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VIA EFILING

September 10, 2024

The Honorable Debbie-Anne A. Reese
Acting Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, DC 20426

Re: *PJM Interconnection, L.L.C.*, Docket No. ER21-1635-00, EL21-91-003

Dear Secretary Reese:

Pursuant to Rule 602 of the Commission's Rules of Practice and Procedure, 18 CFR § 385.602 (2012), Monitoring Analytics, LLC acting in its capacity of the Independent Market Monitor for PJM ("IMM"), submits the enclosed Settlement Agreement and Offer of Settlement ("Settlement") and accompanying materials resolving all matters relating to the above-captions proceeding.

This submission includes the following materials:

- This letter of transmittal;
- An Explanatory Statement in support of the Settlement (Appendix A);
- The Settlement (Appendix B);
- Affidavit of Dr. Joseph Bowring and supporting attachments (Appendix C);
- Revisions to OATT Schedule 6A para. 18-Clean (Appendix D);
- Revisions to OATT Schedule 6A para. 18-Redline (Appendix E); and
- A certificate of service certifying that the Settlement documents, including this transmittal letter, were served in accordance with the requirements of Rules 2010 and 602(d) of the Commission's Rules of Practice and Procedure (Appendix F).

The Market Monitor has served the parties listed on the Commission's official service list for Docket Nos. EL21-91-003; and posted the Settlement on its website, located at *http://www.monitoringanalytics.com*.

Sincerely,

Jeffrey Mayes
General Counsel
Monitoring Analytics, LLC
2621 Van Buren Avenue, Suite 160
Eagleville, Pennsylvania 19403

APPENDIX A

Explanatory Statement

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.	))))	Docket No. EL21-91-003 ER21-1635-009

EXPLANATORY STATEMENT IN SUPPORT OF OFFER OF SETTLEMENT

Monitoring Analytics, acting in its capacity as the Independent Market Monitor for PJM ("IMM"), submits this Explanatory Statement pursuant to Rule 602 of the Rules of Practice and Procedure of the Federal Energy Regulatory Commission ("FERC" or the "Commission"),[1] in support of its Offer of Settlement ("IMM Settlement Offer").

The IMM Settlement Offer is submitted as an offer of a settlement to be binding upon all other parties to the pending proceeding upon its approval by the Commission ("Settlement"). If approved by the Commission, the Settlement will resolve the issues set for hearing and settlement in this proceeding.[2]

I. BACKGROUND

This explanatory statement incorporates by reference the background provided in the Explanatory Statement of the Settling Parties filed August 14, 2024.

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1 18 CFR § 385.602 (2024).

2 *See PJM Interconnection, L.L.C.*, 182 FERC ¶ 61,194 at P 32 ("Hearing Order"); *see also PJM Interconnection, L.L.C.*, 176 FERC ¶ 61,080 (2021) ("Show Cause Order").

II. THE IMM OFFER PROVIDES JUST AND REASONABLE RESOLUTION TO ISSUES IN THE PROCEEDING, IS SUPPORTED BY SUBSTANTIAL EVIDENCE, AND SERVES THE PUBLIC INTEREST.

The IMM Settlement Offer resolves the issues raised in this proceeding because it replaces CRF values in paragraph 18 of Schedule 6A to the OATT for units entering service prior to June 6, 2021, with a method to calculate an appropriate CRF for each such unit based on the period of investment recovery for each such unit. The new CRF values would become effective September 1, 2021, which is a date established for administrative convenience based on the refund period commencing August 17, 2021, and ending after the 15 month refund period, on November 30, 2022.

Details on the approach are provided in the Bowring Affidavit (at 18:8–19:6):

> The Market Monitor's proposed corrected CRF values for settlement are based on defined steps: start with the beginning of the Commission defined refund period, adjusted from August 17, 2021 to September 1, 2021, for administrative convenience; determine the outstanding investment principal as of that date; and calculate a corrected CRF based on the original financial parameters and state income tax rate assumption, updated federal income tax rules and a recovery period equal to the time remaining in the original capital recovery period.[footnote omitted]
>
> Refunds are calculated equal to the difference between the revenues using the incorrect CRF values and the corrected CRF values over the 15 month Commission defined refund period, from September 1, 2021, through November 30, 2022.
>
> There are no refunds calculated after the end of the Commission's refund period, between December 1, 2022, and December 31, 2024, based on the Commission's statement on retroactive ratemaking and the limits on the Commission's refund authority.
>
> For the units that have a capital cost recovery period ending prior to January 1, 2025, there is no further adjustment. For resources that have a capital cost recovery period after January 1, 2025, the corrected CRF values are applied starting on January 1, 2025, through the end of the capital cost recovery period.

> The combination of the proposed CRF values and refunds will result in a lower payment for black start units than under the current, incorrect rates, but at the end of the recovery period the owners of the black start units will have received revenue sufficient to, or in some cases more than sufficient to, provide for the payback of debt at 7 percent interest, federal and state income tax liabilities, a 12 percent return on equity and the return of the equity portion of the capital investment.

The Settlement Offer does not require a determination that an over payment occurred in prior period prior to August 17, 2021. The proposed CRF values accept and recognize payments prior to August 17, 2021, and adjust for each unit the CRF values based on the remaining investment to be recovered after August 17, 2021. The offer of settlement is the only approach that fully accounts for the impact of the TCJA on the implementation of the formula rate in paragraph 18 of Schedule 6A to the OATT. The IMM Settlement Offer is just and reasonable because it calculates and applies accurate CRF values based on the known changes to the tax rates, and changes to tax depreciation rules, that resulted from the enactment of the TCJA.

The approach is unable to provide complete relief to customers only because the approach is designed to avoid operating retroactively and some units will continue to receive payments under the current CRF table after the end of the refund period. Acceptance of this limitation recognizes prior Commission statements on the relief available and is a reasonable compromise to achieve settlement of this case. No change to the formula rate, the method for calculation of the current CRF values or the amounts previously paid, with the exception of fifteen month refund period established in this proceeding, is required to implement the IMM Offer of Settlement.

The basis for the calculation of the unit specific settlement CRF values is supported by substantial evidence in the form of an affidavit of Dr. Joseph Bowring and supporting attachments. Confidential Attachment T describes the CRF values calculated for each unit. The IMM Offer of Settlement can be certified to the Commission if uncontested, and, even if contested, under either of the first two criteria of the *Trailblazer* approach for evaluating contested settlement.[3] The IMM Offer of Settlement should be certified to the Commission.

On August 14, 2024, the Settling Parties filed a motion to waive the initial decision. On August 23, 2024, the Market Monitor filed an answer opposing the motion. On August 30, 2024, the Presiding Judge denied the motion without prejudice. The Market Monitor does not oppose the motion to waive the initial decision solely to the extent that granting such waiver is necessary for the Presiding Judge to certify the IMM Offer of Settlement to the Commission, and for the Commission to consider the IMM Offer of Settlement on its merits.

The IMM Offer of Settlement should be approved because it fully addresses the issues set for hearing in the Hearing Order and set for investigation in the Show Cause Order, subject only to the avoidance of providing for retroactive changes to the amounts paid under the current rate not subject to refund. The IMM Offer of Settlement is just and reasonable and consistent with the public interest, subject to the presumption that complete relief is not possible. The IMM Offer of Settlement should be approved by the Commission.

If the Market Monitor's presumption of the possibility of complete relief is incorrect, and the Commission determines that complete relief should be provided consistent with its longstanding precedent on the filed rate doctrine as it applies to formula rates, the Market Monitor does not object to and would support changing the terms of settlement to afford such relief. The Market Monitor does not oppose modifications to the IMM Offer of

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[3] The four approaches for approving a settlement under *Trailblazer Pipeline Company* include: (i) addressing the contentions of the contesting party on the merits when there is any adequate record; (ii) approving a contested settlement as a package on the ground that the overall result of the settlement is just and reasonable; (iii) determining that the contesting party's interest is sufficiently attenuated such that the settlement can be analyzed under the fair and reasonable standard applicable to uncontested settlements when the settlement benefits the directly affected settling parties; or (iv) preserving the settlement for the consenting parties while allowing contesting parties to obtain a litigated result on the merits. *See Trailblazer Pipeline Company*, 85 FERC ¶ 61,345 (1998).

Settlement that the Commission determines are necessary for the IMM Offer Settlement to be found just and reasonable.

III. TERMS OF SETTLEMENT

Article 1 of the Settlement incorporates by reference Article 1 of the Settling Parties Offer of Settlement filed August 14, 2024, which provides the background regarding the proceeding, the procedural history, and the parties.

Article 2.1 provides that PJM will replace the CRF values in paragraph 18 of Schedule 6A of its OATT for units selected prior to June 6, 2021, with an approach for calculating unit specific CRF values effective during the period from September 1, 2021, through November 30, 2022.

Article 2.2 states that the Settlement Rates shall be effective as of August 17, 2024.

Article 3 provides that the various provisions of this Settlement shall become binding and effective upon issuance of a Commission order approving this Settlement ("Settlement Effective Date").

Article 4.1 provides that the Settlement constitutes the entire agreement with regard to the matters addressed in the captioned proceedings and implies no right, duties, or other restrictions not expressly set forth in the Settlement.

Article 4.2 sets the ordinary just and reasonable standard for any changes to the Settlement.

Article 4.3 makes the Settlement binding on and for the benefit of the parties and their successors and assigns.

Article 4.4 provides that the Commission's approval of the Settlement shall constitute the requisite grant of waivers of any regulation as may be necessary to permit the implementation of the Settlement.

Article 4.5 establishes no ambiguity in the Settlement will be construed against any party on the basis of that party being the drafter.

Article 4.6 explains that the title and headings of the sections of the Settlement are for reference purposes only and are not to be construed or considered in interpreting the Settlement.

IV. POLICY CONSIDERATIONS OF THE SETTLEMENT

The Chief Administrative Law Judge has released a public notice that specifies questions that an Explanatory Statement submitted in support of a proposed settlement agreement should address.[4] The questions, and specific responses applicable to the Settlement, are as follows:

A. Does the Settlement Affect Other Pending Cases?

The Settlement does not affect other pending cases.

B. Does the Settlement Involve Issues of First Impression?

The Settlement does not involve any issues of first impression.

C. Does the Settlement Depart from Commission Precedent?

The Settlement does not depart from Commission precedent.

D. Does the Settlement Seek to Impose a Standard of Review Other than the Ordinary Just and Reasonable Standard with Respect to Any Changes to the Settlement that Might be Sought by Either a Third Party or the Commission Acting *Sua Sponte*?

Article 4.2 of the Settlement sets the ordinary just and reasonable standard for any changes to the Settlement.

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[4] See Amended Notice to the Public on Information to Be Provided with Settlement Agreements and Guidance on the Role of Settlement Judges (December 15, 2016).

V. CONCLUSION

The Market Monitor respectfully request that the Presiding Judge certify the Settlement to the Commission and that the Commission issue an order approving the Settlement.

APPENDIX B

Offer of Settlement

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.	))))	Docket No. EL21-91-003 ER21-1635-009

OFFER OF SETTLEMENT AND SETTLEMENT AGREEMENT

This Settlement Agreement ("Settlement") and Offer of Settlement ("IMM Settlement Offer"), submitted to the Federal Energy Regulatory Commission for approval pursuant to Rule 602 of the Commission's Rules of Practice and Procedure,[5] is entered into as of the date of this filing by Monitoring Analytics, LLC, acting in its capacity as the Independent Market Monitor for PJM ("Market Monitor"). The IMM Settlement Offer is submitted to be binding upon all other parties upon Commission approval of the IMM Settlement Offer. If approved by the Commission, the IMM Settlement Offer will resolve the issues set for hearing and settlement in this proceeding.[6]

Subject to the conditions set forth in this IMM Settlement Offer, the parties to the above referenced proceedings shall adhere to a Settlement including the following terms:

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5 18 CFR § 385.602 (2024).

