VERIFIED REBUTTAL TESTIMONY OF PATRICK N. AUGUSTINE

Q1. Please state your name, professional position, and business address.

A1. My name is Patrick N. Augustine. I am a Vice President in Charles River Associates' Energy Practice. My business address is 1201 F Street, NW, Washington, DC 20004.

Q2. On whose behalf are you submitting this rebuttal testimony?

A2. I am submitting this testimony on behalf of Northern Indiana Public Service Company LLC ("NIPSCO").

Q3. Are you the same Patrick N. Augustine who prefiled direct and supplemental direct testimony in this Cause?

A3. Yes.

Q4. What is the purpose of your rebuttal testimony in this proceeding?

A4. The purpose of my rebuttal testimony is to respond to the testimonies filed April 16, 2024 on behalf of the Indiana Office of Utility Consumer Counselor ("OUCC"), the Citizens Action Coalition of Indiana, Inc. ("CAC"), and the NIPSCO Industrial Group ("Industrial Group" or "IG"), as further set out below. My rebuttal

testimony is limited to a discussion of the issues set out below, and the failure to address each and every issue in each piece of testimony does not imply agreement with the positions taken by any party with respect to other issues.

Q5. Are you sponsoring any attachments to your rebuttal testimony?

A5. Yes. I am sponsoring Attachment 7-R-A, which was prepared by me or under my direction and supervision.

OVERALL OBSERVATIONS

Q6. What are your general observations regarding the testimony filed by the OUCC, CAC, and the Industrial Group?

A6. Overall, while the parties directly and implicitly challenge the size and technology composition of NIPSCO's proposed CT Project, no party has testified that NIPSCO does not have a need for the type of new capacity that was identified in its 2021 IRP and in the subsequent analyses undertaken after the submission of the IRP. In fact, the OUCC "agrees that load-following replacement generation capacity is necessary to reliably serve NIPSCO's customers"[1] and "recognizes that NIPSCO's IRP and updated analysis shows additional replacement capacity for retiring

[1] See Witness Armstrong direct testimony, p. 3, lines 17-18.

generation is needed to preserve reliability, resiliency, and stability."[2] Furthermore, the CAC points out that if recent proposed MISO market reforms are implemented, "NIPSCO likely needs more capacity starting in 2028"[3] even when assuming that the proposed CT Project enters into service. Overall, these statements affirm NIPSCO's requirement for incremental capacity, and I believe that the evidence presented in my direct testimony continues to support NIPSCO's CT Project as a required addition that will help fill this need.

Q7. Please summarize how NIPSCO's evidence continues to support NIPSCO's CT Project in light of the parties' testimony.

A7. As I outlined in my direct testimony, NIPSCO's 2021 IRP identified a preferred portfolio with new thermal peaking capacity through a comprehensive portfolio analysis that included a detailed reliability assessment. Then, as part of the IRP's short-term action plan, NIPSCO conducted a Flexible Resource Analysis to further assess market risk exposure and portfolio needs across a range of uncertainties in load, wind output, and solar output. This analysis concluded that increasing the amount of long-duration dispatchable capacity above the 300 MW identified in the

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2 See Witness Armstrong direct testimony, p. 10, lines 17-19.

3 See Witness Sommer direct testimony, p. 21 heading and Figure 1 on p. 24.

2021 IRP would contribute to risk mitigation for customers. Finally, NIPSCO's 2023 portfolio analysis demonstrated that when taking into account the latest market, policy, and technology developments, new natural gas peaking additions with characteristics similar to those of the proposed CT Project would be cost-effective for the portfolio relative to alternatives. While the parties question certain assumptions and elements of these analyses, I do not believe that their arguments or offered evidence contradict any of the key conclusions outlined in my direct testimony in support of NIPSCO's Petition. In the remainder of this rebuttal testimony, I address the parties' testimonies in relation to the 2023 portfolio analysis, the Flexible Resource Analysis, NIPSCO's future supply-demand balance, and additional analysis and considerations that were introduced.

2023 PORTFOLIO ANALYSIS

Q8. In his direct testimony, IG Witness Gorman states that, "[i]nstead of relying on a complete, or updated IRP, NIPSCO based the request for a 400 MW CT on a Flexible Resource Study ("FRS")."[4] Is this a fair characterization of the analysis

[4] See Witness Gorman direct testimony, p. 4, lines 18-19. Note that Witness Gorman calls the Flexible Resource Analysis ("FRA") introduced in my direct testimony the Flexible Resource Study or FRS.

NIPSCO undertook in support of its requested certificate of public convenience and necessity ("CPCN")?

A8. No. Witness Gorman has provided an incomplete characterization of the analysis NIPSCO performed in support of its requested CPCN. As I just summarized above and as I outlined in detail in my direct testimony, the Flexible Resource Analysis was only one component of the further diligence NIPSCO performed on the preferred portfolio from its 2021 IRP. Although the conclusions from the Flexible Resource Analysis supported and contributed to NIPSCO's sizing decision for the CT Project, NIPSCO also performed a 2023 portfolio analysis to assess the performance of alternative portfolio options against updated market conditions and the latest available information. In fact, although Witness Gorman summarizes the four major market developments since the 2021 IRP[5] that motivated NIPSCO and CRA to perform the 2023 portfolio analysis, his direct testimony neglects to address the substance of the analysis or even reference the fact that it was performed. This is puzzling, especially in light of the fact that NIPSCO has presented, and the Commission has relied upon, this same analysis post-2021 IRP to support approval of other generation projects.

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[5] See Witness Gorman direct testimony, p. 5, lines 13-18.

Q9. Please summarize again how the 2023 portfolio analysis was performed and what was evaluated.

