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VERIFIED REBUTTAL TESTIMONY

OF

JASON D. DE STIGTER

ON BEHALF OF

INDIANAPOLIS POWER & LIGHT COMPANY

IURC Cause No. 45264

VERIFIED REBUTTAL TESTIMONY OF JASON D. DE STIGTER ON BEHALF OF INDIANAPOLIS POWER & LIGHT COMPANY

1		1. INTRODUCTION
2	Q1.	Please state your name and business address.
3	A1.	My name is Jason De Stigter, and my business address is 9400 Ward Parkway, Kansas
4		City, Missouri 64114.
5	Q2.	By whom are you employed and in what capacity?
6	A2.	I am employed by Burns & McDonnell Engineering Company, Inc. ("Burns &
7		McDonnell") and lead Burns & McDonnell's Capital Asset Planning team as part of our
8		Utility Consulting Practice.
9	Q3.	Are you the same Jason De Stigter who filed prefiled direct testimony in this matter?
10	A3.	Yes.
11	Q4.	What is the purpose of your rebuttal testimony in this proceeding?
12	A4.	My rebuttal testimony addresses the following testimonies:
13		• City of Indianapolis Witness Mr. Dennis Stephens EE
14		• Indiana Office of Utility Consumer Counselor ("OUCC") Witness Mr.
15		Brien R. Krieger
16		• IPL Industrial Group Witness Mr. Brian C. Collins
17		• City of Indianapolis Witness Mr. Paul J. Alvarez
18	Q5.	Are you sponsoring any attachments?
19	A5.	No.
20	Q6.	Are you submitting workpapers?

1 A6. No.

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2. RESPONSES TO CITY OF INDIANAPOLIS WITNESS DENNIS STEPHENS' DIRECT TESTIMONY

4 Q7. Please summarize the main points City of Indianapolis Witness Stephens makes in his 5 direct testimony with respect to justification of prospective replacements.

6 A7. City of Indianapolis Witness Stephens' main point is that the methodology to select 7 prospective replacements is flawed overstating the need for investment. He develops the 8 following arguments to support this assertion: (1) IPL's plan does not follow the industry 9 standard practice to run assets to failure, he makes some exceptions, (2) Burns & 10 McDonnell's age-based approach is flawed because asset age is not a good predictor of 11 failure and historical asset failures were not utilized to develop the survivor curves. City of 12 Indianapolis Witness Stephens makes other assertions, such as the use of equipment 13 testing, but they go to support these core arguments.

14 Q8. What will your rebuttal testimony state regarding these items?

15 A8. My rebuttal testimony will assert the following: (1) proactive replacement aligns with best 16 practice asset management and is an active strategy employed by many utilities, (2) a 17 significant portion of IPL's Plan aligns with the exceptions City of Indianapolis Witness 18 Stephens promotes, (3) City of Indianapolis Witness Stephens' characterization of the 19 Burns & McDonnell approach is inaccurate, it is risk-based rather than being reliability-20 based, (4) historical failure rates are NOT the best predictor of future asset failures, and (5) 21 the survivor curves incorporate historical asset failures. Finally, I will comment the need 22 for investment is NOT overstated.

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A. Proactive Asset Replacements

Q9. Please summarize City of Indianapolis Witness Stephens' opinion of prospective asset
 replacements and standard industry practice.

4 A9. City of Indianapolis Witness Stephens asserts that standard industry practice is not to perform prospective replacements, but rather to replace assets only as they fail.¹ However, 5 6 Witness Stephens provides exceptions to this assertion. Those exceptions are for high-7 consequence assets, such as those that serve thousands of customers or present a public safety issue when they fail, such as power transformers, breakers, and wood poles.² For 8 9 these exceptions, City of Indianapolis Witness Stephens states that equipment testing and 10 inspection are used to identify assets for prospective replacement.³ One additional point, City of Indianapolis Witness Stephens uses the term prospective, I will use the term 11 12 proactive except in the case where I directly quote him.

