VERIFIED REBUTTAL TESTIMONY

OF

JEFFREY W. CUMMINGS

SENIOR VICE PRESIDENT UMS GROUP, INC.

ON BEHALF OF

INDIANAPOLIS POWER & LIGHT COMPANY

IURC Cause No. 45264

SPONSORING ATTACHMENTS JWC 1-R THROUGH JWC 7-R

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INTRODUCTION

Q1. Please state your name and business address.

A1. My name is Jeffrey W. Cummings. My business address is 1543 Abbotsford Drive, Naperville, IL 60563.

Q2. By whom are you employed and in what capacity?

A2. I am employed by UMS Group Inc. ("UMS Group" or "UMS"), located at Morris Corporate Center, 300 Interpace Parkway, Suite C380, Parsippany, New Jersey, 07054. I am Senior Vice President of UMS Group, a consultancy that specializes in asset and performance management, supporting electric, gas and water utilities' business transformations.

Q3. Please generally describe the qualifications of UMS Group.

A3. UMS Group is an International Management Consulting firm founded in 1989 to serve the global utility industry. We specialize in enterprise-level value creation, performance management solutions and utility asset management; applying insights gleaned from a myriad comparative performance assessment across all major functions of our Clients (numbering in excess of 300 electric, gas and water utilities across 6 continents) and a number of Global Learning and Benchmarking Consortia. We have earned our position as an industry leader in risk-based Asset Management as evidenced by our:

1. Designation as an endorsed assessor and trainer by the Institute of Asset Management, the professional body of those involved in the acquisition, operation and care of physical assets – particularly critical infrastructure, and

2. Delivery of projects ranging from initial assessments to full-scale risk-based Asset Management transformations.

UMS Group applies the ISO 55000 standard, against which we measure organizations for compliance with basic risk-based asset management policies and practices, assisting them in ensuring they have the programmatic elements in place to manage their assets, and most importantly, manage all known and implied risks, thus creating superior lifecycle value from their owned and/or operating asset base.

Q4. What is your professional and educational background?

A4. I have attached a summary of my professional and educational background to my testimony as IPL Witness Attachment JWC 1-R.

Q5. Have you previously testified in proceedings before the Indiana Utility Regulatory Commission ("IURC")?

A5. Yes. I offered rebuttal testimony for IURC Cause Nos. 44576 / 44602. Additionally, I have testified before other regulatory commissions, including the New Jersey Board of Public Electric Utilities, the Kansas Corporation Commission, the Ontario Energy Board, and the Alberta Utilities Commission; and have performed audits and assessments on behalf of the staffs of the Pennsylvania and Ohio Regulatory Commissions. Further, I was an active participant in the IURC ordered Asset Management Collaborative started in 2016, where all parties collaborated in validating IPL's risk-based approach to Asset Management, the foundation used to drive IPL's TDSIC Plan.

Q6. Are you sponsoring any attachments as part of your testimony?

A6. Yes. In addition to the above referenced IPL Witness JWC Attachment 1-R, my testimony includes:

- IPL Witness JWC Attachment 2-R (IPL response to IPL Industrial Group Data Request 1-5),
- IPL Witness JWC Attachment 3-R (IPL response to IPL Industrial Group Data Request 1-6),
- IPL Witness JWC Attachment 4-R (IPL response to IPL Industrial Group Data Request 1-7),
- IPL Witness JWC Attachment 5-R (IPL response to IPL Industrial Group Data Request 1-11),
- IPL Witness JWC Attachment 6-R (IPL response to City of Indianapolis Data Request 3-1), and
- IPL Witness JWC Attachment 7-R (City of Indianapolis Data Request 2-21).

Q7. Were the attachments prepared or assembled by you or under your direct supervision?

A7. Yes.

Q8. Are you submitting work papers?

A8. No. My testimony references specific work papers previously provided by IPL.

Q9. What is the purpose of your rebuttal testimony in this proceeding?

A9. I was engaged to assist in monetizing the benefits of IPL's TDSIC Plan. In doing so, I coordinated inputs to, and prepared the narrative to Section 3, "TDSIC Plan Benefits," provided responses to several Data Requests (DRs), and reviewed written testimony from the Office of Utility Consumer Counselor ("OUCC") (specifically Brien R. Krieger), IPL Industrial Group (specifically Brian C. Collins), City of Indianapolis (specifically Paul J. Alvarez and Dennis Stephens), and the Citizens Action Coalition ("CAC") and the Environmental Law and Policy Center ("ELCP") (specifically Ronny Sandoval). With respect to these referenced testimonies, my rebuttal testimony disputes:

1. The premise that IPL's TDSIC Plan consists of projects primarily focused on improving reliability (refer to section entitled, "Risk vs. Reliability Improvement"),
2. The relevance of comparing the level of investment of IPL's TDSIC Plan with the approved TDSIC Plans for the other Indiana utilities (refer to section entitled, "Comparability of IPL's TDSIC Plan"),
3. The statements that benefits ascribed to the Plan are overstated (refer to section entitled, "Benefit and Cost Comparison"), and
4. The requirement of a more comprehensive Integrated Distribution Planning process as a pre-requisite to meeting the TDSIC Statute.

Q10. Could you be more specific regarding your disagreement with certain statements?

A10. I rebut the premise that the TDSIC Plan is, in essence, a reliability improvement initiative, a theme that prevails across the above referenced testimonies (listed in my response to

question 9). Expanding upon the work done in response to Order of the Commission dated March 16, 2016 (IURC Cause No. 44576), specifically related to improving its Asset Management process, IPL applied a risk-based approach in developing a significant portion of the proposed capital investment portfolio that defines the TDSIC Plan. Though reliability constitutes one key element of risk, IPL considered other areas of risk in identifying projects; namely, Safety, Environmental, Regulatory, Financial and Operations. Viewing reliability through the asset risk lens connotes emphasis on maintaining IPL's historically strong reliability performance, a necessary foundation to any future improvement in total system reliability. I explain further below how this distinction shapes the manner in which one should view the Asset Replacement projects and their associated reliability-related monetized benefits.

I also rebut any inference that IPL's TDSIC Plan is out of proportion with other TDSIC Plans approved by the Commission. Certainly, other Indiana electric utilities have much larger territories, heavier loads and less favorable reliability metrics. However, the strategic significance of Indianapolis as the State's capital, the number of assets in a densely populated area, types and increased expectations of customers, and the impact of failures to the State's economy are factors to consider when comparing investment levels. I point later to two statements by other witnesses that do not account for these factors.

Additionally, I rebut any implication that the monetized benefits are overstated. IPL adopted a conservative approach in terms of scope (projects and risk elements to monetize) and factors used for unitized costing and took precautions to avoid any double counting of monetized benefits. I explain below why this perception is not accurate and otherwise respond to applicable portions of the referenced testimonies.

Last, I rebut the notion that a full-fledged Integrated Distribution Planning process is required to comply with, or for that matter applies to the TDSIC Statute. Any such process would necessarily address the challenges of aging infrastructure; and would incorporate a risk-based approach similar to that described in the IPL's TDSIC Plan. With respect to the level of modernization inherent to the Integrated Distribution Planning process, IPL would have to make assumptions amidst an ever-changing view of the role of the future electric utility and the realities of rapidly changing / improving system enabling technologies. However, where certainty does exist, IPL's TDSIC Plan sets the stage for full-scale modernization. It assures customer value in terms of improved reliability and energy savings. The Plan certainly incorporates elements that would constitute the preliminary aspects of Integrated Distribution Planning but extending its scope to address a vastly expanded vision, is risky and by my interpretation, outside the purview of the TDSIC Statute. IPL Witness Bentley further expounds on IPL's position vis a vis Integrated Distribution Planning in his rebuttal testimony.

RISK VS. RELIABILITY IMPROVEMENT

Q11. In your introductory response to the opposing witnesses, you stated that IPL adopted a risk-based approach in developing a significant portion of the TDSIC Plan, inferring that reliability improvement was not the primary driver. Could you explain?

A11. IPL used a risk model to define the five proposed investments categorized as Asset Replacement Projects (as opposed to a reliability improvement model inferred by the referenced testimonies). Of the six categories of consequences of failure criteria used to evaluate specific assets for replacement, reliability is but one. To the extent that reliability

is a factor in these projects, they address the risk of degrading system reliability as opposed to improving system reliability, seemingly the focus of much of the testimonies referenced in my response to question 9. IPL explained this distinction in its response to City of Indianapolis Data Request 2-21, a copy of which is included as IPL Witness JWC Attachment 7-R.

