

1 **REBUTTAL TESTIMONY OF CHARLES E. BOLYARD, JR.**
2 **OF McDONOUGH BOLYARD PECK, INC.**
3 **FOR WILLIAMS SOLAR, LLC**
4 **BEFORE THE NORTH CAROLINA UTILITIES COMMISSION**

5 **Docket No. E-2, Sub 1220**
6 **May 19, 2020**

7
8 **I. INTRODUCTION**

9 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

10 A. Charles E. Bolyard, Jr. My business address is Williams Plaza 1, 3040 Williams
11 Drive, Suite 300, Fairfax, VA 22031.

12 **Q. DID YOU PREVIOUSLY FILE DIRECT TESTIMONY IN THIS**
13 **PROCEEDING?**

14 A. Yes.

15 **II. PURPOSE AND SCOPE**

16 **Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?**

17 A. I respond to the testimony of Duke Energy Progress, LLC (“DEP”) witnesses
18 Jennings & Holmes, McNeil, and Jennings. My testimony is organized as follows:

- 19 • AACE Guidelines and Contingency. I respond to the testimony of Mr. Holmes
20 regarding application of guidelines issued by AACE International (“AACE”) to

1 the Facilities Study estimate (the “Revised Estimate”) provided to Williams
2 Solar by DEP. I specifically address the contingency level applied by DEP in
3 the Revised Estimate provided to Williams Solar, LLC.

4 • DEP’s “Correction” of Maximo Output. I respond to DEP’s assertions
5 regarding its use of Maximo and subsequent manipulation of the Maximo
6 output to arrive at the Revised Estimate.

7 • Good Faith. I respond to DEP’s witness testimony claiming that the estimates
8 they provided were made in good faith. First, DEP admits without saying as
9 much that the SIS estimate (the “Initial Estimate”) was not provided honestly,
10 as DEP believed at the time the estimate was provided to Williams Solar that
11 its estimates were inaccurate. Second, none of DEP’s testimony supports a
12 conclusion that the Revised Estimate was developed in a manner intended to
13 reasonably estimate the actual costs of interconnecting the Williams Solar
14 project. These actions do not appear to be in “good faith,” whether you apply
15 the interpretations DEP’s witnesses try to give to that phrase or any other
16 reasonable meaning.

1 **III. AACE GUIDELINES AND CONTINGENCIES**

2 **Q. PLEASE SUMMARIZE YOUR OPINION WITH REGARD TO THE**
3 **APPROPRIATENESS OF THE CONTINGENCIES APPLIED BY DEP IN**
4 **ITS REVISED ESTIMATE.**

5 A. As stated in my direct testimony, based on the design requirements at the Facilities
6 Study stage and the use of site visits in preparing the Revised Estimate, the 20-
7 percent contingency applied by DEP is excessive and appears to be merely a factor
8 to increase the estimated costs rather than a true contingency.

9 **Q. DOES THE TESTIMONY OF DEP’S WITNESSES CHANGE YOUR**
10 **OPINION REGARDING THE INAPPROPRIATENESS OF THE**
11 **CONTINGENCIES APPLIED BY DEP IN THE REVISED ESTIMATE?**

12 A. No. Nothing in the testimony of DEP’s witnesses changes my opinions about the
13 level of engineering used in preparing the revised estimate, the excessiveness of the
14 20-percent contingency, or my opinion that the “contingency” is being used as a
15 factor to increase estimated costs. DEP’s witnesses mostly confirm that my critique
16 of the Revised Estimate was correct, and where their opinions differ from mine,
17 DEP witnesses’ opinions are not supported.

18 **Q. DO YOU AGREE WITH DEP’S WITNESSES ABOUT THE**
19 **APPROPRIATE FRAMEWORK FOR PREPARING AND ANALYZING**
20 **ESTIMATES?**

1 A. DEP’s witness relies on the AACE International (“AACE”) Cost Estimating
2 Framework embodied in AACE’s Recommended Practice No. 96R-18 as an
3 appropriate framework for considering both the Initial Estimate and the Revised
4 Estimate.¹ As a member, Fellow, and past President of AACE, I am very familiar
5 with this standard and, as noted by Mr. Holmes, I also relied on the AACE standards
6 in arriving at the opinions in my direct testimony. My familiarity with this standard
7 includes, among others, my application of this standard in expert testimony in
8 arbitration proceedings regarding the standard of care as it relates to the preparation
9 of cost estimates, revised cost estimates, and forecasts of costs at construction
10 completion for power generating facilities with costs up to \$3.5 billion and heavy
11 industrial processing facilities with costs up to \$10.2 billion.

12 **Q. DO YOU AGREE WITH DEP WITNESS HOLMES’ SUGGESTION THAT**
13 **THE INITIAL ESTIMATE IS A CLASS 5 ESTIMATE UNDER THE AACE**
14 **COST ESTIMATING FRAMEWORK BASED ON THE DESIGN STAGE**
15 **OF THE PROJECT?**

16 A. No.

17 **Q. PLEASE EXPLAIN.**

18 A. DEP Witness Holmes contends that “in most cases” a System Impact Study
19 estimate is a Class 5 estimate because, at that stage, Duke lacks “detailed design

¹ K. Jennings & Holmes Direct, at 21-27.

1 engineering . . . , a definitive materials list, or a construction schedule” and has not
2 “conducted a site assessment or any field engineering.”² As discussed in the AACE
3 Cost Estimating Framework, Class 5 estimates “are generally prepared based on
4 very limited information,” “may be prepared within a very limited amount of time
5 and with very little effort expended” and are sometimes referred to as “back of the
6 envelope” or “guesstimate[s].”³ DEP Witness Holmes’s conclusion is not
7 consistent with the Initial Estimate, which is based on specific system upgrades that
8 are described and quantified and is not simply conceptual in nature.

9 **Q. WHICH AACE COST ESTIMATING FRAMEWORK CLASSIFICATION**
10 **DO YOU BELIEVE IS APPLICABLE TO THE INITIAL ESTIMATE?**

11 A. The Initial Estimate appears to be at least a Class 4 estimate, based upon the detail
12 known about the project, its location, and the facilities needed to interconnect it, as
13 described in the System Impact Study.

14 One stated purpose of classifying cost estimates is “to align the estimating
15 process with project stage-gate scope development and decision-making
16 processes.”⁴ The estimate classification should match the purpose for which the
17 cost estimate is intended. The AACE Cost Estimating Framework makes clear that

² K. Jennings & Holmes Direct, at 25.

³ K. Jennings & Holmes Direct, Exhibit 1 at 8.

⁴ K. Jennings & Holmes Direct, Exhibit 1 at 6.

1 Class 5 estimates are for concept screening. A project at the System Impact Study
2 stage is well past the concept stage. DEP intends the estimate to be the basis of
3 significant economic decisions by the interconnection customer. These
4 characteristics are consistent with at least a Class 4 estimate.

5 It is my understanding that, in relation to its pending rate proceeding, DEP
6 has represented that “high-level” estimates it has prepared based on “the number of
7 devices to be deployed and the number of circuit miles to be upgraded at the circuit
8 level,” and “per-unit costs based on . . . historical costs,” “without cost estimators
9 visiting actual sites,” are Class 4 estimates.⁵ This is consistent with my
10 understanding of how the Initial Estimate was prepared for Williams Solar.

