

**SOUTHERN INDIANA GAS AND ELECTRIC COMPANY
d/b/a CENTERPOINT ENERGY INDIANA SOUTH
(CEI SOUTH)**

**DIRECT TESTIMONY
OF
STEPHEN R. RAWLINSON
DIRECTOR, ELECTRIC ENGINEERING**

ON

**ELECTRIC CAPITAL INVESTMENTS
AND
ELECTRIC SYSTEM RELIABILITY PERFORMANCE**

**SPONSORING PETITIONER'S EXHIBIT NO. 4,
ATTACHMENTS SRR-1 THROUGH SRR-6**

DIRECT TESTIMONY OF STEPHEN R. RAWLINSON

1 I. **INTRODUCTION**2 **Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

3 A. My name is Stephen R. Rawlinson. My business address is 1 North Main Street,
4 Evansville, Indiana 47711.

5 **Q. BY WHOM ARE YOU EMPLOYED?**

6 A. I am employed by Southern Indiana Gas and Electric Company d/b/a CenterPoint
7 Energy Indiana South (“CEI South”, “Petitioner”, or “Company”), which is an indirect
8 subsidiary of CenterPoint Energy, Inc.

9 **Q. ON WHOSE BEHALF ARE YOU SUBMITTING THIS DIRECT TESTIMONY?**

10 A. I am submitting testimony on behalf of CEI South.

11 **Q. WHAT IS YOUR ROLE WITH RESPECT TO PETITIONER CEI SOUTH?**

12 A. I am Director, Electric Engineering.

13 **Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.**

14 A. I received a Bachelor of Science degree in Mechanical Engineering Technology from
15 Southern Illinois University at Carbondale in 1990. In 2005, I acquired certification as
16 a North American Electric Reliability Corporation (“NERC”) system operator at the
17 reliability coordinator credential level.

18 **Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.**

19 A. I began my career with CEI South¹ in 1996 and since then, have held positions of
20 increasing responsibility within Electric Engineering and System Operations. Prior to
21 becoming Director of Electric Engineering in February 2019, I was Chief Engineer of
22 Electric Engineering. Before that, I held management positions within Electric
23 Engineering and Transmission System Operations.

¹ For the sake of clarity, my testimony refers to CEI South, even though in certain situations, I may be referring to Southern Indiana Gas and Electric Company operating under a prior assumed business name.

1 **Q. WHAT ARE YOUR PRESENT DUTIES AND RESPONSIBILITIES AS DIRECTOR,**
2 **ELECTRIC ENGINEERING?**

3 A. I am responsible for Electric Engineering and Capital Program Management. My
4 specific responsibilities include electric transmission, substation and distribution
5 engineering, electric capital program management, electric system planning, and
6 electric system asset management.

7 **Q. HAVE YOU EVER TESTIFIED BEFORE THE INDIANA UTILITY REGULATORY**
8 **COMMISSION (“COMMISSION”)?**

9 A. Yes, I have routinely provided testimony before the Commission in CEI South’s semi-
10 annual filings in Cause No. 44910 related to the Transmission, Distribution, and
11 Storage System Improvement Charge (“TDSIC”) and its 2017 – 2023 Electric TDSIC
12 Plan (the “2017 – 2023 TDSIC Plan” or “44910 TDSIC Plan”), most recently for Cause
13 No. 44910 TDSIC 13. I also provided testimony before the Commission in Cause No.
14 45894 in support of CEI South’s request for approval of its 2024 – 2028 Electric TDSIC
15 Plan (the “2024 – 2028 TDSIC Plan” or “45894 TDSIC Plan”).

16 **II. PURPOSE & SCOPE OF TESTIMONY**

17 **Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY IN THIS PROCEEDING?**

18 A. I will discuss the electric capital investments CEI South is including in this Cause.
19 Specific to capital investments, I will: (1) discuss the capital investment planning
20 process for CEI South transmission and distribution (“T&D”) infrastructure; (2) describe
21 the capital investments completed since CEI South’s last electric Rate Case (Cause
22 No. 43839), referred to hereinafter as “non-TDSIC” investments; (3) describe the
23 capital investments completed to date associated with CEI South’s 2017 – 2023
24 TDSIC Plan; and (4) describe capital investments planned through 2025, including
25 those associated with CEI South’s 2024 – 2028 TDSIC Plan as well as other non-
26 TDSIC capital investments to improve system performance, support public
27 improvement projects, or support new business for the electric T&D system. In
28 addition, I will discuss the electric reliability performance of CEI South’s system.

29 **Q. ARE YOU SPONSORING ANY ATTACHMENTS IN THIS PROCEEDING?**

30 A. Yes. I am sponsoring the following attachments in this proceeding:

- 1 • Petitioner’s Exhibit No. 4, Attachment SRR-1: CEI South 2017 – 2023 TDSIC
2 Plan Investments
- 3 • Petitioner’s Exhibit No. 4, Attachment SRR-2: CEI South 2024 – 2028 TDSIC
4 Plan
- 5 • Petitioner’s Exhibit No. 4, Attachment SRR-3 (CONFIDENTIAL): CEI South
6 July 1, 2009 – December 31, 2022 Non-TDSIC Large Capital Investments
- 7 • Petitioner’s Exhibit No. 4, Attachment SRR-4: CEI South 2023 T&D Capital
8 Investment Plan Summary
- 9 • Petitioner’s Exhibit No. 4, Attachment SRR-5: CEI South 2024 T&D Capital
10 Investment Plan Summary
- 11 • Petitioner’s Exhibit No. 4, Attachment SRR-6: CEI South 2025 T&D Capital
12 Investment Plan Summary

13 **Q. WERE THESE ATTACHMENTS PREPARED BY YOU OR UNDER YOUR**
14 **SUPERVISION?**

15 A. Yes, they were.

16 **III. BACKGROUND**

17 **Q. PLEASE DESCRIBE CEI SOUTH’S ELECTRIC UTILITY OPERATIONS.**

18 A. The Company owns, operates, and maintains approximately 4,600 miles of 12.5
19 kilovolt (“kV”) distribution overhead circuits; 2,600 miles of 12.5kV distribution
20 underground circuits; 566 miles of 69kV transmission lines; 416 miles of 138kV
21 transmission lines; 64 miles of 345kV transmission lines; 112 substations; various
22 communication systems; and approximately 800 megawatt (“MW”) of generation² to
23 serve approximately 150,000 customers in seven counties in southwestern Indiana.
24 CEI South maintains transmission interconnections with five neighboring entities,
25 including Duke Energy Indiana, Louisville Gas and Electric, Big Rivers Electric Corp.,
26 Hoosier Energy, and AES Indiana (Indianapolis Power and Light).

² As discussed in greater detail by Petitioner’s Witness F. Shane Bradford, A.B. Brown Units 1 and 2 ceased operations in October 2023, and the two new Combustion Turbines approved in Cause No. 45564 (A.B. Brown Units 5 and 6), are under construction and expected to be in-service by mid-2025 to replace the capacity from A.B. Brown Units 1 and 2.

1 **Q. ARE CEI SOUTH’S ELECTRIC TRANSMISSION AND DISTRIBUTION ASSETS IN**
2 **GOOD OPERATING CONDITION AND NECESSARY TO PROVIDE SAFE AND**
3 **RELIABLE SERVICE TO ITS CUSTOMERS?**

4 A. Yes. CEI South has been safely, reliably, and effectively providing electric service to
5 the area for decades and maintains its transmission and distribution electric systems
6 in good operating condition through maintenance optimization, timely asset
7 replacements, opportune construction of new assets in compliance with industry
8 regulations, prudent investment strategy, and leveraging available operational
9 information. A key component of the recent capital investments has been the TDSIC
10 mechanism, which has allowed CEI South to invest in projects aimed at maintaining
11 and improving the electric system’s reliability and modernization.

12 **Q. PLEASE DESCRIBE CEI SOUTH’S CAPITAL INVESTMENT PLAN (“CIP”) AND**
13 **THE CAPITAL INVESTMENTS INCLUDED IN THIS CAUSE.**

14 A. CEI South’s CIP consists of the ongoing programs and projects (“capital investments”)
15 executed to maintain and improve its assets. For purposes of this proceeding, my
16 testimony will focus on, and address, capital investments in the electric transmission
17 and distribution infrastructure, and briefly cover other general capital such as fleet and
18 facilities made after June 30, 2009³ – the date of rate base cutoff from CEI South’s last
19 electric Rate Case (the “43839 rate base cutoff”) – through the date of the projected
20 rate base cutoff in this proceeding, December 31, 2025.⁴ This will include investments
21 made, in progress, or planned for 2023 through 2025. My testimony will separate the
22 investments into two groups: (1) non-TDSIC investments made, in progress, or
23 planned from the 43839 rate base cutoff date through December 31, 2025; and (2)
24 TDSIC-related investments made, in progress, or planned from January 1, 2017
25 through December 31, 2025. Discussion of TDSIC investments from 2017 through
26 2025 will be brief as programs and projects included within CEI South’s two TDSIC
27 Plans have been discussed in detail in the semi-annual TDSIC (or commonly referred
28 to as “TDSIC-x”) filings in Cause No. 44910 and the Company’s evidence in Cause
29 No. 45894. With respect to the non-TDSIC capital investments, while my testimony

³ Cause No. 43839 (IURC April 27, 2011), p. 3. CEI South’s rate base cut off was June 30, 2009.

⁴ For a details related to other capital investments within CEI South’s CIP made, in progress, or planned, from July 1, 2009 through December 31, 2025, please refer to Petitioner’s Witness Ronald W. Bahr who addresses investments related to information technology; and Petitioner’s Witness Bradford who addresses investments related to generation and federal mandate.

1 and attachments focus primarily on the larger capital investments (\$1 million or more),
2 the Company is including all non-TDSIC investments made, in progress, or planned
3 from July 1, 2009 through December 31, 2025 for recovery in this Cause.