Q10. Do you agree with Witness Stephens's assertion that it is general standard industry practice to replace most assets only when they fail?⁴

A10. No. City of Indianapolis Witness Stephens's assertion is flawed for several reasons. First,
as stated previously in the Risk Model Report and in my Direct Testimony, IPL and Burns
& McDonnell utilized a risk-based planning approach to identify and prioritize assets for
replacement⁻⁵ The Asset Risk Model utilized in IPL's TDSIC Plan follows Asset
Management Best Practice. It is based on the ISO 31000 framework for risk management
and the ISO 55001 standard for asset management practices. More and more utilities are

¹ City of Indianapolis Witness Stephens Testimony at 8:7-10.

² City of Indianapolis Witness Stephens Testimony at 8:10-12.

³ City of Indianapolis Witness Stephens Testimony at 8:12-14.

⁴ City of Indianapolis Witness Stephens Testimony at 8:7-10.

⁵ IPL Witness De Stigter direct testimony at 4:3-7; Risk Model Report at 1-1.

looking to the ISO standards to manage their aging infrastructure issues. Figure 5-1 of
 Appendix 8.11 provides a risk management approach for decision making regarding asset
 replacements. I have included that figure below for ease of reference. The IPL TDSIC Plan
 aligns with this decision making framework.



Figure 5-1 of Appendix 8.11

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Consequence of Failure

For lower consequence assets such as distribution poles and wires, the initial best practice
strategy after install is to "Do Nothing". However, as many of the lower consequence assets
move into the upper left portion of the curve, the best practice asset management approach
is to evaluate the cost to buy down the risk, the economic based strategy.

11 More expensive assets to replace in the upper left portion of the grid may warrant a "run-12 to-failure" strategy since investment dollars can be used for less expensive assets in the 13 region. Further, the investment decision making on assets in this upper left section of the 14 risk grid depend on the number and location of assets. For instance, a proactive replacement 15 strategy may be warranted if a critical mass of assets are located in the same geographical region since resource efficiencies exist. However, the same type of asset may have a "runto-failure" approach if only a handful exist in the same geographical region. Investment strategies for assets in this part of the risk-grid (upper left) have many moving parts and require asset risk models to identify the most cost effective approach. I should also note that many utilities are deploying ever increasing sophisticated approaches and tools similar to those employed by IPL to understand where they can achieve value for customer by identifying the best value for money.

8 Finally, in my experience it is standard for utilities such as IPL to proactively replace assets 9 following a risk-based methodology in alignment with the figure shown above. Burns & 10 McDonnell has observed a move toward more proactive replacement within the utility 11 industry.

Q11. With respect to the projects evaluated by Burns & McDonnell, how does City of Indianapolis Witness Stephens' opinions on the standard industry practice align with how assets were selected?

There is significant alignment, especially with respect to the Circuits Rebuilds and 15 A11. 16 Substation Asset Replacement projects. The Circuit Rebuilds project includes wood poles 17 which City of Indianapolis Witness Stephens provides as an exception to his opinion of 18 industry standard practice. Additionally, the Substations Asset Replacement project 19 includes replacement of power transformers and breakers, two other asset classes City of Indianapolis Witness Stephens provides as exceptions. For these asset classes, Citv of 20 21 Indianapolis Witness Stephens recommends utilizing testing and inspection data⁶. As the 22 Risk Model Report, Appendix 8.3, describes in Section 2.2.3, the IPL and Burns &

⁶ City of Indianapolis Witness Stephens Testimony at 8:12-14

1 McDonnell approach aligns with his recommendation to utilize this type of information for 2 power transformers, breakers, and wood poles. Further the IPL and Burns & McDonnell 3 approach accounts for customer count and type in the consequence of failure framework, 4 Section 2.3 of Appendix 8.3. This is just another way the IPL and Burns & McDonnell 5 approach aligns with City of Indianapolis Witness Stephens' opinion of industry standard 6 practice of prospective replacements.

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B. Age-Based Approach and use of Survivor Curves

8 012. How does City of Indianapolis Witness Stephens describe Burns & McDonnell's 9 approach to the identification of proactive asset replacements?

10 City of Indianapolis Witness Stephens describes Burns & McDonnell's approach as an A12. 11 "age-based approach to select assets for prospective (in advance of demonstrated need) replacement."⁷ He regularly describes the approach this way throughout his testimony. This 12 13 implies that asset selection is based on the install or manufacture date of the asset and 14 expected remaining life of those types of assets.

