STATE OF INDIANA

INDIANA UTILITY REGULATORY COMMISSION

PETITION OF INDIANAPOLIS POWER & LIGHT COMPANY ("IPL") FOR AUTHORITY TO INCREASE RATES AND CHARGES FOR ELECTRIC UTILITY SERVICE AND FOR APPROVAL OF: (1) ACCOUNTING RELIEF, INCLUDING IMPLEMENTATION OF MAJOR STORM DAMAGE RESTORATION RESERVE ACCOUNT; (2) REVISED DEPRECIATION RATES; (3) THE INCLUSION IN BASIC RATES AND CHARGES OF THE COSTS OF CERTAIN PREVIOUSLY APPROVED QUALIFIED POLLUTION CONTROL PROPERTY; (4) IMPLEMENTATION OF NEW OR MODIFIED RATE ADJUSTMENT MECHANISMS TO TIMELY RECOGNIZE FOR RATEMAKING PURPOSES LOST REVENUES FROM DEMAND-SIDE MANAGEMENT PROGRAMS AND CHANGES IN (A) CAPACITY PURCHASE COSTS; (B) REGIONAL TRANSMISSION ORGANIZATION COSTS; AND (C) OFF SYSTEM SALES MARGINS; AND (5) NEW SCHEDULES OF RATES, RULES ANDREGULATIONS FOR SERVICE.	)	CAUSE NO. 44576
IN THE MATTER OF THE INDIANA UTILITY REGULATORY COMMISSION'S INVESTIGATION INTO INDIANAPOLIS POWER & LIGHT COMPANY'S ONGOING INVESTMENT IN, AND OPERATION AND MAINTENANCE OF, ITS NETWORK FACILITIES	)	CAUSE NO. 44602

TESTIMONY OF

LEON A. GOLDEN – PUBLIC'S EXHIBIT NO. 3

ON BEHALF OF THE

INDIANA OFFICE OF UTILITY CONSUMER COUNSELOR

JULY 27, 2015

TESTIMONY OF OUCC WITNESS LEON A. GOLDEN
CAUSE NOS. 44576/44602
INDIANAPOLIS POWER & LIGHT COMPANY

I. INTRODUCTION

Q: Please state your name and business address.

A: My name is Leon A. Golden, and my business address is 115 West Washington Street, Suite 1500 South, Indianapolis, Indiana 46204.

Q: By whom are you employed and in what capacity?

A: I am employed by the Indiana Office of Utility Consumer Counselor ("OUCC"), as a Utility Analyst for the Resource Planning and Communications Division. My educational background, experience, and my preparations for this case are detailed in Appendix A attached to this testimony.

Q: What is the purpose of your testimony?

A: I provide an overview of Indianapolis Power & Light Company's ("IPL") asset management program ("AMP"). I also recommend the following:

- An audit of IPL's asset management process with a report submitted to the OUCC and Commission, and
- An investigation and report by IPL regarding methods to include downtown network underground cable in its AMP.

II. IPL'S ASSET MANAGEMENT

Q: What are the characteristics of a successful AMP?

A: A successful AMP assists management in extracting an asset's full value in contrast to simply avoiding immediate costs by overworking assets past their accounting and useful life. A successful AMP should be focused on the value that

a particular asset provides to the organization. Also, a successful AMP should be transparent and understandable to a company's stakeholders. Generally, AMPs cover the procurement, deployment, monitoring and maintenance, and retirement and disposal of the asset.

Q: Has IPL begun implementation of an asset management standard to serve as a long term plan for its AMP?

A: Yes. Subsequent to the 2011 O'Neill Report, IPL indicates it began implementation of the AES Asset Management Global Standards ("AMS"), which was finalized in 2013.[1]

Q: Please provide a brief description of IPL's AMP processes as they apply to its downtown network.

A: With regard to IPL's downtown network, inspection data is gathered using MobileFrame software on tablets. This inspection information is later imported into Ivara software where algorithms determine the criticality of any identified maintenance issues. Ivara then creates a Consequence Priority Number.[2] IPL uses Enterprise Maintenance Planning and Control ("EMPAC") software as a database for asset information for its downtown network, as well as its substations, power plants, and inventory. The EMPAC software also assists in planning work for these areas. IPL uses Work Management Information System ("WMIS") software for distribution work planning, scheduling outside of the downtown network, generating cost estimates, and well as some Central Business District ("CBD") work done by contractors.

