 19, Viridity's Load Resources did not have an Ancillary Service Resource Responsibility and Viridity did not have a corresponding Ancillary Service Supply

[10] ERCOT Nodal Protocols § 6.5.7.6.2.2(8), LFC Deployment (Feb. 1, 2021) ("Once RRS is deployed, the QSE's obligation to deliver RRS remains in effect until specifically instructed by ERCOT to stop providing RRS.") (emphasis added).

[11] *See, e.g.*, Direct Testimony of Kenan Ogelman at 30:1-3, 31:7-9 (July 11, 2023) (establishing the obligation); 38:4-15 (continuing the obligation).

Responsibility.[12] There is no clear distinction made as to the difference between an obligation to provide a MW level of RRS and an Ancillary Service Resource Responsibility, which is the obligation to provide a MW level of RRS.

Q. IS MR. OGELMAN CORRECT?

A. No. Mr. Ogelman is arguing the "new day, new trade" concept in this extended emergency situation, which represents that all Load Resources should submit offers to provide RRS even though they are currently deployed and would be unable to curtail load further. ERCOT agrees that, during the Disputed Payment Period, Viridity's Load Resources had, by operation of the Protocols, ongoing obligations to continue providing RRS that began on February 15 and extended until recalled on February 19.

The proper analysis, for both the Ancillary Service Supply Responsibility and the Ancillary Service Resource Responsibility, was confirmed by ERCOT's expert on Market Design and Operation, David Maggio in deposition.[13]

Question: "[T]he subparagraph [Protocol 6.5.7.6.2.2(8)] we were discussing says the QSE's obligation to deliver RRS remains in effect until specifically instructed to stop. Correct?"

Answer: "It does."

Question: "So wouldn't you agree then that the QSE obligation was present?"

Answer: "There was . . . . there was an obligation to continue to remain deployed."

Question: "And it was a QSE obligation. Is that correct?"

Answer: "Yes. As the representative of the resource. That was the QSE's obligation."

Question: "[w]ould you agree then that the specific load resources that were deployed also had the obligation to provide RRS?"

Answer: "Yes, they . . . they had the obligation to continue to remain deployed."

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[12] *See, e.g.*, Direct Testimony of Kenan Ogelman at 2:21—3:1 (July 11, 2023).

[13] Exhibit R-MP-1, Deposition of David J. Maggio at 25:9—26:11 (Aug. 8, 2023).

Question: "[W]hen you say 'they had the obligation to continue to remain deployed,' are you saying something different than they had the obligation to provide RRS?"

Answer: "I guess the – no. It's really the – remaining deployed is – I guess would be the same as, I guess, the delivery of RRS that's here in the protocol."[14]

In addition, during Winter Storm Uri, ERCOT acknowledged that Viridity Load Resources had been deployed since February 15 pursuant to an RRS instruction, were currently providing RRS, and had an ongoing obligation to continue providing RRS via load interruption until recall.[15] After a series of emails and phone calls with ERCOT on February 18, ERCOT clarified that "Based on Protocol Section 6.5.7.6.2.2 (8), ERCOTs expectation is that LRs are to remain deployed ***until instructed to stop providing RRS***."[16] This email explicitly shows that after considered reflection, ERCOT arrived at the conclusion that Viridity's Load Resources ***were*** in the course of "providing RRS" – because if they were not in the course providing RRS, they wouldn't need an instruction to stop doing so.[17]

[14] Exhibit R-MP-1, Deposition of David J. Maggio at 25:9—26:11 (Aug. 8, 2023).

[15] *See, e.g.*, Direct Testimony of Michael Pavo, Exhibit MP-2 at 4—7 (May 30, 2023) (providing various emails between ERCOT's Steve Krein and Mark Patterson on February 18, 2021) (emphasis added).

[16] Direct Testimony of Michael Pavo, Exhibit MP-2 at 4—7 (May 30, 2023) (providing various emails between ERCOT's Steve Krein and Mark Patterson on February 18, 2021).

[17] Direct Testimony of Michael Pavo, Exhibit MP-2 at 4—7 (May 30, 2023) (providing various emails between ERCOT's Steve Krein and Mark Patterson on February 18, 2021). Mr. Ogelman discusses these emails in his direct testimony, but does not repudiate the substance or conclusions described therein. Direct Testimony of Kenan Ogelman at 81—82 (July 11, 2023). Earlier in the same section, Mr. Ogelman, discussing an email reporting verbal communications between ERCOT and ENGIE on February 18, concludes that "the BASA Load Resources acted properly based on ERCOT's instructions. Because the BASA Load Resources were deployed in an emergency condition, they were required to deploy and remain deployed until they were recalled by ERCOT." *Id.* at 77.

2. The undisputed facts show that the Viridity Load Resources provided RRS from February 15 until recalled on February 19, 2021.

Q. WHAT MEASUREMENT QUANTIFIES THE PROVISION OF RRS BY NON-CONTROLLABLE LOAD RESOURCES?

A. Once a Dispatch Instruction is issued, per Protocol § 8.1.1.4.2(7) (relating to Responsive Reserve Energy Deployment Criteria), actual performance is gauged by measuring the Load's power consumption just prior to the Deployment Instruction against its power consumption after the Deployment Instruction:

> … the performance of a Load Resource in response to a Dispatch Instruction must be determined by subtracting the Load Resource's actual Load response from its Baseline. ***"Baseline" capacity is calculated by measuring the average of the real power consumption for five minutes before the Dispatch Instruction***.... The actual ***Load response is the average of the real power consumption data being telemetered*** to ERCOT during the Settlement Interval . . . .[18]

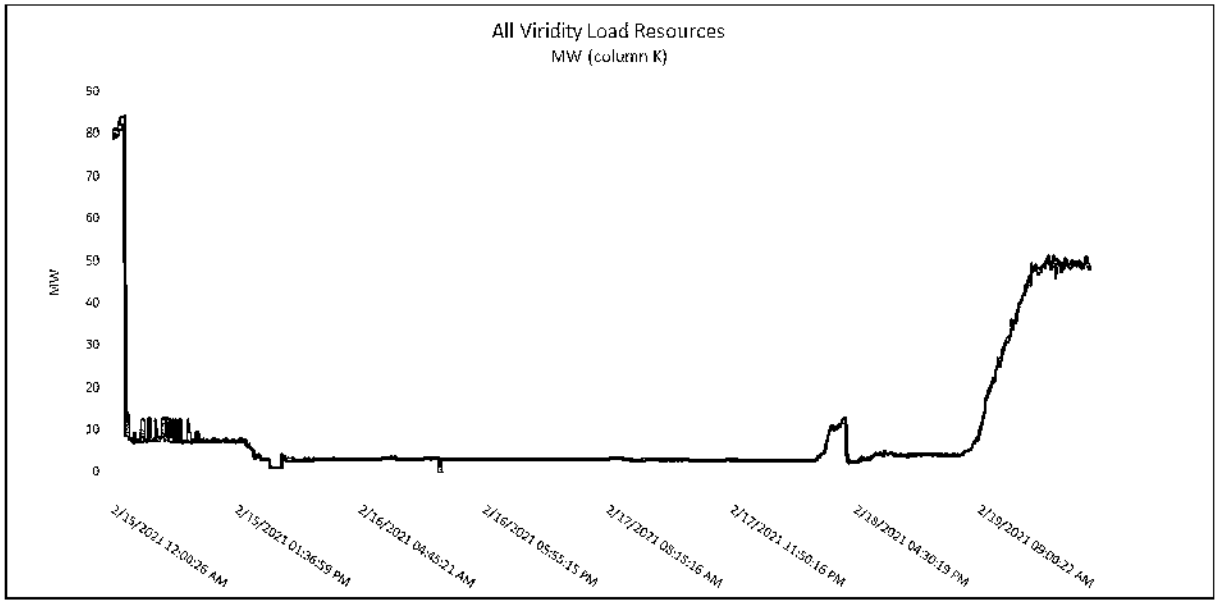
In other words, the measurement that matters for determining the performance of RRS is the participant's MW Baseline capacity just before the Dispatch Instruction and the MW Load response for each interval during the deployment. This analysis is done retrospectively by ERCOT using Utility metering data.

Q. DID THE VIRIDITY LOAD RESOURCES COMPLY WITH THIS PROTOCOL?

A. Yes. Neither ERCOT nor Staff dispute the fact that the 78 MW of Viridity Load Resources at issue in this case interrupted Load and remained interrupted for the duration of the Disputed Payment Period as required by the ERCOT Protocols and ERCOT Dispatch Instructions. Viridity Load Resources provided 78 MW of RRS for Operating Day February 15, 2021, were instructed to deploy shortly after 1 a.m. on February 15, and were

[18] ERCOT Nodal Protocols § 8.1.1.4.2(7), Responsive Reserve Energy Deployment Criteria (Feb. 1, 2021) (emphasis added).

required to continue providing RRS until recalled by ERCOT on February 19, 2021. The Disputed Payment Period in this case begins on February 16 and continues until ERCOT recalled the Load Resources on February 19. The 78 MW is depicted graphically on the following chart, which shows the aggregated load (consumption) just prior to ERCOT's deployment until ERCOT's recall on February 19, 2021.



The provision of RRS by interval and by Load Resources is calculated in Exhibit MP-5 to my direct testimony and has not been controverted in either the testimony of ERCOT witnesses nor the testimony of Staff witnesses.

3. The Viridity Load Resources should be compensated for providing the service instructed.

Q. SHOULD THE VIRIDITY LOAD RESOURCES BE COMPENSATED FOR PROVIDING RRS SERVICE?

A. Yes. Those who provide a service to ERCOT should be paid for the service. This is especially the case where ERCOT instructed resources to provide the service during an emergency to help avert a potential catastrophe affecting the entire state. As testified by Mr. Totten, making sure that those who provide services are credited is one of ERCOT's core functions, and the Commission is charged with overseeing that ERCOT meets that responsibility:

- The Public Utility Regulatory Act identifies as one of ERCOT's four key functions "ensur[ing] that electricity production and delivery are accurately accounted for among the generators and wholesale buyers and sellers in the region." [19]
- The Protocols themselves likewise note that a core function of ERCOT is to "Ensure that electricity production and delivery are accurately accounted for...."[20] The Protocols acknowledge that they "are intended to implement the above-described function[n]," and that in exercising its discretion under the Protocols "ERCOT shall act in a reasonable, nondiscriminatory manner."[21]
- ERCOT's core function of ensuring that market participants are accurately credited for services rendered is complemented by Commission rule, which requires the Commission to "monitor the activities of market entities [including ERCOT] to determine if such activities... ***are consistent with the proper accounting for the production and delivery of electricity among generators and other market participants***."[22]

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[19] Public Utility Regulatory Act ("PURA"), Tex. Util. Code Ann. § 39.151(a)(4).

[20] ERCOT Nodal Protocols § 1.2(1)(d), Functions of ERCOT (Feb. 1, 2021).

[21] ERCOT Nodal Protocols § 1.2(6), Functions of ERCOT (Feb. 1, 2021).

[22] 16 Tex. Admin. Code ("TAC") § 25.503(d).

Q. HOW SHOULD THE PROVISION OF RRS BE COMPENSATED?

A. In my direct testimony, I provided the appropriate compensation for Viridity Load Resources for the 78 MW of RRS provided for each day From February 16-19. Based on the Market Clearing Price for Capacity the value is $140,552,029. Running the same calculations but not counting the 27 MW allocable to BASA/ENGIE, and thus counting only the remaining 51 MW for Viridity, results in $91,899,404.

These calculations are based on the Day Ahead prices for RRS during the February 16-19 time period and are included in Exhibit MP-8 to my direct testimony. ERCOT has never provided Viridity with its own calculation of the appropriate award amount and never challenged or disputed Viridity's calculation. Likewise, ERCOT's direct testimony acknowledges, but does not contradict, the calculation,[23] from which it appears that ERCOT is not contesting these numbers regarding the value of the RRS provided.

Q. HOW DO YOU ADDRESS MR. OGELMAN'S CLAIM THAT VIRIDITY IS NOT ENTITLED TO COMPENSATION?

A. My understanding of Mr. Ogelman's testimony is that Mr. Ogelman believes that Viridity is not entitled to any relief associated with the 78 MW of RRS provided by Viridity Load Resources because that 78 MW of RRS was either self-arranged and provided for the benefit of ENGIE (via the 27 MW ancillary service trade with ENGIE supplied by BASA Load Resources) or Priority Power Management, LLC ("PPM") (via the 51 MW ancillary service trade with PPM). Mr. Ogelman claims Viridity is not entitled to compensation for

[23] *See* Direct Testimony of Kenan Ogelman at 42:7 (July 11, 2023).

the RRS because Viridity did not offer the RRS in the day ahead market nor was it accepted by ERCOT.[24]

Q. DO YOU AGREE WITH MR. OGELMAN'S POSITION THAT VIRIDITY IS NOT ENTITLED TO COMPENSATION?

A. No. Mr. Ogelman is attempting to construct scenarios under the Protocols where none of the Market Participants providing the RRS to the market are compensated for providing the service. Instead of seeking methods of avoiding payment for the valuable service provided during Winter Storm Uri, ERCOT should instead rely on the Protocols and rules requiring compensation. Instead of arguing that the Protocols require a new trade for each new day for unavailable capacity, acknowledge that the Protocols prohibit offering into the Day-Ahead market for RRS when Load Resources were not recalled and had no expectation of being recalled.

Q. HOW WOULD VIRIDITY BE COMPENSATED IF IT DID NOT SUBMIT OFFERS FOR THE RRS?

A. The obligation to provide the RRS from the Viridity Load Resources originated for Operating Day February 15, 2021, from trades with ENGIE and PPM. ERCOT argues that the trades did not continue for the Disputed Payment Period and so the RRS may not be used to offset Ancillary Service Obligations of ENGIE or PPM. If the Commission accepts Mr. Ogelman's argument as correct, then the compensation for providing the RRS should be paid to Viridity as the QSE representing the Load Resources. Under ERCOT Protocol

[24] Direct Testimony of Kenan Ogelman at 95–99 (July 11, 2023).

§ 4.4.7.1(1),[25] any Self-Arranged Ancillary Service Quantities beyond a QSE's Ancillary Service Obligation should be considered by ERCOT to be offered into the Day-Ahead Market. This means that ERCOT may not just accept the benefit provided by the RRS during the emergency and not compensate or credit for it.

Q. SHOULD THE COMMISSION CREDIT PPM FOR THE TRADE AS OPPOSED TO COMPENSATING VIRIDITY?

A. No. The PPM trade and the circumstances involved are different from the ENGIE trade. For the 51 MW associated with the PPM trade, the trade was not made pursuant to a long-term contract like the ENGIE trade was. It was made on an hour-by-hour basis. Even if the trade were held to continue as a result of the extended deployment, ERCOT acknowledges that PPM acquired replacement RRS,[26] meaning that the RRS provided was in excess of PPM's Ancillary Service Obligation for the Disputed Payment Period. Accordingly, the RRS should still be considered to be offered into the Day-Ahead Market and Viridity, as the QSE representing the Load Resources, should be compensated the market clearing price of capacity.