11 **Q. DOES THE ESTIMATE CLASSIFICATION, BY ITSELF, DETERMINE**
12 **HOW ACCURATE AN ESTIMATE IS EXPECTED TO BE?**

13 A. No. As described in the AACE Cost Estimating Framework, estimate accuracy is
14 driven by a number of systemic risks including level of familiarity with the
15 technology, uniqueness or remoteness of a project location, complexity of the
16 project, quality of reference cost estimating data.⁶

17 **Q HOW DO THOSE FACTORS AFFECT THE EXPECTED ACCURACY OF**

⁵ Public Staff Testimony of Jeff Thomas, Docket No. E-2, Sub 1219, at 73, *available at*
<https://starw1.ncuc.net/NCUC/ViewFile.aspx?Id=2607e867-0b10-4b5b-be39-1d804cfd6de7>.

⁶ Jennings & Holmes Direct, Exhibit 1 at 6-7.

1 **THE INITIAL ESTIMATE?**

2 A. Here, given DEP's touted experience with installing solar interconnection projects
3 of this size and in this region, it is reasonable to expect the Initial Estimate to be
4 more accurate than a typical Class 4 estimate, likely in the range of -15% to +20%
5 of actual costs. Taking DEP's contention that the Revised Estimate is more
6 accurate as true for the sake of argument, the Initial Estimate was unacceptably
7 inaccurate.

8 **Q. TURNING TO THE REVISED ESTIMATE, HOW DO YOU RESPOND TO**
9 **THE CONTENTION OF DEP'S WITNESSES REGARDING THE LEVEL**
10 **OF ENGINEERING SUPPORTING THAT ESTIMATE?**

11 A. DEP Witnesses K. Jennings and Holmes seem to suggest that there is a round of
12 more detailed engineering that occurs after execution of an interconnection
13 agreement and that the engineering underlying the Revised Estimate is somehow
14 preliminary.⁷ This is not consistent with my understanding of the North Carolina
15 Interconnection Procedures, which I understand require design of interconnection
16 facilities and upgrades at the Facilities Study stage. NC Procedures § 4.4.5. It is
17 my understanding that the estimates provided at the Facilities Study stage are
18 incorporated into the Interconnection Agreement. DEP Witnesses Jennings and
19 Holmes's suggestion is undercut by other testimony by DEP's witnesses and by

⁷ K. Jennings & Holmes Direct, at 20-21, 26.

1 DEP's repeated argument in this proceeding that the Facilities Study is when the
2 detailed engineering occurs. For instance, DEP Witness Scott Jennings states that
3 "the Facilities Study does not always result in the final engineering and design of
4 the interconnection,"⁸ suggesting that the Facilities Study sometimes does produce
5 the final engineering and design of the interconnection. According to Mr. S.
6 Jennings, the "Facilities Study often involves a field visit which provides the
7 opportunity to perform a more detailed engineering estimate taking into account
8 actual facility and site conditions."⁹ The suggestion that there is substantial
9 engineering uncertainty left after completion of the Facilities Study is unwarranted.

10 Furthermore, to the extent that there was some sort of significant
11 engineering design effort to be undertaken after an Interconnection Agreement was
12 signed, I would expect to see a significant charge for design costs to be included as
13 a line item in the Revised Estimate. There is no line item in any of the estimates
14 produced by DEP for engineering or design costs.

15 **Q. DO YOU AGREE WITH DEP WITNESS HOLMES' SUGGESTION THAT**
16 **THE REVISED ESTIMATE IS A CLASS 3 OR CLASS 4 ESTIMATE?**

17 A. No.

18 **Q. PLEASE EXPLAIN.**

⁸ S. Jennings Direct, at 5-6.

⁹ *Id.* at 6.

1 A. The Revised Estimate should be at the AACE Estimate Class 2. Based on DEP's
2 description of its processes, including design, underlying the development of its
3 Revised Estimate and the discussion of the intent of the Facility Study Report found
4 in the North Carolina Interconnection Procedures, along with the discussion of the
5 Interconnection Agreement process, the Revised Estimate represents the point at
6 which the project is ready to move into construction planning and execution. This
7 status of project definition is commensurate with AACE Estimate Class 2, which is
8 at "project control or bid/tender" status. This means that the project is ready to turn
9 over to field forces for construction.

10 **Q. WHAT RANGE OF ACCURACY WOULD YOU EXPECT FROM THIS**
11 **ESTIMATE?**

12 A. The expected accuracy range at Estimate Class 2 is -15% (low) to +20% (high),
13 particularly when considering DEP's purported extensive experience on regional
14 independent generator facility interconnection projects of similar size to the
15 Williams Solar project.

16 **Q. HOW DOES THIS RANGE OF ACCURACY RELATE TO THE**
17 **APPROPRIATE LEVEL OF CONTINGENCY THAT SHOULD BE**
18 **APPLIED AT THE FACILITIES STUDY STAGE?**

19 A. It is important to understand that the range of accuracy of estimates described in
20 the AACE standards is different than the contingency. The contingency should be

1 considered in general based on the risks associated with known, but undefinable,
2 circumstances that experience on similar projects identifies are likely to occur
3 during project execution. Given that DEP's Revised Estimate is at a minimum Class
4 2, I would expect the contingency, again with DEP's touted extensive
5 interconnection experience and ability to evaluate risk, to be in the range of 5% to
6 10% maximum.

7 **Q. HOW SHOULD ESTIMATES BE RELATED TO COST CONTROL?**

8 A. Estimates are not just numbers that induce a "yes" or "no" response from investors.
9 Cost estimates should also be used for cost control—that is, DEP should be using
10 the cost estimates on an ongoing basis as a "check" to protect against unjustified
11 cost overruns on interconnection projects.

12 **Q. DID DUKE'S WITNESSES ADDRESS THE USE OF THE ESTIMATES**
13 **FOR COST CONTROL PURPOSES?**

14 A. I do not see any indication in DEP's testimony, or in the discovery material that I
15 have reviewed, that DEP is using its estimates in this manner. At least some of the
16 difference between DEP's estimates and its actual incurred costs may result from a
17 failure of cost control during construction performance rather than pre-construction
18 cost estimating.

19 Furthermore, DEP's explanation regarding the RET is that the process of
20 developing it began when DEP realized it had cost overruns at the "true up" stage—

1 that is, after projects were completed.¹⁰ If DEP were using its estimates for cost
2 control, the fact that the estimates were being grossly overrun would have been
3 discovered and addressed during construction, not after the fact.

4 **IV. DEP'S MANIPULATION OF MAXIMO OUTPUT**

5 **Q. DOES THE TESTIMONY OF DEP'S WITNESSES CHANGE YOUR**
6 **OPINION THAT THE REVISED ESTIMATE WAS UNREASONABLE**
7 **AND UNRELIABLE?**

8 A. No.

9 **Q. PLEASE EXPLAIN.**

10 A. As previously stated, my criticism of the Revised Estimate and the Revised
11 Estimating Tool (RET) that generated it is that the method applied by DEP is
12 unreliable and unreasonable. The evidence shows that DEP generates an estimate
13 using Maximo—which is an industry-standard, appropriate method—but then it
14 manipulates that estimate using various multipliers, which is an inappropriate
15 method.

16 DEP appears to agree that using Maximo to generate cost estimates is
17 consistent with industry standards. DEP Witness S. Jennings states:

18 While there are nuances to the specific design standards used by

¹⁰ K. Jennings Direct, at 28030; *see also* Exhibit CEB-6 at 28 (“In Q1 2018, DET Management directed DET Process to further investigate observed discrepancies between estimated construction costs and actual construction costs for distribution interconnection projects coming online during Q4 2017.”).