4 **Q. YOU INDICATE THAT YOUR TESTIMONY WILL ADDRESS INVESTMENTS MADE,**
5 **IN PROGRESS, OR PLANNED FOR 2023 THROUGH 2025. WHAT PROCEDURES**
6 **ARE IN PLACE TO ENSURE THAT THE AMOUNT REFLECTED AS UTILITY**
7 **PLANT IN SERVICE ON CEI SOUTH’S BOOKS AND RECORDS REPRESENTS**
8 **THE ACTUAL COST OF UTILITY PLANT IN SERVICE AS OF A GIVEN DATE?**

9 A. CEI South maintains continuing property records using a structured capital work order
10 process and plant accounting application. Work orders are created for each project in
11 the plant accounting application and are approved by management before costs are
12 incurred and construction is initiated. The construction work order procedure ensures
13 the cost of new construction is not transferred to utility plant in service until verification
14 the assets are in service. This verification is accomplished when field operating
15 personnel submit to plant accounting a report listing the actual quantities of the
16 property units installed. Similarly, CEI South has a retirement work order procedure
17 that assures property is removed from utility plant in service when the plant accounting
18 department, upon receipt from field operations, processes documentation that the
19 retirement work is completed.

20 **Q. PLEASE DESCRIBE THE COMPANY’S TDSIC.**

21 A. TDSIC Plans are governed under Ind. Code ch. 8-1-39 (the “TDSIC Statute”). The
22 Company’s first TDSIC Plan covers the seven-year period of January 1, 2017 through
23 December 31, 2023, and was approved by the Commission on September 20, 2017
24 (the “44910 TDSIC Plan”). The final year of the seven-year 44910 TDSIC Plan is 2023
25 and will be within the \$446.5 million program cap. Within the 44910 TDSIC Plan, CEI
26 South had focused its investment on proactively replacing aging, high-risk equipment
27 throughout its electric system. The 44910 TDSIC Plan investments, covering the
28 timeframe between January 1, 2017 and April 30, 2023, have been approved and are
29 included in CEI South’s semi-annual TDSIC 1 through TDSIC 13 filings. On February
30 1, 2024, CEI South will file TDSIC 14, covering the timeframe between May 1, 2023
31 through December 31, 2023. CEI South will reconcile TDSIC 13 and TDSIC 14 from
32 Cause No. 44910 in a future TDSIC tracker filing.

1 The Company’s second TDSIC Plan, docketed as Cause No. 45894, was filed with
2 the Commission in May 2023 and covers the five-year period of January 1, 2024
3 through December 31, 2028 (the “45894 TDSIC Plan”). The proposed scope of the
4 45894 TDSIC Plan includes \$454 million dollars of planned investments. Additional
5 details on the 44910 and 45894 TDSIC Plans are provided in Petitioner’s Exhibit No.
6 4, Attachments SRR-1 and SRR-2. The TDSIC Statute provides that the utility must
7 file a general rate case prior to the conclusion of a TDSIC plan, and this general rate
8 case satisfies that obligation for the 44910 TDSIC Plan, as described in further detail
9 by Petitioner’s Witnesses Chrissy M. Behme and Matthew A. Rice.

10 **Q. DOES CEI SOUTH’S ANNUAL TRANSMISSION AND DISTRIBUTION CIP**
11 **INCLUDE PROJECTS AND PROGRAMS OUTSIDE OF THE TDSIC PLANS?**

12 A. Yes, capital investments that fall outside of the TDSIC Plans are required on an
13 ongoing basis. The CIP includes recurring investments that generally fall in the
14 categories of (1) customer growth and new business projects; (2) T&D facility
15 relocations for public improvement projects; (3) customer outage restoration costs
16 from significant weather events; (4) dusk to dawn and municipal street lighting projects;
17 (5) metering infrastructure; (6) other system improvement projects; (7) office buildings
18 and other facilities; (8) fleet equipment; (9) general tools and equipment; and (10)
19 technology investments (or intangible plant). Later in my testimony, I will describe how
20 the Company forecasts and manages these recurring investments on an annual basis.
21 While the CIP may include other non-TDSIC capital investments that do not qualify as
22 recurring investments, these types of projects are managed within the recurring
23 investment categories described above. An example of this would be Midcontinent
24 Independent System Operator (“MISO”) cost shared projects, which are managed
25 within the non-TDSIC transmission category of investment. I will discuss the non-
26 TDSIC investments later in my testimony and will provide further information relative
27 to MISO cost shared projects.

28 **IV. CAPITAL INVESTMENT PLANNING PROCESS**

29 **Q. PLEASE EXPLAIN HOW THE CAPITAL INVESTMENT PLAN IS DEVELOPED.**

30 A. CEI South performs an annual budgeting process that includes various internal
31 stakeholders from field operations, fleet, facilities, finance, and engineering to develop

1 and maintain the capital investment plan. Electric Engineering has overall
2 responsibility for the comprehensive T&D capital investment plan.

3 The process begins with a review and update of the ten-year, high-level capital budget
4 that incorporates projected available capital funding targets. The ten-year budget is
5 primarily populated with spending categories and “program” investments – such as
6 TDSIC, new business, system improvement, and public improvement – rather than
7 specific individual projects. High level adjustments are made to years six through ten,
8 while years one through five are reviewed and revised, incorporating additional detail
9 in the spending categories such as specific known individual capital projects, where
10 applicable or available.

11 The capital investment plan is managed at total Plan and Program level, not at an
12 individual project or work order level. The projects that fall within the annual capital
13 investment plan are reviewed a year in advance of construction and updated
14 accordingly based on final project scope, material costs, and construction bids. This
15 review can result in adjustments to the individual program and project costs and in
16 aggregate may impact the annual capital investment plan.

17 **Q. DOES CEI SOUTH MANAGE ITS CAPITAL INVESTMENTS AT THE PROJECT OR**
18 **WORK ORDER LEVEL?**

19 A. While CEI South endeavors to manage costs at the work order level, various factors
20 make this challenging. For example, many of the assets to be replaced were installed
21 decades ago and historical information can be incomplete; environmental conditions
22 vary; unforeseeable conflicts arise with below-ground facilities; site restoration and
23 traffic control requirements vary, etc. Construction bids also have significant influence
24 on project cost management. Bids generally are in close alignment with estimated
25 labor, but in some cases can be significantly higher or lower than estimated labor due
26 to resource constraints, industry climate, perceived work order complexity, etc. This
27 can result in adjustments to individual work order estimates and may, in the aggregate,
28 impact the annual investment plan to account for increased or reduced work order
29 costs, i.e., work orders may be postponed, or other work orders added based upon
30 overall bid results.

1 CEI South also endeavors to manage TDSIC, other system improvement, public
2 improvement, and new business work orders at both project and work order levels –
3 balancing the need for individual work orders against the annual budget for those
4 categories of work. As described previously, the budgets for these categories are
5 based primarily on historical data. Variance of actual expenditures from the capital
6 investment plan, while typically small, can be significant in any given year due to
7 external factors such as the state of the economy, housing market, interest rates,
8 individual state budgets, etc.

9 **Q. PLEASE DESCRIBE HOW CEI SOUTH MANAGES CAPITAL INVESTMENTS**
10 **ASSOCIATED WITH PUBLIC IMPROVEMENT AND NEW BUSINESS PROJECTS.**

11 A. Public improvement and new business projects are initiated by customers or other
12 third parties. As such, the Company must perform new business and public
13 improvement projects that meet specific criteria. For example, new business projects
14 that are subject to the Commission’s line extension rules are completed regardless of
15 whether the new business budget has been exceeded. Similarly, in most cases,
16 relocation of electric infrastructure in support of public improvement projects must be
17 performed to facilitate the completion of the road, sewer, or like projects executed for
18 the public good and to minimize the risk of damage to electric facilities resulting from
19 the public project. Most electric distribution facilities are located in public rights-of-way,
20 so efforts are made through conflict analysis and collaboration with the public entity to
21 adjust the public project plans to minimize the required relocation of the electric
22 facilities where possible.

23 **Q. PLEASE DESCRIBE HOW CEI SOUTH MANAGES CAPITAL INVESTMENTS**
24 **ASSOCIATED WITH FLEET AND FACILITIES.**

25 A. A functional fleet and adequate facilities are necessary to support the Company’s
26 construction, and operation and maintenance of its infrastructure. When evaluating
27 capital investments for these assets, CEI South uses a total quality approach to sustain
28 an adequate operational environment for employees to meet the needs of the
29 organization, including providing equipment and a workplace that allows for the
30 attraction and retention of talent.

31 CEI South maintains and monitors vehicles and other mobile equipment to ensure long
32 and useful lives. It is necessary to periodically replace vehicles and equipment due to

1 age, economics, or condition; and the Company monitors vehicle mileage, condition,
2 and operating costs to optimize replacement timing. The Company's various building
3 structural, mechanical, and electrical systems are evaluated, maintained, and replaced
4 based on age, functionality, and condition to ensure that they remain reliable for both
5 daily and 24-hour/7-day per week operations.

6 **Q. PLEASE DESCRIBE HOW CEI SOUTH MANAGES ACTUAL RECURRING**
7 **CAPITAL INVESTMENTS DURING EACH YEAR RELATIVE TO THE CAPITAL**
8 **INVESTMENT PLAN OF PROJECTED RECURRING INVESTMENTS, WITH THE**
9 **UNDERSTANDING THAT INVESTMENT PRIORITIES EMERGE DURING THE**
10 **YEAR THAT MAY NOT BE SPECIFICALLY IDENTIFIED IN THE PLAN.**

11 A. CEI South endeavors to manage the recurring⁵ investments on target to the
12 established budget for each activity by increasing/decreasing the number of individual
13 tasks completed when possible. Some recurring investments such as installation of
14 new customer service lines may be less or more than the budgeted annual amount
15 due to economic factors outside of the Company's control. For example, a strong
16 market for residential housing construction may increase the number of services
17 requested and installed, resulting in more actual expenditures than budgeted for this
18 activity. To summarize, this work is managed to the established budgets for each
19 activity, but spending may be adjusted based on changes in risk or priority determined
20 throughout the year.

