

**STATE OF NORTH CAROLINA  
UTILITIES COMMISSION  
RALEIGH**

DOCKET NO. E-22, SUB 546

BEFORE THE NORTH CAROLINA UTILITIES COMMISSION

In the Matter of	
Application by Virginia Electric and Power	)
Company, d/b/a Dominion Energy North	) ORDER DECIDING CONTESTED
Carolina Pursuant to G.S. 62-133.2 and	) ISSUES AND REQUIRING
Commission Rule R8-55 Regarding Fuel and	) COMPLIANCE FILING
Fuel-Related Costs Adjustments for Electric	)
Utilities	)

HEARD: Monday, November 7, 2017, beginning at 1:30 p.m. in Commission Hearing Room 2115, Dobbs Building, 430 North Salisbury Street, Raleigh, North Carolina 27603

BEFORE: Chairman Edward S. Finley, Jr., Presiding, Commissioner Bryan E. Beatty, Commissioner ToNola D. Brown-Bland, Commissioner Jerry C. Dockham, Commissioner James G. Patterson, Commissioner Lyons Gray, and Commissioner Daniel G. Clodfelter

APPEARANCES:

For Dominion Energy North Carolina:

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Mary Lynne Grigg, McGuireWoods LLP, 434 Fayetteville Street, Suite 2600, Raleigh, North Carolina 27601

For the Carolina Industrial Group for Fair Utility Rates I (CIGFUR I):

Warren K. Hicks, Bailey & Dixon, LLP, Post Office Box 1351, Raleigh, North Carolina 27602

For Nucor Steel Hertford (Nucor):

Joseph W. Eason, Nelson Mullins Riley & Scarborough, LLP, 4140 Park Lake Avenue, Suite 200, Post Office Box 301519, Raleigh, North Carolina 27622

For the Public Staff:

Lucy E. Edmondson, Staff Attorney, Public Staff - North Carolina Utilities  
Commission, 4326 Mail Service Center, Raleigh, North Carolina  
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BY THE COMMISSION: On August 23, 2017, Virginia Electric and Power Company, d/b/a Dominion Energy North Carolina (DENC or the Company), filed its application for a fuel charge adjustment, along with accompanying testimony and exhibits, pursuant to G.S. 62-133.2 and Commission Rule R8-55 relating to fuel and fuel-related charge adjustments for electric utilities.<sup>1</sup> The application was accompanied by the testimony and exhibits of Bruce E. Petrie, Manager of Generation System Planning, James D. Merritt, Regulatory Analyst II, Ronnie T. Campbell, Supervisor of Accounting for the Power Generation and Power Delivery Groups, Tom A. Brookmire, Manager of Nuclear Fuel Procurement, and Gregory A. Workman, Director - Fuels.

On August 30, 2017, the Commission issued its Order Scheduling Hearing, Requiring Filing of Testimony, Establishing Discovery Guidelines, and Requiring Public Notice.

Petitions to intervene were filed by CIGFUR I on August 28, 2017, and Nucor on August 31, 2017. These petitions were granted by Orders dated September 13 and 12, 2017, respectively. The Public Staff's participation and intervention is recognized pursuant to G.S. 62-15(d) and Commission Rule R1-19(e).

On October 2, 2017, DENC filed a letter requesting that the Commission allow it to publish an amended public notice. This request was granted by Order issued on October 3, 2017. The Company filed its Affidavit of Publication on November 13, 2017.

On October 23, 2017, the Public Staff filed the affidavit and exhibit of Sonja R. Johnson, Staff Accountant, Electric Section, Public Staff Accounting Division, and the testimony and exhibits of Dustin R. Metz, Engineer, Public Staff Electric Division. On October 25, 2017, the Public Staff filed the revised testimony and exhibits of witness Metz.

On October 30, 2017, the Company filed the rebuttal testimony of Brandford L. Stanley, Director, Nuclear Regulatory Affairs, John Rosenberg, Director – Nuclear Site Engineering, Julius A. Wright, Managing Partner, J. A. Wright & Associates, LLC, and witness Petrie.

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<sup>1</sup> Pursuant to G.S. 62-133.2(a3), DENC is not eligible to recover non-fuel (but still fuel-related) costs through the annual rate adjustments authorized pursuant to G.S. 62-133.2, except for certain costs authorized by G.S. 62-133.2(a1)(6), which DENC did not incur during the test period and is not projected to incur during the rate period. Therefore, throughout this order, the costs being considered for recovery shall be termed "fuel costs," and the proceeding shall be termed the "fuel charge proceeding".

On November 2, 2017, DENC and the Public Staff filed a joint motion requesting that the Commission issue an order excusing the appearance of DENC witnesses Brookmire, Campbell, Merritt, and Workman; and Public Staff affiant Johnson. The Commission granted the motion by Order dated November 3, 2017.

The matter came on for evidentiary hearing on November 7, 2017, as scheduled. No public witnesses appeared at the hearing. Witness Petrie testified on direct on behalf of the Company; witness Metz testified on behalf of the Public Staff; and witnesses Stanley, Rosenberger, Petrie and Wright testified on behalf of the Company on rebuttal. The pre-filed testimony of the witnesses who were excused from attending the hearing was stipulated into evidence as if given orally from the stand.

On November 17, 2017, the Company filed Company Late-Filed Exhibit 1, which set forth what the nuclear capacity factors (in total and by unit) would have been if the Company had not experienced the outages for which the Public Staff recommends disallowance of replacement fuel costs.

On December 1, 2017, Nucor filed a post-hearing brief. On December 18, 2017, the Company and the Public Staff each filed a proposed order.

Based upon the verified application, the evidence received at the hearing, and the entire record in this matter, the Commission makes the following:

#### FINDINGS OF FACT

1. DENC is duly organized as a public utility operating under the laws of the State of North Carolina and is subject to the jurisdiction of the North Carolina Utilities Commission. The Company is engaged in the business of generating, transmitting, distributing, and selling electric power to the public in northeastern North Carolina. DENC is lawfully before the Commission based on its application filed pursuant to G.S. 62-133.2.

2. The test period for purposes of this proceeding is the twelve months ended June 30, 2017.

3. The Company's fuel procurement practices during the test period were reasonable and prudent.

4. The test period per book system sales are 83,820,303,238 kilowatt-hours (kWh).

5. The test period per book system generation is 84,848,419 megawatt-hours (MWh), which includes various types of generation as follows:

<u>Generation Types</u>	<u>MWh</u>
Nuclear	27,998,627
Coal	18,885,985
Heavy Oil	186,787
Wood and Natural Gas Steam	1,530,691
Combined Cycle and Combustion Turbine	28,477,922
Solar and Hydro - Conventional and Pumped Storage	3,155,211
Net Power Transactions	7,176,726
Less: Energy for Pumping	(2,563,530)

6. In both the test period for this proceeding and in the test period for the prior proceeding (Docket No. E-22, Sub 534), the Company's nuclear capacity factor exceeded the most recent NERC five-year average nuclear capacity factor, thereby avoiding a presumption of imprudence pursuant to Commission Rule R8-55(k).

7. The Public Staff recommends a disallowance of replacement power costs associated with certain outages at the Company's nuclear units during the test period for this proceeding and in the test period for the prior proceeding.

8. Root Cause Evaluations are business records of the Company that should be available for review by the Public Staff.

9. The Company's baseload plants were managed prudently and efficiently during the test period in this proceeding and in the test period for the prior proceeding so as to minimize fuel costs, including the management of and response to outages at its nuclear units.

