REBUTTAL TESTIMONY OF MARTIN D. DICKEY
VICE PRESIDENT, TRANSMISSION CONSTRUCTION AND MAINTENANCE
DUKE ENERGY BUSINESS SERVICES LLC
ON BEHALF OF DUKE ENERGY INDIANA, LLC
CAUSE NO. 45647
BEFORE THE INDIANA UTILITY REGULATORY COMMISSION

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is Martin D. Dickey, and my business address is 1000 East Main Street, Plainfield, Indiana 46168.

Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?

A. I am employed as Vice President, Transmission Construction and Maintenance by Duke Energy Business Services LLC, a service company subsidiary of Duke Energy Corporation, and a non-utility affiliate of Duke Energy Indiana, LLC ("Duke Energy Indiana" or "Company").

Q. ARE YOU THE SAME MARTIN D. DICKEY THAT PRESENTED DIRECT TESTIMONY IN THIS PROCEEDING?

A. Yes, I am.

Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?

A. I am responding to the testimony of Indiana Office of Utility Consumer Counselor ("OUCC") witness Dr. Casey A. Shull. Specifically, I will address Dr. Shull's testimony regarding transmission system redundancy, hardening, resiliency, and the need for specific transmission projects.

Q. DR. SHULL'S TESTIMONY SEEMS TO INDICATE THAT IT IS A NEGATIVE THAT DUKE ENERGY INDIANA'S TRANSMISSION SYSTEM IS ALREADY HIGHLY REDUNDANT. IS THIS ACCURATE?

A. No. Our Bulk Electric System ("BES") is designed to be highly redundant in order to maintain reliability for all of the downstream customers served by those transmission lines. I believe Dr. Shull's testimony takes only a portion of a sentence from my direct testimony out of context.

The BES is the highest voltage portion of the transmission system, consisting of the transmission lines and equipment operating above 100kV and serving to transmit large amounts of power throughout the system. The BES is subjected to mandatory reliability standards published and administered by the North American Electric Reliability Council ("NERC") under the authority of the Federal Energy Regulatory Commission. These standards require sufficient redundancy within the BES so it can continue operating even when one or more elements of the system are out of service. The BES's redundancy and ability to withstand an outage of an element without resulting in outages to distribution customers was illustrated by the wind-caused failure of 345kV towers described in my direct testimony.

The 69kV transmission lines and equipment are not part of the BES but are transmission lines that deliver power to many of the distribution substations. The level of redundancy in the 69kV portion of the transmission system, and its ability to withstand an outage of an element of the system without resulting in customer outages, is different from the BES. Duke Energy Indiana's 69kV lines typically run from a circuit breaker in one source substation to a circuit breaker in another source substation, with several distribution substations fed along the circuit in a "daisy chain" fashion. These two sources to the circuit provide a certain level of redundancy. These 69kV circuits are typically operated with a normally-open switch at some point along the circuit. A fault within a segment of such a 69kV line will often result in an outage to the substations and distribution circuits between the circuit breaker and the normally-open switch, until the faulted section can be identified and the switches along the line opened or closed to isolate the faulted section and restore power to the substations from the un-faulted portions of the circuit.

Q. WHAT IS YOUR RESPONSE TO DR. SHULL'S ASSERTION THAT ADDITIONAL REDUNDANCY IS UNNECESSARY TO IMPROVE RELIABILITY?

A. Dr. Shull appears to misunderstand my direct testimony. When I stated in my direct testimony that Duke Energy Indiana's TDSIC 2.0 plan intended to "increase our resiliency by adding redundant capabilities," I was not referring to an effort to add additional redundant circuits or make other large-scale projects to build additional redundancy into the BES. Nor was I referring to a large-scale redesign of the 69kV transmission system to increase it to the level of redundancy contained in the BES.

Rather, my testimony explains that there are targeted projects within TDSIC 2.0 that address specific existing "single point of failure" vulnerabilities. For example, a short 69kV radial tap feeding a substation that cannot be isolated and restored through switching if a line fault occurs on that tap. In several projects, we plan to slightly change the line route to "loop through" the substation so there is no portion of the transmission line that would prevent restoring power to the substation. Looping through the substation in this manner allows the transmission line to be "sectionalized" by operating switches to isolate a faulted section of the line and to restore the electric supply to the substation in the event of a line outage. Switches installed within the substation can also be equipped with remote monitoring and control more easily than switches located on the transmission line at a distance from the substation. Substation switches are also inspected during the periodic substation "rounds" inspections to identify and repair any developing issues.

