STATE OF NORTH CAROLINA
UTILITIES COMMISSION
RALEIGH

DOCKET NO. E-100, SUB 165

In the Matter of:	)	NC WARN AND CENTER FOR
2020 Biennial Integrated Resource	)	BIOLOGICAL DIVERSITY'S
Plans and Related 2020 REPS	)	REPLY COMMENTS ON
Compliance Plans	)	DUKE'S INTEGRATED
	)	RESOURCE PLANS

Pursuant to North Carolina Utilities Commission ("NCUC" or "Commission") Rule R8-60(K) and the Commission's *Order Granting Further Extension of Time* entered on May 11, 2021, NC WARN ("NC WARN") and the Center for Biological Diversity ("The Center" or "CBD"), through undersigned counsel, submit the following Reply Comments concerning the 2020 Integrated Resource Plans ("IRP") of Duke Energy Carolinas, LLC ("DEC") and Duke Energy Progress, LLC ("DEP") (collectively, the "Companies" or "Duke Energy").

INDEX OF ATTACHMENTS

The following is a list of the attachments filed contemporaneously with these Reply Comments. These attachments are referenced in the present Reply Comments and/or William Powers's Supplemental Report.

Attachment 1: Supplemental Review of DEC and DEP's 2020 Integrated Resource Plans by William Powers;

Attachment 2: DEC's Response to NCWARN/CBD's Data Request 4-2;

Attachment 3: DEC's Supplemental Response to NCWARN/CBD's Data Request 4-5;

Attachment 4: DEP's Response to NCWARN/CBD's Data Request 4-2;

Attachment 5: DEP's Supplemental Response to NCWARN/CBD's Data Request 4-5;

Attachment 6: Duke Energy's Review of February 20 [2015] Extreme Cold Weather Event;

Attachment 7: DEC's Supplemental Response to NCWARN/CBD's Data Request 4-6;

Attachment 8: DEP's Supplemental Response to NCWARN/CBD's Data Request 4-6;

Attachment 9: DEP's Supplemental Response to NCWARN/CBD's Data Request 4-7;

Attachment 10: DEC's Supplemental Response to NCWARN/CBD's Data Request 4-7;

Attachment 11: DEC's Response to NCWARN/CBD's Data Request 4-5; and

Attachment 12: DEP's Response to NCWARN/CBD's Data Request 4-5.

DISCUSSION

I. In Their IRPs, DEC and DEP Report Inaccurate Operating Reserve Margins, and Therefore, the Companies Should Be Ordered to File Revised IRPs with Updated Analyses Reflecting Accurate Operating Reserve Margins.

This Section I of NC WARN and The Center's Reply Comments is generally based upon the Supplemental Report of Powers, which is attached hereto as **Attachment 1**. Powers's Supplemental Report should be consulted for additional details and citations.

A. Background Concerning the Importance of Operating Reserve Margins in the Present IRP Docket.

The Companies' IRPs advocate for an excessively high planning reserve margin ("PRM") of seventeen percent (17%). In order to meet that excessive

PRM, DEC proposes to add 3,051 MW of natural-gas fired generation by 2034,[1] and DEP also proposes to add 3,051 MW of natural-gas fired generation by 2028.[2] If the proposed seventeen percent (17%) PRM is indeed excessive, it will result in a costly and unnecessary overbuilding of generation assets. Of course, protecting against such unnecessary overbuilding is one of the Commission's important functions during IRP proceedings. *State ex rel. Utilities Comm. v. Empire Power Co.*, 112 N.C. App. 265, 278, 435 S.E..2d 553, 560 (1993) (holding that the purpose of IRP proceedings is to "provide for the orderly expansion of the State's electric generating capacity in order to create the most reliable and economical power supply possible **and to avoid the costly overbuilding of generation resources**." (emphasis added)).

In order to justify the seventeen percent (17%) PRM, and therefore justify an extensive natural gas buildout, the Companies' IRPs allege that the operating reserve margins ("ORM") of DEC and DEP frequently drop below ten percent (10%).[3] In fact, the Companies' IRPs cited to several extreme winter peak days in the 2014-2019 time period on which their ORMs were supposedly very narrow.[4] Therefore, the Companies' ORMs are at the heart of this IRP proceeding, as the supposedly narrow ORMs serve as a justification for the Companies' proposed seventeen percent (17%) reserve margin and accompanying natural gas buildout.

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[1] DEC's IRP, p 103.
[2] DEP's IRP, p 105.
[3] DEC's IRP, pp 69-72; DEP's IRP, pp 71-74.
[4] DEC's IRP, pp 71-72; DEP's IRP, pp 73-74.

As described below, however, the Companies' ORMs are not nearly so narrow as reported in their IRPs. Indeed, in his attached Supplemental Report, Mr. Powers corrects several errors in the Companies' ORM calculations, which corrections reveal that, during the critical winter peak dates at issue, the Companies' ORMs never dropped below 19.8% (DEC) or 11.6% (DEP).[5]

Unfortunately, however, the Public Staff's Initial Comments do not question the Companies' allegedly narrow ORMs, and the Public Staff furthermore does not object to Duke Energy's proposed seventeen percent (17%) PRM.[6] The present Section I of these Reply Comments is dedicated to rebutting the initial comments of the Public Staff or any other intervenor tacitly consenting to the Companies' supposedly narrow ORMs. In fact, as described below, the Companies' responses to data requests served after the deadline for Initial Comments cast yet further doubt upon the accuracy of ORMs contained in the IRPs of DEC and DEP.[7]

B. General Description of the Companies' Errors in Calculating ORMs.

During the subject winter peak events in 2014-2019, the Companies' ORMs were significantly higher than reported in the DEC and DEP IRPs.[8] As described more fully below, the Companies' calculation errors are the result of their failure to include the following within their ORM calculations:

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[5] **Attachment 1**, Powers's Supplemental Report, p 3.
[6] Public Staff's Initial Comments, pp 65-80.
[7] **Attachments 2-5 & 7-10**.
[8] **Attachment 1**, Powers's Supplemental Report, pp 2-3; *see also* Initial Comments of NC WARN & CBD, pp 7-11.

(a) failure to include non-firm energy transfers,[9]

(b) failure to include transfers pursuant to the Joint Dispatch Agreement ("JDA") between DEC and DEP,[10] and

(c) failure to account for unnecessarily idle units.[11]

Below, these Reply Comments explain why each of these omissions constitutes a material calculation error. Furthermore, the below portions of these Reply Comments update ORM calculations to correct these calculation errors and provide the Companies' true ORMs.

C. Correcting the Companies' ORM Calculation Errors.

Following the deadline for Initial Comments, the Companies served responses to data requests concerning the ORMs of DEC and DEP on the most extreme winter peak events referenced in their IRPs: namely January 7, 2014 and February 20, 2015.[12] The narrative body of DEC's IRP calls specific attention to January 7, 2014 as a perilously narrow ORM.[13] Similarly, the narrative body of DEP's IRP calls specific attention to February 20, 2015 as involving a negative ORM.[14] In other words, the centerpiece of Duke Energy's argument for an extravagant seventeen percent (17%) PRM is the supposedly narrow—or negative—ORMs on January 7, 2014 and February 20, 2015.[15]

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[9] **Attachment 1**, Powers's Supplemental Report, pp 2-3.
[10] *Id.*
[11] *Id.* at 1-2; *see also* Initial Comments of NC WARN & CBD, pp 10-11.
[12] **Attachments 3-5 & 7-10.**
[13] DEC's IRP, pp 69-70.
[14] DEP's IRP, pp 71-72.
[15] DEC's IRP, pp 69-72; DEP's IRP, pp 71-74.

However, as described more fully below, the Companies' recent responses to data requests establish that DEC and DEP's ORMs on January 7, 2014 and February 20, 2015 actually ranged from 11.6% (DEP) to 21.9% (DEC).[16]

For context, it is helpful to identify the ORMs on January 7, 2014 and February 20, 2015 as reported in DEC and DEP's IRPs:

Table 1. ORMs reported by DEC and DEC for January 7, 2014 and February 20, 2015[17]

Utility	Date	Peak demand, MW	ORM, %	PRM, %
DEC	01/07/14	18,275[18]	0.2	24.8
DEC	02/20/15	18,589	1.2	27.6
DEP	01/07/14	14,159	0.2	33.6
DEP	02/20/15	15,515	-1.6	31.7

Naturally, calculating the Companies' ORMs on January 7, 2014 and February 20, 2015 requires consideration of projected available capacity for those dates, including firm contracts and demand side management ("DSM"). This information is provided in Table 2 below:

[16] **Attachment 1**, Powers's Supplemental Report, p 3.

[17] DEC's IRP, p 71; DEP's IRP, p 73.

[18] DEC lowered its winter peak demand values in response to data requests from Southern Environmental Law Center. *See* **Attachment 5** to NC WARN and CBD's Initial Comments. DEC's revised winter peak demand values are listed in Table 1.

Table 2. Available 2013/2014 and 2014/2015 winter capacity in DEC and DEP service territories without including non-firm imports from 2013 DEC and DEP IRPs[19]

Utility	IRP winter season	IRP generating capacity, MW	Firm contracts, MW	DSM, MW	Cumulative capacity, MW
DEC	2013/2014	21,281	229	561	22,070
DEC	2014/2015	21,351	216	584	22,151
DEP	2013/2014	14,253	1,925	506	16,684
DEP	2014/2015	14,253	1,925	506	16,684

In fairness to the Companies, it is necessary to remove from the ORM calculation any forced outages. Obviously, Duke Energy's forced outages would be unavailable to meet demand on January 7, 2014 and February 20, 2015. DEC and DEP's outages on January 7, 2014 and February 20, 2015 were as follows:

Table 3. DEC and DEP generation in forced outage on January 7, 2014 and February 20, 2015[20]

Utility	Date	Forced outage, MW[21]
DEC	01/07/14	185
DEC	02/20/15	1,393
DEP	01/07/14	574
DEP	02/20/15	490

However, an important caveat to the above outage numbers is necessary. In response to data requests, the Companies identified units which were generally not operational to meet peak on January 7, 2014 or February 20, 2015. However, the Companies did not distinguish between *forced* outage and *planned*

[19] **Attachment 1**, Powers's Supplemental Report, p 1.

[20] *Id.* at 2.

[21] As described on pages 7-8 of these Reply Comments, these "Forced outage" numbers may include some *planned* outages. The Companies should not perform planned maintenance during predictable winter peak events, and any units in planned outage should have been available to meet demand. Therefore, these forced outage numbers may be lower than reported.

outage. On the other hand, the Companies' data responses concerning winter peak dates in 2017-2019 revealed that substantial assets were not operating due to *planned* maintenance.[22]

It is therefore reasonable to assume that some of the Companies' units were in *planned*, not forced, outage on January 7, 2014 and February 20, 2015. Of course, planned maintenance should not be scheduled during periods on which winter peaks are reasonably expected to occur.[23] To the extent that planned outages are included within the "Forced outage" column of Table 3 above, such planned outages should be removed from the calculation, because the units subject to scheduled maintenance should have been available to meet demand.

On a related note, it is significant that the Companies refused to operate several units during these critical winter peak dates because it was more cost-effective to perform JDA transfers and non-firm imports. For example, on January 25, 2019, DEC relied on 925 MW in JDA imports and 1,229 MW of non-firm imports.[24] On the same date, DEC identified 2,195 MW of its combustion turbine fleet as "Contingency Reserve/Out of Economics."[25] Seemingly, these

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[22] **Attachment 11**, DEC's Response to NCWARN/CBD's Data Request 4-5 (referencing numerous units "undergoing planned maintenance or testing"); **Attachment 12**, DEP's Response to NCWARN/CBD's Data Request 4-5 (same).

[23] **Attachment 1**, Powers's Supplemental Report, pp 1-2.

[24] **Attachment 7**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-6; **Attachment 10**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-7.

[25] **Attachment 3**, DEC's Supplemental Responses to NCWARN/CBD's Data Request 4-5, pp 3-4.

"Out of Economics" units were available to meet peak but the Companies determined that importing electricity was more cost-effective.

In Mr. Powers's attached Supplemental Report, the above data are used to revise the Companies' reported ORMs on January 7, 2014 and February 20, 2015 without the benefit of transfers under the JDA or non-firm imports.[26] As described in Mr. Powers's Supplemental Report, the corrected ORMs, without JDA transfers or non-firm imports, are as follows:

Table 4. Calculated DEC and DEP ORMs on January 7, 2014 and February 20, 2015 without non-firm imports[27]

Utility	Generation capacity, MW	Firm imports, MW	Available DSM, MW	Forced outages, MW[28]	Demand, MW	ORM, %
January 7, 2014						
DEC	21,281	229	561	185	18,275	19.8
DEP	14,253	1,925	506	574	14,159	13.8
February 20, 2015						
DEC	21,351	1,307	537	1,393	18,589	17.3
DEP	14,253	2,313	545	490	15,515	7.1

ORM, % = [(available generation capacity + firm imports + DSM – forced outages) ÷ demand] x 100

These corrected ORMs are far higher than the ORMs reported by the Companies.[29] DEC and DEP set a target of relying upon an ORM of 10% or more.[30] Yet, as noted in Table 4 above, during the two most extreme winter weather events, DEC maintained ORMs well above the Companies' 10% goal:

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[26] **Attachment 1**, Powers's Supplemental Report, p 2.

[27] *Id.*

[28] As described in pages 7-8 of these Reply Comments, these "Forced outage" numbers may include some *planned* outages. However, the Companies should not perform planned maintenance during predictable winter peak events, and any units in planned outage should have been available to meet demand. Therefore, these forced outage numbers may be lower than reported.

[29] DEC's IRP, p 71; DEP's IRP, p 73.

[30] DEC's IRP, p 69; DEP's IRP, pp 71-72.

19.8% on January 7, 2014, and 17.3% on February 20, 2015.[31] DEP's ORM was a safe 13.8% on January 7, 2014, and was 7.1% on February 20, 2015, not including non-firm imports.[32] Therefore, these corrected calculations reveal that the Companies' ORMs are not nearly as narrow as indicated in their IRPs, even when non-firm imports and transfers under the JDA are not considered.

Further corrections are necessary, however. The above-provided revised ORMs do not consider transfers under the JDA or non-firm imports.[33] In practice, the Companies regularly rely upon both JDA transfers and non-firm imports to reliably meet demand.[34] For example, on February 20, 2015, DEP relied on JDA transfers from DEC in the amount of 500 MW[35] and non-firm imports of 200 MW.[36] On January 25, 2019, DEC relied upon 925 MW in JDA transfers and 1,229 MW of non-firm imports.[37]

The Companies' extensive and reliable use of imports was discussed in the Initial Comments of NC WARN and The Center.[38] For example, the said

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[31] **Attachment 1**, Powers's Supplemental Report, p 2.

[32] *Id.*

[33] *Id.* at 2-3.

[34] *E.g.*, NC WARN and CBD's Initial Comments, pp 7-9; **Attachment 1**, Powers's Supplemental Report, pp. 3-5; *see also* **Attachment 7**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-6; **Attachment 9**, DEP's Supplemental Response to NCWARN/CBD's Data Request 4-7.

[35] **Attachment 7**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-6; **Attachment 8**, DEP's Supplemental Response to NCWARN/CBD's Data Request 4-6.

[36] **Attachment 9**, DEP's Supplemental Response to NCWARN/CBD's Data Request 4-7; **Attachment 10**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-7.

[37] **Attachment 7**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-6; **Attachment 10**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-7.

[38] NC WARN and CBD's Initial Comments, pp 7-10.

Initial Comments discussed that, following the polar vortex incident on February 20, 2015, the Companies' witness testified before the Commission during a Staff Conference that the Companies had copious available non-firm imports to meet demand.[39] Indeed, when asked by the Commission "how far were you [i.e., DEC and DEP] from having to shed load" on February 20, 2015, the Companies' witness responded as follows:

> Well, so certainly there were several other options still available. We had not called on VACAR reserves, so we still had firm transmission availability to bring reserves in. There were still energy options. **We still could have pushed more non-firm energy.**[40]

Later during the same Staff Conference, the Companies' witness again testified to the ample available energy purchases and the ease with which the Companies met load during a uniquely high-load event:

> We were able to bring in—you know, I think we were importing about 1,200 MW of energy at one time into our BAA. That's a sizeable energy move in a very stressful time. So we were able to move energy in from PJM. We moved energy in from Southern Company. We had our reserve sharing capabilities on our firm transmission. **So I didn't see any deficiencies.**[41]

It is impossible to square the Companies' easy reliance upon non-firm imports on February 20, 2015—a uniquely trying winter peak event—with the Companies' failure to include non-firm imports within its ORM calculations. Indeed, the Companies' responses to data requests show that DEC and DEP

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[39] *Id.* at 9-10.

[40] *Id.* at 9 (quoting pages 11-12 of **Att. 7** to Initial Comments) (emphasis added).

[41] *Id.* at 9 (quoting page 17 of **Att. 7** to Initial Comments) (emphasis added).

relied upon non-firm imports to meet winter peak on each of the supposedly narrow ORM events in 2012-2015 and 2018-2019.[42] Hence, non-firm imports are a reliable and important component of the Companies' historical efforts to meet winter peak.

Therefore, any fair calculation of ORM would consider non-firm imports and JDA transfers.[43] These calculations were performed in Powers's Supplemental Report and are included within Table 5 below:

Table 5. Calculated DEC and DEP ORMs on January 7, 2014 and February 20, 2015 with non-firm imports included[44]

Utility	Generation capacity, MW	Firm imports, MW	Available DSM, MW	Non-firm imports, MW	Forced outages, MW[45]	Demand, MW	ORM, %
January 7, 2014							
DEC	21,281	229	561	0	185	18,275	19.8
DEP	14,253	1,925	506	data not provided	574	14,159	13.8
February 20, 2015							
DEC	21,351	1,307	537	857	1,393	18,589	21.9
DEP	14,253	2,313	545	700	490	15,515	11.6

ORM, % = [(available generation capacity + firm contracts + DSM – forced outages) ÷ demand] x 100

Within Table 6 below, these corrected, and more accurate, ORMs are compared to the ORMs reported in the IRPs of DEC and DEP:

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[42] **Attachment 7**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-6; **Attachment 8**, DEP's Supplemental Response to NCWARN/CBD's Data Request 4-6; **Attachment 9**, DEP's Supplemental Response to NCWARN/CBD's Data Request 4-7; **Attachment 10**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-7.

[43] This argument is more fully developed in Section II below.

[44] **Attachment 1**, Powers's Supplemental Report, p 3.

[45] As described in pages 7-8 of these Reply Comments, these "Forced outage" numbers may include some *planned* outages. However, the Companies should not perform planned maintenance during predictable winter peak events, and any units in planned outage should have been available to meet demand. Therefore, these forced outage numbers may be lower than reported.

Table 6. Calculated vs. reported DEC and DEC ORMs for January 7, 2014 and February 20, 2015[46]

Utility	Date	Calculated ORM w/o non-firm imports, %	Calculated ORM with non-firm imports, %	ORM reported in 2020 IRPs, %
DEC	01/07/14	19.8	19.8	0.2
DEC	02/20/15	17.3	21.9	1.2
DEP	01/07/14	13.8	13.8	0.2
DEP	02/20/15	7.1	11.6	-1.6

As noted, DEC and DEP cite to January 7, 2014 and February 20, 2015 as the most extreme weather events occasioning the narrowest ORMs in recent memory.[47] Other Intervenors to this docket have correctly argued that Duke Energy's PRM should not be approved based upon extreme, outlier weather events.[48] Putting aside such compelling objections, Duke Energy's ORMs on January 7, 2014 and February 20, 2015—the most extreme peak events in the record—never dropped below 19.8% (DEC) and 11.6% (DEP).[49] The availability of such ample capacity proves that the Companies' proposed PRM of seventeen percent (17%) is unnecessarily high.