21 **V. NON-TDSIC CAPITAL INVESTMENTS IN THIS CAUSE: JULY 1, 2009 –**
22 **DECEMBER 31, 2022**

23 **Q. PLEASE PROVIDE AN OVERVIEW OF THE INFORMATION PROVIDED IN**
24 **PETITIONER'S EXHIBIT NO. 4, ATTACHMENT SRR-3 (CONFIDENTIAL): CEI**

⁵ As mentioned earlier in my testimony, the capital investment plan may include non-TDSIC capital investments that do not qualify as recurring investments; however, these types of projects are managed within the recurring investment categories described above. Therefore, for simplification, I only use the word recurring; however, this section also applies to those non-recurring investments that are also non-TDSIC as applicable.

1 **SOUTH JULY 1, 2009 – DECEMBER 31, 2022 NON-TDSIC LARGE CAPITAL**
2 **INVESTMENTS.**

3 A. **Attachment SRR-3(CONFIDENTIAL)** provides a summary of the larger non-TDSIC
4 capital investments placed in service after the 43839 rate base cutoff date of June 30,
5 2009 through December 31, 2022. The cost threshold for the projects listed in
6 **Attachment SRR-3 (CONFIDENTIAL)** is generally those that exceed \$1 million;
7 however, exceptions may exist based on project type and scope. As I previously
8 testified, while generally only larger non-TDSIC capital investments are described on
9 **Attachment SRR-3 (CONFIDENTIAL)**, the Company is including all non-TDSIC
10 investments made, in progress, or planned from July 1, 2009 through December 31,
11 2025 for recovery in this Cause.

12 **Q. PLEASE IDENTIFY AND DESCRIBE THE MORE SIGNIFICANT DISTRIBUTION-**
13 **RELATED, NON-TDSIC CAPITAL ADDITIONS CONSTRUCTED FROM JULY 1,**
14 **2009 THROUGH DECEMBER 31, 2022 INCLUDED IN THIS CAUSE.**

15 A. Electric distribution investments typically fall into the following seven categories: (1)
16 wood pole replacements; (2) aging infrastructure projects that replace or rebuild
17 existing distribution lines or distribution substation equipment; (3) distribution line and
18 substation expansion projects based on planning analysis of future load conditions;
19 (4) customer growth projects; (5) storm restoration; (6) dusk to dawn or street lighting
20 projects; and (7) metering infrastructure. Examples of these distribution investments
21 are discussed in more detail below in my testimony and provided in **Attachment SRR-**
22 **3 (CONFIDENTIAL).**

23 Wood pole inspection and replacement represents a significant on-going capital cost
24 for CEI South’s electric distribution system. Wood poles are inspected on an ongoing
25 basis (as an industry standard practice) and are replaced proactively through CEI
26 South’s wood pole inspection and replacement program. The wood pole inspection
27 and replacement program targets ten percent of the pole population for inspection
28 annually. CEI South selected the initial circuits for the first ten-year inspection cycle,
29 which began in 2016, by reviewing and evaluating a mix of meter count, meter density,
30 circuit performance (by worst performing), and pole age. These inputs were weighted
31 and ranked accordingly. After the first ten-year cycle, future inspection circuits will be
32 determined based on lapse in time, rotating annually based on a ten-year inspection
33 cycle. The next ten-year cycle of inspections begins in 2026.

1 The inspection and replacement program differentiates serviceable poles from end-of-
2 life poles. End-of-life poles are scheduled for replacement; and serviceable poles are
3 treated with fumigant to extend life and reduce ongoing insect damage. Wood poles
4 are also replaced reactively when failures occur due to age, weather, public (vehicle)
5 damage, and other circumstances. A failed pole creates a much longer time to restore
6 customer outages and also creates safety issues and potential property damage
7 depending on where it falls and whether the transformers, other facilities or foreign
8 attachments associated with the failed pole are also damaged if it falls. This potentially
9 causes additional issues for those customers the failed pole serves. Historically, the
10 wood pole inspection and replacement program has had both capital and O&M
11 associated with the program. However, in recent years, the majority of program costs
12 have been capital.

13 Prior to the implementation of CEI South’s electric TDSIC Plans, the wood pole
14 inspection and replacement program was included in CEI South’s normal annual
15 system improvement budget. Costs associated with the Company’s wood pole
16 inspection and replacement program were later requested and approved to be
17 included in CEI South’s 44910 TDSIC Plan. From January 1, 2017 through October
18 31, 2017, the Company invested \$4.1 million in the wood pole program, and those
19 capital investments were subsequently included for recovery in the 44910 TDSIC 1
20 and TDSIC 2 tracker filings. In 2018, due to an Indiana Supreme Court decision which
21 impacted the TDSIC statute, the Company removed the costs associated with the
22 wood pole inspection and replacement program from its 44910 TDSIC Plan and
23 thereafter included the capital investments associated with the wood pole program in
24 the non-TDSIC category of projects I am describing. These non-TDSIC capital costs
25 are included in this Cause and summarized in **Attachment SRR-3 (CONFIDENTIAL)**.

26 Aging infrastructure and unplanned equipment failures also drive significant capital
27 reinvestment in CEI South’s electric distribution system. Examples of non-TDSIC
28 aging infrastructure projects from **Attachment SRR-3 (CONFIDENTIAL)** include Work
29 Order 100100182 Northwest Substation Transformer #1 replacement; and Work Order
30 19202701016012 Lynnville Substation Transformer #1 Replacement. Both of these
31 projects were required to reactively replace failed equipment at existing substations.

1 Customer growth and load expansion also drives significant capital investment in the
2 distribution system. Examples of this from **Attachment SRR-3 (CONFIDENTIAL)**
3 include Work Order 09202701016012 Bergdolt Rd Electric Distribution Substation;
4 Work Order 101904393 Anderson Rd Distribution Substation; and Work Order
5 18202701016026 Toyota South Distribution Substation. The Bergdolt Road
6 distribution substation addition was required due to commercial and industrial load
7 growth in the area immediately south of the Evansville Regional Airport. The Anderson
8 Road distribution substation addition was driven largely from residential load growth
9 in Warrick County. The Toyota South distribution substation addition was driven by
10 industrial load growth and expansion at Toyota’s vehicle manufacturing plant in Gibson
11 County.

12 Storm restoration costs represent another significant on-going capital cost on the
13 electric distribution system. Severe weather events occur on an annual basis within
14 CEI South’s service territory, and CEI South has a duty to timely respond to customer
15 outages that occur from these events. Examples of significant storm restoration costs
16 from **Attachment SRR-3 (CONFIDENTIAL)** include Work Order 14585401078011
17 Storm Restoration May 9, 2014; and Work Order 104525278 August 1 Level III Storm
18 in 2022. CEI South defines a Level I disaster as short duration with restoration of
19 service completed in less than 12 hours, affecting isolated areas that can be handled
20 by the normal work force of the organization. Level II disaster is defined as moderate
21 damage that can be repaired and all service restored in 12 to 36 hours, requiring the
22 assistance of personnel from other departments and possibly contract crews. A Level
23 III disaster is severe damage that will require over 36 hours to restore all electric
24 service, requiring help from outside crews and other departments’ personnel.

25 Dusk to dawn or street lighting is also a driver of capital investment on the distribution
26 side. This type of investment can occur from asset replacement due to failure, requests
27 from local municipalities for new installations, or other customer requested decorative
28 lighting, dusk to dawn lights or flood lights. One example of this type of capital work
29 provided in **Attachment SRR-3 (CONFIDENTIAL)** is Work Order 585476001, which
30 is a blanket work order that captures these types of costs in the Evansville area.

1 In addition, as further discussed in the Direct Testimony of Petitioner’s Witness Amy
2 L. Folz, the Advanced Metering Infrastructure (“AMI”) Project,⁶ including Work Orders
3 17203101056012 and 17203101056013, represents one of the largest stand-alone
4 distribution-related capital investments included in this Cause.

5 Another non-TDSIC distribution-related capital investment is the Advanced
6 Distribution Management System (“ADMS”) project. This project was initially proposed
7 as part of the 44910 TDSIC Plan but was removed as agreed upon in the 44910
8 Settlement Agreement. CEI South performed this work outside of the TDSIC program
9 and the project went into service in 2018. The project is not included in **Attachment**
10 **SRR-3 (CONFIDENTIAL)**. Petitioner’s Witness Bahr provides information related to
11 the ADMS Consolidation Investment.

12 **Q. PLEASE IDENTIFY AND DESCRIBE THE MORE SIGNIFICANT TRANSMISSION**
13 **RELATED NON-TDSIC CAPITAL ADDITIONS CONSTRUCTED FROM JULY 1,**
14 **2009 THROUGH DECEMBER 31, 2022 INCLUDED IN THIS CAUSE.**

15 A. Electric transmission investments generally fall into three categories: (1) aging
16 infrastructure projects that replace or rebuild existing transmission lines or
17 transmission substation equipment; (2) transmission expansion projects based on
18 planning analysis of future load conditions and post-contingency system performance;
19 and (3) customer growth projects.

20 Two examples of aging infrastructure projects included in **Attachment SRR-3**
21 **(CONFIDENTIAL)** are Work Order 13202701058012 Y33 Mt. Vernon to Benton
22 Corner; and Work Order 14202701058027 Y33 Rebuild Benton Corner to New
23 Harmony. These adjacent segments of the Y33 wood pole transmission line were
24 reconstructed due to deteriorating condition and reliability performance issues. The
25 reconstructed line was brought to current engineering design, utilizing Corten
26 weathering steel alloy monopoles. Additionally, the line was retrofitted with Optical
27 Ground Wire (“OPGW”), providing improved fiber optic communication capability for
28 use with high-speed relay protection, Supervisory Control and Data Acquisition
29 (“SCADA”), and other applications.

⁶ Costs incurred for the AMI project were approximately \$37 million, which is less than the cap set forth in the Stipulation and Settlement Agreement approved by the Commission in Cause No. 44910 (the “44910 Settlement Agreement”).