Q12. What is the significance of this distinction?

A12. In invoking risk-based Asset Management, IPL has avoided the pitfall evident in the referenced testimonies of assuming that historical investment levels and focus will assure the continuation of current reliability performance, a point IPL Witness De Stigter expands upon in his rebuttal testimony citing the bathtub curve model as the basis for projecting increases to historical failure rates. Predicating future investment strategies on past equipment failure rates is therefore neither prudent nor rational. Consequently, a large portion of IPL's TDSIC Plan starts with a review of the condition of individual assets within critical asset classes to compute their likelihood of failure. These assets (station breakers, power transformers, batteries, transmission / sub-transmission circuits and overhead /underground primary distribution) are currently functioning well but operating at varying levels of risk (with an ever-increasing number of assets migrating into the high-risk zone). In submitting its TDSIC Plan, IPL seeks to counter the continuing trend of more assets moving into the high-risk region, which will lead to more frequent equipment failures, thus affecting larger numbers of customers.

Q13. Are there any projects that will result in improved system reliability?

A13. Yes. The Tap Reliability Improvement Program ("TRIP") and Distribution Automation projects, representing 15 percent of the TDSIC Plan, provide for improved reliability.

However, the TRIP project targets taps prone to reoccurring outages (equivalent to a worst performing circuit program, but isolated to overhead fused taps), and given the comparatively small number of customers impacted, will improve reliability at the circuit level thus improving the customer experience (a key element in achieving customer satisfaction), but will have no major impact on system reliability. Distribution Automation, on the other hand, strategically prepares the distribution system for managing distributed energy resources and loads, with the tactical benefits of improved reliability, enhanced safety and voltage management / associated energy conservation. However, contrary to the views implied by the five testimonies referenced in my response to question 9 and specifically stated in City of Indianapolis Witness Alvarez's testimony (pages 5 and 6), extending these reliability improvement benefits to predict overall system reliability improvement on a quarterly or annual basis is difficult, if not impossible. The challenge of relating specific investments to overall system reliability improvement is further expounded upon in IPL Witness JWC Attachments 4-R and 7-R.

Q14. Please explain your statement regarding the difficulty of predicting reliability improvement.

A14. Several factors affect reliability performance. Some fall outside the control of the utility (e.g.; variability of weather and vehicular accidents), and despite a robust asset risk assessment, there remains randomness regarding the failure of specific assets and subsequent outage events. Thus, within any timeframe, the impact of a specific project on reliability will depend on these factors as well as the proximity of an event that could lead to an outage. Further, one would base any such projection of reliability metrics on historical outages and would inaccurately assume that future outages would be, on average equivalent

to the historical outage frequency and duration. Specific to the Distribution Automation project, there is no doubt that the strategic placement of 1,200 new reclosers combined with Fault Location, Isolation and Service Restoration (FLISR) functionality will reduce the size and duration of system outages. However, one cannot (1) ensure that an event (e.g.; failed equipment or major storm) will occur where this added functionality exists or (2) anticipate the occurrence of an unrelated event elsewhere in the system that could offset the reliability benefits delivered by this project.

Q15. How are these points relevant to the referenced testimonies from the OUCC, City of Indianapolis and the IPL Industrial Group?

A15. There are several instances in the referenced testimonies where the witnesses erroneously assume that IPL will maintain its strong historical reliability without a proactive plan to address increasing risk levels attributed to aging assets. The following questions point to specific areas where this false assumption comes into play.

Q16. IPL Industrial Group Witness Collins in his testimony states:

> **"Based on repeated assertions made by the Company, IPL already has a very reliable system. Thus, it is questionable whether the benefits of the incremental increase in reliability are indeed cost-justified in light of the very expensive plan proposed by IPL (Page 2)."**

Do you concur?

A.16 No. IPL Industrial Group Witness Collins missed the underlying premise of the IPL TDSIC Plan: Adopting a forward-looking perspective, the Plan addresses the projected increased level of risk of asset failures, which pose a threat to IPL maintaining its current level of reliability. Though IPL has been able to maintain acceptable (bordering on leading) performance to date, an increase in the number of high-risk assets due to age and condition poses a threat of more frequent and longer outages. Given new norms regarding customer

expectations, even among those categorized as residential (e.g.; the advent of home-based businesses, and increased reliance on electronics), any degradation in system performance will be viewed unfavorably.

Q17. IPL Industry Group Witness Collins further asserts:

> **"IPL has taken recent steps to improve its system reliability, such as increasing its tree trimming expense and establish a storm reserve account. Again, the improvements to reliability that those recent developments are expected to yield should reduce the need for aggressive spending to achieving smaller increments of reliability benefits. (Pages 2 and 3)"**

Do you agree?

A17. No. These recent steps are certainly part of an overall reliability improvement strategy, particularly as they relate to storm hardening and outage response. However, should IPL and its customers' experience an increase in equipment failure caused outages, any gains attributed to these initiatives will, as a minimum, be neutralized. Again, the focus of IPL's TDSIC Plan is on stabilizing the performance of current assets, thus ensuring any reliability improvement initiatives can have their desired effect.

Q18. OUCC Witness Krieger in his testimony states:

> **"IPL has testified the network is well maintained and in good condition and ranks favorably (top quartile) in performance benchmarking compared to 80+ other utilities. IPL has said that based on SAIDI results, IPL expected to be in the industry's top quartile in "average customer experience" for 2018. Plus, the IURC's 2018 Reliability Report rates IPL second compared to Indiana's five investor-owned electric utilities. (Page 6)"**

Please comment.

A18. As discussed by IPL Witness Shields, IPL has a history of providing safe and reliable service. IPL, through the development of its TDSIC, aims to maintain this performance level and improve upon it. OUCC Witness Krieger's testimony reflects a short-term perspective, whereas the risk model shows a steadily mounting "bow wave" of impending

equipment-failure caused outages. The fact that the 2018 SAIDI results are favorable is commendable but does not speak to future reliability performance. Not only is the risk of deterioration in reliability greater in the "business as usual" scenario, the time and investment necessary to return to today's performance levels will be extensive.

Q19. The majority of the referenced testimonies presume IPL's TDSIC Plan is all about improving reliability, none more so than the testimony filed by City of Indianapolis Witness Alvarez. Examples include:

> **"IPL estimates that reliability improvements will be the source of 70% of the economic benefits from its TDSIC Plan, and almost 60% of the reliability improvement value will come from prospective asset replacement (5 Plan components). (Page 4)"**
>
> **"IPL provides no estimate of system-wide reliability improvements it expects from its TDSIC Plan … Given that IPL's own benefit-cost analysis indicates that the Plan would not be cost effective without reliability improvements, the lack of reliability improvement estimates is a troubling observation. (Page 5)"**

Please comment.

A19. The 60 percent cited in City of Indianapolis Witness Alvarez's testimony refers to the five Asset Replacement projects that address maintaining current levels of reliability and are not drivers of reliability improvement. The other 10 percent of reliability-based benefits (pertaining to the TRIP and Distribution Automation projects), either focus on the customer experience-TRIP (as opposed to significantly improving overall system SAIFI and SAIDI), or in the case of Distribution Automation on improving reliability. However, for reasons explained in my response to question 13 above and further expanded upon in IPL Witness JWC Attachments 4-R and 7-R, IPL cannot project the benefits ascribed to Distribution Automation to a specific system-wide reliability improvement target.

Q20. City of Indianapolis Witness Alvarez continues to presume the Plan is reliability improvement based (in contrast to risk based) with statements on the use of the US Department of Energy's Interruption Cost Estimator ("ICE") tool. He states:

> **"The tool employs research-supported estimates for the value of electric service (and therefore the cost of service lost) by customer class (residential, commercial, and industrial), and multiplies by the number of customers in each class who stand to benefit from the reliability improvement action. The driver of reliability value in dollars is the estimated improvement in SAIDI or CAIDI or SAIFI. (Pages 5 and 6)"**

Is this an accurate statement?

A20. Partially so. The ICE Tool estimates either interruption costs or benefits associated with reliability improvements. In the case of IPL's TDSIC Plan, the focus of the five Asset Replacement projects is on estimating interruption costs (i.e. not reliability improvement) to quantify, in the absence of replacing aging assets, the effect of additional interruptions and a likely outcome in the event of a failed asset.