1 each utility, the general process of utilizing standards based on
2 compatible units to calculate bills of material and labor estimates,
3 coupled with application of overhead rates, is consistent across the
4 industry. Based upon my experience, I am confident that the
5 methodology that Duke utilizes within Maximo to develop cost
6 estimates is consistent with good utility practice¹¹

7 What Mr. Jennings does not state, and what he appears to intentionally avoid
8 saying, is that DEP’s use of the RET is “good utility practice.” Rather, Mr. Jennings
9 states only that use of the RET “is intended to supplement” DEP’s use of Maximo.

10 Mr. Jennings explains that, for various reasons—primarily that doing so
11 would be difficult and time consuming—DEP decided not to update the cost
12 database in Maximo itself so that it would be capable of producing accurate
13 estimates on its own without supplementation.¹²

14 Mr. Jennings’s explanation regarding the RET is also undercut by a hidden
15 worksheet in the RET (previously filed as Exhibit CEB-13) that I did not observe
16 until after receiving Mr. Jennings’ testimony. That worksheet, labeled “Revision
17 Notes,” indicates that DEP was using the RET (or a prior version of it) to adjust
18 Maximo output as early as April 2018. CEB Rebuttal Exhibit 1, at 5. That is, it
19 appears DEP’s manipulation of Maximo output started well before DEP completed
20 its comparison of estimates and actuals culminating in the RET in mid- to late 2019.

¹¹ S. Jennings Direct, at 21.

¹² S. Jennings Direct, at 15-16.

1 As previously stated, DEP’s witnesses provided no information regarding
2 the development of the RET. While DEP states that the RET is a result of a
3 “multivariate analysis,” it has not produced any evidence of that analysis in
4 discovery or in its witness testimony.

5 The problem with DEP’s approach should be apparent. Maximo is a tool—
6 which DEP apparently uses for its own network upgrades—that generates estimated
7 costs by matching the various components of the project to a database of equipment
8 costs, labor rates, expected labor time for specified activity, applicable taxes, and
9 overheads. This is the way cost estimates should be performed—developing costs
10 from the “bottom up.” If labor rates or equipment costs change, then the
11 appropriate approach is to go into the database and input cost data to reflect those
12 updated rates. If the time associated with a specific task changes, then the database
13 should also be updated accordingly.

14 By contrast, what DEP did here was multiply the Maximo output (which,
15 again, is apparently satisfactory for Duke’s own purposes) by a series of
16 mathematical multipliers solely to get to a higher number—i.e., a “top down”
17 approach to estimating. DEP wanted the estimates to yield higher results, so it
18 started from this premise and worked backward to find the “right” combination of
19 multipliers that achieved the top line number they wanted. The effect of using blunt
20 multipliers is that it divorces the estimation process from the specifics of the project

1 in question. For example, if the multiplier increases the labor charge, that increase
2 may not be appropriate to the specific project based on its unique labor needs. Or
3 if the multiplier grosses up equipment costs, those higher costs might not be
4 relevant to what is needed for the project. This approach to estimation is simply
5 not consistent with industry standards. No credible construction estimator would
6 start with what the general contractor wanted to charge for a project and then work
7 backward to achieve that result by artificially manipulating labor rates, overheads,
8 and contingencies.

9 I simply cannot fathom why a company with Duke's resources would be
10 unable to appropriately and accurately estimate the costs of these projects,
11 especially with the Maximo tool in place, and with Duke's vast experience over
12 many years with precisely the sort of projects that are in issue here.

13 **Q. HOW DO YOU RESPOND TO DEP WITNESS K. JENNINGS'S**
14 **CONTENTION THAT THE ADJUSTMENTS MADE BY THE RET ARE**
15 **NOT ARBITRARY?**

16 A. DEP Witness K. Jennings provides no evidence that the adjustments are not
17 arbitrary. Mr. Jennings testifies that the "purpose of the RET was to improve the
18 cost estimates to better align with actually-experienced project costs,"¹³ but he
19 provides no evidence that the mathematical adjustments to the Maximo estimate

¹³ Jennings & Holmes Direct, at 31-32.

1 made by the RET are connected or tied to specific differences in actual costs in
2 comparison to estimated costs. DEP has provided no information regarding the
3 “multivariate analysis” that led it to apply the adjustments it makes in the RET, and
4 there is no way to evaluate its statistical or even its logical validity. Instead, DEP
5 Witnesses K. Jennings and S. Jennings each state that the other provides detail
6 about this analysis, while neither actually does so.¹⁴

7 Furthermore, DEP Witness S. Jennings seems to confirm the arbitrary
8 nature of several of the adjustments. In his testimony, Mr. Jennings states that DEP
9 would consider adjusting the overhead or contingency factors to reduce estimates
10 in the future if RET estimates exceed actual costs.¹⁵ Mr. Jennings’s testimony is
11 not that DEP would reduce these factors if the overheads or contingencies turn out
12 to be overestimated, but that these factors would be used as “dials” to adjust total
13 estimates downward, in the same way the RET currently uses these factors to dial
14 total estimates upward. This testimony confirms that the RET’s multipliers are not
15 tied to DEP’s actual expected costs in discrete areas (e.g., labor, overheads, or
16 contingencies). Instead, DEP is using these factors to gross up the estimate to reach
17 some predetermined higher cost level.

18 **Q. IS THERE ANY OTHER EVIDENCE OF THE ARBITRARINESS OF THE**

¹⁴ Jennings & Holmes Direct, at 31; S. Jennings Direct, at 24-25.

¹⁵ S. Jennings Direct, at 19-20.

1 **RET ADJUSTMENTS APPLIED BY DEP?**

2 A. Yes. In discovery, DEP produced an e-mail dated June 19, 2019 (when the RET
3 was in its final approval stages), in which Beckton James (the creator of the RET)
4 indicates that a revised estimate—apparently generated using the RET—should be
5 provided to an interconnection customer using a “[c]ontingency adder of 10% to
6 cover potential risk from weather, work conditions and environmental work.” CEB
7 Rebuttal Exhibit 2. It is unclear why Mr. James would consider a 10% contingency
8 based on those factors appropriate for one project, but a 20% contingency
9 appropriate for all other projects, like Williams Solar.

10 **Q. IS IT YOUR OPINION THAT THE ONLY PROBLEM WITH THE**
11 **REVISED ESTIMATE IS THAT IT PRODUCES A HIGHER RESULT**
12 **THAN THE INITIAL ESTIMATE?**

13 A. No. As I hope my direct testimony and this rebuttal testimony make clear, my
14 critique of the Revised Estimate is not that the estimate is high in comparison to the
15 Initial Estimate but that there is no reason to think it is a valid estimate. The Initial
16 Estimate—although apparently wildly inconsistent with data known to Duke at the
17 time it was provided to Williams Solar—at least uses a valid estimating
18 methodology despite relying on the outdated cost data. My critique of the Revised
19 Estimate is that it was not based on a valid methodological approach that was
20 designed to produce accurate estimates.

