

Schedule 6A should be revised to replace the inaccurate CRF values now included in Schedule 6A and the proposed formula for calculating CRF values should be added to the tariff.

The April 7th Filing removes the inaccurate CRF values and replaces the values with a description of the components of the CRF calculation. The April 7th Filing does not correct the flawed implementation of the CRF formula to existing black start units. The April 7th Filing instead requests validation of the incorrect implementation to date and extend that incorrect implementation for all existing black start units for each unit's entire recovery period.

The CRF values became inaccurate effective January 1, 2018, when amendments to the U.S. Internal Revenue Code became effective, reducing the federal corporate income tax rate from a maximum 35 percent to 21 percent and changing the tax depreciation provisions.³ The federal tax rate and depreciation provisions are inputs to the CRF formula and the combination significantly reduced tax obligations and therefore significantly reduced the CRF values.

The result was that, after that date, the revenue requirements paid to black start units included payments for taxes that the unit owners did not actually pay.

Commission precedent related to the failure to correct tariff rates when tax laws change is clear. In addition, there is no reason to allow a discriminatory preference to existing units relative to new units providing the same service under formula rates. The April 7th Filing should not be accepted without requiring changes to expand the scope to apply to all black start units. The correct CRF values should be applied to all black start units effective with the change in the tax rates on January 21, 2018. The CRF equation should be included in Schedule 6A and not in the PJM manuals. The correct value of each input to the formula should be included in the PJM manuals.

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

The April 7th Filing includes a number of other changes that the Market Monitor supports as just and reasonable, including a change to use the life of black start equipment as the basis for the commitment period, and a change to the calculation of the Minimum Tank Suction Level (“MTSL”) to include only the volume of fuel used to provide black start service. The changes are improvements to the existing rules. A commitment period based on the life of the black start equipment should be applied to new or additional investments going forward, without unjustified and discriminatory consideration of whether the unit entered service before or after June 6, 2021.

I. COMMENTS

A. Background

1. Black Start Service Is Compensated Under a Formula Rate

Black Start Units are paid under a formula rate set forth in Paragraph 18 of Schedule 6 to the OATT. Black Start Unit owners have the option to receive compensation for black start service under one of the formula rates included in Paragraph 18 or owners can file a cost of service rate with the Commission.⁴ A “formula rate,” the Commission has explained, is “the formula itself, the algebraic equation used to calculate the rates.”⁵ In approving a formula, the Commission has explained, “It does not approve the inputs into the formula or the charges resulting from the application of the inputs to the algebraic equation.”⁶ The formula rate is the filed rate, and should be established and revised in a Section 205 filing.⁷

⁴ See *PJM Interconnection, L.L.C.*, 127 FERC ¶ 61,197 at PP 4, 9 (2009).

⁵ See *PJM Interconnection, L.L.C.*, 166 FERC ¶ 61,216 at P 49 (2019).

⁶ *Id.*

⁷ See *PJM Interconnection, L.L.C.*, 110 FERC ¶ 61,053 at P 120 (2005) (“[T]he formula alone constitutes the filed rate. The Commission’s acceptance of a formula rate authorizes the utility to use the formula rate on an ongoing basis. Further, section 205 filings are unnecessary as long as the utility continues to apply the formula that was accepted”).

The input values and the values resulting from the application of the formula are not the filed rate, and are not established or revised by filing.⁸ The input values must be determined and applied in accordance with the formula. If the input values are subsequently determined to be inaccurately determined or applied, then the calculation must be performed correctly and the billing must be corrected.⁹ Retroactive billing is not prohibited. On the contrary, retroactive billing is required under the filed rate doctrine.¹⁰ The correct result of the formula must be applied.¹¹

⁸ See, e.g., *id.* at P 120 n.105 (2005) (“[T]he costs used in applying the formula rate are not part of the rate and have not been reviewed. These costs may be challenged by customers and other entities. (*Appalachian Power Company*, 23 FERC ¶ 61,032 at 61,088 (1983) (Commission not precluded from examining the reasonableness of fuel costs automatically collected under a formula rate). If the costs are shown to be unjust and unreasonable, the Commission may require retroactive relief. (*Golden Spread Electric Cooperative, Inc. v. Southwestern Public Service Company*, 72 FERC P 61,142 at 61,727 n.9; *Public Service Company of New Hampshire*, 6 FERC ¶ 61,299 at 61,710 (1979) (fuel adjustment costs challenged and refunds required of the extra costs of spot coal).”)