15 Q13. Do you agree with City of Indianapolis Witness Stephens' characterization of the 16 Burns & McDonnell approach as age-based?

17 A13. No. City of Indianapolis Witness Stephens is inaccurate in his statements that the approach 18 is based on asset age, it is risk-based. The main text of IPL's TDISC Plan, my direct 19 testimony, and Appendix 8.3 are very clear that the identification, prioritization, and 20 justification of assets and projects is risk-based. The Burns & McDonnell approach aligns 21 with those used by other TDSIC filings. The fact that the Burns & McDonnell approach is 22 not age-based is also clearly reflected in the title of the report, "IPL TDSIC Asset Risk and

⁷ City of Indianapolis Witness Stephens Testimony at 3:8-10.

Investment Assessment Report". While age data is a component to calculate likelihood of
 failure (LOF), it is not the only component. City of Indianapolis Witness Stephens
 disregards the asset condition, health information, and criticality or consequence data
 utilized in the Burns & McDonnell approach.

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Q14. What is the difference between an age-based approach and risk-based approach?

A14. An age-based approach would replace all assets in an asset class when they reached a
predetermined age. A risk-based approach, in alignment with ISO 31000 and 55001,
identifies assets for replacement based on their risk and location in the risk grid (figure
shown above). Risk is defined as the likelihood of failure (LOF) multiplied by the
consequence of failure (COF). LOF is based on asset age, condition (when data is
available), and estimated service lives. COF is based on a range of criteria, typically
including safety, customer, environmental, financial, regulatory, and other system impacts.

Q15. For IPL would an age-based approach require less investment compared to the risk based approach?

15 A15. No, in fact an age-based could require significantly more than \$1.0 to \$1.5 billion over the 16 next seven years. The Risk Model Report, Appendix 8.3, includes two additional 17 investment alternatives as comparison to the risk-based plan. The first alternative is to 18 replace all assets with an LOF5, 80 percent or greater LOF based on the assets 'effective' age and survivor curve, score within the next seven years. The second alternative is to 19 20 replace all the assets with an LOF5 or LOF4, 60 percent or greater, score. Details regarding 21 these scenarios are included in Section 5.4 and 5.5 of Appendix 8.3. Figure 5-19 of the 22 Risk Model Report, Appendix 8.3, provides a summary of the investment level for these 23 two likelihood based plans compared to the risk-based plan. I have included the figure

below for ease of reference. The figure also includes the resulting risk-level and risk 2 reduction per dollar invested for each of the scenarios. As the figure shows, the LOF5 and LOF4 scenarios require investment of approximately \$1 billion and \$1.5 billion, 3 4 respectively.

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Figure 5-19 of the Risk Model Report, Appendix 8.3

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7 The totals understate the investment level for an age-based scenario for IPL's system since 8 the LOF4 and LOF5 scenarios are based on an asset's 'effective' age. From Section 2.2.3 9 of the Risk Model Report, "In general, the average asset age decreased with the AHI 10 approach. This means that the AHI approach moved more assets from the higher LOF to 11 the lower LOF regions of the heat matrix, thereby reducing the amount of investment

1		recommended per the Asset Risk Model." For this reason, an age-based scenario would
2		require more than \$1 to \$1.5 billion in investment depending on the nominal age at which
3		assets are replaced.
4	Q16.	Do you agree with City of Indianapolis Witness Stephens' comment that actual
5		historical failure rates are the best predictor of future asset failure? ⁸
6	A16.	No. I do not agree with his assertion that historical failure rates are the "best predictor of
7		asset failure." Assets will eventually wear out, no matter how well they are operated and
8		maintained. The example of the 'bathtub curve' below provides a conceptual view of an
9		age-related failure profile for a population of assets. The figure shows early life failures
10		(typically manufacturing or other defects), some period of constant failure rates, then an
11		increase in the failure rate toward the wear out period.

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⁸ City of Indianapolis Witness Stephens Testimony at 10:17-18.

"Bathtub" Curve



Condition Based Age

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City of Indianapolis Witness Stephens claims that historical failures are the best predictor of future failures may result from experience when the majority of the asset base is within the 'Useful Life' portion of the curve. However, using history as the guide for the future ignores the fact that assets in a population do not last forever and will eventually reach the "Wear Out" period, regardless of how much maintenance has been performed. As a critical mass of the asset base approaches the elbow point of the "Wear Out" period the failure rate will increase.