1 **Q. HOW DO YOU RESPOND TO MR. SCOTT JENNINGS’S CLAIM THAT**
2 **THE DATA USED IN MAXIMO IS NOT OUTDATED AND THAT THE**
3 **MAXIMO ESTIMATES ARE NOT UNRELIABLE AND**
4 **UNREASONABLE?**

5 A. There is no evidence that the data used in Maximo is up to date with regard to any
6 cost other than materials. DEP Witness S. Jennings provides little or no information
7 about the vintage of data in Maximo that were used to produce the Revised
8 Estimate. I would point out that DEP has repeatedly referred to the RET as
9 “updat[ing]” the Maximo output, not the underlying cost data, and that Mr.
10 Jennings’s testimony is that the RET was developed out of necessity because
11 updating Maximo data is time consuming.¹⁶ I know of no reason why a company
12 with Duke’s resources could not properly update the Maximo tool. DEP’s
13 explanation that it is “time consuming” is not a reason, in my judgment, for letting
14 the utility of the tool lapse. As I indicated in my direct testimony, Maximo is
15 designed with the intention that it be properly and timely updated. If DEP is not
16 properly updating the tool—and every indication is that it is not—then the tool is
17 of little value.

18 As far as Maximo output being “unreliable and unreasonable,” DEP

¹⁶ S. Jennings Direct, at 15.

1 Witness S. Jennings says the data are “accurate” for the purpose of “DEP’s
2 historical experience in terms of system-wide materials and labor costs.”¹⁷ But
3 that’s not the purpose of the estimates provided to Williams Solar or discussed in
4 my testimony. My testimony addresses the fact that it is DEP’s position that
5 Maximo does not itself accurately estimate interconnection facilities and upgrade
6 costs. No DEP witness contests this point. Furthermore, the existence of the RET
7 is predicated on DEP’s belief in the inaccuracy of Maximo’s output. It is
8 impossible for Maximo and the RET to both be accurate.

9 **Q. DID DEP’S WITNESSES PROVIDE ANY DETAILS ON HOW THE RET**
10 **WAS CREATED THAT SUPPORT THE VALIDITY OF THE ESTIMATES**
11 **COMING OUT OF THE RET?**

12 A. No.

13 **Q. DO DEP’S WITNESSES PROVIDE ANY DATA SUPPORTING THEIR**
14 **CLAIMS THAT THE RET PROVIDES ESTIMATES THAT ARE “MORE**
15 **ACCURATE”?**

16 A. No.

17 **Q. DO DEP’S WITNESSES PROVIDE ANY EVIDENCE THAT THE SIS**
18 **ESTIMATION TOOL REV1 GENERATES REASONABLE ESTIMATES**
19 **OR ESTIMATES COMPARABLE TO THE RET?**

¹⁷ *Id.* at 11.

1 A. No. DEP Witness McNeill states that “a simple multiplier” was used in the SIS
2 Estimation Tool Rev1 for the purpose of expediency, not accuracy. The only data
3 I have seen regarding the performance of SIS Estimation Tool Rev1 is in
4 Exhibit CEB-21. This data indicates that there were [BEGIN CONFIDENTIAL]
5 [REDACTED] [END CONFIDENTIAL] projects for which an SIS estimate
6 was generated after the June 2019 implementation of SIS Estimation Tool Rev1
7 and for which the Facilities Study estimate was produced after the July 30, 2019
8 implementation of the RET. The total Facilities Study estimates for these projects
9 is, on average, [BEGIN CONFIDENTIAL] [REDACTED] [END CONFIDENTIAL]
10 higher than the total SIS estimate. That is, the “simple multiplier” of 2.0 seems to
11 be producing wildly inaccurate estimates, not estimates that are “generally in
12 alignment” with or “substantially similar to” estimates produced by the RET, as
13 DEP Witness McNeill contends.

14 **V. RESPONSE TO DEP’S “GOOD FAITH” CONTENTIONS**

15 **Q. DO YOU HAVE AN OPINION ABOUT WHAT THE PHRASE “GOOD**
16 **FAITH” MEANS IN TERMS OF DEP’S OBLIGATION TO PROVIDE**
17 **COST ESTIMATES IN THE SYSTEM IMPACT STUDY AND THE**
18 **FACILITIES STUDY?**

19 A. I am not an attorney. I am informed by Williams Solar’s attorneys that the phrase
20 “good faith” is a legal term that has been addressed in many different contexts, and

1 that, in general, it means

2 A state of mind consisting in (1) honesty in belief or purpose, (2)
3 faithfulness to one's duty or obligation, (3) observance of reasonable
4 commercial standards of fair dealing in a given trade or business, or
5 (4) absence of intent to defraud or to seek unconscionable
6 advantage.

7 *Black's Law Dictionary* (11th ed. 2019). This is consistent with my lay
8 understanding of the phrase "good faith."

9 **Q. HOW DOES YOUR TESTIMONY AND THE TESTIMONY OF DEP'S**
10 **WITNESSES RELATE TO WHETHER THE ESTIMATES PROVIDED BY**
11 **DEP TO WILLIAMS SOLAR WERE PROVIDED IN "GOOD FAITH"?**

12 A. In my testimony, I have not opined specifically on what the standard of "good faith"
13 means. However, based on DEP's discovery responses, the documents it has
14 produced, and the testimony of its witnesses, it is my opinion that DEP's estimates
15 do not meet any of the "good faith" standards described in my previous answer or
16 in the testimony of DEP's witnesses.

17 **Q. PLEASE EXPLAIN.**

18 A. Starting with the general definition described above, the Initial Estimate meets none
19 of those standards. DEP believed as early as Q1 2018 that its cost estimates did not
20 match its actual costs and, as a consequence of its research into the identified
21 discrepancies, DEP had developed the RET by the end of 2018 just before the Initial
22 Estimate was provided to Williams Solar. It is indisputable that DEP knew or

1 should have known that it would not stand behind the estimate provided in the
2 Williams Solar System Impact Study in January 2019. Providing that estimate,
3 with the intent that Williams Solar would rely on it, was not honest, was not
4 consistent with DEP's admitted obligation to provide a reasonable estimate,¹⁸ and
5 was not consistent with any reasonable commercial standards, including industry
6 estimating standards.

7 As for the Revised Estimate, DEP's RET is not consistent with industry
8 standards, and, as I have previously stated, appears to apply a series of arbitrary
9 adjustments to the Maximo output.

10 Considering other possible interpretations of "good faith," DEP Witness
11 Kenneth Jennings offers that good faith is "those efforts that are reasonable in light
12 of the totality of the circumstances and consistent with the overall structure of the
13 arrangement."¹⁹ This is an incredibly vague statement. However, the "totality of
14 the circumstances" seems to be that DEP has an extensive recent experience with
15 exactly this sort of project and it is unreasonable for its efforts to estimate costs to
16 consist of knowingly using outdated costs (the Initial Estimate), and manipulating
17 the output of its industry standard estimating method using a series of unjustified

¹⁸ McNeill Direct, at 26.

¹⁹ K. Jennings & Holmes Direct, at 17-18.

1 multipliers (the Revised Estimate). DEP Witness Kenneth Jennings also suggests
2 that “good faith” is the absence of “bad faith,” meaning “a specific intent or motive
3 to harm or deceive.”²⁰ Without diving too deep on DEP’s motives, in my opinion,
4 DEP’s providing an estimate that it believed was inaccurate (the Initial Estimate) is
5 deceptive, whatever its motivation was.

6 DEP Witness McNeill’s suggestion that the estimates provided to Williams
7 Solar were done in good faith because DEP followed its own protocols²¹ does not
8 make sense to me. If DEP’s protocols are not designed to produce accurate or
9 reliable cost estimates—and I do not believe they were—simply following those
10 protocols does not imply the resultant cost estimates were made in good faith.

11 Finally, although DEP Witness S. Jennings repeats the phrase “good faith,”
12 he provides no indication of what he believes that phrase means, so I am unable to
13 address his assertions.