1 Examples of transmission expansion projects included in **Attachment SRR-3**
2 **(CONFIDENTIAL)** are Work Order 13202701018028 Leonard Rd Substation; and
3 Work Order 13202701058017 Y32 Loop Mead Johnson to Leonard Rd. These projects
4 were completed in conjunction with each other. The Leonard Road Substation addition
5 provided increased transmission reliability performance in the vicinity of the City of Mt.
6 Vernon and the State of Indiana Southwind Maritime Port. The area surrounding the
7 City of Mt. Vernon is the most highly industrialized in CEI South’s electric service
8 territory. The Leonard Road Substation added an additional interface between existing
9 138kV and 69kV transmission lines in the area and provided improved transmission
10 switching capability and reliability performance. The Y32 looping project was a new
11 transmission line addition that originated at the Leonard Road Substation and
12 terminated at the Mead Johnson (now AstraZeneca) Park Substation. Prior to the
13 looping project, the Mead Johnson Substation was served from a radial transmission
14 line tap. Prior to these upgrades, the loss of the radial 69kV transmission placed the
15 Mead Johnson Substation at substantial risk of an extended outage.

16 A recent example of a customer driven transmission project included in **Attachment**
17 **SRR-3 (CONFIDENTIAL)** is Work Order 100078546 Kaiser Substation. Alcoa Power
18 Generating, Inc. (“Alcoa”) previously owned and operated the Warrick rolling facility.
19 In 2021, Kaiser Aluminum acquired the aluminum rolling facility from Alcoa; the
20 aluminum rolling facility produces specialized aluminum sheet products. CEI South
21 worked with Alcoa and Kaiser to separate Kaiser’s electrical load from Alcoa’s Warrick
22 smelting and power plant (the “Kaiser Project”), using existing and new CEI South
23 infrastructure to provide redundant 138kV feeds for Kaiser’s aluminum rolling facility.

24 **Q. PLEASE IDENTIFY AND DESCRIBE THE MORE SIGNIFICANT MISO COST**
25 **SHARED TRANSMISSION PROJECTS CONSTRUCTED FROM JULY 1, 2009**
26 **THROUGH DECEMBER 31, 2022.**

27 A. As part of its regional transmission planning obligation and associated MISO
28 Transmission Expansion Plan (“MTEP”), MISO identifies transmission upgrades that
29 generate shared benefits for its stakeholders. MISO’s project identification and
30 justification criteria, cost sharing methodology, and project execution methodology has
31 changed over time. Prior to 2013, MISO approved certain Baseline Reliability Projects
32 (“BRPs”) as cost shared projects. Since 2013, MISO has retired the BRP project
33 classification and currently uses the following classifications for cost shared projects:

1 Market Efficiency Projects (“MEPs”), Multi-Value Projects (“MVPs”), Targeted MEPs
2 (“TMEPs”), Interregional MEPs (“IMEPs”), and Generator Interconnection Projects
3 (“GIPs”). MISO collects and allocates costs for shared projects based on the cost
4 allocation methodology that is established at the time of MISO project approval.
5 Detailed information on MISO’s procedures relative to these project types can be found
6 in the MISO Tariff.⁷

7 As a MISO Transmission Owner, CEI South has participated in the construction of
8 certain MISO cost shared projects. Examples included in **Attachment SRR-3**
9 **(CONFIDENTIAL)** consist of Work Order 07202758044 AB Brown to BREC Reid
10 345kV (BRP project type); Work Order 12202701058022 Z84-3 Duff Substation to IPL
11 Petersburg Uprate (MEP project type); and Work Order 18202701018025 Duff
12 Substation Terminal for Duff to Coleman 345kV (MEP project type). MISO cost shared
13 projects are commonly referred to as MISO Regional Expansion Criteria and Benefits
14 (“RECB”) projects in **Attachment SRR-3 (CONFIDENTIAL)**. MISO cost shared
15 projects are excluded from CEI South’s rate base and revenue requirement as non-
16 jurisdictional as discussed by Petitioner’s Witness Behme.

17 **Q. PLEASE IDENTIFY AND DESCRIBE THE MORE SIGNIFICANT FACILITIES-**
18 **RELATED NON-TDSIC CAPITAL ADDITIONS FROM JULY 1, 2009 THROUGH**
19 **DECEMBER 31, 2022 INCLUDED IN THIS CAUSE.**

20 A. Work Order 17A57501000041, included in **Attachment SRR-3 (CONFIDENTIAL)**, is
21 a new 15,500 square foot combined gas/electric training center constructed for CEI
22 South personnel at the pre-existing Bergdolt operations storage/training site in
23 Evansville. This facility is centrally located within CEI South’s service territory, used
24 property CEI South had already owned, and was constructed to provide facilities for
25 both classroom and hands-on instruction for electric training in a controlled
26 environment. Locating the training center in a centralized location allows for reduced
27 travel time for the Company’s technicians attending training, thus maximizing their
28 productivity. The costs for this project were shared with the gas utility, and the only
29 costs related to this facility included in this Cause are those costs allocated to the
30 electric utility.

⁷ <https://www.misoenergy.org/legal/tariff/>.

1 Also included in **Attachment SRR-3 (CONFIDENTIAL)** is Work Order 102840859
2 Boonville Lower Garage and Lot; and Work Order 20A57501000020 2020 Boonville
3 Operating Center Garage – both of which involve investments completed at the
4 Boonville operating center to enhance crew productivity and material storage
5 capabilities. The lower garage and lot improvements were completed to allow
6 personnel to store a larger variety of stock poles, thus avoiding unnecessary trips to
7 remote storage yards. These upgrades also improved the operating center’s ability to
8 store materials in racks off the ground for a longer shelf life and improved the general
9 flow of the Company’s storage area for safer working conditions for our employees
10 driving in the lot. The construction of the main operating center garage has allowed
11 employees to park trucks inside as well as improve the storeroom areas in the
12 operating center. The costs for this project were shared with the gas utility, and the
13 only costs related to these facilities included in this Cause are those costs allocated to
14 the electric utility.

15 **Q. PLEASE IDENTIFY AND DESCRIBE THE FLEET-RELATED, NON-TDSIC**
16 **CAPITAL ADDITIONS FROM JULY 1, 2009 THROUGH DECEMBER 31, 2022**
17 **INCLUDED IN THIS CAUSE.**

18 A. Examples of CEI South’s fleet investments can include (1) light trucks and other
19 vehicles for moving materials, tools, and personnel; (2) insulated utility bucket trucks
20 for multipurpose overhead work; (3) derrick-digger trucks for setting padmounted
21 equipment and poles; (4) trenching equipment; and (5) other miscellaneous equipment
22 such as forklifts, cable pulling equipment, and equipment trailers. Vehicles and other
23 mobile equipment are maintained and monitored to ensure long and useful lives. It is
24 necessary to periodically replace vehicles and equipment due to age, economics, or
25 condition; the Company monitors vehicle mileage, condition, and operating costs to
26 optimize replacement timing. **Attachment SRR-3 (CONFIDENTIAL)** captures some
27 of the larger fleet investments for the referenced time period.

1 VI. **TDSIC PLAN OVERVIEW AND RELATED CAPITAL INVESTMENTS**

2 Q. **PLEASE SUMMARIZE WHAT CEI SOUTH HAS ACCOMPLISHED THROUGH ITS**
3 **INVESTMENTS UNDER ITS FIRST TDSIC PLAN – THE 44910 TDSIC PLAN.**

4 A. As mentioned earlier in my testimony, the Company’s first TDSIC Plan, the 44910
5 TDSIC Plan, was approved by the Commission on September 20, 2017 and covers
6 the seven-year period of January 1, 2017 through December 31, 2023. CEI South is
7 in its final year of the seven-year 44910 TDSIC Plan, which evaluated asset health
8 and condition and focused its investment on proactively replacing aging infrastructure
9 and high-risk equipment; as well as improving reliability and modernization of the
10 electric system. The processes created and implemented during the execution of the
11 44910 TDSIC Plan have led to positive understandings and overall improvements
12 across all areas of the work plan with CEI South’s Electric Program Management
13 Team providing oversight of the TDSIC Plan, and collaborating, cross-functionally,
14 across CEI South from project design through completion. Several noteworthy
15 accomplishments from CEI South’s 44910 TDSIC Plan through the end of 2022
16 include:

- 17 • Substation Power Transformers Replaced – 36
- 18 • Substation Circuit Breakers Replaced – 135
- 19 • SCADA Systems Upgraded – 51
- 20 • Miles of Distribution Overhead Circuit Rebuilt – 223.3
- 21 • Miles of Distribution Underground Circuit Rebuilt – 124.1
- 22 • Distribution Line Transformers Replaced – 3,275
- 23 • Distribution Structures Replaced/Installed – 8,671
- 24 • Miles of Transmission Circuit Rebuilt – 133.6
- 25 • Miles of Transmission Optical Ground Wire Installed – 163.2
- 26 • Transmission Structures Replaced/Installed – 2,637

27 In addition, at the end of the seventh year of CEI South’s 44910 TDSIC Plan, all the
28 4kV circuits will have been converted to 12.5kV.

29 Please refer to Petitioner’s Exhibit No. 4, **Attachment SRR-1** for a summary of the
30 44910 TDSIC Plan investments by filing period and program through TDSIC 13.