6 *See PJM Interconnection, L.L.C.*, 182 FERC ¶ 61,194 at P 32 ("Hearing Order"); *see also PJM Interconnection, L.L.C.*, 176 FERC ¶ 61,080 (2021) ("Show Cause Order").

ARTICLE 1: BACKGROUND

1.0 Background. Article 1 incorporates by reference Article 1 of the Settling Parties Offer of Settlement filed August 14, 2024.

ARTICLE II: RATE MATTERS

2.1 Settlement Rates. The Settlement revises Schedule 6A of the PJM Tariff to replace the Legacy CRFs with corrected CRF values calculated by the Market Monitor. The calculation is based on defined steps: start with the beginning of the Commission defined refund period, adjusted from August 17, 2021 to September 1, 2021, for administrative convenience; determine the outstanding investment principal as of that date; and calculate a corrected CRF based on the original financial parameters and state income tax rate assumption, updated federal income tax rules and a recovery period equal to the time remaining in the original capital recovery period.

Refunds are calculated equal to the difference between the revenues using the incorrect CRF values and the corrected CRF values over the 15 month Commission defined refund period, from September 1, 2021, through November 30, 2022.

The CRF values for each specific unit have been calculated and are included as confidential Attachment T to the Affidavit of Dr. Joseph Bowring submitted in support of this Settlement.

2.2 Effective Date of Settlement Rates. Subject to this Settlement becoming effective in accordance with Article III below, the Settlement Rates shall be effective on a permanent basis as of August 17, 2021.

ARTICLE III: EFFECTIVE DATE

3.0 Effective Date. The various provisions of this Settlement shall become binding and effective upon issuance of a Commission order approving this Settlement.

ARTICLE IV MISCELLANEOUS PROVISIONS AND RESERVATIONS

4.1 Entire Agreement. This Settlement, including any exhibits or attachments, constitutes the entire agreement with regard to the matters in the captioned proceeding and implies no right, duties, or other restrictions not expressly set forth herein.

4.2 Standard of Review. The standard of review for any proposed changes to the terms of this Settlement unilaterally sought by any party to this proceeding shall be the ordinary just and reasonable standard.

4.3 Successors and Assigns. This Settlement is binding upon and for the benefit of the Parties and their successors and assigns.

4.4 Requisite Waivers. The Commission's approval of this Settlement shall constitute the requisite grant of any waivers of any regulations as may be necessary to permit the implementation of the provisions of this Settlement by its terms.

4.5 Ambiguities. No ambiguity shall be construed in favor of or against any party on the basis that a particular party was or was not the drafter.

4.6 Headings. Section headings are used in this Settlement solely for convenience of reference and shall not be used to interpret or modify the terms of this Settlement.

IN WITNESS WHEREOF, this Settlement is entered into as of the date first written above.

Respectfully submitted,

/s/ Jeffrey Mayes
Jeffrey W. Mayes
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APPENDIX C

Affidavit of Dr. Joseph Bowring

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

PJM Interconnection, L.L.C.	)))	Docket No. EL21-91-000, -003

AFFIDAVIT OF JOSEPH E. BOWRING
ON BEHALF OF THE INDEPENDENT MARKET MONITOR FOR PJM

Q 1. PLEASE STATE YOUR NAME AND POSITION.

A. My name is Joseph E. Bowring. I am the Market Monitor for PJM. I am the President of Monitoring Analytics, LLC. My business address is 2621 Van Buren Avenue, Suite 160, Eagleville, Pennsylvania. Monitoring Analytics serves as the Independent Market Monitor (Market Monitor or IMM) for PJM, also known as the Market Monitoring Unit (MMU). Since March 8, 1999, I have been responsible for all the market monitoring activities of PJM, first as the head of the internal PJM Market Monitoring Unit and, since August 1, 2008, as President of Monitoring Analytics. The market monitoring activities of PJM are defined in the PJM Market Monitoring Plan, Attachment M and Attachment M-Appendix to PJM Open Access Transmission Tariff (OATT).[1]

Q 2. WHAT IS THE PURPOSE OF YOUR AFFIDAVIT?

A. The purpose of my affidavit is to explain: (1) the nature and purpose of the formula rate at issue in this proceeding; (2) how the existing Capital Recovery Factor (CRF) values for generating units that were selected to provide Black Start Service prior to June 6, 2021, were calculated;[2] (3) why, as a result of changes in federal income tax provisions resulting from the Tax Cuts and Jobs Act (TCJA),[3] the existing CRF values result in a Capital Cost Recovery Rate for generating units that were selected

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1 *See PJM Interconnection, L.L.C.*, 86 FERC ¶ 61,247; 18 CFR § 35.34(k)(6).

2 *See* PJM OATT Schedule 6A Para. 18.

3 Tax Cuts and Jobs Act of 2017, Pub. L. No. 115-97, 131 Stat. 2054 (2017).

to provide Black Start Service prior to June 6, 2021, that are unjust, unreasonable, and unduly discriminatory or preferential; (4) how the CRF input to the existing black start formula rate should be adjusted to produce a correct Capital Cost Recovery Rate for such units; and (5) how substantial evidence supports the offer of settlement filed by the Market Monitor as a just and reasonable resolution of the issues raised in this proceeding.

Q 3. PLEASE PROVIDE A SUMMARY OF THE CENTRAL ISSUE IN THIS CASE.

A. The federal tax law inputs to the formula rate for black start capital cost recovery changed as a result of tax law changes that became effective on January 1, 2018. The result was that the correctly calculated CRF values decreased significantly effective January 1, 2018. PJM failed to reflect those changed inputs in the CRF values used to calculate the rates paid to black start owners. PJM failed to change the CRF values after being notified of the issue by the Market Monitor. PJM finally changed the CRF values in a filing approved by order issued by the Commission on August 10, 2021, but those rates failed to address the ongoing overpayments to black start resources that had been selected to provide service prior to June 6, 2021.[4] PJM's approach in this case misunderstands the fundamental purpose of the CRF provision. That purpose is to ensure the payment of 100 percent of the defined return to investors. PJM's approach would result in substantial overpayment to investors in all affected black start units. This is a factual matter.

Q 4. WHAT ISSUES DID THE COMMISSION SET FOR HEARING?

A. The Commission's March 24, 2023, order set the following issue of fact for hearing:

> [W]hether, as a result of changes from the TCJA, the existing CRF values result in a Capital Cost Recovery Rate for generating units that were selected to provide Black Start Service prior to June 6, 2021 that is unjust and unreasonable. While the record does not contain conclusive evidence that the existing CRF values include a 35% tax rate, the Market Monitor has introduced sufficient evidence that those values may include a 35% tax rate, raising a disputed issue of

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[4] *See PJM Interconnection, L.L.C.*, 176 FERC ¶ 61,080 (2021).

> material fact as to whether changes to the tax rate render the existing CRF values unjust and unreasonable. The import of the tax rate in the determination of the CRF value is a material fact that cannot be determined based on the existing record, which warrants setting the justness and reasonableness of the existing CRF values for hearing and settlement judge procedures.[5]

I conclude in this affidavit that the CRF calculation for black start resources that were selected prior to June 6, 2021, included a tax rate of 36 percent and did not include the TCJA bonus depreciation provisions. I conclude that the TCJA federal tax provisions should have been included in all CRF values effective on January 1, 2018, and thereafter. I conclude that failure to include the correct tax provisions in the CRF component of the formula rate resulted in overstated rates and resulted in excess payments to black start resources that were unjust and unreasonable as a result. I explain how to provide appropriate relief to ensure, to the maximum extent consistent with Commission policy on refunds, that PJM customers do not overpay for black start service based on PJM's errors in implementing the impact of the TCJA on the CRF component of the formula rate for black start resources selected for service prior to June 6, 2021.

Q 5. WHAT ARE THE ISSUES SET FOR HEARING THAT THE MARKET MONITOR OFFER RESOLVES?

A. The Commission noted that the Market Monitor had provided sufficient evidence to raise the issue but did not find that there was conclusive evidence as to the tax rate included in the CRF calculations. This affidavit and attachments provide dispositive evidence that the existing CRF values are based on a 36 percent tax rate, including public PJM reports.[6] [7] This affidavit and attachments provide dispositive evidence that the existing CRF values were based on the use of Modified Accelerated Cost

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5 *See PJM Interconnection, L.L.C.*, 182 FERC ¶ 61,194 at P 32.

6 *Comments of the Independent Market Monitor for PJM* at 6, Docket No. ER21-1635-000 (April 28, 2021). *See* Attachment L.

7 *Id*. at footnote 15.

Recovery System (MACRS) depreciation, including public PJM reports.[8] [9] The question is not complicated. The straightforward CRF math demonstrates the tax rate that is incorporated in the referenced CRF values. As a result, this affidavit demonstrates that the existing CRF values that PJM continues to apply to black start resources selected prior to June 6, 2021, are simply wrong. The federal income tax rate was reduced to 21 percent and the MACRS depreciation was replaced with the more favorable bonus depreciation. Because the CRF values do not include the actual tax rate and depreciation provisions that became effective on January 1, 2018, both of which significantly reduced the taxes paid by the referenced black start resources, the rates necessarily allow for over recovery of the investment that the rate is designed to recover, and are therefore unjust and unreasonable. The rate is excessive and the over recovery is substantial. The rate cannot be properly determined to be just and reasonable based on a determination that the impact is de minimis. The impact is not de minimis.

Once the factual issue is resolved, the issue of how to determine the appropriate going forward CRF values for units selected prior to June 6, 2021, must be resolved, in order to ensure just and reasonable recovery of their discrete investment under the applicable formula rate.

Q 6. WHAT IS THE EVIDENCE FOR THE LEVEL AND DEFINITION OF THE FEDERAL TAX RATE IN THE ORIGINAL CRF VALUES?

A. PJM's required reports to stakeholders (see Attachment E at 7, Attachment F at 8 and Attachment G at 8 to this affidavit) all document explicitly the inputs to CRF calculations and that the level of the federal tax rate included in the CRF values is 36 percent. PJM also included the 36 percent tax rate in its report to stakeholders dated October 2019, after the tax law changes took effect. The income tax and depreciation assumptions are also validated by responses to discovery questions by the Market Monitor and PJM. In response to S-IMM-1.1, the Market Monitor provided a spreadsheet that shows the calculation of the CRF values (Attachment P). In response to S-PJM-1.2, PJM provided a copy of the original spreadsheet that was used to calculate the CRF values (Attachment S). These CRF values, including the superseded 36 percent federal tax rate, and the superseded MACRS depreciation,

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[8] *See* Attachment D at 6.

[9] Spreadsheets provided in response to data requests also validate that 15 year MACRS factors were used to calculate the original CRF. See responses to Staff-IMM 1-1 and Staff-PJM 1-2, provided as Attachments P and S.

have applied and continue to apply to black start resources that were selected to provide black start service prior to June 6, 2021.

Q 7. PLEASE DESCRIBE THE NATURE AND PURPOSE OF THE RATE AT ISSUE IN THIS PROCEEDING.

A. The specific rate at issue in this proceeding is a formula rate included in Paragraph 18 of Schedule 6A of the OATT (Schedule 6A). The formula rate in Schedule 6A compensates black start service units included in PJM's system restoration plan. PJM relies on the black start system restoration plan to restore service if there is a system wide black out event, a shutdown of the PJM transmission system.