Likelihood of failure for a risk-based planning model should use a combined approach that incorporates historical failure information, available current inspection and/or condition data and recent trends of that data, and an understanding of how a population of assets deteriorate out toward the end of their life. Using a subset of these three components may be appropriate in some cases but will not result in the best predictor of age-related asset
 failure.

The Risk Model Report outlines the approach Burns & McDonnell used to mirror this approach with the exception of historical failure rates which I discuss in the next question.

Q17. Why did you not use actual historical failure rates to develop survivor curves as City

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of Indianapolis Witness Stephens recommends?

A17. As discussed in my direct testimony, there is not enough actual historical failure data
available to perform a statistical analysis and develop deterioration curves, since most
utilities work to prevent failures. For this reason, Iowa survivor curves are widely used in
the utility industry and asset management organizations. The survivor curves applied to the
analysis were based on survivor curves used in the depreciation study and subject matter
experience

Q18. City of Indianapolis Witness Stephens asserts the survivor curves do not reflect actual historical failures. Do the curves outlined in the depreciation study include historical failure rates of the asset class?

A18. Yes. City of Indianapolis Witness Stephens is correct on the use of survivor curves by accounting to understand how to depreciate rate base, but he is inaccurate in how the curves are developed. Manufacturer-provided estimated useful life estimates are not inputs into the survivor curves. The survivor curves themselves are a representation of mortality characteristics of an asset population based on historically observed retirements. Utilities regularly (IPL in 2017) update the survivor curves used in the depreciation study based on updates to the property accounting records, which include additions and retirements. While

1		there are many reasons for retiring assets, a main cause is asset failure. Given this, the
2		survivor curves within IPL depreciation study do reflect historical asset failures.
3	с. <u>с</u>	ondition Data
4	Q19.	Please summarize City of Indianapolis Witness Stephens' direct testimony with
5		respect to utilizing inspection and testing data for prospective investment.
6	A19.	City of Indianapolis Witness Stephens strongly supports the use of inspection and testing
7		data several times throughout his testimony. ⁹ He advocates that use of inspection and
8		testing data is especially valuable in the case of high consequence assets, and goes into
9		detail to describe the types of testing and data that are valuable in assessing power
10		transformers and circuit breakers.
11	Q20.	Is City of Indianapolis Witness Stephens correct in his assertion that the five Plan
12		components in the TDSIC Plan were not developed using testing results? ¹⁰
13	A20.	No. As discussed prior, City of Indianapolis Witness Stephens's statement is inaccurate.
14		Where available, asset condition data was used to forecast likelihood of failure (LOF). ¹¹
15		As previously described in my direct testimony, asset LOF is based on an asset class
16		survivor curve, age, and Asset Health Index (AHI), which is derived from available asset
17		condition information, inspection information, and service history or test data. ¹²
18	Q21.	City of Indianapolis Witness Stephens promotes as industry standard practice for
10		newer transformer prospective replacement when chemical ail testing show changes

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power transformer prospective replacement when chemical oil testing show changes

⁹ City of Indianapolis Witness Stephens Testimony at 11:18-23; 13:3-7.
¹⁰ City of Indianapolis Witness Stephens Testimony at 3:10-13.
¹¹ Risk Model Report at Section 2.2.3.
¹² De Stigter direct testimony at 5:17-19.

1		to indicate failure. ¹³ Did you incorporate these types of testing data into your
2		assessment?
3	A21.	Yes, I would refer you to Figure 2-4 of Appendix 8.3, Risk Model Report, for all the factors
4		included in calculating the asset health index for power transformers.
5	Q22.	Did you incorporate testing and inspect data for other asset classes?
6	A22.	Yes, circuit breakers and wood poles. Figure 2-5 and Figure 2-6 of the Risk Model Report,
7		Appendix 8.3, show the factors included in calculating the asset health indices and
8		estimating effective age of the breakers and wood poles, respectively.
9	Q23.	What does your direct testimony and the Risk Model Report conclude regarding the
10		impact of utilizing testing and inspection data with respect to asset effective age?
11	A23.	As previously discussed in Section 2.2.3 of the Risk Model Report, in general, the average
12		asset age decreased with the AHI approach. ¹⁴
13	D. <u>S</u>	<u>ummary</u>
14	Q24.	City of Indianapolis Witness Stephens' summary of Direct Testimony states the
15		following, "I then provide evidence for my claim that the methodology IPL employs
16		to justify prospective asset investment overstates the need for such investments.
17		These include the facts that 1) The use of age-based failure predictions to justify
18		prospective asset replacements is not standard industry practice; 2) Asset age is a
19		poor predictor of asset failure; and 3) IPLs future asset failure rate assumptions,
20		which it calls survivor curves, have no basis in historical asset failure rates. The