10. It is not appropriate for DENC to apply a 2% forced outage allowance in its calculation of replacement power costs.

11. The nuclear capacity factor appropriate for use in determining the prospective fuel factor in this proceeding is 93.54%, which is the estimated nuclear capacity factor for DENC during the 12 months beginning January 1, 2018.

12. The adjusted test period system sales for use in this proceeding are 84,774,563,328 kWh.

13. The adjusted test period system generation for use in this proceeding is 85,796,167 MWh, which is categorized as follows:

<u>Generation Types</u>	<u>MWh</u>
Nuclear	27,442,508
Coal (Including wood & natural gas steam)	20,939,580
Heavy Oil	191,548
Combined Cycle and Combustion Turbine	29,207,250
Hydro – Conventional and Pumped Storage	3,106,119
Solar	49,093
Net Power Transactions	7,472,692
Less: Energy for Pumping	(2,563,530)

14. Only actual fuel costs associated with power purchases may be recovered by DENC through its fuel charge proceeding and, therefore, a marketer percentage must be derived to serve as a proxy for fuel costs when actual fuel costs are not available. In this proceeding, a marketer percentage of 78% to be applied to determine purchase power expense should continue to be used.

15. The adjusted test period system fuel expense for use in this proceeding is \$1,758,608,978.

16. The appropriate North Carolina retail test period jurisdictional fuel expense over-collection is \$5,450,950, including interest, and the adjusted North Carolina retail jurisdictional test period sales are 4,299,466,351 kWh.

17. The remaining balance of the under-recovery from the mitigation proposal approved by the Commission in Docket No. E-22, Sub 515 is \$381,535.

#### EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT NO. 1

This finding of fact is essentially informational, jurisdictional, and procedural in nature and is not controverted.

#### EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT NO. 2

G.S. 62-133.2(c) sets out the verified, annualized information that each electric utility is required to furnish the Commission in an annual fuel charge adjustment proceeding for an historical 12-month test period. Commission Rule R8-55(b) prescribes the 12 months ending June 30 as the test period for DENC. The Company's filing was based on the 12 months ended June 30, 2017.

#### EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT NO. 3

The evidence for this finding of fact is contained in the direct testimony and exhibits of DENC witnesses Workman and Brookmire.

Commission Rule R8-52(b) requires each electric utility to file a Fuel Procurement Practices Report at least once every ten years and each time the utility's fuel procurement practices change. The Company's current fuel procurement practices were filed with the Commission in Docket No. E-100, Sub 47A, on December 20, 2013.

In his direct testimony, Company witness Workman discussed commodity prices, the Company's fuel procurement policy, and coal, natural gas, oil, and biomass procurement. He explained that commodity prices (including coal, natural gas, and crude oil) have begun to recover after falling to historic lows last year, with natural gas, coal, and domestic crude oil prices increasing approximately 32%, 37%, and 16%, respectively, from the prior test year. Witness Workman described the Company's fossil fuel procurement practices and explained that the Company continues to follow the same procurement practices as in the past in accordance with its report filed in Docket No. E-100, Sub 47A.

Witness Workman described the Company's hedging program under which it hedges commodities using a range of volume targets that decrease over a three-year period. The duration of the physical procurement agreements is staggered, and may include a fixed price or price trigger option.

To procure natural gas, the Company employs periodic solicitations and the open market to obtain a combination of day-ahead, monthly, seasonal, and multi-year physical gas supply purchases. The Company also continues to evaluate its pipeline transportation and storage contracts, and participates in the interstate pipeline capacity release and physical supply markets, as well as longer-term, pipeline expansion projects.

In regard to coal procurement, witness Workman noted that the Company followed a multi-year plan accomplished primarily through periodic solicitations and secondarily on the open market, allowing the Company to layer in coal contracts of staggered terms and blended prices to mitigate exposure to significant price swings.

Concerning biomass procurement, witness Workman testified that multiple suppliers began serving the Hopewell and Southampton Power Stations under long-term agreements effective January 1, 2017, while one supplier continues to serve the long-term needs of the Altavista and Pittsylvania Power Stations. The co-fired Virginia City Hybrid Energy Center facility continues to be served by short-term contracts with various suppliers. In addition, all five biomass plants receive wood deliveries by truck.

Witness Workman further testified that the Company procures its No. 2 fuel oil and No. 6 oil requirements on the spot market.

With respect to the nuclear fuel market, Company witness Brookmire testified that in the past five years, prices have decreased in the uranium, conversion, and enrichment markets due to the impact of the March 2011 earthquake and tsunami and reductions in demand worldwide. However, some decreases in supply may have somewhat offset the downward trend in demand. Prices for spot conversion services have dropped

significantly, though prices for long-term supply remain higher. The cost of enrichment services appears to have stabilized, while domestic fabrication prices are generally expected to continue to increase. Further, several more reactors in Japan are expected to restart in 2017, which may increase prices of front-end components. Witness Brookmire further testified that these changes have not significantly impacted the Company's near-term costs because the current mix of longer-term front-end component contracts has reduced the impact of changes in market prices. In addition, while the Company still has some older, legacy contracts, its market-based contracts allow it to avail itself of current lower prices. Witness Brookmire also noted that the Company continues to follow the same nuclear fuel procurement practices as it has in the past, in accordance with its procedures filed in Docket No. E-100, Sub 47A.

No party contested the Company's fuel procurement and power purchasing practices. Based on the foregoing, the Commission concludes that the Company's fuel procurement and power purchasing practices during the test period were reasonable and prudent.

#### EVIDENCE AND CONCLUSIONS FOR FINDINGS OF FACT NOS. 4 - 5

The evidence for these findings of fact is contained in the direct testimony and exhibits of DENC witnesses Campbell and Petrie.

DENC witness Merritt testified that the Company's test period per book system sales were 83,820,303,238 kWh, and witness Petrie testified that the Company's test period per book system generation was 84,848,419 MWh. Witness Petrie stated that the test period per book system generation is categorized as follows:

<u>Generation Types</u>	<u>MWh</u>
Nuclear	27,998,627
Coal	18,885,985
Heavy Oil	186,787
Wood and Natural Gas Steam	1,530,691
Combined Cycle and Combustion Turbine	28,477,922
Solar and Hydro - Conventional and Pumped Storage	3,155,211
Net Power Transactions	7,176,726
Less: Energy for Pumping	(2,563,530)

No other party offered or elicited testimony on the level of test period per book system MWh sales or generation. The Commission thus concludes that the foregoing test period per books levels of sales and generation are reasonable and appropriate for use in this proceeding.

#### EVIDENCE AND CONCLUSIONS FOR FINDINGS OF FACT NOS. 6 – 9

The evidence for these findings of fact is contained in the direct and rebuttal testimony of Company witness Petrie, the rebuttal testimony of Company witnesses

Wright, Rosenberger and Stanley, and the testimony and exhibits of Public Staff witness Metz.

DENC and the Public Staff included in their proposed orders their positions regarding the presumption contained in Commission Rule R8-55(k). In summary, DENC contends that the rebuttable presumption of imprudence in Rule R8-55(k) should also be applied in reverse, so that if a utility meets the NERC average there is a rebuttable presumption that the utility managed its nuclear units in a reasonable and prudent manner. The Public Staff disagrees with this interpretation. The Commission appreciates the information provided by DENC and the Public Staff on this point. However, as discussed below, the Commission has weighed all of the material evidence in the record without applying any presumption. Therefore, a ruling regarding the parameters of the presumption contained in Commission Rule R8-55(k) is unnecessary.

#### Standard for Determining Imprudence

Prudent is defined, in pertinent part, as “1. Wise in handling practical matters; exercising good judgment or common sense. 2. Careful in regard to one’s own interests; provident.” American Heritage Dictionary, at 1054 (Houghton Mifflin Co., 1978).