A9. As I explained in my direct testimony, the 2023 portfolio analysis evaluated different portfolio options with the same market dispatch and financial modeling tools used by NIPSCO in its IRP and incorporating updated technology cost, market, and policy assumptions. The portfolio analysis assessed the net present value of revenue requirements over a 30-year planning horizon for three distinct portfolio concepts.[6] While CAC Witness Sommer's observation that the 2023 portfolio analysis "did not include re-optimization of capacity expansion plans to determine a lowest cost portfolio"[7] is accurate, this is not a flaw in the analysis, as a full cost accounting of a portfolio that included new gas peaking capacity relative to the viable alternatives was performed. As I explained in my direct testimony, to develop portfolio options and perform the cost analysis, NIPSCO used the preferred portfolio themes from its 2021 IRP and updated their composition

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6 For more detail, please refer to my direct testimony, pp. 27-36.

7 See Witness Sommer direct testimony, p. 17, lines 9-10.

according to the latest market information, which resulted in additional wind capacity, less solar capacity, and more thermal peaking or storage capacity.[8]

Q10. IG Witness Gorman suggests that NIPSCO failed to take into account the introduction of MISO's seasonal resource construct and that NIPSCO has not fully evaluated its resource obligations at various times of the year.[9] Is this an accurate assessment?

A10. No. As I described in my direct testimony, although MISO's seasonal construct was implemented after the submission of NIPSCO's 2021 IRP, NIPSCO anticipated this change and evaluated seasonal peak load forecasts and seasonal capacity ratings for resource options in its 2021 IRP in order to develop portfolios based on capacity requirements for both the summer and winter seasons.[10] Furthermore, NIPSCO's 2023 portfolio analysis incorporated updated seasonal reserve margin targets and seasonal accredited capacity levels that were published after FERC approved MISO's seasonal construct.[11] As explained in my direct testimony,

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8 See my direct testimony, p. 32, lines 2-5.

9 See Witness Gorman direct testimony, p. 6, lines 2-5.

10 See p. 26, lines 1-6 of my direct testimony, along with pp. 13-15, Section 4.5, Section 8.2.4, Section 9.2, and Section 9.3 of NIPSCO's 2021 IRP, which was included in my direct testimony as Attachment 7-A.

11 See p. 26, lines 7-8 of my direct testimony.

higher winter reserve margin targets contributed to higher requirements for dispatchable thermal or storage capacity additions in the 2023 portfolio analysis relative to the levels evaluated in NIPSCO's 2021 IRP.[12] This was directly accounted for in the portfolio construction.

Q11. CAC Witness Sommer indicated in her direct testimony that she did not perform independent modeling in part due to "concerns about the portfolios that were examined since they include projects that NIPSCO has canceled."[13] Is this an accurate assessment of the portfolios evaluated in the 2023 portfolio analysis?

A11. While some of the portfolios did include projects that NIPSCO has since canceled, preferred Portfolio 3 was explicitly developed to incorporate the risk of project cancellations,[14] specifically "the potential loss of four out of ten (or 700 MW of solar and 30 MW of storage) of NIPSCO's current solar and solar plus storage projects."[15] Consistent with these assumptions, NIPSCO has since filed

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[12] See p. 31, line 14, and p. 32, lines 1-5 of my direct testimony.

[13] See Witness Sommer direct testimony, p. 18, lines 11-12.

[14] See footnote 17 of my direct testimony, in which this is discussed in more detail.

[15] See my direct testimony, p. 30, lines 6-8. The details regarding the assumed project cancellations were documented by NIPSCO in Confidential Attachment A in its response to CAC Data Request 7-001, as well as in the workpapers provided in my supplemental direct testimony. As documented in NIPSCO's response to CAC Data Request 7-001, NIPSCO's analysis assumed the cancellation of the Elliott, Brickyard, Greensboro, and Gibson projects.

termination notices for these four projects[16] and has used the 2023 portfolio analysis to support replacement of these projects with incremental wind and solar capacity,[17] as explicitly modeled in preferred Portfolio 3. The Commission has since approved these projects, including relying specifically upon the 2023 portfolio analysis in doing so.[18]

Q12. OUCC Witness Hanks argues that the costs used for new peaking capacity in the 2023 portfolio analysis were artificially inflated[19] and that NIPSCO inappropriately combined the results of an all-source RFP and a technology and configuration restricted RFP.[20] How do you respond?

A12. Witness Hanks appears to misunderstand what NIPSCO requested in the two RFPs that were issued in 2022, as well as the types of bids that were received. As a result, the comparisons he attempts to make in his testimony are inappropriate. Contrary to Witness Hanks' claims, and as described and documented in

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16 Since the completion of the 2023 portfolio analysis, NIPSCO filed notices of termination for the Elliott project, the Brickyard PPA, the Greensboro PPA, and the Gibson PPA. The Gibson project now remains in NIPSCO's portfolio under a new ownership structure, although at a smaller project size.

17 NIPSCO filed a CPCN for the 200 MW Appleseed solar project and the 200 MW Templeton wind project in Cause No. 45887 and a CPCN for the 200 MW Carpenter wind project in Cause No. 45908.

18 CAC did not intervene or object to the use of the 2023 portfolio analysis to support NIPSCO's CPCNs for 400 MW of wind and 200 MW of solar in these Causes.

19 See Witness Hanks direct testimony, p. 14, lines 7-8.

20 See Witness Hanks direct testimony, p. 15, lines 13-16.

NIPSCO's response to OUCC Data Request 1-005,[21] NIPSCO's Schahfer Development or EPC RFP was not technology and configuration restricted. While NIPSCO did require a dispatchable, blackstart-capable resource at the Schahfer site with several other performance criteria as summarized by NIPSCO Witness Baacke in his direct and rebuttal testimony, no restrictions were placed on the technology and configurations that could be proposed by bidders, and bids into this RFP were used by NIPSCO and CRA to arrive at the $1,440/kW direct capital cost number I presented in my direct testimony and in the 2023 portfolio analysis.[22] *Separately*, other thermal resources were offered into NIPSCO's All-Source RFP, but did not provide the local capacity, dispatchability, and blackstart requirements NIPSCO identified in its 2021 IRP[23] and asked for in the Schahfer Development RFP. While Witness Hanks correctly notes that NIPSCO reported an average capital cost of $763/kW for these other thermal resources in its summary review of

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[21] In NIPSCO's response to OUCC Data Request 1-005, NIPSCO provided all RFP documents, including the details and bid templates associated with the Schahfer Development or EPC RFP.