 ¹³ City of Indianapolis Witness Stephens Testimony at 14:13-19.
 ¹⁴ Risk Model Report at Section 2.2.3.2.

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survivor curves, and associated failure rate predictions, are therefore based entirely on assumptions."¹⁵ Please respond to his summary.

City of Indianapolis Witness Stephens' "facts" for item 1 and 2 are based on an inaccurate 3 A24. 4 understanding of IPL's and Burns & McDonnell's approach for identification, 5 prioritization, and justification of asset selections. He asserts the use of an age-based 6 approach. This is incorrect as the approach is risk-based. For "fact" 3 I have explained that 7 City of Indianapolis Witness Stephens' assertions on how survivor curves are developed are inaccurate; the survivor curves do reflect retirements, which on many occasions were 8 9 caused by asset failures as recorded in the property accounting record. The survivor curves 10 are not based entirely on assumptions, they do incorporate actual failure data.

Q25. City of Indianapolis Witness Stephens recommends that the five projects evaluated by Burns & McDonnell be rejected.¹⁶ Do you agree?

13 A25. No. City of Indianapolis Witness Stephens' recommendation is based on his view that these projects do not align with his opinion of standard industry practice and a 14 mischaracterization of the approach utilized by Burns & McDonnell as age-based without 15 16 incorporating historical failure rates. To my knowledge, he did not perform any analysis of 17 the IPL asset base to come to this conclusion. The Burns & McDonnell team that I led 18 performed a robust and detailed risk-based evaluation of the asset base including all power 19 transformers, breakers, batteries, wood poles, primary, towers, and transmission conductor 20 (see Section 3 of Appendix 8.3). The circuits assets were modeled at the span level 21 providing a very granular level of detail for investment decision making. The evaluation

¹⁵ City of Indianapolis Witness Stephens Testimony at 24:1-7.

¹⁶ City of Indianapolis Witness Stephens Testimony at 13:10-13.

1 estimated a LOF for each of these assets based on the assets 'effective' age and survivor 2 curves. Asset health indices based on condition data were utilized to calculate 'effective' 3 age for power transformers, breakers, and wood poles, a significant portion of the asset 4 base (see Section 2.2 of Appendix 8.3). The evaluation further factored in 6 different 5 consequence categories with 15 total sub-categories to estimate the consequence of failure 6 for each of these assets. The consequence categories are comprehensive including safety, 7 customers, environmental, financial, system operations, and regulatory factors (see Section 8 2.3 of Appendix 8.3). The risk-based evaluation then plots all the assets within the risk-9 grid providing the guidance for recommended investment strategy based on best practice 10 asset management principles (see Section 4.0 of Appendix 8.3). Finally, the plan prioritizes 11 investments to replace high-risk assets and provide the highest risk reduction per dollar 12 invested (see Section 5.0 of Appendix 8.3). 13 The risk-based approach used by IPL and Burns & McDonnell to identify the assets for

replacement for the five projects, prioritize the investments, and provide justification is based on a robust data-driven best practice methodology recognized by ISO and applied by utilities across Indiana and the United States. The results of the evaluation shown in the various risk grids or Appendix 8.3, clearly show IPL's system has high risk assets and the need for proactive replacement.

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3. RESPONSE TO OUCC WITNESS BRIEN R. KRIEGER'S DIRECT TESTIMONY

Q26. What is your response to OUCC Witness Krieger's position on the "Do Nothing" scenario?