14 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

15 A. Yes.

²⁰ *Id.* at 52.

²¹ McNeill Direct, at 26.

Exhibits List

CEB Rebuttal Exhibit 1	Copy of Time and Expense Template.xlsx
CEB Rebuttal Exhibit 2	June 19, 2019 E-mail Re: [Redacted] – Revised Interconnection Agreement

Docket No. E-2, Sub 1220

CEB Rebuttal Exhibit 1

Copy of Time and Expense
Template.xlsx

CEB Rebuttal Exhibit 1

Copy of Time and Expense Template.xlsx
“Data Input & Output” worksheet

Designer Inputs From Maximo "Project Estimation by Compatible Unit" Cost Report	
Data from Project Estimation By Compatible Unit Cost Report:	Value:
Maximo WO	21585565
Overhead Costs (for Material & Labor)	\$ 15,347.48
Material	\$ 13,587.05
Labor (Install, Remove, and Transfer)	\$ 35,332.47
Vegetation Management (estimated by vegetation group/contractor)	\$ 10,000.00
Total Manhours	577.27
Maximo Estimate (before Adders)	\$ 64,267.00

\$ 23,069.76 \$ 12,262.71
376.85 200.42
61.22 61.19

Calculator Outputs	
Adders - add to the estimate (choose appropriate CU for additional labor) If no CU - could add to Microsoft Excel CU Estimate file. Revising the Microsoft Excel file does not update the estimate in Maximo.	
Adder CU Name	Estimated Value
CADD-TREE-TRIM-C (DEC) CADD-TREE-TRIM-P (DEP)	\$ 10,000.00
CADD-FLAGGING-C (DEC) CADD-FLAGGING-P (DEP)	\$ 17,318.10
OADD-1DOLLAR-C (DEC) OADD-1DOLLAR-P (DEP)	\$ 31,325.29
Adder Sub-Total	\$ 58,643.39
Maximo Estimate (before adders)	\$ 64,267.00
Adders Overhead (estimated)	\$ 21,698.05
Maximo Total (should be close to this amount once all adders added)	\$ 144,608.44

\$ 30.00 577.27

Time & Equipment Basic Comparison to Maximo CU Estimate (Cells in Yellow need to be inputted by the Designer) The data below is simply for a Designer to use as comparison against Maximo data. The Calculator Outputs should place your estimate to a value that will incorporate this possible overrun below.	
Data from Project Estimation By Compatible Unit Cost Report:	Value:
Maximo WO	21585565
Estimated Productive Manhours	577.27
Estimated Hours to Complete Work	577.27
Cost per Man Week	6,000.00
Number of Crew Members (assumes 5 per OH crew)	5.00
Number of Crews	1.00
Estimated weeks of work (calculated)	2.886350
Estimated loaded crew costs (with Duke overheads) could adjust based on alliance partnership - assumed \$6,000 per man per week	\$ 30,000.00
Estimated T&E Labor Costs	\$ 86,590.50
Material Costs	\$ 13,587.05
Material overhead (17%)	\$ 2,309.80
Flagging Estimate	\$ 17,318.10
Tree Trim Estimate	\$ 10,000.00
Value of Estimate after correcting for T&E	\$ 129,805.45
If Calculator Output is greater than T&E estimate should be okay to move forward.	Greater

If cell F15 states "less than", use the data below	
Difference between T&E and Maximo	\$ (14,802.99)
If the calculator output above is labeled "less than", Designer may consider adding in additional Ohlabor money - estimated addition is shown to the right. This is on top of the OHLAB\$ adder that is shown to the left.	
If the calculator output above is labeled "greater", simply use the adder CU name on the left as shown.	

Time & Equipment Basic Comparison to Maximo CU Estimate (Cells in Yellow need to be inputted by the Designer) The data below is simply for a Designer to use as comparison against Maximo data. The Calculator Outputs should place your estimate to a value that will incorporate this possible overrun below.	
Data from Project Estimation By Compatible Unit Cost Report:	Value:
Maximo WO	21585565
Estimated Productive Manhours	577.27
Estimated Hours to Complete Work	769.69
Cost per Man Week	6,000.00
Number of Crew Members (assumes 5 per OH crew)	5.00
Number of Crews	1.00
Estimated weeks of work (calculated)	4.000000
Estimated loaded crew costs (with Duke overheads) could adjust based on alliance partnership - assumed \$6,000 per man per week	\$ 30,000.00
Estimated T&E Labor Costs	\$ 120,000.00
Material Costs	\$ 13,587.05
Material overhead (17%)	\$ 2,309.80
Flagging Estimate	\$ 15,200.00
Tree Trim Estimate	\$ 10,000.00
Value of Estimate after correcting for T&E	\$ 161,096.85
If Calculator Output is greater than T&E estimate should be okay to move forward.	Less Than

If cell F15 states "less than", use the data below	
Difference between T&E and Maximo	\$ 16,488.41
If the calculator output above is labeled "less than", Designer may consider adding in additional Ohlabor money - estimated addition is shown to the right. This is on top of the OHLAB\$ adder that is shown to the left.	
If the calculator output above is labeled "greater", simply use the adder CU name on the left as shown.	

Assumptions:		
Hours in a Week	Productive Hours	Productivity Rate
40	30	75%
Contingency	Overhead Burdens	
25%	25%	

Flagger - # in a Crew	Flaggers - Average Hourly rate
3	\$ 31.67

CEB Rebuttal Exhibit 1

Copy of Time and Expense Template.xlsx

“Revision Notes” worksheet

CEB Rebuttal Exhibit 1

Copy of Time and Expense Template.xlsx
“Est Template System Upgrade” worksheet

CEB Rebuttal Exhibit 1

Copy of Time and Expense Template.xlsx
“Est Template IC Facility” worksheet

Assumptions														
Enter Data in Yellow fields only:														
Work Order Numbers														
		Maximo Labor Hours Estimated	Labor Expense Estimated	Labor Overhead Estimated	Material Costs Estimated	Materials Overhead Estimated	Service Cost Estimated	Service Cost O/H Estimated	Veg Mgt Expenses Estimated	Flagging Expenses Estimated	Adder Amount for Additional	Maximo Total Estimated Expenses	Flagging Yes / No	
1													No	
2														
3														
4														
5														
6														
7														
8														
9														
10														
11														
Total:														

Notes:

Time & Equipment Basic Comparison to Maximo CU Estimate	
Data from Project Estimation By Compatible Unit Cost Report:	Value:
Maximo WO	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11
Estimated Productive Manhours	-
Estimated Hours to Complete Work	-
Cost per Man Week	3,180.00
Estimated weeks of work (calculated)	-
Labor Costs	\$ -
Vehicle costs	\$ -
Hotel	\$ -
Per Diem	\$ -
Estimated T&E Labor Costs	\$ -
Material Costs	\$ -
Material O/H	\$ -
Material Alloc 25.75% (Storage Loading 15%)	\$ -
Flagging Estimate	\$ -
Free Trim Estimate	\$ -
Metering Costs	\$ -
Total Direct Costs	\$ -
Contingency	\$ -
Sub-Total before Burdens with Contingency	\$ -
Overhead Burdens	\$ -
T&E Estimate	\$ -
If Calculator Output is greater than T&E estimate should be okay to move forward.	