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[25] ERCOT Nodal Protocol § 4.4.7 relates to "Ancillary Service Supplied and Traded." Protocol 4.4.7.1, relating to "Self-Arranged Ancillary Service Quantities," provides in relevant part:

> . . . If a QSE elects to self-arrange Ancillary Service capacity, then ERCOT shall not pay the QSE for the Self-Arranged Ancillary Service Quantities for the portion that meets its Ancillary Service Obligation. *Any Self-Arranged Ancillary Service Quantities in excess of a QSE's Ancillary Service Obligation will be considered to be offered in the DAM or Supplemental Ancillary Service Market (SASM), as applicable, for $0/MWh.* (emphasis added).

[26] Direct Testimony of Kenan Ogelman at 80:6 (July 11, 2023).

Q. IS MR. OGELMAN'S POSITION, THAT NEITHER VIRIDITY NOR ENGIE SHOULD BE COMPENSATED FOR THE ANCILLARY SERVICE, AN APPROPRIATE OUTCOME?

A. No. ERCOT is required to settle the market, properly account for the production and delivery of energy among market participants, and ensure that ancillary services are available at reasonable prices. Mr. Ogelman is attempting to create a scenario where ERCOT may reap the benefit of ongoing provision of RRS by Viridity's Load Resources without paying for them. Mr. Ogelman's theory is analogous to an employer requiring an employee to work twenty-four hours a day for four consecutive days and, at the end of the work week, claiming that the employee will not get paid because she did not clock out and clock back in every evening at midnight. As will be addressed below, there is no requirement that the Load Resources are re-offered or re-traded once Dispatched in an emergency because the capacity is already being provided to, and used by, ERCOT, as ERCOT is well aware. Once Dispatched by ERCOT and used for energy purposes in an emergency, the Load Resources no longer have physical capacity to be offered or traded.

Q. CAN YOU ADDRESS MS. ZHANG'S TESTIMONY THAT THERE IS NO SEPARATE SETTLEMENT FOR DEPLOYMENT OF LOAD RESOURCES?

A. Based on her deposition, I understand Ms. Zhang to be testifying that 1) the settlement for the Day-Ahead market is the only settlement applicable to Load Resources providing RRS and 2) if the provision of RRS is not scheduled for Load Resources in the DAM for certain hours, then the Load Resources may never receive compensation nor credit for those hours even it an emergency deployment extended the requirement to provide RRS beyond the original hours committed.

Q. DO YOU AGREE WITH MS. ZHANG'S ASSERTIONS?

A. No. RRS provided over an extended deployment should be compensated the same amount and in the same manner (credit or compensation) as any other provision of RRS from Load Resources and as all other Load Resources deployed during Winter Storm Uri. And if they are not compensated or credited in the DAM, a billing dispute or subsequent accounting would be proper to provide the compensation. Ms. Zhang did not contradict that this appeal is the appropriate forum for seeking compensation. Instead, Ms. Zhang admitted in deposition that she is not very familiar with the billing dispute process, the alternative dispute resolution process, or the Commission's complaint process.

B. ERCOT AND STAFF ASSERT VARIOUS JUSTIFICATIONS FOR NOT COMPENSATING OR CREDITING COMPLAINANTS FOR THEIR PROVISION OF RRS

Q. WHAT JUSTIFICATION DOES ERCOT ASSERT FOR NOT COMPENSATING OR CREDITING COMPLAINANTS FOR THE RRS VIRIDITY LOAD RESOURCES PROVIDED FOR THE BENEFIT OF THE ERCOT MARKET DURING THE CRISIS?

A. ERCOT attempts to provide multiple justifications for ERCOT's failure to appropriately credit or compensate Complainants for the 78 MW of RRS from Viridity Load Resources during Winter Storm Uri. I address several of ERCOT's arguments below. Others are addressed by Jess Totten and Ray Cunningham.

1. Commission Rules and ERCOT Protocols requiring capacity to support offers or trades made submitting offers or trades impermissible.

Q. WHAT TOPIC DO YOU ADDRESS IN THIS PORTION OF YOUR TESTIMONY?

A. I address Mr. Ogelman's and Ms. Zhangs' claims that the offers or trades may be made without physical capacity to support the offers or trades.[27]

Q. IS HAVING CAPACITY A PREREQUISITE TO OFFERING OR TRADING RRS FROM LOAD RESOURCES?

A. Yes. The Protocols unequivocally require a QSE to have physical capacity before self-arranging RRS, offering RRS to the market, or accepting an RRS responsibility in a trade. Having physical capacity to provide the service is a fundamental requirement under the Protocols:

Self-Arranged Ancillary Service Quantities

- ERCOT Nodal Protocols, § 4.4.7.1(1), - "The QSE must indicate . . . the Self-Arranged Ancillary Service Quantities, by service, so ERCOT can determine how much Ancillary Service ***capacity***, by service, needs to be obtained through the DAM." (emphasis added).

- ERCOT Nodal Protocols, § 4.7.1(4) "By 1430 in the Day-Ahead, all ***Self-Arranged Ancillary Service Quantities must be represented by physical capacity***, either by Generation Resources or by Load Resources, or backed by Ancillary Service Trades." (emphasis added).

Ancillary Service Offer Criteria

- ERCOT Nodal Protocols, § 4.4.7.2.1(1), "Each ancillary Service Offer must be submitted by a QSE and must include the following information: . . . ***The quantity in MW*** and Ancillary Service type from that Resource for this specific offer and

[27] Direct Testimony of Kenan Ogelman at 52—60 (July 11, 2023); Direct Testimony of Wen Zhang at 8:5-12 (Aug. 10, 2023) (Question: "Can a deployed Load Resource be scheduled to provide RRS?" Answer: "Deployed Load Resources can still be utilized to fulfill a QSE's ASSR, assuming their original capability prior to deployment is enough to satisfy the amount of ASRR that would be assigned by the QSE. Deployment is not a component in the Resource's Ancillary Service Offer submission (Nodal Protocols 4.4.7.2.1), nor is it a specific component in that Resource's Current Operating Plan (COP), and thus would not preclude a QSE from offering Ancillary Services from a deployed Load Resource into the market or using the deployed Load Resource to satisfy its ASSR.").

the specific quantity in MW and Ancillary Service type of any other Ancillary Service offered from this same ***capacity***." (emphasis added).

Ancillary Service Trades

- ERCOT Nodal Protocols, § 4.4.7.3(1), "An Ancillary Service Trade is the information for a QSE-to-QSE transaction that transfers an obligation to provide Ancillary Service ***capacity*** between a buyer and a seller." (emphasis added).

- ERCOT Nodal Protocols, § 4.4.7.4(3) ("By 1430 in the Day-Ahead, the QSE must notify ERCOT, in the QSE's COP, which Resources represented by the QSE ***will provide the Ancillary Service capacity*** necessary to meet the QSE's Ancillary Service Supply Responsibility . . . ." (emphasis added).

Q. WHY IS CAPACITY AN IMPORTANT REQUIREMENT FOR AN OFFER OR TRADE?

A. Because a non-controllable Load Resource cannot provide RRS (interrupt Load) if it does not have capacity (Load Available for interruption). The Protocols define RRS in terms of Load response as:

> An Ancillary Service that provides operating reserves that is intended to:
>
> (a) Arrest frequency decay within the first few seconds of a significant frequency deviation on the… grid using … ***interruptible*** Load; and
>
> ***
>
> (c) Provide… ***continued Load interruption*** during the implementation of the Energy Emergency Alert (EEA).[28]

[28] ERCOT Nodal Protocols § 2.1, Definitions (Feb. 1, 2021) (defining Responsive Reserve (RRS)) (emphasis added); *see also* § 3.17.2(1), Responsive Reserve Service (explaining that "Responsive Reserve (RRS) is a service used to restore or maintain the frequency of the ERCOT System . . . in response to, or to prevent, significant frequency deviations."); § 3.17.2(3), Responsive Reserve Service (explaining that ". . . during the implementation of an EEA . . . RRS provides . . . capacity from . . . *interruptible* Load available for deployment on ten minutes' notice." (emphasis added)). For an explanation of the qualifications necessary for Load Resources to participate in the RRS program, see ERCOT Nodal Protocols § 8.1.1.2.1.2, Responsive Reserve Service Qualifications (Feb. 1, 2021). *Id.* § 8.1.1.2.1.2(1)–(3) Responsive Reserve Service Qualifications (explaining that "RRS may be provided by" Load Resources "*loaded and capable of unloading* the scheduled amount of RRS within ten minutes of instruction by ERCOT and must either be immediately responsive to system frequency or be interrupted by action of under-frequency relays." (emphasis added)); § 8.1.1.2.1.2(8)(d), Responsive Reserve Service Qualifications (explaining how Load Resources desiring qualification to provide RRS are subjected to a test deployment, with ERCOT indicating the MW amount, and ERCOT measuring the Resource's response as described

Q. DO COMMISSION RULES ALSO PROHIBIT OFFERING RESOURCES OR CONFIRMING TRADES FOR RESOURCES WITHOUT HAVING CAPACITY TO BE PROVIDED?

A. Yes. Although I am not a lawyer and do not purport to provide a legal opinion, my understanding is that the Commission Rules, 16 TAC §§ 25.503(f)(6) and 25.503(g)(3), prohibit offers or trades of RRS from Load Resources that do not have capacity (*i.e.* will not be carrying load available for interruption). Having capacity – *carrying load available for interruption* – is also a foundational requirement under the Protocols.

Q. DOES MR. OGELMAN AGREE THAT CAPACITY IS A REQUIREMENT FOR SELF-ARRANGING RRS, OFFERING RRS, OR CONFIRMING A TRADE OF RRS?

A. Yes. Mr. Ogelman agrees that having physical capacity is a requirement of self-arranging RRS, offering RRS, or confirming a trade of RRS.[29]

Q. WHAT IS THE CAPACITY OF A NON-CONTROLLABLE LOAD RESOURCE?

A. The capacity of a non-controllable Load Resource is the net consumption (Load in MW) that is available to be curtailed. The Protocols define the capacity of a non-controllable Load Resource as the net consumption available to be curtailed.[30]

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under § 8.1.1.4.2—by measuring the amount of power consumption five minutes prior to the deployment instruction to power consumption afterwards).

[29] Direct Testimony of Kenan Ogelman at 57:18-19 (July 11, 2023) ("I agree that Load Resources must have physical capacity . . .").

[30] ERCOT Nodal Protocols § 6.7.5, Real-Time Ancillary Service Imbalance Payment or Charge (Feb. 1, 2021) (defining RTNCLRCAP as "Real-Time Capacity from Non-Controllable Load Resources carrying Responsive Reserve for the QSE"). The Protocols also contain a formula for calculating the capacity of a non-controllable Load Resource as the net power consumption, minus the low power consumption (which is not applicable in this case). *Id.* Maximum capacity limited to 150% of the Ancillary Service Supply Responsibility of the QSE. *Id.*

During the Disputed Payment Period, the Viridity Load Resources did not have Load available for interruption because it was already interrupted. In other words, the capacity had already been provided to the Market as instructed by ERCOT. ERCOT's own witness David Maggio agrees that:

- The Viridity Load Resources had zero capacity during the Disputed Payment Period.[31]
- The capacity of a non-controllable Load Resource, in real-time and in future periods, is the net power consumption available to curtail.[32]

[31] Exhibit R-MP-1, Deposition of David J. Maggio at 28:5-11 (Aug. 8, 2023) (Question: "Could you tell me sitting here right now though how much RRS -- RRS capacity each load resource had during the disputed payment period?" Answer: "The -- obviously, we can look at the specific spreadsheet, but my memory of it at this moment is that the value was zero for all of the load resources that are part of the discussion here."); 31:20–32:2 (Question: "[F]or these load resources, the Viridity load resources, the subject of this case, is it your position that the capacity in real-time would be measured by their physical load?" Answer: "For the purposes of this calculation, that would certainly be true, that it would be looking at the net power consumption in real-time for these real-time ancillary service imbalance calculations.").

[32] Exhibit R-MP-1, Deposition of David J. Maggio at 29:11-25 (Aug. 8, 2023) (Question: "[C]an you at a high level explain the difference between what you would say is capacity for a load resource and what you would say is capacity for a generation resource?" Answer: "I guess it would be, more or less, the distinction would be what I was just describing. So in the case of the load resource, capacity would consist of either in the moment what consumption could be reduced or, looking at sort of a future time period, could be the projected level of consumption that could be reduced. So, again, in the case of load resources, it's primarily focused on what the energy's consumption is or could be and -- and a reduction or potential reduction in that level of consumption."); 32:3-7 (Question: "[Y]ou mentioned another possible definition of capacity forward looking as the amount of consumption that could be reduced. Did I hear that correctly?" Answer: "Yes."); 32:8-14 (Question: "[I]f these load resources would not be able to reduce any consumption in that situation, would you say they had zero capacity?" Answer: "If they were projecting that they were not -- would not be able to consume at a future time period, then, yes, in that future time period we would presume they would have zero capacity."); 33:15-22 (Question: "[S]pecifically, the terms you used in your testimony, is it ERCOT's position that that is how they should be interpreted?" Answer: "I guess I -- I believe that is the – that's the intent, that these are our expectations as ERCOT in terms of how these terms work and how these calculations would function.").

Q. MR. OGELMAN TESTIFIED THAT THE VIRIDITY LOAD RESOURCES DID HAVE CAPACITY TO BE OFFERED OR TRADED. CAN YOU ADDRESS HIS CLAIM?

A. Yes. Mr. Ogelman seems to be conflating the fact that deployed Load Resources are compensated for the capacity provided, with the fact that deployed Load Resources do not have physical capacity when deployed.

Q. IS THE DESCRIPTION OF THE QUANTITY OF CAPACITY CURTAILED, AND COMPENSATED FOR, PERTINENT TO THE REQUIREMENT THAT A LOAD RESOURCE BE REPRESENTED BY PHYSICAL CAPACITY?

A. No, they are two different concepts. The physical capacity needed for self-arranging RRS, offering RRS, or trading RRS is the net consumption available for interruption. As Mr. Maggio testified in deposition, if a Load Resource is "projecting that they were not – would not be able to consume at a future time period, then, yes, in that future time period we would presume they would have zero capacity."[33] The compensation for capacity is made when the capacity self-arranged, offered, or traded is made available for interruption or curtailed pursuant to an ERCOT Dispatch Instruction.

[33] Exhibit R-MP-1, Deposition of David J. Maggio at 32:8-14 (Aug. 8, 2023) (Question: "[I]f these load resources would not be able to reduce any consumption in that situation, would you say they had zero capacity?" Answer: "If they were projecting that they were not -- would not be able to consume at a future time period, then, yes, in that future time period we would presume they would have zero capacity."); 33:15-22 (Question: "[S]pecifically, the terms you used in your testimony, is it ERCOT's position that that is how they should be interpreted?" Answer: "I guess I -- I believe that is the – that's the intent, that these are our expectations as ERCOT in terms of how these terms work and how these calculations would function.").