[22] The Schahfer Development or EPC RFP is discussed in more detail by NIPSCO Witnesses Baacke and Warren in their rebuttal testimonies. Note that in response to CAC Data Request 1-006, NIPSCO provided all bids offered into the Schahfer Development or EPC RFP.

[23] NIPSCO's preferred plan from the 2021 IRP included local thermal peaking capacity to meet reliability requirements, as described in detail in Section 9.2.7 of the 2021 IRP, which was included in my direct testimony as Attachment 7-A. See, in particular, p. 256 where NIPSCO concluded that, "Portfolios with local thermal peaker and storage resources provide the most reliability attributes and perform best on the composite reliability score."

the All-Source RFP results, this average was based on existing or planned resources that were out of NIPSCO's service territory and did not conform to NIPSCO's requirements, particularly those associated with reliability.[24] Thus, any comparison of these costs with those from the Schahfer Development or EPC RFP would be completely inappropriate.

Q13. OUCC Witness Hanks also suggests that the capital costs for the CT Project used in your analysis understate the costs of the project by excluding indirect costs.[25] How do you respond?

A13. Mr. Hanks' criticism is misplaced. For modeling purposes, in order to ensure an "apples-to-apples" comparison with other potential resource options, only the direct costs of the project were included in my analysis. This is both commonplace and appropriate. While NIPSCO includes indirect costs in the overall project cost estimate, these costs are generally ancillary to the core project components and incorporate overheads and other internal allocations. Including these company-specific indirect costs in weighing resource options would serve only to skew the results. Also, NIPSCO's business may absorb similar indirect cost allocations for

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[24] NIPSCO provided all bids offered into the All-Source RFP in response to CAC Data Request 1-006.

[25] See Witness Hanks direct testimony, p. 6, lines 3-10.

other project types, such as the recent wind, solar, and storage acquisitions NIPSCO has made via Build Transfer Agreements. The purpose of the portfolio and revenue requirement modeling analysis I performed is primarily to compare costs of resource options; therefore, excluding indirect costs provides a direct cost comparison, which is more meaningful and is a reasonable approach.

Q14. Did NIPSCO introduce the 2023 portfolio analysis for the first time in this proceeding?

A14. No. NIPSCO relied in part on the 2023 portfolio analysis in its CPCN application for a new solar project in Cause No. 45926 (Gibson Solar), its requests for approval of three PPAs in Cause Nos. 45887 (Appleseed Solar and Templeton Wind) and 45908 (Carpenter Wind), and in its requests for changes in cost and ownership structure for various solar and solar plus storage projects in Cause Nos. 45936, 46028, and 46032, the latter two of which are still pending before the Commission.

Q15. In those proceedings where a final order has been issued, did the Commission acknowledge the role of the 2023 portfolio analysis in supporting NIPSCO's resource decisions after the submission of its 2021 IRP?

A15. Yes, the Commission acknowledged the role of the 2023 portfolio analysis in supporting NIPSCO's resource decisions in all four of the proceedings in which it

was introduced and in which the Commission has issued an Order. In its Order in Cause No. 45887, for example, the Commission stated that, "the record demonstrates that the 2023 portfolio analysis accounted for NIPSCO's ongoing resource planning and other market conditions and developments that have occurred since the 2021 IRP was completed," and that "the inclusion of this additional evidence further supports NIPSCO's request in this Cause."[26] In approving the PPAs in Cause Nos. 45887 and 45908, the Commission found that, "NIPSCO's 2021 IRP, as supplemented and supported by the 2023 portfolio analysis, is a valid basis for approval."[27] In granting NIPSCO's CPCN in Cause No. 45926 and approving NIPSCO's requests for changes to project ownership structure in Cause No. 45936, the Commission also noted that, "the evidence of record demonstrates that the 2023 portfolio analysis confirmed the direction of the preferred portfolio,"[28] and that NIPSCO's requests were "consistent with and supported by the 2021 IRP and 2023 portfolio analysis."[29] To my knowledge, none of the parties in this proceeding objected to the conclusions of the 2023 portfolio

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[26] See Commission Order in Cause No. 45887, p. 19.

[27] See Commission Order in Cause No. 45887, p. 19 and Commission Order in Cause No. 45908, p. 10.

[28] See Commission Order in Cause No. 45926, p. 20.

[29] See Commission Order in Cause No. 45936, p. 23.

analysis nor offered perspectives on the 2023 portfolio analysis contrary to those included in the Commission Orders in any earlier proceedings, and, as best as I can tell, none of the parties even acknowledge the Commission's prior statements about and reliance upon the 2023 portfolio analysis.

FLEXIBLE RESOURCE ANALYSIS

Q16. CAC Witness Sommer notes that the Flexible Resource Analysis did not quantify the cost of NIPSCO's potential market price risk exposure or compare the costs of resources that could reduce the net load exposure.[30] Is this an accurate summary of the analysis?

A16. Yes. As I explained in my direct testimony, the Flexible Resource Analysis was designed to assess the energy adequacy and flexibility characteristics of NIPSCO's preferred portfolio from the 2021 IRP and to analyze and characterize the potential for market exposure risk.[31] As Witness Sommer correctly points out, the Flexible Resource Analysis was not an economic assessment, but a means of assessing the magnitude, frequency, and duration of market exposure risk and the overall ability for NIPSCO's portfolio to be positioned to respond to evolving market

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30 See Witness Sommer direct testimony, p. 20, lines 1-2 and lines 9-10.

31 See my direct testimony, p. 19, lines 9-19 and Highly Confidential Attachment 7-D to my direct testimony.

conditions and bring its fair share of reliability attributes to the system in the face of uncertain MISO rules.