CEB Rebuttal Exhibit 1

Copy of Time and Expense Template.xlsx

“Email” worksheet

password



CEB Rebuttal Exhibit 1

Copy of Time and Expense Template.xlsx

“Total Est vs Actuals” worksheet

Engineer: - Preparer	
Approver:	
Approval Date:	

Time & Equipment Basic Comparison to Maximo CU Estimate			
Data from Project Estimation By Compatible Unit Cost Report:	Worksheet Calculation	MAXIMO ESTIMATE	VARIANCE
Maximo WO			
Estimated Productive Manhours	-	-	0
Estimated Hours to Complete Work	-	-	-
Cost per Man Week	6,360.00		
Estimated weeks of work (calculated)	-	-	-
Labor Costs	\$ -	\$ -	-
Vehicle costs	\$ -	\$ -	-
Hotel	\$ -	0	-
Per Diem	\$ -	0	-
Estimated T&E Labor Costs	\$ -	\$ -	\$ -
Material Costs	\$ -	\$ -	\$ -
Material O/H (Mat Alloc 33.75% + Stores Loading 15%)	\$ -	\$ -	\$ -
Flagging Estimate	\$ -	\$ -	\$ -
Tree Trim Estimate	\$ -	\$ -	\$ -
Environmental Cost Estimate	\$ -	\$ -	\$ -
Adder Amount for Additional Estimated Costs	\$ -	\$ -	\$ -
Total Direct Costs	\$ -	\$ -	\$ -
Contingency	\$ -	\$ -	\$ -
Sub-Total before Burdens with Contingency	\$ -	\$ -	\$ -
Overhead Burdens	\$ -	\$ -	\$ -
T&E Estimate	\$ -	\$ -	\$ -

Engineer: - Preparer	
-----------------------------	--

Approver:	
Aproval Date:	

Interconnection Facilities			
Description	Worksheet Calculation	MAXIMO ESTIMATE	VARIANCE
Estimated Productive Manhours	-		
Estimated Hours to Complete Work	-	-	-
Cost per Man Week	3,180.00		
Estimated weeks of work (calculated)	-		-
Labor Costs	\$ -	\$ -	-
Vehicle costs	\$ -		-
Hotel	\$ -		-
Per Diem	\$ -		-
Estimated T&E Labor Costs	\$ -	\$ -	\$ -
Material Costs	\$ -	\$ -	\$ -
Material O/H (Mat Alloc 33.75% + Stores Loading 15%)	\$ -	\$ -	\$ -
Flagging Estimate	\$ -	\$ -	\$ -
Tree Trim Estimate	\$ -	\$ -	\$ -
Adder Amount for Additional Estimated Costs	\$ -		\$ -
Total Direct Costs	\$ -	\$ -	\$ -
Contingency	\$ -		\$ -
Sub-Total before Burdens with Contingency	\$ -	\$ -	\$ -
Overhead Burdens	\$ -	\$ -	\$ -
T&E Estimate	\$ -	\$ -	\$ -

Engineer: - Preparer	
-----------------------------	--

Approver:	
Approval Date:	

System Upgrades			
Description	Worksheet Calculation	MAXIMO ESTIMATE	VARIANCE
Estimated Productive Manhours	-		
Estimated Hours to Complete Work	-	-	-
Cost per Man Week	3,180.00		
Estimated weeks of work (calculated)	-	-	-
Labor Costs	\$ -	\$ -	-
Vehicle costs	\$ -		-
Hotel	\$ -		-
Per Diem	\$ -		-
Estimated T&E Labor Costs	\$ -	\$ -	\$ -
Material Costs	\$ -	\$ -	\$ -
Material O/H (Mat Alloc 33.75% + Stores Loading 15%)	\$ -	\$ -	\$ -
Flagging Estimate	\$ -	\$ -	\$ -
Tree Trim Estimate	\$ -	\$ -	\$ -
Adder Amount for Additional Estimated Costs	\$ -		\$ -
Total Direct Costs	\$ -	\$ -	\$ -
Contingency	\$ -		\$ -
Sub-Total before Burdens with Contingency	\$ -	\$ -	\$ -
Overhead Burdens	\$ -	\$ -	\$ -
T&E Estimate	\$ -	\$ -	\$ -

CEB Rebuttal Exhibit 1

Copy of Time and Expense Template.xlsx

“T and E Assumptions” worksheet

Assumptions:

Productive Hours per Day	Work Days per Week	Work Hours per Day	Productivity Rate
6	5	8	75%
Flaggers - Average Hourly rate - 10% Mark Up	Material Overhead Rate	Lodging	Per Diem
\$ 38.38	48.75%	\$ -	\$ -

Flagging Calculation

$$D12 * D5 * C5 * b7$$

Overhead Burdens	Contingency	Productive Hours / Day	Inflation Adder
25%	20%	6	6%
Number of Crews	Linemen # in Crew	Flaggers # in Crew	Work Days in a week
1	4	1	5
Labor - Contractor Aver Hourly Rate	Vehicles - Contractor Aver Hourly Adder		
\$ 75.00	\$ 30.00		

Contractor Labor Assumptions		
Guaranteed Hours in a Week	Productive Hours	Productivity Rate
60	30	50%

Drop Down Lists

- | | | |
|-----|-----|----|
| Yes | DEC | NC |
| No | DEP | SC |

CEB Rebuttal Exhibit 1

Copy of Time and Expense Template.xlsx
"Example" worksheet

Assumptions													
Enter Data in Yellow fields only:													
Work Order Numbers													
	Maximo Labor Hours Estimated	Labor Expense Estimated	Labor Overhead Estimated	Material Costs Estimated	Materials Overhead Estimated	Service Cost Estimated	Service Cost O/H Estimated	Veg Mgt Expenses Estimated	Flagging Expenses Estimated	Adder Amount for Additional	Maximo Total Estimated Expenses	Flagging Yes / No	
Work Order Number: 32052898	3,133.07	\$209,638.83	\$86,370.37	\$56,488.31	\$10,450.34	\$0.00	\$0.00	\$ -	\$ -	\$ -	\$362,945.84	Yes	
Remove Labor Adder from Estimate	(600.00)	\$ (39,000.00)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	(\$39,000.00)		
Remove Flagging from Labor Total	(480.00)	\$ (32,088.00)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 32,088.00	\$ -	\$0.00		
Substation Estimate	-	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$0.00		
Additional Flagging	-	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$0.00		
6	-	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$0.00		
7	-	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$0.00		
8	-	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$0.00		
9	-	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$0.00		
10	-	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$0.00		
11	-	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$0.00		
Total:	2,053.07	\$ 138,548.83	\$ 86,370.37	\$ 56,488.31	\$ 10,450.34			\$ -	\$ 32,088.00	\$ -	\$ 323,945.84		

Notes:

This is an example on how to remove the extra hours added to the Labor Hours so the estimated hours is only for the Maximo generated labor to complete the work.
 Recommendation is to not alter the row with the original work order so that these numbers always tie to the Maximo generated Work Orders. It will be easier to see what changes have been made to the system generated estimates if there are updates.
 The Flagging that was included in the original Maximo estimate is removed from the total labor hours and Labor Expense Estimated, but then moved to the Flagging Expense Column.
 If you would like to add additional expenses to the Estimate Template, use the cells in Column AD - Adder Amount.
 Ex. If you would like to have additional flagging because the system does not add enough flagging in your opinion.
 Or if you want to add in Substation work use this column.