II. Duke Energy's Exclusion of Energy Transfers from Its Resource Planning Is an Outlier and Should Be Rejected.

The Public Staff's Initial Comments reveal a significant inconsistency between the Companies and Dominion Energy North Carolina ("Dominion"). The Public Staff's Initial Comments state that Dominion has a lower PRM than Duke Energy, fifteen percent (15%) versus seventeen percent (17%), and that

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[46] **Attachment 1**, Powers's Supplemental Report, p 3.
[47] DEC's IRP, pp 69-70; DEP's IRP, pp 71-72.
[48] *E.g.*, Partial Initial Comments of Southern Alliance for Clean Energy, Sierra Club, and Natural Resources Defense Council, pp 14-15.
[49] **Attachment 1**, Powers's Supplemental Report, p 3.

Dominion's ORM occasionally falls below zero percent (0%) throughout the year.[50] As discussed above, the Companies' ORMs, correctly calculated, remained well above their ten percent (10%) target, and even if the Companies' ORM calculations are accepted without revision, its ORMs were negative on only one occasion (DEP on February 20, 2015).[51] Despite a significantly more conservative ORM, the Companies have requested a PRM which is two percent (2%) higher than Dominion's.[52]

This inconsistent treatment of Dominion and the Companies should be rejected. The experience of Dominion reveals that energy transfers serve as a reliable means of meeting demand. As noted in the Public Staff's Initial Comments, Dominion relies upon imports from PJM to meet peak load, yet there is seemingly no allegation of unreliable operation in Dominion's service territory because of this practice.[53]

Indeed, this inconsistent treatment is the result of the Companies' presumption that DEC and DEP operate in "island" mode during times of peak demand—*i.e.*, the Companies' assumption that, during peak, DEC and DEP each exclusively rely upon their own generation to meet demand.[54]

To the contrary, DEC and DEP rely extensively upon energy transfers during peak demand.[55] For example, on February 20, 2015, DEP relied on JDA

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[50] Public Staff's Initial Comments, p 80 & n.86.
[51] **Attachment 1**, Powers's Supplemental Report, p 3.
[52] DEC's IRP, p 66; DEP's IRP, p 68.
[53] Public Staff's Initial Comments, n.86.
[54] **Attachment 1**, Powers's Supplemental Report, pp 4-5.
[55] *E.g.*, NC WARN and CBD's Initial Comments, pp 7-9; **Attachment 1**, Powers's Supplemental Report, pp. 3-5; *see also* **Attachment 7**, DEC's

transfers from DEC in the amount of 500 MW[56] and non-firm imports of 200 MW.[57] On January 25, 2019, DEC relied upon 925 MW in JDA imports and 1,229 MW of non-firm imports.[58] The Companies' extensive reliance upon energy transfers to meet peak was discussed in more detail in the Initial Comments of NC WARN and The Center.[59]

Dominion operates reliably with a fifteen percent (15%) reserve margin, and Dominion relies upon energy transfers when its ORM drops below zero percent (0%).[60] In the present docket, the Public Staff has not objected to Dominion's operations.[61] Duke Energy should receive the same treatment.

III. NC WARN and The Center Support the Initial Comments of Several Additional Intervenors.

There is much to commend about the Initial Comments of several other Intervenors to the present docket. By way of example but not limitation, NC WARN and The Center support the following positions taken by the Initial Comments of other Intervenors:

Supplemental Response to NCWARN/CBD's Data Request 4-6; **Attachment 9**, DEP's Supplemental Response to NCWARN/CBD's Data Request 4-7.

[56] **Attachment 7**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-6; **Attachment 8**, DEP's Supplemental Response to NCWARN/CBD's Data Request 4-6.

[57] **Attachment 9**, DEP's Supplemental Response to NCWARN/CBD's Data Request 4-7; **Attachment 10**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-7.

[58] **Attachment 7**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-6; **Attachment 10**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-7.

[59] NC WARN & CBD's Initial Comments, pp 8-10.

[60] Public Staff's Initial Comments, p 80 & n.86.

[61] *Id.*

- The Commission should adopt the Public Staff's statement that firm capacity should be a line item in the winter and summer peak capacity tables included in future IRPs;[62]

- NC WARN and The Center agree with the position of the Tech Customers that DEC's IRP underestimates the financial benefits of transitioning to renewables and overstates the financial impediments of transitioning to renewables;[63]

- Vote Solar's Initial Comments correctly argue that climate-related risks are material to DEC and DEP's operations, and that the Companies have an obligation to demonstrate in their IRPs a least-cost plan which considers climate-related risks;[64]

- NC WARN and The Center concur with many of the arguments proffered in the Partial Initial Comments of NCSEA, CCEBA and SACE et al., especially their overarching conclusions that the Companies' IRPs reflect inaccurate data and unrealistic assumptions, and that, when these errors are corrected, the least-cost plan is one which relies extensively upon clean energy options that mitigate the risks of global climate change;[65]

- NC WARN and The Center also concur with many components of the Initial Comments of NCSEA and CCEBA, including their conclusions that the Companies' IRPs erroneously model solar costs and storage costs, and that the

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[62] *Id.* at 196.
[63] *E.g.*, Tech Customers' Initial Comments, p 2.
[64] *E.g.*, Vote Solar's Initial Comments, pp 1-2.
[65] *E.g.*, Partial Initial Comments of NCSEA, CCEBA, and SACE *et al.*, pp 2-3.

Companies underestimate solar and storage capacity contributions to peak load;[66]

- In their Partial Initial Comments, SACE, Sierra Club and the Natural Resources Defense Council correctly argue that higher levels of DSM and energy efficiency would avoid or defer the construction of new gas-fired generation, and that the Companies' reserve margins are improperly inflated;[67] and
- Finally, NC WARN and The Center agree with the Attorney General's Office's conclusion that increased power sharing with other utilities would reduce the costs of maintaining grid reliability, and that the Companies' IRPs make several flawed assumptions concerning the value and costs of adding additional clean energy resources.[68]

Indeed, a review of the Initial Comments of nearly all Intervenors reveals similar and repeated criticisms of the Companies' IRPs. NC WARN and The Center urge the Commission to heed these arguments and reject Duke Energy's IRPs.

IV. There Are Several Factual Disputes Concerning DEC and DEP's Respective IRPs, and an Evidentiary Hearing May Be Necessary to Resolve those Factual Disputes.

In their Initial Comments, NC WARN and The Center noted that, at this early juncture, it appears likely that there will be disputes of fact concerning

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[66] *E.g.*, Initial Comments of NCSEA and CCEBA, pp 4-5.

[67] *E.g.*, Partial Initial Comments of Southern Alliance for Clean Energy, Sierra Club, and Natural Resources Defense Council, pp 2-3.

[68] *E.g.*, Attorney General's Office's Initial Comments, pp 4-6.

several crucial issues within this IRP proceeding.[69] By way of example, the following issues appear likely to the subject of factual disputes:

- The accuracy of DEC and DEP's stated operating reserves;
- Whether DEC and DEP have sufficient capacity to achieve reliability;
- The cost of battery storage versus gas-fired generation;
- The accuracy of the conclusions in the National Renewable Energy Laboratory (NREL) study concerning the impact and productivity of integrating increasing levels of solar and battery storage; and
- The reasonableness of DEC and DEP's demand growth projections.

Of course, the Commission has the discretion to convene an evidentiary hearing during any biennial IRP docket.[70] After reviewing the Companies' anticipated reply comments, NC WARN and The Center may file a motion for evidentiary hearing concerning any continuing disputes of fact.

CONCLUSION

In this proceeding, the Companies propose a massive buildout of natural gas-fired generation. In order to justify this expansion of natural gas, the Companies assert that a seventeen percent (17%) PRM is necessary due to several weather events that supposedly resulted in narrow ORMs. The facts, however, do not support the Companies' claims. In fact, the Companies' ORMs

[69] NCWARN/CBD's Initial Comments, pp 35-36.

[70] Commission Rule R8-60(k) ("[t]he Public Staff or any intervenor may identify any issue that it believes should be the subject of an evidentiary hearing. . . . A hearing to address issues raised by the Public Staff or other intervenors may be scheduled at the discretion of the Commission.").

never dropped below 19.8% (DEC) and 11.6% (DEP), and the Companies have ample non-firm transfer resources to meet peak.

For all of the above reasons, among others, the Commission should reject portions of the Initial Comments of any Intervenor which are inconsistent with the present Reply Comments, and the Commission should require DEC and DEP to file revised IRPs which correct the issues that were addressed above and in the Initial Comments of NC WARN and The Center.

This the 28th day of May, 2021.

/s/ Matthew D. Quinn
Matthew D. Quinn
N.C. Bar No. 40004
Lewis & Roberts, PLLC
3700 Glenwood Avenue, Suite 410
Raleigh, North Carolina 27612
mdq@lewis-roberts.com
Telephone: 919-981-0191
Facsimile: 919-981-0199

/s/ Howard M. Crystal
Howard Crystal (*pro hac vice*)
D.C. Bar No. 446189
Center for Biological Diversity
Energy Justice Program Legal Director
and Senior Attorney
1411 K Street NW, Suite 1300
Washington, DC 20005
hcrystal@biologicaldiversity.org
Telephone: 202-809-6926

Attorneys for Petitioners NC WARN and Center for Biological Diversity

CERTIFICATE OF SERVICE

I hereby certify that I have this day served a copy of the foregoing document upon all counsel of record by email transmission.

This the 28th day of May, 2021.

/s/ Matthew D. Quinn
Matthew D. Quinn

Attachment 1

Supplement to Review of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC's 2020 Integrated Resource Plans

NCUC Docket No. E-100, Sub 165

By: William Powers, P.E.

May 28, 2021

Attachment 1
NC WARN & CBD's Reply Comments

I. ORMs on January 7, 2014 and February 20, 2015

In their 2020 Integrated Resource Plans (IRP), Duke Energy Carolinas LLC ("DEC") and Duke Energy Progress LLC ("DEP") (collectively, "Duke Energy") cited specifically in the narrative to January 7, 2014 and February 20, 2015 as examples of very low operating reserve margins ("ORM") that occurred despite high planning reserve margin ("PRM"). However, at the time opening comments were filed on March 1, 2020, Duke Energy had not yet responded to NC WARN's data requests for a detailed list of the units and MW capacity that was available on January 7, 2014 and February 20, 2015. Table 1 shows the ORMs and PRMs reported by DEC and DEP for January 7, 2014 and February 20, 2015 in their respective 2020 IRPs. Both DEC and DEP noted that the calculated ORMs did not include non-firm imports.[1] Duke Energy does not include its ORM calculation procedure in the 2020 IRPs.

Table 1. ORMs reported by DEC and DEC for January 7, 2014 and February 20, 2015[2]

Utility	Date	Peak demand, MW	ORM, %	PRM, %
DEC	01/07/14	18,275[3]	0.2	24.8
DEC	02/20/15	18,589	1.2	27.6
DEP	01/07/14	14,159	0.2	33.6
DEP	02/20/15	15,515	-1.6	31.7

The 2013 IRPs prepared by DEC and DEP provided a forecast of available winter capacity for DEC and DEP service territories in the winters of 2013/2014 and 2014/2015.[4] The projected available capacity values include demand side management ("DSM"). This information is provided in Table 2.

Table 2. Available 2013/2014 and 2014/2015 winter capacity in DEC and DEP service territories without including non-firm imports from 2013 DEC and DEP IRPs

Utility	IRP winter season	IRP generating capacity,[5] MW	Firm contracts, MW	DSM, MW	Cumulative capacity, MW
DEC	2013/2014	21,281	229	561	22,070
DEC	2014/2015	21,351	216	584	22,151
DEP	2013/2014	14,253	1,925	506	16,684
DEP	2014/2015	14,253	1,925	506	16,684

Only capacity in forced outage would have been unavailable to meet demand on January 7, 2014 and February 20, 2015. All other capacity, including capacity in planned maintenance outage, should have been available to meet the winter peak demand. Planned maintenance should not be scheduled during periods when winter or summer peak loads can reasonably be expected to occur. The DEC capacity in forced outage on January 7, 2014 and the DEP capacity in forced outage on February 20, 2015 is shown in Table 3. DEP capacity in planned and forced outage on January 7, 2014, and DEC capacity in planned

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[1] Table 9-A, DEC and DEP 2020 IRPs.

[2] Ibid.

[3] In response to a data request by Southern Environmental Law Center, Duke Energy provided lower winter peak demand values than the demand shown in DEC IRP Table 9-A for a number of the low ORM days listed. See **Attachment 5** to NC WARN's Initial Comments. The revised DEC peak demand in 2014 was 18,275 MW. This is lower than the DEC demand reported in Table 9-A for January 7, 2014 of 18,626 MW. For this reason, 18,275 MW is used as the default revised demand for January 7, 2014.

[4] E-100, Sub 137.

[5] Table 8-D, DEC and DEP 2013 IRPs. The generating capacity shown includes renewables capacity.

and forced outage on February 20, 2015, are also provided in Table 3. Duke Energy did not distinguish which DEP units were in planned outage on January 7, 2014 or which DEC units were in planned outage on February 20, 2015. For this reason, for DEP on January 7, 2014 and for DEC on February 20, 2015, the sum of planned and forced outages is used to calculate the ORM.

Table 3. DEC and DEP generation in forced outage on January 7, 2014 and February 20, 2015[6]

Utility	Date	Forced outage, MW
DEC	01/07/14	185
DEC	02/20/15	1,393[7]
DEP	01/07/14	574[8]
DEP	02/20/15	490

The data in Tables 1-3 can be used to calculate the ORM on January 7, 2014 and February 20, 2015 in DEC and DEP service territories, without considering transfers between DEC and DEP pursuant to the Joint Dispatch Agreement ("JDA") or non-firm imports. The calculated ORMs in DEC and DEP service territories on January 7, 2014 and February 20, 2015 are shown in Table 4.

Table 4. Calculated DEC and DEP ORMs on January 7, 2014 and February 20, 2015 without non-firm imports

Utility	Generation capacity, MW	Firm imports,[9] MW	Available DSM, MW	Forced outages, MW	Demand, MW	ORM, %
January 7, 2014						
DEC	21,281	229	561	185	18,275	19.8
DEP	14,253	1,925	506	574	14,159	13.8
February 20, 2015						
DEC	21,351	1,307[10]	537[11]	1,393	18,589	17.3
DEP	14,253	2,313[12]	545[13]	490	15,515	7.1

ORM, % = [(available generation capacity + firm imports + DSM – forced outages) ÷ demand] x 100

The calculated ORMs shown in Table 4 bear little relation to the DEC and DEP ORMs shown in their respective 2020 IRPs for the same dates (see Table 1). Only DEC- and DEP-owned generation not in forced outage, firm contracts, and DSM are considered in calculating the ORMs in Table 4. Both DEC and DEP were well above Duke Energy's target minimum ORM of 10 percent at the peak hour on January 7, 2014.

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[6] **Attachment** 2, DEC's Response to NCWARN/CBD's Data Request 4-2; **Attachment 3**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-5, pp 10-11; **Attachment 4**, DEP's Response to NCWARN/CBD's Data Request 4-2; and **Attachment 5**, DEP's Supplemental Response to NCWARN/CBD's Data Request 4-5, pp 9-10.

[7] DEC DR4-5-1 and DR4-4 does not distinguish which units are in planned outage and which are in forced outage. This value is a worst-case value that assumes all units listed are in forced outage on February 20, 2015.

[8] DEC DR4-2 does not distinguish which DEP units are in planned outage and which are in forced outage on January 7, 2014. This value is a worst-case value that assumes all units listed are in forced outage.

[9] DEC and DEC use the term "firm purchases" in their respective IRPs.

[10] **Attachment 6**, Duke Energy's Review of February 20 [2015] Extreme Cold Weather Event, p 6.

[11] Ibid.

[12] Ibid at 8.

[13] Ibid.

DEC was well above the target minimum ORM on February 20, 2015 at 17.3 percent. DEP was somewhat below the target minimum ORM at 7.1 percent. However, DEC had ample reserves available for transfer to DEP under the JDA. This did happen, as 500 MW was transferred under the JDA from DEC to DEP.[14] The actual DEC and DEP ORMs are recalculated in Table 5 with non-firm transfers, including JDA transfers, included in the ORM calculation. As shown in Table 5, at the peak hour on February 20, 2015 DEC's ORM was above 20 percent, and DEP's ORM above 10 percent, when all available supply being relied upon is accounted for.

Table 5. Calculated DEC and DEP ORMs on January 7, 2014 and February 20, 2015 with non-firm imports included

Utility	Generation capacity, MW	Firm imports, MW	Available DSM, MW	Non-firm imports, MW	Forced outages, MW	Demand, MW	ORM, %
January 7, 2014							
DEC	21,281	229	561	0	185	18,275	19.8
DEP	14,253	1,925	506	data not provided	574	14,159	13.8
February 20, 2015							
DEC	21,351	1,307	537	857[15]	1,393	18,589	21.9
DEP	14,253	2,313	545	700[16]	490	15,515	11.6

ORM, % = [(available generation capacity + firm contracts + DSM – forced outages) ÷ demand] x 100

Table 6 compares the ORMs calculated in Tables 4 and 5 to the ORM values reported by DEC and DEP for January 7, 2014 and February 20, 2015 in their respective 2020 IRPs.

Table 6. Calculated vs. reported DEC and DEC ORMs for January 7, 2014 and February 20, 2015

Utility	Date	Calculated ORM without non-firm imports, %	Calculated ORM with non-firm imports, %	ORM reported in 2020 IRPs, %
DEC	01/07/14	19.8	19.8	0.2
DEC	02/20/15	17.3	21.9	1.2
DEP	01/07/14	13.8	13.8	0.2
DEP	02/20/15	7.1	11.6	-1.6

As shown in Table 6, only DEP on February 20, 2015 had a calculated ORM below 10 percent when DEP is assumed to rely exclusively on DEP-owned generation, firm imports, and DSM. In fact, on this day DEP relied on JDA transfers from DEC (500 MW)[17] and non-firm imports (200 MW) to increase the ORM.[18] The adjusted DEP ORM at the peak hour on February 20, 2015, using the calculated ORM in Table 5 and

[14] **Attachment 7**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-6; **Attachment 8**, DEP's Supplemental Response to NCWARN/CBD's Data Request 4-6.

[15] **Attachment 6**, Duke Energy's Review of February 20 [2015] Extreme Cold Weather Event, p 6.

[16] Ibid at 8.

[17] **Attachment 7**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-6; **Attachment 8**, DEP's Supplemental Response to NCWARN/CBD's Data Request 4-6.

[18] **Attachment 9**, DEP's Supplemental Response to NCWARN/CBD's Data Request 4-7; **Attachment 10**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-7.

adding 500 MW of JDA transfers and 200 MW of non-firm imports, is 11.6 percent.[19] Duke Energy also had additional supply options at its disposal that it did not access on February 20, 2015, as discussed in detail in the Initial Comments of NC WARN and the Center for Biological Diversity in the present docket.[20]

Duke Energy's proposed PRM of 17 percent is excessive given that Duke Energy has maintained healthy ORMs during the most extreme winter weather events, especially given the reality that Duke Energy relies on non-firm imports and JDA transfers as needed to meet winter peak demand.