1 Q. PLEASE SUMMARIZE THE COMPANY’S SECOND TDSIC PLAN – THE 45894
2 TDSIC PLAN – AND ASSOCIATED PROGRAMS.

3 A. CEI South filed its second TDSIC Plan in May 2023, which covers a five-year period
4 of January 1, 2024 through December 31, 2028. As explained earlier in my testimony
5 and discussed in greater detail by Petitioner’s Witness Rice, the 45894 TDSIC-related
6 investments CEI South has included for recovery in this Cause will only be those
7 TDSIC-related investments made, in progress, or planned through December 31, 2025
8 – the date of the projected rate base cutoff in this proceeding. The remaining years of
9 the 45894 TDSIC Plan (i.e., January 1, 2026 through December 31, 2028) will be
10 included in CEI South’s semi-annual 45894 TDSIC-x filings and the next ensuing rate
11 case – the one filed after this Cause. CEI South’s 45894 TDSIC Plan is designed to
12 cost-effectively maintain and enhance CEI South’s grid reliability and resiliency,
13 manage life-cycle investments from aging equipment, and modernize CEI South’s grid
14 for long-term customer benefit while continuing to deliver service safely. The 45894
15 TDSIC Plan consists of approximately \$454 million in planned investments across
16 seven different Programs, including:

- 17 • Distribution 12kV Circuit Rebuild
- 18 • Distribution Underground Rebuild
- 19 • Distribution Automation
- 20 • Wood Pole Replacement
- 21 • Transmission Line Rebuild
- 22 • Substation Rebuild
- 23 • Substation Physical Security

24 **Attachment SRR-2** provides the annual and total five-year capital investment included
25 in the 45894 TDSIC Plan. A description of each Program can be found below:

26 **Distribution 12kV Circuit Rebuild Program:** includes the replacement of: (a)
27 obsolete and aged conductors, within a protection zone, with higher capacity and
28 stronger aluminum cables, (b) aging wood poles with poles based on current, more
29 robust material standards, and (c) other hardware and equipment as needed to satisfy
30 current engineering and material standards designed to improve reliability. In addition,
31 CEI South will incorporate looping (circuit ties) with modern switches, where
32 applicable, that will improve grid resilience by providing alternate feeds for
33 reenergizing customers during extended outages.

1 **Distribution Underground Rebuild Program:** involves the replacement of
2 deteriorating underground (“UG”) bare concentric neutral cable with jacketed cable.
3 The program also includes the replacement of aged conductors, within a protection
4 zone, with conductor that meets current engineering and material standards. In
5 addition, CEI South will incorporate looping that will improve grid resilience by
6 providing alternate feeds for reenergizing customers during extended outages.

7 **Distribution Automation (“DA”) Program:** consists of installing DA capable
8 equipment to allow automatic switching of customers during an outage event. This
9 type of equipment can be opened and closed remotely from CEI South’s Control Room
10 allowing for reduced mobilizations to return the system to normal conditions. The
11 program includes new reclosers, communication devices, and other supporting
12 equipment. The associated communication and automation can be leveraged in the
13 future to enable more complex schemes to manage the evolving distribution system
14 to accommodate electric vehicles (“EVs”) and distributed energy resources (“DERs”).

15 **Wood Pole Replacement Program:** includes a wood pole treatment and replacement
16 program that utilizes inspection data of approximately 11,000 poles annually with the
17 flexibility to address urgent and emergent situations as those are identified.

18 **Transmission Line Rebuild Program:** involves rebuilding aging transmission line
19 sections to reduce the risk of failure, taking into consideration future communication
20 and capacity needs. Projects can include reconductoring, wood to steel pole
21 conversions, and Optical Ground Wire (“OPGW”) installation. The deployment of
22 OPGW (or fiber optic communications) facilitates substation to substation and
23 substation to control center communication, and is used in a variety of communications
24 use cases including high-speed protective relaying, SCADA, and backhaul for
25 corporate network traffic from power generation locations, service centers,
26 substations, etc.

27 **Substation Rebuild Program:** consists of rebuilding and replacing obsolete and/or
28 end of life substation equipment. Assets replaced include transformers, breakers,
29 relays, communications, and others. Modernized substation engineering designs and
30 material standards facilitate both flexibility and optionality to manage a modern grid.

1 **Substation Physical Security Program:** addresses the evolving security threat at
2 the Company’s substation facilities by investing in additional security measures.

3 **VII. FIVE PILLARS**

4 **Q. ARE YOU FAMILIAR WITH HOUSE ENROLLED ACT 1007, CODIFIED AS IND.**
5 **CODE § 8-1-2-0.6, WHICH BECAME EFFECTIVE JULY 1, 2023 AND DECLARED,**
6 **“DECISIONS CONCERNING INDIANA’S ELECTRIC GENERATION RESOURCE**
7 **MIX, ENERGY INFRASTRUCTURE, AND ELECTRIC SERVICE RATEMAKING**
8 **CONSTRUCTS MUST CONSIDER” CERTAIN ATTRIBUTES COMMONLY**
9 **REFERENCED AS THE “FIVE PILLARS”?**

10 **A.** Yes. I reviewed the Five Pillars utilities need to consider when submitting various types
11 of petitions, filings, plans, and reports with the Commission.

12 **Q. PLEASE DESCRIBE THE FIVE PILLARS.**

13 **A.** The five attributes commonly referenced as the “Five Pillars” are:

- 14 (1) Reliability,
15 (2) Resiliency,
16 (3) Stability,
17 (4) Affordability, and
18 (5) Environmental sustainability.

19 Pursuant to the Commission’s General Administrative Order (“GAO”) 2023–04, each
20 electric utility must include information, discussions, and/or evidence regarding the
21 Five Pillars in its case-in-chief for any case filed with the Commission concerning the
22 utility’s electric generation resource mix, energy infrastructure, and/or electric service
23 ratemaking constructs, including base rate cases submitted to the Commission after
24 June 30, 2023.

25 Electric system **reliability** is the adequacy and operational reliability of electric utility
26 service. The first concept, adequacy, includes the ability of the electric system to
27 supply electrical demand and energy requirements of its end users at all times, taking
28 into account scheduled and reasonably expected unscheduled outages. The second
29 fundamental concept of reliability is operational reliability, which is the electric system’s
30 ability to withstand sudden disturbances, such as electric short circuits or

1 unanticipated loss of system components. Electric system **resiliency** describes
2 the ability of a system or its components to adapt to changing conditions,
3 withstand disruptions and off-nominal events, and rapidly recover. Electric
4 system **stability** describes the ability of the system to maintain a state of equilibrium
5 during normal and abnormal conditions or disturbances and deliver a stable source of
6 electricity, in which frequency and voltage are maintained within defined
7 parameters, consistent with industry standards. For a discussion of the definitions
8 and information related to CEI South’s proposed actions and considerations
9 related to **affordability** and **environmental sustainability**, please refer to the
10 Direct Testimony of Petitioner’s Witnesses Richard C. Leger, Bradford, and Rice.

11 **Q. PLEASE EXPLAIN THE RELIABILITY AND MODERNIZATION ASPECTS OF CEI**
12 **SOUTH’S TDSIC PLANS.**

13 A. The 44910 TDSIC Plan represented a good step forward towards better reliability and
14 modernization of assets by replacing aging infrastructure, but there remains a need to
15 continue replacing other aging infrastructure that was not included in the 44910 TDSIC
16 Plan. The same need for modernizing older assets with assets that incorporate the
17 latest technology and ensure system reliability still exists.

18 The 45894 TDSIC Plan is designed to maintain and enhance CEI South’s grid
19 reliability and resiliency, manage life-cycle investments from aging equipment, and
20 modernize CEI South’s grid for long-term customer benefit while continuing to deliver
21 service safely. Replacing aging infrastructure and implementing new or upgraded
22 technology that was not previously available allows the Company to better serve its
23 customers in a safer way for them, the public, and those that work on the electric
24 system. In particular, replacement of aging infrastructure to address the causes of
25 outages, equipment failures, brief interruptions, and enhance controls around
26 distribution and transmission lines and substation equipment benefits customers in the
27 long-term by increasing overall safety and reliability. Where applicable CEI South also
28 incorporated looping into projects that will improve grid resilience by providing
29 alternate feeds for reenergizing customers during extended outages. By investing in
30 the assets to ensure proper life-cycle management, the system should provide
31 reduced future reactive/restorative costs to customers from aging equipment failures.
32 By proactively replacing those assets, the Company will maintain and improve

1 reliability by lowering the number of outages that customers experience during blue
2 sky days, extreme weather events, and unexpected system changes. The projects that
3 have been identified to replace aging assets are designed based on updated
4 engineering and material standards that help meet the needs for today and the needs
5 of the future grid. Grid flexibility and optionality are key aspects of the Company’s
6 overall modernization strategy. A modernized grid will position CEI South to better
7 meet its customers’ future energy needs by ensuring electric reliability and providing
8 a flexible, resilient, secure, sustainable, and adaptable platform for DER integration
9 and other consumer benefits.

10 **Q. PLEASE EXPLAIN THE GRID HARDENING AND RESILIENCY ASPECTS OF CEI**
11 **SOUTH’S TDSIC PLANS.**

12 A. CEI South recognizes hardening as the ability for the electric system to physically
13 withstand damages from severe weather or extreme events. Resiliency is one of the
14 outputs from a hardened system, but resiliency is also impacted by the modernization
15 of the system assets. A modernized system is a smarter system and allows the grid to
16 react faster and more effectively to severe events. While a more hardened system
17 helps prevent damage, a resilient system facilitates quicker recovery when those
18 damages or outages do occur.

19 A direct benefit of replacing aging assets that have surpassed or are nearing their end
20 of life is avoiding outages caused by those assets failing. The Company’s engineering
21 and construction standards have evolved over time since those initial assets were put
22 into service. The newer standards provide a more hardened system leading to better
23 resiliency through severe events such as weather. Two examples are larger poles
24 (moving from Class 4 to Class 2) that have more stringent loading standards and larger
25 wire that is thicker in diameter that adds strength and capacity to the system. Other
26 updated standards in substation design include the adding of redundancy for station
27 power, Direct Current (“DC”) panels, and trip coils on breakers and circuit switchers.
28 Updated engineering material standards, including replacement of bare concentric
29 underground cable with jacketed cable, and replacement of electro-mechanical relays
30 with microprocessor relays, have also added to system hardening and resiliency.

1 Targeted investments in resiliency and modernization programs have a direct result in
2 improving system hardening and resiliency. All seven of the Programs in the TDSIC
3 Plan support resiliency and hardening of CEI South’s electric system and overall grid.
4 The replacement of aging assets near or past their expected life with assets meeting
5 newer engineering and material standards will enhance the hardening of our
6 distribution and transmission system. Modernization projects, such as distribution
7 automation, SCADA upgrades, microprocessor relay upgrades, and optical ground
8 wire installation increase flexibility and functionality of the overall electric system.
9 These projects also help promote self-healing and fault isolation that leads to better
10 resiliency during events.