The formula rate included in Schedule 6A is:

(Fixed BSSC) + (Variable BSSC) + (Training Costs)
+ (Fuel Storage Costs)} * (1 + Z)

Only the Fixed BSSC term of the formula is at issue in this proceeding and even more specifically only the CRF component of the Fixed BSCC as it applies to black start units selected to provide black start service prior to June 6, 2021, is at issue in this proceeding. Selected to provide service means that PJM selected the black start resource pursuant to a PJM RFP process prior to June 6, 2021, and does not refer to the date that the resource actually began providing service.

There are three options for calculating the Fixed BSSC term: the Base Formula Rate; the Capital Cost Recovery NERC-CIP Specific Recovery; and the Capital Cost Recovery Rate.

The first option is the Base Formula Rate for Fixed BSSC:

(Net CONE * Black Start Unit Capacity * X.)

The Base Formula Rate formula calculates a rate based on the net cost of new entry (Net CONE) for a new unit in the PJM Capacity Market in $/MW-day, multiplied by the Black Start Unit Capacity in MW, multiplied by an allocation factor X which is defined to be .02 for CTs (combustion turbine generators). The Net CONE value is a parameter of the PJM Capacity Market and has nothing directly to do with the cost of units providing black start service.

The Base Formula Rate for Fixed BSSC does not provide for the recovery of a specific capital investment in black start capability. The default Fixed BSSC is not based on the cost of the black start resource. The Base Formula Rate in Paragraph 18 is not a cost of service rate.

The second option is the Capital Cost Recovery NERC-CIP Specific Recovery, a special purpose Fixed BSCC that allows existing black start units to recover incremental costs associated with compliance with NERC reliability standards.[10] The formula for Capital Cost Recovery NERC-CIP Specific Recovery is:

(Net Cone * Black Start NERC-CIP Unit Capacity * X) + (Incremental Black Start NERC-CIP Capital Costs * CRF) + (Fuel Assurance Capital Costs * CRF)

The third option, the Capital Cost Recovery Rate, is at issue in this proceeding.[11] The Fixed BSCC formula is:

(FERC-approved rate) + (Incremental Black Start Capital Costs * CRF) + (Fuel Assurance Capital Costs * CRF)

The issue in this case is the correct CRF values for black start resources that are paid under the Capital Cost Recovery Rate.

As there is no “FERC-approved rate” component of the rates for the units at issue in this proceeding, the “FERC approved rate” component is effectively zero dollars.

None of the black start resources at issue have any Fuel Assurance Capital Costs to date.

Therefore, the effective Fixed BSCC formula for purposes of this proceeding is:

(Incremental Black Start Capital Costs * CRF)

The CRF provides for the return on and of a discrete, defined investment in black start capability over a defined period at a defined rate of return, after which the

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[10] *See PJM Interconnection, L.L.C.*, 127 FERC ¶ 61,197, at P 39; order on compliance filing 1, 128 FERC ¶ 61,249 (September 17, 2009); delegated order on compliance filing 2 (November 17, 2009).

[11] This option was established by the Commission in 2011. *See PJM Interconnection, L.L.C.*, 138 FERC ¶ 61,020; PJM Filing, Docket No. ER11-1440 (August 30, 2011) at 9.

payment for black start becomes the default black start charge for the remainder of the term for which the resource provides black start service.

Q 8. WHAT IS A CRF?

A. CRF means capital recovery factor. A CRF is a rate component which, when multiplied by the investment in an asset, results in an equal annual revenue requirement over the defined term of the CRF. That annual revenue requirement provides for full recovery of the investment costs and a return on that investment over the defined term of the CRF at a rate of return defined in the CRF formula. CRF is a general financial concept broadly applicable across investments and industries. (See the IMM reports on the CRF calculations in Attachment B, Attachment C and Attachment M at 7–10).

Q 9. WHAT IS THE PURPOSE OF THE CRF CALCULATIONS FOR BLACK START REVENUE REQUIREMENTS?

A. The CRF calculations in the PJM OATT were originally developed for use in defining market seller offer caps in PJM capacity market auctions.[12] The purpose of the CRF values in the capacity market was to explicitly match the return of and on capital to the expected life of the incremental investment in capacity resources, defined as APIR in the OATT, Attachment DD.[13] At the time of the establishment of the RPM capacity market rules, coal units with relatively short expected remaining lives were required to make large investments in environmental controls. As a result, it was necessary to provide for different time periods over which the opportunity for full recovery of capital costs could occur. The CRF table defined CRF levels for a range of expected asset lives with a defined set of input variables and values.

The purpose of the CRF calculations in Attachment DD and in the Capital Cost Recovery formula is the same. The purpose of the CRF calculations for black start revenue requirements is to provide for full recovery of the incremental investment costs in black start resources and a return on that investment over the defined term of the CRF at a rate of return defined in the formula.

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12 *See PJM Interconnection, L.L.C.*, 117 FERC ¶ 61,331 (2006); OATT Attachment DD § 6.8(a).

13 *See* OATT Attachment DD § 6.8(a).

Q 10. HOW WERE THE EXISTING CRF VALUES CALCULATED FOR GENERATING UNITS THAT WERE SELECTED TO PROVIDE BLACK START SERVICE PRIOR TO JUNE 6, 2021?

A. The CRF values were included in the initial RPM filing in 2005.[14] The Market Monitor calculated the CRF values that were included in PJM's 2005 RPM filing.[15] The CRF values were added to Schedule 6A in 2009 to allow for the recovery of new or additional fixed black start capital costs.[16] It was explicit at the time of the filing that the CRF values were an input to a specifically defined formula rate and not a stated rate.[17]

Q 11. WERE THE CRF VALUES ALWAYS BASED ON EXPLICTLY STATED INPUT VALUES, INCLUDING THE APPLICABLE FEDERAL INCOME TAX RATE?

A. Yes. There are six defined inputs to the CRF formula: debt to equity ratio, rate of return on equity, interest rate on debt, federal income tax rate, state income tax rate and depreciation factors.[18] These inputs were stated explicitly the very first time that PJM filed the CRF values in the capacity market filing. The Market Monitor developed the CRF method that was incorporated in the CRF tables in the PJM OATT.

Q 12. IS THE CRF CALCULATION A BLACK BOX CALCULATION?

A. No. The CRF calculation is not and has never been a black box calculation. The CRF calculation is based on a limited set of known inputs that result in the defined

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14 PJM Filing, ER05-1410 (August 31, 2005) Tab C (Revised Original Sheet No. 590).

15 Affidavits by Joseph Bowring and Raymond Pasteris included in PJM's Filing in ER05-1410 describe the CRF calculation and the model assumptions. *Id.*, Tab G (Affidavit of Joseph E. Bowring) at 23, and Tab I ("Independent Study to Determine Cost of New Entry Combustion Turbine Power Plan Revenue Requirement," Attachment to the Affidavit of Raymond M. Pasteris on Behalf of PJM Interconnection, L.L.C.) at 3–4.

16 *See* Attachment J at 7.

17 *Id*.

18 *See* the Market Monitor reports on the CRF calculations in Attachment B and Attachment C.

CRF values that were first listed in a table in Attachment DD to the PJM OATT. In addition to the fact that the Market Monitor calculated the CRF values and the details of those calculations have been provided, PJM also explicitly states the detailed assumptions of the original CRF calculation. See PJM reports that demonstrate PJM's knowledge of the detailed nature of the CRF calculations: Attachment F at 7, Attachment G at 8, Attachment H at 8, Attachment K at 9 to this affidavit.)

Q 13. IS THE FEDERAL INCOME TAX RATE ONE OF THE INPUTS TO THE CRF CALCULATION?

A. Yes. The federal income tax rate is one of the explicitly stated inputs to the CRF calculation. The original CRF calculations explicitly included a federal income tax rate of 36 percent. This tax rate was included in the original PJM RPM filing, has been stated publicly by the Market Monitor on numerous occasions, and was included in PJM's reports to stakeholders on black start costs.[19]

Q 14. IS THE TAX DEPRECIATION METHOD ONE OF THE INPUTS TO THE CRF CALCULATION?

A. Yes. The tax laws in place prior to the TCJA provided for the use of MACRS depreciation in the calculation of federal taxes. The TCJA replaced MACRS with a bonus depreciation method that allowed for depreciation of 100 percent of the asset value in the first year of operation.[20] The impact of that change was to reduce the federal income taxes owed by the affected entity. The original CRF calculations explicitly included federal income tax payments based on MACRS depreciation rate. The MACRS depreciation method was included in the original PJM RPM

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[19] *See* Attachment E at 7, Attachment F at 8, Attachment G at 8, Attachment K at 9, Attachment S.

[20] Bonus depreciation is 100 percent for capital investments placed in service after September 27, 2017 and before January 1, 2023. Bonus depreciation is 80 percent for capital investments placed in service after December 31, 2022 and before January 1, 2024, and the bonus depreciation level is reduced by 20 percent for each subsequent year through 2026. Capital investments placed in service after December 31, 2026 are not eligible for bonus depreciation. See 26 U.S. Code §168(k)(6)(A).

filing, has been stated publicly by the Market Monitor on numerous occasions, and was included in an October 31, 2006, presentation to the MIC.[21]

Q 15. HAS THE MARKET MONITOR USED DIFFERENT APPROACHES TO DEFINING THE CRF FORMULA?

A. Yes. The Market Monitor has used different approaches but all of them are substantively identical. The Market Monitor used a multiyear financial model to calculate the CRF values that were included in Attachment DD to the PJM OATT. That financial model included repayment of debt on a fixed mortgage style schedule and recognized that all net revenue in excess of costs including debt costs and tax obligations flow to the equity owner of the asset. This approach is called the flow to equity (FTE) approach.

In 2021, the Market Monitor developed a formula that is the equivalent of the multiyear financial model for calculating CRF values.[22] However, the formula provided by the Market Monitor used the weighted average cost of capital (WACC) approach to defining returns to debt holders and equity owners rather than the FTE approach. The WACC approach maintains a constant debt to equity ratio by attributing net revenue in excess of costs to both debt holders and equity owners in proportion to the debt to equity ratio. That formula was filed by PJM and approved by the Commission and is now both in Attachment DD and Schedule 6A of the PJM OATT.

As part of the Market Monitor's responses to Commission Staff discovery in this case, the Market Monitor clarified that the FTE approach correctly reflects the ownership interests in net revenue in excess of costs.[23] The pre-June 6, 2021, CRFs were calculated using a flow to equity (FTE) financial model that incorporates a mortgage payment approach for the loan repayment. Under this approach, the debt to equity ratio is not constant during the cost recovery period. The formula for the post-June 6, 2021, CRF was derived from a weighted average cost of capital (WACC) financial model that maintains a constant debt to equity ratio. When the

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[21] *See* Attachment D.

[22] Comments of the Independent Market Monitor for PJM, ER21-1635-000 (April 28, 2021) at 16.

[23] *See* the Market Monitor's response to discovery question S-IMM-1.3, Attachment O, Attachment Q.

revenue is equal to the level required to meet all the payment obligations, without excess payments, the results of the two models are quite close.

When there are payments in excess of the level required to meet all the payment obligations, as has occurred in this case, the difference between the models is significant. In the WACC model, the revenue in excess of income taxes, required interest payments and return on equity is split between accelerated loan repayment and payment to equity according to the debt to equity ratio, and the debt to equity ratio is maintained at a constant level during the cost recovery period. In the FTE model, revenue in excess of income taxes and required debt payments flows to the equity investor.

In this case, payments to black start resources used CRF calculations based on taxes higher than actual required tax payments. As a result, there were payments in excess of the level required to meet all the payment obligations. In cases where there are excess payments, the FTE model accurately captures the excess returns to equity while the WACC model does not.