The magnitude of firm imports utilized by DEC and DEP under winter peak conditions is substantially greater than the firm import assumptions in the IRPs. For example, DEC's operating plan for February 20, 2015 assumed 1,585 MW of firm imports would be relied upon. Ultimately DEC accessed 1,307 MW of firm imports at the peak.[21] The 2013 DEC IRP assumed 216 MW of firm imports would be utilized at the 2014/2015 winter peak.[22] DEP accessed 2,313 MW of firm imports at the peak on February 20, 2015.[23] The 2014 DEC IRP assumed 1,954 MW of firm imports would be utilized at the 2014/2015 winter peak.[24]

The magnitude of JDA transfers and non-firm imports utilized under winter peak demand conditions varies, and can be in excess of 2,000 MW. For example, on January 25, 2019, DEC relied on 925 MW in JDA imports and 1,229 MW non-firm imports.[25] Concurrently DEC identified 2,195 MW of its combustion turbine fleet as "Contingency Reserve/Out of Economics".[26] The JDA transfers and non-firm imports were apparently chosen on January 25, 2019 by DEC as a lower-cost alternative to DEC resources that were otherwise available to serve the demand.

II. Reply to Initial Comments of the Public Staff

A. The Public Staff's treatment of reserve margins should be consistent across North Carolina utilities.

Duke Energy asserts in both the DEC and DEP 2020 IRPs that the Commission should discount its (very high) PRMs going forward and instead justify the need for new procurement on the low ORM values

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[19] [(16,684 MW + 500 MW + 200 MW) – 490 MW] ÷ 15,515 MW = 1.0888 (8.9 percent).

[20] NCWARN/CBD's Initial Comments, Docket No. E-100, Sub 165, p. 16, footnote 75. "Attachment 7, Transcript of NCUC Staff Conference, March 2, 2015, pp. 11-12. Duke Energy VP Mr. Peeler was asked by the NCUC Chairman, "So how far were you away from having to shed load?" Mr. Peeler stated, "Well, so certainly there were several other options still available. We had not called on VACAR reserves, so we still had firm transmission availability to bring reserves in. There were still energy options. We still could have pushed more non-firm energy."

[21] **Attachment 3**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-5, pp 10-11; **Attachment 6**, Duke Energy's Review of February 20 [2015] Extreme Cold Weather Event, p 6.

[22] 2013 DEC IRP, October 15, 2013, Docket No. E-100, Sub 137, Table 8-D, p. 30.

[23] **Attachment 5**, DEP's Supplemental Response to NCWARN/CBD's Data Request 4-5, pp 9-10; **Attachment 6**, Duke Energy's Review of February 20 [2015] Extreme Cold Weather Event, p 8.

[24] 2014 DEC IRP, September 2, 2014, Table 8-C, p. 33.

[25] **Attachment 7**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-6; **Attachment 10**, DEC's Supplemental Response to NCWARN/CBD's Data Request 4-7.

[26] **Attachment 3**, DEC's Supplemental Responses to NCWARN/CBD's Data Request 4-5, pp. 3-4.

reported in Table 9-A of each 2020 IRP.[27] These tables presume DEC and DEP operate in "island" mode at times of peak demand, exclusively relying on their own generation to meet that demand.

The Public Staff is silent on the validity of the implication by Duke Energy that the ORM, with DEC and DEP presumed to be operating in island mode, is a more informative reliability metric than the PRM for justifying new procurement. At the same time, Public Staff notes without comment that Dominion NC has a lower PRM than DEC and DEP, 15 percent versus 17 percent,[28] and that Dominion NC's operating reserves occasionally fall below 0 percent throughout the year.[29] The Public Staff observes that in these situations, Dominion relies on imports from PJM to meet peak load.[30] There is no mention of reliability concerns in Dominion NC service territory as a result of these practices.

The Public Staff makes no comment about Duke Energy's claim (Tables 9-A) that it occasionally experiences low ORMs at the winter peak despite very high PRMs at the same time. This is inconsistent with the Public Staff's acceptance of Dominion NC's reliance on imports to reliably meet peak demand.

In fact, DEC and DEP are also relying on imports as a standard operating procedure, as discussed in NC WARN's Initial Comments.[31] In the context of this standard DEC and DEP operating procedure, the DEC and DEP PRMs of 17 percent are conservative. Dominion NC operates reliably with a 15 percent PRM, to meet demand, relying on firm and non-firm imports to maintain an adequate ORM under peak demand conditions. DEC and DEP are following the same operating procedure. The Public Staff should be advocating for consistent treatment of the three utilities. A PRM of 15 percent should be the PRM standard applied uniformly, with the understanding that the utilities can and will rely on firm and non-firm imports for a variety of reasons to supplement their own generation assets during the course of the year.

B. NC WARN and the Center for Biological Diversity concur with the Public Staff that Duke Energy must provide firm import capacity.

In its Initial Comments, the Public Staff states that "future IRPs should provide firm import capacity."[32] NC WARN and the Center for Biological Diversity support the Public Staff on this point. On February 20, 2015, DEC relied on 1,307 MW of firm imports, about 1,100 MW greater than the 216 MW of firm purchases forecast in the 2013 IRP for the 2014/2015 winter peak.[33] DEP relied on 2,313 MW of firm imports at the peak hour on that day,[34] 359 MW greater than the 2014 DEP IRP forecast of 1,954 MW of firm purchases at the winter peak.[35] The firm import capacity should be a line item in the winter and summer peak capacity tables included in the IRPs.

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[27] *E.g.*, DEC 2020 IRP, p. 69: "It is almost certain DEC would have shed firm load in 2014 had the reserve margin going into the winter been 17%."
[28] Public Staff Initial Comments, Table 12, p. 80.
[29] Ibid, footnote 86.
[30] Ibid.
[31] NCWARN/CBD's Initial Comments, Docket No. E-100, Sub 165, pp 7-11.
[32] Public Staff Initial Comments, p. 196.
[33] **Attachment 6**, Duke Energy's Review of February 20 [2015] Extreme Cold Weather Event, p 6.
[34] Ibid, p. 8.
[35] 2014 DEP IRP, September 2, 2014, Table 8-C, p. 33 (1st column, "Cumulative Purchase Contracts").

Attachment 2

DUKE ENERGY CAROLINAS, LLC

Request:

Identify all generation units in Duke Energy Progress, LLC's inventory that were in planned or forced outage on January 7, 2014 at the time of DEC peak.

Response:

DEC is providing the requested information for the specified date. Please see attachment - NC WARN DEC DR4-2.docx.

Question #: NCWARN DEC DR4-2

Question Detail: Identify all generation units in Duke Energy Progress, LLC's inventory that were in planned or forced outage on January 7, 2014 at the time of DEC peak.

Response: DEC is providing the requested information for the specified date.

DEP Units in Planned or Forced Outage at 01/07/14 Peak

Unit
ROXBORO (RCOG) COGEN
BROAD RIVER IPP CT 04
BROAD RIVER IPP CT 05
RICHMOND CO. CT 06

Attachment 3

DUKE ENERGY CAROLINAS, LLC

Request:

In response to NC WARN's Data Request No. 3-1, the Company identified several units that were "not operating at full capacity" during several dates occurring in 2018-2019 and identified on Figure 9-A (page 72) of the Company's 2020 Integrated Resource Plan. Please identify the output in MW (if any) for the units identified in response to NC WARN's Data Request No. 3-1 at peak time for the dates on which responsive information was provided. (For clarity, the present data request is intended to ascertain the extent to which the units identified in response to NC WARN's Data Request No. 3-1 were operating below full capacity, or alternatively, were not operational.)

Supplemental Response: (March 26, 2021)

Please see attachment - NC WARN DEC DR4-5-v2.docx - for data and additional explanation.

Initial Response:

Per the agreement of counsel, DEC is providing the requested information for the dates in the time period 2018-2019. Because the explanatory parenthetical in the request provides more clarity on the intent of the request, data for each date are separated into those units/groups that were online and those that were offline. In addition, it appears the intent is to determine the additional MW capability which could have served additional load. The actual capabilities of the units/groups for these dates and times are not the same as the stated Net Dependable Capacities. Ambient conditions (e.g., temperature, humidity, sun angle and cloud cover for solar resources) have a significant effect, positive or negative, on the actual capability of a given unit. For this reason, the available unloaded capability for each unit is provided although it was not actually requested. For offline units, this value is estimated actual capability. Please see attachment - NC WARN DEC DR4-5.docx - for data and additional explanation.

Question #: NCWARN DEC DR4-5

Question Detail: In response to NC WARN's Data Request No. 3-1, the Company identified several units that were "not operating at full capacity" during several dates occurring in 2018-2019 and identified on Figure 9-A (page 72) of the Company's 2020 Integrated Resource Plan. Please identify the output in MW (if any) for the units identified in response to NC WARN's Data Request No. 3-1 at peak time for the dates on which responsive information was provided. (For clarity, the present data request is intended to ascertain the extent to which the units identified in response to NC WARN's Data Request No. 3-1 were operating below full capacity, or alternatively, were not operational.)

Response: DEC is providing the requested information for the dates in the time period 2018-2019. Because the explanatory parenthetical in the request provides more clarity on the intent of the request, data for each date are separated into those units/groups that were online and those that were offline. In addition, it appears the intent is to determine the additional MW capability which could have served additional load. The actual capabilities of the units/groups for these dates and times are not the same as the stated Net Dependable Capacities. Ambient conditions (e.g, temperature, humidity, sun angle and cloud cover for solar resources) have a significant effect, positive or negative, on the actual capability of a given unit. For this reason, the available unloaded capability for each unit is provided although it was not actually requested. For offline units, this value is estimated actual capability.

Some additional explanation is needed to fully understand the meanings of the reasons given.

- Online
    - Constrained – unit(s) temporarily constrained during some part of the hour, e.g., unit ramping up from a previous outage
    - Forced Derate – unit(s) constrained to operate at a lower level due to failure or limitation of one or more subsystems
    - Reliability – unit(s) constrained to operate at a specified level or range to avoid violation of reliability constraints
    - Reserves – the unloaded capacity is spinning reserve used for regulation and to provide a portion of contingency reserves
- Offline
    - Contingency Reserve – quick start unit(s) needed to complete contingency reserve needs
    - Forced Outage – unit(s) undergoing repairs due to an unforeseen/unplanned issue
    - Maint Outage – unit(s) undergoing planned maintenance or testing
    - Minimal Sun – integrated solar aggregate for the hour did not provide an entire MWh because sunlight was not strong enough to meet minimum inverter operation
    - Out of Economics – unit cost high enough and demand low enough to preclude need to run this unit
    - Reserve - Fuel Mgmt – unit(s) held in reserve to conserve a limited fuel
    - Reserve Shutdown – units in cold shutdown because longer term forecasts (weeks/months) indicated units would not be needed during the period

Data is provided for peaks for the following dates in 2018-2019: 1/2/2018, 1/25/19, 1/31/19, 3/6/19, 1/5/18, 12/6/18, and 1/11/19. As with the NCWARN DR3-1 response, the reason why each unit/group was not operational is indicated by the Reason column. Some units have been ungrouped from the NCWARN DR3-1 listing since loadings and available capacity differ for those in the group. Additionally, the tables have columns labeled Loading and Available to show the actual integrated hourly loading in MW and the unloaded MW capacity up to the actual capability of the unit/group for the given hour.

- Reasons marked with an asterisk (*) indicate that the unit(s) was/were online for a part of the hour but tripped before the end of the hour; for these units the Available column does not show the amount actually available but the amount that could have been available if not for the trip.
- CONVENTIONAL HYDRO is a group of multiple units at several plants. Available capacity varies throughout the day and is somewhat less than the sum of the Net Dependable Capacities of these units due to outages and derates to meet licensing, environmental, testing, etc. requirements.

Addendum (3/26/21): DEC is also providing information for 1/07/14 as specified in the subsequent request to supplement the NCWARN DR3-1 response and as agreed to by counsel. Data for this date is appended at the end of the original set of tables. The format of the table is consistent with the original response.

DEC Units/Groups Not Operational at Full Capacity at 01/02/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
CONVENTIONAL HYDRO	Reserves	593	342
JOCASSEE PS	Reserves	770	10
LEE CT 07	Reserves	45	1
LINCOLN CT 02	Constrained	17	82
LINCOLN CT 04	Constrained	7	91
LINCOLN CT 09	Reserves	96	1
LINCOLN CT 10	Reserves	97	1
MILL CREEK CT 06	Reserves	89	3

Offline Units/Groups

Unit/Group	Reason	Loading	Available
3RD PARTY SOLAR	Minimal Sun	0	0
DUKE SOLAR	Minimal Sun	0	0
LEE STEAM 03	Maint Outage	0	0
LINCOLN CT 05	Contingency Reserve	0	97
LINCOLN CT 06	Contingency Reserve	0	97

LINCOLN CT 07	Contingency Reserve	0	98
LINCOLN CT 08	Contingency Reserve	0	98
LINCOLN CT 12	Forced Outage	0	0
LINCOLN CT 13	Contingency Reserve	0	98
MARSHALL 03	Forced Outage	0	0
ROCKINGHAM CT 01	Maint Outage	0	0

DEC Units/Groups Not Operational at Full Capacity at 01/25/19 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
BAD CREEK PS	Reserves	1241	119
CLIFFSIDE 06	Forced Derate	645	0
CONVENTIONAL HYDRO	Reserves	523	192
JOCASSEE PS	Reserves	729	51
LEE CC PB1	Reserves	795	21
MARSHALL 01	Reserves	330	50
MARSHALL 02	Reserves	328	52
MARSHALL 04	Reliability	531	129
ROCKINGHAM CT 02	Reserves	178	2
ROCKINGHAM CT 03	Reserves	178	2
ROCKINGHAM CT 04	Reserves	178	2
ROCKINGHAM CT 05	Reserves	178	2

Offline Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 01	Reserve - Fuel Mgmt	0	167
ALLEN 02	Reserve - Fuel Mgmt	0	167
ALLEN 03	Reserve - Fuel Mgmt	0	270
ALLEN 04	Reserve - Fuel Mgmt	0	267
ALLEN 05	Reserve - Fuel Mgmt	0	259
BELEWS CREEK 01	Forced Outage	0	0
BELEWS CREEK 02	Maint Outage	0	0
CLIFFSIDE 05	Reserve - Fuel Mgmt	0	546
KEOWEE HYDRO	Maint Outage	0	0
LEE CT 07	Maint Outage	0	0
LEE CT 08	Maint Outage	0	0
LEE STEAM 03	Reserve Shutdown	0	160
LINCOLN CT 01	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 02	Contingency Reserve/Out of Economics	0	92

LINCOLN CT 03	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 04	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 05	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 06	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 07	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 08	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 09	Contingency Reserve/Out of Economics	0	91
LINCOLN CT 10	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 11	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 12	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 13	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 14	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 15	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 16	Contingency Reserve/Out of Economics	0	92
MARSHALL 03	Reserve Shutdown	0	658
MILL CREEK CT 01	Out of Economics	0	91
MILL CREEK CT 02	Out of Economics	0	90
MILL CREEK CT 03	Out of Economics	0	91
MILL CREEK CT 04	Maint Outage	0	0
MILL CREEK CT 05	Out of Economics	0	89
MILL CREEK CT 06	Out of Economics	0	86
MILL CREEK CT 07	Out of Economics	0	90
MILL CREEK CT 08	Out of Economics	0	90

DEC Units/Groups Not Operational at Full Capacity at 01/31/19 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 05	Reliability	258	1
BAD CREEK PS	Reserves	1206	154
CLIFFSIDE 06	Reserves	841	8
CONVENTIONAL HYDRO	Reserves	567	50
JOCASSEE PS	Reserves	704	76
LEE CC PB1	Reserves	793	25
MARSHALL 01	Reserves	372	8
MARSHALL 02	Reserves	375	5
MARSHALL 03	Reliability	644	14
MILL CREEK CT 01	Reserves	85	8
MILL CREEK CT 02	Reserves	84	8
MILL CREEK CT 03	Reserves	85	7
ROCKINGHAM CT 01	Reserves	170	10
ROCKINGHAM CT 02	Reserves	163	17

ROCKINGHAM CT 03	Reserves	162	18
ROCKINGHAM CT 04	Reserves	167	13
ROCKINGHAM CT 05	Reserves	178	2

Offline Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 01	Reserve - Fuel Mgmt	0	167
ALLEN 02	Reserve - Fuel Mgmt	0	167
ALLEN 03	Reserve - Fuel Mgmt	0	270
ALLEN 04	Reserve - Fuel Mgmt	0	267
CLIFFSIDE 05	Reserve - Fuel Mgmt	0	546
KEOWEE HYDRO	Maint Outage	0	0
LEE CT 07	Maint Outage	0	0
LEE CT 08	Maint Outage	0	0
LEE STEAM 03	Reserve Shutdown	0	160
LINCOLN CT 01	Contingency Reserve/Out of Economics	0	95
LINCOLN CT 02	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 03	Contingency Reserve/Out of Economics	0	95
LINCOLN CT 04	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 05	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 06	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 07	Contingency Reserve/Out of Economics	0	95
LINCOLN CT 08	Contingency Reserve/Out of Economics	0	95
LINCOLN CT 09	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 10	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 11	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 12	Contingency Reserve/Out of Economics	0	95
MILL CREEK CT 04	Out of Economics	0	92
MILL CREEK CT 05	Out of Economics	0	90
MILL CREEK CT 06	Out of Economics	0	88
MILL CREEK CT 07	Out of Economics	0	91
MILL CREEK CT 08	Out of Economics	0	92

DEC Units/Groups Not Operational at Full Capacity at 03/06/19 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
BAD CREEK PS	Reserves	1019	341
CONVENTIONAL HYDRO	Reserves	472	256
JOCASSEE PS	Reserves	600	180

KEOWEE HYDRO	Reserves	80	72
LEE CT 07	Reserves	47	2
LEE CT 08	Reserves	48	1
MILL CREEK CT 01	Reserves	26	65
MILL CREEK CT 02	Reserves	25	65
MILL CREEK CT 03	Reserves	76	15
MILL CREEK CT 04	Reserves	75	16
ROCKINGHAM CT 02	Reserves	133	47
ROCKINGHAM CT 03	Reserves	170	10
ROCKINGHAM CT 05	Reserves	110	70

Offline Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 01	Reserve - Fuel Mgmt	0	167
ALLEN 02	Reserve - Fuel Mgmt	0	167
ALLEN 03	Maint Outage	0	0
ALLEN 04	Maint Outage	0	0
ALLEN 05	Reserve - Fuel Mgmt	0	259
BUCK CC PB1	Maint Outage	0	0
LEE STEAM 03	Reserve Shutdown	0	160
LINCOLN CT 01	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 02	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 03	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 04	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 05	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 06	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 07	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 08	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 09	Contingency Reserve/Out of Economics	0	91
LINCOLN CT 10	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 11	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 12	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 13	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 14	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 15	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 16	Contingency Reserve/Out of Economics	0	92
MARSHALL 02	Maint Outage	0	0
MARSHALL 03	Forced Outage	0	0
MARSHALL 04	Forced Outage	0	0
MILL CREEK CT 05	Out of Economics	0	89
MILL CREEK CT 06	Out of Economics	0	86