[1] Attachment LAG-1, IPL response to OUCC DR 28-03.
[2] Attachment LAG-2, IPL response to OUCC DR 59-3, Attachment 1, p.5.

Q: Please list the IPL transmission and distribution assets that are evaluated by the AMP.

A: IPL's AMP evaluates transformers, breakers, network manholes, network vaults, network transformers, and network protectors.[3] It is notable that underground cables in the downtown network are not evaluated in the AMP.

Q: Is the OUCC concerned IPL's AMP does not evaluate the network's underground cables?

A: Yes. As discussed by OUCC Witness Ray Snyder, a majority of downtown network events are a result of cable faults. Because of the possibly severe consequences associated with underground cable failure, the OUCC is concerned these assets are not adequately evaluated as part of IPL's AMP. The frequency of such cable failures, as discovered in the OUCC's review, makes the absence of cable evaluation in its AMP even more worrisome.

Q: How effective is IPL's AMP?

A: Unfortunately, it is too soon to tell. IPL is still in the early stages of implementing the AES AMS and its own AMP. This means there is not a large amount of historical information from which to draw conclusions. However, even in these early stages, a few aspects of IPL's AMP cause concern.

Q: Please describe your concerns.

A: First, when making asset management decisions that involve assessing risk, IPL currently gathers data from assets in service to assess field conditions and employs a condition-based asset maintenance and replacement program.[4] This process may be sufficient for the assets that are actually reviewed in the field as

[3] Attachment LAG-3, IPL response to OUCC DR 59-05.
[4] Attachments LAG-4 and LAG-5, IPL responses to OUCC DR 28-06 and 28-07 respectively.

part of its AMP. However, as explained previously, this process is not applied to IPL's underground cable.[5]

Second, IPL's AMP consists of disjointed software programs. IPL personnel must navigate through several systems that provide maintenance, criticality, engineering design, and historical asset data. The quality of data gathered by these numerous systems could be compromised due to human error, software glitches, or program redundancies. In fact, since September 2014, IPL itself has identified a number of "gaps" in some of its asset management processes related to these software programs. For example, IPL states:

- [I]t was found that on a few occasions when the MobileFrame tablet was docked, not all of the inspection data got uploaded to the MobileFrame server.
- [W]hen new assets are created in EMPAC, an interface runs to populate and update Ivara. However, the Ivara indicators associated with that asset need to be created manually. Some assets in Ivara were missing the necessary indicators.
- [D]ue to a bug in the Ivara application when indicators were created an External ID field necessary for the MobileFrame to Ivara interface did not get populated.[6]

Finally, in contradiction with AES' AMS, IPL does not currently have a written asset management strategy. In the AES Asset Management Global Standard adopted by IPL in 2013, STD0001 §3.4 states "[t]he business shall

[5] Attachment LAG-3, IPL response to OUCC DR 59-05.
[6] Attachment LAG-6, IPL response to IURC Staff DR 5-06.

establish, **document**, implement and maintain a long-term AM Strategy[.]"[7] Emphasis added. However, IPL stated that its "Asset Management Strategy" is a philosophy and not a written document.[8]

Q: Has O'Neill expressed concerns similar to the OUCC's with IPL's Asset Management practices?

A: Yes. The 2011 O'Neill Report, an independent analysis of IPL's internal processes and procedures to maintain the reliability of its downtown network, states that IPL "crews and their managers were more in the mode of corrective maintenance than preventative… more focused on what was in imminent danger of failure rather than what might fail under different circumstances or over a longer period of time."[9] Following the recommendations made in the 2011 O'Neill Report, IPL implemented some asset management processes, and it continues to adopt the AES Asset Management Global Standards in accordance with its commitments to the Commission. However, even with the implementation of its 2011 recommendations, O'Neill's 2015 Report notes its concerns with the transparency of IPL's AMP. Specifically, O'Neill states:

> In the area of asset management, we note IPL's significant improvement in asset management methods and procedures since implementing our fifth recommendation of the December, 2011 Report (See Section 5.1 for that recommendation and further details). Nevertheless, we feel there is not sufficient transparency in IPL's process of asset management to allow the IURC and the concerned public to see how IPL's responsiveness is reflective of a systematic program of asset management. We recognize that IPL continues to improve its asset management process, yet we think

[7] Attachment LAG-7, AES Asset Management Global Standard, p.19.
[8] Attachments LAG-8 and LAG-9, IPL response to OUCC DR 59-08 and 63-02 respectively.
[9] "Independent Assessment of Indianapolis Power & Light's Downtown Underground Network. O'Neill Management Consulting, December 13, 2011". p. 31.
http://in.gov/iurc/files/IPL_Downtown_Network_Audit_Report_-_Final_Report(1).pdf

> the time has come to also document to the outside in some detail the process by which the asset management function serves to address the risk and performance of the system, all in the context of cost effectiveness. To that end, we recommend an audit of the asset management process. (See Section 9,1, Finding 5 and Section 9.3, Recommendation 2). [sic] [10]

Q: Does the OUCC concur with O'Neill's recommendation for an audit of the asset management process?

A: Yes. The OUCC agrees with O'Neill's observation that "some aspects [of IPL's AMP] are conceptually envisioned but not yet fully developed, i.e. what we would call aspirational."[11] An audit of IPL's asset management process would assist IPL in ensuring its asset management system is addressing the most critical system issues – such as the underground cable failures that caused a majority of the downtown network events. IPL's current AMP strategy should be more than a philosophy – especially considering the hundreds of downtown network events IPL has experienced since 2003. OUCC Witness Snyder discusses these downtown network events in more detail.

Q: What are the OUCC's recommendations for the asset management system audit?

A: The audit of IPL's asset management system should be conducted by an independent third-party to be retained within 90 days of a final order in this Cause. IPL's asset management program audit should be complete with the final

[10] "Investigation of IPL's Network, Cause 44602, Report of Independent Consultant. Final – 22 Jun 2015." O'Neill Management Consulting, LLC., p. 5, https://myweb.in.gov/IURC/eds/Modules/Ecms/Cases/Docketed_Cases/ViewDocument.aspx?DocID=0900b631801c84f2

[11] *Id.*, p. 5, Footnote 2.

audit report submitted to the Commission and the OUCC no later than eight weeks prior to IPL filing its next rate case.

Q: How does auditing IPL's asset management program benefit ratepayers?

A: An audit would provide a final report to identify existing gaps within IPL's processes and recommendations on areas for IPL to improve upon. The final report will be a tool the Commission and the OUCC can use to determine if IPL's spending on asset management delivers measurable value to ratepayers.

III. RECOMMENDATIONS

Q: Please summarize your recommendations.

A: The OUCC recommends the following:

- The completion of an independent third-party audit of IPL's asset management process which meets the following criteria:
  - i. An auditor should be retained within 90 days of a final order in this Cause;
  - ii. A final audit report should be submitted to the Commission and the OUCC no later than eight weeks prior to IPL filing its next rate case.
- IPL should investigate methods to include its downtown network underground cable in its AMP. It should report its findings and action plan within six months after a final order in this Cause.

Q: Does this conclude your testimony?

A: Yes, it does.

APPENDIX A

Q: Please describe your educational background and experience.

A: I graduated from Purdue University School of Engineering and Technology - Indianapolis in 2011, with a Bachelor of Science degree in Mechanical Engineering. In October of 2011, I passed the Fundamentals of Engineering exam administered by the Indiana Professional Licensing Agency.

I worked as a civil engineering technician from 2005-2008, performing materials testing in field and laboratory settings, conducting analysis of mechanical properties of soils, and working in accordance with a variety of testing standards. From 2009-2014, I worked as a project engineer in the electric utility industry in a number of different areas, including; Customer Projects, Substation Relaying and Protection, Standards and Code Compliance, and distributed generation interconnections.

I have participated in several IEEE technical workshops, including; Smart Grid Cyber-security, Smart Distribution Systems, and Wind Farm Collector System Design workshops. I have attended the Center for Public Utilities' Basic Regulatory Training for the Electric Industry in New Mexico.