11 **VIII. 2023 – 2025 CAPITAL INVESTMENT PLANS**

12 **Q. PLEASE SUMMARIZE THE COMPANY’S 2023 TRANSMISSION AND**
13 **DISTRIBUTION CAPITAL INVESTMENT PLAN FORECASTED FOR 2023 AND**
14 **INCLUDED IN THIS CAUSE.**

15 A. For 2023, CEI South forecasted \$142 million in capital expenditures for electric
16 transmission and distribution infrastructure, fleet, and facilities, of which approximately
17 45%, or \$64 million, is comprised of TDSIC projects identified in the Cause No. 44910
18 TDSIC Plan and approved in the Commission’s September 20, 2017 Order. The
19 remaining \$78 million is comprised of non-TDSIC new business, public improvement,
20 storm restoration, system improvement, fleet, and facilities. Petitioner’s Exhibit No. 4,
21 **Attachment SRR-4** – CEI South’s 2023 T&D Capital Investment Plan Summary –
22 provides the 2023 capital expenditures by major category.

23 **Q. PLEASE SUMMARIZE THE COMPANY’S 2024 TRANSMISSION AND**
24 **DISTRIBUTION CAPITAL INVESTMENT PLAN FORECASTED FOR 2024 AND**
25 **INCLUDED IN THIS CAUSE.**

26 A. For 2024, CEI South forecasted \$132 million in capital expenditures for electric
27 transmission, distribution, and substation infrastructure, fleet, and facilities, of which
28 approximately 65%, or \$86 million, is comprised of TDSIC projects identified in the
29 Cause No. 45894 TDSIC Plan, which is pending before the Commission. The
30 remaining \$46 million was forecasted for non-TDSIC new business, public
31 improvement, storm/restoration, system improvement, fleet, and facilities. Petitioner’s

1 Exhibit No. 4, Attachment SRR-5 – CEI South’s 2024 T&D Capital Investment Plan
2 Summary – provides the 2024 capital expenditures by major category.

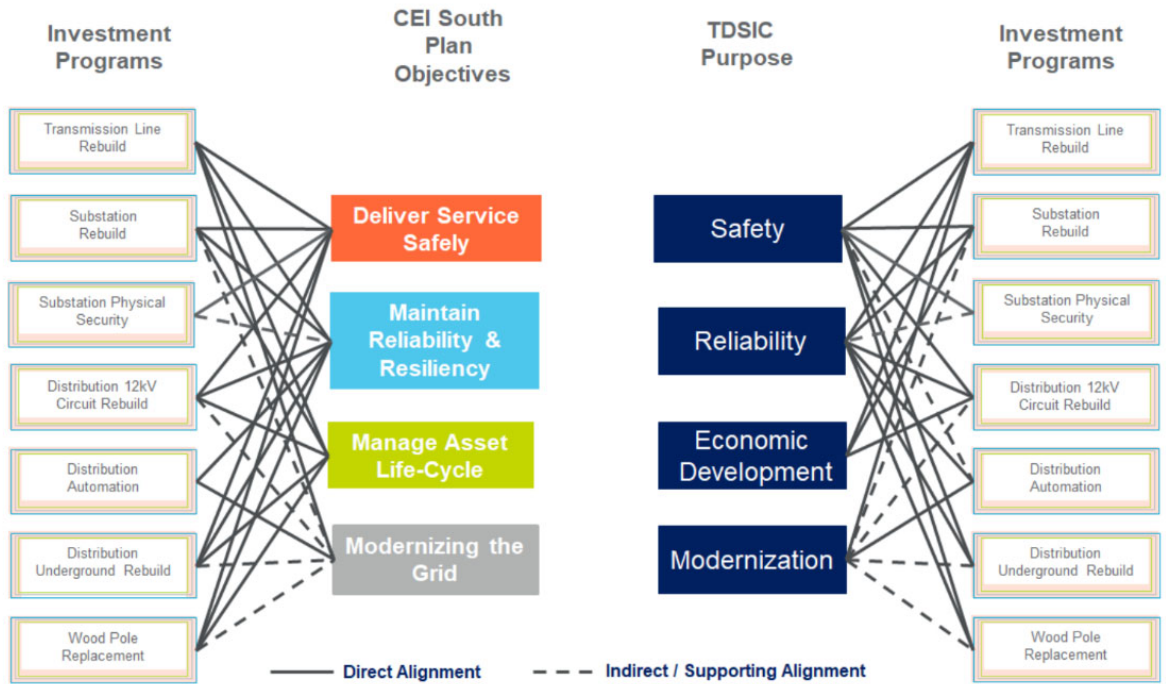
3 **Q. PLEASE SUMMARIZE THE COMPANY’S 2025 TRANSMISSION AND**
4 **DISTRIBUTION CAPITAL INVESTMENT PLAN FORECASTED DURING THE TEST**
5 **YEAR AND INCLUDED IN THIS CAUSE.**

6 A. For 2025, CEI South forecasted approximately \$167 million in capital expenditures for
7 electric transmission, distribution, and substation infrastructure, fleet, and facilities of
8 which approximately 58%, or \$96 million, is comprised of TDSIC projects identified in
9 the Cause No. 45894 TDSIC Plan, which is pending before the Commission. The
10 remaining \$71 million was forecasted for non-TDSIC new business, public
11 improvement, storm/restoration, system improvement, fleet, and facilities. Petitioner’s
12 Exhibit No. 4, Attachment SRR-6 – CEI South’s 2025 T&D Capital Investment Plan
13 Summary – provides the 2025 capital expenditures by major category.

14 **Q. PLEASE DESCRIBE THE BENEFITS ASSOCIATED WITH THE PROJECTS**
15 **COMPLETED, IN-PROGRESS, OR PLANNED INCLUDED IN THIS CAUSE AS**
16 **PART OF CEI SOUTH’S CAPITAL INVESTMENT PLAN AND HOW THESE**
17 **INVESTMENTS ALIGN WITH THE FIVE PILLARS AND GAO 2023–04.**

18 A. As explained earlier in my testimony, there are a number of benefits CEI South and its
19 customers realize upon completion of capital investments in electric infrastructure. CEI
20 South’s electric transmission and distribution Capital Investment Plan targets
21 maintaining and ultimately improving CEI South’s electric system performance as it
22 relates to reliability, resiliency, and stability. Section IX (Reliability Performance), infra,
23 provides detailed information on how CEI South’s investments in aging infrastructure
24 have improved reliability performance as it relates to equipment failure. Sections VI
25 (TDSIC Plan Overview and Related Capital Investments) and VII (Five Pillars), above,
26 describe how CEI South’s 44910 and 45894 TDSIC Plans improve long-term
27 transmission and distribution system reliability performance. The investments CEI
28 South have made in regional transmission, local transmission and distribution looping,
29 distribution automation, relay protection upgrades, SCADA systems and numerous
30 other project categories specifically address and improve long-term system resilience
31 and stability. **Figure SRR-1**, below, illustrates how CEI South’s investment programs
32 that are the subject of Cause No. 45894 align to CEI South’s reliability and resilience
33 goals.

Figure SRR-1 – Investment Alignment to CEI South’s 45894 TDSIC Plan Objectives and the TDSIC Purpose



1 The stability of the electric system is also inherently dependent upon generation
 2 resources that have the automatic capability to respond in real-time to frequency (real
 3 power) and transmission voltage (reactive power) excursions. Traditional thermal
 4 dispatchable generation resources are best suited to fulfill this need, as the grid’s
 5 resources transition to a renewable based portfolio. Please refer to the Direct
 6 Testimony of Petitioner’s Witness Bradford for information related to how the
 7 investments associated with CEI South’s generation transition plan are consistent with
 8 the Five Pillars. Separately, Petitioner’s Witnesses Folz and Gregg M. Maurer provide
 9 additional information in their testimony in this Cause about the maintenance programs
 10 CEI South undertakes, and how those programs support transmission and distribution
 11 reliability. Additionally, Petitioner’s Witness Bahr describes the technology related
 12 initiatives CEI South is undertaking to improve operational capabilities as it relates to
 13 outage monitoring and response.

1 **IX. RELIABILITY PERFORMANCE**

2 **Q. HOW DOES CEI SOUTH MEASURE THE RELIABILITY PERFORMANCE OF ITS**
 3 **ELECTRIC SYSTEM?**

4 A. As discussed previously in my testimony, CEI South has been investing in modernizing
 5 and enhancing the safety and reliability of its electric distribution and transmission
 6 system. System Average Interruption Duration Index (“SAIDI”), Customer Average
 7 Interruption Duration Index (“CAIDI”), and System Average Interruption Frequency
 8 Index (“SAIFI”) (as defined further below) are key reliability performance indices
 9 impacted by major event days (“MEDs”). The Institute of Electrical and Electronics
 10 Engineers (“IEEE”) defines MEDs as, “. . . all days that have a SAIDI greater than T_{med} ”
 11 (IEEE Std 1366-2012). CEI South’s reliability performance indices are monitored with
 12 MEDs included, and with MEDs excluded. Exclusion of MEDs from the indices allows
 13 the Company to better normalize the annual performance data to recognize extreme
 14 weather impacts. This methodology ultimately provides the Company insight into how
 15 its electric system and associated assets perform during a normal weather day. The
 16 normalized data helps guide the decision-making process as it relates to operational
 17 practices, asset replacement strategies, etc. Since 2013, for identification of MEDs,
 18 CEI South continues to define a day as any 24-hour period. In addition, each day
 19 following the initial event is categorized as a MED until the last customer interruption
 20 caused by the initial event is restored.

21 **System Average Interruption Duration Index (“SAIDI”)** indicates the total duration
 22 of interruption for the average customer during a predefined period of time. It is
 23 commonly measured in minutes or hours of interruption.

24
$$SAIDI = \frac{\text{Total Customer Minutes of Interruption}}{\text{Total Number of Customers Served}}$$

25 **Customer Average Interruption Duration Index (CAIDI)** represents the average
 26 time required to restore service.