Time & Equipment Basic Comparison to Maximo CU Estimate			
Data from Project Estimation By Compatible Unit Cost Report:	Worksheet Calculation	MAXIMO ESTIMATE	VARIANCE
Maximo WO			
Estimated Productive Manhours	2,053.07	2,053.07	
Estimated Hours to Complete Work	2,737.42	2,737.42	(442.58)
Cost per Man Week	3,180.00		
Estimated weeks of work (calculated)	18.00		
Labor Costs	\$ 228,960.00	\$ 138,548.83	(90,411.17)
Vehicle costs	\$ 91,584.00		(91,584.00)
Hotel	\$ -		-
Per Diem	\$ -		-
Estimated T&E Labor Costs	\$ 320,544.00	\$ 138,548.83	\$(181,995.17)
Material Costs	\$ 59,877.61	\$ 56,488.31	\$(3,389.30)
Material O/H	\$ 29,190.33	\$ 10,450.34	\$(18,740.00)
Material O/H Burden (25% of Expense Loading 25%)	\$ 27,632.00	\$ 32,088.00	\$ 4,456.00
Flagging Estimate	\$ -	\$ -	\$ -
Tree Trim Estimate	\$ -	\$ -	\$ -
Adder Amount	\$ -	\$ -	\$ -
Total Direct Costs	\$ 437,243.94	\$ 237,576.47	\$(199,668.47)
Contingency	\$ 87,148.79		\$(87,148.79)
Sub-Total before Burdens with Contingency	\$ 524,692.73	\$ 237,576.47	\$(287,117.26)
Overhead Burdens	\$ 108,006.20	\$ 86,370.37	\$(22,535.82)
T&E Estimate	\$ 633,598.93	\$ 323,945.84	\$(309,653.08)

CEB Rebuttal Exhibit 1

Copy of Time and Expense Template.xlsx

“Time and Expense” worksheet

Assumptions:			
Maximo Estimate Labor Hours	Contingency	Overhead Burdens	Productive Hours / Day
3,087.40	0%	37%	6
Number of Crews	Linemen # in Crew	Flaggers # in Crew	Work Days in a week
1	5	4	5
Inflation Adder	Labor - Contractor Aver Hourly Rate	Vehicles - Contractor Aver Hourly Adder	Vegetation Management
0%	\$ 112.00	\$ 40.00	\$ -

Productive Hours per Day	Work Days per Week	Work Hours per Day	Productivity Rate
6	5	8	75%
Flaggers - Average Hourly rate - 10% Mark Up	Material Overhead Rate	Lodging	Per Diem
\$ 38.38	17%	\$ 125.00	\$ 65.00

Contractor Labor Assumptions		
Guaranteed Hours in a Week	Productive Hours	Productivity Rate
60	30	50%

Time & Equipment Basic Comparison to Maximo CU Estimate	
Data from Project Estimation By Compatible Unit Cost Report:	Value:
Maximo WO	21585565
Estimated Productive Manhours	3,087.40
Estimated Hours to Complete Work	4,116.53
Cost per Man Week	4,480.00
Estimated weeks of work (calculated)	21.00
Labor Costs	\$ 470,400.00
Vehicle costs	\$ 168,000.00
Hotel	\$ 65,625.00
Per Diem	\$ 34,125.00
Estimated T&E Labor Costs	\$ 738,150.00
Material Costs	\$ 194,000.00
Material overhead (17%)	\$ 32,980.00
Flagging Estimate	\$ 128,949.33
Tree Trim Estimate	\$ -
Total Contractor Costs	\$ 1,094,079.33
Contingency	\$ -
Sub-Total before Burdens	\$ 1,094,079.33
Overhead Burdens	\$ 404,809.35
T&E Estimate	\$ 1,498,888.69
If Calculator Output is greater than T&E estimate should be okay to move forward.	

CEB Rebuttal Exhibit 1

Copy of Time and Expense Template.xlsx
“DET est vs DOT est” worksheet

PUBLIC VERSION

Designer Inputs From Maximo	
Data from Project Estimation By Compatible Unit Cost Report:	Value:
Maximo WO	21585565
Overhead Costs (for Material & Labor)	\$ 15,947.48
Material	\$ 13,587.05
Labor (Install, Remove, and Transfer)	\$ 35,332.47
Vegetation Management (estimated by vegetation group/contractor)	10,000.00
Total Manhours	577.27
Maximo Estimate (before Adders)	\$ 64,267.00

DOT Template - Time & Equipment Basic Comparison to Maximo CU Estimate	
Data from Project Estimation By Compatible Unit Cost Report:	Value:
Maximo WO	21585565
Estimated Productive Manhours	577.27
Estimated Hours to Complete Work	577.27
Cost per Man Week	6,000.00
Number of Crew Members (assumes 5 per OH crew)	5.00
Number of Crews	1.00
Estimated weeks of work (calculated)	2.86350
Estimated loaded crew costs (with Duke overheads) (could adjust based on alliance partnership - assumed \$6,000 per man per week)	\$ 30,000.00
Estimated T&E Labor Costs	\$ 86,590.50
Material Costs	\$ 13,587.05
Material overhead (17%)	\$ 2,309.80
Flagging Estimate	\$ 17,318.10
Tree Trim Estimate	\$ 10,000.00
Value of Estimate after correcting for T&E	\$ 129,805.45
If Calculator Output is greater than T&E estimate should be okay to move forward.	Less Than

DER Template - Time & Equipment Basic Comparison to Maximo CU Estimate	
Data from Project Estimation By Compatible Unit Cost Report:	Value:
Maximo WO	21585565
Estimated Productive Manhours	577.27
Estimated Hours to Complete Work	769.69
Cost per Man Week	1,400.00
Number of Crew Members (assumes 5 per DH crew)	5.00
Number of Crews	1.00
Estimated weeks of work (calculated)	4.00
Labor Costs	\$ 28,000.00
Vehicle costs	\$ 8,000.00
Hotel	\$ 12,500.00
Per Diem	\$ 6,500.00
Estimated T&E Labor Costs	\$ 55,000.00
Material Costs	\$ 13,587.05
Material overhead (17%)	\$ 2,309.80
Flagging Estimate	\$ 24,561.78
Tree Trim Estimate	\$ 20,000.00
Total Contractor Costs	\$ 115,458.63
Contingency	\$ 28,864.66
Sub-Total before Burdens	\$ 144,323.28
Overhead Burdens	\$ 53,399.61
T&E Estimate	\$ 197,722.90
Variance	\$ 53,114.46
Percentage	37%
If Calculator Output is greater than T&E estimate should be okay to move forward.	

Assumptions:			
Hours in a Week	Work Days in a week	Productive Hours	Productivity Rate
40	5	30	75%
Contingency	Overhead Burdens	Linemen - Average Hourly rate	Vehicles - Hourly Adder
25%	37%	\$ 35.00	\$ 10.00

Flagger - # in a Crew	Flaggers - Average Hourly rate - 10% Mark Up	Lodging	Per Diem
4	\$ 38.38	\$ 125.00	\$ 65.00

Contractor Labor Assumptions		
Paid Hours in a Week	Productive Hours	Productivity Rate
60	30	50%

Calculator Outputs	
Adders - add to the estimate (choose appropriate CU for additional labor) If no CU - could add to Microsoft Excel CU Estimate file. Revising the Microsoft Excel file does not update the estimate in Maximo.	
Adder CU Name	Estimated Value
CADD-TREE-TRIM-C (DEC)	\$ 10,000.00
CADD-FLAGGING-C (DEC)	\$ 17,318.10
CADD-FLAGGING-P (DEP)	\$ 31,325.29
OADD-1DOLLAR-C (DEC)	\$ 58,643.39
OADD-1DOLLAR-P (DEP)	\$ 64,267.00
Adder Sub-Total	\$ 21,698.05
Maximo Estimate (before adders)	\$ 64,267.00
Adders Overhead (estimated) - 37%	\$ 21,698.05
Maximo Total (should be close to this amount once all adders added)	\$ 144,608.44

If cell F15 shows "less than", use the data below	
Difference between T&E and Maximo	\$ 129,805.45
If the calculator output above is labeled "less than", Designer may consider adding in additional O labor money - estimated addition is shown to the right. This is on top of the OHLABS adder that is shown to the left.	\$ 129,805.45
If the calculator output above is labeled "greater", simply use the adder CU name on the left as shown.	