MILL CREEK CT 07	Out of Economics	0	90
MILL CREEK CT 08	Out of Economics	0	90
ROCKINGHAM CT 01	Out of Economics	0	180
ROCKINGHAM CT 04	Out of Economics	0	180

DEC Units/Groups Not Operational at Full Capacity at 01/05/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 01	Reserves	143	13
ALLEN 03	Reliability	253	5
ALLEN 04	Reserves	250	8
ALLEN 05	Reserves	254	4
BAD CREEK PS	Reserves	883	477
BELEWS CREEK 02	Reserves	1102	8
CLIFFSIDE 05	Forced Derate	523	0
CONVENTIONAL HYDRO	Reserves	633	241
JOCASSEE PS	Reserves	710	70
LEE CT 07	Reserves	47	1
LEE CT 08	Reserves	47	1
LINCOLN CT 01	Reserves	97	1
LINCOLN CT 02	Reserves	97	2
LINCOLN CT 03	Reserves	96	3
LINCOLN CT 04	Reserves	97	1
LINCOLN CT 05	Reserves	96	1
LINCOLN CT 08	Reserves	97	1
LINCOLN CT 15	Reserves	96	2
MARSHALL 03	Forced Derate	632	0
MARSHALL 04	Reserves	654	11
ROCKINGHAM CT 01	Reserves	177	2
ROCKINGHAM CT 02	Reserves	178	1
ROCKINGHAM CT 03	Reserves	178	1
ROCKINGHAM CT 04	Reserves	178	1
ROCKINGHAM CT 05	Reserves	177	2

Offline Units/Groups

Unit/Group	Reason	Loading	Available
LEE STEAM 03	Out of Economics	0	168
LINCOLN CT 06	Contingency Reserve	0	97
LINCOLN CT 09	Contingency Reserve	0	97

LINCOLN CT 10	Contingency Reserve	0	98
LINCOLN CT 11	Contingency Reserve	0	98
LINCOLN CT 12	Contingency Reserve	0	98
LINCOLN CT 13	Contingency Reserve	0	98
LINCOLN CT 14	Contingency Reserve	0	97
LINCOLN CT 16	Forced Outage	0	0
MILL CREEK CT 01	Out of Economics	0	92
MILL CREEK CT 02	Out of Economics	0	92
MILL CREEK CT 03	Out of Economics	0	92
MILL CREEK CT 06	Out of Economics	0	92

DEC Units/Groups Not Operational at Full Capacity at 12/06/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 03	Reliability	222	48
ALLEN 04	Reliability	238	29
BAD CREEK PS	Reserves	1159	201
BELEWS CREEK 01	Constrained	229	881
CLIFFSIDE 05	Maint Derate	401	0
CLIFFSIDE 06	Maint Derate	766	0
CONVENTIONAL HYDRO	Reserves	572	164
JOCASSEE PS	Reserves	690	90
LEE CT 07	Reserves	48	1
LEE CT 08	Reserves	47	2
MARSHALL 01	Reserves	307	73
MARSHALL 02	Reserves	376	4
MARSHALL 03	Reliability	615	43
MARSHALL 04	Constrained	626	34
MILL CREEK CT 01	Reserves	89	2
MILL CREEK CT 02	Reserves	89	2
MILL CREEK CT 04	Reserves	90	1
ROCKINGHAM CT 01	Reserves	177	3
ROCKINGHAM CT 02	Reserves	179	1
ROCKINGHAM CT 03	Reserves	179	1
ROCKINGHAM CT 04	Reserves	179	1
ROCKINGHAM CT 05	Reserves	179	1

Offline Units/Groups

Unit/Group	Reason	Loading	Available

ALLEN 01	Maint Outage	0	0
ALLEN 02	Maint Outage	0	0
ALLEN 05	Maint Outage	0	0
BELEWS CREEK 02	Maint Outage	0	0
CATAWBA NUCLEAR 01	Maint Outage	0	0
LEE CC PB1	Forced Outage	0	0
LEE STEAM 03	Maint Outage	0	0
LINCOLN CT 01	Contingency Reserve	0	93
LINCOLN CT 02	Contingency Reserve	0	92
LINCOLN CT 03	Contingency Reserve	0	94
LINCOLN CT 04	Contingency Reserve	0	93
LINCOLN CT 06	Contingency Reserve	0	92
LINCOLN CT 09	Contingency Reserve	0	92
LINCOLN CT 10	Contingency Reserve	0	92
LINCOLN CT 11	Contingency Reserve	0	93
LINCOLN CT 12	Contingency Reserve	0	94
LINCOLN CT 13	Contingency Reserve	0	94
OCONEE NUCLEAR 01	Maint Outage	0	0

DEC Units/Groups Not Operational at Full Capacity at 01/11/19 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
CLIFFSIDE 05	Reliability	543	3
BAD CREEK PS	Reserves	1351	9
JOCASSEE PS	Reserves	765	15
LEE CT 07	Reserves	48	1
LEE CT 08	Reserves	47	2
LEE CC PB1	Reserves	776	41
CONVENTIONAL HYDRO	Reserves	606	158
MILL CREEK CT 02	Constrained	71	20
MILL CREEK CT 01	Constrained	70	22

Offline Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 01	Reserve - Fuel Mgmt	0	167
ALLEN 02	Reserve - Fuel Mgmt	0	167
ALLEN 03	Reserve - Fuel Mgmt	0	270
ALLEN 04	Reserve - Fuel Mgmt	0	267
ALLEN 05	Reserve - Fuel Mgmt	0	259

BELEWS CREEK 01	Reserve - Fuel Mgmt	0	1110
CLIFFSIDE 06	Forced Outage	0	0
DUKE SOLAR	Minimal Sun	0	0
LEE STEAM 03	Reserve Shutdown	0	160
LINCOLN CT 01	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 02	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 03	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 04	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 05	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 06	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 07	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 08	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 09	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 10	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 11	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 12	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 13	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 14	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 15	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 16	Contingency Reserve/Out of Economics	0	92
MARSHALL 01	Reserve - Fuel Mgmt	0	380
MARSHALL 02	Reserve - Fuel Mgmt	0	380
MILL CREEK CT 03	Out of Economics	0	91
MILL CREEK CT 04	Out of Economics	0	91
MILL CREEK CT 05	Out of Economics	0	90
MILL CREEK CT 06	Out of Economics	0	87
MILL CREEK CT 07	Out of Economics	0	91
MILL CREEK CT 08	Out of Economics	0	91

DEC Units/Groups Not Operational at Full Capacity at 01/07/14 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
BAD CREEK PS	Reserves	943	417
BUCK CC PB1	Reserves	339	88
CLIFFSIDE 05	Reserves	553	5
DAN RIVER CC PB1	Reserves	431	72
JOCASSEE PS	Reserves	763	17
LEE CT 07	Reserves	47	2
LEE CT 08	Reserves	48	1
LEE STEAM 03	Reserves	151	22
LINCOLN CT 01	Reserves	94	3

LINCOLN CT 10	Forced Outage*	62	0
MARSHALL 01	Reserves	372	6
MILL CREEK CT 05	Reserves	96	1
MILL CREEK CT 06	Reserves	94	3
MILL CREEK CT 07	Reserves	96	1
MILL CREEK CT 08	Reserves	95	2
ROCKINGHAM CT 01	Reliability	177	3
ROCKINGHAM CT 02	Reliability	177	3
ROCKINGHAM CT 03	Reliability	176	4
ROCKINGHAM CT 04	Reliability	172	8

*unit tripped part-way of the hour

Offline Units/Groups

Unit/Group	Reason	Loading	Available
LEE STEAM 01	Reserve Shutdown	0	91
LEE STEAM 02	Reserve Shutdown	0	99
LINCOLN CT 05	Maint Outage	0	0
LINCOLN CT 06	Maint Outage	0	0
MILL CREEK CT 02	Forced Outage	0	0
MILL CREEK CT 04	Forced Outage	0	0
ROCKINGHAM CT 05	Maint Outage	0	0

Attachment 4

DUKE ENERGY PROGRESS, LLC

Request:

Identify all generation units in Duke Energy Carolinas, LLC's inventory that were in planned or forced outage on February 20, 2015 at the time of DEP's peak.

Response:

DEP is providing the requested information for the specified date. Please see attachment - NC WARN DEP DR4-2.docx.

Question #: NCWARN DEP DR4-2

Question Detail: Identify all generation units in Duke Energy Carolinas, LLC's inventory that were in planned or forced outage on February 20, 2015 at the time of DEP's peak.

Response: DEP is providing the requested information for the specified date.

DEC Units in Planned or Forced Outage at 02/20/15 Peak

Unit
COWANS FORD 3
GASTON SHOALS 5
LEE STEAM 03
LINCOLN CT 12
LOOKOUT 3
MARSHALL 01
MARSHALL 04
TENNESSEE CREEK
TUXEDO 2

Attachment 5

DUKE ENERGY PROGRESS, LLC

Request:

In response to NC WARN's Data Request No. 3-1, the Company identified several units that were "not operating at full capacity" during several dates occurring in 2018-2019 and identified on Figure 9-A (page 74) of the Company's 2020 Integrated Resource Plan. Please identify the output in MW (if any) for the units identified in response to NC WARN's Data Request No. 3-1 at peak time for the dates on which responsive information was provided. (For clarity, the present data request is intended to ascertain the extent to which the units identified in response to NC WARN's Data Request No. 3-1 were operating below full capacity, or alternatively, were not operational.)

Supplemental Response: (March 26, 2021)

Please see attachment - NC WARN DEP DR4-5-v2.docx - for data and additional explanation.

Initial Response:

Per the agreement of counsel, DEP is providing the requested information for the dates in the time period 2018-2019. Because the explanatory parenthetical in the request provides more clarity on the intent of the request, data for each date are separated into those units/groups that were online and those that were offline. In addition, it appears the intent is to determine the additional MW capability which could have served additional load. The actual capabilities of the units/groups for these dates and times are not the same as the stated Net Dependable Capacities. Ambient conditions (e.g., temperature, humidity, sun angle and cloud cover for solar resources) have a significant effect, positive or negative, on the actual capability of a given unit. For this reason, the available unloaded capability for each unit is provided although it was not actually requested. For offline units, this value is estimated actual capability. Please see attachment - NC WARN DEP DR4-5.docx - for data and additional explanation.

Question #: NCWARN DEP DR4-5

Question Detail: In response to NC WARN's Data Request No. 3-1, the Company identified several units that were "not operating at full capacity" during several dates occurring in 2018-2019 and identified on Figure 9-A (page 74) of the Company's 2020 Integrated Resource Plan. Please identify the output in MW (if any) for the units identified in response to NC WARN's Data Request No. 3-1 at peak time for the dates on which responsive information was provided. (For clarity, the present data request is intended to ascertain the extent to which the units identified in response to NC WARN's Data Request No. 3-1 were operating below full capacity, or alternatively, were not operational.)

Response: DEP is providing the requested information for the dates in the time period 2018-2019. Because the explanatory parenthetical in the request provides more clarity on the intent of the request, data for each date are separated into those units/groups that were online and those that were offline. In addition, it appears the intent is to determine the additional MW capability which could have served additional load. The actual capabilities of the units/groups for these dates and times are not the same as the stated Net Dependable Capacities. Ambient conditions (e.g, temperature, humidity, sun angle and cloud cover for solar resources) have a significant effect, positive or negative, on the actual capability of a given unit. For this reason, the available unloaded capability for each unit is provided although it was not actually requested. For offline units, this value is estimated actual capability.

Some additional explanation is needed to fully understand the meanings of the reasons given.

- Online
  - Constrained – unit(s) temporarily constrained during some part of the hour, e.g., unit ramping up from a previous outage
  - Forced Derate – unit(s) constrained to operate at a lower level due to failure or limitation of one or more subsystems
  - Reliability – unit(s) constrained to operate at a specified level or range to avoid violation of reliability constraints
  - Reserves – the unloaded capacity is spinning reserve used for regulation and to provide a portion of contingency reserves
- Offline
  - Contingency Reserve – quick start unit(s) needed to complete contingency reserve needs
  - Forced Outage – unit(s) undergoing repairs due to an unforeseen/unplanned issue
  - Maint Outage – unit(s) undergoing planned maintenance or testing
  - Minimal Sun – integrated solar aggregate for the hour did not provide an entire MWh because sunlight was not strong enough to meet minimum inverter operation
  - Out of Economics – unit cost high enough and demand low enough to preclude need to run this unit
  - Reserve - Fuel Mgmt – unit(s) held in reserve to conserve a limited fuel
  - Reserve Shutdown – units in cold shutdown because longer term forecasts (weeks/months) indicated units would not be needed during the period

Data is provided for peaks for the following dates in 2018-2019: 01/02/18, 01/03/18, 01/05/18, 01/07/18, 01/08/18, and 01/16/18. As with the NCWARN DR3-1 response, the reason why each unit/group was not operational is indicated by the Reason column. Some units have been ungrouped from the NCWARN DR3-1 listing since loadings and available capacity differ for those in the group. Additionally, the tables have columns labeled Loading and Available to show the actual integrated hourly loading in MW and the unloaded MW capacity up to the actual capability of the unit/group for the given hour.

- Reasons marked with an asterisk (*) indicate that the unit(s) was/were online for a part of the hour but tripped before the end of the hour; for these units the Available column does not show the amount actually available but the amount that could have been available if not for the trip.
- NCEMC HAMLET 02 and 03 output is controlled by NCEMC and delivered to PJM.

Addendum (3/26/21): DEP is also providing information for 2/20/15 as specified in the subsequent request to supplement the NCWARN DR3-1 response and as agreed to by counsel. Data for this date is appended at the end of the original set of tables. The format of the table is consistent with the original response.

DEP Units/Groups Not Operational at Full Capacity at 01/02/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ASHEVILLE 01	Reliability	185	2
ASHEVILLE 02	Reliability	184	1
ASHEVILLE CT 03	Forced Derate	124	0
BROAD RIVER IPP CT 01	Reliability	126	49
BROAD RIVER IPP CT 04	Forced Outage*	6	0
DARLINGTON CO. CT 13	Forced Outage*	63	0
NCEMC HAMLET CT 01	Reserves	55	1
NCEMC HAMLET CT 05	Reserves	55	1
SUTTON CT 04	Reserves	50	1
SUTTON CT 05	Reserves	50	1
WEATHERSPOON CT 01	Reserves	109	55

Offline Units/Groups

Unit/Group	Reason	Loading	Available
3RD PARTY SOLAR	Minimal Sun	0	0
BROAD RIVER IPP CT 02	Forced Outage	0	0
DARLINGTON CO. CT 01	Forced Outage	0	0
DARLINGTON CO. CT 03	Forced Outage	0	0

DARLINGTON CO. CT 07	Forced Outage	0	0
DARLINGTON CO. CT 12	Reserve - Fuel Mgmt	0	121
MARSHALL HYDRO	Forced Outage	0	0
NCEMC HAMLET CT 02	Pseudo-tied to PJM	0	0
NCEMC HAMLET CT 03	Pseudo-tied to PJM	0	0
WAYNE CT 12	Forced Outage	0	0

DEP Units/Groups Not Operational at Full Capacity at 01/03/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ASHEVILLE 01	Reliability	181	8
ASHEVILLE 02	Reliability	184	5
ASHEVILLE CT 03	Forced Derate	118	0
ASHEVILLE CT 04	Reliability	135	50
BROAD RIVER IPP CT 02	Reliability	143	29
DARLINGTON CO. CT 02	Reliability	52	12
DARLINGTON CO. CT 03	Reserves	57	6
DARLINGTON CO. CT 06	Reserves	54	8
DARLINGTON CO. CT 08	Forced Outage*	24	0
DARLINGTON CO. CT 10	Reliability	53	12
FAYETTEVILLE CC 01	Forced Derate	225	0
MAYO 01	Reserves	710	5
NCEMC ANSON CT 01	Reserves	54	2
NCEMC ANSON CT 02	Reserves	55	1
NCEMC ANSON CT 03	Reserves	26	30
NCEMC ANSON CT 04	Reserves	54	2
NCEMC ANSON CT 05	Reserves	54	2
NCEMC HAMLET CT 01	Reserves	55	1
NCEMC HAMLET CT 04	Reserves	54	2
NCEMC HAMLET CT 05	Reserves	55	1
RICHMOND CO. CC 04	Reserves	521	19
RICHMOND CO. CT 01	Reserves	162	27
RICHMOND CO. CT 02	Reserves	157	30
RICHMOND CO. CT 03	Reserves	163	22
RICHMOND CO. CT 04	Reliability	134	52
RICHMOND CO. CT 06	Reliability	135	52
ROXBORO 02	Forced Derate	639	0
SUTTON CC PB1	Reserves	703	14
WAYNE CT 10	Reserves	182	10
WAYNE CT 11	Reserves	182	10
WAYNE CT 12	Reserves	182	11

WAYNE CT 13	Reserves	176	15
WAYNE CT 14	Reserves	182	13

Offline Units/Groups

Unit/Group	Reason	Loading	Available
3RD PARTY SOLAR	Minimal Sun	0	0
BLEWETT CT	Forced Outage	0	0
DARLINGTON CO. CT 01	Forced Outage	0	0
DARLINGTON CO. CT 04	Forced Outage	0	0
DARLINGTON CO. CT 05	Forced Outage	0	0
DARLINGTON CO. CT 07	Forced Outage	0	0
DARLINGTON CO. CT 12	Forced Outage	0	0
DARLINGTON CO. CT 13	Forced Outage	0	0
DUKE SOLAR	Minimal Sun	0	0
MARSHALL HYDRO	Maint Outage	0	0
NCEMC ANSON CT 06	Forced Outage	0	0
NCEMC HAMLET CT 02	Pseudo-tied to PJM	0	0
NCEMC HAMLET CT 03	Pseudo-tied to PJM	0	0
WEATHERSPOON CT 01	Out of Economics	0	164

DEP Units/Groups Not Operational at Full Capacity at 01/05/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ASHEVILLE 01	Reliability	185	4
ASHEVILLE 02	Reliability	185	4
ASHEVILLE CT 03	Forced Derate	119	0
ASHEVILLE CT 04	Reliability	118	67
BLEWETT CT	Forced Derate	6	0
BROAD RIVER IPP CT 02	Reliability	144	28
BROAD RIVER IPP CT 03	Reliability	165	7
BROAD RIVER IPP CT 05	Reliability	161	11
DARLINGTON CO. CT 02	Reliability	53	11
DARLINGTON CO. CT 04	Reserves	54	12
DARLINGTON CO. CT 06	Forced Outage*	1	0
DARLINGTON CO. CT 07	Reserves	55	10
DARLINGTON CO. CT 08	Reliability	54	12
DARLINGTON CO. CT 10	Reliability	60	5
DARLINGTON CO. CT 12	Reliability	80	53
DARLINGTON CO. CT 13	Reliability	110	23