27
$$CAIDI = \frac{\text{Total Customer Minutes of Interruption}}{\text{Total Number of Customers Interrupted}}$$

1 **System Average Interruption Frequency Index (SAIFI)** indicates how often the
2 average customer experiences a sustained interruption over a predefined period of
3 time.

$$4 \qquad \qquad \qquad SAIFI = \frac{\text{Total Number of Customers Interrupted}}{\text{Total Number of Customers Served}}$$

5 As shown in **Figure SRR-2** (below), the number of MEDs for 2018, 2019, and 2022 is
6 similar, but, as shown in **Figure SRR-3** (below), Reliability Indices with MEDs, the
7 impact on the SAIFI and SAIDI for 2019 and 2022 is much more pronounced. In 2019,
8 three of the four events combined for 64 minutes of SAIDI, and in 2022, two of the five
9 events combined for 320 minutes. A single event (a thunderstorm with high winds)
10 occurring on August 1, 2022 is responsible for 277 minutes of the total SAIDI for that
11 year. The events in 2022 had a similar impact on CAIDI by driving the average
12 restoration time to approximately 250 minutes.

13 **Figure SRR-4** (below), Reliability Indices without MEDs, shows a similar trend for
14 2019 and 2022, as inclement weather drove the normalized SAIFI and SAIDI up for
15 those years. Several days in 2019 and 2022 had a daily SAIDI significantly above
16 average but still below CEI South’s exclusion criteria. In comparison, 2018 also had
17 several days with higher than normal SAIDI, but on average, these days had less
18 impact, resulting in much better reliability.

Figure SRR-2 – Major Event Days

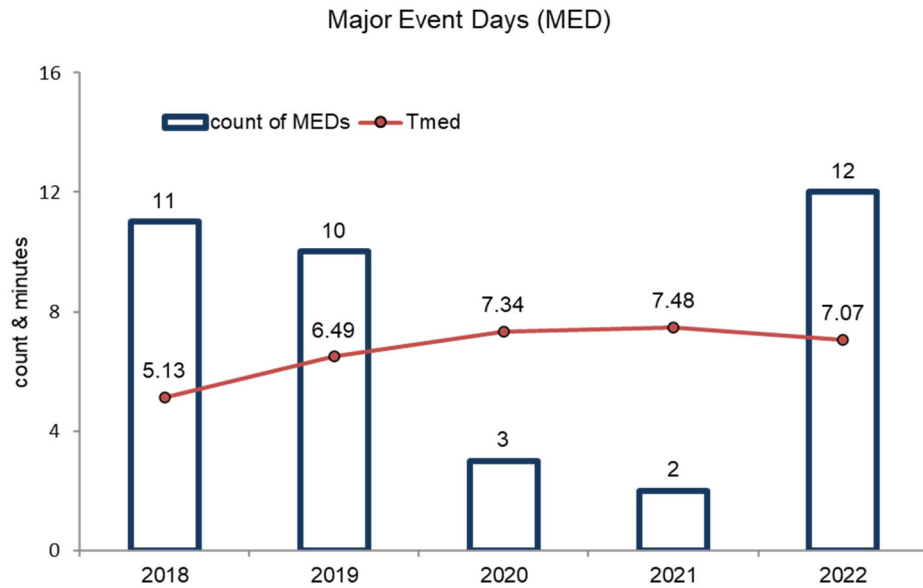


Figure SRR-3 – Reliability Indices with MEDs

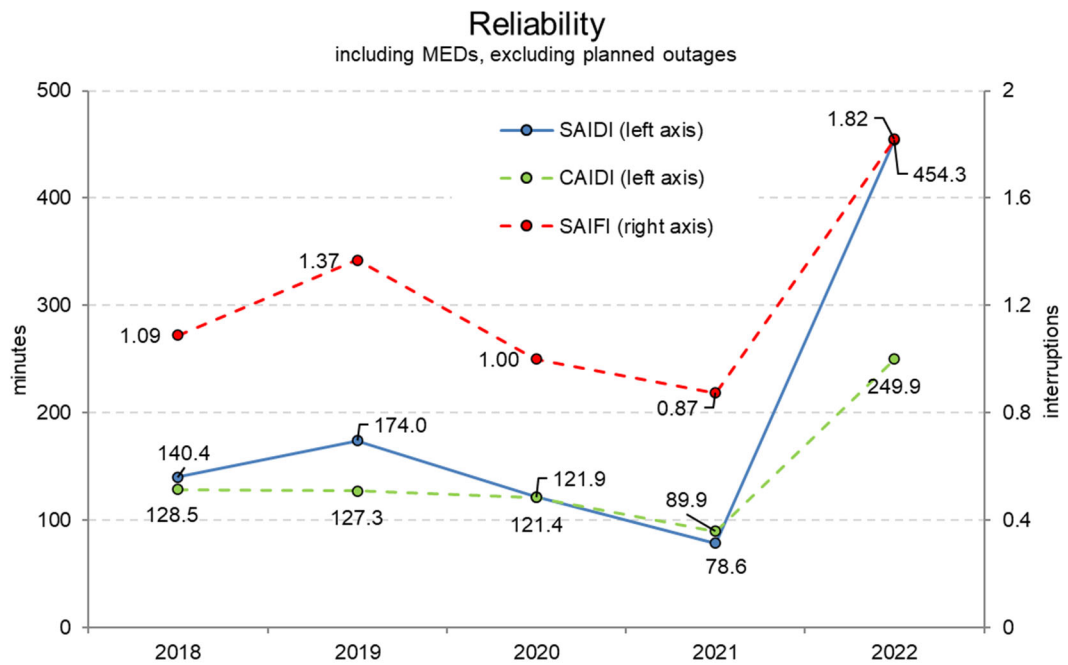
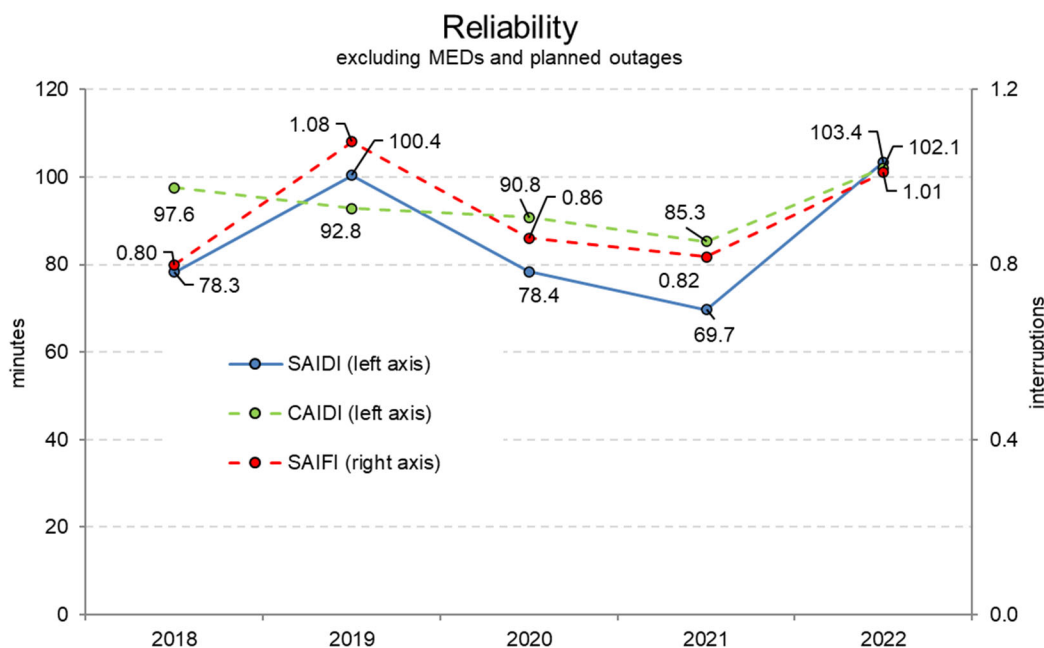


Figure SRR-4 – Reliability Indices without MEDs



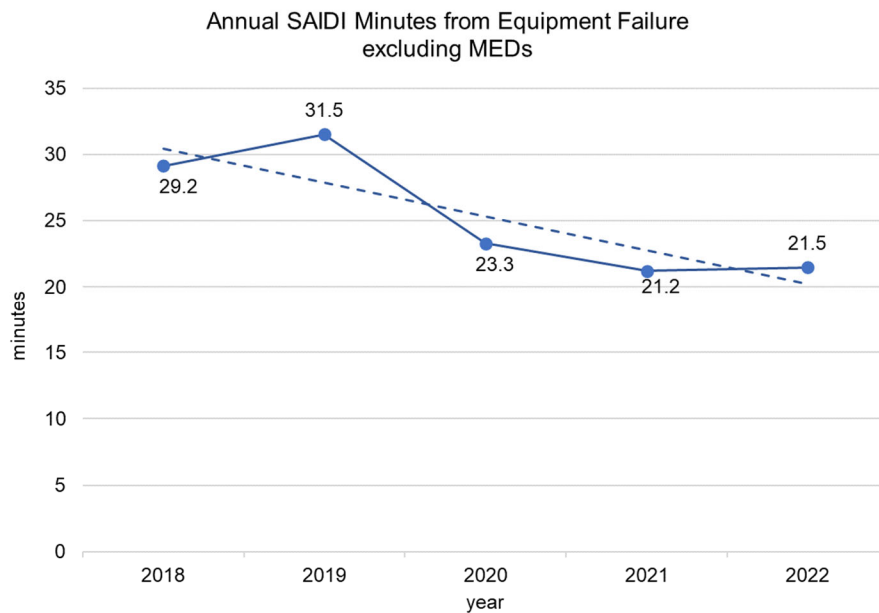
1 Q. DID CEI SOUTH ACHIEVE ANY REDUCTION OF RISK THROUGH COMPLETION
 2 OF THE PROJECTS IN THE 44910 TDSIC PLAN? PLEASE EXPLAIN.