A26. Section 4.0 of the Risk Model Report explains why the use of the "Do Nothing" scenario
is appropriate. Specifically, it says, "The 'Do Nothing' scenario represents the increase in

1 risk for the assets in the Asset Risk Model if no assets are replaced during the 7-Year 2 planning period. This provides a baseline for comparing investment scenarios and their 3 impact to IPL's system risk. This approach is appropriate because few utilities, including 4 IPL, have a long-term (5 to 10 year) baseline for capital improvements with specific 5 projects. 'Do Nothing' scenarios are routinely used to perform analysis such as that 6 presented in this report." Further, this scenario is consistent, can be readily modeled, and 7 is appropriate for use in creating risk reduction comparisons. Additionally, previous TDSIC plans by NIPSCO, Duke Energy Indiana, and Vectren used a Do-Nothing scenario for 8 9 calculating risk reduction benefits of those plans. This issue is further discussed by IPL 10 Witness Williams. One point of clarification, the "Do Nothing" strategy discussed in 11 Question and Answer 10 above is different from the "Do Nothing" scenario. The scenario 12 assumes none of the assets are proactively replaced. The strategy is specific for some assets 13 that have low consequence or the cost to buy down the risk is so high that the investment 14 dollars could be better spent on other parts of the system. 4. 15 **RESPONSES TO IPL INDUSTRIAL GROUP WITNESS** 16 **BRIAN C. COLLINS AND CITY OF INDIANAPOLIS WITNESS** 17

19 Q27. How do IPL Industrial Group Witness Collins and City of Indianapolis Witness
20 Alvarez describe the cost-benefit analysis with respect to the five projects evaluated
21 by Burns & McDonnell?
22 A27. IPL Industrial Group Witness Collins and City of Indianapolis Witness Alvarez state that

PAUL J. ALVAREZ DIRECT TESTIMONY

the monetization analysis, Appendix 8.11 for the five projects evaluated by Burns &
McDonnell, constitutes the cost-benefit analysis.¹⁷ In his Direct Testimony, IPL Industrial

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¹⁷ IPL Industrial Group Witness Collins Testimony at 14:9-23.

Group Witness Collins includes several references to IPL's current reliability metrics and to the monetization of reliability benefits.¹⁸ Additionally, City of Indianapolis Witness Alvarez repeatedly places emphasis on the reliability improvements realized through the TDSIC Plan.¹⁹ This continued emphasis on reliability suggests that IPL's plan is a *reliability based* plan, but it is not.

Q28. Have IPL Industrial Group Witness Collins and City of Indianapolis Witness Alvarez accurately portrayed the cost-benefit analysis performed by IPL with respect to the five projects assessed by Burns & McDonnell?

A28. No. Both IPL Industrial Group Witness Collins and City of Indianapolis Witness Alvarez
have mischaracterized the cost-benefit analysis. The identification, prioritization and
justification of the five projects evaluated by Burns & McDonnell is risk-based. The main
text of IPL's TDSIC Plan, my direct testimony, and the Risk Model Report (Appendix 8.3)
are very clear on this point. The Burns & McDonnell risk-based approach aligns with best
practice asset management and various ISO standards (31000 and 55001). In question 25,
above, I provide a brief description of the risk-based approach.

Further, the risk monetization report, Appendix 8.11, does not consider all the benefit factors of replacing assets. The Asset Risk and Investment Assessment Report, Appendix 8.3, includes factors for safety, environmental, system operations impact, and regulatory requirements in addition to the customer and reactive failure costs factors that are only evaluated in Appendix 8.11. Figure 2-3 of Appendix 8.11 shows the limited number of consequence factors included in the monetization assessment, all those factors are included

¹⁸ IPL Industrial Group Witness Collins Testimony at 7:3-8:8; 9:1-10:12; 12:14-15; 12:18-21; 13:4-6.

¹⁹ City of Indianapolis Witness Alvarez Testimony at 3:20-4:2; 4:11-15; 5:7-15.

in the risk-based evaluation, Appendix 8.3. I want to stress, this is a risk-based plan in
 alignment with other TDSIC filings, not a reliability based plan. It should be noted that
 customer impact is one of the factors in the risk-based evaluation.