	Straight Rate	Overtime Rate	Straight Wages	O/T Wages	Total Wages	40 Hour Work Week Rate	40 \$	1,680.99 per Week
Foreman - Working	\$	18.92 \$	25.91 \$	756.80 \$	518.20 \$	1,275.00 \$	\$	31.88
Labor	\$	17.92 \$	24.55 \$	716.80 \$	491.00 \$	1,207.80 \$	\$	30.20
Labor	\$	16.87 \$	23.11 \$	674.80 \$	462.20 \$	1,137.00 \$	\$	28.43
Labor	\$	15.93 \$	21.99 \$	637.20 \$	439.80 \$	1,077.00 \$	\$	26.93
Labor	\$	12.45 \$	17.43 \$	498.00 \$	348.60 \$	846.60 \$	\$	21.17
Vehicle	\$	7.13 \$	7.13 \$	285.00 \$	342.50 \$	427.50 \$	\$	10.69
Vehicle	\$	7.68 \$	7.68 \$	307.00 \$	153.50 \$	460.50 \$	\$	11.51
Vehicle	\$	7.81 \$	7.81 \$	312.50 \$	156.25 \$	468.75 \$	\$	11.72
Vehicle	\$	2.88 \$	2.88 \$	115.00 \$	57.50 \$	172.50 \$	\$	4.31
Per Diem	\$	65.00 \$	\$	65.00 \$	- \$	65.00 \$	\$	1.63
Lodging	\$	125.00 \$	\$	125.00 \$	- \$	125.00 \$	\$	3.13
	\$		\$				\$	

CEB Rebuttal Exhibit 1

Copy of Time and Expense Template.xlsx
“DEC Summary – Account Mgr” worksheet

DEC	NC
Interconnection Facilities Item Description	Estimated Installed Cost
Estimated Construction cost	\$ 60,000.00
Estimated Metering cost	\$ 35,000.00
Standard Metering Cost Credit	(\$306.21)
Subtotal of Estimated Interconnection Facilities	\$ 94,693.79
Overhead costs (processing, technology, oversight, management)	\$ 20,000.00
Estimated (Commissioning Costs Average = \$15,000)	\$15,000.00
Subtotal of Taxable costs	\$ 129,693.79
Utility Sales Tax	\$X,XXX.XX
Estimated Total Interconnection Costs. Pursuant to Article 6, Section 6.1, the actual costs for these upgrades are subject to the Final Accounting Report.	\$AA,AAA.AA
Facilities Charges	Estimated Monthly Charges
Estimated Customer MFC (1.1% Monthly Facilities Charge)	\$m,mmm.mm
7% NC Utility Sales Tax to be applied on invoice	

Docket No. E-2, Sub 1220

CEB Rebuttal Exhibit 2

June 19, 2019 E-mail Re: [Redacted]
– Revised Interconnection
Agreement

Microsoft Word ribbon interface for a message titled "Revised Interconnection Agreement - Message (HTML) (Read-Only)". The ribbon includes tabs for File, Message, Acrobat, and Litera. The Message tab is active, showing options like Ignore, Delete, Reply, Forward, Meeting, Move, Mark Unread, Categorize, Follow Up, Translate, Find, Related, Select, Zoom, Show/Hide EM Toolbar, Properties, Save Attachments, and Where Filed. Below the ribbon is the iManage E-Mail Management toolbar with options like Duke Energy Corp - STATE - SC Generator Interconnection, File, Delete, Private, and Save Attachments.

Wed 6/19/2019 11:59 AM
 James, Beckton
 [Redacted] - Revised Interconnection Agreement
 To Bhagat, Neil

Neil,

Per our conversation, I recommend that the system upgrade estimate in the Interconnection Agreement for [Redacted] be revised to \$2,256,026.09 from \$1,443,275.98.

- The increase is due to:
- Complexity of Work
 - o Reconductoring a line in the Transmission ROW that is already double circuited
 - Estimating tool estimates a standard single circuit being reconducted
 - General Foreman expenses not included in original estimate
 - Fleet / Equipment costs underestimated in original estimate
 - Flagging estimate is low
 - Contingency adder of 10% to cover potential risk from weather, work conditions and environmental work.
 - Overhead burdens increased due to additional expenses

System Upgrades			
	Revised Estimate	MAXIMO ESTIMATE	Variance
Estimated Hours to Complete Work	11,868.59	13,010.82	1,142.23
Cost per Man Week	2,968.00		
Estimated weeks of work (calculated)	74.00	65.05	(8.95)
Labor Costs - Flagging Removed from Maximo Est	\$ 878,528.00	\$ 823,421.08	(55,106.92)
Vehicle costs	\$ 376,512.00	\$ -	(376,512.00)
General Foreman Adder - Not in Maximo Est	\$ 87,852.80		(87,852.80)
	\$ -		-
	\$ -		-

Revised Interconnection Agreement - Message (HTML) (Read-Only)

File Message Acrobat Litera Tell me what you want to do...

Ignore, Delete, Reply, Reply All, Forward, Meeting, More, Move, Rules, Actions, Mark Unread, Categorize, Follow Up, Translate, Find, Related, Select, Zoom, Show/Hide EM Toolbar, Save Attachments, Where Filed, Properties, iManage

iManage E-Mail Management

Duke Energy Corp - STATE - SC Generator Interconnection (Lightbulb, Print, Refresh, Zoom, File, Delete, Private, Save Attachments, Info, Print)

Wed 6/19/2019 11:59 AM

 James, Beckton

 - Revised Interconnection Agreement

To Bhagat, Neil

General Foreman Adder - Not in Maximo Est	\$	87,852.80		(87,852.80)
	\$	-		-
Estimated T&E Labor Costs	\$	1,255,040.00	\$	823,421.08
Material Costs - 6% Inflation Mark-up for Revised Est	\$	190,594.83	\$	179,806.44
Material O/H (Mat Alloc 33.75% + Stores Loading 15%)	\$	92,914.98	\$	33,264.20
Flagging Estimate	\$	102,196.44	\$	25,581.92
Tree Trim Estimate	\$	-	\$	-
Environmental Cost Estimate	\$	-	\$	-
Total Direct Costs	\$	1,640,746.25	\$	1,062,073.64
Contingency - 10%	\$	164,074.62	\$	-
Sub-Total before Burdens with Contingency	\$	1,804,820.87	\$	1,062,073.64
Overhead Burdens	\$	451,205.22	\$	381,202.34
T&E Estimate	\$	2,256,026.09	\$	1,443,275.98
	\$		\$	(812,750.11)

Any questions, please let me know.

Regards,

Beckton James

DET – Senior Business & Technical Consultant
(980) 373-2896 – office
(919) 740-6597 – mobile