Although no comparative cost analysis was performed, in addition to the magnitude, frequency, and duration summaries provided in my direct testimony and supporting attachments, NIPSCO also provided, in response to CAC Data Request 1-008, a copy of which is attached hereto as Attachment 7-R-A, a summary of the expected timing of market exposure events of longer than four hours, which is a key metric supporting the need for dispatchable capacity with duration longer than 4-hour lithium ion battery storage resources. As illustrated in NIPSCO's response, the market exposure events were projected to be concentrated in the late evening, overnight, and early morning hours, particularly in the fall months. These periods of exposure align with MISO's own expectations of when tight hours and system-wide loss of load events are likely to occur,[32] which would also

[32] See, in particular, MISO's Market Redefinition: Accreditation Reform presentation from its November Resource Adequacy Subcommittee meeting: https://cdn.misoenergy.org/20231107-08%20RASC%20Item%2011ai%20Resource%20Accreditation%20Presentation%20(RASC-2020-4%202019-2)630757.pdf Pages 20-24 of this presentation summarize MISO's evolving perspective regarding the timing of at risk hours. A key conclusion was that, "the severity of loss of load risk is expected to shift away from Summer into Fall/Winter and nighttime hours."

coincide with periods of time with high market prices and high economic costs for NIPSCO if it lacks available resources.

Therefore, although NIPSCO did not quantify the costs of market exposure risk in the Flexible Resource Analysis, the key outcomes are supportive of the fact that additions of long-duration dispatchable capacity like the CT Project will improve reliability and reduce market exposure cost risk for customers—something CAC Witness Sommer did not challenge.

Q17. CAC Witness Sommer argues there was no evaluation of an alternative approach to mitigate potential risks identified in the Flexible Resource Analysis, such as a portfolio with battery storage and more demand response.[33] How do you respond?

A17. This is inaccurate. In addition to the resource attribute needs identified in the Flexible Resource Analysis, NIPSCO's 2023 portfolio analysis specifically evaluated a portfolio with additional battery storage resources and no new thermal peaking capacity to assess the economic tradeoffs relative to the portfolio that contained the new peaker. This analysis concluded that the portfolio with

[33] See Witness Sommer direct testimony, p. 20, lines 15-17.

new peaking capacity was lower cost for customers. NIPSCO's 2021 IRP did the same and concluded that the portfolio with new peaker capacity performed similarly or better on the cost-based metrics than a portfolio relying only on storage and best on the reliability metrics.[34] NIPSCO has performed *multiple* evaluations to assess alternative approaches and arrive at its preferred portfolio with the CT Project.

NIPSCO'S FUTURE SUPPLY-DEMAND BALANCE

Q18. IG Witness Gorman testifies that NIPSCO has failed to account for the expected changes in Rate 531 Tier 1 demand and has therefore failed to "right size" the CT Project.[35] How do you respond?

A18. First, although NIPSCO recognizes that Tier 1 commitments may decline over time, particularly after the Rate 831/531 Modification Agreement approved in Cause No. 45772, no firm declarations of commitment reductions have been made by any Rate 531 customer, and it is not certain that all seven current Rate 531 customers would elect to reduce their demand to the tariff minimum as outlined by Witness Gorman. Second, the Rate 831/531 Modification Agreement outlines

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[34] See NIPSCO's 2021 IRP, which was included in my direct testimony as Attachment 7-A, particularly the scorecard in Figure 9-42 and the reliability assessment discussion in Section 9.2.7.

[35] See Witness Gorman direct testimony, pp. 7-8.

the pace at which Rate 531 customers could reduce their commitments over a multi-year period through 2033. Until that time, *even with* the 400 MW CT Project addition, NIPSCO will likely still require additional capacity purchases or other capacity additions to meet current seasonal MISO planning requirements,[36] as well as potential future changes associated with resource accreditation rules at MISO,[37] and to meet potential future demand growth. Finally, NIPSCO's 2021 IRP did evaluate a scenario with the exact reduction in Tier 1 demand commitments suggested by Witness Gorman,[38] and NIPSCO's preferred portfolio was found to perform well under such assumptions.[39] For all of these reasons, Witness Gorman's implication that NIPSCO's evaluation of the proposed 400 MW CT Project is deficient due to a lack of consideration of Rate 831/531 Tier 1 demand changes is without merit.

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[36] See p. 9 of my supplemental direct testimony and the associated workpaper provided with my supplemental testimony.

[37] See p. 23 and 24 of CAC Witness Sommer's direct testimony.

[38] See NIPSCO's 2021 IRP, which was included in my direct testimony as Attachment 7-A, p. 54-55. In the narrative description on p. 54 of the IRP, it is noted that "NIPSCO incorporated the potential for additional industrial load migration to the new industrial rate service structure. The scenario incorporated a reduction of firm industrial load in Rate 831 down to 70 MW."

[39] See in particular Figure 9-18 and Figure 9-42 from NIPSCO's 2021 IRP, which was included in my direct testimony as Attachment 7-A, which summarize NIPSCO's cost to customer results across scenarios and NIPSCO's integrated scorecard, respectively.

Q19. CAC Witness Sommer suggests that, by 2028, NIPSCO will likely have a larger capacity need than the one you summarized in your direct and supplemental testimonies, largely driven by new MISO market rules. How do you respond?

A19. As Witness Sommer outlined, MISO filed its proposed Direct Loss of Load ("D-LOL") resource accreditation proposal with FERC in March 2024, with a plan to implement the new market design for the 2028/29 planning year. While NIPSCO will continue to study the implications of this proposed rule change on its portfolio, as Witness Sommer indicates, resource accreditations for most resource types are likely to decline, resulting in a *greater* future capacity need. Although NIPSCO's capacity obligation will also likely decline,[40] I agree with Witness Sommer's general conclusion that NIPSCO will "need to deploy additional resources"[41] even beyond the addition of the proposed CT Project.[42]

Witness Sommer proposes that battery storage and demand response resources be deployed and argues that such resources "can be added more quickly than the CT

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40 This is because times of system stress will not necessarily occur during the times when NIPSCO's load is peaking.