Rather than assuming that a part of excess earnings flow to debt holders as the WACC approach does, the FTE approach correctly recognizes that all of the excess earnings flow to equity holders. The FTE approach is the correct way to calculate CRF values because it reflects the fact that excess revenues flow to the equity holders. The FTE is also expressed as a formula with the same inputs and same input values as the Market Monitor's formula with the WACC approach.[24] The Market Monitor developed and provided the CRF formula based on the FTE approach as part of the responses to Staff discovery in this matter.[25]

Q 16. ARE THERE MULTIPLE WAYS TO CORRECTLY CALCULATE THE CRF?

A. No. The FTE approach is the correct way to calculate CRF values because it reflects the fact that excess revenues flow to the equity holders. The choice of inputs to the CRF is not a matter of judgment. The inputs are defined and have been recognized by PJM.

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[24] Attachment B provides the FTE formula at 11. Attachment C shows the WACC formula at 7.

[25] See spreadsheet attached to the Market Monitor's response to discovery question S-IMM-1.3, Attachment Q.

Q 17. WHAT IS THE RELATIONSHIP BETWEEN THE CRF TABLE IN ATTACHMENT DD AND THE CRF TABLE IN SCHEDULE 6A?

A. The table of CRF values based on the CRF table in Attachment DD was included in Schedule 6A for black start because the issue was the same issue addressed in the capacity market. The issue was how to match the expected or intended life of the asset (black start investment) to the recovery of the capital costs using equal annual payments for a range of different recovery periods. The financial calculation is the same for any asset if the inputs are the same. The inputs were the same for the capacity market and the black start cost recovery. One important difference between the two applications of CRF is that the CRF is intended to pay black start owners the exact amount of the CRF revenue requirement while in the capacity market, the CRF/APIR calculation changes the market seller offer cap and provides the opportunity to receive the full annual revenue requirement in the capacity market.

Q 18. DOES SCHEDULE 6A PROVIDE FOR FULL RECOVERY OF BLACK START INVESTMENT COSTS OVER A DEFINED PERIOD?

A. Yes. Schedule 6A provides that at the conclusion of the recovery of the specific and discrete investment cost over the defined term of the recovery period, recovery of the investment cost using the Capital Cost Recovery Rate is complete. The Capital Cost Recovery Rate is specifically designed for the recovery of a discrete fixed capital investment plus a return on the invested capital. When the Capital Cost Recovery Rate has served its purpose and provided a return of and on the investment, continued black start service is then compensated under the default rate.

Q 19. WHAT IS THE DIFFERENCE BETWEEN A STATED RATE AND A FORMULA RATE?

A. A stated rate is a fixed value approved by the Commission. A formula rate is a formula approved by the Commission with defined inputs. As input values change, the new values are used in the formula to calculate the applicable rate.[26] The Capital Cost Recovery Rate is a formula rate. The CRF, a component of the Capital Cost Recovery Rate, is a specific input to a formula rate that is calculated based on a defined formula.

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[26] *See* Attachment L at 3–4.

Q 20. WHY DO THE EXISTING CRF VALUES RESULT IN AN OVERRECOVERY OF CAPITAL COSTS FOR BLACK START UNITS SELECTED PRIOR TO JUNE 6, 2021?

A. The CRFs, when multiplied by the capital investment amount, result in an annual revenue payment that is sufficient to provide for the return on and return of the capital investment and to provide for the income taxes associated with the annual revenue payment over the term of the CRF.

The original CRF calculation, which resulted in values calculated by the Market Monitor and proposed by PJM for inclusion in the OATT in 2005, and included in Schedule 6A of the PJM OATT in 2009, was based on a federal income tax rate of 36 percent and depreciation using the 15 year Modified Accelerated Cost Recovery System (MACRS).[27]

The TCJA reduced the federal income tax rate for existing and new investments, including black start investments, effective January 1, 2018. The TCJA reduced the federal corporate income tax rate to 21 percent. The TCJA also included a provision that allows for 100 percent bonus depreciation for property placed in service after September 27, 2017, and before January 1, 2023.[28] [29]

The result was a significant reduction in the CRF for black start investments. The continued application of the CRF inputs that include higher than actual tax obligations has resulted in customers paying black start owners a windfall equal to the impact of the reduction in tax obligations under the TCJA. Customers paid and are paying for the capital costs of black start resources as if those resources were obligated to pay taxes at the prior high rate when those resources were actually paying taxes at a much lower rate.[30]

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[27] *See* for example Attachment D at 6, Attachment E at 7, Attachment F at 8, Attachment G at 8, Attachment K at 9.

[28] Tax Cuts and Jobs Act, Pub. L. No. 115-97, 131 Stat. 2096, Stat. 2105 (2017) at Subtitle C, Part I, SEC. 13001.

[29] *Id*. at Subtitle C, Part III, SEC. 13201.

[30] *See* Attachment M, Attachment B, Section F at13.

PJM should have reduced CRF values immediately, effective January 1, 2018, for all existing and new black start resources. The result would have been to ensure that all black start owners received what they reasonably expected when PJM selected them to provide black start service and to ensure that all customers paid what they could have reasonably expected. Those reasonable expectations included a return on and of the capital invested to provide black start service, over the defined recovery period.

The Market Monitor notified PJM by email of the CRF errors on October 3, 2019.[31] Eighteen months later, in April 2021, PJM filed to update the CRFs and at that time argued the original CRFs were black box values that could not be updated for existing black start providers. PJM recognized in 2020 that the federal income tax rate in the CRF values needed to be corrected from 36 percent to 21 percent.[32]

When the Market Monitor identified the impact of the tax change on the accuracy of the CRF values, neither the Market Monitor, nor PJM nor any stakeholder identified any other issue with the accuracy of the CRF table. The Market Monitor requested that PJM file to change the CRF values solely to address the impacts of the known change in the applicable tax rates. After prolonged and unnecessary delay, PJM filed to correct the impact of the tax change issue going forward, and no other issue, in Docket No. ER21-1635-000.[33] In response to the Market Monitor and others' pleadings protesting the failure to address the impact on the CRF values of the tax change issues on formula rates applied prior to June 6, 2021, and no other issue, the Commission issued a show cause order in Docket No. EL21-91-000.[34]

Q 21. WHAT HAS BEEN THE RESULT OF THE FAILURE TO CORRECTLY CALCULATE THE CRF VALUES?

A. There are 49 black start generators that have received payments based on the outdated CRFs that reflect federal income tax rates and depreciation schedules corresponding to the tax laws in effect prior to the passage of the TCJA. The 49 generators include 29 black start generators that began providing black start service

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31 *See* Attachment H.

32 *See* Attachment L at 9, attached, Black Start Education, PJM Interconnection, L.L.C., PJM Operating Committee Meeting (May 14, 2020).

33 PJM FPA Section 205 Filing, Docket No. ER21-1635-000 (April 7, 2021).

34 176 FERC ¶ 61,080.

prior to September 27, 2017, and would not have been eligible for bonus depreciation under the TCJA. Of those 29 black start generators, 11 completed their capital recovery terms between January 1, 2018, and June 2021. The excess payments to these 29 generators were due to the change in the federal income tax rate alone and were not affected by the changes to depreciation rules. Of the 49 black start generators, 20 began black start service after September 27, 2017, and before January 1, 2023, and received excess payments as a combined result of the change in the federal income tax rate and the change in depreciation rules included in the TCJA. Of the 38 black start generators, from that group of 49, that have not completed their capital recovery terms, 24 generators will complete their capital recovery terms in 2024 and 2025. An additional 8 generators will complete their capital recovery terms in 2026. The last 6 generators will complete their capital recovery terms from 2035 through 2040.

Q 22. WHAT IS THE SOURCE OF THE ISSUES IN THIS CASE?

A. The original source of the issue in this case was the failure of PJM to change the CRF values in the black start formula rate, effective January 1, 2018, to correctly reflect the changes in the tax code that resulted from the TCJA. PJM knew the inputs to the CRF and had a tariff defined responsibility to review the black start formula rate and its costs components for accuracy.[35] In PJM's review of and related report on the black start formula rates dated October 2019, PJM failed to recognize that the tax rate had changed effective January 1, 2018, and incorrectly stated the federal tax rate.[36]

This case is about how to address PJM's failure to recognize the issue, and once the issue had been brought to their attention, PJM's failure to address the issue consistent with the tariff and in a timely manner. PJM could have filed to correct the tax rate included in the black start formula rate effective on January 1, 2018, at any time. Yet PJM failed to make any such filing. PJM proposed to change the formula rate only for black start generators that are scheduled for service after June 6, 2021. The result has been to substantially over charge PJM customers and to substantially over pay black start generators.

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[35] OATT Schedule 6A para. 18 ("Every five years, PJM shall review the formula and its costs components set forth in this section 18, and report on the results of that review to stakeholders.").

[36] *See* Attachment G.

PJM, in this case, fails to take responsibility for that failure. PJM continues to delay a resolution of the issue that is based on the tax code and the tariff while attempting to blame the Market Monitor for delays.

Q 23. THE FILING PARTIES REFERENCE DELAY AND LITIGATION RISK. WHO IS RESPONSIBLE FOR DELAY IN THIS MATTER?

A. PJM had and continues to have the ability to file with the Commission to change the CRF. PJM could have filed with the Commission to modify the CRF values based on the new tax code, effective January 1, 2018. PJM could still make that filing, effective when filed.

It is at best ironic that PJM should complain about the Market Monitor slowing down the process.

Q 24. HOW DOES TIMING AFFECT THE POSSIBLE OUTCOMES IN THIS MATTER?

A. The Commission has indicated that retroactive application of revised CRFs to black start resources that have completed their capital cost recovery is not a viable option in this proceeding.[37] There are 22 black start resources that will complete their capital recovery terms between January 1, 2025, and December 31, 2025. There are eight black start resources that will complete their capital recovery terms between January 1, 2026, and December 31, 2026. There are six black start resources that will complete their capital recovery terms after December 31, 2026. In the absence of a Commission decision, these black start resources will continue to be paid based on the incorrect and overstated CRFs through the full term of their CRFs.

Q 25. HOW DOES THE MARKET MONITOR PROPOSE TO SETTLE THIS CASE ON A JUST AND REASONABLE BASIS?

A. The perfect resolution of this case would be to recalculate the formula rate accurately for the entire period of capital cost recovery since the TCJA became effective, to apply that rate going forward from the date the TCJA became effective, and to require refunds of the difference between the incorrect rate and the correct rate. The Commission has stated in this proceeding that this approach would constitute retroactive ratemaking.[38] As a result, the Market Monitor's settlement

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[37] *See* 176 FERC ¶ 61,080 at P 50.

[38] *Id*.

proposal is based on the assumption that the Commission would not accept this perfect approach.

For purposes of settlement, the Market Monitor proposes an approach that avoids retroactive adjustments of any kind. The Market Monitor settlement approach adjusts the applicable CRF values going forward from the start of the Commission's refund period, based on the capital recovered, which is a function of the service period start and end dates for each affected black start unit and the collected CRF value.

The Market Monitor has calculated those CRF values that would provide a just and reasonable resolution in this case and avoid any retroactive calculations. Those CRF values are in confidential Attachment T.

In addition, the Market Monitor has calculated the refunds for the Commission defined refund period and the associated interest on those refunds.

Q 26. HOW IS THE CAPITAL COST RECOVERY RATE ADJUSTED FOR THE UNITS SELECTED TO PROVIDE SERVICE PRIOR TO JUNE 6, 2021, IN THE MARKET MONITOR'S SETTLEMENT PROPOSAL?