Q21. IPL Industrial Group Witness Collins also views IPL's TDSIC Plan primarily through the lens of reliability improvement. When queried regarding additional indices besides SAIDI, SAIFI and CAIDI that are valuable for measuring outage impacts on customers, IPL Industrial Group Witness Collins replied in the affirmative, adding:

> **"Two such indices include Customers Experiencing Multiple Interruptions ("CEMI") and Customers Experiencing Long Interruption Duration ("CELID") … The function of these indices is to provide a more customer-oriented view of performance. These indices in essence focus on the customers that experience the longest and most frequent outages, i.e. customers on the worst performing circuits of the Company's system. Ideally, the Company's proposed TDSIC plan should ensure that it is bringing these customers up to the higher level of system average reliability that the majority of its customers already experience. (Page 8)"**

Please comment.

A21. Though I continue to emphasize that the IPL TDSIC Plan is primarily risk-based, it does consist of projects that address a portion of IPL Industrial Group Witness Collins' view to tie more directly to the customer experience. Specifically, the two projects identified in my response to question 13 as providing improved reliability also address these issues:

- TRIP targets taps where customers experience the longest and most frequent outages; and
- Distribution Automation will operate more often in areas where more outages occur.

Q22 Do you have other comments on the opposing party testimony relevant to risk vs. reliability improvement?

A22. Yes, there are a couple of other statements that warrant discussion as they run counter to the risk-based approach used in developing IPL's TDSIC Plan.

Q23. In the context of reviewing the IPL TDSIC Plan against industry standards, City of Indianapolis Witness Stephens states:

> **"If IPL has been delivering safe, exceptionally reliable service at reasonable rates through compliance with standard industry practices, I see no rationale for departing from standard industry practices in IPL's TDSIC Plan (Page 7)"**

Do you concur?

A23. No. The practices to which City of Indianapolis Witness Stephens refers is **"to replace assets only as they fail (page 8)."** (Emphasis added to distinguish City of Indianapolis Witness Stevens' statement from my testimony) This has been a standard approach in the past, but the industry as a whole is trending towards a more proactive approach due primarily to three factors:

1. Lower customer tolerance for unplanned outages, even during major storm events and independent of the number of customers affected,

2. The previously mentioned mounting "bow wave" of assets with a high risk of failure, potentially resulting in more frequent extended outages, and

3. As IPL adds more distributed resources to the distribution system, they are isolated until restoration.

In addition, consistent with the other witnesses, City of Indianapolis Witness Stevens' testimony erroneously assumes that IPL will maintain a steady risk profile at current levels and focus of investments.

Q24. Regarding alternative scenarios, IPL Industrial Group Witness Collins asserts that:

> **"… IPL does not compare the asserted benefits of the proposed $1.2 billion plan to a plan with a less aggressive level of spending over the next 7 years, and therefore does not demonstrate that the proposed $1.2 billion investment would yield sufficient incremental benefits compared to a more moderate and less expensive plan. (Page 14)"**

In his recommendations, he further states:

> **"The $1.2 billion plan presented by IPL would be much more reasonable over two TDSIC periods rather than one, or 14 years of work rather than 7 years. That would reduce the initial plan to the $600 million range, which is much more appropriate for a utility with a compact service territory and a history of strong performance on reliability metrics. (Page 20)"**

Do you agree?

A24. No. These statements reflect a lack of understanding of the process invoked in assessing asset-related risk, while simultaneously laying the foundation for the integration of new technologies. A funding level of $600 million would force IPL to conduct suboptimal trade-offs between Age and Condition projects (totaling approximately $1.0 billion in cost in IPL's TDSIC Plan) and those focused on Deliverability (totaling approximately $200

million in cost). Even if IPL were to totally forego the Deliverability projects (Distribution Automation and Substation Design Upgrades) which is not advisable, a significant gap would exist (approximately $400 million) in proactively addressing asset health related risks. In deferring these investments seven years (as inferred by IPL Industrial Group Witness Collins' recommendation), the likelihood of failure for these high-risk of assets increases, and the resulting backlog creates even a greater challenge for years 8 through 14.

IPL Industrial Group Witness Collins' statements regarding more moderate and less expensive plans also run counter to the approach in formulating a plan that optimizes the balance between mitigating risk, assuring safe and reliable service, and implementing the foundational elements for grid modernization. It is my view that the current investment level of $1.2 billion reflects an iterative prioritization process, focused on meeting the objectives as specified in the TDSIC Statute.

Q25. How would you summarize your rebuttal of the referenced testimonies relating to Risk and Reliability?

A25. There are five distinct, yet related points:

1. IPL's TDSIC Plan applied sound Asset Management principles in its formulation, applying a risk-based approach in identifying assets for replacement,

2. IPL's TDSIC Plan centers on managing risk, and clearly is not solely a reliability improvement plan.

3. The presumption that historical investment levels will maintain the current level of reliability is flawed,

4. Customer expectations regarding safe and reliable service continue to increase, resulting in lower tolerance for unplanned outages, with or without major events, and

5. IPL's TDSIC Plan positions its system for future distributed energy resources, and is so doing, will positively affect reliability.

Q26. Does this conclude your rebuttal testimony on the points raised around IPL's risk-based approach and its relationship with IPL's electric system reliability?

A26. Yes

COMPARABILITY OF IPL's TDSIC PLAN

Q27. In response to questions 9 and 10 above, you disputed the relevance of comparing IPL's TDSIC Plans with those submitted by the other Indiana electric utilities. Could you expand on this point?

A27. There are a couple of points to emphasize with respect to comparability of IPL's TDSIC Plan with those submitted by the other Indiana electric utilities:

1. IPL's approach, aligned to the core tenets of ISO 55000 and sound Asset Management practices, deployed a risk model similar to that used by the other Indiana electric utilities, the outputs of which drove the creation of much of the Plan. In that IPL and the other Indiana electric utilities used a risk model to define the scope of their submittals, the plans are comparable. OUCC Witnesses Krieger and Collins missed this point in their testimonies (specific portions of

which I cite below in question 28), that the scope of the IPL Asset Replacement projects is the result of a similar risk modeling process.

2. In applying risk as a key driver (defined as the product of likelihood and consequence of failure), not only age and condition of specific assets come into play, the notion of the consequence of an asset failure plays a significant role in determining and prioritizing risk remediation efforts. Indianapolis represents a comparably large population center with a wide range of customer categories (i.e.; residential, commercial and industrial) and corresponding increased expectations for safe and reliable service, which definitely increases the calculated consequences of any service interruption as compared to outages in other, perhaps larger, service territories. Though the comparison by IPL Industrial Group Witness Collins (specific statement cited in question 27) focused on other factors (e.g.; larger service territories, heavier load, and less favorable reliability metrics), to suggest that IPL's funding request is out of proportion with other TDSIC plans approved by the Commission ignores the effect of these potentially higher consequences.

Q28. As stated in my response to question 27, two witnesses specifically address this issue. OUCC Witness Krieger in his testimony states:

> **"IPL's testimony in recent cases touting network reliability does not seem in sync with the cost of the requested Plan. (Page 6)"**

In addition, IPL Industrial Group Witness Collins expands upon OUCC Witness Krieger's theme:

> **"The $1.2 billion plan proposed by IPL involves a comparable level of investment to approved TDSIC plans for other Indiana electric utilities with much larger territories, heavier load, and less favorable reliability metrics. The**

proposal here therefore appears to be out of proportion with other TDSIC plans approved by the Commission. (Page 3)"

Do you concur with these statements?

A28. No. The context of these statements is flawed. Understanding the full import of a risk-based approach and expanding upon the points made in the previous section, the risk-based analysis performed by Burns and McDonnell reveals that maintaining highly touted reliability will require a significant investment in IPL's electric distribution infrastructure. The analysis infers that failure to adopt a proactive strategy for replacement of critical assets will lead to a noted decrease in reliability; with the unfavorable consequences related to increased customer reliance on technology and corresponding expectations regarding safe and reliable service.

Q29. Does this conclude your rebuttal testimony on the points raised around the comparability of IPL's TDSIC Plan with those of the other Indiana electric utilities?

A29. Yes.