FAYETTEVILLE CC 01	Reliability	242	18
MAYO 01	Reserves	709	6
NCEMC ANSON CT 01	Reserves	54	2
NCEMC ANSON CT 02	Reserves	54	2
NCEMC ANSON CT 03	Reserves	27	29
NCEMC ANSON CT 04	Reserves	54	2
NCEMC ANSON CT 05	Reserves	54	2
NCEMC HAMLET CT 01	Reserves	54	2
NCEMC HAMLET CT 04	Reserves	55	1
NCEMC HAMLET CT 05	Reserves	55	1
RICHMOND CO. CT 01	Reserves	135	54
RICHMOND CO. CT 02	Reserves	162	25
RICHMOND CO. CT 03	Reserves	161	24
RICHMOND CO. CT 06	Reliability	139	48
ROXBORO 03	Reserves	692	6
ROXBORO 04	Reserves	707	4
SUTTON CC PB1	Reserves	632	85
SUTTON CT 04	Forced Derate	43	0
WAYNE CT 10	Reserves	162	13
WAYNE CT 11	Reserves	160	15
WAYNE CT 12	Reserves	174	1
WAYNE CT 13	Reserves	174	1
WEATHERSPOON CT 01	Reserves	20	144

Offline Units/Groups

Unit/Group	Reason	Loading	Available
MARSHALL HYDRO	Maint Outage	0	0
DARLINGTON CO. CT 01	Forced Outage	0	0
DARLINGTON CO. CT 05	Out of Economics	0	66
RICHMOND CO. CT 04	Forced Outage	0	0
NCEMC ANSON CT 06	Forced Outage	0	0
NCEMC HAMLET CT 02	Pseudo-tied to PJM	0	0
NCEMC HAMLET CT 03	Pseudo-tied to PJM	0	0
SUTTON CT 05	Maint Outage	0	0

DEP Units/Groups Not Operational at Full Capacity at 01/07/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ASHEVILLE CT 03	Forced Derate	153	0

BROAD RIVER IPP CT 01	Reliability	174	6
BROAD RIVER IPP CT 02	Reliability	171	1
BROAD RIVER IPP CT 03	Reliability	151	14
DARLINGTON CO. CT 04	Reserves	53	1
NCEMC ANSON CT 01	Reserves	55	1
NCEMC ANSON CT 02	Reserves	54	2
NCEMC ANSON CT 03	Forced Derate	27	0
NCEMC ANSON CT 04	Forced Derate	26	0
NCEMC ANSON CT 05	Reserves	55	1
NCEMC ANSON CT 06	Forced Derate	26	0
NCEMC HAMLET CT 01	Reserves	55	1
NCEMC HAMLET CT 04	Reserves	55	1
RICHMOND CO. CC 04	Reserves	498	52
RICHMOND CO. CT 02	Reserve - Fuel Mgmt	115	46
RICHMOND CO. CT 06	Reserve - Fuel Mgmt	107	66
SUTTON CT 05	Reserves	43	8
WAYNE CT 10	Reserves	136	46
WAYNE CT 11	Reserves	137	42
WAYNE CT 12	Reserves	141	36
WAYNE CT 13	Reserves	136	42
WAYNE CT 14	Reserves	154	28
WEATHERSPOON CT 01	Reserves	138	26

Offline Units/Groups

Unit/Group	Reason	Loading	Available
DARLINGTON CO. CT 01	Forced Outage	0	0
DARLINGTON CO. CT 05	Forced Outage	0	0
DARLINGTON CO. CT 08	Reliability	0	0
DARLINGTON CO. CT 10	Out of Economics	0	61
MARSHALL HYDRO	Maint Outage	0	0
NCEMC HAMLET CT 02	Pseudo-tied to PJM	0	0
NCEMC HAMLET CT 03	Pseudo-tied to PJM	0	0
RICHMOND CO. CT 04	Forced Outage	0	0
SUTTON CT 04	Out of Economics	0	51

DEP Units/Groups Not Operational at Full Capacity at 01/08/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
BLEWETT CT	Maint Derate	4	0

DARLINGTON CO. CT 02	Reliability	52	2
DARLINGTON CO. CT 03	Reliability	52	1
DARLINGTON CO. CT 04	Reliability	53	1
DARLINGTON CO. CT 08	Reliability	53	7
DARLINGTON CO. CT 12	Reliability	100	20
DARLINGTON CO. CT 13	Reliability	100	10
NCEMC ANSON CT 01	Reserves	54	2
NCEMC ANSON CT 02	Reserves	54	2
NCEMC ANSON CT 03	Forced Derate	26	0
NCEMC ANSON CT 05	Reserves	16	40
NCEMC HAMLET CT 01	Reserves	55	1
NCEMC HAMLET CT 04	Reserves	55	1
NCEMC HAMLET CT 05	Reserves	55	1
RICHMOND CO. CT 01	Reserves	119	45
RICHMOND CO. CT 02	Reserves	116	45
RICHMOND CO. CT 03	Reserves	131	31
RICHMOND CO. CT 06	Reserves	105	68
SUTTON CC PB1	Forced Derate	570	0
SUTTON CT 04	Reserves	50	1
SUTTON CT 05	Reserves	50	1
WAYNE CT 10	Reserves	104	78
WAYNE CT 11	Reserves	102	77
WAYNE CT 12	Reserves	124	53
WAYNE CT 13	Reserves	157	21
WAYNE CT 14	Reserves	123	59

Offline Units/Groups

Unit/Group	Reason	Loading	Available
ASHEVILLE CT 03	Forced Outage	0	0
DARLINGTON CO. CT 01	Forced Outage	0	0
DARLINGTON CO. CT 05	Forced Outage	0	0
DARLINGTON CO. CT 06	Forced Outage	0	0
DARLINGTON CO. CT 10	Forced Outage	0	0
MARSHALL HYDRO	Maint Outage	0	0
NCEMC ANSON CT 04	Forced Outage	0	0
NCEMC ANSON CT 06	Forced Outage	0	0
NCEMC HAMLET CT 02	Pseudo-tied to PJM	0	0
NCEMC HAMLET CT 03	Pseudo-tied to PJM	0	0
RICHMOND CO. CT 04	Forced Outage	0	0

DEP Units/Groups Not Operational at Full Capacity at 01/16/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ASHEVILLE CT 03	Forced Derate	69	0
BROAD RIVER IPP CT 03	Reserves	171	1
DARLINGTON CO. CT 12	Reserves	108	25
HF LEE CC PB1	Reserves	1025	15
NCEMC ANSON CT 01	Reserves	54	1
NCEMC ANSON CT 02	Reserves	53	2
NCEMC HAMLET CT 01	Reserves	55	1
NCEMC HAMLET CT 04	Reserves	55	1
NCEMC HAMLET CT 05	Reserves	55	1
RICHMOND CO. CC 04	Reserves	532	8
RICHMOND CO. CT 01	Reserves	140	23
RICHMOND CO. CT 02	Reserves	138	21
RICHMOND CO. CT 03	Reserves	151	15
RICHMOND CO. CT 04	Forced Derate	97	0
RICHMOND CO. CT 06	Reserves	140	20
SUTTON CT 04	Reserves	50	1
SUTTON CT 05	Reserves	50	1
WAYNE CT 11	Reserves	112	70
WAYNE CT 12	Reserves	153	29
WAYNE CT 14	Reserves	160	24

Offline Units/Groups

Unit/Group	Reason	Loading	Available
BLEWETT CT	Forced Outage	0	0
BROAD RIVER IPP CT 01	Out of Economics	0	171
BROAD RIVER IPP CT 02	Out of Economics	0	165
BROAD RIVER IPP CT 04	Out of Economics	0	178
BROAD RIVER IPP CT 05	Out of Economics	0	174
DARLINGTON CO. CT 01	Forced Outage	0	0
DARLINGTON CO. CT 02	Out of Economics	0	60
DARLINGTON CO. CT 03	Out of Economics	0	59
DARLINGTON CO. CT 04	Out of Economics	0	66
DARLINGTON CO. CT 05	Forced Outage	0	0
DARLINGTON CO. CT 06	Out of Economics	0	62
DARLINGTON CO. CT 07	Out of Economics	0	65
DARLINGTON CO. CT 08	Out of Economics	0	66
DARLINGTON CO. CT 10	Forced Outage	0	0
FAYETTEVILLE CC 01	Forced Outage	0	0
HARRIS NUCLEAR 01	Forced Outage	0	0

MARSHALL HYDRO	Maint Outage	2	0
NCEMC ANSON CT 03	Out of Economics	0	56
NCEMC ANSON CT 05	Out of Economics	0	54
NCEMC ANSON CT 06	Out of Economics	0	56
NCEMC HAMLET CT 02	Pseudo-tied to PJM	0	56
NCEMC HAMLET CT 03	Pseudo-tied to PJM	0	56
WAYNE CT 10	Out of Economics	0	182
WAYNE CT 13	Out of Economics	0	177
WEATHERSPOON CT 01	Out of Economics	0	164

DEP Units/Groups Not Operational at Full Capacity at 02/20/15 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ASHEVILLE 01	Reliability	188	4
ASHEVILLE 02	Reliability	186	1
ASHEVILLE CT 04	Reliability	151	34
BLEWETT CT	Forced Derate	12	0
BROAD RIVER IPP CT 03	Reliability	161	6
DARLINGTON CO. CT 01	Reliability	35	8
DARLINGTON CO. CT 02	Reserves	67	66
DARLINGTON CO. CT 04	Reserves	41	22
DARLINGTON CO. CT 05	Reserves	42	24
DARLINGTON CO. CT 07	Reserves	44	18
DARLINGTON CO. CT 08	Reserves	64	1
DARLINGTON CO. CT 09	Reserves	29	37
FAYETTEVILLE CC 01	Reliability	664	19
HF LEE CC PB1	Reserves	675	57
NCEMC ANSON CT 01	Reliability	54	8
NCEMC ANSON CT 03	Reliability	55	7
NCEMC ANSON CT 04	Reliability	54	8
NCEMC ANSON CT 05	Reliability	54	8
NCEMC ANSON CT 06	Reliability	55	7
RICHMOND CO. CT 02	Reliability	152	31
RICHMOND CO. CT 03	Reserves	154	29
RICHMOND CO. CT 04	Reserves	153	32
RICHMOND CO. CT 06	Reliability	152	34
ROXBORO 04	Reserves	413	8
WAYNE CT 10	Reliability	152	40
WAYNE CT 11	Reliability	161	31
WAYNE CT 12	Reserves	178	15
WAYNE CT 13	Reserves	175	10

WAYNE CT 14	Reserves	180	17

Offline Units/Groups

Unit/Group	Reason	Loading	Available
ASHEVILLE CT 03	Forced Outage	0	0
DARLINGTON CO. CT 03	Forced Outage	0	0
DARLINGTON CO. CT 11	Forced Outage	0	0
MARSHALL HYDRO	Maint Outage	0	0
NCEMC HAMLET CT 02	Pseudo-tied to PJM	0	0
NCEMC HAMLET CT 03	Pseudo-tied to PJM	0	0
RICHMOND CO. CC 04	Forced Outage	0	0
ROBINSON CT 01	Retired	0	0