41 See Witness Sommer direct testimony, p. 23, lines 15-16.

42 See Figure 1 in Witness Sommer's direct testimony on p. 24, which shows a larger capacity gap than what I presented in my supplemental direct testimony, even with the New Gas Peaker included.

project can be built."[43] While development and deployment timelines will vary by resource, I will note that NIPSCO's preferred portfolio from its 2021 IRP and 2023 portfolio analysis already contemplates new battery storage and demand side management resource additions by 2028, and I expect additional capacity additions will be identified as NIPSCO continues its ongoing resource planning activities in 2024 and beyond. The pending MISO rules changes also appear to offer additional evidence in support of NIPSCO's proposed CT project. The resource is expected to be in service by the end of 2027, in advance of the 2028/29 planning year when the MISO rules are due to change, and the resource offers a firm, dispatchable addition to NIPSCO's portfolio that will help fill the existing and emerging capacity gap.

Q20. CAC Witness Sommer suggests that under the proposed D-LOL structure, battery resources will have stronger capacity accreditation than natural gas peaker resources and that NIPSCO's capacity calculations "overstate both summer and winter accreditation for the proposed natural gas peaker resource, while understating the value of battery storage resources."[44] Do you agree?

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43 See Witness Sommer direct testimony, p. 27, lines 5-6.

44 See Witness Sommer direct testimony, p. 23, lines 2-4.

A20. No. Future capacity accreditations under D-LOL remain too uncertain to definitively make such a claim, and the forward-looking information published by MISO is actually supportive of the assumptions used in NIPSCO's 2023 portfolio analysis, which included stable accreditation for gas resources and declining accreditations for four-hour battery storage resources over time. To support her argument, Witness Sommer provided MISO's calculated accreditation under the D-LOL construct for the *2023-24 planning year only* and compared it to NIPSCO's forward expectations for 2028. Although it is true that MISO reported higher accreditation for battery storage than for natural gas plants *under current conditions*, MISO has also recently provided forward-looking views for five and ten years into the future, which I have summarized in the table below.

	Planning Year 23-24[45]		MISO's "5 years out" view[46]		MISO's "10-year out" view[47]	
	Summer	Winter	Summer	Winter	Summer	Winter
Battery Storage	94%	91%	85%	92%	89%	56%
Natural Gas	88%	66%	84%	80%	84%	82%

These forward-looking views suggest that four-hour battery storage accreditations are likely to decline over time, with significant declines possible in the winter season, a season Witness Sommer acknowledges will be just as important as the summer for NIPSCO.[48] This expectation is consistent with the risks associated with four-hour battery storage accreditation I introduced in my direct testimony.[49] Therefore, although I acknowledge that there is significant uncertainty associated with future resource accreditations under the D-LOL construct, I disagree with

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45 MISO Market Redefinition: Accreditation Reform RASC Meeting from February 28, 2024: https://cdn.misoenergy.org/20240228%20RASC%20Item%2005a%20Accreditation%20Presentation%20RASC-2020-4%202019-2631885.pdf Note that this source was used to develop Table 3 in CAC Witness Sommer's direct testimony.

46 MISO Market Redefinition: Accreditation Reform RASC Meeting from January 17, 2024: https://cdn.misoenergy.org/20240117%20RASC%20Item%2007a%20Accreditation%20Presentation%20(RASC-2020-4%20and%202019-2631379.pdf Note that Witness Sommer cited this source in her direct testimony when outlining MISO's proposed Direct Loss of Load methodology.

47 Ibid.

48 See Witness Sommer direct testimony, p. 23, lines 8-11.

49 See page 35 (lines 2-6 and footnote 22, in particular) of my direct testimony in this proceeding.

Witness Sommer's statement that NIPSCO has understated the value of battery storage resources relative to natural gas.

ADDITIONAL ANALYSIS AND CONSIDERATIONS

Q21. CAC Witness Sommer performed a levelized cost analysis to compare the costs of NIPSCO's proposed CT Project with potential battery storage capacity at the existing Schahfer site to suggest that new battery additions would be lower cost than NIPSCO's proposed CT Project?[50] How do you respond to this analysis?

A21. While levelized cost analysis can be a useful way of comparing resource options, Witness Sommer's calculations were not performed correctly, nor do they replace the 2023 portfolio analysis performed by NIPSCO and CRA, which aimed to provide a more holistic comparison of NIPSCO's preferred portfolio concept versus one that relies primarily on new storage additions. Witness Sommer's analysis includes a significant calculation error and several limitations relative to the 2023 portfolio analysis:

- First, the approach Witness Sommer has taken to calculate levelized costs for new battery additions relative to the CT Project is incorrect. Rather than

[50] See Witness Sommer direct testimony, p. 28, summarized in Table 7.

levelize the upfront capital costs and then add the ongoing fixed operations and maintenance ("FOM") cost assumptions, her calculations first add the capital and FOM costs together and then perform the levelization.[51] This is incorrect, because the FOM costs she includes in the calculation are already annual numbers that should not be further levelized. Instead, this additional, incorrect levelization serves to inappropriately lower the cost of the battery storage resource relative to the CT Project.[52] If corrected, the CT Project's levelized cost would be *lower* than that of the potential battery storage projects.

- In addition, Witness Sommer's levelized cost analysis includes both direct costs and indirect costs for the CT Project, while not contemplating potential additional indirect costs for the battery storage alternative. As I discussed earlier, the 2023 portfolio analysis included only direct costs for

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[51] Calculations were summarized by Witness Sommer in a workpaper attached to her direct testimony: "CN 45947-- CAC Exhibit 1--Workpaper AS-2-CONFIDENTIAL--CT and DR Capacity Levelization CONF".