Q. DO THE PROTOCOLS SUPPORT THE DEFINITION OF CAPACITY THAT IS RELIED ON BY MR. TOTTEN, VIRIDITY, ENGIE, AND MR. MAGGIO?

A. Yes. For Load Resources providing RRS in the ERCOT Protocols, Protocol 8.1.1.2.1.2(3) requires that a QSE's Load Resource must be "loaded and capable of unloading" the scheduled amount of RRS within 10 minutes of instruction by ERCOT.[34]

Q. IS MR. OGELMAN'S CONCEPT OF CAPACITY AS "ABILITY TO CONSUME POWER" SUPPORTED BY THE PROTOCOLS?

A. Not for a non-controllable Load Resource. The Protocols state that the physical capacity of a Load Resource is the net consumption available to be curtailed. Mr. Ogelman's position that even Load Resources that are not consuming power "*do* have physical capacity" is inconsistent with the use of capacity in the Protocols. For example, the Protocols require ERCOT to monitor the net consumption of non-controllable Load Resources for purposes of monitoring capacity.[35] Mr. Ogelman testifies "[t]he ability to consume power is physical capacity, no less than the ability to reduce power consumption is."[36] First, Mr. Ogelman cannot claim that a deployed Load Resource has the ability to consume power when they are required to remain offline. Second, Mr. Ogelman seems to

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[34] ERCOT Nodal Protocols § 3.17.2, Responsive Reserve Service (Feb. 1, 2021) ("Under EEA, RRS provides . . . interruptible load available for deployment on ten minutes notice."); § 8.1.1.2.1.2(3), Responsive Reserve Service Qualification ("A QSE's Load Resource must be loaded and capable of unloading the scheduled amount of RRS within ten minutes of instruction by ERCOT").

[35] Exhibit R-MP-2, Second Deposition of Kenan Ogelman at 32:21—33:3 (Aug. 4, 2023) (Question: "[Under Protocol 6.5.7.5 titled Ancillary Services Capacity monitor"] the value ERCOT reports for the capacity of a load resource is the consumption. Is that right?" Answer: "In this calculation, the value that is reported is as you described." Question: "Okay. It's the consumption?" Answer: "Yes."); 36:7-11 (Question: "[W]ould you agree that when the – after a real-time co-optimization is implemented, the capacity of a load resource must be measured by the load resource's average load level in the last five minutes?" Answer: "For purposes of capacity monitoring, yes").

[36] Direct Testimony of Kenan Ogelman at 57—58 (July 11, 2023).

be describing a theoretical capability, rather than physical capacity as required by the Protocols.

It appears that Mr. Ogelman's argument is indispensable to ERCOT's case, but ERCOT has not put forth any realistic concept of capacity to support ERCOT's claims that ENGIE and Viridity are required to submit offers or trades for Load Resources that have depleted their capacity.

Q. ARE THERE OTHER PROTOCOLS THAT CONTRADICT MR. OGELMAN'S POSITION THAT CAPACITY IS THE "ABILITY TO CONSUME POWER"?

A. Yes. Mr. Ogelman's contention that a deployed Load Resource has capacity is contravened by the plain language of the Protocols, which repeatedly explain that non-controllable Load Resources provide RRS by *interrupting* load – not *increasing* load:

- The Protocols define "Responsive Reserve (RRS)" in terms of Load response as:

  > An Ancillary Service ***that provides operating reserves*** that is intended to:
  >
  > (a) Arrest frequency decay within the first few seconds of a significant frequency deviation on the ERCOT Transmission Grid using … ***interruptible*** Load;
  >
  > (b) Provide … ***continued Load interruption*** during the implementation of the Energy Emergency Alert (EEA);[37]

- Protocol § 3.17.2, relating to Response Reserve Service, explains at § 3.17.2 (3) that "…during the implementation of an EEA… RRS provides … capacity from … ***interruptible*** Load available for deployment on ten minutes' notice." (emphasis added).
- Protocol § 8.1.1.2.1.2(3) "A QSE's Load Resource must be loaded and capable of unloading the scheduled amount of RRS within ten minutes of instruction by ERCOT."

[37] ERCOT Nodal Protocols § 2.1, Definitions (Feb. 1, 2021) (definition of Responsive Reserve (RRS)) (emphasis added).

- Protocol § 3.7.1.2, relating to Load Resource Parameters, which discusses " (1) Resource Parameters that may be modified…, include the following for each of its Load Resources that is a non- Controllable Load Resource: (a) Maximum ***interruption*** time;…" (emphasis added).
- Protocol § 6.5.1.1(2)(a)(iii): "Load capacity may be provided by Entities who, at ERCOT's direction, would ***interrupt consumption of electric power and remain interrupted until released*** by ERCOT." (emphasis added).
- Protocol § 8.1.1.2.1.2, relating to Responsive Reserve Qualifications, which explains the qualifications necessary for Load Resources to participate in the RRS program.
  - Protocol § 8.1.1.2.1.2(1) and (3) explain that "RRS may be provided by" Load Resources "loaded and capable of unloading the scheduled amount of RRS within ten minutes of instruction by ERCOT and must either be immediately responsive to system frequency or be interrupted by action of under-frequency relays"
  - Protocol § 8.1.1.2.1.2(8)(d) explains how Load Resources desiring qualification to provide RRS are subjected to a "***Load interruption*** test" deployment, with ERCOT indicating the MW amount, and ERCOT measuring the Resource's response as described under Section 8.1.1.4.2 [by measuring the amount of power consumption five minutes prior to the deployment instruction to power consumption afterwards]. (emphasis added).

2. The most important telemetered data for RRS is the Load consumption.

Q. WHY IS REAL POWER CONSUMPTION THE MOST IMPORTANT ASPECT OF TELEMETRY FOR THIS CASE?

A. ERCOT has brought up telemetry issues repeatedly, but so far has not substantively addressed the most important aspect of telemetry in this case. Telemetry (including the Utility meter reading serving each Load Resource) showing real power consumption before any deployment instruction and then separately after deployment is the most important aspect of telemetry in this case because once deployed, non-controllable Load Resources – unlike all other RRS providers (for example, generators) – are subject to the special requirements of Protocol 8.1.1.4.2(7) for determining performance. This Protocol

mandates that performance over the entire period of deployment be determined by the power consumption and not by any other telemetered data:

> ***During periods when the Load level of a Load Resource… has been affected by a Dispatch Instruction from ERCOT***, the performance of a Load Resource in response to a Dispatch Instruction ***must be determined*** by subtracting the Load Resource's actual Load response from its Baseline. "Baseline" capacity is calculated by measuring the average of the real power consumption for five minutes before the Dispatch Instruction.

During a Dispatch Instruction, Protocol § 8.1.1.4.2(7) determines the performance of non-controllable Load Resources. Regardless of how the provision of RRS is documented in ERCOT's various systems during "normal operations," once Load Resources are subject to ERCOT Dispatch Instructions – as they were in this case, from February 15 through February 19 – ERCOT Protocol § 8.1.1.4.2(7) requires that Load Resource's performance which was directed by an ERCOT Dispatch Instruction be determined by the power consumption of such Load Resource over the entire period of deployment.[38] As covered previously, the telemetry for Viridity's Load Resources showed 78 MW of load interruption through the end of the deployment period.

[38] *See, e.g., Horizon/CMS Healthcare Corp. v. Auld*, 34 S.W.3d 887, 901 (Tex. 2000) (citing the traditional canon of construction that specific provisions control over more general provisions).

3. For a non-controllable Load Resource, ONRL means available for Dispatch of RRS – and Dispatch of RRS is an instruction to reduce load on ten minutes notice.

Q. WHAT TOPIC DO YOU ADDRESS IN THIS PORTION OF YOUR TESTIMONY?

A. I address Mr. Ogelman's and Ms. Zhang's testimony that indicates that a Load Resource Status Code of OUTL indicates that a Load Resource *will not follow* any instruction from ERCOT.[39]

Q. HOW DO YOU RESPOND TO MR. OGELMAN'S AND MS. ZHANG's CONTENTION THAT OUTL INDICATES THAT A LOAD RESOURCE WILL NOT RESPOND TO ANY DISPATCH INSTRUCTION?

A. The Resource Status code of OUTL means that a Load Resource is not available for Dispatch of RRS. References in the Protocols and ERCOT materials use and interpret "available for Dispatch of RRS" as available for interruption, as indicated in the lengthy list of resources cited in my direct testimony.[40] Mr. Ogelman and Ms. Zhang's testimony is contradicted by those sources.

[39] Direct Testimony of Kenan Ogelman at 40, 50, 52, 55—56, 59 (July 11, 2023); Direct Testimony of Wen Zhang at 9:19—10:6 (Aug. 10, 2023).

[40] Direct Testimony of Michael Pavo at 39:1—42:24 (May 30, 2023).

Q. MS. ZHANG CITES TO ONE OF THE SAME ERCOT SOURCES, BUT INDICATES THAT OUTL COULD MEAN "NOT AVAILABLE FOR CONTROL." PLEASE ADDRESS HER CLAIM.

A. Ms. Zhang is correct that OUTL is used for a Load Resource that is not available for interruption or control.[41] However, Ms. Zhang overlooks that OUTL applies to non-controllable Load Resources, such as the Viridity Load Resources, and controllable Load Resources. The reference to available for control refers to controllable Load Resources that may be ramped up or down. A non-controllable Load Resource is only shut off to address frequency deviations. Thus, the portion of the instruction referring to non-controllable Load Resources is the reference to not available for interruption.

Q. DO THE PROTOCOLS EVER REFERENCE MECHANISMS TO "CONTROL" RRS FROM NON-CONTROLLABLE LOAD RESOURCES?

A. Yes, the Protocols do refer to non-controllable Load Resources being "controlled" by high-set under-frequency relays, but there again the control is limited to interruption of Load. A high-set under-frequency relay will trip when the frequency drops too low and will automatically interrupt the Load of the non-controllable Load Resource. However, a high-set under-frequency relay cannot increase nor restore Load as Ms. Zhang seems to imply. Non-controllable Load Resources are never Dispatched to provide RRS by increasing Load when the frequency is too high.

[41] Direct Testimony of Michael Pavo, Exhibit MP-6 at 125 (May 30, 2023) (ERCOT's Business Practice for Current Operating Plan Practices by QSEs, stating "[u]se OUTL for a Load Resource that is not available for interruption or control.").

4. Viridity did not confirm new offers for RRS from Load Resources for operating days February 16-19 to avoid credit risks or for any reason other than that they had no further capacity for load interruption after deployment on February 15.

Q. WHAT DOES ERCOT SUGGEST WITH REGARD TO THE REASONS WHY VIRIDITY DID NOT CONFIRM TRADES FOR THE VIRIDITY LOAD RESOURCES FOR FEBRUARY 16-19?

A. Mr. Ogelman makes bald suggestions that Viridity did not confirm offers related to its Load Resources on February 16 through 19 for reasons other than that they had exhausted any capacity available for further deployment because they had already been interrupted pursuant to ERCOT's ongoing deployment instruction beginning on February 15, 2021.

ERCOT suggests, for example, that the real reason for not confirming trades is that Viridity wanted to avoid liability for non-performance[42] or that Viridity wanted to avoid liability for Ancillary Service imbalance charges that would be associated with each hour that RRS was provided by Viridity's Load Resources.[43]

Q. IS THERE ANY TRUTH TO THESE SPECULATIONS?

A. No. As a preliminary matter, Viridity and Viridity Load Resources were already subject to Ancillary Service obligations that began on February 15, and that were extended automatically by Protocol § 6.5.7.6.2.2(8), which requires that once deployed in an emergency, "the obligation to deliver RRS remains in effect until specifically instructed by

[42] *See* Direct Testimony of Kenan Ogelman at 60:10-12 (July 11, 2023) (identifying "credit risks" discussed in the deposition of Michael Pavo).

[43] *See* Direct Testimony of Kenan Ogelman at 60:3-10 (July 11, 2023).

ERCOT to stop providing RRS."[44] Once deployed, there was no way to avoid that obligation absent recall permission from ERCOT.

5. Viridity and other Market Participant communications with ERCOT.

Q. WHAT DOES ERCOT SAY WITH REGARDS TO ERCOT'S COMMUNICATIONS DURING THE STORM?

A. Mr. Ogelman discusses ERCOT communications with Complainants in an attempt to downplay their significance and ignore the fact that ERCOT did provide guidance and/or make statements both internally and to Market Participants.[45] Among other things, Mr. Ogelman testifies:

- ERCOT is not required to give advice, and Market Participants are charged with understanding what the Protocols require;[46]
- ENGIE and Viridity blame ERCOT employees for giving bad advice;[47]
- Emails from ERCOT's Steve Krein were internal to ERCOT, and thus are not relevant;[48] and
- My email to ERCOT implied that Viridity's Load Resources "have no ERCOT RRS obligation for 2/16 – 2/18."[49]

Q. DOES VIRIDITY BLAME ERCOT EMPLOYEES FOR GIVING BAD ADVICE DURING WINTER STORM URI?

A. No. The advice given by ERCOT employees which Viridity and ENGIE relied upon is consistent with the Protocols and ENGIE and Viridity's actions and requested relief. It is

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[44] ERCOT Nodal Protocols § 6.5.7.6.2.2(8), LFC Deployment (Feb. 1, 2021) ("Once RRS is deployed, the QSE's obligation to deliver RRS remains in effect until specifically instructed by ERCOT to stop providing RRS.").

[45] Direct Testimony of Kenan Ogelman at 77—84 (July 11, 2023).

[46] Direct Testimony of Kenan Ogelman at 78:3-7, 82:6-8 (July 11, 2023).

[47] Direct Testimony of Kenan Ogelman at 83:19-21 (July 11, 2023).

[48] Direct Testimony of Kenan Ogelman at 81:15-18 (July 11, 2023).

[49] Direct Testimony of Kenan Ogelman at 82:11-12 (July 11, 2023).

ERCOT which characterized that advice as "imperfect" after the fact.[50] In any case, a Market Participant's opinion as to the quality of the advice given by ERCOT is just a red herring and the critical point is that ERCOT employees did give advice and make statements which cannot and should not be ignored.

Q. HOW DO YOU RESPOND TO ERCOT (AND STAFF'S) ASSERTIONS THAT COMPLAINANTS (AS ALL MARKET PARTICIPANTS) ARE REQUIRED TO BE KNOWLEDGEABLE ABOUT THE PROTOCOLS?

A This is true, but in the context provided by ERCOT and Staff is little more than a form of "victim blaming." The very existence of this case shows that Viridity was knowledgeable about the Protocols – both the dawning realization that as the Winter Storm Uri emergency extended the obligation to continue providing RRS from deployed Load Resources, scheduling for extended deployments are not included in the Protocols, and the normal trading process would not be applicable during a multi-day event. There was no such "practice" in this unprecedented situation, so Viridity relied on the Rules and Protocols. There was no mechanism available for accurately recording the continuing obligations under the extended deployment and how those obligations were being met in the real world. Complainants reached out to ERCOT to alert ERCOT to the dilemma and seeking ERCOT input to ensure compliance with all Protocols and Rules during this unprecedented emergency event.

[50] Direct Testimony of Michael Pavo, Exhibit MP-3 at 15 (May 30, 2023) (ERCOT Market Notice to Viridity, stating "[e]ven if ERCOT provided imperfect advice during the call, that conversation would not affect the resolution of this ADR.").

Q. WHAT IS THE SIGNIFICANCE OF YOUR EMAIL TO ERCOT?

A. Mr. Ogelman references my email to ERCOT dated February 18, 2021.[51] A copy of the email is attached to my direct testimony as Exhibit MP-2. This email followed a teleconference with ERCOT representatives about proper handling of RRS provided by Load Resources during the Storm. Viridity was serving as the QSE for resources that were deployed pursuant to ERCOT's ongoing RRS deployment instructions, and the Load Resources could not restore load absent specific recall from ERCOT to do so. At first, ERCOT stated that the deployment ended at the end of the Operating Day on February 15 and the Load Resources had no obligations for deployment on February 16 to 18 and could restore load (and thus could resume scheduling).