In Docket No. E-2, Sub 537, in the Commission’s Order regarding CP&L’s Harris Nuclear Plant, the Commission disallowed certain costs of construction based on its findings of imprudence by CP&L that resulted in unreasonable delays and avoidable errors in the construction of CP&L’s Harris plant. 78 North Carolina Utilities Commission Orders and Decisions 238 (August 5, 1988) (Harris Order); reversed in part, and remanded (on other grounds), Utilities Commission v. Thornburg, 325 N.C. 484, 385 S.E.2d 463 (1989). The Commission stated the general standard of prudence as

[w]hether management decisions were made in a reasonable manner and at an appropriate time on the basis of what was reasonably known or reasonably should have been known at that time (citation omitted)...The Commission notes that this standard is one of reasonableness that must be based on a contemporaneous view of the action or decision under question. Perfection is not required. Hindsight analysis – the judging of events based on subsequent developments – is not permitted.

Harris Order, at 251-252.

In the Harris Order, the Commission concluded that there was substantial evidence showing three main instances of imprudence by CP&L. The first was CP&L’s delay in developing detailed design documents for the plant’s riser supports. CP&L was relying on standard riser support designs, or “typicals,” until the spring of 1982. However, the Commission concluded that CP&L knew, or should have known, by July 1981 that the NRC had changed its design requirements to mandate that riser supports be designed in greater detail, rather than merely relying on typicals, and that this was an imprudence that



resulted in seven months delay in beginning construction on a portion of the plant that relied on having the riser supports in place. Harris Order, at 292-305.

A second finding of imprudence was based on CP&L's delay in complying with the NRC's Appendix R, which was effective in February 1981. Appendix R established guidelines for a utility's fire protection program, and was initially applicable to nuclear plants licensed prior to Harris. However, in July 1981 the NRC decided to apply Appendix R to nuclear plants under construction, and in September 1981 directed that CP&L perform a comparison of its fire protection program to justify any deviations from the Appendix R requirements. There was substantial evidence from CP&L's records indicating that CP&L understood that the Appendix R requirements would be applied to its Harris fire protection program. Nevertheless, CP&L did not submit a major component of its program, its safe shutdown analysis (SSA), until 22 months after the September 1981 directive from the NRC. The Commission concluded that CP&L was imprudent in not submitting the SSA to the NRC earlier, and that its delay in doing so had caused a five-month delay in construction. Harris Order, at 305-317.

A third finding of imprudence was based on repeated work errors that caused ongoing delays and additional work in the construction of Harris, most notably thousands of welds that were improperly made and had to be reworked. The Commission noted that engineering and construction errors are inevitable on a major construction project, but concluded that the extent of the Harris errors went beyond a reasonable level. The Commission attributed this unreasonable amount of errors to CP&L's failure to appropriately record Field Change Requests (FCRs), failure to use root cause studies to understand and correct errors, and imprudent management that allowed a shortage of unskilled labor and a high instance of errors to continue over an extended period of time. Harris Order, at 318-344.

The Commission's decisions in the Harris Order regarding imprudence are illustrative of three general guidelines for determining whether a utility's actions or omissions were imprudent:

1. Whether the utility's actions were reasonable based on the information known to the utility at the time.
2. Whether the utility's actions were reasonable based on the information that the utility reasonably should have known at the time.
3. Whether there were repeated errors that the utility failed to discover due to inaccurate record keeping or other deficiencies, or failed to correct in a reasonable time or manner.

Further, the Harris Order is illustrative of the Commission's authority to review in detail individual management decisions that impact the operation of the utility.

In essence, the Commission expects public utilities to exercise reasonable care and good judgment in operating and maintaining their nuclear units.

### Use of Root Cause Evaluations

Company witness Petrie testified on direct that the Company's four nuclear units operated at an aggregate capacity factor of 95.5% during the test period, which exceeded the five-year average net capacity factor of 88.5% for the period 2011 - 2015 for 800 to 999 megawatt (MW) units, as reported by NERC in its latest Generating Availability Report. He also noted that for the same five-year period, the Company's net capacity factor was 91.0%, as compared to the national average of 88.5%. During the 2015 - 2016 and 2016 - 2017 test periods, the Company's nuclear fleet achieved aggregate capacity factors of 92.2% and 95.5%, respectively. In his rebuttal testimony, witness Petrie noted that the Company's net capacity factor for the nuclear fleet from 2012 - 2016 was 93.52%, as compared to the 90.00% NERC industry average for similar units for the same period.

Public Staff witness Metz agreed with Company witness Petrie that the Company had met the standard of Commission Rule R8-55(k) by achieving an actual system-wide nuclear capacity factor that exceeded the NERC weighted average nuclear capacity factor. He also noted that the Company's two-year simple average of its system-wide nuclear capacity factor exceeded the NERC weighted average nuclear capacity factor. Therefore, witness Metz concluded that no presumption that the utility imprudently incurred increased fuel costs had been created. Thus, there is no disagreement between the Company and the Public Staff as to whether any presumption of imprudence was created pursuant to Rule R8-55(k) – there was not. The next step of witness Metz's investigation was to examine individual outages to determine whether they occurred under efficient management and whether the ensuing replacement power costs were prudently incurred.

Public Staff witness Metz testified that the Company's proposed EMF reflects increased fuel costs resulting from the purchase of replacement power during an outage at North Anna Unit 2 that occurred July 30 - August 3, 2016, and an outage at Surry Unit 2 that occurred October 9 - 13, 2016. Additionally, the Company and Public Staff agreed in the 2016 DENC fuel cost proceeding, Sub 534, that the Public Staff would continue its review of nuclear outages that occurred at Surry Unit 1 from July 11 - 22, 2015, and October 13 - November 18, 2015, and at Surry Unit 2 from July 13 - 22, 2015, and December 4 - 11, 2015, and that any adjustments would be reflected in the EMF adopted in this proceeding.<sup>2</sup> Therefore, the Public Staff undertook to determine what caused these

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<sup>2</sup> Finding of Fact No. 6 of the Commission's Order Approving Fuel Charge Adjustment, issued December 22, 2016, in Sub 534, provides:

The Public Staff completed its review of test year plant performance except for the following outages: 1) Surry Unit 1, July 11-22, 2015; 2) Surry Unit 1, October 13 - November 18, 2015; 3) Surry Unit 2, July 13-22, 2015; and Surry Unit 2, December 4-11, 2015. Should any adjustment be appropriate due to these outages, such adjustments will be made in the experience modification factor (EMF) in the 2017 fuel adjustment proceeding.

outages, whether it believed the additional costs were reasonable and prudently incurred, and, if not, what adjustment to the Company's proposed EMF it should recommend to the Commission.

In determining what caused these outages, witness Metz testified, and the Company verified, that the Public Staff conducted extensive discovery, including numerous data requests and conference calls. He indicated that as part of its investigation, the Public Staff reviewed and considered information in the Company's Root Cause Evaluations (RCEs), which document the Company's investigation of the causes of and contributing factors to specific outages and recommend appropriate corrective actions. Witness Metz testified that he used the RCEs as a "launch point" to "narrow down" the Public Staff's investigation to "specific information." (T. p. 214, ln. 2-5)

Witness Stanley testified that the Nuclear Regulatory Commission (NRC) mandates that each nuclear licensee establish measures to assure that conditions adverse to quality are promptly identified and corrected, that in cases of significant conditions adverse to quality the measures assure that the cause of the condition is determined and corrective action taken to prevent repetition, and that the identification of the condition, the cause, and the corrective action be documented and reported. He discussed in detail the Company's Corrective Action Procedure to implement these requirements. Under this Procedure, when a condition adverse to quality is identified, a Condition Report is generated, the Condition Report Review Team reviews the report, and an RCE is performed to determine the cause or causes and identify corrective actions. He explained how the RCE team members are selected and how the Corrective Action Review Board (CARB) approves that team and the RCE problem statement, and provides management oversight of the Corrective Action Program. He noted that every other year, the NRC performs a Program Identification and Resolution (PI&R) inspection of the licensee's Corrective Action Program (CAP), which includes RCEs, and that the last inspection for North Anna and Surry Power Stations did not identify any findings or violations of more than minor significance and none as related to RCEs.