[52] This is because the battery storage project has a higher expected ongoing FOM cost than the CT Project. If the annual FOM costs were properly accounted for instead of being improperly further levelized, the reported cost of the battery storage would increase significantly. Note that Witness Sommer also failed to consider inflation in the FOM costs over the life of the project and just used the first year values.

the CT Project in an effort to provide an "apples-to-apples" comparison relative to other resource alternatives.

- Furthermore, in comparing the levelized costs of the two resource options, Witness Sommer assumes equal capacity accreditation for battery storage additions and the CT Project. While future capacity accreditation is uncertain, as I outlined in my direct testimony[53] and as I described earlier, capacity accreditation declines are likely to be more significant for battery storage, an expectation that was incorporated in the 2023 portfolio analysis but not addressed in Witness Sommer's levelized cost analysis. In other words, more nameplate battery storage capacity may be required to provide equivalent accredited capacity, and if no capacity adjustment is made in a levelized cost analysis, the resulting comparison is not complete.

- Additionally, although Witness Sommer suggests that NIPSCO did not model the possibility that new battery storage could qualify for the energy community bonus,[54] NIPSCO did in fact assume that up to 150 MW of new storage capacity would qualify for the additional energy community bonus

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53 See my direct testimony at p. 34, line 11 through p. 35, line 7.

54 See Witness Sommer direct testimony, p. 28, lines 1-4.

based on the expectation that some capacity could be sited in locations like Schahfer, even though no bidders to the 2022 RFP offered energy community-eligible storage projects.[55] Thus, although it is possible that NIPSCO could acquire more bonus credit qualifying storage capacity than was assumed, an uncertainty I acknowledged in my direct testimony,[56] the economic analysis embedded in the 2023 portfolio analysis did include a reasonable assumption for bonus ITC qualification for new storage.

- Finally, Witness Sommer's levelized cost analysis did not incorporate the potential energy value that different resource types may provide to NIPSCO's customers within the broader MISO market, something that is explicitly incorporated in the 2023 portfolio analysis via market dispatch analysis against MISO energy prices and portfolio-level cost accounting. While Witness Sommer reasonably points to the potential for greater ancillary services value for battery storage resources in her direct

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[55] In response to CAC Data Request 3-014, NIPSCO noted this assumption as follows: "Although no bidders to NIPSCO's 2022 RFP offered storage projects located within energy communities, NIPSCO and CRA made the assumption that up to 150 MW of new battery storage could be located in an energy community, such as at the Schahfer site, and receive the 10% ITC bonus and a 40% ITC for the total project cost."

[56] See my direct testimony at p. 34, line 8.

testimony,[57] her comparisons with gas peaking technology are based only on the frame combustion turbine technology evaluated in NIPSCO's 2021 IRP without consideration for potential additional value associated with faster ramping and more flexible aeroderivative turbines,[58] and her analysis does not attempt to quantify the potential energy value differences between the proposed CT Project and battery storage options.

Q22. OUCC Witness Hanks and CAC Witness Sommer both oppose NIPSCO's application in part because of the cost of the aeroderivative turbine component,[59] and Witness Hanks argues that "NIPSCO has not established that the benefits of aeroderivative units are worth the higher cost relative to industrial frame units."[60] How do you respond?

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57 I acknowledged that future ancillary services value could impact the conclusions of the 2023 portfolio analysis. See my direct testimony at p. 34, lines 6-8.

58 Note that NIPSCO's 2021 IRP evaluated four-hour lithium battery storage relative to a natural gas combustion turbine frame technology, as documented on p. 242 of NIPSCO's 2021 IRP, which was included in my direct testimony as Attachment 7-A. Note also that NIPSCO's 2021 IRP acknowledged that ancillary services value is highly uncertain. See p. 245 of NIPSCO's 2021 IRP, which noted in reference to NIPSCO's ancillary services analysis that "While these estimates provide perspective on the relative performance of various portfolio strategies, significant uncertainty exists and the realization of such benefits is dependent on market rules evolution, MISO generation mix changes, and market participant behavior."

59 See Witness Hanks direct testimony, p. 2, lines 6-10; and Witness Sommer direct testimony, p. 6, lines 21-22 through p. 7, lines 1-3 and p. 10, lines 4-9.

60 See Witness Hanks direct testimony, p. 2, lines 11-12.

A22. While NIPSCO Witnesses Baacke and Warren both discuss the rationale for NIPSCO's proposed unit configuration in more detail in both their direct and rebuttal testimonies, NIPSCO's 2021 IRP and Flexible Resource Analysis are also supportive of resource additions with the attributes of the aeroderivative turbines. In NIPSCO's 2021 IRP, the ancillary services valuation and the reliability assessment both highlighted the need for certain attributes like fast ramping capability, particularly as the MISO markets evolve.[61] In addition, NIPSCO's Flexible Resource Analysis identified growing 3-hour and 10-minute ramping requirements by 2030.[62] While these analyses did not identify specific preferred technologies, they highlighted the growing need and anticipated value of highly responsive, fast start resources for NIPSCO's portfolio and in the MISO market in general.

In addition, as explained further by NIPSCO Witness Holcomb in his rebuttal testimony, the U.S. Environmental Protection Agency released greenhouse gas emission rules for the power sector on April 24, 2024 that lay out best system of

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61 See Sections 9.2.6 and 9.2.7 in NIPSCO's 2021 IRP, which was included in my direct testimony as Attachment 7-A.

62 See, in particular, p. 9 and p. 10 of the Flexible Resource Analysis, which was included in my direct testimony as Highly Confidential Attachment 7-D.

emission reduction standards for new natural gas-fired facilities based on their capacity factor. For gas peakers like the CT Project, two capacity factor tiers will exist: units operating below 20% will need to use a low-emitting fuel like natural gas, while units operating between 20% and 40% will need to operate with an emission rate at or below 1,170 lb CO2/MWh. Based on the expected operational characteristics of NIPSCO's proposed units, the overall CT Project will be able to operate within the standards of the rule. Furthermore, given their higher efficiencies, the aeroderivative turbines will be able to more easily achieve the 1,170 lb CO2/MWh standard than the frame turbine, offering more flexibility and optionality for NIPSCO to operate the units at higher capacity factors should conditions within the MISO market make such operations beneficial for its customers.