⁹ See, e.g., *Ameren Ill. Co.*, 162 FERC ¶ 61,025 at P 26 (2018) (“The Commission’s acceptance of a formula rate constitutes acceptance of the formula, but not the inputs to the formula. Parties can challenge the inputs to the formula rate in the same way as they can challenge costs in a stated rate case, including by raising prudence issues. In order for formula rates to work properly, they must allow for after-the-fact corrections and updates. While parties should use due diligence to ensure that correct data is used, should an error be discovered, the inputs to the formula rate must be corrected and the formula rate re-calculated to prevent parties from being overcharged or undercharged.”); *Kan. Elec. Power Coop. v. Evergy Kan. Cent.*, 175 FERC ¶ 61,044 (2021) (“longstanding precedent allows participants to challenge formula rate inputs or implementation errors whenever the participants discover them,” citing, e.g., *Delmarva*, 145 FERC ¶ 61,055 at P 23; *Entergy Services*, 145 FERC ¶ 61,049 at P 10; *Pioneer Transmission*, 126 FERC ¶ 61,281 at nn.100–101; *PSEG*, 124 FERC ¶ 61,303 at nn.17-18 (citations omitted); *Quest Energy, L.L.C. v. Detroit Edison Co.*, 106 FERC ¶ 61,227, at ¶ 21 (2004); *Yankee Atomic Elec. Co.*, 60 FERC ¶ 61,316 at 62,094, 62,096–97 (1992) (noting the Commission’s authority to order refunds of imprudent costs charged to customers through formula rates in prior periods).

¹⁰ See, e.g., 110 FERC ¶ 61,053 at P 120.

¹¹ *Id.*

In contrast, a traditional cost of service rate, or stated rate, specifies the value and does not necessarily indicate the supporting rationale.¹² The stated rate must be applied.

a. Capital Recovery Factor (CRF) Values

The capital recovery factor (CRF) is a key component used in the formulas for determining the annual black start service revenue requirements for owners recovering capital investment.¹³ The CRF is a rate, multiplied by the relevant investment, which defines the annual payment needed to provide a return on and of capital for the investment over a defined time period. CRFs include as inputs the weighted average cost of capital and its components, including the rate of return on equity and the interest rate on debt and the capital structure, in addition to depreciation and taxes. For example, a five year CRF will allow the recovery of the relevant depreciation plus a return over five years. The revenue requirement defined by the CRF is only part of the total annual revenue requirement which may also include O&M costs and other costs.

The April 7th Filing misrepresents the values in the CRF table as “‘black box’ numbers.”¹⁴ The basis for the CRF was clear when the CRF values were calculated in 2007 and the basis has been explained repeatedly in the PJM stakeholder process. Paragraph 18 of Schedule 6A requires PJM to review the black start service formula and its costs components every five years and to report on the results of that review to stakeholders. PJM presented its report to the PJM Members Committee on October 10, 2019, but that report failed to address the change in federal tax rates.¹⁵ The Market Monitor explained the

¹² Stated rates are routinely established under black box settlement agreements that explicitly lack any cost based rationale and are accepted only because they are agreed to.

¹³ The CRF is also used in the OATT to calculate the avoidable cost rate (ACR) used in the calculation of cost offers in the PJM Reliability Pricing Model (RPM).

¹⁴ See April 7th Filing at 12.

¹⁵ See PJM Operation Analysis & Compliance Department, Review of Black Start Formula and Cost Components (October, 2019) at 8 (“The CRF table has several different assumptions such as: the Capital Recovery Factor based on a levelized proforma for a 100MW Combustion Turbine for \$1M,

basis for CRF values to the PJM Operating Committee on August 6 and September 3, 2020.¹⁶ The values in the CRF table in Paragraph 18 are not black box values. The Commission uses the term black box to describe settlements that do not resolve issues on principle or approve specific calculation methods.¹⁷ The values in the CRF table were calculated by the Market Monitor including exactly the components of CRF identified in the revisions to Paragraph 18 in the April 7th Filing.¹⁸ The proposed revised language for Paragraph 18 in the April 7th Filing makes reference to a standard formula to be included in the PJM manuals.¹⁹ The CRF

2.5 percent inflation, 36 percent federal tax rate, 9 percent state tax rate, income tax rate 41 percent, 50 percent equity and 50 percent debt with a 7 percent interest rate, and a 12percent internal rate of return on equity.”), which can be accessed at: <<https://www.pjm.com/-/media/committees-groups/committees/mc/20191030-webinar/20191030-item-05-review-of-black-start-formula-and-cost-components.ashx>> (“PJM 2019 Black Start Formula Review”).

¹⁶ See “Black Start Issues,” presented by Market Monitor at the August 6 and September 3, 2020, PJM Operating Committee Meetings, and revised on September 9, 2020. The presentations can be found at:< <https://www.monitoringanalytics.com/reports/Presentations/2020.shtml>> .