BENEFIT AND COST COMPARISON

Q30. In your introductory remarks, you took exception to the notion that the benefits are greatly overstated. Please explain.

A30. I will first state and respond to specific testimony that addresses this topic, and then summarize the discussion to address any statements or inferences that underlie any previously mentioned statements.

Q31. In IPL Industrial Group Witness Collins' testimony, he states that:

"The cost-benefit analysis relied upon by IPL to justify its proposal compares 7 years of spending with 20 years of computed benefits, but the costs are significantly understated and the benefits are greatly overstated. That analysis

is not a reliable basis to support the conclusion that the incremental benefits justify the proposed $1.2 billion of investments (Page 3)"

Do you concur with this statement?

A31. No. The 20 years of computed benefits represents a conservative window of continued customer benefits after the completion of the TDSIC-identified projects. The asset replacement and configuration changes related to these projects generally have expected lives in excess of 20 years. To suggest that customers can only benefit during the actual installation timeframe of new assets and capabilities, and that there is no residual benefit after installation defies logic.

The inference that the incremental benefits as presented are overstated and do not justify the proposed $1.2 billion of investment fails to recognize the full range of plan benefits. IPL explains these benefits in its response to IPL Industrial Group Data Requests 1-5, 1-6, and 1-11 and City of Indianapolis Data Request 3-1, attached hereto as IPL Witness JWC Attachments 2R. 3R, 5R, and 6R. More specifically, the position of IPL Industrial Group Witness Collins and City of Indianapolis Witness Alvarez overlook the following:

1. IPL adopted a portfolio perspective in formulating the TDSIC Plan, accounting for a host of quantitative and qualitative benefits across a comprehensive, integrated and inter-related group of 13 projects,

2. In combining this portfolio perspective with monetizing only those benefits most directly realized by IPL's customers (e.g.; prevention or reduction of customer interruptions, energy savings, and elimination of reactive work), and limiting the monetization to seven of the 13 projects that define the TDSIC Plan, IPL avoided overstating (i.e.; double counting) the portfolio's economic value,

3. Of the seven "Benefit Categories" presented in Table 3.1 of IPL's TDSIC Plan, IPL only partially monetized portions of two for the five Asset Replacement Projects (Reactive Work and Customer and Small C&I Reliability). Similarly, IPL only partially monetized a subset of three for TRIP and Distribution Automation Projects (Reduced Maintenance and Reliability for TRIP and Reliability and Conservation Voltage Reduction for Distribution Automation),

4. Though approaches exist to assign economic value to Safety, IPL opted not to place a dollar value on health and safety; and similarly for environmental benefits,

5. IPL maintained a conservative posture regarding cost factors for the partial list of monetized benefits. Examples include applying a profile of reduced reliability benefits as TRIP proceeds through the seven-year window, using lower than computed conservation reduction factors, delaying the benefit realization profile for Distribution Automation, and maintaining congruency with the Risk Model in computing reliability-related benefits, but without large Commercial and Industrial Customers for the five Asset Replacement Projects, and

6. IPL applied industry standard approaches in monetizing for reliability-related benefits, most notably the US Department of Energy funded Interruption Cost Estimate Calculator, which given the changing dynamic around customer expectations is viewed as conservative in estimating the value a residential customer assigns to a service interruption.

I maintain the position stated in Section 3.1 of the Plan, that IPL's proposed TDSIC Plan provides benefits, both quantitative and qualitative, that far exceed the calculated monetized benefit-to-cost ratio. The fact that this partial monetization and application of the above listed factors of conservatism result in monetized benefits that exceed the cost of the plan (either from a nominal or NPV perspective-refer to my response to question 32 below) substantiates this claim.

Q32. With respect to the actual computation of the net monetized benefit, IPL Industrial Group Witness Collins further states that the Plan:

> **"… shows only nominal dollar figures, without any adjustment to determine a Net Present Value ("NPV") of the benefits. Therefore, the computed $938 million in benefits occur over a 20-year window and the Company's presentation does not account for the time value of money. (Page 13)"**

Please respond.

A32. IPL presented the monetized benefits of the TDSIC Plan in nominal terms to maintain consistency with the total cost of the Plan of $1.219 billion, also presented in nominal terms. The following table recasts these numbers, showing NPV for both the cost and benefits of IPL's TDSIC Plan.

Table 1. Summary of Monetized Benefits (20-Year Period)

Project	Category	NPV ($M)
Distribution Automation	Self-Healing / Reliability	$194
	Conservative Voltage Reduction	$31
Tap Reliability Improvement Program	Repair / Line Clearance	$24
	Customer Reliability	$98
Asset Replacement Projects[1]	Reduction of Reactive Work	$303
	Customer and Small C&I Reliability	$536
	Total Monetized Benefit	**$1,186**
	TDSIC Plan	($944)
	Net Monetized Benefit	**$242**

Q33. Regarding the feasibility of IPL's customers actually receiving the computed reliability-based benefits, City of Indianapolis Witness Alvarez states:

> **"The reliability improvements required to deliver the $1.5 billion in reliability value IPL estimates from its TDSIC Plan will be impossible to achieve. (Page 8)"**

He further states:

> **"Using the same ICE tool IPL claimed to have used in the valuation of reliability improvements, and using IPL-specific inputs the ICE tool requires, I was able to interpolate SAIDI and SAIFI improvements which would deliver $1.079 billion in reliability-related customer value over 20 years. (Page 8)"**

He then adds:

> **"I found that IPL needed to achieve 42% improvements in both SAIDI and SAIFI in order to deliver $1.079 billion in reliability-related customer value over 20 years. (Page 9)"**

Do you concur with these calculations?

A33. No. At the macro-level, a significant portion of the reliability benefit ($872 million[1] specified in IPL response to City of Indianapolis Data Request No. 2-21 hereto attached as IPL Witness JWC Attachment 7-R) deals with maintaining current reliability (i.e.; no impact on current SAIFI or SAIDI other than to increase the likelihood of maintaining current levels of performance). This one factor significantly reduces the 42 percent improvement target presented by City of Indianapolis Witness Alvarez. For those projects projecting improved reliability (i.e.; TRIP and Distribution Automation), IPL's focus for establishing a baseline was on the full customer experience (i.e.; IPL included Major Event Days in its calculations), whereas it appears City of Indianapolis Witness Alvarez excluded the more costly and longer outage duration Major Event Days in his calculations. With Major Event Days included, equipment failures at IPL already account for 30 percent of

[1] The $872 million of nominal reliability benefits relates to the five Asset Replacement projects, applying the DOE ICE Model to compute. benefits realized by IPL's residential and small commercial and industrial customers. It does not include $207 million of similarly calculated benefits ascribed to TRIP (equating to the $1.079 billion figure cited above by Witness Alvarez) or the $429 million of similarly calculated benefits ascribed to Distribution Automation (i.e.; adding all three components totals the $1.5 billion cited by Witness Alvarez).

the outages and is likely to increase without TDSIC (as opposed to the steady state 20 percent figure used by City of Indianapolis Witness Alvarez). In summary, City of Indianapolis Witness Alvarez's approach and supporting calculations ignore a TDSIC objective to replace those assets projected to perform poorly in the near future and ignores the customer experience during major outage events.

Q34. City of Indianapolis Witness Alvarez then goes on to say:

> **"IPL also overstates the economic benefits from sources other than reliability improvements. (Page 10)"**

Adding:

> **"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. (Page 10)"**

Do you agree?

A34. No. In this context, reactive work refers to unplanned work performed in response to an equipment failure, as opposed to proactive work that relates to planned work in advance of an anticipated or projected equipment failure. The savings attributed to reducing the cost of reactive work in IPL's monetization analysis (i.e.; the inefficiency factor for performing work in a reactive, unplanned manner) centers exclusively on the five Asset Replacement projects. The specific assets identified for replacement were the result of applying the previously mentioned Risk Model, where embedded in this model and overall approach is the likelihood that a specific asset will fail, which combined with a computed consequence of failure, determines the appropriate risk remediation action (replace, maintain or "run-to-failure"). This approach coincides with standard Asset Management practices where the probabilistic aspect of risk provides a valid basis for making asset-related decisions, and therefore demonstrates prudence in determining the appropriateness of proactively

replacing critical assets. City of Indianapolis Witness Alvarez's above statement defies this core tenet of effective risk-based Asset Management, a process strongly embraced by IPL and the Commission (as evidenced by the Collaborative conducted in 2016 and the commitments resulting from that effort).