3 A. Yes. Many of the projects (approximately 95% of the TDSIC Plan projects) included
 4 the replacement of aging infrastructure for transmission circuits, substations, and
 5 distribution circuits. Replacement of aging infrastructure reduces the risk of failures
 6 across the system, specifically with investments targeting at-risk equipment. More at-
 7 risk equipment includes infrastructure with higher likelihoods of failure and higher
 8 consequences, specifically risk equals the likelihood or probability of failure multiplied
 9 by the consequence of failure. The 44910 TDSIC Plan included targeting older
 10 equipment, utilizing condition information where applicable while factoring equipment
 11 consequences. Replacement of the at-risk equipment reduces the risk of customer
 12 outages, reactive replacements costs, environmental consequences such as oil spills
 13 from applicable equipment, elevated levels of O&M that generally occur at the end of
 14 an asset’s life, and re-replacement costs when non-standard equipment is utilized as
 15 a stopgap measure after a failure. Additionally, replacement of at-risk equipment
 16 mitigates the risk of catastrophic failure types that can cause serious injuries to
 17 personnel. This is especially the case for substation assets where high levels of energy
 18 are concentrated in a more confined area. While all electrified equipment in a
 19 substation poses these types of risk, older equipment is more likely to fail

1 catastrophically exposing Company personnel to risk. Outside of substations,
 2 replacing older equipment on transmission and distribution circuits decreases the risk
 3 of failure to the public.

4 **Figure SRR-5** (below) illustrates CEI South’s historical reliability performance for
 5 customer outages associated with equipment failure. The performance trend illustrates
 6 that the investments CEI South has made in its 44910 TDSIC Plan have mitigated
 7 equipment failure risks while improving customer reliability.

Figure SRR-5 – Annual SAIDI Minutes from Equipment Failure excluding MEDs



8 Additionally, **Figures SRR-6** and **SRR-7** (below) illustrate how CEI South’s
 9 investments have addressed aging infrastructure risks in a tangible way. Prior to CEI
 10 South’s 44910 TDSIC Plan investments, the Company was addressing substation
 11 power transformer failures in a largely reactive fashion. The Company’s proactive
 12 investments in high-consequence substation equipment have reduced reactive
 13 operational costs and have increased overall customer reliability.

Figure SRR-6 – Average Age of Distribution Substation Power Transformers

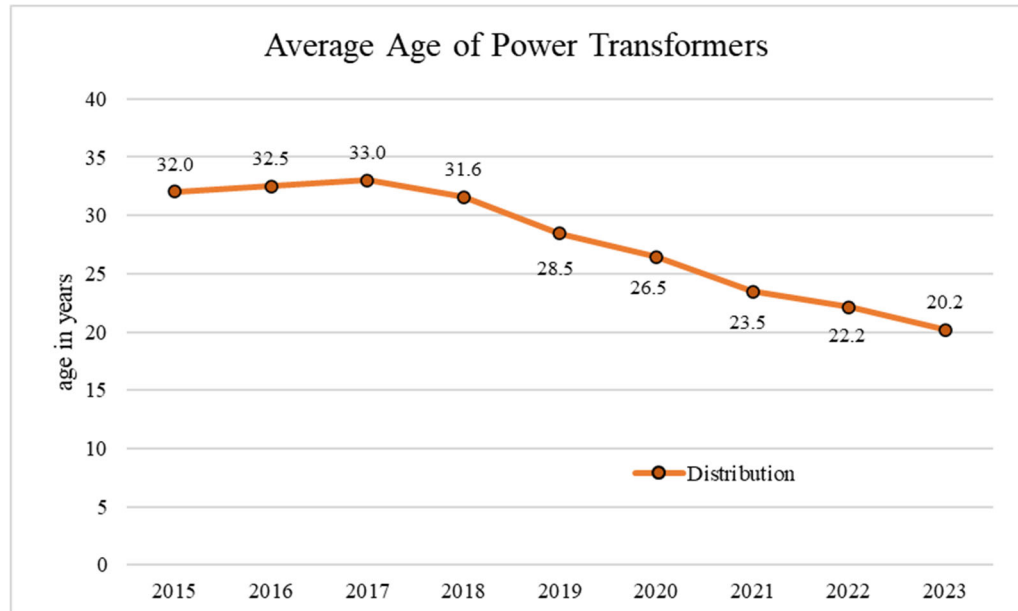
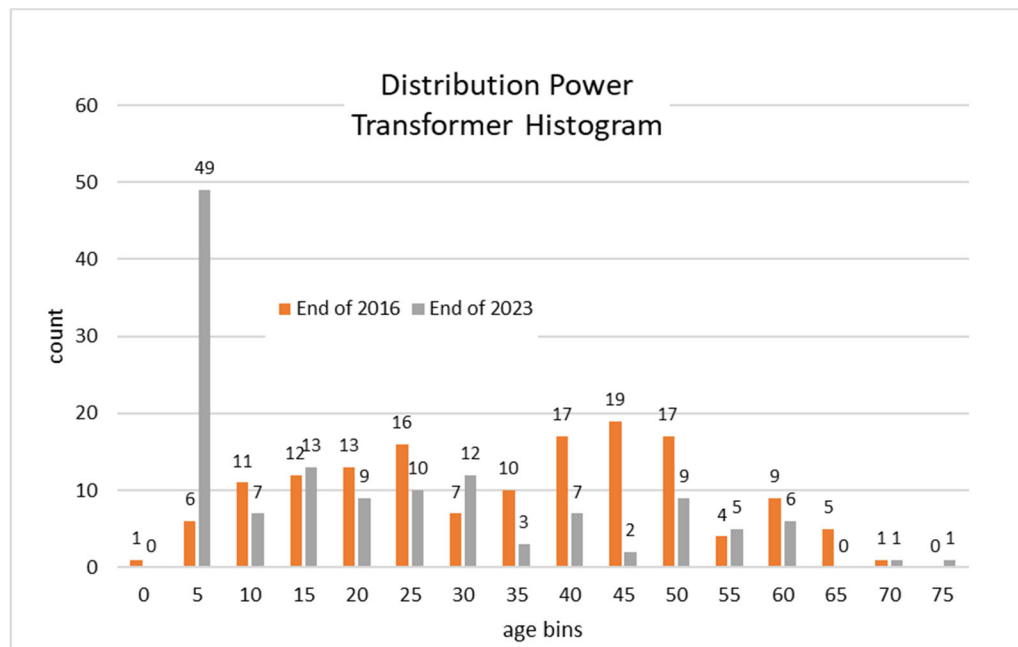


Figure SRR-7 – Distribution Substation Power Transformer Histogram



1 **Q. PLEASE SUMMARIZE CEI SOUTH’S EXPECTATIONS RELATED TO RISK**
 2 **REDUCTION UNDER THE 2024 – 2028 TDSIC PLAN.**

3 **A.** The goal of the 2024 – 2028 TDSIC Plan is the same as the 44910 TDSIC Plan: to
 4 replace aging assets at or beyond their expected life prior to the asset failing and to
 5 install certain new assets. Even with the risk reductions achieved in the 44910 TDSIC

1 Plan, as stated earlier, there are still many assets on the system that need
2 replacement. The additional investment into these assets in the TDSIC Plan will further
3 increase system reliability and resiliency while better serving our customers safely.

4 **X. FEDERAL FUNDING**

5 **Q. PLEASE DISCUSS WHETHER CEI SOUTH HAS APPLIED FOR, OR RECEIVED,**
6 **GRANT FUNDING THROUGH THE 2021 FEDERAL INFRASTRUCTURE**
7 **INVESTMENT AND JOBS ACT (“IIJA”).**

8 A. The Indiana Office of Energy Development (“OED”) submitted a grant application for
9 Topic Area 3 of the U.S. Department of Energy’s (“DOE”) Funding Opportunity
10 Announcement for Grid Resilience & Innovation Partnerships (DE-FOA-0002740) in
11 partnership with Indiana utilities. As a utility partner in this effort, CEI South was a
12 potential subrecipient of this grant funding. CEI South submitted approximately \$23
13 million in proposed projects as part of this effort, as outlined below:

- 14 • AMI Distributed Intelligence Project – This project was to deploy Distributed
15 Intelligence (“DI”) software and build upon existing AMI system capability. DI
16 enables smart edge distributed intelligence within the metering technology by
17 leveraging the advanced metering infrastructure network deployed in 2017 –
18 2020.
- 19 • Perry Substation Rebuild – The project was to upgrade the Perry Substation
20 and provide a redundant 69kV transmission source into the radial fed rural
21 substation. This project was proposed to increase reliability by replacing aging
22 substation assets and by also preventing outages due to a transmission failure.
- 23 • Distribution Automation Circuit Reconfiguration (“DACR”) Project – The project
24 proposed ten DACR circuits out of five rural substations located near
25 disadvantaged communities.

26 However, the OED was not successful in its grant application to the DOE. The DOE
27 informed the OED in October 2023, that its grant application did not receive funding
28 under the Grid Resilience & Innovation Partnership, therefore CEI South will not
29 receive funding as part of this effort.

1 XI. CONCLUSION

2 Q. DOES THIS CONCLUDE YOUR PREPARED DIRECT TESTIMONY?

3 A. Yes, it does.

VERIFICATION

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

SOUTHERN INDIANA GAS AND ELECTRIC
COMPANY D/B/A CENTERPOINT ENERGY
INDIANA SOUTH



Stephen R. Rawlinson
Director, Electric Engineering

11-27-2023

Date

CAUSE NO. 45990

Attachment SRR-1 Provided in Native Excel Format

CAUSE NO. 45990

Attachment SRR-2 Provided in Native Excel Format

CAUSE NO. 45990

Attachment SRR-3 (CONFIDENTIAL) Filed Confidentially in Native Format

CAUSE NO. 45990

Attachment SRR-4 Provided in Native Excel Format

CAUSE NO. 45990

Attachment SRR-5 Provided in Native Excel Format

CAUSE NO. 45990

Attachment SRR-6 Provided in Native Excel Format