¹⁷ See, e.g., *Texas Gas Transmission Corporation*, 53 FERC ¶ 61,022 at 61088 (1990) (“Article V of the settlement, as stated above, recognizes that neither Texas Gas, its customers, the Commission, the Commission’s staff, nor any other person shall be deemed to have approved, accepted, agreed, or consented to any ratemaking principle or any method of cost-of-service determination, cost allocation or rate design underlying or supposed to underlie any of the rates or refunds provided for in the settlement. This is the essence of a so-called ‘black box’ settlement. The Commission recognizes that there is no underlying agreement as to the appropriate level of any individual cost categories and there are no ‘working papers’ showing any agreed upon allocation of costs among the various cost-of-service components, as Western Kentucky seeks to clarify.”).

¹⁸ See April 7th Filing, Attachment C (Marked), provided OATT Schedule 6A para 18:

The CRF shall consist of the following components: (i) capital structure and cost of capital; (ii) federal income tax and depreciation rates as utilized by the U.S. Internal Revenue Service; (iii) average state tax rate, and (iv) debt interest rates, all as determined in accordance with Manual 15. The CRF shall be updated annually in accordance with the procedures in Manual 15 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. The CRF capital structure and cost of capital include the following rate components: [i] A capital structure debt/equity ratio of 50 percent debt and 50 percent equity; and [ii] An after-tax internal rate of return on equity of 12 percent.

¹⁹ See April 7th Filing, Attachment C (Marked), provided OATT Schedule 6A para 18.

calculation has been explained in the PJM stakeholder process, and additional information was and is available to any participant inquiring about it, including during the annual review of black start formula rates. Neither the CRF calculation nor the values in the CRF table were disputed.

Contrary to the position PJM now adopts, PJM’s report in 2019 specified the inputs, and the value of the inputs, to the CRF calculation. This further demonstrates that the values included in the CRF table reflect the underlying CRF calculation based on specific inputs and do not themselves constitute the filed rate that PJM is required to apply. PJM also explained in its 2019 report that it would accept values different from the CRF values included in the tables if black start service unit owners could justify a different CRF value based on the CRF formula components.²⁰ This also demonstrates that the CRF values are calculated based on specific inputs and are not a black box. PJM could not have taken the position that it was acceptable to using alternative CRF values if the CRF values in the table constituted black box or stated values.

Table 1 shows the CRF values for black start units currently included in Paragraph 18 of Schedule 6A to the OATT.

Table 1 Existing CRF table for black start units

Age of Black Start Unit (Years)	Term of Black Start Unit Commitment (Years)	Levelized CRF
1 to 5	20	0.125
6 to 10	15	0.146
11 to 15	10	0.198
16+	5	0.363

²⁰ PJM 2019 Black Start Formula Review at 8 (“Optionally, a Black Start unit owner may elect to apply an alternative Capital Recovery Factor (CRF), in lieu of the age-based CRF table listed on page 7, which is based upon the expected capital Improvement Lifespan of the new or additional capital improvements (as determined by the applicable depreciation period of the capital improvement, as published from time to time by the US Internal Revenue Service).”).

b. Changes Affecting CRF Values

The existing CRF values in Table 1 were made obsolete as of January 1, 2018, when amendments to the federal tax code became effective, reducing the federal corporate income tax rates from 35 percent to 21 percent and making the depreciation provisions more beneficial.²¹ PJM failed to update the CRF values at that time.

The Commission recognized and addressed the same issue in another context. In 2018, the Commission issued an Order to Show Cause concerning the impacts of federal tax laws on transmission rates.²²

The Commission explained:

2. On December 22, 2017, the Tax Cuts and Jobs Act of 2017 (Tax Cuts and Jobs Act)[n3: Tax Cuts and Jobs Act, Pub. L. No. 115-97, 131 Stat. 2054 (2017).] was signed into law. The Tax Cuts and Jobs Act, among other things, lowered the federal corporate income tax rate from a maximum 35 percent to a flat 21 percent rate, effective January 1, 2018. This means that, beginning January 1, 2018, companies, including those subject to the Commission's jurisdiction, will compute income taxes owed to the Internal Revenue Service based on a 21 percent tax rate. This tax rate reduction will result in lower income tax expense going forward and a reduction in accumulated deferred income taxes on the books of rate-regulated companies.[footnote omitted]

3. The recovery of federal corporate income taxes is reflected in transmission rates. When tax expense decreases, so does the cost of service. The Commission must ensure that the rates, terms, and conditions of jurisdictional services under the FPA are just, reasonable, and not unduly discriminatory or preferential.[n5: 16 U.S.C. §§ 824d-e (2012).] It has been the Commission's policy to allow transmission rates to be established through, among other things, formulas. Regarding formula rates, the Commission has stated that "the formula itself is the rate, not the particular components of the formula." [footnote omitted] Thus, periodic adjustments, which are typically performed on an annual basis,

²¹ Tax Cuts and Jobs Act, Pub. L. No. 115-97, 131 Stat. 2054 (2017).