Witness Stanley explained that the RCE process is not designed to assess prudence, but rather to systematically evaluate conditions adverse to quality and ensure that appropriate corrective actions are taken to preclude repetition, in compliance with NRC regulations. He testified that using portions of the RCE beyond the root cause, such as contributing causes identified in an RCE, exposes the Company to unwarranted risk of disallowance of costs due to other parties' unfamiliarity with the applicability and intent of the RCE process and from potential misinterpretation of the different elements that were evaluated in that process. Witness Stanley noted that, until 2016, the Company did not provide entire RCEs to the Public Staff, or any party other than the NRC, because by their nature RCEs use hindsight to analyze operations and are not based on what could have reasonably been known at the time, which witness Stanley stated is his understanding of the standard for evaluating prudence. He noted further that RCEs contain highly sensitive information regarding the inner workings of the Company's nuclear facilities, thereby presenting a safety and security risk to North Carolina and

Virginia residents if they fall into the wrong hands, which risk is not fully satisfied by treating these documents as confidential in these regulatory proceedings.

At the hearing, witness Stanley agreed with counsel for the Public Staff that the NRC is not looking at prudence when it carries out periodic evaluations of RCEs, but rather is looking to see that the Company has found the root cause and that the Company's corrective actions are logically a result of that, and are taken in a timely and effective manner. He also clarified that while the information contained in the RCEs related to the outages at issue can be relied upon for the purpose of evaluating the root cause and contribution causes and actions for the outages, they were not written or intended to be used to determine prudence.

On rebuttal, Company witness Rosenberger noted that witness Metz focused on the category of forced outages identified by NERC guidance that results from the extreme unit trip, and that half of the disputed outages in this case fall within the other two outage categories. Witness Rosenberger also echoed witness Stanley's testimony that RCEs are not written with the intent to assess reasonable and prudent operations, but rather contain conclusions based on contributing causes or enhancements discovered during the evaluation process. He cautioned against selectively applying information from RCEs, or from conversations that occurred outside of the formal discovery process. He noted that, of the 168 outages associated with the 2015-2016 and 2016-2017 test periods, only 11 occurred at nuclear units, meaning that only 7% of the outages to be assessed as reasonable and prudent would have an RCE available to review, since non-nuclear units are not required to perform these evaluations.

Witness Metz noted that there is already a shorter time for review of DENC's fuel proceeding, compared to Duke Energy Carolinas, LLC (DEC) and Duke Energy Progress, LLC (DEP), and that access to complete and readily available RCEs allows the Public Staff to avoid delays, focus its investigation, and complete its review more quickly. According to his testimony, DEC and DEP already have an agreement in place with the Public Staff to provide all available RCEs to the Public Staff. Witness Metz requests that the Commission require DENC to provide completed RCEs on a semi-annual basis, beginning on a date as agreed upon by DENC and the Public Staff.

The Commission finds that the RCEs are business records of the Company that should be available for review by the Public Staff. RCEs contain relevant information about outages and identify documents that may be useful to the Public Staff in its investigation. It is reasonable for the Public Staff to review the information contained in RCEs, taking into consideration the purpose for which the RCEs were created, and the specific criteria and guidelines to which they must adhere. While the Company's determination of what constitutes a root, direct, or contributing cause in the RCEs should be given appropriate weight, the Commission is not bound by the Company's conclusions on what the cause or causes of an outage were. Regardless of whether prudence was assessed by the Company in preparing its RCEs, it is appropriate for the Commission to consider information presented to it from the RCEs in its review of the Company's prudence. Therefore, the Commission concludes that DENC shall provide completed

RCEs to the Public Staff every six months, beginning on a date as agreed upon with the Public Staff.

### Contested Unplanned Outages

In his testimony, witness Metz recommended disallowances for the replacement power costs associated with four outages, two in the current test year and two in the Sub 534 test year. These four outages are: **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]**

Witness Rosenberger also provided detailed and specific responses to each of the outages addressed by Public Staff witness Metz, as discussed below.

### Four Day North Anna Unit 2 Outage, July and August 2016

**[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** Witness Metz concluded that these were omissions that were within the Company's control and avoidable and, but for the omissions, the outage would not have occurred. As such, witness Metz recommended that the Commission find that the Company failed to prudently, efficiently, and economically manage the project during the outage and that replacement power costs of \$113,645 should be excluded.

Witness Rosenberger testified that Company personnel at Unit 2 of the Company's North Anna station observed unidentified leakage of the Reactor Coolant System (RCS), determined that there was an unisolable through-wall leak in the piping associated with the Reactor Coolant Pump seal, and as a result initiated a shutdown of Unit 2, which was required by the station's technical specifications. **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** He stated that the Company remedied the situation by placing the unit in a condition to perform needed repairs, collecting vibration data associated with the piping, replacing the piping, performing post-maintenance testing, and fully restoring the unit to service. He stated that the outage was performed in a thorough and efficient manner. Witness Rosenberger disagreed with witness Metz's conclusions regarding this outage, stating that **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** He therefore concluded that the Company could not have anticipated the leak on the seal return line.

Based on the entire record, the Commission concludes that this outage could not have reasonably been prevented by the Company given the information it knew at the time, and that it did not result from unreasonable or imprudent management. The Commission is persuaded by witness Rosenberger that the Company acted reasonably and prudently not only upon discovery of the Reactor Coolant System (RCS) leak, and by its remediation of the situation, but also prior to the event. Given the circumstances surrounding this area of piping, the Company's application of routine, approved procedures and good practice with regard to the installation of this piping and monitoring of the space as discussed by witness Rosenberger, the Commission is not persuaded by the evidence that the Company should have foreseen this issue. The Commission concludes that in this instance the contributing causes identified in the RCE did not

directly cause the outage, and were presented as support for additional corrective actions that go beyond addressing the root cause. The Commission agrees that the Company's management adhered to the applicable procedures, and that DENC's actions were reasonable based on the information that it knew or reasonably should have known at the time that DENC performed the piping modification. Specifically, the Company could not have reasonably foreseen that the modifications it made would have the consequences that they did. The Commission also concludes that witness Rosenberger's testimony presented at the hearing with respect to this outage is especially persuasive. The Commission particularly notes witness Rosenberger's testimony at the hearing that indicated that this was an area of the unit that is characterized by a high degree of noise, close confinement, and a high dose of radiation, and concludes that personnel would reasonably complete their required duties without lingering to examine other parts of that area of the plant. The Commission therefore concludes that the outage was not the result of imprudence by DENC, and that the replacement power costs associated with this outage were reasonable and prudently incurred under efficient management and economic operations at North Anna Unit 2.

#### **Four-Day Surry Unit 2 Outage, October 9 - 13, 2016**

Witness Metz testified that **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** the outage could have been avoided. He concluded that the outage could have been prevented under efficient management and economic operations, and that the replacement power costs associated with this outage of \$118,829 should be disallowed.