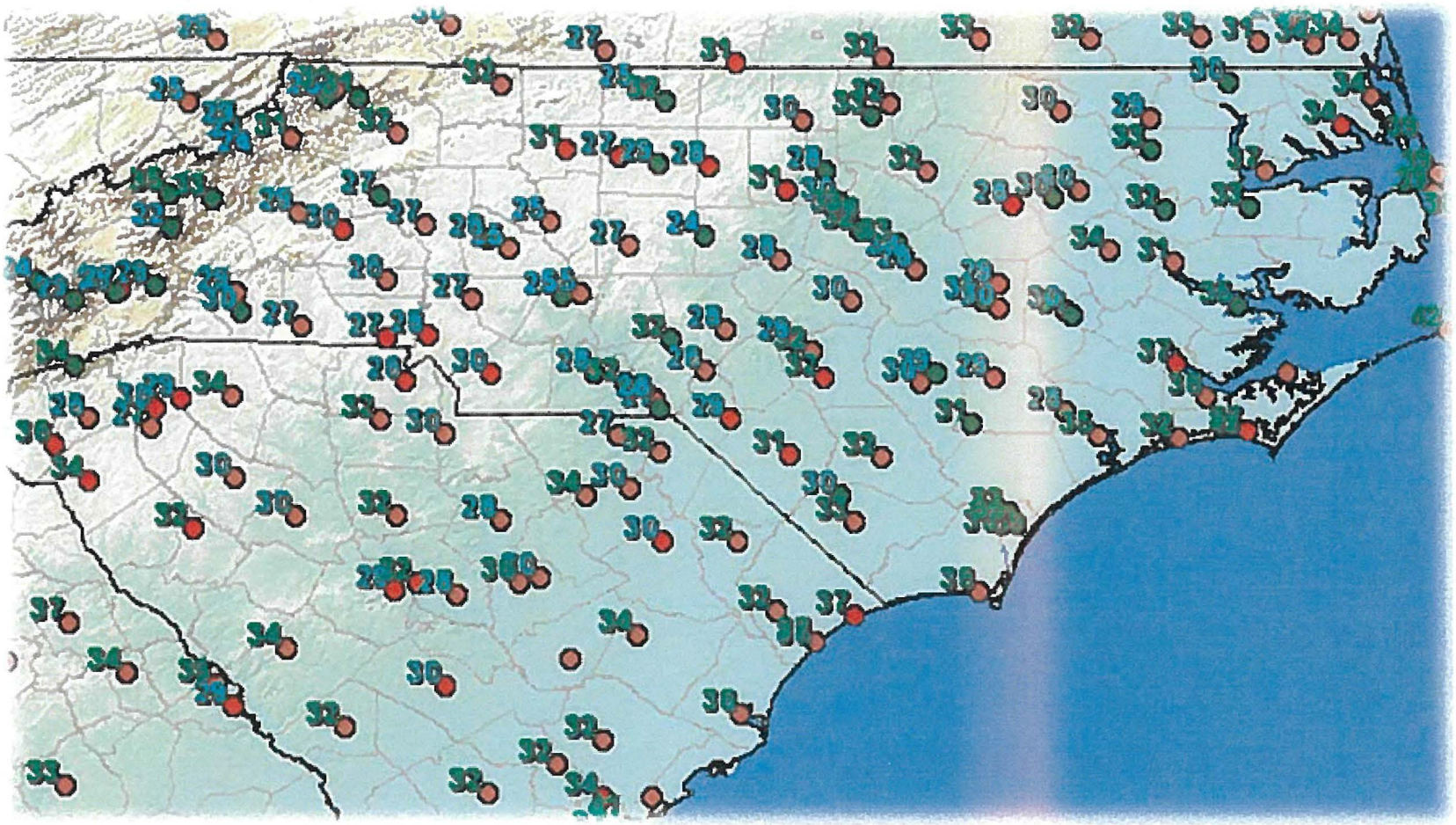
Attachment 6

Review of February 20 Extreme Cold Weather Event

Nelson Peeler – VP Transmission System Operations

DUKE ENERGY®

Typical Winter Morning 7:00 AM Temperatures

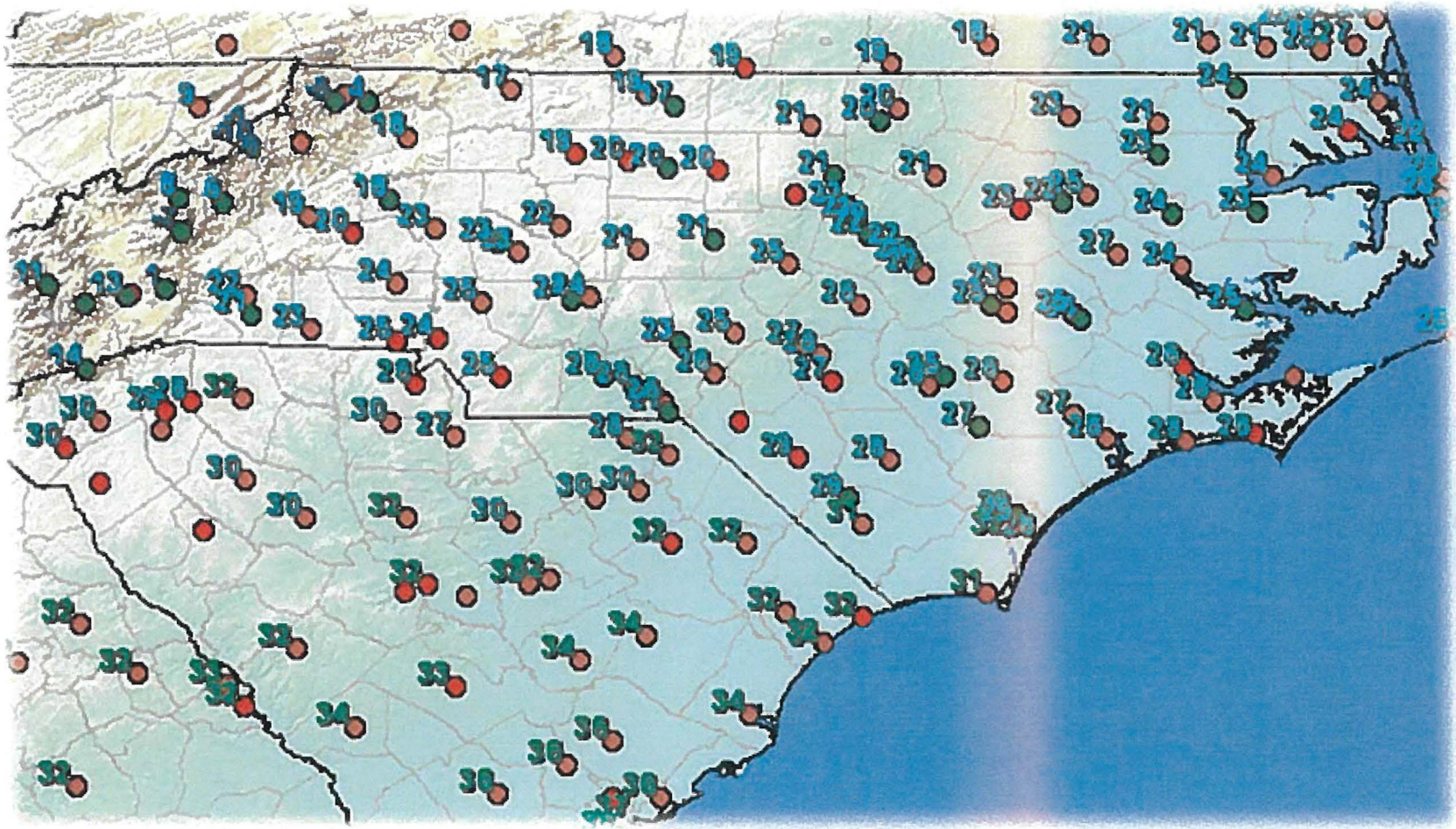


NC CRONOS Database version 2.7.2

Preparations for Severe Cold Weather Operations

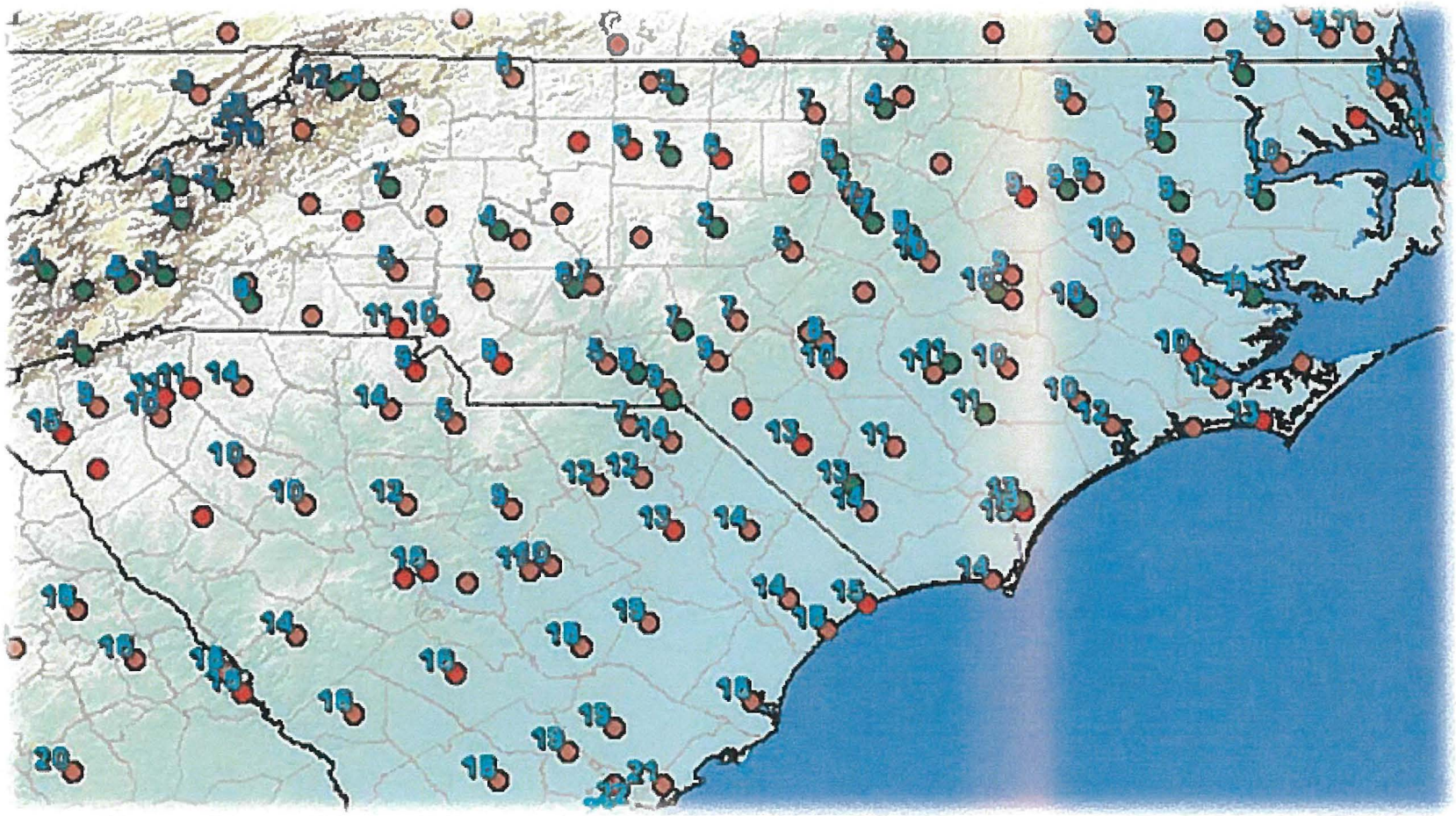
- Planning for this extreme cold weather event started with an event analysis and implementing associated lessons learned from the Polar Vortex event on Jan 7, 2014
- Detailed preparation activities were initiated approximately a week prior to the February 20 event, based on weather forecasts
- Additional preparations included:
  - Participating on NERC and NATF Severe Cold Weather Preparation webinars
  - Holding a Severe Cold Weather preparation webinar internally with all Duke Energy stakeholders participating and presenting how lessons learned had been incorporated
  - Changing the schedule of our VACAR RSG conference calls to occur at 06:00 in order to address potential issues going into the peak hour
  - Holding tailgate team meetings to ensure preparedness of all parties
  - Communicating with wholesale customers to ensure 'complete' preparedness for the BAAs

February 19, 2015 4:00 PM Temperatures



NC CRONOS Database version 2.7.2

February 20, 2015 7:00 AM Temperatures



NC CRONOS Database version 2.7.2

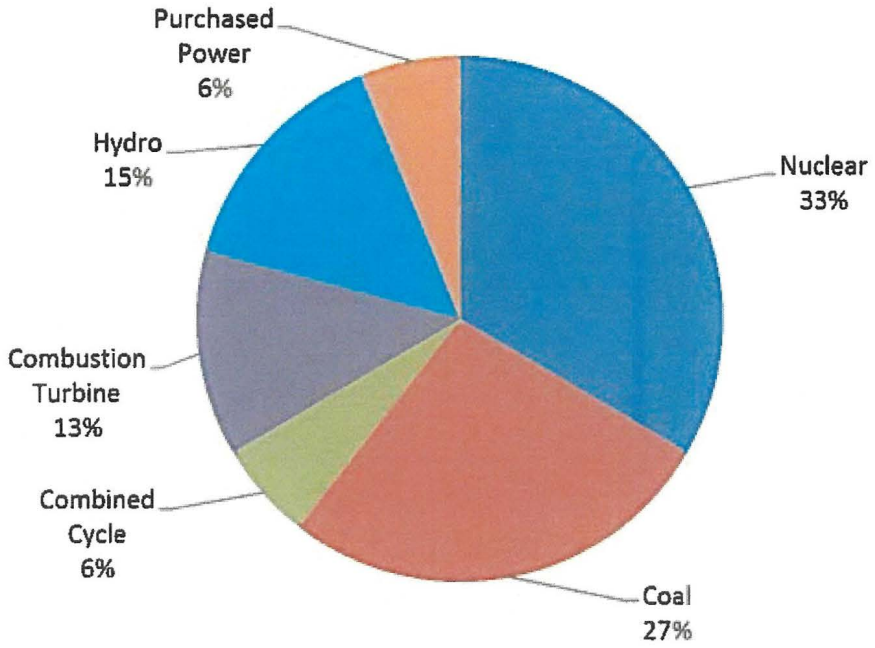
DEC Winter Planning versus Actual

DEC Winter Operations	IRP	Operating Plan	20-Feb
INSTALLED AVAILABLE CAPACITY	21,227	20,661	20,041
FIRM PURCHASES	298	1,585	1,307**
TOTAL SUPPLY RESOURCES	21,525	22,246	21,348
OBLIGATION BEFORE DSM	17,350	19,473	21,638
DSM	605	607	537
OBLIGATION AFTER DSM	16,745	18,866	21,101
RESERVES	4,780	3,380	247
Capacity Margin	22%	15%	1%
Reserve Margin	28%	18%	1%

** In addition to the number shown, 857 MW of non-firm purchases were used to serve the peak demand during HE 08:00

DEC Capacity Mix for February 20, Hour Ending 08:00

Capacity Mix for February 20, HE08:00



Resource Type	% of Total	MW
Nuclear	33.4%	7,140
Coal	27.1%	5,781
Combined Cycle	6.1%	1,292
Combustion Turbine	12.6%	2,691
Hydro (includes P/S)	14.7%	3,136
Net Firm Purchases	6.1%	1,307
Total	100.0%	21,348

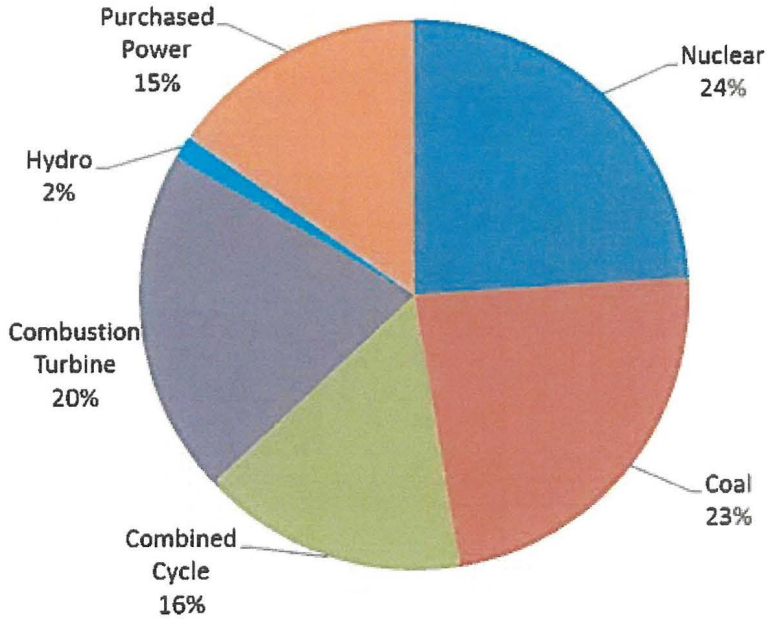
DEP Winter Planning versus Actual

DEP Winter Operations	IRP	Operating Plan	20-Feb
INSTALLED AVAILABLE CAPACITY	13,866	13,804	12,883
FIRM PURCHASES	2,130	2,130	2,313**
TOTAL SUPPLY RESOURCES	15,996	15,934	15,196
OBLIGATION BEFORE DSM	12,579	14,784	15,991
DSM	573	554	545
OBLIGATION AFTER DSM	12,006	14,230	15,446
RESERVES	3,990	1,704	-250
Capacity Margin	25%	11%	-1.6%
Reserve Margin	33%	12%	-1.6%

** In addition to the number shown, 700 MW of non-firm purchases were used to serve the peak demand during HE 08:00

DEP Capacity Mix for February 20, Hour Ending 08:00

Capacity Mix for February 20, HE08:00



Resource Type	% of Total	MW
Nuclear	24%	3,652
Coal	23%	3,547
Combined Cycle	16%	2,394
Combustion Turbine	20%	3,075
Hydro	2%	215
Net Firm Purchases	15%	2,313
Total	100%	15,196

Summary

- Even with effective integrated planning and preparation, a significant amount of non-firm energy was required to serve this record peak demand
- Risk mitigation included standing down normal daily functions such as transmission maintenance activities, vegetation management, generation maintenance activities, and IT projects
- The response from our customers with respect to requests for voluntary conservation of energy and implementation of load reduction programs was vital to reliably serving this record peak demand
- The Transmission and Distribution systems performed well during the extreme cold weather

Questions?

Attachment 7

DUKE ENERGY CAROLINAS, LLC

Request:

Confirm whether non-firm energy purchases were obtained via the Joint Dispatch Agreement between DEC and Duke Energy Progress, LLC to maintain adequate operating reserves on the days listed in Table 9-A (page 71) of the Company's 2020 Integrated Resource Plan.

Supplemental Response: (March 26, 2021)

Please see attachment - NC WARN DEC DR4-6-v2.docx - for data and additional explanation.

Initial Response:

DEC objects to this request on the grounds that it is overbroad and would be unduly burdensome, time consuming and costly to review the extensive records necessary to compile and provide the requested information from 2009 to present. Without waiving its objections, DEC is providing the requested information for the dates in the time period 2018-2019.

Non-firm purchases do not include a capacity component and are subject to be cut or reduced with little warning; for this reason, such purchases do not provide reserve benefit – any reduced loading on resources must be ready to replace the loss of the purchase in the event it is cut or reduced.

Data is provided for peaks for the following dates in 2018-2019: 01/02/18, 01/05/18, 12/06/18, 01/11/19, 01/25/19, 01/31/19, and 03/06/19. The table below provides the hourly integrated DEC purchases in MWh under the Joint Dispatch Agreement during the peak hours on each of the dates listed.

DEC Peak Hour JDA Purchases on Specified Dates

Date	MWh
01/02/18	0
01/05/18	0
12/06/18	0
01/11/19	0
01/25/19	925
01/31/19	0
03/06/19	1

Question #: NCWARN DEC DR4-6

Question Detail: Confirm whether non-firm energy purchases were obtained via the Joint Dispatch Agreement between DEC and Duke Energy Progress, LLC to maintain adequate operating reserves on the days listed in Table 9-A (page 71) of the Company's 2020 Integrated Resource Plan.

Response: DEC objects to this request on the grounds that it is overbroad and would be unduly burdensome, time consuming and costly to review the extensive records necessary to compile and provide the requested information from 2009 to present. Without waiving its objections, DEC is providing the requested information for the dates in the time period 2018-2019.

Non-firm purchases do not include a capacity component and are subject to be cut or reduced with little warning; for this reason, such purchases do not provide reserve benefit – any reduced loading on resources must be ready to replace the loss of the purchase in the event it is cut or reduced.

Data is provided for peaks for the following dates in 2018-2019: 01/02/18, 01/05/18, 12/06/18, 01/11/19, 01/25/19, 01/31/19, and 03/06/19. The table below provides the hourly integrated DEC purchases in MWh under the Joint Dispatch Agreement during the peak hours on each of the dates listed.

Addendum (3/26/21): DEC is also providing information for 01/07/14 as agreed to by counsel. Data for this date is appended at the end of the original table. The format of the table is consistent with the original response.

DEC Peak Hour JDA Purchases on Specified Dates

Date	MWh
01/02/18	0
01/05/18	0
12/06/18	0
01/11/19	0
01/25/19	925
01/31/19	0
03/06/19	1
01/07/14	0

Attachment 8

DUKE ENERGY PROGRESS, LLC

Request:

Confirm whether non-firm energy purchases were obtained via the Joint Dispatch Agreement between DEP and Duke Energy Carolinas, LLC to maintain adequate operating reserves on the days listed in Table 9-A (page 73) of the Company's 2020 Integrated Resource Plan.

Supplemental Response: (March 26, 2021)

Please see attachment - NC WARN DEP DR4-6-v2.docx - for data and additional explanation.

Initial Response:

DEP objects to this request on the grounds that it is overbroad and would be unduly burdensome, time consuming and costly to review the extensive records necessary to compile and provide the requested information from 2009 to present. Without waiving its objections, and based on the agreement of counsel, DEP is providing the requested information for the dates in the time period 2018-2019.

Non-firm purchases do not include a capacity component and are subject to be cut or reduced with little warning; for this reason, such purchases do not provide reserve benefit – any reduced loading on resources must be ready to replace the loss of the purchase in the event it is cut or reduced.

Data is provided for peaks for the following dates in 2018-2019: 01/02/18, 01/03/18, 01/05/18, 01/07/18, 01/08/18, and 01/16/18. The table below provides the hourly integrated DEP purchases in MWh under the Joint Dispatch Agreement during the peak hours on each of the dates listed.

DEP Peak Hour JDA Purchases on Specified Dates

Date	MWh
01/02/18	0
01/03/18	0
01/05/18	3
01/07/18	497
01/08/18	629
01/16/18	168

Question #: NCWARN DEP DR4-6

Question Detail: Confirm whether non-firm energy purchases were obtained via the Joint Dispatch Agreement between DEP and Duke Energy Carolinas, LLC to maintain adequate operating reserves on the days listed in Table 9-A (page 73) of the Company's 2020 Integrated Resource Plan.

Response: DEP objects to this request on the grounds that it is overbroad and would be unduly burdensome, time consuming and costly to review the extensive records necessary to compile and provide the requested information from 2009 to present. Without waiving its objections, DEP is providing the requested information for the dates in the time period 2018-2019.

Non-firm purchases do not include a capacity component and are subject to be cut or reduced with little warning; for this reason, such purchases do not provide reserve benefit – any reduced loading on resources must be ready to replace the loss of the purchase in the event it is cut or reduced.

Data is provided for peaks for the following dates in 2018-2019: 01/02/18, 01/03/18, 01/05/18, 01/07/18, 01/08/18, and 01/16/18. The table below provides the hourly integrated DEP purchases in MWh under the Joint Dispatch Agreement during the peak hours on each of the dates listed.

Addendum (3/26/21): DEP is also providing information for 02/20/15 as agreed to by counsel. Data for this date is appended at the end of the original table. The format of the table is consistent with the original response.

DEP Peak Hour JDA Purchases on Specified Dates

Date	MWh
01/02/18	0
01/03/18	0
01/05/18	3
01/07/18	497
01/08/18	629
01/16/18	168
02/20/15	500

Attachment 9

DUKE ENERGY PROGRESS, LLC

Request:

Provide the quantity in MW of non-firm energy purchases relied upon to maintain adequate operating reserves on the days listed in Table 9-A (page 73) of the Company's 2020 Integrated Resource Plan.

Supplemental Response: (March 26, 2021)

Please see attachment - NC WARN DEP DR4-7-v2.docx - for data and additional explanation.

Initial Response:

DEP objects to this request on the grounds that it is overbroad and would be unduly burdensome, time consuming and costly to review the extensive records necessary to compile and provide the requested information from 2009 to present. Without waiving its objections, and based upon the agreement of counsel, DEP is providing the requested information for the dates in the time period 2018-2019.
Non-firm purchases do not include a capacity component and are subject to be cut or reduced with little warning; for this reason, such purchases do not provide reserve benefit – any reduced loading on resources must be ready to replace the loss of the purchase in the event it is cut or reduced.

Data is provided for peaks for the following dates in 2018-2019: 01/02/18, 01/03/18, 01/05/18, 01/07/18, 01/08/18, and 01/16/18. The table below provides the hourly integrated DEP non-firm purchases in MWh during the peak hours on each of the dates listed.

DEP Peak Hour Non-Firm Purchases on Specified Dates

Date	MWh
01/02/18	338
01/03/18	0
01/05/18	307
01/07/18	387
01/08/18	213
01/16/18	1200

Question #: NCWARN DEP DR4-7

Question Detail: Provide the quantity in MW of non-firm energy purchases relied upon to maintain adequate operating reserves on the days listed in Table 9-A (page 73) of the Company's 2020 Integrated Resource Plan.

Response: DEP objects to this request on the grounds that it is overbroad and would be unduly burdensome, time consuming and costly to review the extensive records necessary to compile and provide the requested information from 2009 to present. Without waiving its objections, DEP is providing the requested information for the dates in the time period 2018-2019.

Non-firm purchases do not include a capacity component and are subject to be cut or reduced with little warning; for this reason, such purchases do not provide reserve benefit – any reduced loading on resources must be ready to replace the loss of the purchase in the event it is cut or reduced.

Data is provided for peaks for the following dates in 2018-2019: 01/02/18, 01/03/18, 01/05/18, 01/07/18, 01/08/18, and 01/16/18. The table below provides the hourly integrated DEP non-firm purchases in MWh during the peak hours on each of the dates listed.

Addendum (3/26/21): DEP is also providing information for 02/20/15 as agreed to by counsel. Data for this date is appended at the end of the original table. The format of the table is consistent with the original response.

DEP Peak Hour Non-Firm Purchases on Specified Dates

Date	MWh
01/02/18	338
01/03/18	0
01/05/18	307
01/07/18	387
01/08/18	213
01/16/18	1200
02/20/15	200

Attachment 10

DUKE ENERGY CAROLINAS, LLC

Request:

Provide the quantity in MW of non-firm energy purchases relied upon to maintain adequate operating reserves on the days listed in Table 9-A (page 71) of the Company's 2020 Integrated Resource Plan.

Supplemental Response: (March 26, 2021)

Please see attachment - NC WARN DEC DR4-7-v2.docx - for data and additional explanation.

Initial Response:

DEC objects to this request on the grounds that it is overbroad and would be unduly burdensome, time consuming and costly to review the extensive records necessary to compile and provide the requested information from 2009 to present. Without waiving its objections, DEC is providing the requested information for the dates in the time period 2018-2019.

Non-firm purchases do not include a capacity component and are subject to be cut or reduced with little warning; for this reason, such purchases do not provide reserve benefit – any reduced loading on resources must be ready to replace the loss of the purchase in the event it is cut or reduced.