²² Alcoa Power Generating Inc.—Long Sault Division, et al., 162 FERC ¶ 61,224 (2018) (*Alcoa Power*).

"made in accordance with the Commission-approved formula do not constitute changes to the rate itself and accordingly do not require section 205 [of the FPA][footnote omitted] filings." [footnote omitted]

4. Formula rates include the federal income tax rate as either a fixed line item or an input that is adjusted annually. For formula rates with inputs that are adjusted annually, the current 21 percent federal corporate income tax rate will be reflected in a transmission revenue requirement without requiring a revision to the formula rate. However, for those formula rates where the federal corporate income tax rate is a fixed line item, absent a revision to the formula rate, the current 21 percent federal corporate income tax rate would, to the detriment of customers, not be reflected in a transmission revenue requirement.

The same tax law changes identified by the Commission in this 2018 case affect the correct calculation of CRF values and the Commission's reasoning applies directly to the CRF issue.

c. PJM's Letters to New Service Providers Are Not Contracts and Do Not Change the Formula Rate.

Paragraph 18 in Schedule 6A include several variants of a formula rate for compensation for black start service. The formula rates apply to multiple scenarios. None of the formula rates included in Paragraph 18 apply to the recovery of investment in new equipment to enable the provision of black start service.

PJM determined that it needed black start service in locations where new investment in existing units would be required so that the unit could provide black start service. PJM did not file to revise Paragraph 18 to provide a formula rate specifically applicable to this scenario. Instead, PJM drafted letters to black start service providers making new investments in units that PJM represented as how PJM intended to interpret and apply the formulas in Paragraph 18 to investment in new black start service capability.

The Market Monitor includes the text of one such recent letter as Attachment A, with identifying information removed.²³ The letter states: “the purpose of this correspondence is to memorialize the terms associated with providing [COMPANY] the opportunity to recover new or additional Black Start Capital Costs as set forth in paragraph 6 of Schedule 6A of the Tariff.” The letter is substantively similar to other letters from PJM to new black start service unit owners.

The letters constitute unilateral communications by PJM. These letters are not contracts, and PJM is not bound to interpret and apply the tariff as indicated in the letters. PJM did not and could not agree to make any payment not provided for under Schedule 6A, which included the filed formula rate and the review process for the components included in the formula rate. PJM is required to apply the filed rate, in this case, a formula rate.

The letters are not contracts. PJM’s signing the letter is not the equivalent to its executing a contract. The letters contain no terms or conditions that typically would be included in contracts. The letters were not filed with the Commission, as would be required for contracts for jurisdictional service.²⁴ The letters make explicit reference to “paragraph 6 of Schedule 6A of the Tariff,” the paragraph allowing for recovery under formula rates, and do not purport to be self standing.

The letters refer to the CRF, stating:

As [COMPANY] is electing to recover Black Start Capital Costs in a manner consistent with the approach specified in Paragraph 6 of Schedule 6A of the Tariff, the Fixed Black Start Service Costs for each Black Start Unit shall be the product of (i) the Incremental Black Start Capital Cost for such Black Start Unit and (ii) the

²³ The Market Monitor has taken this approach, out an abundance of caution, in order to protect confidential Member information and to efficiently address what are essentially form letters to multiple unit owners. The Market Monitor can provide copies of the letters to the Commission upon request.

²⁴ See 16 U.S.C § 824d(c).

applicable Capital Recovery Factor (“CRF”) as set forth in the Capital Recovery Factor table in Schedule 6A of the Tariff (the “CRF Table”). For the purposes of [] CT2 and [] CT4, PJM has determined that the appropriate CRF and recovery period will be five (5) years, and that the applicable CRF for the purposes of the Project will be 0.363.²⁵

PJM was not authorized to make a final determination on rates at the time it sent the letters. PJM’s letters preceded, by as much as two years, the Market Monitor’s review of the cost inputs for new black start units under Paragraph 17B of Schedule 6A. Under that process, the Market Monitor reviews the actual capital costs once incurred, based on invoices, attempts to come to an agreement with the black start service unit owner about the appropriate level of capital costs. After receiving notice of the Market Monitor’s position, PJM makes its determination on the total revenue requirement.

The Market Monitor raised the issue of incorrect CRF values with PJM as part of the review of specific black start units in 2020. PJM approved three owners’ revenue requirement calculations despite the Market Monitor’s explicit objection to the CRF rate used. PJM is authorized to make a determination after the Market Monitor’s review is complete.²⁶ PJM was not bound by the level of payments estimated in its letters and there is no evidence that PJM agreed to the level of payment in the letters. There is no evidence that any unit owner disputed PJM’s final revenue requirement decisions because they differed from the preliminary estimates included in the letters.