Q23. In arguing against NIPSCO's proposed project configuration of the CT Project, OUCC Witness Sanka claims that, "[b]ase load plants come at a lower initial cost and have lower operations and maintenance ("O&M") costs compared to a peaker plant containing aeroderivative units, making them more financially viable. Therefore, in the context of a 30-year lifespan, the cost-effectiveness of using a configurated base load plant outweighs the benefits of using a

configuration containing aeroderivative technology for peaker plants."[63] How do you respond?

A23. First, Witness Sanka's definition of "base load" is not clear. This term typically refers to resources with relatively low variable operating costs that run at relatively high capacity factors. However, Witness Sanka appears to be arguing in support of the frame unit in favor of the aeroderivatives even though the frame technology has a higher heat rate, which would be expected to result in *higher* variable operating costs and *lower* capacity factors. Nevertheless, I believe that Witness Sanka's framing of the cost-effectiveness evaluation is incomplete, particularly as resource planning questions become more complex. Given growing intermittency in NIPSCO's system and MISO as a whole, traditional resource positioning into base load vs. peaking categories is being supplanted by fuller evaluations that assess energy and capacity contributions and take into account resource attributes like flexibility and fast ramping. NIPSCO's 2021 IRP and subsequent analyses have performed such assessments, as I have documented throughout my direct testimony and this rebuttal testimony.

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63 See Witness Sanka direct testimony, p. 10, lines 4-9.

Q24. CAC Witness Sommer raises concerns about the ability for intervenors to use Aurora in this proceeding, particularly with regard to its ability to execute its own simulations in Aurora.[64] How do you respond?

A24. While I cannot speak on behalf of Energy Exemplar, the licensor of the Aurora software, nor can I offer a legal opinion regarding interpretation of different clauses within the proposed limited license agreement, I can report that CRA's account manager from Energy Exemplar communicated to Witness Sommer and me via email that the intervenor license is "not 'read-only' and that the limitation is that the licenses are limited to running simulations for the purpose of the proceeding."[65] In my follow-up communication with Energy Exemplar after Witness Sommer raised her concerns, the company reiterated that acceptable use of the limited license includes running the licensed deliverables in relation to the proceeding, as specified in Exhibit A of the limited license agreement that was offered. While I recognize that different parties may be interpreting contract language differently, I know that NIPSCO and CRA are committed to continuing to work with Energy Exemplar in the 2024 IRP process, which is now ongoing, to

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64 See Witness Sommer direct testimony, p. 32.

65 Email communication from Energy Exemplar to Anna Sommer and Patrick Augustine from November 17, 2023.

provide the opportunity for stakeholders to license the model with the purpose of running independent simulations.

CONCLUSION

Q25. Based on the testimony filed in this Cause, what do you conclude?

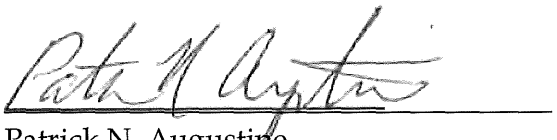
A25. Based on the testimony filed in this Cause, I continue to conclude that NIPSCO's proposed CT Project is aligned with the findings from NIPSCO's 2021 IRP, its 2023 portfolio analysis, and the Flexible Resource Analysis. While the parties have challenged certain elements of NIPSCO's proposal, they have not offered any evidence that directly contradicts NIPSCO's demonstration of a capacity need nor the core conclusions from a series of analyses that point to a resource with the characteristics of the CT Project to fill that need. Overall, the CT Project is expected to provide a firm source of year-round capacity, while effectively hedging against market exposure risk, particularly in light of emerging uncertainties associated with intermittent generation and the potential limitations associated with reliance solely on short-duration storage resources. The CT Project will help ensure key Indiana Energy Task Force pillars like reliability, resiliency, and stability are met, and it is part of an overall portfolio that is designed to be environmentally sustainable and affordable for NIPSCO's customers.

Q26. Does this conclude your prefiled rebuttal testimony?

A26. Yes.

VERIFICATION

I, Patrick N. Augustine, Vice President, Charles River Associates, affirm under penalties of perjury that the foregoing representations are true and correct to the best of my knowledge, information, and belief.



Patrick N. Augustine

Dated: May 21, 2024

Cause No. 45947
Northern Indiana Public Service Company LLC's
Objections and Responses to
Citizens Action Coalition of Indiana, Inc.'s First Set of Data Requests

CAC Request 1-008:

Re: NIPSCO Exhibit 7 (Direct Testimony of Augustine), page 23 lines 1-6. With regards to the "few dozen events of longer than four hours" that were identified in the Flexible Resource Analysis:

(a) Please identify the date and time of each of the "few dozen events of longer than four hours."

(b) Please identify and produce any estimate or projection, including supporting workpapers or modeling input and output files, of the cost of the market exposure of such events if the additional 100 – 200 MW of additional flexible capacity relative to the 2021 IRP's preferred portfolio was all 4-hour duration battery storage rather than "long-duration flexible capacity." If no such estimate or projection exists, please explain why not.

(c) Please identify and produce any analysis that NIPSCO has carried out or reviewed regarding the potential for long-duration energy storage of 10 or more hours. If NIPSCO has not carried out or reviewed any such analysis, explain why not.

(d) Please state whether NIPSCO has pursued any funding or grants from the U.S. Department of Energy or other federal agency for long-duration energy storage. If so, please explain what fundings or grants were pursued and the result. If not, please explain why not.