Witness Rosenberger testified that Unit 2 at the Company's Surry station automatically tripped due to a generator differential lockout, which occurred at a time when no activities were in progress, and grid conditions were stable. **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** He stated that the Company remedied the situation by removing drain plugs and drying all components that experienced water intrusion, extensively inspecting and testing components exposed to water, replacing gaskets and applying silicon to flange surfaces and fully restoring the unit to service approximately four days later. He stated that the quick restoration of the unit to service included a thorough evaluation of the components while performing actions to prevent recurrence. Witness Rosenberger disagreed with witness Metz's conclusion, explaining that reliance solely on the RCE conclusions omits a significant detail regarding the amount of rainfall experienced at this site. He explained that the root cause must be within the control of the licensee with actions to prevent repeat occurrences, and that, since weather is not a factor that can be controlled by the Company, it could not be found as either a root cause or contributing cause. He testified that this outage and the Company's management of it were reasonable and prudent, and stated that the collection of water within the enclosure could not have been anticipated. He explained that even though extreme weather cannot factor into the RCE process due to regulatory constraints, the unprecedented amount of rainfall in the area is applicable to the analysis of whether the outage was reasonable and prudent. He noted that some areas surrounding Surry Power Station experienced back-to-back 100-year storms and a few experienced rainfall in amounts that reached 500-year storm levels. He noted that Surry experienced

11 inches of rain in an 18-day period with over 5 inches falling in the 2 days prior to the outage with wind gusts reaching 41 miles per hour. He stated that the Company had no reason to believe that the vendor product would not meet the station's needs, and that the vendor, which is experienced in providing water tight enclosures, was contracted to provide enclosures within certain specifications. He concluded that it was not possible for the Company to foresee the extreme weather the station experienced, or the fact that the enclosures would not perform their design function.

At the hearing in response to questions from Public Staff counsel, witness Rosenberger testified that operating experience is used as an input to designing and planning the installation of a modification, in an effort to not repeat mistakes others have made and to apply learnings others have acquired. He also stated his belief that the missed opportunity noted by the RCE with respect to operating experience in this instance was to further explore and consider the effect of the operating experience. He testified in addition that the Company would have come to the same conclusion even after further exploration and consideration of the operating experience, which was that if it carried out the normal vendor recommended maintenance activities, the Company would be able to detect any problem.

The Commission agrees with witness Rosenberger that the collection of water within the enclosure, which caused the Surry Unit 2 to trip and resulted in this outage, is applicable to the analysis of whether the outage was reasonable and prudent, and could not have been anticipated by the Company. Surry station experienced an unusual amount of rainfall in the area and, prior to this outage, the Company had no reason to believe that the product at issue from the vendor would not meet the needs of the station. DENC's testimony established that the vendor is experienced in providing watertight enclosures, and was contracted by the Company to provide enclosures within certain specifications. It was not reasonably possible for the Company to foresee that the enclosures would not perform their design function during the unusual amount of rainfall. The Commission also finds persuasive witness Rosenberger's testimony at the hearing that, even after further exploration and consideration of the relevant operating experience, it would have come to the same conclusion, which was that if it carried out the normal vendor recommended maintenance activities, the Company would be able to detect any problem. Witness Rosenberger explained that the RCE could not identify as a root cause, or even a contributing cause, a factor that was beyond the Company's control. Based on the evidence presented, the Commission therefore concludes that the Company adhered to the applicable procedures, and that DENC's actions with regard to the installation, inspections and monitoring of the SST were reasonable based on the information that DENC knew, or reasonably should have known, at the time of the installation, inspections and monitoring of the SST. Specifically, the Company could not have reasonably foreseen that the design and installation of the SST might lead to the accumulation of water in the equipment during an unusual amount of rainfall. The Commission further concludes that the replacement power costs associated with this outage were reasonably and prudently incurred under efficient management and economic operations.

## **11-Day Surry Unit 1 Outage, July, 2015**

**[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]**

Witness Metz testified that the Company was aware of the risk of FME, because it included extra time for pipe flushing in its master outage schedule. However, he pointed out the importance of preventing foreign material from entering the system in the first place, as opposed to flushing it out after it has entered the system. Witness Metz noted that the flushing may cause foreign material to move within the piping system and cause damage.

**[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** He testified that in his experience with installing pipe, when there is cutting or welding, as occurred in this case, there is a high probability that remnants of or shavings from the pipe will get into the piping system. **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** would not have occurred, and constitutes inefficient management. Therefore, he recommended that the Commission disallow replacement power costs of \$369,184.

Witness Rosenberger testified that, on May 31, 2015, a newly installed seal at Unit 1 of the Company's Surry station showed evidence of degradation and declining differential pressure across the #1 seal and #3 seal, with the result that the Company shut down Unit 1 on July 11, 2015 to replace the seal. Upon investigation, the Company determined the direct cause of the issue to be **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** The Company remedied the situation by replacing the seal and fully restoring the unit to service on July 22, 2015.

In response to witness Metz's analysis of this outage, witness Rosenberger testified that, **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]**

This outage was incurred to allow the Company to replace a seal at Unit 1 that had degraded after being modified. The Commission gives substantial weight to witness Rosenberger's testimony that the Company had established a program and process consistent with industry practices to address the issue that caused this outage, and that it followed that process, and even performed additional preventative measures beyond that process. The Commission is not persuaded by the evidence that if the Company had followed other specific procedures, or pursued the vendor for more information beyond what was provided, the outage could have been prevented. Rather, the Commission concludes that the Company reasonably relied upon the relevant operating experience at another utility to inform its process with respect to the seal modification. In addition, as witness Rosenberger explains, the Company would have had no reason to pursue the vendor for more information prior to this event, in part because the vendor representatives would have worked closely with the Company to design the seal installation and would have been onsite with the Company for installation and for the subsequent modifications. In addition, the Commission does not agree with witness Metz that the Company's previous experience with this seal does not support a conclusion that it acted reasonably and prudently with respect to the seal at this Unit. The Commission is persuaded by



witness Rosenberger's testimony that in this regard the Company had been maintaining its seals according to a procedure that had been in place since 2009 and the procedure had not presented any issues before. In particular, the Commission notes his testimony that the Company had replaced a similar seal in May 2015 with no issues or degradation, and his testimony from the hearing that adequate procedures should have addressed the issue that gave rise to this outage. As a result, the Commission concludes that it is clear from the evidence that the Company reasonably believed it had implemented adequate procedures in this case, and that based on this and other factors the Company's procedures as they relate to the issue giving rise to this outage were prudent and robust and sufficient to ensure quality work and reliable operation of the pumps. The Commission also notes witness Rosenberger's testimony that because the North Anna failure event cited by witness Metz as previous indication of this issue dealt with a distinct issue at that facility and that the Surry Unit 1 event resulting in the July 2015 outage did not have the same initiating cause or extended consequences as the North Anna event, it is not appropriate to compare the two events at these facilities or the Company's actions taken in response. Based on the evidence presented, the Commission concludes that the Company adhered to the applicable procedures, and that DENC's actions with regard to the inspection, cleaning and installation of the seal and piping were reasonable based on the information that DENC knew, or reasonably should have known, at the time of the inspection, cleaning and installation. The Commission further concludes that the replacement power costs associated with this outage were reasonably and prudently incurred under efficient management and economic operations.