Black start service unit owners cannot claim reasonable reliance on estimates included in the letters. PJM could not and did not predetermine the results of the review process under Section 17B of Schedule 6A.

In addition, the argument for reliance ignores the nature of the specific component of the CRF formula affected by the tax law changes. The CRF formula includes an incentive

²⁵ See Attachment A.

²⁶ See OATT Schedule 6A para. 17B.

component accounting for a just and reasonable rate of return. The changes to the tax laws had no effect on the incentive component. The tax law changes affected only the cost-based tax component of the CRF formula. The adjustment recommended by the Market Monitor would ensure that customers are not required to compensate black start resources for costs that are not actually paid by black start resources. An adjustment to the level of CRF values is required for the same reason that the Commission required an adjustment to transmission rates in *Alcoa Power*.

2. The Inaccurate Values in the CRF Table Have Had and Will Continue to Have Significant Impacts.

Since as early as October 2019, the Market Monitor has raised the issue of incorrect CRF values included in the tariff with PJM. PJM has sole authority to implement the tariff and should implement the filed rate, including formula rates, without delay.²⁷ The Market Monitor urged PJM to correctly implement the black start formula rate and to apply corrected CRF values based on the changes to corporate tax rates effective January 1, 2018, and the Commission's determination in *Alcoa Power*. Because such changes involve the correct application of the formula rate, PJM had and has the authority to implement the changes immediately and was not required to initiate any stakeholder process or to submit a Section 205 filing. The Market Monitor encouraged PJM to take action to correct the CRF as quickly as possible.

PJM took no action to correct the inaccurate payments and charges that resulted from and continue to result from the use of inaccurate CRF values. PJM instead took up the matter in the stakeholder process. Even though the need to correct the CRF values was clear in fact and law, the PJM Members Committee produced no affirmative recommendation.²⁸

²⁷ See OATT § 12A; 18 CFR § 35.28(g)(3)(iii)(A).

²⁸ April 7th Filing at 2.

The April 7th Filing includes proposed revisions developed by PJM and filed under Section 205 of the Federal Power Act (at 1–2). The April 7th Filing clarifies and makes explicit the CRF component of the formula rate for future black start service units. The April 7th Filing makes no corrective actions concerning the inaccurate implementation of the formula rate since January 1, 2018. The April 7th Filing instead proposes to exclude existing black start service units from corrective action. Accepting the April 7th Filing without condition would make PJM’s failure to take corrective action permanent and would extend that failure into the future indefinitely for all existing black start units with revenues based on CRF values.

Without further delay, PJM should correct, or be directed to correct, its implementation of the Schedule 6A formula rate and inaccurate billing since January 1, 2018, regardless of when or whether the revisions proposed in the April 7th Filing become effective.

B. The Formula Rate Should Apply Accurate CRF Values for All Black Start Units.

The April 7th Filing eliminates the table of CRF values that are subject to change when the inputs change. The April 7th Filing identifies the components of the formula in Paragraph 18, but does not include the formula.²⁹

The April 7th Filing is prospective only. The April 7th Filing does not change PJM’s obligation to apply the correct filed formula rate since January 1, 2018. The April 7th Filing proposes to continue paying owners of existing black start units for the entire remaining CRF payment period for each unit based on known incorrect CRF values.

It is unjust and unreasonable to apply the black start service formula rate using the CRF values known to be inaccurate. PJM has not supported this approach. There is no justification for providing owners of existing black start service units a windfall at the

²⁹ See April 7th Filing, Attachment C (Marked), provided OATT Schedule 6A para 18.

expense of PJM customers. Applying inaccurate values contradicts the precedent set in *Alcoa Power*.³⁰ The same corrected formula should apply to owners of both new and existing owner units.

C. The Commitment Period Based on the Life of the Black Start Equipment Should Apply to All Units.

The April 7th Filing states (at 8–9):

PJM proposes to revise Schedule 6A, section 6 to streamline the commitment period and termination provisions for the Black Start Service commitment by Black Start Units electing to recover new or additional Black Start Capital Costs. The commitment period for these units will now be the life of the Black Start equipment.

The Market Monitor supports the revisions changing the commitment period based on the life of the black start equipment. The proposed revisions, however, do not apply the new commitment period rules to all new investments in black start resources. The proposed revisions continue to apply the current commitment period to new investments at units that existed prior to June 6, 2021.