A. The CRF values in Attachment T are recalculated for the units selected to provide Black Start Service prior to June 6, 2021, in order to ensure that the purpose of the Capital Cost Recovery Rate is met, and that black start units are correctly compensated over the defined term for each such unit. That recalculation reflects the return of capital already received by existing black start units under the applied CRF values, and, as a result, eliminates the excess recovery that would occur if the current CRF values remain in place, if there is sufficient time remaining in the defined term. The proposed CRF values are set at a level that pays for the full tax liability and the full return on the black start capital investment (rate of return or cost of capital) and the full return of the black start capital investment (depreciation) over the full defined term. A description of this general approach and a formula for calculating the updated CRF was included in the Market Monitor's Comments in this docket.[39]

[39] *See* Comments of the Independent Market Monitor for PJM, Docket No. EL21-91-000 (November 11, 2021), corrected (November 18, 2021), at 19–26.

Simply applying the post-June 6, 2021, CRF formula to the black start units that started service prior to June 6, 2021, would not provide an equitable resolution. An equitable resolution must account for the capital costs already returned to the equity investors.[40] The reduction in the income tax liability introduced with the Tax Cuts and Jobs Act significantly lowered the income tax payments. The resulting increased revenues have gone to the equity investors, accelerating the capital cost recovery compared to what was assumed in the original CRF values.

The Market Monitor's proposed corrected CRF values for settlement are based on defined steps: start with the beginning of the Commission defined refund period, adjusted from August 17, 2021, to September 1, 2021, for administrative convenience; determine the outstanding investment principal as of that date; and calculate a corrected CRF based on the original financial parameters and state income tax rate assumption, updated federal income tax rules and a recovery period equal to the time remaining in the original capital recovery period.[41]

Refunds are calculated equal to the difference between the revenues using the incorrect CRF values and the corrected CRF values over the 15 month Commission defined refund period, from September 1, 2021, through November 30, 2022.

There are no refunds calculated after the end of the Commission's refund period, between December 1, 2022, and December 31, 2024, based on the Commission's statement on retroactive ratemaking and the limits on the Commission's refund authority.

For the units that have a capital cost recovery period ending prior to January 1, 2025, there is no further adjustment. For resources that have a capital cost recovery period after January 1, 2025, the corrected CRF values are applied starting on January 1, 2025, through the end of the capital cost recovery period.

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[40] The Market Monitor showed in a previous filing that an equity investor would have fully recovered its capital investment in the 2nd year of capital recovery in the case that bonus depreciation was applicable. See Table 6 in Attachment M Exhibit IMM-0014, Attachment B.

[41] For purposes of the calculations here, the refund period is assumed to start on September 1, 2021, rather than the actual Commission date of August 17, 2021, and end after 15 months, on November 30, 2022.

The combination of the proposed CRF values and refunds will result in a lower payment for black start units than under the current, incorrect rates, but at the end of the recovery period the owners of the black start units will have received revenue sufficient to, or in some cases more than sufficient to, provide for the payback of debt at 7 percent interest, federal and state income tax liabilities, a 12 percent return on equity and the return of the equity portion of the capital investment.

Q 27. HOW DOES THE MARKET MONITOR'S SETTLEMENT PROPOSAL ADDRESS THE BLACK START RESOURCES FOR WHICH THE CRF PERIOD ENDED PRIOR TO JANUARY 1, 2025?

A. Generating units that were selected to provide Black Start Service prior to June 6, 2021, and that will have completed their capital recovery periods based on the duration of their CRF values prior to the start of the refund period on September 1, 2021, will not be affected.

Generating units that were selected to provide Black Start Service prior to June 6, 2021, and that will have completed their capital recovery periods based on the duration of their CRF values after September 1, 2021, but prior to January 1, 2025, will refund the difference between the revenues collected under the incorrect CRF values as they were applied and the revenues they should have collected if the correct CRF values had been applied during the Commission defined refund period, plus interest.

Q 28. HOW DOES THE MARKET MONITOR'S SETTLEMENT PROPOSAL ADDRESS THE BLACK START RESOURCES FOR WHICH THE CRF PERIOD ENDS AFTER JANUARY 1, 2025?

A. Generating units that were selected to provide Black Start Service prior to June 6, 2021, and that will not have completed their capital recovery periods based on the duration of their CRF values prior to January 1, 2025, will refund the difference between the revenues collected under the incorrect CRF values as they were applied and the revenues they should have collected if the correct CRF values had been applied during the Commission defined refund period, plus interest. In addition, these units will be paid the Capital Cost Recovery Rate from January 1, 2025, through the end of their CRF period based on the correct CRF value calculated effective September 1, 2021.

Q 29. HOW DOES TIMING AFFECT THE POSSIBLE OUTCOMES IN THIS MATTER?

A. There are 11 black start resources that will complete their capital recovery terms between January 1, 2018, and September 1, 2021. These resources are not affected by the Market Monitor's proposal.

There are two black start resources that will complete their capital recovery terms between September 1, 2021, and December 31, 2024.

There are 22 black start resources that will complete their capital recovery terms between January 1, 2025, and December 31, 2025. There are eight black start resources that will complete their capital recovery terms between January 1, 2026, and December 31, 2026. There are six black start resources that will complete their capital recovery terms after December 31, 2026. In the absence of a Commission decision, these black start resources will continue to be paid based on the incorrect and overstated CRFs through the full term of their CRFs.

As delays continue, the number of units that complete their capital recovery terms increases as does the amount of excess revenue.

Q 30. HOW WOULD THE ADJUSTMENT PROPOSED BY THE MARKET MONITOR ADDRESS THE PROBLEM?

A. If the Market Monitor's settlement offer were implemented effective January 1, 2025, the excess payment for capital cost recovery would be reduced from $89.7 million to $55.0 million based solely on the corrected capital cost recovery formula rate. The Market Monitor's settlement offer also includes $26.3 million in refunds. After accounting for refunds the Market Monitor's settlement offer reduces the excess payments to $31.4 million. (See Table 1.) For comparison, Table 1 also includes the Market Monitor's resolution, first proposed in November 2021 in Docket No. EL21-91-000, that shows the capital cost recovery payments that would result if the CRF updates were based on the outstanding investment principal as of January 1, 2025, with no refunds. Table 2 shows the interest on the refunds calculated according to Title 18 in the Code of Federal Regulations.[42]

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[42] Code of Federal Regulations, Title 18, Chapter I, Subchapter B, Part 35, Subpart C §35.19a.

The Commission established a 15 month refund period that began on August 17, 2021.[43] That 15 month refund period has expired.

Table 1 Market Monitor resolution based on the settlement offer compared to status quo

	Capital Recovery Payments 2018 - 2040 ($ millions)	Payments in excess of base case ($ millions)	Refund Payments ($ millions)	Payments in excess of base case less Refunds ($ millions)
Updated CRFs effective January 1, 2018 (base case)	$424.6			
Current CRFs remain in place	$514.3	$89.7	$0.0	$89.7
Updated CRFs effective January 1, 2025	$448.2	$23.6	$0.0	$23.6
Updated CRFs effective September 1, 2024	$479.6	$55.0	$23.6	$31.4

Table 2 Refund payments under Market Monitor Settlement Offer

	Refunds Under Market Monitor Settlement Offer
Total refund payments under Market Monitor Settlement Offer	$23.6
Interest on refunds at quarterly average prime rate	$5.2
Total refund payments with interest at January 1, 2025	$28.7

Q 31. IS THE MARKET MONITOR OFFER OF SETTLEMENT RETROACTIVE RATEMAKING?

A. No. The Market Monitor’s settlement proposal does not include changing capital cost recovery rates for any prior period, other than for the Commission defined refund period.

The CRF is a component of a capital cost recovery formula rate that defines total payments over a defined term. If the CRF is overstated in the early years, regardless of the reason, it can be reduced in the later years in order to produce the intended result over the entire term. That is not retroactive ratemaking as it does not require the repayment of payments made under a stated or filed rate. The proposed going forward adjustment to the formula produces an outcome that is the only outcome consistent with the purpose of this specific formula rate, to provide recovery of all capital costs plus the defined return to both debt and equity investors over the defined term of the CRF.

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43 August 10, 2021 Order at 54.

Q 32. HAS THE COMMISSION RULED THAT THE MARKET MONITOR'S RESOLUTION IS RETROACTIVE RATEMAKING?

A. No. In the August 2021 Order, the Commission declined to "include in this proceeding" the Market Monitor's proposal that new CRFs, calculated using the post June 6, 2021, CRF formula, be applied back to the later of the black start service date or January 1, 2018.[44] The Market Monitor's current proposal, which only affects the going forward CRF values, was first introduced in a November 2021 comment in response to the PJM's Answer to the Show Cause order.[45] The Commission has not commented on the Market Monitor's proposed resolution.

Q 33. IS THE MARKET MONITOR'S OFFER OF SETTLEMENT SUPPORTED BY SUBSTANTIAL EVIDENCE?

A. Yes. This affidavit and supporting exhibits provide evidence that the Capital Cost Recovery Rate was incorrectly calculated effective January 1, 2018, and that incorrect rate resulted in significant excess payments by customers for black start service. Evidence is provided of the exact amount of excess payment based on a calculation of the Capital Cost Recovery Rate using the correct tax provisions. Evidence is provided that modifying the Capital Cost Recovery Rate going forward can result in the correct capital cost recovery for some units and more correct capital cost recovery for additional units.

Q 34. DOES THE MARKET MONITOR'S PROPOSAL PUT AN UNDUE ADMINISTRATIVE BURDEN ON PJM?

A. No. The data required for each black start unit are the capital investment amount, the service start date and capital recovery term. These are the same data requirements for assigning a CRF to any black start generator. The Market Monitor's resolution does not place an undue administrative burden on PJM both because the calculations are not difficult and because the Market Monitor has done

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[44] 176 FERC ¶ 61,080 at P 50.

[45] See Attachment M at 49 (Section H).

all the necessary calculations and provided a copy of these calculations in spreadsheet format via discovery.[46]

In addition, once PJM has corrected the current issues with the CRFs for generating units that were selected to provide Black Start Service prior to June 6, 2021, the process under the Market Monitor approach will be identical to the current tariff approach to units that were selected to provide Black Start Service after June 6, 2021.

Q 35. CAN YOU PROVIDE A CHRONOLOGY OF EVENTS RELEVANT TO THIS PROCEEDING?

A. Yes. Attachment A to this affidavit is a chronology of the key dates in the history of the CRF issue. The chronology includes: the implementation date of CRF values in the capacity market; the implementation date of the Capital Cost Recovery Rate component in Paragraph 18 of Schedule 6A for black start; the enactment and effective dates of the TCJA; the dates of the Market Monitor's efforts to correct the CRF table to reflect the changed federal tax provisions; the dates of the PJM stakeholder process relating to the CRF; the dates in this proceeding of PJM's filings with the Commission and the Commission's investigation.

Q 36. PLEASE EXPLAIN THE ATTACHMENTS SUPPORTING THIS AFFIDAVIT

A. Attachment A is the CRF Chronology.

Attachment B is the IMM's "Capital Recovery Factors for the Flow to Equity Approach Technical Reference," dated December 10, 2021. This Technical Reference defines CRF and includes the derivation of the CRF formula under the flow to equity (FTE) approach. The original CRF values, filed by PJM in 2005 for the capacity market and in 2009 for black start, were calculated using the FTE approach. The Technical Reference explains the role of federal tax rates and the difference between the tax depreciation provisions prior to the TCJA (MACRS) and the tax depreciation provisions included in the TJCA (bonus depreciation).

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[46] *Response of the Independent Market Monitor for PJM to PJM Interconnection, L.L.C.'s First Set of Data Requests*, PJM-IMM-1.7, PJM-IMM-1.13, PJM-IMM-1.15 (July 8, 2024). The responses are CUI/PRIV-HC.