To be clear, I was not providing my opinion in my email to ERCOT, I was confirming ERCOT's stated position as it was contrary to what I understood as the continuing obligations of the Load Resources.

Q. DID ERCOT PERSONNEL LATER REVISE THEIR POSITION TO CONFORM WITH THE PROTOCOLS AND YOUR UNDERSTANDING OF THE CONTINUING OBLIGATION TO PROVIDE RRS?

A. Yes. After my request for clarification, ERCOT personnel discussed internally, ERCOT recognized the problem, reversed course, and clarified that "Based on Protocol Section 6.5.7.6.2.2 (8), ERCOT's expectation is that LRs are to remain deployed ***until instructed to stop providing RRS***."[52] Load Resources that had begun to restore Load were advised to

[51] *See, e.g.*, Direct Testimony of Kenan Ogelman at 64:4-8 (July 11, 2023).

[52] *See, e.g.*, Direct Testimony of Michael Pavo, Exhibit MP-2 at 4—7 (May 30, 2023) (providing various emails between ERCOT's Steve Krein and Mark Patterson on February 18, 2021) (emphasis added).

revert to offline. Note that this email explicitly shows that after reflection, ERCOT arrived at the conclusion that Viridity's Load Resources ***were*** "providing RRS."

Mr. Ogelman references this chain of emails out of context to suggest the exact opposite of the truth: that Viridity believed that the Load Resources did not have an ongoing RRS obligation.

Q. DO YOU AGREE WITH MR. OGELMAN'S TESTIMONY THAT ERCOT PERSONNEL'S STATEMENTS ARE NOT RELEVANT BECAUSE THEY WERE INTERNAL COMMUNICATIONS?

A. No. Mr. Ogelman tries to divert attention from the fact that these communications demonstrate that ERCOT explicitly expected Viridity Load Resources to continue to provide RRS. Ignoring ERCOT's position at the time, Mr. Ogelman tries to get the Commission to disregard ERCOT's statements by suggesting that this email traffic between ERCOT employees is not relevant because it was not shared externally. However, that is not exactly true. While the emails between Steve Krein and Mark Patterson referencing that ERCOT's expectations were for the Viridity Load Resources to continue providing RRS are internal emails, they are discussing the message conveyed to me over the phone regarding the Viridity Load Resources' obligation to continue providing RRS. ERCOT's direction to me during Winter Storm Uri undercuts ERCOT's assertion that the Protocols dictate the course of action ERCOT currently insists to be correct; and (to the extent the Protocols do so) supports granting a good cause waiver for compliance with those Protocols so that entities who provided RRS service in a once-in-a-lifetime emergency can be credited or compensated – rather than penalized – for doing so.

Q. DID ERCOT AT ANY POINT OVER THE ENTIRE FIVE-DAY COURSE OF THE EMERGENCY COMMUNICATE WITH VIRIDITY THAT THE RRS WAS NOT BEING PROVIDED OR THAT VIRIDITY'S TELEMETRY WAS INCORRECT?

A. No.

Q. WAS ERCOT OBLIGATED TO VALIDATE THE TELEMETRY FOR LOAD RESOURCES WITH AN RRS RESPONSIBILITY?

A. Yes. ERCOT is required to validate each QSEs COP, on submission, for compliance with requirements for reporting the Ancillary Service Resource Responsibility and for the reported resource status (e.g., "OUTL" vs. "ONRL").[53] Had ERCOT believed either were reported incorrectly, ERCOT was required to notify the QSE[54] within one hour.[55] ERCOT never notified Viridity of EDF, as the QSE for the Load Resources, that the COP submissions were incorrect or inadequate. In fact, Viridity (via EDF) and ERCOT remained in contact while the Load Resources were deployed throughout the emergency, and ERCOT had ample opportunity to raise any concerns or issues. Of course, even though the Protocols require that an Ancillary Service Resource Responsibility be reported and that ERCOT verify the submissions, the failure to report or verify does not terminate the obligation to provide RRS nor ERCOT's Dispatch Instruction.[56]

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[53] ERCOT Nodal Protocols § 3.9.2, Current Operating Plan Validation (Feb. 1, 2021).

[54] ERCOT Nodal Protocols § 3.9.2(1), Current Operating Plan Validation (Feb. 1, 2021).

[55] ERCOT Nodal Protocols § 3.9.2(4), Current Operating Plan Validation (Feb. 1, 2021).

[56] *See, e.g.*, Direct Testimony of Michael Pavo, Exhibit MP-9, Resolution of ADR Proceedings between ERCOT and Tenaska Power Services Co. (ADR No. 2021-TPS-05), ERCOT Market Notice M-A050720-01 (Aug. 5, 2022). Due to circumstances beyond Tenaska's control, ERCOT did not receive *any* telemetry regarding the Load Resources providing RRS for a period of time during Winter Storm Uri. *Id.* at 1. ERCOT credited the Load Resources in the DAM and clawed back the payments in Real-Time due to the lack of telemetry. *Id.* at 1. However, following the alternative dispute resolution process, ERCOT granted Tenaska's requested relief and credited the RRS provided by the Load Resources –*despite not having any telemetry data. Id.* at 4.

Q. DID ERCOT AT ANY POINT OVER THE ENTIRE FIVE-DAY COURSE OF THE EMERGENCY COMMUNICATE WITH VIRIDITY THAT TRADES OR OFFERS SHOULD BE MADE TO RECEIVE COMPENSATION, DESPITE THAT LOAD RESOURCES HAD NO CAPACITY?

A. No.

Q. DID ERCOT AT ANY POINT OVER THE ENTIRE FIVE-DAY COURSE OF THE EMERGENCY TELL YOU TO SUBMIT OFFER/TRADES WHILE DEPLOYED?

A. No.

6. ERCOT's draft NPRR would be necessary to interpret the Protocols as ERCOT now wants them interpreted, but ERCOT cannot interpret its draft NPRR into the Protocols

Q. WHAT TOPIC DO YOU ADDRESS IN THIS PORTION OF YOUR TESTIMONY?

A. I address Mr. Ogelman's testimony on the Nodal Protocol Revision Request ERCOT has drafted, but not yet implemented. The draft NPRR would write into the Protocols ERCOT's current position that during extended deployments, a QSE may submit offers or trades for deployed load resources.[57] Mr. Ogelman admits that the existing Protocols could be improved to more clearly reflect ERCOT's current expectations, which are not clear in the Protocols based on the very fact that ERCOT felt the need to revise the Protocols after the Storm.

[57] Direct Testimony of Kenan Ogelman at 85 (July 11, 2023).

Q. WOULD THE DRAFT NPRR FUNDAMENTALLY CHANGE THE CURRENT PROTOCOLS?

A. Yes. Currently, the Protocols require that an offer or trade is represented by physical capacity. The proposed revisions would permit a QSE to submit offers or trades for deployed Load Resources at a level no higher than the physical capacity at the time that the Load Resource was originally dispatched by ERCOT, rather than the anticipated physical capacity during the commitment period. The change proposed in the draft NPRR would be necessary in order to permit a QSE to submit an offer or trade based on historical capacity levels rather than anticipated physical capacity. This is seen upon review of the proposed changes, which affect Protocol 6.5.7.6.2.2 Deployment of Response Reserve (RRS), and are reproduced below:

From: Patterson, Mark <Mark.Patterson@ercot.com>
Sent: Friday, December 10, 2021 9:45 AM
To: Krein, Steve <Steve.Krein@ercot.com>
Subject: Draft NPRR for Extended RRS Deployments

I wanted to get this out there so we can start drafting our ideas into protocol language. I still want to have something drafted by sometime next week so others can start weighing in.

***

(8) Once RRS is deployed, the QSE's obligation to deliver RRS remains in effect until specifically instructed by ERCOT to stop providing RRS. For extended deployments beyond the initial responsibility period the QSE may continue to offer those deployed resources into the DAM to avoid possible failure to provide charges as long as the Resources are able to remain deployed ….However, except in an Emergency Condition, the QSE's obligation to deliver RRS may not exceed the period for which the service was committed.

From: Krein, Steve <Steve.Krein@ercot.com>
Sent: Monday, December 13, 2021 2:22 PM
To: Patterson, Mark
Subject: RE: Draft NPRR for Extended RRS Deployments
Attachments: Draft NPRR for Extended RRS Deployments - sdk.doc

I made this into a new paragraph and added some additional language. How does this look?

Steve Krein

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(8a) Once RRS is deployed, the QSE's obligation to deliver RRS remains in effect until specifically instructed by ERCOT to stop providing RRS. ~~For extended deployments beyond the initial responsibility period the QSE may continue to offer those deployed resources into the DAM to avoid possible failure to provide charges as long as the Resources are able to remain deployed ….~~However, except in an Emergency Condition, the QSE's obligation to deliver RRS may not exceed the period for which the service was committed.

(8b) For extended deployments, a QSE may submit offers or trades for RRS in subsequent DAM activities using the deployed Load Resources. The offer or trade should not exceed the value of the NPC – LPC at the time it was initially dispatched. However, once recalled the Load Resources must return to service and be prepared to cover their RRS Responsibility within three hours of the recall instruction being issued.

58

Q. DOES MR. OGELMAN INDICATE THAT THE PROPOSED CHANGE WOULD BE NEEDED TO PERMIT A QSE TO SUBMIT OFFERS OR TRADES FOR SOMETHING OTHER THAN PHYSICAL CAPACITY?

A. No. Mr. Ogelman indicates that the current Protocols are clear to permit a QSE to offer a deployed Load Resource without physical capacity. But Mr. Ogelman ignores the numerous Protocols requiring an offer or trade of RRS for Load Resources to be represented by physical capacity, such as Protocol 4.4.7.1 (4):"Before 1430 in the Day-

[58] Direct Testimony of Michael Pavo, Exhibit MP-4 at 76–90 (May 30, 2023) (ERCOT's response to ENGIE and Viridity's first set of Requests for Information).

Ahead, all Self-Arranged Ancillary Service Quantities **must be represented by *physical capacity*** , either by Generation Resources or Load Resources, or backed by Ancillary Service Trades."

Q. WHAT PROTOCOL DOES MR. OGELMAN INDICATE PROVIDES THE GUIDANCE ON OFFERING A RESOURCE WITHOUT PHYSICAL CAPACITY?

A. Mr. Ogelman testifies that "the Protocols in effect during the Disputed Payment Period were clear that an Ancillary Service trade lasted only for a single Operating Day. Protocol 4.4.7.1(2) expressly provided that a QSE was required to "indicate before 1000 in the Day-Ahead the Self-Arranged Ancillary Service Quantities, by service, so that ERCOT can determine how much Ancillary Service capacity, by service, needs to be obtained through the [Day-Ahead Market]." [59]

Q. HOW DOES THE PROTOCOL CITED BY MR. OGELMAN PROVIDE GUIDANCE THAT A QSE MAY SUBMIT AN OFFER OR TRADE REPRESENTED BY A LOAD RESOURCE THAT HAD NO CAPACITY?

A. It does not. Mr. Ogelman, instead, seems to argue that the obligation to provide capacity through a trade may only last one day. But here again, Mr,Ogelman ignores the fact that obligation may be extended by operation of Protocol § 6.5.7.6.2.2(8),[60] even under the revisions proposed in ERCOT's draft NPRR. So the proposition Mr. Ogelman relies on is faulty under current Protocols and ERCOT's draft NPRR.

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[59] Direct Testimony of Kenan Ogelman at 86:1-6 (July 11, 2023).

[60] ERCOT Nodal Protocols § 6.5.7.6.2.2(8), LFC Deployment (Feb. 1, 2021) ("Once RRS is deployed, the QSE's obligation to deliver RRS remains in effect until specifically instructed by ERCOT to stop providing RRS. However, except in an Emergency Condition, the QSE's obligation to deliver RRS may not exceed the period for which the service was committed.").

7. ERCOT's assertions of compliance issues are not pertinent to the 78 MW of RRS provided by the Viridity Load Resources made the subject of this suit.

Q. PLEASE IDENTIFY WHAT MR. OGELMAN TESTIFIES ON WITH RESPECT TO COMPLIANCE ISSUES.

A. As described above in Section IV.A.3, Viridity Load Resources provided 78 MW of RRS for Operating Day February 15, 2021. The Viridity Load Resources were carrying in excess of 78 MW of Load, were instructed to deploy shortly after 1 a.m. on February 15, and were required to continue providing RRS until recalled by ERCOT on February 19, 2021. When discussing "compliance" issues, ERCOT is discussing:

- Certain Load Resources that did not have Load at the time of ERCOT's Dispatch Instruction.
- Certain Load Resources that were not able to drop their usage all the way to zero, or the roughly 2.6 MW, on average, depicted below the Load line in chart provided in Section IV.A.3 for the Disputed Payment Period.
- The ability of Load Resources to restore Load within the three-hour window after recall by ERCOT.

In other words, the "compliance issues" do not address any "compliance" issue with the 78 MW of Load Resources made the subject of this appeal of ERCOT's decision during the Disputed Payment Period. The inclusion of such evidence does not impact the performance of the 78 MW of Load Resources curtailed as instructed by ERCOT.

Q. WHY WERE SOME LOAD RESOURCES NOT CURTAILED IN TEN MINUTES?

A. All Load Resources capable of curtailing were curtailed within the required MW limits of 95% of their dispatch instructions. However, with respect to the timing, there was an instance of a faulty breaker that delayed the curtailment of one Load Resource while technicians were dispatched during the Storm, at great personal risk to themselves, to fix

the breaker and permit the load to be curtailed.[61] As shown on Exhibit MP-5 to my direct testimony, Viridity had 82.5 MW of capacity at the time of the Dispatch Instruction. The average Load reduction over the Disputed Payment Period is in excess of 79 MW, which is more than 95% of the capacity to be curtailed.

Q. DID MANY OTHER LOAD RESOURCES EXPERIENCE ISSUES PROVIDING RRS DURING WINTER STORM URI?

A. Yes. ERCOT acknowledges that it was short hundreds of MW of RRS during the Disputed Payment Period. ERCOT also noted that out of the 285 non-controllable Load Resources that were deployed during the winter storm event, 56 (less than 20%) were determined to have "passed" the metrics described in the Protocols.[62]

8. Ancillary Service Imbalance Charges make QSEs indifferent to the use of their capacity for energy or Ancillary Service Reserves – not to penalize performance.

Q. WHAT ARE ANCILLARY SERVICE IMBALANCE CHARGES?

A. Ancillary Service Imbalance Charges are governed by ERCOT Protocol 6.7.5 and consist of Real-Time On-Line Reliability Deployment Price Adders and Real-Time On-Line Reserve Price Adders that are recalculated every 15 minutes, and each calcution for any given 15 minute interval is subject to change over time as the inputs used to determine the charges are found to be inaccurate or are otherwise revised.

ERCOT is required to calculate the Ancillary Service Imbalance Settlement to make Resources indifferent to the utilization of their capacity for energy or Ancillary

[61] Exhibit R-MP-3, Deposition of Ray Cunningham at 29:10—32:14 (June 23, 2023).

[62] Exhibit R-MP-4, ERCOT Response to ENGIE and Viridity RFI 7-11.