The proposed revisions state:

Owners of Black Start Units selected to provide Black Start Service prior to June 6, 2021, in accordance with section 4 of this Schedule 6A and electing to recover new or additional Black Start Capital Costs shall commit to provide Black Start Service from such Black Start Units for a term based upon the age of the Black Start Unit or the longest expected life of the Incremental Black Start Capital Cost, as set forth in the applicable CRF Table.³¹

The commitment rules governing new investments should be the same regardless of whether the black start unit was selected before or after June 6, 2021. Nothing justifies applying different commitment periods to new investments at black start units based on an

³⁰ 162 FERC ¶ 61,224.

³¹ See April 7th Filing, Attachment C (Marked Sheet), proposed revised OATT Schedule 6A para. 6.

arbitrary date of June 6, 2021. This unduly discriminatory feature of the proposed revisions in the April 7th Filing should be rejected.

D. Recommended Approach

The Market Monitor has calculated the correct CRF values for existing and new black start units. The Market Monitor also provides the formula that can be used in the tariff to calculate correct CRF values as the various input values change.

PJM should be directed to include the formula, with input definitions, in the tariff.

Correctly calculated CRF values are different for black start resources added under the prior tax provisions and black start resources added under the new tax provisions. Black start resources added after January 1, 2018, pay taxes based on both the identified 21 percent corporate tax rate and the depreciation provisions that apply to new investment. Table 2 includes the CRF values reflecting those inputs.

Table 2 Updated CRF table for black start units: Tax rate and depreciation changes

Age of Black Start Unit (Years)	Black Start Cost Recovery Period (Years)	Updated Levelized CRF
1 to 5	20	0.101
6 to 10	15	0.116
11 to 15	10	0.147
16+	5	0.246

Black start resources added prior to January 1, 2018, pay taxes based on the identified 21 percent corporate tax rate and on the depreciation provisions in effect at the time of that investment. Table 3 includes the CRF values reflecting those inputs.

Table 3 Updated CRF table for black start units: Tax rate changes only

Age of Black Start Unit (Years)	Black Start Cost Recovery Period (Years)	Updated Levelized CRF
1 to 5	20	0.115
6 to 10	15	0.132
11 to 15	10	0.175
16+	5	0.308

While the CRF values can be calculated using a standard financial model, that model can also be reduced to a formula which produces exactly the same results. The formula uses identified inputs to calculate the correct CRF values based on those input values.

A general formula for calculating CRF values is:^{32 33}

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

The inputs are listed in Table 4.

Table 4 Variable descriptions for the CRF formula

Formula	
Symbol	Description
r	After tax Weighted Average Cost of Capital (ATWACC)
s	Effective Tax Rate
B	Bonus Depreciation Percent
N	Cost Recovery Period (years)
L	Lesser of N or 16 (years)
m _j	Modified Accelerated Cost Recovery System (MACRS) depreciation factor for year j = 1, ..., 16

The CRF values in Table 2 can be replicated using the formula with the input values in Table 5 and 100 percent bonus depreciation (B = 100 percent). Bonus depreciation at 100 percent is applicable for 2022 but for each year after 2022, the applicable bonus depreciation is reduced by 20.0 percent. In 2023 and after the 15 year MACRS depreciation factors will be applicable.³⁴

³² The formula is derived from a CRF formula typically found in engineering economics textbooks. For example, "Economic Evaluation and Investment Decision Methods," Stermole, F.J. and Stermole, J.M. (1993).

³³ The CRF formula is based on the MMU MOPR valuation model and assumes mid year levelized payments.

³⁴ See 15 year MACRS with half year convention in Appendix A, Table A-1, IRS Publication 946, United States Department of Treasury (2020).

Table 5 Parameter values^{35 36}

Model Parameter	Parameter Value
Equity Funding Percent	45.000%
Debt Funding Percent	55.000%
Equity Rate	13.000%
Debt Interest Rate	6.000%
Federal Tax Rate	21.000%
State Tax Rate	9.300%
After tax Weighted Average Cost of Capital (AT WACC)	8.215%
Effective Tax Rate	28.347%

The CRF values previously provided by the Market Monitor have been revised slightly based on lessons learned during the MOPR review process. The prior CRF values incorporated a mortgage style term loan structure. The proposed CRF values are fully consistent with the financial model used by the Market Monitor and PJM to calculate MOPR Gross CONE values.³⁷

Continued use of the incorrect CRF values for existing black start resources will cause customers to overpay by more than \$96 million over the full CRF life of these resources.

The overpayment was calculated separately for each unit, applying the correct CRF for units with investments made prior to the new tax laws and for units with investments made after the new tax laws.

³⁵ Effective Tax Rate = 9.3% + 21.0% · (1 – 9.3%). State tax rate plus federal tax rate.

³⁶ ATWACC = 45.0% · 21.0% + 55.0% · 6.0% · (1 – 28.347%).