4 Q29. How then should the risk monetization analysis and results be viewed and 5 understood?

6 The risk monetization benefits for the five projects evaluated by Burns & McDonnell A29. 7 should be viewed and understood in the following two ways. (1) Significantly aligned with 8 the Risk and Investment Assessment from Appendix 8.3. The analysis was performed 9 across the same assets outlined in Risk Model Report. Additionally, the monetization 10 analysis utilizes the same methodology for LOF as described in the Risk Model Report, 11 except that the term used in the analysis of the Monetization Report is longer than the term used in the analysis described in the Risk Model Report.²⁰ Further, the Monetization Report 12 13 describes monetization of two subcategories of the Consequence of Failure framework outlined in the Asset Risk Model.²¹ (2) Supplementary and subordinate analysis to the Risk 14 & Investment Assessment, Appendix 8.3. The monetization assessment only includes 2 of 15 16 the 15 subcategories from the consequence of failure framework. It does not factor in 17 safety, environmental, system operations, or regulatory risk reduction benefits. Appendix 18 8.11 should be read and understood only after reading and understanding Appendix 8.3. 19 Fundamentally, the monetization analysis monetizes two consequence of failure subcategories and extends the evaluation period to 20 years from the Risk & Investment 20

²⁰ Monetization Report at Section 2.2.

²¹ Monetization Report at Section 2.3.

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Assessment to calculate the avoided risk reduction benefits. Whereas Appendix 8.3 estimates risk as a score, Appendix 8.11 estimates risk in dollars.

Q30. Even though the cost justification analysis for the five projects evaluated by Burns &
 McDonnell is risk-based, would you still like to respond to IPL Industrial Group
 Witness Collins' statement regarding the reasonableness of comparing 7 years of
 spending to 20 years of projected benefits for the monetized risk evaluation?²²

A30. Yes, the evaluation period of 20 years is reasonable. Most of the infrastructure investment
as part of the five projects has average service lives in the 40 to 50 year range. For this
reason, much of the T&D asset base is depreciated over this long period of time. This
allows for better matching of the cost and benefit period for customers. Since the life-span
on the asset base for the five projects is expected to be over 40 years, the evaluation used
a period of 20 years for capturing benefits. This issue is further discussed by IPL Witness
Cummings.

14 031. Related to the previous question, IPL Industrial Group Witness Collins states the 15 following, "IPL has not shown that the 7 years of investments would be justified by 16 years of monetized benefits, and instead the report at Appendix 8.11 to IPL Attachment BJB-2 indicates at page 12 that the "break-even point" does not occur 17 18 until after the 7-year plan period. IPL therefore seeks to burden present ratepayers 19 in the near term with substantial costs that may not be cost-justified for 20 years, raising further concerns of inter-generational equity."23 Would you like to respond 20 21 why the break-even point is not a concern?

²² IPL Industrial Group Witness Collins Testimony at 13:1-14:23.

²³ IPL Industrial Group Witness Collins Testimony at 14:18-23.

A31. Yes. I will use Figure 3-1 from Appendix 8.11 as it is instructive in comparing the plan
investment costs versus monetized benefits. The figure is included below for ease of
reference. The cash flows below zero are costs, the ones above zero are benefits. The red
area shows the TDSIC investment, the gray area the benefit from reactive failure cost
reduction, and the blue area as the benefit to residential and small C&I customers. The
dotted blue line shows the net (positive or negative) of the three cash flows for all 20 years.

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9 The figure shows that benefits start in 2020, but because investments increase each year 10 for the first 4 years, net positive benefits do not occur until 2024, year 5. Net total benefits 11 of the plan do not occur until year 8, the first year where benefits are not burdened by costs. 12 In other words, the plans total net benefits, meaning total benefits outweigh total costs, 13 occur within one year after the plan's investment stops. For this reason, I am not concerned 14 about the 8 year payback period. Additionally, every year after year 8 increases the total 15 net monetized risk benefits to a total of \$658 million by year 20.