Service reserves.[63] It is not intended to act as a penalty to QSEs for providing RRS as instructed by ERCOT. Mr. Maggio's calculation of the charges seems to be an attempt to accomplish the latter. In fact, Mr. Ogelman seems to claim that QSEs that provide Ancillary Services will incur Ancillary Service Imbalance Charges even if they do not receive any compensation for providing Ancillary Services.

Q. DO YOU AGREE WITH MR. MAGGIO'S TESTIMONY THAT ANCILLARY SERVICE IMBALANCE CHARGES SHOULD OFFSET ANY COMPENSATION OR CREDIT FOR PROVIDING RRS?

A. Based on the intended purpose of the Ancillary Service Imbalance Charges under the Protocols, it seems that ERCOT is misapplying it in this case and during Winter Storm Uri. ERCOT charged Viridity Ancillary Service Imbalance Charges for February 15, 2021, which Viridity disputed through the ADR process.

Q. DO YOU AGREE WITH MR. MAGGIO'S QUANTIFICATION OF PURPORTED ANCILLARY SERVICE IMBALANCE CHARGES?

A. No. Even assuming Ancillary Service Imbalance Charges are intended to penalize QSEs for providing the Ancillary Services instructed to be provided, which they are not, Mr. Maggio's calculation *does not* use information required to be used in the calculation of Ancillary Service Imbalance Charges and instead uses information that *is not* used in the calcution of Ancillary Service Imbalance Charges.

[63] ERCOT Nodal Protocols § 6.7.5(1), Real-Time Ancillary Service Imbalance Payment of Charge (Feb. 1, 2021) ("Based on the Real-Time On-Line Reliability Deployment Price Adders, Real-Time On-Line Reserve Price Adders and a Real-Time Off-Line Reserve Price Adders, ERCOT shall calculate Ancillary Service imbalance Settlement, which will make Resources indifferent to the utilization of their capacity for energy or Ancillary Service reserves, as set forth in this Section.").

Q. PLEASE DESCRIBE THE ISSUES YOU HAVE SPOTTED WITH MR. MAGGIO'S CALCULATION OF ANCILLARY SERVICE IMBALANCE CHARGES?

A. First, Mr. Maggio did not calculate the Ancillary Service Imbalance Charges he sponsors in his exhibit DJM-2. The calculation was provided to him.[64] He only spot checked pricing information and "known quantities" from the case.[65] For the "known quantities" he used, he admitted that such information are not included as billing determinants in calculating Ancillary Service Imbalance Charges.[66] In addition to including information for billing determinates that are not used in the calculation under the Protocols, he also admitted that certain billing determinates that are used in the calculation under the Protocols were not used in his Exhibit DJM-2.[67] Mr. Maggio's Exhibit DJM-2 is intended to be a hypothetical calculation of Ancillary Service Imbalance Charges for Viridity Load Resources. Mr. Maggio's Exhibits DJM-1 and DJM-3 are purported to be actual calculations of Ancillary Service Imbalance Charges. A simple comparison of Mr. Maggio's Exhibit DJM-2 to Mr. Maggio's Exhibits DJM-1 and DJM-3 easily demonstrates that they do not use the same information. ERCOT's position that Viridity Load Resources would incur $45.2 million in imbalance charges cannot be given any weight in this case because the calculation is

[64] Exhibit R-MP-1, Deposition of David J. Maggio at 59:10-21.

[65] Exhibit R-MP-1, Deposition of David J. Maggio at 59:10-21.

[66] Exhibit R-MP-1, Deposition of David J. Maggio at 58:4-8 (Aug. 8, 2023) (Question: "[I]n Column H, you have a megawatt value of 27 megawatts. Are you saying you included 27 megawatts there simply because that is the disputed value of megawatts?" Answer: "Correct." Question: "Is the disputed value of megawatts a billing determinant in the calculation of ancillary service imbalance charges?" Answer: "It is not. . . . .").

[67] Exhibit R-MP-1, Deposition of David J. Maggio at 57:5-13 (Aug. 8, 2023) (Question: "[W]hen we were discussing Exhibit DJM-[3], there was a billing determinant for net power consumption. Was that right?" Answer: "There was a – yes, there was a column for the net power consumption, correct." Question: "Okay. And that is not provided here, is it?" Answer: "It is not included here, no.").

based on a hypothetical set of variables that have not been verified by ERCOT to the appropriate extent and cannot be vetted properly by Complainants because ERCOT has not provided the necessary information and explanations backing the assumptions to allow a full understanding of the calculation.

The calcution provided by Mr. Maggio is very cursory and does not provide all of the data inputs required for the calculation of the price adders which are impacted by multiple factors in the market, such as offers, awards, the Commission's pricing Order, and even a variable based on temperature. Moreover, the above factors are subject to changing over time as new or revised data is determined, and they have changed at least six times since February of 2021. Without the information, my finance team cannot review the majority of the calcution to identify any further discrepancies or disputed information.

Q. HAS VIRIDITY REQUESTED THE DATA FROM ERCOT?

A. Yes. ENGIE and Viridity requested from ERCOT all data for other Market Participants and Load Resources, including any adders, ERCOT used in calculating imbalance charges provided in Record Exhibit 5. ERCOT claims to not have used data from other Market Participants in calculating the Ancillary Service Imbalance charges provided in Record Exhibit 5.[68] If ERCOT's response is true, then ERCOT's Exhibit DJM-2 should not be relied upon as accurate. If ERCOT's response is false, then ERCOT's Exhibit DJM-2 should not be relied upon as ENGIE and Viridity have not been provided the opportunity to review or address the information when requested through discovery.

[68] Exhibit R-MP-7, ERCOT Response to ENGIE and Viridity Seventh RFI 7-2, 7-3, 7-17, 7-20, 7-21.

Q. WHY DO YOU SAY THAT ERCOT'S EXHIBIT DJM-2 SHOULD NOT BE RELIED UPON AS ACCURATE IF IT DOES NOT USE DATA FROM OTHER MARKET PARTICIPANTS IN CALCULATING THE CHARGES?

A. As I noted above, Ancillary Service Imbalance charges are made up of 1) Real-Time On-Line Reliability Deployment Price Adders and 2) Real-Time On-Line Reserve Price Adders (collectively "Price Adders"). Each of those Price Adders rely on a host of data inputs from other market participants. For example, the Real-Time On-Line Reliability Deployment Price Adders are calculated according to a complex formula in Protocol 6.5.7.3.1, that incorporates, among other variables:

- Impacts to energy prices due the reliability deployments for:
  - RUC-committed resources;
  - RMR Resources that are On-Line;
  - Deployed Load Resources other than Controllable Load Resources
  - Deployed Emergency Response Service;
  - Real-time DC Tie exports to address emergency conditions;
  - Energy delivered to ERCOT through block load transfers; and
  - Energy delivered to ERCOT from another power pool through registered block load transfers during an emergency condition.[69]

Presumably, because the energy prices during the Disputed Payment Period were administratively set at $9,000 pursuant to the Commission's Pricing Order, there would be no impact on energy prices for any of the above deployments, contrary to the output assumed in Exhibit DJM-2. It is impossible for ENGIE and Viridity to verify the

[69] ERCOT Nodal Protocols § 6.5.7.3.1(2), Determination of Real-Time On-Line Reliability Deployment Price Adder (Feb. 1, 2021).

calculations if they are not provided the data. However, if ERCOT is correct that they did not even use the above data from other Market Participants, then the Price Adders in Exhibit DJM-2 should not be relied upon.

The Real-Time On-Line Reserve Price Adders are calculated according to a complex formula in ERCOT's Methodology for Implementing Operating Reserve Demand Curve ("ORDC") to Calculate Real-Time Reserve Price Adders,[70] that is a function of all the Real-Time reserves that can be expected to be available within the hour. The Real-Time reserves that can be expected to be available within any hour under any given set of parameters is information that may only come from other Market Participants. Again, it is impossible for ENGIE and Viridity to verify the calculations if ERCOT withholds such data for other Market Participants and a calculation of how ERCOT used the data to arrive at the Price Adders used in ERCOT Exhibit DJM-2. However, if ERCOT is correct that they did not even use the above data from other Market Participants, then the Price Adders in Exhibit DJM-2 should not be relied upon.

C. "GOOD CAUSE" WAIVERS AND EQUITY.

Q. HAS THERE BEEN ANY OPPOSITION RAISED TO COMPLAINANTS' REQUEST FOR A WAIVER IN THE EVENT THE PROTOCOLS SHOULD BE INTERPRETED AS ERCOT NOW CLAIMS?

A. Yes. The alternative request for a good cause exception is addressed in Jess Totten's rebuttal. Below is a summary of the facts supporting an alternative finding of good cause:

- As a general rule, those who provided emergency services in time of deep crisis should be credited or compensated for the service they provided.

[70] Exhibit R-MP-6, ERCOT's Methodology for Implementing Operating Reserve Demand Curve (ORDC) to Calculate Real-Time Reserve Price Adders, Version 2.6 (June 9, 2020).

- Making sure that those who provide services are credited is one of ERCOT's core functions[71] and that of the Protocols,[72] and the Commission is charged with overseeing that ERCOT meets that responsibility.[73]

- The RRS was provided by the Viridity Load Resources. The ERCOT system got the benefit of 78 MW load interrupted by Viridity's Load resources in response to ERCOT's deployment instruction from February 15 to February 19, 2021. Neither Staff nor ERCOT have provided any evidence contravening the fact that this Load interruption directed by ERCOT actually occurred.

- ENGIE and Viridity followed ordinary trading practices leading up to the deployment on February 15, 2021.

- ERCOT's systems did not have a mechanism to allow those systems to submit trades or to reflect deployment and proper crediting beyond a single operating day nor did ERCOT's systems have a mechanism to allow manual correction or reporting that Load Resources already providing RRS pursuant to a trade and Dispatch Instruction from a prior operating day were continuing to do so on subsequent days of a multi-day deployment.

- ERCOT Protocols and PUCT rules indicate that Load Resources without physical capacity may not offer new trades offering the interruption of Load if there is no load available to interrupt.

- Following the rules and Protocols prohibiting offers of Load Resources without capacity, Viridity refused to confirm any new purported offers to provide RRS for Operating Days February 16-19, 2021, from Load Resources which it knew to have zero capacity based on deployments and trades originating on February 15 and ongoing.

- To the extent ERCOT's interpretation of the Protocols – that a new trade is necessary each new day to document an ongoing trade involving previously deployed resources to make sure that those providing RRS are credited for same -- is deemed to be correct, and that failure to take such action results in those providing RRS not being credited for providing same, then in this unprecedented event, the Commission should waive compliance with such Protocols under the circumstances so that those actually providing RRS can in fact be credited for rendering that service.

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[71] PURA § 39.151(a)(4).

[72] ERCOT Nodal Protocols § 1.2(1)(d). Functions of ERCOT (Feb. 1, 2021).

[73] 16 TAC § 25.503(d).

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes, but I reserve the right to address any further issues in supplemental testimony as appropriate.

STATE OF TEXAS §
§
COUNTY OF TRAVIS §

BEFORE ME, the undersigned authority, on this day personally appeared Michael Pavo, who, having been placed under oath by me, did depose as follows:

My name is Michael Pavo. I am of legal age and a resident of the State of Maryland. The foregoing rebuttal testimony and any attached exhibits offered by me are true and correct, and the opinions stated therein are accurate, true and correct.

Michael Pavo

Michael Pavo

SUBSCRIBED AND SWORN TO BEFORE ME by the said Michael Pavo this 12th day of September, 2023. This notarial act was an online notarization.

ANGELA MONTALVO
Notary ID
12976781-2
My Commission Expires
4/1/2026

Angela Montalvo

Notary Public, State of Texas

EXHIBIT R-MP-1

SOAH DOCKET NO. 473-23-04518

PUCT DOCKET NO. 53377

COMPLAINT OF ENGIE ENERGY MARKETING NA, INC. AND VIRIDITY ENERGY SOLUTIONS, INC. AGAINST THE ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.	)))))	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS

ORAL DEPOSITION OF

DAVID J. MAGGIO

AUGUST 8, 2023

(Via Zoom Videoconference)

ORAL DEPOSITION of DAVID J. MAGGIO, produced as a witness at the instance of the Complainant and duly sworn, was taken in the above-styled and numbered cause on August 8, 2023, from 10:09 a.m. to 12:05 p.m., before LuAnn M. Gill, Certified Shorthand Reporter in and for the State of Texas, reported remotely by computerized stenotype machine at the location of the witness, pursuant to the Texas Rules of Civil Procedure and the provisions stated on the record or attached hereto.

me that the responsibility is really at a QSE level and so you wouldn't have an ancillary service resource responsibility if the QSE did not have a responsibility.

Did I characterize what you were saying correctly?

MR. CLARK: Objection, form.

A That is correct. A resource would not have a responsibility unless their QSE had a responsibility.

Q (BY MR. MACK) Okay. And the subparagraph we were discussing says the QSE's obligation to deliver RRS remains in effect until specifically instructed to stop. Correct?

A It does.

Q So wouldn't you agree then that the QSE obligation was present?

A There was --

MR. CLARK: Objection, form.

A There was an obligation to continue to remain deployed.

Q (BY MR. MACK) And it was a QSE obligation. Is that correct?

A Yes. As the representative of the resource, that was the QSE's obligation.

Q Okay. So would you agree then that the specific load resources that were deployed also had the

obligation to provide RRS?

MR. CLARK: Objection, form.

A Yes, they -- they had the obligation to continue to remain deployed.

Q (BY MR. MACK) And when you say "they had the obligation to continue to remain deployed," are you saying something different than they had the obligation to provide RRS?

A I guess the -- no. It's really the -- remaining deployed is -- I guess would be the same as, I guess, the delivery of RRS that's here in the protocol.

Q Okay. All right. Could you turn to Page 12 of your testimony and let me know when you're there?

A I am on Page 12.

Q On Line 5 you note the term capacity of a load resource, and you note that it is used in calculating the ancillary service imbalance charge. Is that correct?

A I'm just reading here the specific line.

Q Sure. Take your time, please.

A Yeah. It is -- right. It is the amount of capacity based on -- for the case of a load resource that's providing it via the relay, it's based on the, amongst other things, the telemetered consumption and the ancillary service schedule for RRS.

tab on one of these spreadsheets that had some relevant formula that calculated the real-time ancillary service imbalance values.

Q Okay. And we'll get to those and go through them in a bit. Could you tell me sitting here right now though how much RRS -- RRS capacity each load resource had during the disputed payment period?

A The -- obviously, we can look at the specific spreadsheet, but my memory of it at this moment is that the value was zero for all of the load resources that are part of the discussion here.

Q So when you say "zero," you contend that they had zero capacity. Is that correct?

MR. CLARK: Objection, form.

A That they had zero on-line capacity as it counts towards this ancillary service imbalance calculation.

Q (BY MR. MACK) Okay. To your knowledge, is the term "capacity" defined in the protocols?

A I don't believe it specifically is as a singular term.

Q But it's used quite often, is it not?

A I think it's a pretty common term, yes, that that's used within the protocol.

Q Okay. In your opinion, would it be fair to

assume that it's used for load resources one way and other resources another?

A Certainly to the degree we're talking about a case where, for example, a load resource provides reserves through a reduction in the demand as opposed to, for example, a generator that provides reserves through a -- an increase in energy produced, I would say those -- there's a corollary there, but it means something slightly different between those two types of resources.