These types of targeted investments are intended to improve the reliability of our system for our customers, and do not create unnecessary or wasteful redundancy.

Q. WHAT IS YOUR RESPONSE TO DR. SHULL'S CONCERN REGARDING 69KV TRANSMISSION PROJECTS BEING UNNECESSARY AND LACKING SUPPORTING EVIDENCE?

A. I disagree that our 69kV transmission projects are unnecessary and lack supporting evidence. The "redundancy" that is present in most of the 69kV transmission system can be described as providing the ability to feed a substation from either of two sections of transmission line and the ability to transfer from one of those sections to the other, when one section must be de-energized for any reason. Transmission line outages can be caused by a number of things including vehicles striking the poles, debris being blown into the lines, and high winds, in addition to failure of components of the line such as the poles, crossarms, insulators or conductors. Most outages that occur on the transmission line are confined within a single section of the transmission line and the ability to transfer a substation's transmission source between two transmission line sections allows the faulted section of the line to be isolated by opening switches on either side of the faulted section and the power restored to the substation by closing other switches to supply it from other lines. Locating and repairing the cause of the outage to the section of the 69kV circuit may require the faulted section of the line to be de-energized for many hours. The ability to sectionalize the transmission line and restore power to the substations it feeds allows the outage duration that customers experience to be reduced to the amount of time required to perform the switching.

Outage information related to eleven projects included in TDSIC 2.0 shows that for the period 2015 – 2021 there were 273 outages overall, totaling 11.78 million retail and wholesale customer minutes interrupted ("Grid CMI"), on the transmission lines being evaluated. This data provides the full outage picture, as opposed to the attachment referenced in Dr. Shull's testimony (OUCC Attachment CAS-2 pg. 2). Nonetheless, if these transmission lines did not include sufficient redundancy to allow sectionalizing and restoring the outages, the CI and Grid CMI experienced by the customers fed from these lines would have been many times worse. Investments proposed in TDSIC 2.0 will allow Duke Energy Indiana to reduce transmission line outages and Grid CMI.

Q. DO YOU AGREE WITH WITNESS SHULL'S RECOMMENDATION TO REMOVE CERTAIN TRANSMISSION LINE PROJECTS FROM TDSIC 2.0? PLEASE EXPLAIN.

A. No. TDSIC 2.0 includes eleven projects associated with the seven 69kV circuits that Dr. Shull recommends be removed. Eight of these projects are to rebuild aged and deteriorated sections of the circuits and three of the projects are to replace and upgrade specific switches located within other segments of the circuits. These circuits directly supply a total of 25 substations operated by Duke Energy Indiana plus 11 substations owned by others. Due to the length and complexity of these circuits it is impractical to rebuild the entire circuit on a single project nor in a single year. Therefore, each of these circuits was selected to be rebuilt over a number of distinct projects spread across multiple years. These specific circuits were selected based on a number of factors including the longer-term history of outages, assessed age and condition of the poles and other equipment, the circuit being constructed using an outdated design that is susceptible to failure of wood crossarms, and other prioritizing factors. Rebuild projects were, for all but one of these circuits, included in TDSIC 1.0, and the projects included in TDSIC 2.0 continue this longer-term effort to address remaining sections of these lines.

These circuits were selected as being among the highest outage concerns, and ongoing outage history supports the need to continue rebuilding the remaining sections of these lines. The need to continue the rebuild projects on these circuits is illustrated by the fact that these circuits experienced a total of 273 outages resulting in 11.78 million Grid CMI from 2015-2021. TDISC 2.0 will allow Duke Energy Indiana to continue reduce the number of outages on these circuits.

Furthermore Dr. Shull's stated reasons for recommending removing these projects are incorrect and inaccurate, as I will explain below. Duke Energy Indiana has evaluated and selected each of these transmission line rebuild projects to improve reliability to the customers supplied by those transmission lines by reducing the risk of outages caused by failure of their aged and deteriorated line equipment, and continues to be convinced that performing these projects is in the best interest of our customers.