IPL Witness De Stigter further expands on these points in his rebuttal testimony.

Q35. City of Indianapolis Witness Alvarez then focuses specifically on the Tap Reliability Improvement Program, stating:

> **"IPL claims the Tap Reliability projects will save $50 million in operating expenses over 20 years. In discovery, when asked how many headcounts IPL would reduce to secure these benefits, IPL's response is zero. It is difficult to understand how IPL can estimate $50 million in customer benefits from zero headcount. (Page 10)"**

Please comment.

A35. The majority of the interruptions on TRIP tap lines occur outside normal business hours and / or during adverse weather events. Restoration often involves tree trimming contractors, line construction contractors, and overtime for IPL employees. Therefore, the $50 million reduction in operating expenses over a 20-year period reflects adjustments in contract labor and reduced overtime, and the IPL employees typically assigned to reactive work will likely perform activities to support the maintenance, refurbishment, operation and replacement of assets.

Q36. City of Indianapolis Witness Alvarez then shifts his focus from benefit monetization to the Plan's cost by raising an issue regarding carrying charges of $772 million over the established 20-year period of calculated monetized benefits, stating:

"IPL's cost estimate ignores carrying charges customers must pay, which I estimate at $772 million over the first 20 years, a 63% increase over IPL's estimate of $1.218 billion. (Page 13)"

Please comment.

A36. In my experience I have not come across a situation where a benefit and cost comparison for a capital investment portfolio included the carrying charges to which Witness Alvarez refers. That said, the net monetized benefit of $939 million represented in IPL's TDSIC Plan (refer to Table 3.3 in the IPL TDSIC Plan) exceeds the $772 million in carrying charges estimated by City of Indianapolis Witness Alvarez. Further, when one accounts for the qualitative benefits that do not lend themselves to monetization (e.g.; improved customer experience and modernization), or additional quantifiable benefits (e.g.; safety and environmental) that IPL opts not to monetize, the gap between the total benefits and cost of the IPL TDSIC Plan only widens. Thus, viewed from an overall Plan perspective, the combined contribution of all benefits (qualitative and quantitative) far exceeds these carrying charges.

Q37. IPL Industrial Group Witness Collins then presents the cost of IPL's TDSIC Plan in a different context, addressing the Plan's impact on transmission and distribution rate base:

"With a transmission and distribution spend of another $1.2 billion in IPL's proposed TDSIC plan, this amounts to an average spend per customer of approximately $2,409 based on the number of customers in 2018, nearly twice the amount of 2018 transmission and distribution rate base per customer of $1,208. (Page 5)"

Please comment.

A37**.** Similar to my response to question 36, I have not encountered a situation where increase in rate base per customer is a metric in the benefit and cost evaluation of a major capital

investment plan. Though this metric is certainly enlightening, these costs are based on pre-set formulae that presents the cost of the Plan in comparison to rate base, as opposed to an incremental increase to IPL's seven-year capital investment plan. Surely, from either perspective, IPL's TDSIC Plan represents a large undertaking, yet one where the customer benefits far exceed its cost.

Q38. IPL Industrial Group Witness Collins then uses the 20-year window for computed benefits to presume spending will continue after seven years:

> **"The analysis compares 7 years of investment against 20 years of computed benefits, but spending is not likely to end after 7 years. (Page 14)"**

Do you concur?

A38. No. The seven years of investment represent the time required to complete the scope outlined in IPL's TDSIC Plan, and as stated in my response to question 31, "the 20 years of computed benefits represents a conservative window of continued customer benefits after the completion of the TDSIC-identified projects." Thus, the seven years of investment is not only unrelated to the 20-year window, it is defined by statute as the limit to any TDSIC-related expenditures. Any capital investments after seven years will likely be subjected to traditional ratemaking. IPL Witness De Stigter also addresses this point in his rebuttal testimony.

Q39. How would you summarize your rebuttal of the referenced testimonies relating to Benefit and Cost Comparison?

A39. There are three points that warrant emphasis:

- IPL's monetization of benefits was appropriately conservative in scope (only some, not all of the benefits were monetized), and process (application of cost factors),
- IPL's monetization process maintained alignment with the Risk Model for the five Asset Replacement projects and deployed industry accepted practices in calculating reliability-related benefits from the customer perspective, and
- Though IPL did not monetize the majority of the benefits summarized in Table 3.1 and expanded upon in Section 6 of its TDSIC Plan, this partial monetization yields economic value (in either nominal or NPV terms) that exceeds the cost of the Plan.

Q40. Does this conclude your rebuttal testimony on the points raised around Benefit and Cost Comparison?

A40. Yes

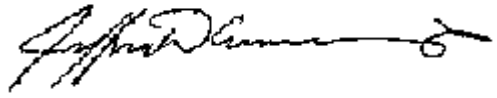
Q41. Does this conclude your prepared verified rebuttal testimony?

A41. Yes.

VERIFICATION

I, Jeffrey W. Cummings, Senior Vice President of UMS Group Inc., affirm under penalties of perjury that the foregoing representations are true and correct to the best of my knowledge, information and belief.

Dated: October 23, 2019



Jeffrey W. Cummings

IPL Witness JWC Attachment 1-R

JEFFREY W. CUMMINGS

SUMMARY AND BACKGROUND

Mr. Cummings has over 39 years of professional consulting experience, with an extensive background in engineering, strategic and operational planning for vertically integrated investor-owned utilities and municipalities in North America and Asia Pacific. His most recent engagements include projects for Portland General Electric, AES-Indianapolis Power and Light Company, Pacific Gas and Electric, FirstEnergy (Ohio, West Virginia, Maryland, New Jersey and Pennsylvania), NIPSCO (Gas), ATCO Electric, Lansing Board of Water and Light, Saskatchewan Power, Ameren (Illinois and Missouri), Ergon Energy, Toronto Hydro (THESL), and Public Service Electric and Gas Company. He supports the industry across a wide range of activities, addressing: (1) key strategic and operational challenges related to T&D network modernization, (2) electric system cost and service level performance, (3) project / portfolio management, (4) system reliability, (5) energy efficiency, (6) fleet optimization, (7) capital investment planning and prioritization, (8) asset risk strategy and plan development, (9) organizational transformation, and (10) regulatory strategy. When called upon, he has offered expert testimony and/or opinion, most recently for a Canadian Provincial Utility, one Mideast Utility and for four US Investor-owned utilities operating in Kansas, New Jersey, Ohio, and Pennsylvania.

Earlier in his career, he held a series of engineering leadership positions at Vectra Technologies (formerly Pacific Nuclear and a publicly traded nuclear services company) and ultimately became Vice President of Nuclear Engineering. In that capacity, he served as the profit/loss manager for over 425 professional engineers across five regional offices in the U.S. In performing this role, he actively engaged in formulating strategies for customer development, product/service expansion, business consolidation, and oversaw the management of over 500 projects annually for approximately 75 percent of the U.S. nuclear utilities. Prior to his tenure with Vectra Technologies, Stone and Webster Engineering Corporation employed Mr. Cummings where he assumed increasing levels of responsibility in the management of large Lignite and Nuclear Power engineering and construction projects, culminating as Project Controls Manager for the completion of the last U.S. commercial nuclear power generating station (Clinton Power Station).

Mr. Cummings holds an M.S. degree in Operations Research from the U.S. Naval Postgraduate School and a B.S. degree from the U.S. Naval Academy at Annapolis, Maryland

HIGHLIGHTS OF EXPERIENCE

Conducted an enterprise-wide review of a mid-western utility to corporate organization structure considering pre-established strategic goals and six major initiatives, all geared towards its vision as a Utility of the Future. Included was the establishment of a Project Office for a new CCGT plant, the planned retirement of a coal-fired station, four major IT / OT initiatives, considerations regarding aging workforce and the attending opportunities to retool its staff, a mandate to reduce O&M spending by 15 percent, all within the construct of managing risk during a major industry

transformation. His efforts included detailed analyses of staffing levels, worker productivity, O&M program execution, and capital efficiency, benchmarking cost and service level performance, and identifying industry best practices to close identified performance gaps, The recommendations were presented and accepted by the utility (with minor adjustments) and is in the process of extending the contract to include implementation support.