Q Okay. And can you at a high level explain the difference between what you would say is capacity for a load resource and what you would say is capacity for a generation resource?

A I guess it would be, more or less, the distinction would be what I was just describing. So in the case of the load resource, capacity would consist of either in the moment what consumption could be reduced or, looking at sort of a future time period, could be the projected level of consumption that could be reduced.

So, again, in the case of load resources, it's primarily focused on what the energy's consumption is or could be and -- and a reduction or potential reduction in that level of consumption.

would be just the difference between those two, the 8 megawatts.

Q Okay. And you performed a calculation in real-time for the capacity of these load resources. Right?

A Specific to, I guess, these -- the calculations here for the ancillary service imbalance values?

Q Yes.

A Yes. There were calculations in real-time that looked at these values for all, I guess, all of the resources, including load resources.

Q Okay. And so you know for these load resources there is no low sustained limit. Correct? Or am I wrong?

A I believe that's the case. Of course, I think that data is in some of the information that's included in the files, but I was speaking more generally around how that calculation works for load resources.

Q Okay. Then let me ask another question a little bit different. So for these load resources, the Viridity load resources, the subject of this case, is it your position that the capacity in real-time would be measured by their physical load?

A For the purposes of this calculation, that would certainly be true, that it would be looking at the

net power consumption in real-time for these real-time ancillary service imbalance calculations.

Q Okay. And then you mentioned another possible definition of capacity forward looking as the amount of consumption that could be reduced. Did I hear that correctly?

A Yes.

Q And so if these load resources would not be able to reduce any consumption in that situation, would you say they had zero capacity?

A If they were projecting that they were not -- would not be able to consume at a future time period, then, yes, in that future time period we would presume they would have zero capacity.

Q Okay. Are you aware of protocols that provide a different interpretation of capacity for noncontrollable load resources than the one you're providing here today?

MR. CLARK: Objection, form.

A Not off the -- I guess there are specific calculations for various parts, but I can't think of a distinction and definition off the top of my head.

Q (BY MR. MACK) Does your testimony set forth ERCOT's official interpretation of the protocols and the defined terms of the protocols as it relates to the

issues in dispute in this case?

MR. CLARK: Objection, form.

A I'm sorry. Can you please repeat that question?

Q (BY MR. MACK) Sure. Does your testimony set forth ERCOT's official interpretation of the protocols and the defined terms within the protocols as it relates to the issues in dispute in this case?

MR. CLARK: Objection, form.

A I don't believe the intent of my testimony was to make any sort of legal interpretation. It is our understanding of how the protocols work as it relates to the defined terms that are called out within the testimony.

Q (BY MR. MACK) Okay. And, specifically, the terms you used in your testimony, is it ERCOT's position that that is how they should be interpreted?

MR. CLARK: Objection, form.

A I guess I -- I believe that is the -- that's the intent, that these are our expectations as ERCOT in terms of how these terms work and how these calculations would function.

Q (BY MR. MACK) Okay. Thank you.

Could you turn to Page 17 of your testimony?

Q So I would sum these two, the values in Rows 185 and Row 186, Column H. Correct?

A Yes, sir.

Q And for the 15th, that comes to 3.78 million?

A Yes, sir.

Q And then do the same thing for the 16th. And I am going to do that as we're talking. Please let me know if you see me do something incorrect. Okay. And I believe I've got them all. I wouldn't go to the 20th, right, or would I?

A I believe it only includes through the 19th. And I believe all the values were all zero for the 20th anyways.

Q Okay. And I came to 47.3 million.

A I did not see anything incorrect.

Q Okay. Well, we both can go back and redo it. We can follow up with discovery, written discovery if it can't be reproduced. Would that be okay with you?

A Yes, sir.

Q Did Enerwise submit a billing dispute regarding these charges that you represent in your Exhibit DJM-3?

A Not that I'm aware of.

Q Okay. So if they did not submit a billing dispute, is it fair to assume they would not have had an ADR proceeding on the ancillary service imbalance

to do these calculations.

Q Okay.

A Beyond, of course, plugging in the disputed megawatt quantities.

Q Okay. So when we were discussing Exhibit DJM-1, there was a billing determinant for net power consumption. Was that right?

A We were discussing DJM-3.

Q Yes.

A There was a -- yes, there was a column for the net power consumption, correct.

Q Okay. And that is not provided here, is it?

A It is not included here, no.

Q Okay. So that is at least one billing determinant input that is not included in your Exhibit DJM-2. Right?

A It was not included because it's not needed to perform the calculations.

Q Okay. Earlier you had mentioned that the net power consumption is an input to the ancillary service imbalance charge. Is that still accurate or your testimony?

A It is used to calculate the megawatt quantity in the ancillary service imbalance charges. In the case of this specific spreadsheet in DJM-2, the megawatt

quantities were derived based on the disputed megawatts, not on the resource information that would otherwise be used to calculate it.

Q Okay. So in Column H, you have a megawatt value of 27 megawatts. Are you saying you included 27 megawatts there simply because that is the disputed value of megawatts?

A Correct.

Q Is the disputed value of megawatts a billing determinant in the calculation of ancillary service imbalance charges?

A It is not. This spreadsheet a -- is trying to represent a hypothetical case in which the QSE had retained the ancillary service supply responsibility into these operating days. So I guess I would not say that this spreadsheet follows the exact form of the A-S imbalance calculation because in this case, the megawatts are derived from the case itself as opposed to being based on the real-time data coming into those calculations.

Q Okay. And I think we may have touched on this a bit, but the labels provided in Row 1 for each column may have parts of a billing determinant in it, but it's got also other language. Where does that other language come from?

A I think those were -- some of them are a function of just data within our system. Some of it was just added as, I guess, as a specific label to recognize what the data is, but it is not associated necessarily directly with any billing determinant.

Q Okay. Who added the extra text? Did you add that?

A I did not add that. That was in the spreadsheet that was shared with me.

Q Okay. So this spreadsheet was shared with you. It wasn't anything you calculated?

A I did not pull the data directly, no.

Q Who pulled it?

A I guess I don't know who specifically was the expert who pulled it within ERCOT.

Q Did you verify it?

A I did spot check the pricing information, in particular, the 27 and -- the 27-megawatt value and the 78 megawatts. Those were just sort of the known quantities. But I did go through and look at the pricing data in F and G, Columns F and G, I should say.

MR. CLARK: We've been going an hour and a have. Can we take a break? But if you're still on this, I don't want to interrupt you.

MR. MACK: Let me just look at my notes.

EXHIBIT R-MP-2

SOAH DOCKET NO. 473-23-04518

PUCT DOCKET NO. 53377

COMPLAINT OF ENGIE ENERGY MARKETING NA, INC. AND VIRIDITY ENERGY SOLUTIONS, INC. AGAINST THE ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS

ORAL DEPOSITION OF

KENAN OGELMAN

Friday, August 4, 2023

ORAL DEPOSITION of KENAN OGELMAN, produced as a witness at the instance of the Complainant and duly sworn, was taken in the above-styled and numbered cause on Friday, August 4, 2023, from 9:30 a.m. to 11:01 a.m., before Kim Pence, Certified Shorthand Reporter in and for the State of Texas, reported by computerized stenotype machine at the offices of Winstead PC, 401 Congress Avenue, Suite 2100, Austin, Texas 78701, pursuant to the Texas Rules of Civil Procedure and the provisions stated on the record or attached hereto.

based on the telemetry from -- from the resource.

Q Which value from the telemetry?

A It's based on what the resource is doing at that moment.

Q Is it the telemetered consumption?

A It's the telemetered consumption at the -- at the specific time that the calculation needs to be made.

Q Okay. Earlier you said capacity was the same as the resource responsibility. Right?

MR. CLARK: Objection, form.

A Yes, I did.

Q (BY MR. MACK) Okay. So is it -- are you saying in this protocol it's different?

A So what this -- the protocols you were referring to previously are the calculation of the ancillary service obligation. This is monitoring the effectiveness of the deployment by calculating it every ten seconds. I'm tracking what that resource is doing. In other words, I'm tracking whether it's following the dispatch instructions or not.

Q Okay. So the value ERCOT reports for the capacity of a load resource is the consumption. Is that right?

MR. CLARK: Objection, form.

A In this calculation, the value that is reported

is as you described.

Q (BY MR. MACK) Okay. It's the consumption?

A Yes.

Q And it's not the resource responsibility, is it?

A I would use this calculation to validate the resource. What did you call it, resource obligation? Was that the word that you used?

Q I said resource responsibility.

A Resource responsibility. This -- this calculation would just track whether I was getting the capacity from the resource that I was expecting.

Q All right. Can you turn to Ogelman Exhibit 4, please?

A (Complied)

Q All right. And this is an excerpt of Protocol 8.1.1.3.2 titled Responsive Reserve Capacity Monitoring Criteria.

A Uh-huh.

Q Are you familiar with that?

A Yes.

Q And it states in Subsection (b) (sic) "For Load Resources not deployed by a Dispatch Instruction from ERCOT, the amount of RRS capacity provided must be measured as the Load Resource's average Load level in

ancillary services based on an alternate optimization algorithm that is not currently in operation. Instead, currently ancillary services are deployed -- well, responsive reserve service is deployed based on a dispatch instruction. You don't see the word "dispatch instruction" here.

Q Okay. But would you agree that when the -- after a real-time co-optimization is implemented, the capacity of a load resource must be measured by the load resource's average load in the last five minutes?

A For the purpose of capacity monitoring, yes.

Q Are you aware of any protocol quantifying the capacity of a load resource as an input to any formula for settlement purposes?

MR. CLARK: Objection, form.

A I would -- I would benefit from repeating the question. I'm sorry. I tracked most of them, but then lost the beginning.

Q (BY MR. MACK) All right. Are you aware of any protocol that defines capacity to be used and uses it in a formula for settlement purposes?

A For settlement purposes. I believe there is a requirement to telemeter the correct status that would then lead to a calculation for settlement purposes in the protocols.

EXHIBIT R-MP-3

SOAH DOCKET NO. 473-23-04518

DOCKET NO. 53377

COMPLAINT OF ENGIE ENERGY MARKETING NA, INC. AND VIRIDITY ENERGY SOLUTIONS, INC. AGAINST THE ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.	) BEFORE THE STATE OFFICE)) OF))) ADMINISTRATIVE HEARINGS

ORAL DEPOSITION OF

RAY CUNNINGHAM

June 23, 2023

(Contains Highly Sensitive/Confidential Portions)

ORAL DEPOSITION of RAY CUNNINGHAM, produced as a witness at the instance of the Electric Reliability Council of Texas, Inc. and duly sworn, was taken in the above-styled and numbered cause on June 23, 2023, from 9:30 a.m. to 4:17 p.m., before Lorrie A. Schnoor, Certified Shorthand Reporter in and for the State of Texas, Registered Diplomate Reporter and Certified Realtime Reporter, reported by computerized stenotype machine at Naman, Howell, Smith & Lee, PLLC, 8310 North Capital of Texas Highway, Suite 490, Austin, Texas 78731, pursuant to the Texas Rules of Civil Procedure and the provisions stated on the record or attached hereto.

A Correct.

Q So unless and until we see at least 25.65 megawatts in Column BT, BASA is not complying with the ERCOT protocols. Correct?

A BASA did not comply with the protocol; however, they do have a valid excuse for not doing so.

Q Okay.

MR. CLARK: I'll object to -- as nonresponsive to everything after the protocol.

Q (BY MR. CLARK) If you look on Exhibit MP-5, Cunningham Deposition Exhibit 5, Page 2, Row 66 --

A I'm sorry. Page 2.

Q Uh-huh.

A Row 66. All right.

Q And feel free to look above that, but it appears that the first time at which BASA was in compliance with the protocol requirement to have 95 percent of its load deployed was on February 15th at approximately 4 p.m. Correct?

A Yes, the 26.3 is larger than the 95 percent. Correct.

Q And up until that time, BASA had not complied with the dispatch instruction to fully unload, according to the protocols, 95 percent. Correct?

A The compliance requirement also has valid

excuses for not complying, so this petty little argument about this one megawatt, if you'll let me speak to why they couldn't reply, we can talk about that.

Q Well, I want to talk about what you say in your testimony, and then maybe your lawyer will ask you to elaborate on what it is you want to talk about about petty excuses.

A No, I was talking about your petty one megawatt of compliance, not a petty -- the excuse is real.

Q Mr. Cunningham, on Page 11, Line 1 of your testimony --

A Page 11, Line 1.

Q -- you say, "The BASA Load Resources were deployed, as instructed by ERCOT." Correct?

A I'm sorry. I'm on the wrong page. Page 11, Line 1. The BASA Load Resources were deployed, as instructed by ERCOT, for the entirety of the five-day event. Yes, that's what I said.

Q ERCOT's instructions were for 100 percent of the 27 megawatts to be deployed. Correct?

A I don't know about 100 percent. I think the rule that we just discussed is 95 percent.

Q Okay. ERCOT instructed BASA to deploy 27 megawatts?

A All their resources, yes, 27 megawatts.

Q And so your statement here needs to be qualified by they were short, as you say a little bit. Right?

A I don't think it needs that qualification.

Q Why not?

A Because I think you're being petty.

Q You think that --

A You are --

Q -- complying with the protocols is petty?

A No, I think you are being petty. I think compliance with the protocols was done because they had valid excuses for what happened for this one megawatt shortage that you seem to be focused on. They provided 27 megawatts. They ought to get a gold star, but you're punching them in the nose for a one megawatt. It's ridiculous.

Q Well, they didn't provide 27 megawatts. Right? We saw on Cunningham Exhibit 5 that they provided 23.4 megawatts when first deployed?

A When first deployed and then 26.3 and then 27.7.

Q 15 hours later?

A Yeah, when they finally got the equipment that was broken to deploy -- open the breaker. That was the problem. The breaker wouldn't open.

Q Well, whether they have an excuse or not doesn't excuse you providing testimony that says they complied with the protocols when you know that they didn't?

MR. MACK: Objection, form.

A I don't agree with that statement.

Q (BY MR. CLARK) Which part of it?

A All of it.

Q Okay. So you've agreed already today that BASA did not comply with the protocols when it first deployed?

A If you ignore the excuse that they have, then yes, that is a -- that is a result you could erroneously come to.

Q And you swear under oath that they complied with the protocols before today?

A Yes. And performed admirably.

Q Which protocol requires admirable performance?

A That is my description of their performance, admirable. They saved ERCOT from having a statewide blackout and probably saved lives. That is admirable in my view.

Q Well, if we turn to Page 18, Line 4 --

MR. CLARK: And I'll object to nonresponsive to the last answer.

EXHIBIT R-MP-4

QUESTION NO. ENGIE/VIRIDITY 7-11:

How many Load Resources had trades or offers submitted for RRS on February 16, 2021 while remaining deployed through February 19, 2021? Provide the identity of each Load Resource and the associated amount of MW deployed. How many of those Load Resources received ensuing awards? Identify when the deployment instructions were issued. Identify when the recall instructions were issued. Please indicate how deployment compliance was measured, and how many resources met the requirement to deploy within the compliance timeframe following deployment instructions.

RESPONSE:

Please refer to ERCOT's response to Question No. Engie/Viridity 7-10. For information regarding how compliance was measured, please refer to Protocol 8.1.1.4.2. Regarding NCLR deployment of RRS, there were 285 NCLRs that were deployed during the winter storm event. Of those, 56 were determined to have "passed" the metrics described in the Protocols.