**36 Day Surry Unit 1 Outage, October - November, 2015 and  
Eight Day Surry Unit 2 Refueling Outage Extension, December 2015**

**[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]**

In summary, witness Metz stated that he believed that one or a combination of the causes he identified caused or exacerbated this outage. He further noted that all of these causes were within DENC's control and could have been avoided. Therefore, he found that the Company's acts or omissions in connection with this outage constituted management inefficiency, and the costs of replacement power of \$1,003,635 should be disallowed.

With respect to the Surry Unit 2 outage, witness Metz testified that **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** the extended outage at Surry Unit 2 would not have occurred. As a result, he recommended that the costs incurred for replacement power during the extended outage of Surry Unit 2 of \$202,603 be disallowed.

Witness Rosenberger testified that the Unit 1 reactor at the Surry station tripped after receiving fault signals from the main generator protection system. **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** The unit was offline while the Company disassembled the failed components, procured and refurbished a new exciter, repaired the main generator shaft, replaced the exciter shaft coupling with a newly manufactured coupling, and installed the Surry Unit 2 exciter onto the Unit 1 generator.

Witness Rosenberger testified that, **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]**

With respect to the Surry Unit 2 outage, witness Rosenberger testified that after Unit 2 at Surry Station entered a planned refueling, the planned outage was extended by approximately eight days because certain components from Surry Unit 2 had been used to expedite restart of Unit 1 from its October 2015 forced outage. Witness Rosenberger stated that the decision to extend the Surry Unit 2 outage in order to expedite the return to service of Unit 1 should be viewed as a stand-alone case. He explained that in a situation where two nuclear units are in outage, the prudent response is to return each to service as safely and efficiently as possible. He stated that by returning Surry Unit 1 and extending the Surry Unit 2 outage, the Company reduced total outage time by approximately 17.5 days, saving approximately \$474,626 on a North Carolina jurisdictional basis.

This outage event involved Surry Unit 1 tripping after receiving fault signals from the main generator protection system, and was determined to result from an issue with the design of a component of this Unit installed a decade earlier. The Commission is persuaded by witness Rosenberger's testimony that based on representations of the vendor that supplied this component that had been used elsewhere, and on the Company's recent experience with a similar component at Surry Unit 2, it was reasonable for the Company to not expect that additional maintenance practices were required and to believe that this was a prudently designed component with effective maintenance instructions. The Commission also gives substantial weight to witness Rosenberger's testimony that Company personnel used the guidance regarding this component that was available, and could not have known that such guidance did not fully identify the latent issue with this component, and that even the original manufacturer did not fully understand this latent vulnerability with equipment that is disconnected only approximately every nine years, so it could not have relayed such information to the Company. Finally, the Commission finds that witness Rosenberger's explanation that the Company had operating experience using the same procedures and process with regard to Surry Unit 2 in 2012, combined with the factors noted above, are convincing evidence that the Company had no reason to believe that the maintenance activities it had successfully performed previously would have led to this event. Based on all of these factors, the Commission concludes that the Company adhered to the applicable procedures, and that its actions with regard to the disassembly and reassembly of the spacer coupling component were reasonable based on the information that DENC knew, or reasonably should have known, at the time of the disassembly and reassembly. The Commission further concludes that the replacement power costs associated with this outage were reasonably and prudently incurred under efficient management and economic operations.

With respect to the extension of a planned outage at Surry Unit 2, which the Company undertook in order to use certain components from Unit 2 to expedite restart of Surry Unit 1 from the October-November, 2015 outage discussed above, the Commission

agrees with witness Rosenberger that in a situation where two nuclear units are in outage, the prudent response is to return each to service as safely and efficiently as possible, and finds persuasive his testimony that by returning Surry Unit 1 to service and extending the Surry Unit 2 outage, the Company reduced total outage time by approximately 17.5 days, saving approximately \$474,626 on a North Carolina jurisdictional basis. While the Commission agrees with witness Metz's testimony that, had Unit 1 not tripped in the first place, Unit 2 would not have incurred additional outage time, that does not mean that the Unit 2 outage resulted from inefficient or imprudent management. Viewed on a stand-alone basis, as advocated by witness Rosenberger, the Commission agrees that the Company reasonably and prudently managed Unit 2. Even viewed in combination with the Unit 1 outage, since we have concluded as discussed above that the Company reasonably and prudently managed Surry Unit 1 during the 2015-2016 test period, it follows that the Unit 2 outage extension, which was incurred to return Unit 1 to service more quickly, was also prudently managed. Therefore, based on the evidence presented we conclude that the Company managed Surry Unit 2 prudently and efficiently during the test period, and that the replacement power costs associated with this outage were prudently incurred under efficient management and economic operations.

The Commission appreciates the work and diligence of the Public Staff in investigating the outages discussed above. The Commission encourages the Public Staff to continue presenting its concerns about utility operations to the Commission. However, in this docket the Commission declines to order any replacement cost disallowances as recommended by the Public Staff. The Commission agrees with Company witness Rosenberger that forced outages will occasionally occur at nuclear generating units even under the best of scenarios, and that the Company's expertise and experience in operating its nuclear units during these events allowed the Company to keep these outages to a minimum timeframe while ensuring system safety and reliability. Therefore, based on a preponderance of the evidence in the record, the Commission concludes that the Company managed its baseload plants during the present and prior test periods, including its nuclear fleet, prudently and efficiently so as to minimize fuel and fuel-related costs.

#### EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT NO. 10

The evidence for this finding of fact is contained in the rebuttal testimony of Company witness Petrie, the testimony and exhibits of Public Staff witness Metz, and the affidavit and exhibits of Public Staff witness Johnson.

Public Staff witness Metz testified that the Company calculated its North Carolina replacement power costs for each unit by taking the difference between the variable costs for a unit in an outage and the actual market price for power, then deducting 2% of the costs until a unit's forced outage allowance was met, and allocating the appropriate portion to North Carolina. As indicated by witness Metz, DENC establishes a cap for each unit, so that DENC recovers all replacement power costs for any number of outages for a particular unit until the unit's cap is met. Witness Metz testified that while it was reasonable to use a 2% forced outage rate for planning, it is not reasonable for the

Company to deduct a 2% forced outage allowance from its replacement power costs. He noted that the Company has the responsibility to operate its plants in a reasonable and prudent manner. If an outage is due to inefficient management, witness Metz argued that ratepayers should not bear the costs of the replacement power.

Witness Metz calculated the costs of the replacement power associated with the Subs 534 and 546 outages discussed above without applying the 2% forced outage allowance and recommended that total replacement power costs of \$1,807,896 on a North Carolina retail basis be excluded from cost recovery. Public Staff witness Johnson incorporated witness Metz's recommendation into her calculations of Rider B.

In his rebuttal testimony, Company witness Petrie generally agreed with Public Staff witness Metz's description of replacement power costs and the Company's method of calculation. He presented the Company's calculations of replacement power costs for the Sub 534 and 546 outages with and without the 2% forced outage allowance. DENC's calculation of replacement power costs for these outages without application of the 2% forced outage allowance are \$55,567 lower than those calculated by witness Metz. In regard to the Sub 546 outages, because of the application of the 2% forced outage allowance, DENC contended it had no replacement power costs, as the costs fell within the 2% cap for each unit. Witness Petrie contends that without the 2% forced outage allowance, the Company would be held to a standard of perfection.

Witness Petrie contends that Public Staff witness Metz believes that DENC's operations should be compared to perfect operations. However, witness Metz testified that he reviewed a number of forced outages for fossil and nuclear plants in Subs 534 and 546 and did not recommend disallowance of any replacement power costs beyond the outages (and refueling outage extension) discussed above. Therefore, he maintained that he clearly did not apply a standard of perfection.