Attachment C is the IMM's "Capital Recovery Factors Technical Reference," dated April 25, 2022. This Technical Reference defines CRF and includes the derivation of the CRF formula under the weighted average cost of capital (WACC) approach. The CRF formula added to the PJM OATT in October 2021 and currently applicable to black start generators that are scheduled for service after June 6, 2021, was derived by the Market Monitor using the WACC approach. The WACC CRF formula is included in Schedule 6A of the PJM OATT.

Attachment D is an IMM MIC presentation, dated September 18, 2006. This IMM presentation provides a description of proposed tariff changes applicable to black start units. The presentation includes the original CRF values on slide 6. Slide 6 also makes explicit that Modified Accelerated Cost Recovery System (MACRS) depreciation was used in the calculation of taxes included in the CRF values at that time, prior to the TCJA. This demonstrates that the tax depreciation schedule used in the calculation of the CRF values was an explicit part of the calculation of the original CRF values.

Attachment E is PJM's "Review of Black Start Formula and Cost Components," dated June 2011. This PJM report was required by the tariff and included "a review of the components and formulas in the current approved version of Schedule 6A: Section 18," and "report on the results of that review to stakeholders." This PJM report was the first report to the stakeholders that addressed the use of the CRF for black start resources. The report provides a complete description of the CRF model assumptions (at 7), including all six inputs and including a federal tax rate of 36 percent. The report states that the CRF values used for black start originated in the capacity market tariff. The report was included in the meeting materials for and reviewed at a meeting of the Black Start Service Task Force on June 21, 2011.

Attachment F is PJM's "Review of PJM Black Start Formula and Cost Components," dated December 2014. This PJM report was the second report to stakeholders on the review of the black start formula as required by the PJM tariff. The report provides a complete description of the CRF model assumptions (at 8), including all six inputs and including a federal tax rate of 36 percent. The report was included in the meeting materials for and reviewed at the MC Webinar on January 20, 2015.

Attachment G is PJM's "Review of PJM Black Start Formula and Cost Components," dated October 2019. This PJM report was the third report to stakeholders on the review of the black start formula as required by the PJM tariff.

The report provides a complete description of the CRF model assumptions (at 8), including all six inputs and including a federal tax rate of 36 percent. This report was included in the meeting materials for and reviewed at the MC Webinar on October 30, 2019. This report was presented to the stakeholders after the tax law changes in the TCJA became effective on January 1, 2018. This report was presented to stakeholders after the Market Monitor had informed PJM by email of the incorrect CRF values on October 3, 2019. The report concludes (at 10) that "PJM has received, reviewed, and approved several resources during the multiple RFPs listed above. As a result, no additional changes are needed due to the response following the above mentioned RTO Wide and Incremental RFPs." Two of the referenced RFPs were issued after the January 1, 2018, effective date of the TCJA tax provisions. The Market Monitor referenced this report in Comments of the Independent Market Monitor for PJM, Docket No. ER21-1635-000 (April 28, 2021) at 5–6 n.15.

Attachment H is an email from the Market Monitor to PJM, dated October 3, 2019. The email clearly documents the required changes to the CRF values in the PJM tariff as a result of the tax law changes included in the TCJA. The email also documents the appropriate level of each of the inputs to the CRF calculation as a result of the TCJA.

Attachment I is an email from PJM to the Market Monitor, dated February 7, 2020. The email shows that PJM is in agreement with the Market Monitor regarding the updates to the CRF values in the PJM tariff as a result of the tax law changes included in the TCJA. Attachment I is treated as confidential at PJM's request.

Attachment J is PJM's filing in Docket ER09-730 Filing, dated February 19, 2009. This is the PJM filing that included the tariff updates with the original black start CRF values. The PJM filing letter describes the addition of the CRF values at pages 3-4, and 7.

Attachment K is PJM's presentation to the PJM Operating Committee: "Black Start Education, Black Start Unit Testing, Substitution, Termination Rules, and Capital Recovery Factor (CRF)," dated May 14, 2020. This PJM presentation shows (at 9) the changes to the CRF parameter assumptions that are necessary due to the TCJA, including a reduction in the federal tax rate from 36 percent to 21 percent.

Attachment L is the Market Monitor's initial response to the PJM filing to update the CRF in Docket ER21-1635. The Market Monitor addresses (at 5-7) the derivation of the CRF values, notes (at 6 and fn 15) the tariff requirement that PJM provide a periodic review of the CRF values and assumptions, states (at fn 15) the parameter assumptions used to compute the CRF and includes (at 16) a general formula for calculating CRF values. The Market Monitor also objects (at 13) to PJM's proposal to leave in place the incorrect CRF values for units selected for black start service prior to June 6, 2021.

Attachment M is the Market Monitor's response in accordance with paragraph 53 of 176 FERC ¶ 61,080. These comments were filed on November 18, 2021, in ER21-91-000 and are a revised version of the Market Monitor's comments filed on November 11, 2021. Attachment B to this filing is a clean version of the comments. The comments provide a background on CRF (at 7–10), detailed examples explaining the over recovery of capital investment costs that is occurring (at 10-18) and a proposed resolution (at 18-26) that resets the CRF values, on a prospective basis, to levels that provide capital cost recovery that aligns with the intended rates of return (12 percent return on equity, 7 percent cost of debt).

Attachment N is an answer filed by the Market Monitor on December 20, 2021, in response to an answer by Vistra Corp. and Dynegy Marketing and Trade ("Vistra") in EL21-91-000. The Market Monitor's answer provides additional details and clarifications regarding its proposed resolution. The Market Monitor addresses (at 3) Vistra's contention that the Market Monitor's proposed resolution constitutes retroactive ratemaking.

Attachment O is the Market Monitor's response to FERC Trial Staff's first set of data requests.

Attachment P is a spreadsheet attachment to request S-IMM-1.1. The spreadsheet replicates the calculation of the original CRF values.

Attachment Q is a spreadsheet attachment to request S-IMM-1.3. The spreadsheet shows the differences in the FTE and WACC approaches.

Attachment R is PJM's response to FERC Trial Staff's first set of data requests.

Attachment S is a spreadsheet attachment to request S-PJM-1.2. The spreadsheet shows the financial and income tax assumptions used to calculate the original CRF values.

Attachment T is a spreadsheet that includes the updated and corrected CRF values for each unit, the parameter assumptions, the interest calculation on refunds and Tables 1 and 2 from this affidavit. This attachment is confidential and has been marked as CUI//PRIV-HC.

Q 37. DOES THIS CONCLUDE YOUR AFFIDAVIT?

A. Yes.

UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

	)	
PJM Interconnection, L.L.C.	)	Docket No. EL21-91-000, -003
	)	

DECLARATION

JOSEPH E. BOWRING states that I prepared the affidavit to which this declaration is attached with the assistance of the staff of Monitoring Analytics, LLC, and that the statements contained therein are true and correct to the best of my knowledge and belief. Monitoring Analytics, LLC, is acting in its capacity as the Independent Market Monitor for PJM.

Pursuant to Rule 2005(b)(3) (18 CFR § 385.2005(b)(3), citing 28 U.S.C. § 1746), I further state under penalty of perjury that the foregoing is true and correct.

Executed on September 10, 2024.

Joseph E. Bowring

APPENDIX D

Revisions to OATT Schedule 6A para. 18-Clean

OATT Schedule 6A

…

18. The formula for calculating a generator's annual Black Start Service revenue requirement is:

{(Fixed BSSC) + (Variable BSSC) + (Training Costs) + (Fuel Storage Costs)} * (1 + Z)

For units that have the demonstrated ability to operate at reduced levels when automatically disconnected from the grid, the formula is revised to:

(Training Costs) * (1+ Z)

Where:

Fixed BSSC

Black Start Units with a commitment established under section 5 of this Schedule 6A shall calculate Fixed BSSC or "Fixed Black Start Service Costs" in accordance with the following Base Formula Rate:

Base Formula Rate:

Net CONE * Black Start Unit Capacity * X

Where:

"Net CONE" is the then current installed capacity ("ICAP") net Cost of New Entry (expressed in $/MW year) for the CONE Area where the Black Start Unit is located.

"Black Start Unit Capacity" is either: (i) the Black Start Unit's installed capacity, expressed in MW, for those Black Start Units which are not Fuel Assured Black Start Units that are Generation Capacity Resources; (ii) the awarded MWs in the Transmission Provider's request for proposal process under the PJM Manuals, for those Black Start Units, which are not Fuel Assured Black Start Units, that are Energy Resources; (iii) the Fuel Assured Black Start Unit's installed capacity for fuel assured non-intermittent Capacity Resources; or (iv) the monthly 90% confidence MW value calculated by the Transmission Provider for fuel assured intermittent or hybrid Capacity Resources. The 90% confidence MW value is calculated using Black Start Unit historical data to determine the hourly MW value the resource can provide each day in each month for 16 hours. The hourly MW value is then iterated until the confidence level of the unit providing the MW value on a monthly basis for 16 hours is 90%.

"X" is the Black Start Service allocation factor unless a higher or lower value is supported by the documentation of the actual costs of providing Black Start Service. For such units qualifying as Black Start Units on the basis of demonstrated ability to operate at reduced levels when automatically disconnected from the grid, X shall be zero. For non-fuel assured Black Start Units with a commitment established under section 5 of this Schedule 6A, X shall be .01 for Hydro units, .02 for CT units. For fuel assured Black Start Units with a commitment established under section 5 of this Schedule 6A, X shall be .02 for all units.

Black Start Units with a commitment established under section 6 above shall calculate Fixed BSSC or "Fixed Black Start Service Costs" in accordance with one of the following formulas, as applicable:

<u>Capital Cost Recovery Rate – NERC-CIP Specific Recovery</u>

(Net Cone * Black Start NERC-CIP Unit Capacity * X) + (Incremental Black Start NERC-CIP Capital Costs * CRF) + (Fuel Assurance Capital Costs * CRF)

Where:

"Net Cone" is the then current installed capacity ("ICAP") net Cost of New Entry (expressed in $/MW year) for the CONE are where the Black Start Unit is located.

"Black Start NERC-CIP Unit Capacity" is the Black Start Unit's installed capacity, expressed in MW, but, for purposes of this calculation, capped at 100 MW for Hydro units, or 50 MW for CT units.

"Incremental Black Start NERC-CIP Capital Cost" are those capital costs documented by the owner or accepted by the Commission for the incremental equipment solely necessary to enable a Black Start Unit to maintain compliance with mandatory Critical Infrastructure Protection Reliability Standards (as approved by the Commission and administered by the applicable Electric Reliability Organization).

"Fuel Assurance Capital Costs" are the new or additional capital costs documented by the owner for the installation of equipment necessary for the unit to meet the fuel assurance criteria specified in the PJM manuals.

"CRF" or "Capital Recovery Factor" is equal to the levelized CRF as set forth in the applicable CRF table posted on the PJM website in accordance with Tariff, Schedule 6A, section 18 and Manual 15.

A Black Start Unit may elect to terminate forward cost recovery under this Capital Cost Recovery Rate – NERC-CIP Specific Recovery at any time and seek cost recovery under the Capital Cost Recovery Rate, pursuant to the terms and conditions set forth below.

<u>Capital Cost Recovery Rate</u>

(FERC-approved rate) + (Incremental Black Start Capital Costs * CRF) + (Fuel Assurance Capital Costs * CRF)

Where:

“FERC-approved rate” is the Black Start Unit’s current FERC-approved recovery of costs to provide Black Start Service, if applicable. To the extent that a Black Start Unit owner is currently recovering black start costs pursuant to a FERC-approved rate, that cost recovery will be included as a formulaic component for calculating the Black Start Unit’s annual revenue requirement pursuant to this section 18. However, under no circumstances will PJM or the Black Start Unit owner restructure or modify that existing FERC-approved rate without FERC approval.