Preparers: Kenan Ögelman, Steve Krein
Sponsor: Kenan Ögelman

EXHIBIT R-MP-5

Public Utility Commission of Texas

Memorandum

To: Chairman DeAnn T. Walker
Commissioner Arthur C. D'Andrea
Commissioner Shelly Botkin

From: Thomas J. Gleeson, Executive Director

Date: February 19, 2021

Re: Project No. 51812, *Issues Related to the State of Disaster for the February 2021 Winter Weather Event*

On February 12, 2021, pursuant to Texas Government Code § 418.014, in response to an extreme winter weather event, Governor Greg Abbott issued a Declaration of a State of Disaster for all counties in Texas. Further, on February 15, 2021, the Electric Reliability Council of Texas, Inc. (ERCOT) declared its highest state of emergency, an Energy Emergency Alert Level 3 (EEA3), due to exceptionally high electric demand exceeding supply.

Commission Staff will utilize enforcement discretion where rule or protocol requirements conflict with recovery from the emergency conditions experienced since February 15, 2021.

Specifically:

- If an entity was deployed as a load resource during Energy Emergency Alert Level 2 (EEA2) on Monday February 15, 2021, then resumed operations because it was providing a critical service or product, then enforcement discretion will be exercised.

- If an entity was deployed as a load resource on Monday February 15, 2021 and remained deployed until ERCOT recall, but was unable to restore operations within three hours due to damage or lack of essential products, then enforcement discretion will be exercised.

If a regulated entity experiences specific problems with compliance, it should reach out to the Commission's Legal Division.

5

EXHIBIT R-MP-6

Methodology for Implementing Operating Reserve Demand Curve (ORDC) to Calculate Real-Time Reserve Price Adder

Version _2.6

Document Revisions

Date Approved	Version	Description	Author(s)	Approved By	Effective Date
11/19/13	0.5	ERCOT Board approved NPRR568, Real-Time Reserve Price Adder Based on Operating Reserve Demand Curve, and associated OBD, Methodology for Implementing Operating Reserve Demand Curve (ORDC) to Calculate Real-Time Reserve Price Adder	ERCOT	ERCOT Board	Upon system implementation of NPRR568
4/8/14	0.6	Revisions proposed via NPRR598, Clarify Inputs to PRC and ORDC	ERCOT	ERCOT Board	Upon implementation of NPRR568
6/1/14	0.7	Partial unboxing of NPRR568 due to system implementation of NPRR568 and NPRR555, Load Resource Participation in Security-Constrained Economic Dispatch	ERCOT		6/1/14
8/11/15	0.8	Synchronize the OBD with as built methodology, the removal of Phase 2, and the implementation of NPRR698	ERCOT	ERCOT Board	9/1/15
	0.9	Revisions proposed via NPRR710, Removal of ORDC Phase 2 Language and Modification to HASL Calculation	ERCOT	ERCOT Board	Upon implementation of NPRR710
	1.0	Unboxing of NPRR710 due to system implementation	ERCOT	ERCOT Board	10/22/15
6/14/16	1.1	Revisions proposed by NPRR766, Alignment of System-Wide Discount Factor Description with Operational Adjustments to RDF, to the system-wide discount factor determination	ERCOT	ERCOT Board	10/1/16
	1.2	Unboxing of revisions related to NPRR766	ERCOT		10/1/16
1/1/17	1.3	Revisions proposed by NPRR801, Non-Controllable Load Resource MW in PRC, to the Physical Responsive Capability (PRC) calculation and alignment with current implementation.	ERCOT		Upon implementation of NPRR801
	1.4	Unboxing of revisions related to NPRR801	ERCOT		6/29/17

Date Approved	Version	Description	Author(s)	Approved By	Effective Date
4/10/18	1.5	Revisions proposed by OBDRR002, ORDC OBD Revisions for PUCT Project 47199	ERCOT	ERCOT Board	Upon implementation of OBDRR002
	1.6	Unboxing of revisions related to OBDRR002	ERCOT		5/31/18
12/11/18	1.7	Revisions proposed by OBDRR006, Alignment of ORDC OBD with NPRR884, Adjustments to Pricing and Settlement for Reliability Unit Commitments (RUCs) of On-Line Combined Cycle Generation Resources, and OBDRR007, Revisions to the ORDC Methodology to Include Photo-Voltaic Generation Resources (PVGRs)	ERCOT	ERCOT Board	Upon implementation of OBDRR006 and OBDRR007
2/12/19	1.8	Revisions proposed by OBDRR010, Related to NPRR910, Clarify Treatment of RUC Resource that has a Day-Ahead Market Three-Part Supply Award, and OBDRR011, ORDC OBD Revisions for PUCT Project 48551	ERCOT	ERCOT Board	Upon implementation of OBDRR010 and OBDRR011
	1.9	Partial unboxing of revisions related to OBDRR011	ERCOT		3/1/19
	2.0	Unboxing of revisions related to OBDRR010	ERCOT		5/31/19
6/11/19	2.1	Revisions proposed by OBDRR015, Linking of VOLL to the Effective SWCAP	ERCOT	ERCOT Board	6/12/19
8/13/19	2.2	Revisions proposed by OBDRR009, ORDC OBD Revisions for ERCOT-Directed Actions Related to DC Ties	ERCOT	ERCOT Board	Upon implementation of OBDRR009
	2.3	Unboxing of revisions related to OBDRR007	ERCOT		10/18/19
	2.4	Unboxing of revisions related to OBDRR011	ERCOT		3/1/20
	2.5	Unboxing of revisions related to OBDRR006	ERCOT		5/29/20
6/9/20	2.6	Revisions proposed by OBDRR017, Related to NPRR987, BESTF-3 Energy Storage Resource Contribution to Physical Responsive Capability and Real-Time On-Line Reserve Capacity Calculations	ERCOT	ERCOT Board	Upon implementation of NPRR987

PROTOCOL DISCLAIMER

This document describes ERCOT systems and the response of these systems to Market Participant submissions incidental to the conduct of operations in the ERCOT Texas Nodal Market and is not intended to be a substitute for the ERCOT Protocols (available at http://www.ercot.com/mktrules/nprotocols/current), as amended from time to time. If any conflict exists between this document and the Protocols, the Protocols shall control in all respects.

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1. PURPOSE

For each Security-Constrained Economic Dispatch (SCED) process, ERCOT calculates a Real-Time On-Line Reserve Price Adder (RTORPA) and a Real-Time Off-Line Reserve Price Adder (RTOFFPA) based on the On-Line and Off-Line available reserves in the ERCOT System and the ORDC. The price after the addition of RTORPA to Locational Marginal Prices (LMPs) approximates the pricing outcome of Real-Time energy and Ancillary Service co-optimization since RTORPA captures the value of the opportunity cost of reserves based on the defined ORDC. Additionally, the Real-Time Off-Line Reserve Capacity (RTOFFCAP) shall be administratively set to zero when the SCED snapshot of the Physical Responsive Capability (PRC) is less than or equal to the PRC MW at which Energy Emergency Alert (EEA) Level 1 is initiated. An Ancillary Service imbalance Settlement is done based on Protocol Section 6.7.5, Real-Time Ancillary Service Imbalance Payment or Charge, to make Resources indifferent to the utilization of their capacity for energy or Ancillary Service reserves.

This document describes:

- The ERCOT Board-approved methodology that ERCOT uses for determining the Real-Time reserve price adders based on ORDC.
- The ERCOT Board-approved parameters for implementing ORDC.

2. METHODOLOGY FOR IMPLEMENTING ORDC

For each execution of SCED, the System Lambda of the power balance constraint will be determined and the ORDC will be based on analysis of the probability of reserves falling below the minimum contingency level (PBMCL) multiplied by the difference between Value of Lost Load (VOLL) and System Lambda. This approach is needed with the current rules in order to ensure that power balance is given the highest priority and can result in a reserve price that is near zero with an energy price near System-Wide Offer Cap (SWCAP) under scarcity conditions.

Determining the following values is a major part of implementing ORDC to calculate Real-Time Reserve Price Adder:

1. VOLL
2. PBMCL
3. RTORPA and RTOFFPA

2.1 Determine VOLL

The VOLL is a parameter for implementing the ORDC and is set on a daily basis to be equal to the SWCAP, as defined in Protocol Section 4.4.11, System-Wide Offer Caps.

2.2 Determine PBMCL

Another key part of the ORDC concept is the determination of the PBMCL. PBMCL is derived by making certain adjustments to the Loss of Load Probability curve (LOLP). LOLP is the probability, at a given level of reserves, of the occurrence of a loss of reserves greater than the

reserve level and is therefore determined by calculating the mean and standard deviation of differences between the hour-ahead forecasted reserves and the reserves that were available in Real-Time during the Operating Hour using historical data, as described in greater detail, below. The LOLP curve is defined as follows:

$$LOLP(\mu, \sigma, R) = 1 - CDF(\mu, \sigma, R)$$

Where CDF is the Cumulative Distribution Function of the normal distribution with mean μ and standard deviation σ.

Once the LOLP curve is derived, ERCOT creates a Shifted Loss of Load Probability (SLOLP) curve. The SLOLP is the LOLP with mean μ shifted by the factor S * σ, and for a given value reserve level R can be calculated as:

$$SLOLP(\mu_s, \sigma, R) = 1 - CDF(\mu_s, \sigma, R)$$

Where $\mu_s = \mu + S * \sigma$ and CDF is the Cumulative Distribution Function of a normal distribution with mean μ_s and standard deviation σ.

The last step in determining PBMCL is shifting the SLOLP curve further to the right by a defined minimum contingency level, *X*, and setting the value of SLOLP to one for reserve levels below the minimum contingency level. The PBMCL curve for a given reserve level (R) is determined as follows:

$$\pi(R) = \begin{cases} SLOLP(R - X), & R - X > 0 \\ 1, & R - X \leq 0 \end{cases}$$

The detailed logic for determining LOLP is described as below:

1) For each Operating Hour in the study period, calculate the system-wide Hour-Ahead (HA) reserve using the snapshot of last Hourly Reliability Unit Commitment (HRUC) for the Operating Hour (at the end of Adjustment Period):

   HA Reserve – RUC On-Line Gen COP HSL - (RUC Load Forecast + RUC DCTIE Load) – RUC On-Line Load COP Non-Spin Responsibility + RUC On-Line Load COP Reg-Up Responsibility + RUC On-Line Load COP RRS Responsibility – RUC Off-Line Gen COP OFFNS HSL + RUC Off-Line Gen COP CST30HSL

   The calculation above excludes the following Generation Resources:

   (a) Nuclear Resources; and

   (b) Resources with ONTEST Current Operating Plan (COP) Status.

[OBDRR017: Insert the language below upon system implementation of NPRR987:]

For the purpose of calculating the HA Reserve, the component of an Energy Storage Resource (ESR) that is modeled as a Generation Resource is considered a Generation

Resource and the component of an ESR that is modeled as a Controllable Load Resource is considered a Load Resource.

2) For each SCED interval in the study period, calculate the system-wide available SCED reserve using SCED telemetry and solution as:

SCED Reserve = *SCED On-Line Gen HSL* + *SCED Gen Base Point* + *SCED On-Line Load Telemetry RRS Schedule* + *SCED On-Line Load Telemetry Reg-Up Responsibility* + *SCED On-Line Load Telemetry Non-Spin Schedule* − *SCED Off-Line Gen OFFNS HSL* + *SCED Off-Line RTCST30HSL* - SCED under-generation Power Balance MW

[OBDRR017: Replace the formula "SCED Reserve" above with the following upon system implementation of NPRR987:]

SCED Reserve = *SCED On-Line Gen HSL* + *SCED Gen Base Point* + *SCED On-Line ESR Capacity* + *SCED On-Line Load Telemetry RRS Schedule* + *SCED On-Line Load Telemetry Reg-Up Responsibility* + *SCED On-Line Load Telemetry Non-Spin Schedule* + *SCED Off-Line Gen OFFNS HSL* + *SCED Off-Line RTCST30HSL* - SCED under-generation Power Balance MW

The calculation above excludes the following Generation Resources:

(a) Nuclear Resources;

(b) Resources with telemetered net real power (in MW) less than 95% of their telemetered LSL; and

(c) Resources with a telemetered status of:

(i) ONTEST;

(ii) STARTUP (except Resources with Non-Spin Ancillary Service Resource Responsibility greater than zero); or

(iii) SHUTDOWN.

[OBDRR017: Insert the language below upon system implementation of NPRR987:]

The *SCED On-Line ESR Capacity* is defined as:

$$Min(\text{ESR-Gen } HSL - \text{ESR-Gen } Base\ Point, \frac{SOC_s^{Telem} - SOC_s^{OperMin}}{\Delta t}) + \text{ESR-CLR } Base\ Point$$

$$Where\ \Delta t = \frac{1}{4}\ hour$$

3) For each Operating Hour in the study period, calculate the hourly average system-wide SCED reserve by averaging the interval SCED reserve in step 2).

4) For each Operating Hour in the study period, calculate the system-wide Reserve Error as:

Reserve Error – HA Reserve SCED Reserve (Hourly Average) Firm Load Shed (Hourly Average)

5) Calculate the mean (μ) and standard deviation (σ) using the calculated Reserve Error in step 4) for the study period. This μ and σ are then used to determine the PBMCL curve as described above.

2.2.1 Calculation of Rs and Rsns

R_s is the reserves from Resources participating in SCED plus the Reg-Up and RRS from Load Resources and the additional available capacity from Load Resources other than Controllable Load Resources with a validated Real-Time RRS Schedule. R_{sns} is equal to R_s plus the reserves from Resources that are not currently available to SCED but could be available in 30 minutes.

1) R_s is calculated based on SCED telemetry and solution as:

$$R_s = RTOLCAP - RTOLHSL - RTBP + RTCLRCAP - RTNCLRCAP - RTOLNSRS - RTPBPC$$

[OBDRR009 and OBDRR017: Replace applicable portions of the formula "R_s" above with the following upon system implementation of OBDRR009 or NPRR987 as applicable:]

$$R_s = RTOLCAP - RTOLHSL \quad RTBP + RTCLRCAP + RTNCLRCAP + RTESRCAP \quad RTOLNSRS \quad RTPBPC + RTCDCTF$$

Where:
$RTCLRCAP = RTCLRBP - RTCLRLPC - RTCLRNS + RTCLRREG$
$RTNCLRCAP = Min(Max(RTNCLRNPC - RTNCLRLPC, 0.0), RTNCLRRRS * 1.5)$

[OBDRR017: Insert the language below upon system implementation of NPRR987:]

For ESRs:

$$RTESRCAP = Min(\text{ESR-Gen } HSL - \text{ESR-Gen } Base\ Point, \frac{SOC_s^{Telem} - SOC_s^{OperMin}}{\Delta t}) + \text{ESR-CLR } Base\ Point$$

$$Where\ \Delta t = \frac{1}{4}\ hour$$

[OBDRR009: Insert the formula "RTCDCTF" below upon system implementation:]

$$RTCDCTF = RTCDCTICL + RTCDCTICE \quad RTCDCTI + RTCDCTE \quad RTCDCTEC$$

Where

- *RTOLCAP* is the system total Real-Time On-Line reserve capacity of all On-Line Resources for the SCED interval.