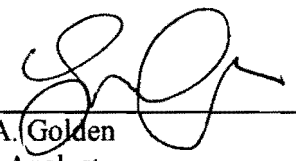
Q: Please describe the review and analysis you conducted in order to prepare your testimony.

A: I reviewed and analyzed reports by O'Neill Management issued in 2011 and in 2015, responses to data requests issued by OUCC and other parties, IPL's response to the 2011 O'Neill Management report, IPL's annual reports to the Commission regarding its commitments made as a result of the recommendations made in the 2011 O'Neill Report, IPL's Root Cause Analysis reports filed

subsequent to network events, and I attended meetings held with IPL personnel to discuss its downtown network and its AMP.

AFFIRMATION

I affirm, under the penalties for perjury, that the foregoing representations are true.



Leon A. Golden
Utility Analyst
Indiana Office of Utility Consumer Counselor

July 27, 2015
Date

Cause No. 44576/44602
IPL

Data Request OUCC DR 28 - 03

Please state when IPL implemented the AES Asset Management Global Standards for its asset management program. If IPL has not implemented the AES Asset Management Global Standards, please explain why.

Objection:

Response:

In 2013, the AES Asset Management Global Standards (AMS) document was finalized. IPL continues the process of implementing the AMS.

The five different categories each have a maximum score. These categories and maximum scores are based on typical best practices. IPL Power Supply and Power Delivery worked together to determine the categories and ratings that both could use.

8. Determining the Appropriate Category Level (Failure Analysis)

It was agreed that the best approach for rating asset criticality levels in each category was to do it outside of Ivara. Ivara will store these ratings.

The general approach was:

- *A prescribed set of questions for each category are answered for each business area.*
- *Each question has a pre-determined maximum potential score aligned with the business risk.*
- *The sum of all the business area scores for a specific review results in a category score.*
- *Category score is later translated to a Consequence Priority Number (CPN)...Criticality.*

An Excel based form with questions and scoring was developed. This allowed customization of the questions for each business. Examples of the Maintenance item scoring questions are shown Figure 8-1 Maintenance Scores.

ASSMNCRITERA	XIMUMSC	CONSEQUENCE	SCORE
Maint - Back-up (inline) Equipment	200	No - the equipment does not have a back-up or inline spare	200
Maint - Back-up (inline) Equipment	200	Yes - the equipment has a back-up or inline spare	0
Maint - Spare Parts Availability	250	No spares available - greater than 7 days delivery time	250
Maint - Spare Parts Availability	250	No spares available - between 1 and 7 days delivery time	100
Maint - Spare Parts Availability	250	No spares available - less than 24 hour delivery time	50
Maint - Spare Parts Availability	250	Inventory off site - Less than 4 hour delivery time	25
Maint - Spare Parts Availability	250	Available - Repair parts available on site or will not repair	0
Maint - Financial Impact	250	Severe - Greater than $1,000,000 to repair asset	250
Maint - Financial Impact	250	High - Between $250,000 and $1,000,000 to repair	100
Maint - Financial Impact	250	Medium - Between $75,000 and $250,000 to repair	50
Maint - Financial Impact	250	Low - Between $1,000 and $75,000 to repair	25
Maint - Financial Impact	250	None - Between $0 and $1,000 to repair	0
Maint - Time to Repair	250	Long - Greater than 1 week to repair	250
Maint - Time to Repair	250	Medium - Between 1 day and 1 week to repair	100
Maint - Time to Repair	250	Short - Between 1 hour and 1 day to repair	50
Maint - Time to Repair	250	Negligible - Less than 1 hour to repair	0

Figure 8-1 Maintenance Scores

Data Request OUCC DR 59 - 05

Please identify each IPL asset that has not been subjected to the "Asset Criticality matrix."

Objection:

Response:

As explained in the response to OUCC DR 59-4, the only T&D asset classes with a formal asset criticality rating are Transformers, Breakers, Network Manholes, Network Vaults, Network Transformers, and Network Protectors.