“Incremental Black Start Capital Costs” are the new or additional capital costs documented by the owner or accepted by the Commission for the incremental equipment solely necessary to enable a unit to provide Black Start Service in addition to whatever other product or services such unit may provide. Such costs shall include those incurred by a Black Start Unit owner in order to meet NERC Reliability Standards that apply to Black Start Units solely on the basis of the provision of Black Start Service by such unit. However, Incremental Black Start Capital Costs shall not include any capital costs that the Black Start Unit owner is recovering for that unit pursuant to a FERC-approved recovery rate.

“Fuel Assurance Capital Costs” are the new or additional capital costs documented by the owner for the installation of equipment necessary for the unit to meet the fuel assurance criteria specified in the PJM manuals. However, Fuel Assurance Capital Costs shall not include any capital costs that the Fuel Assured Black Start Unit owner is recovering for that unit pursuant to a FERC-approved recovery rate.

The Capital Recovery Factor (“CRF”) is equal to the Levelized CRF based on the age of the Black Start Unit, which is modified to provide Black Start Service.

Effective August , 2021, the CRF applicable to Black Start Capital Costs of Black Start Units selected for Black Start Service prior to June 6, 2021, shall be determined based on defined steps: start with the beginning of the Commission defined refund period, adjusted from August 17, 2021 to September 1, 2021, for administrative convenience, through November 30, 2022; determine the outstanding investment principal as of that date; and calculate a corrected CRF based on the original financial parameters and state income tax rate assumption, updated federal income tax rules and a recovery period equal to the time remaining in the original capital recovery period

The CRF applicable to Black Start Capital Costs and/or for Fuel Assurance Capital Costs, of Black Start Units selected for Black Start Service after June 6, 2021, shall be updated annually on March 1 for (i) federal income tax rates as utilized by the U.S. Internal Revenue Service in effect at the time of the annual CRF update; (ii) average state tax rate; and (iii) debt interest rates and shall be posted on the PJM website by March 31 each year as shown in the table below. Interested parties shall have until April 15 of each year to contest PJM’s calculation of the annual CRF value before it becomes effective on June 1 of each year.

PJM determines annual CRF inputs	March 1
PJM posts annual CRF	March 31
Deadline for contesting annual CRF	April 15
Annual revenue requirement calculation	May 3 through May 27
Annual revenue requirement with CRF in effect	June 1

The CRF values shall be calculated for a recovery period based on the age of the Black Start Unit using the equation below:

$$CRF = \frac{r\,(1+r)^N \left[1 - \frac{sB}{\sqrt{1+r}} - s(1-B)\sqrt{1+r}\,\sum_{j=1}^{L} \frac{m_j}{(1+r)^j}\right]}{(1-s)\sqrt{1+r}\left[(1+r)^N - 1\right]} \ldots$$

Where:

Formula Symbol	**Description**
r	After Tax Weighted Average Cost of Capital (ATWACC), which equals (equity percentage)(cost of equity) + (debt percentage)(debt interest rate)(1 – effective tax rate)
s	Effective Tax Rate, which equals (1 – state tax rate)(federal tax rate) + state tax rate
B	Bonus depreciation percent in effect at the Black Start Unit in-service date
N	Cost recovery period based on the age of the unit in years, as established in the Age of Unit/Applicable Recovery Period table below
L	The lesser of N or 16 years
M_j	Modified Accelerated Cost Recovery System (MACRS) depreciation

The following assumptions are used in the calculation:

The current federal tax and depreciation rates are as established by U.S. Internal Revenue Service;

The state tax rate is an average of the income tax rates for all the states in the PJM Region;

The capital investment necessary to make a unit qualify for Black Start Service is made up of 50 percent equity;

The capital investment necessary to make a unit qualify for Black Start Service is made up of 50 percent debt;

The debt interest rate is based on the most recent Net CONE quadrennial review after-tax weighted average cost of capital (ATWACC) and shall be updated as follows:

The debt interest rate will be updated during the Net CONE quadrennial review; and

If the 2-year change in the Moody Utility Index for bonds rated Baa1 is more than 200 basis points, this change will be added to the interest rate used in the most recent Net CONE quadrennial review and will be used as the current year's debt interest rate.

The debt term is equal to the applicable recovery period specified in the Age of Unit/Applicable Recovery Period table below; and

The cost of equity shall be equal to an after tax internal rate of return on equity of 12%.

Any changes to the debt and equity percentages and after tax internal rate of return on equity components stated above shall be included in revisions to this section 18.

Age of the Unit (years)	Incremental Black Start Capital Costs Applicable Recovery Period (years)	Fuel Assurance Capital Costs Recovery Period (years)
1-5	20	20
6-10	15	15
11-15	10	10
16+	5	10

In those circumstances where a Black Start Unit owner has elected to recover Incremental Black Start Capital Costs and/or Fuel assurance Capital Costs, in addition to a FERC-approved recovery rate, its applicable term of commitment shall be the greater of: (i) the FERC-approved recovery period, or; (ii) the applicable term of commitment as set forth in the Age of Unit/Applicable Recovery Period table above.

After a Black Start Unit has recovered its allowable Incremental Black Start Capital Costs, Incremental Black Start NERC-CIP Capital Costs, and/or Fuel assurance Capital Costs as provided by the applicable Capital Cost Recovery Rate, and has satisfied its applicable commitment period required under section 6 of this Schedule 6A, the Black Start Unit shall be committed to providing black start in accordance with section 5 of this Schedule 6A and calculate its Fixed BSSC in accordance with the Base Formula Rate.

Variable BSSC

All Black Start Units shall calculate Variable BSSC or "Variable Black Start Service Costs" in accordance with the following formula:

Black Start Unit O&M * Y

Where:

"Black Start Unit O&M" are the operations and maintenance costs attributable to supporting Black Start Service and must equal the annual variable O&M outlined in the PJM Cost Development Guidelines set forth in the PJM Manuals. Such costs shall include those incurred by a Black Start Owner in order to meet NERC Reliability Standards that apply to the Black Start Unit solely on the basis of the provision of Black Start Service by unit.

"Y" is 0.01, unless a higher or lower value is supported by the documentation of costs. If a value of Y is submitted for this cost, a (1-Y) factor must be applied to the Black Start Unit's O&M costs on the unit's cost-based energy schedule, calculated based on the Cost Development Guidelines in the PJM Manuals.

For units qualifying as Black Start Units on the basis of a demonstrated ability to operate at reduced levels when automatically disconnected from the grid, there are no variable costs associated with providing Black Start Service and the value for Variable BSSC shall be zero.

Black Start Units with the demonstrated ability to automatically remain operating, at reduced levels, when disconnected from the grid may receive NERC compliance costs associated with providing Black Start Service in addition to the formula above, if approved in accordance with the procedures in section 17 of this Schedule 6A.

Training Costs:

All Black Start Units shall calculate Training Costs in accordance with the following formula:

50 staff hours/year/plant*75/hour

Fuel Storage Costs:

Black Start Units that store liquefied or compressed natural gas, propane, or oil on site shall calculate Fuel Storage Costs in accordance with the following formula:

{MTSL + [(# Run Hours) * (Fuel Burn Rate)]} *
(12 Month Forward Strip + Basis) * (Bond Rate)

Where:

Run Hours are the actual number of hours a Transmission Provider requires a Black Start Unit to run. Run Hours shall be at least 16 hours or as defined by the Transmission Owner restoration plan, whichever is less.

"Fuel Burn Rate" is actual fuel burn rate for the Black Start Unit.

"12-Month Forward Strip" is the average of forward prices for the fuel burned in the Black Start Unit traded the first Business Day on or following April 1.

"Basis" is the transportation costs from the location referenced in the forward price data to the Black Start Unit plus any variable taxes.

"Bond rate" is the value determined with reference to the Moody's Utility Index for bonds rated Baa1 reported the first Business Day on or following April 1.

"MTSL" is the "minimum tank suction level" and shall apply to oil fired Black Start Units' storage tanks that have an unusable volume of oil. In the case where a Black Start Unit shares a common fuel tank, the Black Start Unit will be eligible for recovery of the Black Start Energy Tank Ratio of the MTSL in its fuel storage calculation.

Black Start Energy Tank Ratio = {(Fuel Burn Rate * Minimum Run Hours) / (Tank Capacity – MTSL)}

The MTSL fuel storage calculation shall be as follows:
{(Black Start Energy Tank Ratio * MTSL) + [(#Run Hours) * (Fuel Burn Rate)]} * (12 Month Forward Strip + Basis) * (Bond Rate)

For units qualifying as Black Start Units on the basis of a demonstrated ability to operate at reduced levels when automatically disconnected from the grid, there are no associated fuel storage costs and the value for FSC shall be zero.

Z

Z shall be an incentive factor solely for Black Start Units with a commitment established under section 5 above and shall be ten percent for non-fuel assured Black Start Units and twenty percent for Fuel Assured Black Start Units. For those Black Start Units that elect to recover new or additional Black Start or Fuel Assurance Capital Costs under section 6 above, the incentive factor, Z, shall be equal to zero.

Every five years, PJM shall review the formula and its costs components set forth in this section 18, and report on the results of that review to stakeholders.

APPENDIX E

Revisions to OATT Schedule 6A para. 18-Redline

OATT Schedule 6A

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18. The formula for calculating a generator's annual Black Start Service revenue requirement is:

{(Fixed BSSC) + (Variable BSSC) + (Training Costs) + (Fuel Storage Costs)} * (1 + Z)

For units that have the demonstrated ability to operate at reduced levels when automatically disconnected from the grid, the formula is revised to:

(Training Costs) * (1+ Z)

Where:

Fixed BSSC

Black Start Units with a commitment established under section 5 of this Schedule 6A shall calculate Fixed BSSC or "Fixed Black Start Service Costs" in accordance with the following Base Formula Rate:

Base Formula Rate:

Net CONE * Black Start Unit Capacity * X

Where:

"Net CONE" is the then current installed capacity ("ICAP") net Cost of New Entry (expressed in $/MW year) for the CONE Area where the Black Start Unit is located.

"Black Start Unit Capacity" is either: (i) the Black Start Unit's installed capacity, expressed in MW, for those Black Start Units which are not Fuel Assured Black Start Units that are Generation Capacity Resources; (ii) the awarded MWs in the Transmission Provider's request for proposal process under the PJM Manuals, for those Black Start Units, which are not Fuel Assured Black Start Units, that are Energy Resources; (iii) the Fuel Assured Black Start Unit's installed capacity for fuel assured non-intermittent Capacity Resources; or (iv) the monthly 90% confidence MW value calculated by the Transmission Provider for fuel assured intermittent or hybrid Capacity Resources. The 90% confidence MW value is calculated using Black Start Unit historical data to determine the hourly MW value the resource can provide each day in each month for 16 hours. The hourly MW value is then iterated until the confidence level of the unit providing the MW value on a monthly basis for 16 hours is 90%.

“X” is the Black Start Service allocation factor unless a higher or lower value is supported by the documentation of the actual costs of providing Black Start Service. For such units qualifying as Black Start Units on the basis of demonstrated ability to operate at reduced levels when automatically disconnected from the grid, X shall be zero. For non-fuel assured Black Start Units with a commitment established under section 5 of this Schedule 6A, X shall be .01 for Hydro units, .02 for CT units. For fuel assured Black Start Units with a commitment established under section 5 of this Schedule 6A, X shall be .02 for all units.

Black Start Units with a commitment established under section 6 above shall calculate Fixed BSSC or “Fixed Black Start Service Costs” in accordance with one of the following formulas, as applicable:

<u>Capital Cost Recovery Rate – NERC-CIP Specific Recovery</u>

(Net Cone * Black Start NERC-CIP Unit Capacity * X) + (Incremental Black Start NERC-CIP Capital Costs * CRF) + (Fuel Assurance Capital Costs * CRF)

Where:

“Net Cone” is the then current installed capacity (“ICAP”) net Cost of New Entry (expressed in $/MW year) for the CONE are where the Black Start Unit is located.