Data is provided for peaks for the following dates in 2018-2019: 01/02/18, 01/05/18, 12/06/18, 01/11/19, 01/25/19, 01/31/19, and 03/06/19. The table below provides the hourly integrated DEC non-firm purchases in MWh during the peak hours on each of the dates listed.

DEC Peak Hour Non-Firm Purchases on Specified Dates

Date	MWh
01/02/18	0
01/05/18	900
12/06/18	0
01/11/19	500
01/25/19	1229
01/31/19	450
03/06/19	1400

Question #: NCWARN DEC DR4-7

Question Detail: Provide the quantity in MW of non-firm energy purchases relied upon to maintain adequate operating reserves on the days listed in Table 9-A (page 71) of the Company's 2020 Integrated Resource Plan.

Response: DEC objects to this request on the grounds that it is overbroad and would be unduly burdensome, time consuming and costly to review the extensive records necessary to compile and provide the requested information from 2009 to present. Without waiving its objections, DEC is providing the requested information for the dates in the time period 2018-2019.

Non-firm purchases do not include a capacity component and are subject to be cut or reduced with little warning; for this reason, such purchases do not provide reserve benefit – any reduced loading on resources must be ready to replace the loss of the purchase in the event it is cut or reduced.

Data is provided for peaks for the following dates in 2018-2019: 01/02/18, 01/05/18, 12/06/18, 01/11/19, 01/25/19, 01/31/19, and 03/06/19. The table below provides the hourly integrated DEC non-firm purchases in MWh during the peak hours on each of the dates listed.

Addendum (3/26/21): DEC is also providing information for 01/07/14 as agreed to by counsel. Data for this date is appended at the end of the original table. The format of the table is consistent with the original response.

DEC Peak Hour Non-Firm Purchases on Specified Dates

Date	MWh
01/02/18	0
01/05/18	900
12/06/18	0
01/11/19	500
01/25/19	1229
01/31/19	450
03/06/19	1400
01/07/14	0

Attachment 11

DUKE ENERGY CAROLINAS, LLC

Request:

In response to NC WARN's Data Request No. 3-1, the Company identified several units that were "not operating at full capacity" during several dates occurring in 2018-2019 and identified on Figure 9-A (page 72) of the Company's 2020 Integrated Resource Plan. Please identify the output in MW (if any) for the units identified in response to NC WARN's Data Request No. 3-1 at peak time for the dates on which responsive information was provided. (For clarity, the present data request is intended to ascertain the extent to which the units identified in response to NC WARN's Data Request No. 3-1 were operating below full capacity, or alternatively, were not operational.)

Response:

Per the agreement of counsel, DEC is providing the requested information for the dates in the time period 2018-2019. Because the explanatory parenthetical in the request provides more clarity on the intent of the request, data for each date are separated into those units/groups that were online and those that were offline. In addition, it appears the intent is to determine the additional MW capability which could have served additional load. The actual capabilities of the units/groups for these dates and times are not the same as the stated Net Dependable Capacities. Ambient conditions (e.g., temperature, humidity, sun angle and cloud cover for solar resources) have a significant effect, positive or negative, on the actual capability of a given unit. For this reason, the available unloaded capability for each unit is provided although it was not actually requested. For offline units, this value is estimated actual capability. Please see attachment - NC WARN DEC DR4-5.docx - for data and additional explanation.

Question #: NCWARN DEC DR4-5

Question Detail: In response to NC WARN's Data Request No. 3-1, the Company identified several units that were "not operating at full capacity" during several dates occurring in 2018-2019 and identified on Figure 9-A (page 72) of the Company's 2020 Integrated Resource Plan. Please identify the output in MW (if any) for the units identified in response to NC WARN's Data Request No. 3-1 at peak time for the dates on which responsive information was provided. (For clarity, the present data request is intended to ascertain the extent to which the units identified in response to NC WARN's Data Request No. 3-1 were operating below full capacity, or alternatively, were not operational.)

Response: DEC is providing the requested information for the dates in the time period 2018-2019. Because the explanatory parenthetical in the request provides more clarity on the intent of the request, data for each date are separated into those units/groups that were online and those that were offline. In addition, it appears the intent is to determine the additional MW capability which could have served additional load. The actual capabilities of the units/groups for these dates and times are not the same as the stated Net Dependable Capacities. Ambient conditions (e.g., temperature, humidity, sun angle and cloud cover for solar resources) have a significant effect, positive or negative, on the actual capability of a given unit. For this reason, the available unloaded capability for each unit is provided although it was not actually requested. For offline units, this value is estimated actual capability.

Some additional explanation is needed to fully understand the meanings of the reasons given.

- Online
    - Constrained – unit(s) temporarily constrained during some part of the hour, e.g., unit ramping up from a previous outage
    - Forced Derate – unit(s) constrained to operate at a lower level due to failure or limitation of one or more subsystems
    - Reliability – unit(s) constrained to operate at a specified level or range to avoid violation of reliability constraints
    - Reserves – the unloaded capacity is spinning reserve used for regulation and to provide a portion of contingency reserves
- Offline
    - Contingency Reserve – quick start unit(s) needed to complete contingency reserve needs
    - Forced Outage – unit(s) undergoing repairs due to an unforeseen/unplanned issue
    - Maint Outage – unit(s) undergoing planned maintenance or testing
    - Minimal Sun – integrated solar aggregate for the hour did not provide an entire MWh because sunlight was not strong enough to meet minimum inverter operation
    - Out of Economics – unit cost high enough and demand low enough to preclude need to run this unit
    - Reserve - Fuel Mgmt – unit(s) held in reserve to conserve a limited fuel
    - Reserve Shutdown – units in cold shutdown because longer term forecasts (weeks/months) indicated units would not be needed during the period

Data is provided for peaks for the following dates in 2018-2019: 1/2/2018, 1/25/19, 1/31/19, 3/6/19, 1/5/18, 12/6/18, and 1/11/19. As with the NCWARN DR3-1 response, the reason why each unit/group was not operational is indicated by the Reason column. Some units have been ungrouped from the NCWARN DR3-1 listing since loadings and available capacity differ for those in the group. Additionally, the tables have columns labeled Loading and Available to show the actual integrated hourly loading in MW and the unloaded MW capacity up to the actual capability of the unit/group for the given hour.

- Reasons marked with an asterisk (*) indicate that the unit(s) was/were online for a part of the hour but tripped before the end of the hour; for these units the Available column does not show the amount actually available but the amount that could have been available if not for the trip.
- CONVENTIONAL HYDRO is a group of multiple units at several plants. Available capacity varies throughout the day and is somewhat less than the sum of the Net Dependable Capacities of these units due to outages and derates to meet licensing, environmental, testing, etc. requirements.

DEC Units/Groups Not Operational at Full Capacity at 01/02/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
CONVENTIONAL HYDRO	Reserves	593	342
JOCASSEE PS	Reserves	770	10
LEE CT 07	Reserves	45	1
LINCOLN CT 02	Constrained	17	82
LINCOLN CT 04	Constrained	7	91
LINCOLN CT 09	Reserves	96	1
LINCOLN CT 10	Reserves	97	1
MILL CREEK CT 06	Reserves	89	3

Offline Units/Groups

Unit/Group	Reason	Loading	Available
3RD PARTY SOLAR	Minimal Sun	0	0
DUKE SOLAR	Minimal Sun	0	0
LEE STEAM 03	Maint Outage	0	173
LINCOLN CT 05	Contingency Reserve	0	97
LINCOLN CT 06	Contingency Reserve	0	97
LINCOLN CT 07	Contingency Reserve	0	98
LINCOLN CT 08	Contingency Reserve	0	98
LINCOLN CT 12	Forced Outage	0	98
LINCOLN CT 13	Contingency Reserve	0	98
MARSHALL 03	Forced Outage	0	658
ROCKINGHAM CT 01	Maint Outage	0	179

DEC Units/Groups Not Operational at Full Capacity at 01/25/19 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
BAD CREEK PS	Reserves	1241	119
CLIFFSIDE 06	Forced Derate	645	204
CONVENTIONAL HYDRO	Reserves	523	192
JOCASSEE PS	Reserves	729	51
LEE CC PB1	Reserves	795	21
MARSHALL 01	Reserves	330	50
MARSHALL 02	Reserves	328	52
MARSHALL 04	Reliability	531	129
ROCKINGHAM CT 02	Reserves	178	2
ROCKINGHAM CT 03	Reserves	178	2
ROCKINGHAM CT 04	Reserves	178	2
ROCKINGHAM CT 05	Reserves	178	2

Offline Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 01	Reserve Shutdown	0	167
ALLEN 02	Reserve Shutdown	0	167
ALLEN 03	Reserve Shutdown	0	270
ALLEN 04	Reserve - Fuel Mgmt	0	267
ALLEN 05	Reserve Shutdown	0	259
BELEWS CREEK 01	Forced Outage	0	1110
BELEWS CREEK 02	Maint Outage	0	1110
CLIFFSIDE 05	Reserve - Fuel Mgmt	0	546
KEOWEE HYDRO	Maint Outage	0	0
LEE CT 07	Maint Outage	0	49
LEE CT 08	Maint Outage	0	49
LEE STEAM 03	Reserve Shutdown	0	160
LINCOLN CT 01	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 02	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 03	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 04	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 05	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 06	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 07	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 08	Contingency Reserve/Out of Economics	0	93

LINCOLN CT 09	Contingency Reserve/Out of Economics	0	91
LINCOLN CT 10	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 11	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 12	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 13	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 14	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 15	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 16	Contingency Reserve/Out of Economics	0	92
MARSHALL 03	Reserve Shutdown	0	658
MILL CREEK CT 01	Out of Economics	0	91
MILL CREEK CT 02	Out of Economics	0	90
MILL CREEK CT 03	Out of Economics	0	91
MILL CREEK CT 04	Maint Outage	0	90
MILL CREEK CT 05	Out of Economics	0	89
MILL CREEK CT 06	Out of Economics	0	86
MILL CREEK CT 07	Out of Economics	0	90
MILL CREEK CT 08	Out of Economics	0	90

DEC Units/Groups Not Operational at Full Capacity at 01/31/19 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 05	Reliability	258	1
BAD CREEK PS	Reserves	1206	154
CLIFFSIDE 06	Reserves	841	8
CONVENTIONAL HYDRO	Reserves	567	50
JOCASSEE PS	Reserves	704	76
LEE CC PB1	Reserves	793	25
MARSHALL 01	Reserves	372	8
MARSHALL 02	Reserves	375	5
MARSHALL 03	Reliability	644	14
MILL CREEK CT 01	Reserves	85	8
MILL CREEK CT 02	Reserves	84	8
MILL CREEK CT 03	Reserves	85	7
ROCKINGHAM CT 01	Reserves	170	10
ROCKINGHAM CT 02	Reserves	163	17
ROCKINGHAM CT 03	Reserves	162	18
ROCKINGHAM CT 04	Reserves	167	13
ROCKINGHAM CT 05	Reserves	178	2

Offline Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 01	Reserve Shutdown	0	167
ALLEN 02	Reserve Shutdown	0	167
ALLEN 03	Reserve Shutdown	0	270
ALLEN 04	Reserve - Fuel Mgmt	0	267
CLIFFSIDE 05	Reserve - Fuel Mgmt	0	546
KEOWEE HYDRO	Maint Outage	0	0
LEE CT 07	Maint Outage	0	49
LEE CT 08	Maint Outage	0	49
LEE STEAM 03	Reserve Shutdown	0	160
LINCOLN CT 01	Contingency Reserve/Out of Economics	0	95
LINCOLN CT 02	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 03	Contingency Reserve/Out of Economics	0	95
LINCOLN CT 04	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 05	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 06	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 07	Contingency Reserve/Out of Economics	0	95
LINCOLN CT 08	Contingency Reserve/Out of Economics	0	95
LINCOLN CT 09	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 10	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 11	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 12	Contingency Reserve/Out of Economics	0	95
MILL CREEK CT 04	Out of Economics	0	92
MILL CREEK CT 05	Out of Economics	0	90
MILL CREEK CT 06	Out of Economics	0	88
MILL CREEK CT 07	Out of Economics	0	91
MILL CREEK CT 08	Out of Economics	0	92

DEC Units/Groups Not Operational at Full Capacity at 03/06/19 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
BAD CREEK PS	Reserves	1019	341
CONVENTIONAL HYDRO	Reserves	472	256
JOCASSEE PS	Reserves	600	180
KEOWEE HYDRO	Reserves	80	72
LEE CT 07	Reserves	47	2
LEE CT 08	Reserves	48	1
MILL CREEK CT 01	Reserves	26	65
MILL CREEK CT 02	Reserves	25	65
MILL CREEK CT 03	Reserves	76	15
MILL CREEK CT 04	Reserves	75	16

ROCKINGHAM CT 02	Reserves	133	47
ROCKINGHAM CT 03	Reserves	170	10
ROCKINGHAM CT 05	Reserves	110	70

Offline Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 01	Reserve - Fuel Mgmt	0	167
ALLEN 02	Reserve - Fuel Mgmt	0	167
ALLEN 03	Maint Outage	0	270
ALLEN 04	Maint Outage	0	267
ALLEN 05	Reserve - Fuel Mgmt	0	259
BUCK CC PB1	Maint Outage	0	704
LEE STEAM 03	Reserve Shutdown	0	160
LINCOLN CT 01	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 02	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 03	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 04	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 05	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 06	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 07	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 08	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 09	Contingency Reserve/Out of Economics	0	91
LINCOLN CT 10	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 11	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 12	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 13	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 14	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 15	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 16	Contingency Reserve/Out of Economics	0	92
MARSHALL 02	Maint Outage	0	380
MARSHALL 03	Forced Outage	0	640
MARSHALL 04	Forced Outage	0	500
MILL CREEK CT 05	Out of Economics	0	89
MILL CREEK CT 06	Out of Economics	0	86
MILL CREEK CT 07	Out of Economics	0	90
MILL CREEK CT 08	Out of Economics	0	90
ROCKINGHAM CT 01	Out of Economics	0	180
ROCKINGHAM CT 04	Out of Economics	0	180

DEC Units/Groups Not Operational at Full Capacity at 01/05/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 01	Reserves	143	13
ALLEN 03	Reliability	253	5
ALLEN 04	Reserves	250	8
ALLEN 05	Reserves	254	4
BAD CREEK PS	Reserves	883	477
BELEWS CREEK 02	Reserves	1102	8
CLIFFSIDE 05	Forced Derate	523	29
CONVENTIONAL HYDRO	Reserves	633	241
JOCASSEE PS	Reserves	710	70
LEE CT 07	Reserves	47	1
LEE CT 08	Reserves	47	1
LINCOLN CT 01	Reserves	97	1
LINCOLN CT 02	Reserves	97	2
LINCOLN CT 03	Reserves	96	3
LINCOLN CT 04	Reserves	97	1
LINCOLN CT 05	Reserves	96	1
LINCOLN CT 08	Reserves	97	1
LINCOLN CT 15	Reserves	96	2
MARSHALL 03	Forced Derate	632	36
MARSHALL 04	Reserves	654	11
ROCKINGHAM CT 01	Reserves	177	2
ROCKINGHAM CT 02	Reserves	178	1
ROCKINGHAM CT 03	Reserves	178	1
ROCKINGHAM CT 04	Reserves	178	1
ROCKINGHAM CT 05	Reserves	177	2

Offline Units/Groups

Unit/Group	Reason	Loading	Available
LEE STEAM 03	Out of Economics	0	168
LINCOLN CT 06	Contingency Reserve	0	97
LINCOLN CT 09	Contingency Reserve	0	97
LINCOLN CT 10	Contingency Reserve	0	98
LINCOLN CT 11	Contingency Reserve	0	98
LINCOLN CT 12	Contingency Reserve	0	98
LINCOLN CT 13	Contingency Reserve	0	98
LINCOLN CT 14	Contingency Reserve	0	97
LINCOLN CT 16	Forced Outage	0	97
MILL CREEK CT 01	Out of Economics	0	92
MILL CREEK CT 02	Out of Economics	0	92

MILL CREEK CT 03	Out of Economics	0	92
MILL CREEK CT 06	Out of Economics	0	92

DEC Units/Groups Not Operational at Full Capacity at 12/06/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 03	Reliability	222	48
ALLEN 04	Reliability	238	29
BAD CREEK PS	Reserves	1159	201
BELEWS CREEK 01	Constrained	229	881
CLIFFSIDE 05	Maint Derate	401	4
CLIFFSIDE 06	Maint Derate	766	9
CONVENTIONAL HYDRO	Reserves	572	164
JOCASSEE PS	Reserves	690	90
LEE CT 07	Reserves	48	1
LEE CT 08	Reserves	47	2
MARSHALL 01	Reserves	307	73
MARSHALL 02	Reserve Shutdown	376	4
MARSHALL 03	Reliability	615	43
MARSHALL 04	Constrained	626	34
MILL CREEK CT 01	Reserves	89	2
MILL CREEK CT 02	Reserves	89	2
MILL CREEK CT 04	Reserves	90	1
ROCKINGHAM CT 01	Reserves	177	3
ROCKINGHAM CT 02	Reserves	179	1
ROCKINGHAM CT 03	Reserves	179	1
ROCKINGHAM CT 04	Reserves	179	1
ROCKINGHAM CT 05	Reserves	179	1

Offline Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 01	Maint Outage	0	167
ALLEN 02	Maint Outage	0	167
ALLEN 05	Maint Outage	0	259
BELEWS CREEK 02	Maint Outage	0	1110
CATAWBA NUCLEAR 01	Maint Outage	0	0
LEE CC PB1	Forced Outage	0	817
LEE STEAM 03	Maint Outage	0	160
LINCOLN CT 01	Contingency Reserve	0	93

LINCOLN CT 02	Contingency Reserve	0	92
LINCOLN CT 03	Contingency Reserve	0	94
LINCOLN CT 04	Contingency Reserve	0	93
LINCOLN CT 06	Contingency Reserve	0	92
LINCOLN CT 09	Contingency Reserve	0	92
LINCOLN CT 10	Contingency Reserve	0	92
LINCOLN CT 11	Contingency Reserve	0	93
LINCOLN CT 12	Contingency Reserve	0	94
LINCOLN CT 13	Contingency Reserve	0	94
OCONEE NUCLEAR 01	Maint Outage	0	0

DEC Units/Groups Not Operational at Full Capacity at 01/11/19 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
CLIFFSIDE 05	Reliability	543	3
BAD CREEK PS	Reserves	1351	9
JOCASSEE PS	Reserves	765	15
LEE CT 07	Reserves	48	1
LEE CT 08	Reserves	47	2
LEE CC PB1	Reserves	776	41
CONVENTIONAL HYDRO	Reserves	606	158
MILL CREEK CT 02	Constrained	71	20
MILL CREEK CT 01	Constrained	70	22

Offline Units/Groups

Unit/Group	Reason	Loading	Available
ALLEN 01	Reserve - Fuel Mgmt	0	167
ALLEN 02	Reserve - Fuel Mgmt	0	167
ALLEN 03	Reserve - Fuel Mgmt	0	270
ALLEN 04	Reserve - Fuel Mgmt	0	267
ALLEN 05	Reserve - Fuel Mgmt	0	259
BELEWS CREEK 01	Reserve - Fuel Mgmt	0	1110
CLIFFSIDE 06	Forced Outage	0	849
DUKE SOLAR	Minimal Sun	0	0
LEE STEAM 03	Reserve Shutdown	0	160
LINCOLN CT 01	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 02	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 03	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 04	Contingency Reserve/Out of Economics	0	93

LINCOLN CT 05	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 06	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 07	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 08	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 09	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 10	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 11	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 12	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 13	Contingency Reserve/Out of Economics	0	94
LINCOLN CT 14	Contingency Reserve/Out of Economics	0	92
LINCOLN CT 15	Contingency Reserve/Out of Economics	0	93
LINCOLN CT 16	Contingency Reserve/Out of Economics	0	92
MARSHALL 01	Reserve - Fuel Mgmt	0	380
MARSHALL 02	Reserve - Fuel Mgmt	0	380
MILL CREEK CT 03	Out of Economics	0	91
MILL CREEK CT 04	Out of Economics	0	91
MILL CREEK CT 05	Out of Economics	0	90
MILL CREEK CT 06	Out of Economics	0	87
MILL CREEK CT 07	Out of Economics	0	91
MILL CREEK CT 08	Out of Economics	0	91

Attachment 12

DUKE ENERGY PROGRESS, LLC

Request:

In response to NC WARN's Data Request No. 3-1, the Company identified several units that were "not operating at full capacity" during several dates occurring in 2018-2019 and identified on Figure 9-A (page 74) of the Company's 2020 Integrated Resource Plan. Please identify the output in MW (if any) for the units identified in response to NC WARN's Data Request No. 3-1 at peak time for the dates on which responsive information was provided. (For clarity, the present data request is intended to ascertain the extent to which the units identified in response to NC WARN's Data Request No. 3-1 were operating below full capacity, or alternatively, were not operational.)