³⁷ The MOPR model is publicly available at https://www.monitoringanalytics.com/tools/docs/IMM_MOPR_Gross_CONE_Template_v1.xlsx.

Table 6 Lifetime difference in payments to black start units with updated CRF

Years	Existing Annual Revenue Requirement Total	Updated Annual Revenue Requirement Total	Difference Per Year Total	Updated Lifetime Difference Total
Pre 2017 units	\$53,402,977	\$46,637,692	\$6,765,285	\$38,078,930
Post 2017 Units	\$28,217,475	\$19,902,490	\$8,314,985	\$58,811,154
Total	\$81,620,451	\$66,540,182	\$15,080,269	\$96,890,084

E. Other Changes are Just and Reasonable

PJM proposes a number of other revisions to Schedule 6A, including:

- Allowing for the termination the service commitment for specified reasons;
- Coordinating planned outages and substitutions in (Schedule 6A §§ 7–11);
- Conditioning payment on testing within the preceding 13 months (Schedule 6A §§ 12–14);
- Terminating service and forfeiting revenues for black start units failing to obtain a successful test for an extended period of time (Schedule 6A § 15);
- Clarifying that the Minimum Tank Suction Level (“MTSL”) calculation must reflect only the incremental volume of fuel necessary to provide black start service by calculating the Black Start Energy Tank Ratio of MTSL (Schedule 6A § 18).

These proposed revisions should be accepted as just and reasonable because they operate either to ensure PJM and its customers receives the black start service for which they pay and on which they rely to ensure appropriate allocation of incremental black start service costs.

II. CONCLUSION

The Market Monitor respectfully requests that the Commission afford due consideration to these comments as it resolves the issues raised in this proceeding.

Respectfully submitted,



Jeffrey W. Mayes

Joseph E. Bowring
Independent Market Monitor for PJM
President
Monitoring Analytics, LLC
2621 Van Buren Avenue, Suite 160
Eagleville, Pennsylvania 19403
(610) 271-8051
joseph.bowring@monitoringanalytics.com

General Counsel
Monitoring Analytics, LLC
2621 Van Buren Avenue, Suite 160
Eagleville, Pennsylvania 19403
(610) 271-8053
jeffrey.mayes@monitoringanalytics.com

Gerard F. Cerchio
Analyst
Monitoring Analytics, LLC
2621 Van Buren Avenue, Suite 160
Eagleville, Pennsylvania 19403
(610) 271-8050
gerard.cerchio@monitoringanalytics.com

Dated: April 28, 2021

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 28th day of April, 2021.



Jeffrey W. Mayes

General Counsel

Monitoring Analytics, LLC

2621 Van Buren Avenue, Suite 160

Eagleville, Pennsylvania 19403

(610) 271-8053

jeffrey.mayes@monitoringanalytics.com

Attachment A

Re: [COMPANY]–[UNIT] Black Start RFP Proposal Acceptance

Mr. [CONTACT]:

This letter supersedes the [DATE] Black Start RFP Proposal Acceptance letter to [COMPANY] for [UNIT] Facility’s General Electric 7-FA Combustion Turbines located in [LOCATION] (“[] CTs”), [] CT2 and [] CT4 to add [] CT1 and [] CT3 as Black Start capable. This letter also contains the response to [COMPANY] Black Start Proposal submittal to PJM Interconnection, L.L.C. (“PJM”) dated [DATE], regarding the PJM RTO Wide Five Year Selection Process Request for Proposal dated [DATE] (“RFP”) seeking submissions for replacement black start capability in all PJM transmission zones. [COMPANY] proposed black start project capital expenditures estimated in the amount of \$[INVESTMENT] at the [UNITS] (“[]Costs”), which were deemed necessary by [COMPANY] to enable []CT2 and []CT4 to be upgraded to Black Start Units³⁸ and for []CT1 and []CT3 to be made Black Start capable.

PJM is hereby providing notification that [COMPANY]’s proposal has been accepted for [] CT2 and [] CT4 at the [] Facility to provide black start service. Moreover, [] CT1 and [] CT3 are accepted to be Black Start capable. The proposed [] Project Costs have been reviewed and the purpose of this correspondence is to memorialize the terms associated with providing [COMPANY] the opportunity to recover new or additional Black Start Capital Costs as set forth in paragraph 6 of Schedule 6A of the Tariff.³⁹ At this time, PJM expects [] CT2 and [] CT4 to provide Black Start Service as of [DATE].