“Black Start NERC-CIP Unit Capacity” is the Black Start Unit’s installed capacity, expressed in MW, but, for purposes of this calculation, capped at 100 MW for Hydro units, or 50 MW for CT units.

“Incremental Black Start NERC-CIP Capital Cost” are those capital costs documented by the owner or accepted by the Commission for the incremental equipment solely necessary to enable a Black Start Unit to maintain compliance with mandatory Critical Infrastructure Protection Reliability Standards (as approved by the Commission and administered by the applicable Electric Reliability Organization).

“Fuel Assurance Capital Costs” are the new or additional capital costs documented by the owner for the installation of equipment necessary for the unit to meet the fuel assurance criteria specified in the PJM manuals.

“CRF” or “Capital Recovery Factor” is equal to the levelized CRF as set forth in the applicable CRF table posted on the PJM website in accordance with Tariff, Schedule 6A, section 18 and Manual 15.

A Black Start Unit may elect to terminate forward cost recovery under this Capital Cost Recovery Rate – NERC-CIP Specific Recovery at any time and seek cost recovery under the Capital Cost Recovery Rate, pursuant to the terms and conditions set forth below.

Capital Cost Recovery Rate

(FERC-approved rate) + (Incremental Black Start Capital Costs * CRF) + (Fuel Assurance Capital Costs * CRF)

Where:

"FERC-approved rate" is the Black Start Unit's current FERC-approved recovery of costs to provide Black Start Service, if applicable. To the extent that a Black Start Unit owner is currently recovering black start costs pursuant to a FERC-approved rate, that cost recovery will be included as a formulaic component for calculating the Black Start Unit's annual revenue requirement pursuant to this section 18. However, under no circumstances will PJM or the Black Start Unit owner restructure or modify that existing FERC-approved rate without FERC approval.

"Incremental Black Start Capital Costs" are the new or additional capital costs documented by the owner or accepted by the Commission for the incremental equipment solely necessary to enable a unit to provide Black Start Service in addition to whatever other product or services such unit may provide. Such costs shall include those incurred by a Black Start Unit owner in order to meet NERC Reliability Standards that apply to Black Start Units solely on the basis of the provision of Black Start Service by such unit. However, Incremental Black Start Capital Costs shall not include any capital costs that the Black Start Unit owner is recovering for that unit pursuant to a FERC-approved recovery rate.

"Fuel Assurance Capital Costs" are the new or additional capital costs documented by the owner for the installation of equipment necessary for the unit to meet the fuel assurance criteria specified in the PJM manuals. However, Fuel Assurance Capital Costs shall not include any capital costs that the Fuel Assured Black Start Unit owner is recovering for that unit pursuant to a FERC-approved recovery rate.

The Capital Recovery Factor ("CRF") is equal to the Levelized CRF based on the age of the Black Start Unit, which is modified to provide Black Start Service.

Effective **~~January 1, 2024~~August 17, 2021**, the CRF applicable to Black Start Capital Costs of Black Start Units selected for Black Start Service prior to June 6, 2021, shall **~~continue to~~** be determined **~~in accordance with the~~ based on defined steps: start with the beginning of the Commission defined refund period, adjusted from August 17, 2021 to September 1, 2021, for administrative convenience, through November 30, 2022; determine the outstanding investment principal as of that date; and calculate a corrected CRF based on the original financial parameters and state income tax rate assumption, updated federal income tax rules and a recovery period equal to the time remaining in the original capital recovery period. ~~following table:~~**

~~Age of Black Start Unit~~	**~~Term of Black Start Commitment~~**	**~~Levelized CRF~~**
~~1 to 5~~	**~~20~~**	**~~0.1180~~**

~~6 to 10~~	~~15~~	~~0.1348~~
~~11 to 15~~	~~10~~	~~0.1767~~
~~16+~~	~~5~~	~~0.3097~~

The CRF applicable to Black Start Capital Costs and/or for Fuel Assurance Capital Costs, of Black Start Units selected for Black Start Service after June 6, 2021, shall be updated annually on March 1 for (i) federal income tax rates as utilized by the U.S. Internal Revenue Service in effect at the time of the annual CRF update; (ii) average state tax rate; and (iii) debt interest rates and shall be posted on the PJM website by March 31 each year as shown in the table below. Interested parties shall have until April 15 of each year to contest PJM's calculation of the annual CRF value before it becomes effective on June 1 of each year.

PJM determines annual CRF inputs	March 1
PJM posts annual CRF	March 31
Deadline for contesting annual CRF	April 15
Annual revenue requirement calculation	May 3 through May 27
Annual revenue requirement with CRF in effect	June 1

The CRF values shall be calculated for a recovery period based on the age of the Black Start Unit using the equation below:

$$CRF = \frac{r\,(1+r)^N \left[1 - \frac{sB}{\sqrt{1+r}} - s(1-B)\sqrt{1+r}\,\sum_{j=1}^{L} \frac{m_j}{(1+r)^j}\right]}{(1-s)\sqrt{1+r}\,[(1+r)^N - 1]} \ldots$$

Where:

Formula Symbol	**Description**
r	After Tax Weighted Average Cost of Capital (ATWACC), which equals (equity percentage)(cost of equity) + (debt percentage)(debt interest rate)(1 – effective tax rate)
s	Effective Tax Rate, which equals (1 – state tax rate)(federal tax rate) + state tax rate
B	Bonus depreciation percent in effect at the Black Start Unit in-service date

N	Cost recovery period based on the age of the unit in years, as established in the Age of Unit/Applicable Recovery Period table below
L	The lesser of N or 16 years
M_j	Modified Accelerated Cost Recovery System (MACRS) depreciation

The following assumptions are used in the calculation:

The current federal tax and depreciation rates are as established by U.S. Internal Revenue Service;

The state tax rate is an average of the income tax rates for all the states in the PJM Region;

The capital investment necessary to make a unit qualify for Black Start Service is made up of 50 percent equity;

The capital investment necessary to make a unit qualify for Black Start Service is made up of 50 percent debt;

The debt interest rate is based on the most recent Net CONE quadrennial review after-tax weighted average cost of capital (ATWACC) and shall be updated as follows:

The debt interest rate will be updated during the Net CONE quadrennial review; and

If the 2-year change in the Moody Utility Index for bonds rated Baa1 is more than 200 basis points, this change will be added to the interest rate used in the most recent Net CONE quadrennial review and will be used as the current year's debt interest rate.

The debt term is equal to the applicable recovery period specified in the Age of Unit/Applicable Recovery Period table below; and

The cost of equity shall be equal to an after tax internal rate of return on equity of 12%.

Any changes to the debt and equity percentages and after tax internal rate of return on equity components stated above shall be included in revisions to this section 18.

Age of the Unit (years)	Incremental Black Start Capital Costs Applicable Recovery Period (years)	Fuel Assurance Capital Costs Recovery Period (years)
1-5	20	20
6-10	15	15
11-15	10	10
16+	5	10

In those circumstances where a Black Start Unit owner has elected to recover

Incremental Black Start Capital Costs and/or Fuel assurance Capital Costs, in addition to a FERC-approved recovery rate, its applicable term of commitment shall be the greater of: (i) the FERC-approved recovery period, or; (ii) the applicable term of commitment as set forth in the Age of Unit/Applicable Recovery Period table above.

After a Black Start Unit has recovered its allowable Incremental Black Start Capital Costs, Incremental Black Start NERC-CIP Capital Costs, and/or Fuel assurance Capital Costs as provided by the applicable Capital Cost Recovery Rate, and has satisfied its applicable commitment period required under section 6 of this Schedule 6A, the Black Start Unit shall be committed to providing black start in accordance with section 5 of this Schedule 6A and calculate its Fixed BSSC in accordance with the Base Formula Rate.

Variable BSSC

All Black Start Units shall calculate Variable BSSC or “Variable Black Start Service Costs” in accordance with the following formula:

Black Start Unit O&M * Y

Where:

“Black Start Unit O&M” are the operations and maintenance costs attributable to supporting Black Start Service and must equal the annual variable O&M outlined in the PJM Cost Development Guidelines set forth in the PJM Manuals. Such costs shall include those incurred by a Black Start Owner in order to meet NERC Reliability Standards that apply to the Black Start Unit solely on the basis of the provision of Black Start Service by unit.

“Y” is 0.01, unless a higher or lower value is supported by the documentation of costs. If a value of Y is submitted for this cost, a (1-Y) factor must be applied to the Black Start Unit’s O&M costs on the unit’s cost-based energy schedule, calculated based on the Cost Development Guidelines in the PJM Manuals.

For units qualifying as Black Start Units on the basis of a demonstrated ability to operate at reduced levels when automatically disconnected from the grid, there are no variable costs associated with providing Black Start Service and the value for Variable BSSC shall be zero.

Black Start Units with the demonstrated ability to automatically remain operating, at reduced levels, when disconnected from the grid may receive NERC compliance costs associated with providing Black Start Service in addition to the formula above, if approved in accordance with the procedures in section 17 of this Schedule 6A.

Training Costs:

All Black Start Units shall calculate Training Costs in accordance with the following formula:

50 staff hours/year/plant*75/hour

Fuel Storage Costs:

Black Start Units that store liquefied or compressed natural gas, propane, or oil on site shall calculate Fuel Storage Costs in accordance with the following formula:

{MTSL + [(# Run Hours) * (Fuel Burn Rate)]} *
(12 Month Forward Strip + Basis) * (Bond Rate)

Where:

Run Hours are the actual number of hours a Transmission Provider requires a Black Start Unit to run. Run Hours shall be at least 16 hours or as defined by the Transmission Owner restoration plan, whichever is less.

"Fuel Burn Rate" is actual fuel burn rate for the Black Start Unit.

"12-Month Forward Strip" is the average of forward prices for the fuel burned in the Black Start Unit traded the first Business Day on or following April 1.

"Basis" is the transportation costs from the location referenced in the forward price data to the Black Start Unit plus any variable taxes.

"Bond rate" is the value determined with reference to the Moody's Utility Index for bonds rated Baa1 reported the first Business Day on or following April 1.

"MTSL" is the "minimum tank suction level" and shall apply to oil fired Black Start Units' storage tanks that have an unusable volume of oil. In the case where a Black Start Unit shares a common fuel tank, the Black Start Unit will be eligible for recovery of the Black Start Energy Tank Ratio of the MTSL in its fuel storage calculation.

Black Start Energy Tank Ratio = {(Fuel Burn Rate * Minimum Run Hours) / (Tank Capacity – MTSL)}

The MTSL fuel storage calculation shall be as follows:
{(Black Start Energy Tank Ratio * MTSL) + [(#Run Hours) * (Fuel Burn Rate)]} * (12 Month Forward Strip + Basis) * (Bond Rate)

For units qualifying as Black Start Units on the basis of a demonstrated ability to operate at reduced levels when automatically disconnected from the grid, there are no associated fuel storage costs and the value for FSC shall be zero.

Z

Z shall be an incentive factor solely for Black Start Units with a commitment established under section 5 above and shall be ten percent for non-fuel assured Black Start Units and twenty percent for Fuel Assured Black Start Units. For those Black Start Units that elect to recover new or additional Black Start or Fuel Assurance Capital Costs under section 6 above, the incentive factor, Z, shall be equal to zero.

Every five years, PJM shall review the formula and its costs components set forth in this section 18, and report on the results of that review to stakeholders.

APPENDIX F

Certificate of Service

CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Eagleville, Pennsylvania,
this 10th day of September, 2024.

Jeffrey W. Mayes
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