Response:

Per the agreement of counsel, DEP is providing the requested information for the dates in the time period 2018-2019. Because the explanatory parenthetical in the request provides more clarity on the intent of the request, data for each date are separated into those units/groups that were online and those that were offline. In addition, it appears the intent is to determine the additional MW capability which could have served additional load. The actual capabilities of the units/groups for these dates and times are not the same as the stated Net Dependable Capacities. Ambient conditions (e.g., temperature, humidity, sun angle and cloud cover for solar resources) have a significant effect, positive or negative, on the actual capability of a given unit. For this reason, the available unloaded capability for each unit is provided although it was not actually requested. For offline units, this value is estimated actual capability. Please see attachment - NC WARN DEP DR4-5.docx - for data and additional explanation.

Question #: NCWARN DEP DR4-5

Question Detail: In response to NC WARN's Data Request No. 3-1, the Company identified several units that were "not operating at full capacity" during several dates occurring in 2018-2019 and identified on Figure 9-A (page 74) of the Company's 2020 Integrated Resource Plan. Please identify the output in MW (if any) for the units identified in response to NC WARN's Data Request No. 3-1 at peak time for the dates on which responsive information was provided. (For clarity, the present data request is intended to ascertain the extent to which the units identified in response to NC WARN's Data Request No. 3-1 were operating below full capacity, or alternatively, were not operational.)

Response: DEP is providing the requested information for the dates in the time period 2018-2019. Because the explanatory parenthetical in the request provides more clarity on the intent of the request, data for each date are separated into those units/groups that were online and those that were offline. In addition, it appears the intent is to determine the additional MW capability which could have served additional load. The actual capabilities of the units/groups for these dates and times are not the same as the stated Net Dependable Capacities. Ambient conditions (e.g, temperature, humidity, sun angle and cloud cover for solar resources) have a significant effect, positive or negative, on the actual capability of a given unit. For this reason, the available unloaded capability for each unit is provided although it was not actually requested. For offline units, this value is estimated actual capability.

Some additional explanation is needed to fully understand the meanings of the reasons given.

- Online
    - Constrained – unit(s) temporarily constrained during some part of the hour, e.g., unit ramping up from a previous outage
    - Forced Derate – unit(s) constrained to operate at a lower level due to failure or limitation of one or more subsystems
    - Reliability – unit(s) constrained to operate at a specified level or range to avoid violation of reliability constraints
    - Reserves – the unloaded capacity is spinning reserve used for regulation and to provide a portion of contingency reserves
- Offline
    - Contingency Reserve – quick start unit(s) needed to complete contingency reserve needs
    - Forced Outage – unit(s) undergoing repairs due to an unforeseen/unplanned issue
    - Maint Outage – unit(s) undergoing planned maintenance or testing
    - Minimal Sun – integrated solar aggregate for the hour did not provide an entire MWh because sunlight was not strong enough to meet minimum inverter operation
    - Out of Economics – unit cost high enough and demand low enough to preclude need to run this unit
    - Reserve - Fuel Mgmt – unit(s) held in reserve to conserve a limited fuel
    - Reserve Shutdown – units in cold shutdown because longer term forecasts (weeks/months) indicated units would not be needed during the period

Data is provided for peaks for the following dates in 2018-2019: 01/02/18, 01/03/18, 01/05/18, 01/07/18, 01/08/18, and 01/16/18. As with the NCWARN DR3-1 response, the reason why each unit/group was not operational is indicated by the Reason column. Some units have been ungrouped from the NCWARN DR3-1 listing since loadings and available capacity differ for those in the group. Additionally, the tables have columns labeled Loading and Available to show the actual integrated hourly loading in MW and the unloaded MW capacity up to the actual capability of the unit/group for the given hour.

- Reasons marked with an asterisk (*) indicate that the unit(s) was/were online for a part of the hour but tripped before the end of the hour; for these units the Available column does not show the amount actually available but the amount that could have been available if not for the trip.
- NCEMC HAMLET 02 and 03 output is controlled by NCEMC and delivered to PJM.

DEP Units/Groups Not Operational at Full Capacity at 01/02/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ASHEVILLE 01	Reliability	185	2
ASHEVILLE 02	Reliability	184	1
ASHEVILLE CT 03	Forced Derate	124	1
BROAD RIVER IPP CT 01	Reliability	126	49
BROAD RIVER IPP CT 04	Forced Outage*	6	144
DARLINGTON CO. CT 13	Forced Outage*	63	70
NCEMC HAMLET CT 01	Reserves	55	1
NCEMC HAMLET CT 05	Reserves	55	1
SUTTON CT 04	Reserves	50	1
SUTTON CT 05	Reserves	50	1
WEATHERSPOON CT 01	Reserves	109	55

Offline Units/Groups

Unit/Group	Reason	Loading	Available
3RD PARTY SOLAR	Minimal Sun	0	0
BROAD RIVER IPP CT 02	Forced Outage	0	162
DARLINGTON CO. CT 01	Forced Outage	0	63
DARLINGTON CO. CT 03	Forced Outage	0	59
DARLINGTON CO. CT 07	Forced Outage	0	65
DARLINGTON CO. CT 12	Reserve - Fuel Mgmt	0	121
MARSHALL HYDRO	Forced Outage	0	0
NCEMC HAMLET CT 02	Out of Economics	0	56
NCEMC HAMLET CT 03	Out of Economics	0	56
WAYNE CT 12	Forced Outage	0	193

DEP Units/Groups Not Operational at Full Capacity at 01/03/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ASHEVILLE 01	Reliability	181	8
ASHEVILLE 02	Reliability	184	5
ASHEVILLE CT 03	Forced Derate	118	7
ASHEVILLE CT 04	Reliability	135	50
BROAD RIVER IPP CT 02	Reliability	143	29
DARLINGTON CO. CT 02	Reliability	52	12
DARLINGTON CO. CT 03	Reserves	57	6
DARLINGTON CO. CT 06	Reserves	54	8
DARLINGTON CO. CT 08	Forced Outage*	24	42
DARLINGTON CO. CT 10	Reliability	53	12
FAYETTEVILLE CC 01	Forced Derate	225	15
MAYO 01	Reserves	710	5
NCEMC ANSON CT 01	Reserves	54	2
NCEMC ANSON CT 02	Reserves	55	1
NCEMC ANSON CT 03	Reserves	26	30
NCEMC ANSON CT 04	Reserves	54	2
NCEMC ANSON CT 05	Reserves	54	2
NCEMC HAMLET CT 01	Reserves	55	1
NCEMC HAMLET CT 04	Reserves	54	2
NCEMC HAMLET CT 05	Reserves	55	1
RICHMOND CO. CC 04	Reserves	521	19
RICHMOND CO. CT 01	Reserves	162	27
RICHMOND CO. CT 02	Reserves	157	30
RICHMOND CO. CT 03	Reserves	163	22
RICHMOND CO. CT 04	Reliability	134	52
RICHMOND CO. CT 06	Reliability	135	52
ROXBORO 02	Forced Derate	639	4
SUTTON CC PB1	Reserves	703	14
WAYNE CT 10	Reserves	182	10
WAYNE CT 11	Reserves	182	10
WAYNE CT 12	Reserves	182	11
WAYNE CT 13	Reserves	176	15
WAYNE CT 14	Reserves	182	13

Offline Units/Groups

Unit/Group	Reason	Loading	Available
3RD PARTY SOLAR	Minimal Sun	0	0
BLEWETT CT	Forced Derate	0	51
DARLINGTON CO. CT 01	Forced Outage	0	63
DARLINGTON CO. CT 04	Forced Outage	0	66
DARLINGTON CO. CT 05	Forced Outage	0	66
DARLINGTON CO. CT 07	Forced Outage	0	65
DARLINGTON CO. CT 12	Forced Outage	0	133
DARLINGTON CO. CT 13	Forced Outage	0	133
DUKE SOLAR	Minimal Sun	0	0
MARSHALL HYDRO	Maint Outage	0	0
NCEMC ANSON CT 06	Forced Outage	0	56
NCEMC HAMLET CT 02	Out of Economics	0	56
NCEMC HAMLET CT 03	Out of Economics	0	56
WEATHERSPOON CT 01	Out of Economics	0	164

DEP Units/Groups Not Operational at Full Capacity at 01/05/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ASHEVILLE 01	Reliability	185	4
ASHEVILLE 02	Reliability	185	4
ASHEVILLE CT 03	Forced Derate	119	36
ASHEVILLE CT 04	Reliability	118	67
BLEWETT CT	Forced Derate	6	26
BROAD RIVER IPP CT 02	Reliability	144	28
BROAD RIVER IPP CT 03	Reliability	165	7
BROAD RIVER IPP CT 05	Reliability	161	11
DARLINGTON CO. CT 02	Reliability	53	11
DARLINGTON CO. CT 04	Reserves	54	12
DARLINGTON CO. CT 06	Forced Outage*	1	61
DARLINGTON CO. CT 07	Reserves	55	10
DARLINGTON CO. CT 08	Reliability	54	12
DARLINGTON CO. CT 10	Reliability	60	5
DARLINGTON CO. CT 12	Reliability	80	53
DARLINGTON CO. CT 13	Reliability	110	23
FAYETTEVILLE CC 01	Reliability	242	18
MAYO 01	Reserves	709	6
NCEMC ANSON CT 01	Reserves	54	2
NCEMC ANSON CT 02	Reserves	54	2
NCEMC ANSON CT 03	Reserves	27	29
NCEMC ANSON CT 04	Reserves	54	2

NCEMC ANSON CT 05	Reserves	54	2
NCEMC HAMLET CT 01	Reserves	54	2
NCEMC HAMLET CT 04	Reserves	55	1
NCEMC HAMLET CT 05	Reserves	55	1
RICHMOND CO. CT 01	Reserves	135	54
RICHMOND CO. CT 02	Reserves	162	25
RICHMOND CO. CT 03	Reserves	161	24
RICHMOND CO. CT 06	Reliability	139	48
ROXBORO 03	Reserves	692	6
ROXBORO 04	Reserves	707	4
SUTTON CC PB1	Reserves	632	85
SUTTON CT 04	Forced Derate	43	1
WAYNE CT 10	Reserves	162	13
WAYNE CT 11	Reserves	160	15
WAYNE CT 12	Reserves	174	1
WAYNE CT 13	Reserves	174	1
WEATHERSPOON CT 01	Reserves	20	144

Offline Units/Groups

Unit/Group	Reason	Loading	Available
MARSHALL HYDRO	Maint Outage	0	0
DARLINGTON CO. CT 01	Forced Outage	0	63
DARLINGTON CO. CT 05	Out of Economics	0	66
RICHMOND CO. CT 04	Forced Outage	0	186
NCEMC ANSON CT 06	Forced Outage	0	56
NCEMC HAMLET CT 02	Out of Economics	0	56
NCEMC HAMLET CT 03	Out of Economics	0	56
SUTTON CT 05	Maint Outage	0	50

DEP Units/Groups Not Operational at Full Capacity at 01/07/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ASHEVILLE CT 03	Forced Derate	153	2
BROAD RIVER IPP CT 01	Reliability	174	6
BROAD RIVER IPP CT 02	Reliability	171	1
BROAD RIVER IPP CT 03	Reliability	151	14
DARLINGTON CO. CT 04	Reserves	53	1
NCEMC ANSON CT 01	Reserves	55	1
NCEMC ANSON CT 02	Reserves	54	2

NCEMC ANSON CT 03	Forced Derate	27	1
NCEMC ANSON CT 04	Forced Derate	26	2
NCEMC ANSON CT 05	Reserves	55	1
NCEMC ANSON CT 06	Forced Derate	26	2
NCEMC HAMLET CT 01	Reserves	55	1
NCEMC HAMLET CT 04	Reserves	55	1
RICHMOND CO. CC 04	Reserves	498	52
RICHMOND CO. CT 02	Reserve - Fuel Mgmt	115	46
RICHMOND CO. CT 06	Reserve - Fuel Mgmt	107	66
SUTTON CT 05	Reserves	43	8
WAYNE CT 10	Reserves	136	46
WAYNE CT 11	Reserves	137	42
WAYNE CT 12	Reserves	141	36
WAYNE CT 13	Reserves	136	42
WAYNE CT 14	Reserves	154	28
WEATHERSPOON CT 01	Reserves	138	26

Offline Units/Groups

Unit/Group	Reason	Loading	Available
DARLINGTON CO. CT 01	Forced Outage	0	63
DARLINGTON CO. CT 05	Forced Outage	0	59
DARLINGTON CO. CT 08	Reliability	0	0
DARLINGTON CO. CT 10	Out of Economics	0	61
MARSHALL HYDRO	Maint Outage	0	0
NCEMC HAMLET CT 02	Out of Economics	0	56
NCEMC HAMLET CT 03	Out of Economics	0	56
RICHMOND CO. CT 04	Forced Outage	0	168
SUTTON CT 04	Out of Economics	0	51

DEP Units/Groups Not Operational at Full Capacity at 01/08/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
BLEWETT CT	Maint Derate	4	64
DARLINGTON CO. CT 02	Reliability	52	2
DARLINGTON CO. CT 03	Reliability	52	1
DARLINGTON CO. CT 04	Reliability	53	1
DARLINGTON CO. CT 08	Reliability	53	7
DARLINGTON CO. CT 12	Reliability	100	20
DARLINGTON CO. CT 13	Reliability	100	10

NCEMC ANSON CT 01	Reserves	54	2
NCEMC ANSON CT 02	Reserves	54	2
NCEMC ANSON CT 03	Forced Outage	26	2
NCEMC ANSON CT 05	Reserves	16	40
NCEMC HAMLET CT 01	Reserves	55	1
NCEMC HAMLET CT 04	Reserves	55	1
NCEMC HAMLET CT 05	Reserves	55	1
RICHMOND CO. CT 01	Reserves	119	45
RICHMOND CO. CT 02	Reserves	116	45
RICHMOND CO. CT 03	Reserves	131	31
RICHMOND CO. CT 06	Reserves	105	68
SUTTON CC PB1	Forced Derate	570	13
SUTTON CT 04	Reserves	50	1
SUTTON CT 05	Reserves	50	1
WAYNE CT 10	Reserves	104	78
WAYNE CT 11	Reserves	102	77
WAYNE CT 12	Reserves	124	53
WAYNE CT 13	Reserves	157	21
WAYNE CT 14	Reserves	123	59

Offline Units/Groups

Unit/Group	Reason	Loading	Available
ASHEVILLE CT 03	Forced Outage	0	155
DARLINGTON CO. CT 01	Forced Outage	0	63
DARLINGTON CO. CT 05	Forced Outage	0	59
DARLINGTON CO. CT 06	Forced Outage	0	54
DARLINGTON CO. CT 10	Forced Outage	0	61
MARSHALL HYDRO	Maint Outage	0	0
NCEMC ANSON CT 04	Forced Outage	0	56
NCEMC ANSON CT 06	Forced Outage	0	28
NCEMC HAMLET CT 02	Out of Economics	0	56
NCEMC HAMLET CT 03	Out of Economics	0	56
RICHMOND CO. CT 04	Forced Outage	0	168

DEP Units/Groups Not Operational at Full Capacity at 01/16/18 Peak

Online Units/Groups

Unit/Group	Reason	Loading	Available
ASHEVILLE CT 03	Forced Derate	69	86
BROAD RIVER IPP CT 03	Reserves	171	1

DARLINGTON CO. CT 12	Reserves	108	25
HF LEE CC PB1	Reserves	1025	15
NCEMC ANSON CT 01	Reserves	54	1
NCEMC ANSON CT 02	Reserves	53	2
NCEMC HAMLET CT 01	Reserves	55	1
NCEMC HAMLET CT 04	Reserves	55	1
NCEMC HAMLET CT 05	Reserves	55	1
RICHMOND CO. CC 04	Reserves	532	8
RICHMOND CO. CT 01	Reserves	140	23
RICHMOND CO. CT 02	Reserves	138	21
RICHMOND CO. CT 03	Reserves	151	15
RICHMOND CO. CT 04	Forced Derate	97	38
RICHMOND CO. CT 06	Reserves	140	20
SUTTON CT 04	Reserves	50	1
SUTTON CT 05	Reserves	50	1
WAYNE CT 11	Reserves	112	70
WAYNE CT 12	Reserves	153	29
WAYNE CT 14	Reserves	160	24

Offline Units/Groups

Unit/Group	Reason	Loading	Available
BLEWETT CT	Forced Derate	0	34
BROAD RIVER IPP CT 01	Out of Economics	0	171
BROAD RIVER IPP CT 02	Out of Economics	0	165
BROAD RIVER IPP CT 04	Out of Economics	0	178
BROAD RIVER IPP CT 05	Out of Economics	0	174
DARLINGTON CO. CT 01	Forced Outage	0	63
DARLINGTON CO. CT 02	Out of Economics	0	60
DARLINGTON CO. CT 03	Out of Economics	0	59
DARLINGTON CO. CT 04	Out of Economics	0	66
DARLINGTON CO. CT 05	Forced Outage	0	66
DARLINGTON CO. CT 06	Out of Economics	0	62
DARLINGTON CO. CT 07	Out of Economics	0	65
DARLINGTON CO. CT 08	Out of Economics	0	66
DARLINGTON CO. CT 10	Forced Outage	0	65
FAYETTEVILLE CC 01	Forced Derate	0	225
HARRIS NUCLEAR 01	Forced Outage	0	0
MARSHALL HYDRO	Maint Outage	2	0
NCEMC ANSON CT 03	Out of Economics	0	56
NCEMC ANSON CT 05	Out of Economics	0	54
NCEMC ANSON CT 06	Out of Economics	0	56

NCEMC HAMLET CT 02	Out of Economics	0	56
NCEMC HAMLET CT 03	Out of Economics	0	56
WAYNE CT 10	Out of Economics	0	182
WAYNE CT 13	Out of Economics	0	177
WEATHERSPOON CT 01	Out of Economics	0	164