Worked with a west coast electric utility in establishing a Project and Portfolio Management function. Starting with defining criteria for evaluating and selecting projects for execution, the process framework put in place provided the governance and operating guidelines to manage a portfolio and specific projects throughout the fiscal year, establishing the concepts of "contingent" projects, the capture of value, risk mitigation and transparency in comparing the value of electric production and energy delivery investments.

Provided expert opinion regarding a northeast utility's restoration performance during a major storm event in October 2017. Filed with the courts, his opinion addressed the utility's comparable position in restoration time, restoration rate, immediate response, restoration practices deployed, and overall prudence of its decisions in the events leading up and during the storm. He not only provided incontrovertible proof of prudence, but through comparisons (benchmarks) with other major storm events in North America and Europe, he presented a compelling argument that the utility excelled in its performance, effectively managing the trade-offs between performance, cost and operational risk.

Supported a mid-western electric utility's rate case, testifying to the veracity of its asset, risk, and performance management programs and efforts underway to address significant challenges with its central business district underground network system. Consistent with Mr. Cummings' recommendations, he participated in a collaborative effort to define an oversight process that focuses on a comprehensive performance dashboard of KPIs, and monitoring progress towards an Industry Leading Asset Management process.

Spearheaded efforts to provide third party assessments of a mid-Atlantic electric utility's capital investment, O&M spending levels and service level performance in support of a base rate filing; and later assessed the prudence of decisions made in the events leading up and during three extraordinary storm events during the 2011 - 2012 time-frame. He led a comprehensive benchmarking effort, focused on productivity (unit cost), reliability, and storm restoration performance. In both instances, he provided written direct and oral testimony during cross-examination demonstrating the utility's effectiveness in balancing operational performance, cost and risk mitigation.

Assisted a mid-western electric utility in developing a Grid Revitalization Program for submittal to its Board of Directors and State Regulator. The proposed plan provided profiles of projected capital and O&M cash flows, the capture of utility and customer benefits and risks, and an industry context around which to justify such a program. The results of this effort were entered testimony in support of the utility's filing for a capital rider, for which it received sufficient funds to support the initial 18 months of a 10-year program.

Assisted a Canadian electric utility in offering an independent third-party assessment of a recent PBR filing performing high-level comparative analyses (benchmarks) of proposed growth and capital investments geared towards infrastructure renewal over a 5-year period; and assessing the

risk of returning to previously established lower capital investment plans. This effort included providing testimony as part of a formal hearing with the Provincial Utility Commission.

Served as Project Director for a full-scale business renewal effort, establishing a plan to improve the efficiency of capital investments, and decrease O&M spending by $50 million annually without any noted decrease in system performance or increase in operational risk. Conducted across the entire enterprise with a focus on worker productivity (O&M program unit costs), capital efficiency (capital investment portfolio and unit cost management), this effort launched a series of initiatives that over 10 years will decrease spending levels by a cumulative $500 million and set the stage for transitioning to the Utility of the Future. Areas of focus included comparative cost and service level analyses, work planning and execution, performance dashboards, transmission and distribution reliability, capital portfolio optimization, and business value/risk tolerance frameworks; and addressed the necessary infrastructure to construct a "first-of-its-kind" carbon capture generating facility.

Served as Project Director of four comprehensive assessments for separate Transmission and Distribution operating companies of a large US-based electric holding company.

- Three involved a review of practices and processes related to electric system reliability as measured by SAIFI, CAIDI and SAIDI with a thorough review of historical results (as reported in their outage management systems) and supporting reliability programs. Specifically, these assessments analyzed, trended and benchmarked service interruptions, service restoration, organization and staffing, and capital/operating spending patterns with the objective immediately and sustainably improving performance; and included formal presentations to Commission staff across 2 regulatory jurisdictions, and
- Another assessment involved a thorough review of the electric distribution infrastructure from both asset condition and energy efficiency viewpoints, resulting in a long-term strategy and plan to transform the network to 21st century standard. This involved identification of key technical and financial legacy issues, incorporation of several constraints and factors (e.g. financial, technology and social equity), and a holistic portrayal of costs, benefits and risks from both a portfolio and individual circuit/substations perspectives; and the articulation of the plan tailored for each external stakeholder (e.g. commission staff/regulator, legislators, environmentalists, shareholders and customers).

Assisted a large Northeastern utility in identifying over $80 million of O&M cost reduction initiatives without impacting service level (e.g. customer service, availability, system reliability or safety). Areas of focus included benchmarking and practices review of the electric transmission and distribution, customer operations, gas distribution and asset management functions. The outcome has been incorporated into a long-range plan to improve earnings despite an unfavorable outcome is a recent rate case filing.

Performed a capital and O&M spending and risk mitigation diagnostic for a mid-level Midwest utility in support of an overall business case to infuse more capital into its transmission and distribution infrastructure. The case was compelling enough to present to the Board of Directors and the Commission State and will be a cornerstone for subsequent strategic planning and future rate filings.

Supported a mid-level Midwest utility in its energy efficiency/demand response filing with the

state regulatory and governing entities. Applied industry comparative analyses in demonstrating value capture / risk avoidance for all stakeholders (investors, customers and utility), and validated that the proposed program met the intent and letter of the legislative mandate.

Conducted an enterprise-wide capital efficiency assessment for a Canadian Utility spanning electric transmission and distribution and electric generation. In reviewing their planned capital expenditures over a 10-year period, Mr. Cummings led the analyses of worker productivity (unit cost) and capital project execution, and developed a plan to (1) reduce the current planned capital expenditures by 25 percent and (2) optimize the allocation of capital over the 10-year planning horizon with due consideration to optimizing the trade-offs between value and asset risk.

Strategic advisor for a major transformation effort within a U.S. Midwest municipality, that included conducting performance diagnostics (benchmarks) of its engineering and production divisions, development of a work planning and outage management program (and support processes), and several initiatives focused on achieving organizational alignment. Supporting efforts included oversight of the completion of a CCGT Plant (including supporting negotiations with GE for a LTSA), establishing criteria and process for the converging IT/OT, and the creation of an Organizational Efficiency and Effectiveness model.

Assisted a large Australian electricity distribution utility in optimizing the size and mix of its fleet of vehicles and attached equipment, factoring in financial constraints, environmental requirements, and the aligning of work level, staffing and specific task descriptions. The process of arriving at a plan to reduce capital investments by as much as $20.0 million and operating expenses by $1.2 to $2.0 million involved the active participation of the company's internal customers (i.e. users of the fleet assets), resulting in organizational acceptance of the outcome. Mr. Cummings extended this effort to a large Western U.S. electric municipality, developing a strategy and plan to achieve comparative results.

Led the implementation of a process (and supporting software) to optimize the capital spending profile across three operating companies within a large US-based electric and gas company (electric transmission and distribution, gas transmission, distribution and storage, fleet, and electric generation); as well as one of the largest gas utilities in the US Midwest. In performing these projects, Mr. Cummings facilitated the linkage of a proposed investment's value and its contribution to overall corporate strategy as well as the risk should a specific investment be deferred; and equally important, implemented the process in a manner that garnered organizational support for change.

Oversaw the implementation of an industry forum to identify trends and perform causal analyses on the failure of critical transmission equipment and components. In pooling industry equipment/component performance data, the goal was to apply statistically relevant data to predict failure patterns establish optimum replacement vs. refurbishment criteria. In parallel with the initial formation of this forum, Mr. Cummings also performed the following:

- Comprehensive performance diagnostic across all functions of one of the largest electric municipalities within the US Southwest. In so doing, he provided a plan of action to maintain service levels yet reduce operating costs by as much as 25 percent. The utility adopted the recommendations and integrated them with the municipality's five-year operating plan.

- Development of a preventive and corrective fleet (vehicle and attached equipment) maintenance program, adopting may of the best practices from the petroleum and U.S. Naval programs, and tailoring them to application in a gas municipality environment. The project team, led by Mr. Cummings, provided a detailed process manual (with supporting process maps), an implementation plan (i.e. process/procedure changes and additions, technology enhancements and organization adjustments), and a series of key measures to assist the utility in adopting the recommendations. The municipality and city government officials embraced the program as submitted.

Participated in a task force and subsequently joined the implementation team in developing and executing a five-year plan to revamp the electric transmission and distribution infrastructure for the Chicago business district. This effort involved the translation of highly technical specifications and detailed budgeting information into terms easily understood by commission staff, city government, and the utility's customers. All external stakeholders (i.e.; Board of Directors, City of Chicago, Commission Staff and State Regulator accepted the plan.