1 **Q32.** IPL Industrial Group Witness Collins states that the monetized benefits evaluation 2 only included nominal dollar figures and did not calculate a Net Present Value. With 3 respect to the five projects evaluated by Burns & McDonnell is this correct? 4 A32. No. IPL Industrial Group Witness Collins is not accurate in that assertion. Figure 3-3 of 5 the Burns & McDonnell Risk Reduction Benefit Monetization Report (included in the IPL 6 TDSIC Plan as Appendix 8.11) shows both the nominal dollar figures and Net Present 7 Value of the monetized risk evaluation for five projects. 8 Q33. IPL Industrial Group Witness Collins takes exception to the use of using the "Do 9 Nothing" scenario. Would you like to respond? 10 A33. Yes, please see response to question 26 above. 11 **Q34**. IPL Industrial Group Witness Collins states: "IPL's TDSIC plan focuses on the risk 12 of the likelihood of failure of equipment on its system. Per page 15 of its petition, IPL 13 indicates it has developed a risk model to identify high-risk assets and establish a plan 14 to manage the risk, and to invest capital into the system for reliability projects that provide the highest risk reduction per dollar invested."²⁴ Would you like to respond? 15 16 A34. Yes, I would like to make two points. 1) As I mention above, the main cost justification 17 for the five projects evaluated by Burns & McDonnell is risk based as outlined in the Risk 18 Model Report (Appendix 8.3). IPL Industrial Group Witness Collins' first statement, "risk 19 of the likelihood of failure" may be a bit misleading. Risk is defined as the consequence of 20 failure multiplied by the likelihood of failure. 2) The reference to using the risk model to 21 develop "reliability projects" is inaccurate. The more accurate description is, "IPL indicates 22 it has developed a risk model to identify high-risk assets and establish a plan to manage the

²⁴ IPL Industrial Group Witness Collins Testimony at 17:16-20.

risk, and to invest capital into the system for projects that provide the highest risk reduction
per dollar invested."²⁵ Note that this statement excludes the word "reliability". I want to
stress again, that the cost justification for the plan is risk-based, not reliability based as has
been regularly outlined in IPL Industrial Group Witness Collins' Direct Testimony. That
being said, the risk assessment does consider impacts to customers. I refer you to Section
2.3 of the Risk Model Report for the rest of the considered impacts.

Q35. Do you agree with City of Indianapolis Witness Alvarez's statement that IPL "overstates the estimated customer savings benefits"²⁶?

9 No. With respect to customer savings benefit overstatement, City of Indianapolis Witness A35. 10 Alvarez states "(1)et's examine IPL's claim that with prospective asset replacement it will 11 save \$532 million over 20 years by reducing the amount of work it does reactively upon 12 equipment failure. This estimate assumes IPL's prospective replacement will be 100% 13 accurate, i.e., that all the equipment IPL is replacing prospectively would have failed during the seven-year TDSIC Plan period. As discussed in City witness Mr. Stephens' testimony, 14 15 due to inconsistency in equipment failure, only some of these assets would have failed. 16 IPL cannot take credit for reducing the cost of reactive work which never would have been completed, as some of the assets would not have failed."²⁷ City of Indianapolis Witness 17 18 Alvarez mischaracterizes these monetization benefits. The risk monetization assessment 19 does NOT assume all the assets replaced as part of the plan fail within the seven years, 20 rather it factors that same assets will not fail. Figure 2-2 of Appendix 8.11 is instructive in 21 understanding the assessment. I have included the figure below for ease of reference.

²⁵ IPL Industrial Group Witness Collins Testimony at 17:17-20.

²⁶ City of Indianapolis Witness Alvarez Testimony at 4:3.

²⁷ City of Indianapolis Witness Alvarez Testimony at 10:5-12.





3 The figure shows that the asset has an 82.9 percent likelihood of failure over the 20 year 4 evaluation period. This means there is a 17.1 percent likelihood that the asset will not fail 5 over the period. The figure also shows that the likelihood of failure is the same between the "Do Nothing" scenario and Investment Scenario before asset replacement. The 6 evaluation also considers the residual risk of the replaced asset as shown in the figure 7 8 above. For this specific example, the overall benefit of replacing the asset in 2023 is 53.8 9 percent. This is significantly lower than the 100 percent benefit described by City of 10 Indianapolis Witness Alvarez.

11 Q36. Does this conclude your prepared verified rebuttal testimony?

12 A36. Yes.

VERIFICATION

I, Jason De Stigter, Capital Asset Planning Business Lead, affirm under penalties of perjury that the foregoing representations are true and correct to the best of my knowledge, information and belief.

Dated: <u>23</u> October, 2019

_____ son De Stigter