Recovery of [] Project Costs will occur in accordance with the Black Start Service revenue requirement formula set forth in Paragraph 18 of Schedule 6A of the Tariff. As [COMPANY] is electing to recover Black Start Capital Costs in a manner consistent with the approach specified in Paragraph 6 of Schedule 6A of the Tariff, the Fixed Black Start Service Costs for each Black Start Unit shall be the product of (i) the Incremental Black Start Capital Cost for such Black Start Unit and (ii) the applicable Capital Recovery Factor (“CRF”) as set forth in the Capital Recovery Factor table in Schedule 6A of the Tariff (the “CRF Table”). For the purposes of [] CT2 and [] CT4, PJM has determined that the appropriate CRF and

³⁸ Capitalized terms not otherwise defined herein shall have the meaning ascribed to them as set forth in PJM’s Open Access Transmission Tariff, the Amended and Restated Operating Agreement of PJM Interconnection, L.L.C. and/or PJM Manuals, as appropriate and applicable.

³⁹ Importantly, this correspondence makes reference to and incorporates certain provisions of Schedule 6A of the Tariff, and where helpful to resolve ambiguity, the terms set forth herein should be construed in a manner consistent with the Tariff and/or Schedule 6A thereto.

recovery period will be five (5) years, and that the applicable CRF for the purposes of the Project will be 0.363.

Similarly, based upon the reasonable expected life of the [] CTs upon completion of the project, [COMPANY] is committing to provide Black Start Service from [] CT2 and [] CT4 for five (5) years. For its part, by submitting the [] Project Costs for recovery, [COMPANY] acknowledges that consistent with Schedule 6A of the Tariff, [] CT2 and [] CT4, shall not be eligible to recover any incentive rate for providing Black Start Service, including provisions for Fixed BSSC calculated under Paragraph 18 in accordance with Paragraph 5 of Schedule 6A, the "Z" incentive factor, or any similar successor provisions. However, consistent with the allowance for revenue recovery provided in Schedule 6A the [] [C]Ts may recover Variable BSSC, Training Costs and Fuel Storage Costs if applicable.

The five (5) year cost recovery period for the [] CTs shall commence on the first day of the first month following (i) completion of upgrading the [] CT2 and [] CT4 to a Black Start Unit, (ii) successful completion of a Black Start test in accordance with PJM's manual requirements, and (iii) the addition of [] CT2 and [] CT4 as Black Start resources in the [COMPANY] Restoration Plan. Prior to this date [COMPANY] will provide PJM with a best estimate of each unit's annual revenue requirement. Initially, upon entering Black Start Service, [COMPANY]'s Black Start credits will be held by PJM in a non-interesting bearing account until approval of [] CT2's and [] CT4's annual revenue requirement has been approved in accordance with Paragraph 17B of Schedule 6A to the Tariff. However, for each month during the applicable five (5) year cost recovery period, including the months when revenues were withheld by PJM during the revenue approval process, that the [] CTs has successfully complied with all applicable Black Start testing requirements, [COMPANY] will be paid, for the [] CTs: (a) Black Start Service Revenue Requirements for the applicable unit for such year calculated in accordance with the Black Start Service Revenue Requirement set forth in Paragraph 18 of Schedule 6A to the Tariff divided by (b) twelve (12) (the amount calculated by dividing (a) by (b) shall be the "Monthly Black Start Service Revenue Requirement"). For the months when revenues were withheld by PJM during the revenue approval process, PJM will reconcile the estimated annual revenue requirement with the final approved annual revenue requirement pursuant to Paragraph 17B of Schedule 6A to the Tariff and issue credits or charges based on the final approved annual revenue requirement.

Importantly, [COMPANY] shall not include in its RPM avoided costs rates (ACR or APIR – Section 6.8 of Attachment DD to the Tariff) any Black Start Capital Costs or any avoidable costs associated with black start service during this five (5) year term of commitment.

Finally, in the event that during the five (5) year cost recovery period [COMPANY] maintains that an additional amount of capital investment is required in order for the [] CT2 and [] CT4 to provide Black Start Service, the period for recovery of any such additional

capital investment (assuming approval) shall be determined in accordance with Paragraph 18 of Schedule 6A. [COMPANY] acknowledges that the period of recovery of such additional capital investment may run concurrently with the recovery of the costs contemplated in this correspondence. All [] CTs project costs will be recovered by [COMPANY] in [] CT2 and [] CT4 annual revenue requirement unless [] CT1 and [] CT3 is used by [COMPANY] as a substitute in the future in accordance with paragraph 10 of Schedule 6A.

If you should have any questions or concerns, please do not hesitate to contact me at 610-666- 8839.

Sincerely, Stanley H. Williams

Director, Settlements and Operation Analysis & Compliance

CC: Michael Bryson, Vice President – Operations
Joseph Bowring, President, Monitoring Analytics
Glen Boyle, Manager, Operation Analysis & Compliance
David Schweizer, Manager, Generation