The Commission agrees with witness Metz that DENC's use of a 2% forced outage rate is a reasonable assumption for planning purposes, but an unreasonable assumption for cost recovery purposes. If the Commission finds that some replacement power costs were unreasonably or imprudently incurred, the Commission cannot put those costs into rates, regardless of whether they fall within the planned 2% forced outage rate. Costs of replacement power that were not reasonably and prudently incurred should not be included in rates. G.S. 62-133.2(d) requires that "only that portion, if any, of a requested cost of fuel and fuel-related costs adjustment that is based on adjusted and reasonable cost of fuel and fuel-related costs prudently incurred under efficient management and economic operations" be allowed in rates. Therefore, the Commission finds and concludes that it is inappropriate for DENC to apply a 2% forced outage allowance for calculation of replacement power costs. DENC should calculate its replacement power costs by taking the difference between the variable costs for a unit in an outage and the actual market price for power (the Day-Ahead Dom Zone LMP).

## EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT NO. 11

The evidence for this finding of fact is contained in the direct testimony of DENC witness Petrie and the testimony and exhibits of Public Staff witness Metz.

Company witness Petrie testified in his direct testimony that, for the 12 months ending December 31, 2018, the projected net capacity factor for each nuclear unit is as follows: North Anna Unit 1, 90.4%; North Anna Unit 2, 99.6%; Surry Unit 1, 93.1%; and Surry Unit 2, 91.1%. For the nuclear fleet, the projected nuclear generation during the upcoming rate year is expected to be slightly higher than the actual generation during the test period. Based on this projection, the Company has normalized expected nuclear generation and fuel expenses in developing the proposed fuel cost rider. DENC's projected fuel costs are based on a 93.54% nuclear capacity factor, which is what DENC anticipates for the twelve months from January 1, 2018 through December 31, 2018, the period the new rates will be in effect.

Based on the foregoing evidence, the Commission concludes that a projected normalized system nuclear capacity factor of 93.54% is reasonable and appropriate for use in this proceeding.

## EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT NO. 12

The evidence for this finding of fact is contained in the direct testimony of DENC witness Merritt and the testimony of Public Staff witness Metz.

Witness Merritt testified that he was sponsoring the calculation of the adjustment to the Company's system sales for the twelve months ended June 30, 2017, due to changes in usage, weather normalization, and customer growth, in accordance with Commission Rule R8-55(d)(2). The Company's filing further stated that the methodology used for the normalization is the same as adopted by the Commission in Docket No. E-22, Sub 532, the Company's last general rate case. Witness Merritt adjusted total Company sales by 996,840,129 kWh. This adjustment is the sum of adjustments for changes in usage, weather normalization, and customer growth. The Public Staff reviewed and accepted these adjustments. No other party offered or elicited testimony on these adjustments.

Based on the foregoing, the Commission concludes that the adjustments for changes in usage, weather normalization, and customer growth are reasonable and appropriate adjustments for use in this proceeding. The adjusted system sales for the twelve months ended June 30, 2017, are 84,774,563,328 kWh.

### EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT NO. 13

The evidence for this finding of fact is contained in the direct testimony of Company witness Petrie.

DENC witness Petrie presented an adjustment to per book MWh generation for the 12-month period ended June 30, 2017, to incorporate nuclear generation based upon the expected future operating parameters for each unit. Other sources of generation were then normalized, including an adjustment for weather, customer growth, and increased usage. This methodology for normalizing test period generation resulted in an adjusted generation level of 85,796,167 MWh. The Public Staff accepted this adjusted generation level, which includes various types of generation as follows:

<u>Generation Types</u>	<u>MWh</u>
Nuclear	27,442,508
Coal (Including wood & natural gas steam)	20,939,580
Heavy Oil	191,548
Combined Cycle and Combustion Turbine	29,207,250
Hydro – Conventional and Pumped Storage	3,106,119
Solar	49,093
Net Power Transactions	7,472,692
Less: Energy for Pumping	(2,563,530)

No other party offered or elicited testimony on the adjusted test period system generation for use in this proceeding. Thus, based on the foregoing, the Commission concludes that the adjusted test period system generation level of 85,796,167 MWh is reasonable and appropriate for use in this proceeding.

### EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT NO. 14

The evidence for this finding of fact is contained in the direct testimony of DENC witness Campbell and the affidavit of Public Staff witness Johnson.

Company witness Campbell explained that for dispatchable non-utility generators (NUGs) that do not provide actual fuel costs, the Company continued to include 85% of the reasonable and prudent energy and market-based energy costs in the EMF calculation through December 31, 2016. Beginning in 2017, the Company used the 78% marketer's percentage approved by the Commission in Sub 534.

Public Staff witness Johnson explained that during the test period, DENC purchased power through markets administered by PJM Interconnection, LLC (PJM), and from a dispatchable NUG that did not provide DENC with the actual fuel costs associated with the purchases. As a result, a proxy marketer percentage was determined and applied to the total energy costs of the purchases. Witness Johnson also explained that the use of a "proxy" has been accepted by this Commission as reasonable in every fuel

proceeding since 1997. She explained that use of the 85% “marketer’s percentage” was agreed to between the Company and the Public Staff and approved by the Commission in the Company’s 2012 fuel factor proceeding, Docket No. E-22, Sub 485, and was maintained up through the 2015 fuel factor proceeding, Docket No. E-22, Sub 526. Beginning in 2017, the Company used the 78% marketer’s percentage as approved by the Commission in the Company’s 2016 general rate case in Docket No. E-22, Sub 532. The 78% marketer percentage is to remain in effect until the sooner of DENC’s next general rate case or the 2018 fuel charge adjustment proceeding. No party disputed the use of the 85% marketer percentage through December 31, 2016, or the use of the 78% marketer percentage thereafter in this proceeding, or the use of actual fuel costs as described by the Company.

Based upon the foregoing, the Commission concludes that it is reasonable to apply an 85% marketer percentage through December 31, 2016, and a 78% marketer percentage thereafter to DENC’s purchases from suppliers that do not provide the Company with actual fuel costs as the proxy for actual fuel costs associated with such purchases in this proceeding, and that the percentage should be reviewed in the context of DENC’s next general rate case, or its 2018 fuel charge adjustment proceeding, whichever occurs first.

#### EVIDENCE AND CONCLUSIONS FOR FINDING OF FACT NO. 15

The evidence for this finding of fact is contained in the direct testimony and exhibits of Company witnesses Petrie and Merritt, and the testimony and exhibits of Public Staff witness Metz.

Company witness Petrie presented the Company’s system fuel expense for the test period and the normalized system fuel expenses projected for the calendar year 2018 rate period of \$1,758,608,978. He further testified that the fuel overrecovery experienced by the Company was driven by mild weather, moderate commodity prices, and the addition of new natural gas generation. He testified that he normalized fuel expenses using a methodology approved in previous North Carolina fuel rate cases. More specifically, the expense rates for nuclear, coal, oil, and NUGs were based on the actual 12-month average expense rates incurred during the test period. Various adjustments were made, as itemized in witness Petrie’s testimony.

Company witness Merritt presented the Company’s calculation of the proposed Fuel Cost Rider A applicable for each North Carolina retail jurisdiction customer class. He first determined the Company’s proposed average system fuel factor of 2.077¢/kWh, based on system fuel expenses of \$1,758,608,978, and system sales of 84,774,563,328 kWh, that reflected adjustments for changes in usage, weather normalization, and customer growth. Witness Merritt then used customer class expansion factors to determine the North Carolina retail jurisdictional voltage differentiated prospective fuel factors at the sales level applicable to each customer class. For each customer class, the proposed factor was then compared to its corresponding base fuel factor to determine the Company’s proposed Fuel Cost Rider A rate. In his testimony, Public Staff witness

Metz stated that, based upon its investigation, the Public Staff determined that the projected fuel costs and the prospective components of the Company's proposed fuel factor (Rider A), as set forth in the application, were calculated appropriately for this proceeding.