(e) Please state whether you evaluated the ability of increased levels of demand response, energy efficiency, and/or distributed generation to reduce the number of "events longer than four hours" identified in the Flexible Resource Analysis. If so, explain the results of such evaluation, and produce any workpapers, modeling input and output files, and other documents regarding such evaluation. If not, explain why not.

Objections:

NIPSCO objects to sub-part (c) of this Request on the grounds and to the extent that this Request solicits an analysis, calculation, or compilation which has not already been performed and which NIPSCO objects to performing.

Response:

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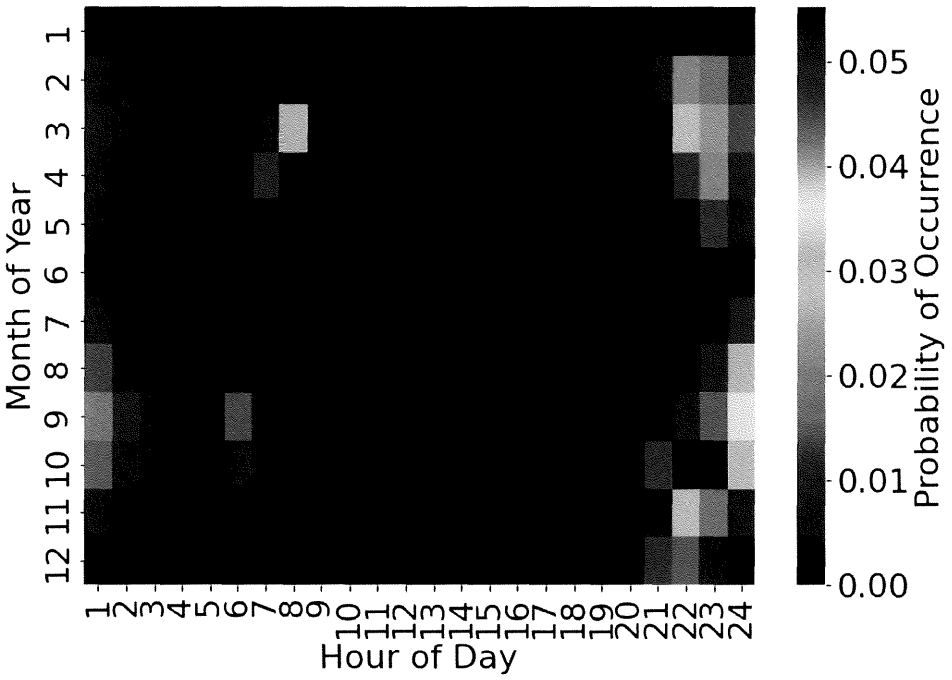
Subject to and without waiver of the foregoing general and specific objections, NIPSCO is providing the following response:

(a) The "few dozen events of longer than four hours" refer to the average number of events where net load was greater than NIPSCO's flexible capacity across the 250 simulations that were conducted, as described in more detail on page 12 of Confidential Attachment 7-D to Mr. Augustine's direct testimony. In particular, an average of 46 events of longer than four hours in duration were identified with the flexible capacity incorporated in NIPSCO's preferred portfolio from the 2021 IRP. Given the large number of total events across all iterations and the inability to provide the date and time for an "average event", the below graphic provides a plot of the probability of a 4+ hour duration net load event by month and hour.



(b) The Flexible Resource Analysis was designed to evaluate and quantify the frequency and duration of NIPSCO's potential future net load exposure based on uncertainty in sub-hourly load, wind output, and solar output. The analysis did not incorporate an evaluation of MISO market prices and was not designed to quantify the cost of the potential market exposure hours. Hence, no such estimate or projection exists.

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(c) Section 4.6.8.4 of NIPSCO's 2021 IRP identified the potential for longer duration storage technologies to "become more viable over the long-term in order to balance diurnal variations in renewable energy resources as well as variations in demand from weekends (low demand) to weekdays (high demand)." NIPSCO solicited offers for emerging technology solutions such as long-duration storage in the RFP conducted as part of the 2021 IRP and received information associated with gravity storage, flow batteries, and compressed or liquefied air storage technologies, as detailed in Section 4.6.8.5 of NIPSCO's 2021 IRP. As noted in that section, "long-duration storage RFP bids were either non-competitive or unpriced (due to technology immaturity)." Thus, long-duration storage resources were not included in NIPSCO's preferred portfolio. NIPSCO also solicited storage resource offers during its 2022 RFP and received only bids containing 4-hour storage solutions, confirming that cost and technology maturity remain limiting factors for large-scale deployment of long-duration storage in the near-term. The 2021 IRP stated that "NIPSCO will continuously evaluate the landscape of storage options, as technology advances and market conditions evolve. Although four-hour lithium-ion battery storage may comprise early additions to the portfolio, longer-duration options are likely to be considered in more detail in future IRPs." This remains true.

(d) NIPSCO has not pursued any funding or grants from the U.S. Department of Energy or other federal agency for long-duration energy storage. However, NIPSCO has a team working to evaluate the Infrastructure Investment and Jobs Act (IIJA) opportunities and pursue funding that would benefit how NIPSCO serves its customers.

(e) The Flexible Resource Analysis incorporated expectations for customer-owned distributed generation in accordance with the 2021 IRP's load forecast and new energy efficiency savings in accordance with the 2021 IRP's preferred portfolio in the development of the load uncertainty distributions. The Flexible Resource Analysis also included the NIPSCO-owned distributed storage included in the 2021 IRP's preferred portfolio in the assessment of the amount of flexible capacity expected to be in the portfolio by 2030. Beyond that, the Flexible Resource Analysis was not designed to evaluate alternative portfolio options as was done in the 2021 IRP and 2023 Portfolio Analysis, but instead provides perspective on the potential future net load exposure associated with NIPSCO's preferred portfolio coming out of the 2021 IRP. NIPSCO expects to continue to pursue increased levels of demand response, energy efficiency, and/or

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distributed generation to meet the energy adequacy and flexible resource needs identified in the Flexible Resource Analysis.