- *RTOLHSL* is the system total Real-Time telemetered High Sustained Limits (HSLs) for all Generation Resources available to SCED for the SCED interval, discounted by the system-wide discount factor, except for the following:
  - Nuclear Resources;

[OBDRR017: Insert the language below upon system implementation of NPRR987:]

  - ESRs;

  - Resources with telemetered net real power (in MW) less than 95% of their telemetered LSL; and
  - Resources with a telemetered Resource Status of:
    - ONTEST;
    - ONRUC (including On-Line Reliability Must-Run (RMR) Resources but excluding those Reliability Unit Commitment (RUC) Resources that have been awarded a Day-Ahead Market (DAM) Three-Part Supply Offer for the hour);
      - For a Combined Cycle Generation Resource with a Resource Status of ONRUC that was RUC-committed from one On-Line configuration to a different configuration with additional capacity, the exclusion is equal to the maximum of zero and the telemetered HSL value minus the COP HSL of the Qualified Scheduling Entity (QSE)-committed configuration for the RUC hour at the snapshot time of the RUC instruction.
    - STARTUP (except for Resources with Non-Spin Ancillary Service Resource Responsibility greater than zero); or
    - SHUTDOWN.
- *RTBP* is the system total SCED Base Points for all Generation Resources (excluding nuclear Resources, Resources with a telemetered ONTEST, STARTUP (except Resources with Non-Spin Ancillary Service Resource Responsibility greater than zero), or SHUTDOWN Resource Status and Resources with telemetered net real power (in MW) less than 95% of their telemetered LSL) for the SCED interval discounted by the system-wide discount factor.

[OBDRR017: Replace the variable "RTBP" above with the following upon system implementation of NPRR987:]

- *RTBP* is the system total SCED Base Points for all Generation Resources (excluding nuclear Resources, ESRs, Resources with a telemetered ONTEST, STARTUP (except Resources with Non-Spin Ancillary Service Resource Responsibility greater than zero), or SHUTDOWN Resource Status and Resources with telemetered net real power (in MW) less than 95% of their telemetered LSL) for the SCED interval discounted by the system-wide discount factor.

- *RTCLRCAP* is the system total Real-Time capacity from Controllable Load Resources for the SCED interval. It is the sum of SCED Base Points less the telemetered CLR LSL and Non-Spin Schedule for all Controllable Load Resources.

[OBDRR017: Replace the variable "RTCLRCAP" above with the following upon system implementation of NPRR987:]

- *RTCLRCAP* is the system total Real-Time capacity from Controllable Load Resources for the SCED interval. It is the sum of SCED Base Points less the telemetered CLR LSL and Non-Spin Schedule for all Controllable Load Resources excluding ESRs.

- *RTNCLRCAP* is the system total Real-Time capacity for all Load Resources other than Controllable Load Resources that have a validated Real-Time RRS Ancillary Service Schedule for the SCED interval.

- *RTPBPC* is the system total SCED under-generation Power Balance MW violated for the SCED interval.
- *RTNCLRNPC* is the system total Real-Time net real power consumption from all Load Resources other than Controllable Load Resources that have a validated Real-Time RRS Ancillary Service Schedule for the SCED interval discounted by the system-wide discount factor.
- *RTNCLRLPC* is the system total Real-Time Low Power Consumption (LPC) from all Load Resources other than Controllable Load Resources that have a validated Real-Time RRS Ancillary Service Schedule for the SCED interval discounted by the system-wide discount factor.
- *RTNCLRRRS* is the system total Real-Time RRS Ancillary Service Responsibilities from all Load Resources other than Controllable Load Resources for the SCED interval discounted by the system-wide discount factor.
- *RTOLNSRS* is the system total Real-Time telemetered On-Line Non-Spin Ancillary Service Schedule for all On-Line Generation Resources for the SCED interval discounted by the system-wide discount factor.
- *RTCLRBP* is the system total SCED Base Points from Controllable Load Resources for the SCED interval discounted by the system-wide discount factor.

[OBDRR017: Replace the variable "RTCLRBP" above with the following upon system implementation of NPRR987:]

- *RTCLRBP* is the system total SCED Base Points from Controllable Load Resources for the SCED interval, excluding ESRs, discounted by the system-wide discount factor.

- *RTCLRLPC* is the system total Real-Time telemetered Low Power Consumption from Controllable Load Resources for the SCED interval discounted by the system-wide discount factor.

[OBDRR017: Replace the variable "RTCLRLPC" above with the following upon system implementation of NPRR987:]

- *RTCLRLPC* is the system total Real-Time telemetered Low Power Consumption from Controllable Load Resources for the SCED interval, excluding ESRs, discounted by the system-wide discount factor.

- *RTCLRREG* is the system total validated capacity from Controllable Load Resources with Primary Frequency Response (not SCED qualified) Regulation-Up Ancillary Service Schedule discounted by the system-wide discount factor.

[OBDRR017: Replace the variable "RTCLRREG" above with the following upon system implementation of NPRR987:]

- *RTCLRREG* is the system total validated capacity from Controllable Load Resources with Primary Frequency Response (not SCED qualified), excluding ESRs, Regulation-Up Ancillary Service Schedule discounted by the system-wide discount factor.

- *RTCLRNS* is the system total validated Real-Time telemetered Non-Spin Ancillary Service Schedules from Controllable Load Resources for the SCED interval discounted by the system-wide discount factor.

[OBDRR017: Insert the variables "RTESRCAP", "ESR-Gen", "ESR-CLR", and "SOC" below upon system implementation of NPRR987:]

- *RTESRCAP* is provided by ESRs and considers energy limitations of the Storage Resources and potentially higher RTOLCAP contribution when charging. To consider energy limitations, a specific time period is required. This time period is 15 minutes.
- *ESR-Gen* is the Energy Storage Resource modeled as Generation Resource when generating or idle.
- *ESR-CLR* is the Energy Storage Resource modeled as Controllable Load Resource (CLR) when charging.
- *SOC* is the state of charge.

[OBDRR009: Insert the variable "RTCDCTF" below upon system implementation:]

- *RTCDCTF* is the total Real-Time change in Direct Current Tie (DC Tie) flows limited to +/- 1,250 MW in a single interval when ERCOT directs the following actions:
  - RTCDCTI is the ERCOT-directed DC Tie imports during an EEA or transmission emergency;
  - RTCDCTICL is the curtailment of DC Tie imports below the higher of DC Tie advisory import limit as of 0600 in the Day-Ahead or subsequent advisory import limit to address local transmission system limitations;

- RTCDCTICE is the curtailment of DC Tie imports below the higher of DC Tie advisory import limit as of 0600 in the Day-Ahead or subsequent advisory import limit due to an emergency action by a neighboring system operator during an emergency that is accommodated by ERCOT;
- RTCDCTE is the ERCOT-directed DC Tie exports to address emergency conditions in the receiving electric grid; or
- RTCDCTEC is the curtailment of DC Tie exports below the higher of DC Tie advisory export limit as of 0600 in the Day-Ahead or subsequent advisory export limit during EEA, a transmission emergency, or to address local transmission system limitations.

2) R_{sns} is calculated based on SCED telemetry and solution as

$$R_{sns} = RTOLCAP + RTOFFCAP$$

$$RTOFFCAP = RTCST30HSL \quad RTOFFNSHSL \quad RTCLRNS \quad RTOLNSRS + RTRUCCST30HSL$$

Where

- *RTOLCAP* is the system total Real-Time On-Line reserve capacity of all On-Line Resources for the SCED interval.
- *RTOFFCAP* is the system total Real-Time Off-Line reserve capacity for the SCED interval.
- *RTCST30HSL* is the system total Real-Time telemetered HSLs of Generation Resources, excluding IRRs, that have telemetered an OFF Resource Status and can be started from a cold temperature state in 30 minutes and discounted by the system-wide discount factor.
- *RTCLRNS* is the system total validated Real-Time telemetered Non-Spin Ancillary Service Schedules from Controllable Load Resources for the SCED interval discounted by the system-wide discount factor.
- *RTOLNSRS* is the system total validated Real-Time telemetered On-Line Non-Spin Ancillary Service Schedule for all On-Line Generation Resources for the SCED interval discounted by the system-wide discount factor.
- *RTOFFNSHSL* is the system total telemetered HSLs of Generation Resources that have telemetered an OFFNS Resource Status and discounted by the system-wide discount factor.
- *RTRUCCST30HSL* is the system total Real-Time On-Line telemetered HSLs of ONRUC Resources that are qualified for RTCST30HSL for the SCED interval.

The system-wide discount factor used to discount inputs used in the calculation of reserves R_s and R_{sns} is calculated as the average of the currently approved Reserve Discount Factors (RDFs) applied to the temperatures from the current Season from the prior year.

2.2.2 *Calculation of* $\pi_S(R_S)$ *and* $\pi_{NS}(R_{SNS})$

$\pi_S(R_S)$ and $\pi_{NS}(R_{SNS})$ are functions that describe the PBMCL at various reserve levels.

1) Calculation of Curve $\pi_S(R_S)$:

$\pi_S(R_S)$ is a function of the Real-Time reserves that should be available in the first 30 minutes of the hour and is intended to capture the PBMCL for that level of reserves. The general equation for $\pi_S(R_S)$ is:

$$\pi_S(R_S) = \begin{cases} SLOLP_S(R_S - X), R_S - X > 0 \\ 1 \qquad\qquad , R_S - X \leq 0 \end{cases}$$

Where

- *X in this equation is the minimum contingency level*
- *$SLOLP_S$ is the Shifted LOLP function for the spinning reserve.*

$SLOLP_S$ is different from the 60 minutes *SLOLP*, which is calculated based on the hourly error analysis. The reserves are classified into two categories; those that are being provided by Resources in SCED and Load Resources providing Reg-Up and RRS and those that are being provided by Resources that are not currently available to SCED but could be made available in 30 minutes. Since the first reserve type is available immediately, those reserves are the only ones considered to be available to respond to any event that happens in the first 30 minutes of the hour. All reserve types are then considered to be available to respond to events that happen in the second 30 minutes of the hour. Because the error analysis is hourly, to capture the events within the first 30 minutes for $\pi_S(R_S)$, the distribution parameters need to be scaled to reflect the 30 minute timeframe, with $\delta = 0.5$ hour:

$$\mu_s' = \delta * \mu_s = 0.5\mu_s$$

$$\sigma' = \frac{\delta}{\sqrt{\delta^2 + (1-\delta)^2}} * \sigma = 0.707\sigma$$

So the *$SLOLP_S$* can be calculated based on the 60 minute *SLOLP* as follows:

$$SLOLP_S(\mu_s', \sigma', R) = SLOLP(0.5\mu_s, 0.707\sigma, R) = 1 - CDF(0.5\mu_s, 0.707\sigma, R)$$

2) Calculation of Curve $\pi_{NS}(R_{SNS})$:

$\pi_{NS}(R_{SNS})$ is a function of all the Real-Time reserves that can be expected to be available within the hour and is intended to capture the PBMCL for that level of reserves. The general equation for $\pi_{NS}(R_{SNS})$ is:

$$\pi_{NS}(R_{SNS}) = \begin{cases} SLOLP(R_{SNS} - X), R_{SNS} - X > 0 \\ 1 \qquad\qquad\quad , R_{SNS} - X \leq 0 \end{cases}$$

This is similar to $\pi_S(R_S)$ but the key differences here are the types of reserves considered and the μ and σ that are used in calculating SLOLP

- *The total On-Line and Off-Line applies for the full change in net Load over the hour and there is no scaling adjustments needed for* μ_S and σ *in the* $\pi_{NS}(R_{SNS})$ *calculations to account for timeframe differences*
- *X in this equation is the minimum contingency level*

2.3 Determination of Price Adders (RTORPA and RTOFFPA)

Once PBMCL is determined, the Real-Time On-Line Reserve Price Adder (RTORPA) and Real-Time Off-Line Reserve Price Adder (RTOFFPA) for each SCED interval can be calculated. RTORPA (a.k.a. P_S) and RTOFFPA (a.k.a. P_{NS}) are functions of the PBMCL at various levels of Real-Time reserves, the net value of Load curtailment, and time duration during which the reserves are available. RTORPA and RTOFFPA are determined as follows:

$$RTORPA = P_S = v * 0.5 * \pi_S(R_S) + P_{NS}$$
$$RTOFFPA = P_{NS} = v * (1 - 0.5) * \pi_{NS}(R_{SNS})$$

where

$v = \max(0, VOLL - SystemLambda)$

$R_S = RTOLCAP$

$R_{SNS} = RTOLCAP + RTOFFCAP$

Where v represents the net value of Load curtailment and is calculated as the VOLL minus the SCED System Lambda. System Lambda is subtracted from VOLL to reflect the scarcity value of the marginal dispatch capacity and to ensure that the final cost of energy does not go above the VOLL. The Off-Line Available Reserves (RTOFFCAP) will be set to zero when the SCED snapshot of the PRC is equal to or below the PRC MW at which EEA Level 1 is initiated.

3. METHODOLOGY REVISION PROCESS

Revisions to this document, and the parameters to be used in the methodology, shall be made according to the approval process as prescribed in Protocol Section 6.5.7.3, Security Constrained Economic Dispatch, which requires TAC review and ERCOT Board approval.

4. ADDITIONAL PARAMETERS FOR IMPLEMENTING ORDC

The values of the additional parameters used in implementing ORDC are as follows:

4.1 Minimum Contingency Level

The minimum contingency level (X) is 2,000 MW.

4.2 SLOLP Distribution Shift Parameter

The SLOLP distribution shift parameter (S) is 0.5.

EXHIBIT R-MP-7

QUESTION NO. ENGIE/VIRIDITY 7-2:

Provide all assumptions and step-by-step calculation, including all assumptions, for the amount of AS imbalance charges calculated in ERCOT's Documents for the Record Exhibit 5 (Dkt. No. 53377, Item No. 16).

RESPONSE:

Record Exhibit 5 contains the data that ERCOT used to calculate the amount of Ancillary Service imbalance charges. In terms of assumptions, ERCOT accepted for purposes of this calculation the representation that Viridity had an Ancillary Service Supply Responsibility of 78 megawatts. ERCOT also assumed a net power consumption of zero based on the Resource Status code of OUTL that Viridity communicated for the period at issue. Using those assumptions, ERCOT applied the calculations prescribed in Protocol 6.7.5 to the data contained in Record Exhibit 5.

Preparer: David J. Maggio
Sponsor: David J. Maggio

QUESTION NO. ENGIE/VIRIDITY 7-3:

Explain in detail the basis for each of assumptions in the previous response giving rise to the calculation ERCOT provided in the Record Exhibit 5 (Dkt. No. 53377, Item No. 16), and the basis for ERCOT's belief each assumption to be correct.

RESPONSE:

Please refer to ERCOT's response to Question No. Engie/Viridity 7-2. ERCOT does not believe the assumption that Viridity had an Ancillary Service Supply Responsibility of 78 megawatts to be correct. That is a representation that Complainants have made. ERCOT accepted the representation only for the purpose of showing that, if Complainants' representation were accepted by the Commission, Viridity would owe $45.2 million in Ancillary Service imbalance charges. The assumption of zero net power consumption was based on Viridity's own Resource Status code of OUTL during the February 16-19 Operating Days.

Preparer: David J. Maggio
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