No other party offered or elicited testimony on the adjusted test period system fuel expense for use in this proceeding. Based upon the foregoing, the Commission concludes that the appropriate level of fuel expenses to be used to set the prospective, or forward-looking, fuel factor in this proceeding is \$1,758,608,978.

The Commission notes that the Company's proposed fuel factors (Rider A) were calculated assuming that such factors (riders) would be in effect for a 12-month period beginning January 1, 2018. Given that the riders established in this proceeding will not actually become effective until February 1, 2018, the Commission shall provide for the Company to recalculate and file proposed fuel factors (Rider A) that will allow it to recover its fuel expense over the 11-month period beginning February 1, 2018, consistent with the findings and conclusions in this Order.

#### EVIDENCE AND CONCLUSIONS FOR FINDINGS OF FACT NOS. 16-17

The evidence supporting these findings of fact is contained in the direct testimony and exhibits of Company witness Merritt, Petrie, and Campbell, the testimony of Public Staff witness Metz, and the affidavit of Public Staff witness Johnson.

Company witness Petrie testified that mild weather, moderate commodity prices, and the addition of new and efficient natural gas generation, as well as the Company's optimization of its diverse fleet of generating assets to reduce system fuel expense, resulted in an over-recovery of fuel costs. Company witness Campbell testified that the fuel costs allocated to North Carolina jurisdictional customers totaled \$87,012,025, while the Company received fuel revenues totaling \$91,751,981 during the test year. The difference between the fuel costs and the fuel revenues resulted in an over-recovery of \$4,739,956 for the test period. Company witness Merritt testified that this total over recovered fuel expense was adjusted by \$710,993 to account for interest, for a total net balance of \$5,450,950. To determine the EMF (Rider B), witness Merritt divided this net balance by the adjusted jurisdictional test period sales of 4,299,466,351 kWh. He then used customer class expansion factors to differentiate the uniform factor by voltage to determine the North Carolina retail jurisdictional voltage differentiated EMF riders at the sales level applicable to each customer class.

Public Staff witness Metz testified that he agreed with the Company's proposed Rider A, the proposed system average fuel factor for the billing period. He also stated that he agreed with the Company's methodology and supporting calculation of Rider B, the EMF, and agreed with the Company's calculation of its over-recovery of \$5,450,950. He also recommended as discussed above that Rider B be adjusted with regard to the Company's replacement power costs associated with certain outages. Specifically, he recommended that \$1,807,896 in replacement power costs be excluded from the EMF –



\$232,473.83 for outages during the 2015-2016 test period and \$1,575,422.45 for outages during the 2016-2017 test period. (101)

Public Staff witness Johnson stated that based on the recommendation of Public Staff witness Metz, she included adjustments to disallow \$1,807,896 in replacement power costs associated with outages during the prior and current test periods. As a result of these adjustments, she recommended that the Company's EMF decrement rider (Rider B) for each customer class be based on net over-recovery of fuel and fuel-related costs of \$6,547,853 and interest of \$982,178, for a total over-recovery of \$7,530,031.

Based upon the evidence, the Commission concludes that the appropriate North Carolina retail test period jurisdictional fuel expense over collection is \$5,450,950 (including interest) and that the adjusted North Carolina jurisdictional test period sales are 4,299,466,351 kWh. Consistent with the Commission's rejection of the Public Staff's proposed disallowance of replacement power costs discussed herein, the Commission also concludes that these amounts should not be adjusted as recommended by the Public Staff.

Company witness Merritt testified regarding Rider B2 approved in Docket No. E-22, Sub 515, to mitigate the rate impact of the high fuel costs that occurred during extremely cold weather in January through March 2014 by allowing the costs to be collected in the EMF for the 2015 and 2016 fuel years, without interest, subject to a final true-up to be determined in the 2017 fuel case and recovered over the 2018 fuel year. Witness Merritt set forth the total under-recovery balance for the 24 months ended December 31, 2016, of \$381,535 as presented in Company witness Campbell's exhibits. Witness Merritt calculated the proposed uniform Rider B2 EMF applicable to the North Carolina jurisdiction and the resulting factor for each customer class of \$0.00009/kWh. Public Staff witness Metz agreed that the final true-up of the EMF Rider B2 should be set to \$0.00009/kWh for the 2018 fuel year. Public Staff witness Johnson recommended approval of the Company's proposed Rider B2 EMF in the amount of \$0.00009/kWh.

The Commission concludes that it is appropriate to implement this final phase of the mitigation proposal EMF Rider B2 in this docket. However, the Commission notes that, like the Company's proposed fuel factors (Rider A), the Company's proposed EMF riders (B and B2) were calculated assuming that such riders would be in effect for a 12-month period beginning January 1, 2018. Given that the riders established in this proceeding will not become effective until February 1, 2018, the Commission shall provide for the Company to recalculate and file proposed EMF Riders (B1 and B2) that will allow it to refund its over-recovered test year fuel costs (including interest) and collect the remaining under-recovery from the mitigation proposal approved in Docket No. E-22, Sub 515 over the 11-month period beginning February 1, 2018, consistent with the findings and conclusions in this Order.

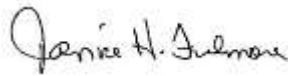
IT IS, THEREFORE, ORDERED as follows:

1. That the Company shall recalculate and file proposed fuel factor increments (Rider A), EMF decrements (Rider B), EMF increments (Rider B2), and the total net fuel factors, on a voltage-differentiated basis, consistent with the findings and conclusions of this Order, to be effective for an eleven-month period beginning on February 1, 2018;
2. That the Company shall work with the Public Staff to verify the accuracy of the increments and decrements described above and to prepare a joint proposed notice to customers of the rate rider adjustments ordered by the Commission herein; and
3. That the Company shall file the information required in Ordering Paragraph Nos. 1 and 2 above in a proposed order approving the proposed riders and customer notice, with attached workpapers, showing the calculation of the proposed riders, as soon as practicable.

ISSUED BY ORDER OF THE COMMISSION.

This the 25<sup>th</sup> day of January, 2018.

NORTH CAROLINA UTILITIES COMMISSION

A handwritten signature in dark ink, appearing to read "Janice H. Fulmore".

Janice H. Fulmore, Deputy Clerk

Commissioner Daniel G. Clodfelter dissents in part.

**DOCKET NO. E-22, SUB 546**

**Commissioner Daniel G. Clodfelter, dissenting in part:**

While I concur in most of the majority's findings and conclusions, on one issue I would reach a different result. On the matter of the eleven-day outage at Surry Unit 1 in July, 2015, caused by seal degradation **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** based on all the evidence presented I find the Public Staff's analysis of the causes of that outage more persuasive. I would therefore conclude that reasonable and prudent management would have rendered that outage avoidable. **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** and this knowledge put the Company on notice and inquiry with respect to the sufficiency of its processes and internal guidance to avoid a similar occurrence.

Concerning the Company's lack of knowledge of **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** I would find that based on prior knowledge and experience it was incumbent on the Company to make inquiry and to determine the necessary **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]** Knowledge of this fact would have heightened the Company's focus on the adequacy of its internal guidance and procedures with respect to **[BEGIN CONFIDENTIAL] [END CONFIDENTIAL]**.

/s/ Daniel G. Clodfelter

Commissioner Daniel G. Clodfelter