While supporting implementation, Mr. Cummings developed the strategies and plans for initially routing, certifying, designing, and installing 135kV and 345kV transmission to meet projected load growth and system reliability requirements. He played a key role in shortening the certification period by as much as 50 percent. This required effective liaison and communication with the Illinois Commerce Commission and Army Corps of Engineers as well as coordination of Commonwealth Edison's engineering and construction organizations and their assigned "contractors of choice."

Provided consulting services to several technology-based enterprises including gas and electric utilities, engineering and architectural firms and manufacturers of electric components. The projects included:

- Strategic and Operational Planning and Integration (Linkage of Business Vision, Core Values, Financial Goals and Core Business Processes, maintaining a balance between long-range sustainability of the business and short-range stakeholder expectations).
- Organizational Development (Competency-based Performance Management System Development and Implementation, Business Culture Assessments, Employee 360-degree Evaluations, Leadership Development, Recruiting and Employee Selection).
- Marketing and Sales Support (Branding Strategy Development, Customer Satisfaction Surveys, Product/Service Positioning and Pricing Strategies, and Sales Training).
- Technical and Commercial Management (Ensuring a proper balance between achieving profit/loss targets and meeting the quality standards as specified by the customer)
- Merger and Acquisition Assessment and Implementation

Worked in a variety of capacities for a nuclear engineering consulting company, serving initially as a Project Manager and ultimately as the Vice President of Nuclear Engineering. Over this 11-year period, he played a major role in growing annual revenues from $5.0 million to $50.0 million while increasing market penetration to approximately 75 percent of the US nuclear utilities. He developed many of the skills and competencies used in his roles as management consultant

(summarized above) through his hands-on experience in managing over 425 engineering professionals and overseeing the management of over 500 projects annually.

Worked in a variety of capacities for Stone and Webster Corporation, primarily assigned to major nuclear power plant design and construction projects. Specific assignments included:

- Assignment to the Beaver Valley Power Station project, establishing a projects control process and system within the Duquesne Light Company to manage the installation of Three Mile Island modifications in support the second refueling outage, improving actual performance in terms of work performed and schedule duration from the initial refueling outage by a factor of three. Following this effort, Mr. Cummings shifted his focus to the unit under construction (unit no. 2) where he installed a process to facilitate the final turnover of the systems (and accompanying documentation) to plant operations over an 18-months period.
- Assignment to Clinton Power Station, where he acted as Project Controls Manager for the contractor, facilitating the lifting of 12 Nuclear Regulatory Commission (NRC) imposed stop work orders and subsequent construction and turnover of the plant to the Illinois Power Company (IPC). Key activities over a two-year period included a successful Fuel Load Caseload presentation to the NRC, rate case preparation, an information system installation to track the turnover of all systems, and instituting an integrated cost and schedule process and system to support weekly and monthly reporting to project and IPC executive management. His role in integrating the construction and system turnover schedules (and subsequent development of computerized detailed system turnover punch lists) served as a primary catalyst for successful completion of the Clinton Power Station project.

Served in the U.S. Navy in increasingly responsible roles culminating as a Weapons Officer on a destroyer, USS Robert E. Peary (FF-1073). In this capacity, he managed and led three divisions totaling 100 sailors, responsible for the maintenance and operation of all weapon and detection systems, the major equipment necessary to support basic seamanship evolutions, and daily consumables for the entire ship's force. He left the U.S. Navy in 1980, having earned the Navy Achievement Medal for his efforts during two extended deployments and extraordinary performance in the areas of Anti-Submarine Warfare and Naval Gunfire Support.

ARTICLES AND SPEECHES

- *"Integrated Risk Management-Application to Pipeline Safety*," a white paper written in collaboration with a utility executive in October 2017.
- "*Driving Reliability Improvements-Regulatory Oversight",* presentation given to the EEI Transmission, Distribution and Metering Conference, New Orleans, LA, April 7, 2009.
- *"A Paradox of Thrift: Economic Barriers to T&D Network Modernization",* an article written in January 2009.
- *"Grid Modernization: A Roadmap to Tomorrow's Infrastructure…Don't Get Lost on the Way to AMI,"* a white paper written in April 2009.

IPL Witness JWC Attachment 2-R

IPL Response to IPL Industrial Group Data Request 1-5

Data Request IG DR1 - 5

Please provide the complete cost benefit analysis for each category (Safety, Reliability and System Modernization). Please provide all assumptions used for each category.

Objection:

Response:

Per Section 3 "TDSIC Benefits" of IPL Attachment BJB-2 IPL's TDSIC Plan, the Plan provides a broad array of benefits, some of which lend themselves to monetization, and others that either do not lend themselves to monetization but bring value to IPL's customers, or as a matter of policy were not monetized (e.g.; safety where IPL opts not to place a specific dollar value on health and safety). Table 3.1 in the Plan maps the 13 projects that comprise the Plan to seven benefit categories, noting that IPL monetized seven projects (see below), and even for those projects, a subset of the benefits ascribed to them. Even within the benefit categories that can be monetized (e.g.; reliability and operational efficiency), for reasons outlined in Section 3.2.1 ("Monetization Approach Overview"), monetization was not applied for every project. Thus, for all the reasons stated or implied above, the total monetized benefit of $2.1 billion summarized in Table 3.3 of the Plan understates the full benefit, both from a total plan perspective and within each benefit category.

From the cost perspective, IPL developed estimates, defining scope and applying established estimating factors, independent of the benefits ascribed to each project. Since the specific elements of any project contribute to more than one benefit category, any attempt to apportion these costs across these categories would not be appropriate.

For these reasons, as IPL monetized portions of specific projects, it adopted a portfolio perspective:

- Incorporating conservatism in projecting actual savings,
- Remaining aligned with well-established risk modeling framework and approaches used in developing the Plan,
- Maintaining consistency with respect to assumptions to the analytics, and
- Avoiding any double counting of benefits attributable to the inherent inter-relationships among the 13 projects.

Assumptions used across each monetized category are contained within Section 3 of the Plan and associated Working Papers already on file. IPL presents the following Table:

Key Monetization Assumptions

Project	Benefit Category		
	Reliability / Resiliency / Modernization[2]	**Operational Efficiency**	**Conservation Voltage Reduction**
Distribution	• 3-YR outage history provides		• Wholesale market prices in years

Automation	a valid basis to project future system performance (Sustained outages average 2 hours in duration / momentary outages average 2 minutes in duration) • DOE Interruption Cost Estimator is a valid method to assign value to an avoided interruption (factors specified in Table 3.2 of the Plan) • Benefits will not begin until 2023 (As the full benefit for any single year of work will not be achieved until the next year, full benefits of DA will not be realized until year 8)		beyond 2027 will remain constant for CVR savings calculations • CVR factors will be at least 0.5 for the entirety of the project although IPL measured higher values • DA will decrease distribution system voltage by 2 percent on the 13.2 kV circuits where it is applied
Tap Reliability Improvement Projects	• Same as above for 3-YR outage history • Same as above for use of DOE Interruption Cost Estimator • 75 percent of the outages will be eliminated • Projects will be completed throughout the year with half completed by mid-year • Projects will be prioritized by reliability and there will be a declining benefit in future years	• Tree density and amount of undergrounding will remain constant. • Program will deliver a constant, full benefit every year in the area of tree trimming • A per outage cost of $3,000 based on 2018 (total amount of unplanned outage repair costs divided by total number of unplanned outages)	
Asset Replacement Projects[1]	• Likelihood of Failure 20 year profiles developed for 'Do Nothing' and Investment Plan scenarios using effective age, asset replacement year, and survivor curves. • Benefits only applied to Primary. • Same as above for use of DOE Interruption Cost Estimator • Omitted large C&I Customers • Omitted benefits attributed to failed poles in the Circuit Rebuilds and 4kV Conversion Projects • Full deployment of Advanced Control System at the onset of the Plan	• Likelihood of Failure 20 year profiles developed for 'Do Nothing' and Investment Plan scenarios using effective age, asset replacement year, and survivor curves. • 'Do Nothing' likelihood of failure used effective age for Poles, Transformers and Breakers and calendar age for Wires and Towers. • 40 percent factor assigned to difference between planned and reactive work • Applied to all assets	

NOTES:

1. **The Asset Replacement Projects refer to an aggregation of the monetized benefits attributable to the Circuit Rebuilds, Substation Assets Replacement, XLPE Cable Replacement, 4 kV Conversion, and Remote End-Breaker/Relay Upgrades Projects.**
2. **IPL combined the monetization of benefits related to improving or decreasing risk of deteriorated Reliability and Resiliency and the automation portion of Modernization since the replacement / installation of new assets work hand-in-hand with any central control system associated with Modernization.**

IPL Witness JWC Attachment 3-R

IPL Response to IPL Industrial Group Data Request 1-6

Data Request IG DR1 - 6

How does the cost benefit analysis provide a monetary amount to various elements including changes in outages; safety; modernization; metering, etc. Please provide all assumptions.