Data Request OUCC DR 28 - 06

When assessing risk in regard to asset management decisions as defined by the AES Asset Management Global Standards, please state if current asset conditions in the field are factored into the evaluation.
a. If yes, please describe in detail how. Provide supporting documentation showing how asset conditions in the field are factored into the evaluation.
b. If no, please describe why not.

Objection:

IPL objects to the Request on the grounds and to the extent it is vague and ambiguous. IPL assumes the series of questions relates to transmission and distribution assets. IPL further objects to the Request on the grounds and to the extent the request solicits information that exceeds the scope of this proceeding and is not reasonably calculated to lead to the discovery of relevant or admissible evidence. Subject to and without waiver of the foregoing objections, IPL provides the following response.

Response:

a. Yes, the asset health condition of key assets, along with the criticality of the asset, defines the risk. The asset health calculation uses inputs such as: visual inspections; oil analysis, maintenance history, power factor (insulation) testing, subject matter expert evaluation, and other inputs as part of the calculation.

   Each input for the health calculation is assigned an importance (weighting factor) and the various conditions of the input are also assigned a weight. The products of the weights and conditions for each input are summed and normalized to use as an overall asset health index for use in assessing risk.

   See OUCC DR 28-06 Attachment 1 for an explanation (supporting documentation) of how asset conditions in the field are factored into the evaluation.

b. NA

Data Request OUCC DR 28 - 07

Please state if IPL gathers and uses data on current asset conditions (e.g. field testing, field observation, raw data) when evaluating risk.
a. If yes, please describe how. Provide supporting documentation, such as inspection reports, or other examples.
b. If no, please describe why not

Objection:

IPL objects to the Request on the grounds and to the extent it is vague and ambiguous. IPL assumes the series of questions relates to transmission and distribution assets. IPL further objects to the Request on the grounds and to the extent the request solicits information that exceeds the scope of this proceeding and is not reasonably calculated to lead to the discovery of relevant or admissible evidence. Subject to and without waiver of the foregoing objections, IPL provides the following response.

Response:

Yes.

a. See the response to OUCC DR 28-6.
   See OUCC DR 28-7 Attachment 1 for an example.

b. NA

Data Request Staff DR 5 - 06

In reference to IPL's response to IURC Testimonial Staff data request 1.6 confidential attachment 1, please describe the process to ensure that all network (Central Business District) manholes, vaults, transformers and protectors are maintained and comply with IPL preventative maintenance cycles. Please include in your response the date the associated processes were implemented and supporting documentation and reports as necessary.

Objection:

Response:

Since 2011, the asset management group has conducted spot audits of the CBD work processes and results. These audits focused on EMPAC work order completion and Ivara and MobileFrame checks.

Beginning in September 2014, complete audits of the MobileFrame, Ivara, and EMPAC data were done. Gaps were identified in some of the processes and all have been corrected.

For example, it was found that on a few occasions when the MobileFrame tablet was docked, not all of the inspection data got uploaded to the MobileFrame server. There was an existing process in place to e-mail selected personnel the results of all of these inspections. However, the work scheduler who was scheduling and completing the EMPAC work orders was not on this notification list. Missed inspection data was not readily apparent. The work scheduler was added to this e-mail notification the first week in October 2014. This allows for anomalies in missing data to be caught at work order completion.

Additionally, when new assets are created in EMPAC, an interface runs to populate and update Ivara. However, the Ivara indicators associated with that asset need to be created manually. Some assets in Ivara were missing the necessary indicators. It was also noted that due to a bug in the Ivara application when indicators were created an External ID field necessary for the MobileFrame to Ivara interface did not get populated. Asset management and scheduling have worked together to simplify the error reporting process and scripts are run to ensure this data loss no longer occurs.

IPL personnel also review a tracking report monthly to compare the number of inspections completed against the schedule. This data previously was queried from EMPAC and has now been pointed to the Ivara. Ivara is the system of record to ensure inspection data is stored. These reports are published on the internal Asset Management web site. Staff DR 5-6 Attachment 1 is a copy of some of the key metrics monitored with pages 2, 7 and 8 showing some of the CBD monitoring. This report has been in use since January 2013.

viii. Include a commitment to the continuous improvement in asset management and asset management performance;
ix. Be documented, implemented and maintained;
x. Be communicated to all relevant stakeholders, including contracted service providers; and
xi. Be reviewed and approved at least annually by the Business Leader to ensure that it remains relevant and consistent with the Business Plan.