Dr. Shull states that "DEI failed to provide empirical evidence or support regarding the public convenience and necessity requiring the replacement or rehabilitation of these transmission lines to improve reliability." (Shull Testimony, p.7) This is false. Each of the projects included in TDSIC 2.0 was evaluated within the model and study performed by Black & Veatch ("B&V"). For each project, the anticipated reliability benefit was quantified using models based upon the "Interruption Cost Estimator" methodology, which is used and accepted industry-wide. Each project showed a strong reliability improvement due to reduced quantity and duration of outages. The evaluated reliability benefit justifies and validates the public convenience and necessity of these projects.

Q. DR. SHULL CLAIMS THESE PROJECTS DO NOT QUALIFY "AS A SYSTEM MODERNIZATION," HOW DO YOU RESPOND?

A. Dr. Shull states that "there are no capacity changes or other upgrades to qualify these projects as a system modernization." (Shull Testimony, p.7) This is false. Although these projects have been initiated and selected primarily to improve reliability, as was explained to Dr. Shull during the February 3, 2022 meeting between Duke Energy Indiana and the OUCC, the circuits will be rebuilt to the current Duke Energy standard, which will provide capacity increases between approximately 27% and 123% because the current standard conductor size is larger than the existing conductors on the circuit. The rebuilt lines will also upgrade and modernize the line by installing "optical groundwire" ("OPGW") as the static shield wire. OPGW includes fiberoptic communications fibers within the shield wire to allow digital telecommunications from one end of the circuit to the other to support modernized protective relaying for the line plus monitoring and control of the substations and their included equipment.

Q. DR. SHULL CLAIMS DUKE ENERGY INDIANA HAS "FAILED TO SHOW THESE LINES HAVE DETERIORATED AND REQUIRE REPLACEMENT," HOW DO YOU RESPOND?

A. This assertion is incorrect. In response to OUCC 5.1 (OUCC Attachment CAS-2 pg. 1) Duke Energy Indiana provided the results from the most recent pole inspection cycle for these circuits. The transmission line rebuild projects that Dr. Shull recommended for removal from the plan had a condition-based recommendation for pole replacement rate that was two times higher (8%) than the average of Duke Energy's transmission system overall. Additionally, when these transmission lines are rebuilt using our current standard of light-duty steel poles, reliability and resiliency will be increased for decades to come.

Dr. Shull states that "DEI provides no evidence that these specific projects result in CI (Customers Interrupted) or CMI reduction or improved reliability" and "there is no justification for including these projects at their project cost." (Shull Testimony, p.7) This is false. The B&V study evaluated these projects and showed significant reliability improvements and that the resulting value of those improvements exceeds and justifies the projected project costs. Although not expressed directly as CI or CMI reduction, the B&V model used to evaluate and prioritize projects for inclusion in TDSIC 2.0 showed these projects to have significant reliability benefits, averaging 4.1 times the cost of the projects.

Q. CAN TRANSMISSION OUTAGES RESULT IN MORE CMI THAN DISTRIBUTION OUTAGES AND WILL TDSIC 2.0 HELP MITIGATE CMI DUE TO TRANMISSION LINE OUTAGES, PLEASE EXPLAIN?

A. Yes, transmission line outages can result in more CMI than distribution outages and TDSIC 2.0 will help mitigate CMI associated with those outages. Most transmission circuits supply multiple substations and each of those substations in turn may supply multiple distribution circuits. Therefore, any outage to the transmission circuit will inherently increase CI, as opposed to an outage on a single distribution circuit. CMI is the product of the number of customers interrupted and the duration of the outage, and a transmission circuit outage will therefore typically show a much larger CMI than an outage on a distribution circuit. The higher the CI from a transmission line outage actually justifies the need for the transmission system reliability investments proposed in TDSIC 2.0. Rebuilding transmission lines and other transmission equipment replacement projects are targeted to reduce the likelihood or probability that these higher-CI transmission interruptions may occur. The redundancy and ability to isolate faulted elements of the transmission system and restore power through alternate transmission paths then allows minimizing CMI of outages that do occur.

Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes, it does.

VERIFICATION

I hereby verify under the penalties of perjury that the foregoing representations are true to the best of my knowledge, information and belief.

Signed: ______________________ Dated: March 4, 2022
Martin D. Dickey