Objection:

Response:

In evaluating the Plan for cost benefit, the following steps were taken:

- Submitted a list of 13 Projects viewed consistent with the requirements of the TDSIC Statute,
- Fully costed them based on scope and the application of estimating factors and methodologies outlined in Section 4.0 "Best Estimates of Project Cost" of IPL Attachment BJB-2 IPL TDSIC Plan,
- Presented a comprehensive listing of benefits, both qualitative, and quantitative in the form of scores and dollars, for each project (Section 6, "TDSIC Project Narratives"), and
- Monetized the benefits of seven projects (or portions thereof) that lent themselves to monetization.

Viewed individually, one can see the cost estimate for each project (refer to Table 2.1 in the TDSIC Plan), with attendant benefits that are largely qualitative or quantitative but not monetized (refer to Section 6, "TDSIC Project Narratives"), and some, where feasible, partially monetized (refer to Section 3, "TDSIC Plan Benefits"). This partial monetization, which again, does not convey the full range of benefits ascribed to each project or the portfolio in its entirety, provides a total $2.1 billion in monetized value against the total TDSIC Plan cost of $1.2 billion. See Table 3.3 for summary of monetized benefits.

Please refer to IPL's response to IG DR 1-5 for the key assumptions used in monetizing the benefits.

IPL Witness JWC Attachment 4-R

IPL Response to IPL Industrial Group Data Request 1-7

Data Request IG DR1 - 7

Please document current reliability metrics and expected changes in reliability metrics by year.

Objection:
IPL objects to the Request on the grounds and to the extent the Request is vague and ambiguous. Subject to and without waiver of the foregoing objection, IPL provides the following.

Response:

See IPL's annual Asset Management and Performance Metrics Collaborative report in Cause No. 44576 and the IURC's annual investor-owned utility reliability data report for current reliability metrics.

The myriad of factors that contribute to reliability challenges, most notably age, condition and location of assets, and variability of weather, renders extremely difficult if not impossible any attempt to precisely link specific capital investments to system-level reliability improvements. Certainly, well-targeted investment on a specific circuit (i.e.; the proposed Tap Reliability Improvement Program) will improve the performance of that specific circuit or a concentrated effort of corridor widening in a densely forested area will improve performance in a specific area of the service territory during a storm event. However, other unanticipated events could impact the benefits ascribed to a specific investment.

IPL Witness JWC Attachment 5-R

IPL Response to IPL Industrial Group Data Request 1-11

Data Request IG DR1 - 11

Regarding system modernization expenditures, please provide the goals and cost of each major system modernization project included in the IPL TDSIC plan.

Objection:

Response:

IPL's TDSIC Plan consists of 13 Projects. While all these Projects have elements of generally modernizing IPL's transmission and distribution system, IPL's Plan specifically identifies 9 of these Projects with modernization being a key benefit resulting from these specific Projects. (See Table 3.1 of IPL Attachment BJB-2). In the IPL TDSIC Plan, IPL defined "modernization" as "replacing and adding assets with modern equipment/material or adding new technology onto the system for improved performance, functionality and operational efficiency." (See page 10 of IPL Attachment BJB-2)

The IPL TDSIC Plan contains an in-depth discussion of the specific goals and how these goals will be achieved in the narrative for each of the 9 Projects identified as having modernization as a primary benefit (see Section 6 of IPL's Plan for Project Narratives).

In addition, it is the general goal of the entire IPL TDSIC Plan to deliver incremental benefits that exceed the overall cost of the plan. As a part of the IPL TDSIC Plan, IPL has endeavored to monetize, in a conservative manner, just some of the quantitative benefits of the IPL's TDSIC Plan. (See Table 3.3 of IPL Attachment BJB-2) Please note that there are many other benefits of IPL's TDSIC Plan that are difficult or impossible to place a monetary value on, for example; safety, environmental impact, and customer experience.

The costs of each major system modernization Project are found in Table 2.1 of IPL's TDSIC Plan. (Page 6 of IPL Attachment BJB-2) Table 2.1 lays out IPL's projected annual capital costs by Project over each of the 7 years of IPL's TDSIC Plan.

IPL Witness JWC Attachment 6-R

IPL Response to City of Indianapolis Data Request 3-1

Data Request City DR 3 **-** 1

Refer to IPL Attachment BJB-2 (Public) in its entirety. Quantified economic benefits are not provided for several of the projects identified in Table 2.1. Provide any economic benefit estimates IPL may have calculated for each of these projects, listed below. If no economic benefit estimates have been developed for any particular project, please explain why not for each.
a. Central Business District Secondary Network Upgrades
b. Static Wire Performance Improvement
c. Pole Replacements
d. Steel Tower Life Extension
e. Substation Design Upgrades.

Objection:

Response:

IPL adopted a portfolio perspective in formulating its TDSIC Plan, accounting for a host of quantitative and qualitative benefits (refer to Table 3.1 in IPL Attachment BJB-2) across a comprehensive, integrated and inter-related group of 13 projects. As such, IPL's approach to monetization focused on those quantifiable benefits most directly realized by IPL's customers (e.g.; prevention or reduction of customer interruptions and conservation voltage reduction) in a manner that avoided (1) overstating (i.e.; double counting) the portfolio's economic value; or (2) assigning economic value to more controversial benefit categories (e.g.; safety). Applying these criteria, IPL did not perform economic benefit estimates for the five above listed projects. See also Appendix 8.11 Risk Reduction Benefit Monetization Report and IPL Witness De Stigter testimony.

IPL Witness JWC Attachment 7-R

IPL Response to City of Indianapolis Data Request 2-21

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Data Request City DR 2 **-** 21

Refer to IPL Attachment BJB-2 (Public), page 23, Table 3.3. The Table presents nominal reliability benefits over 20 years as follows: Distribution Automation, $429 million; Tap Reliability Improvement Program, $207 million; Asset Replacement Projects, $872 million.
a. Calculate the IPL-wide improvements in SAIDI and SAIFI resulting from these three project groups. Include an electronic spreadsheet with all formulas and cells intact and unlocked which show all calculations used to develop this response.
b. Is IPL willing to make the collection of the 20% revenue requirement deferral amount contingent upon the achievement of the IPL-wide improvements in SAIDI and SAIFI calculated? If not, why not?

Objection:

IPL objects to the request on the grounds and to the extent the request seeks a compilation, analysis or study that IPL has not performed and to which IPL objects to performing. IPL further objects to the request on the grounds and to the extent is seeks to negotiate through discovery. Subject to and without waiver of the foregoing objection, IPL provides the following response.

Response:

a. Regarding the $872 million ascribed to the Asset Replacement Projects, the focus is on age and condition of existing assets and addressing risks associated with equipment failure-caused outages. As such, the monetized benefit relates to avoiding degradation of as opposed to improving system reliability. Therefore, in the case of the five Asset Replacement Projects, the notion that IPL's system-wide reliability will improve does not apply, rather these investments will support (though not ensure due to rationale stated below) IPL's ability to maintain its current level of service.

   With respect to Distribution Automation ($429 million) and the Tap Reliability Improvement Program or "TRIP" ($207 million), these investments will improve reliability performance of specific circuits, most significantly in areas where automation is applied. However, there are a number of factors that contribute to reliability performance, most notably variability of weather, vegetation growth rates, faulty equipment and incidents outside the control of the utility. These factors make it difficult if not impossible to precisely calculate future reliability metrics improvements at the system level.
b. For the reasons identified in subpart a, IPL is not willing to make collection of the 20% revenue requirement deferral amount contingent upon a calculated SAIDI and SAIFI improvement.