3.4 Asset Management Strategy

The business shall establish, document, implement and maintain a long-term AM Strategy, which shall be authorized by the business Leadership Team. The AM Strategy shall:

i. Be derived from, and be consistent with, the AM Policy and the Business Plan;
ii. Be consistent with other organization policies and strategies;
iii. Identify and consider the requirements of relevant stakeholders;
iv. Consider the life cycle management of relevant assets;
v. Take account of asset-related risks, asset and asset system criticalities;
vi. Identify the function, performance and condition of existing asset systems and critical assets;
vii. State the desired future function(s), performance and condition of existing and new asset systems and critical assets, the timing of which is aligned to the Business Plan;
viii. Clearly state the approach and principal methods by which assets and asset systems will be managed (e.g. criticality and value criteria, approach to asset risk/reliability management);
ix. Provide sufficient information, direction and guidance to enable specific AM objectives and plans to be produced;
x. Include criteria for optimizing and prioritizing AM objectives and plans;
xi. Be communicated to all relevant stakeholders, including contracted service providers; and
xii. Be reviewed periodically to ensure that it remains effective and consistent with the AM Policy, Business Plan and with other business and/or AES policies and strategies.

3.5 Asset Management Objectives

The business shall establish and maintain AM Objectives, which shall:

i. Be measurable (i.e. quantified or capable of being objectively assessed);
ii. Be derived from and consistent with the AM Strategy;
iii. Be consistent with the commitment to continuous improvement;
iv. Be communicated to all relevant stakeholders, including contract service providers;
v. Be reviewed and updated periodically to ensure they remain relevant and consistent with the AM Strategy;
vi. Consider legal, regulatory, statutory and other AM requirements;
vii. Take into account the expectations of relevant stakeholders and financial, operational and business requirements;
viii. Take into account AM-related risks; and

Data Request OUCC DR 59 - 08

Please provide an electronic unredacted copy of IPL's "Asset Management Strategy," including all related policies, procedures, exhibits, appendices, tables, and other electronic or paper format documents.

Objection:

IPL objects to the Request on the grounds and to the extent the request seeks information that is confidential, proprietary, competitively-sensitive and/or trade secret. Subject to and without waiver of the foregoing objections, IPL provides the following response.

Response:

The "Asset Management Strategy," as referred to in IPL's response to the IURC Docket Entry dated March 24, 2015 Question 5, is a philosophy - not a written strategy document.

However, there is a US SBU Asset Management Policy signed document that is based on the AES Asset Management Standards. Please see OUCC DR 59-8 Confidential Attachment 1.

Data Request OUCC DR 63 - 02

Refer to AES Asset Management Global Standards, (STD0001) Asset Management System, Section 3.4 - Asset Management Strategy, page 19; please describe in detail IPL's Asset Management Strategy and how it aligns with each guideline presented in this section.

Objection:

IPL objects to the request on the grounds and to the extent it is vague and ambiguous. IPL assumes the request relates to transmission and distribution ("T&D") assets and IPL's response is based on IPL's T&D assets. IPL further objects to the Request on the grounds and to the extent the request solicits information that exceeds the scope of this proceeding and is not reasonably calculated to lead to the discovery of relevant or admissible evidence. IPL further objects to the Request on the grounds and to the extent the request solicits information from an entity other than IPL. IPL further objects to the Request on the grounds and to the extent the request is overly broad and unduly burdensome. Subject to and without waiver of the foregoing objections, IPL provides the following response.

Response:

As explained in IPL's response to OUCC DR 59-8, the Asset Management Strategy referred to in IPL's response to the IURC Docket Entry dated March 24, 2015 Question 5, is a philosophy, not a separate written document. The guidelines in Section 3.4 of the AES Asset Management Global Standards speak for themselves. IPL's asset management aligns generally with these guidelines and as noted in IPL's response to OUCC DR 45-3, IPL is in the process of formalizing and documenting how its methods and criteria conform to the AES Asset Management Global Standards.