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MISSOURI PUBLIC SERVICE COMMISSION

CASE NO. ER-2026-0143

REBUTTAL TESTIMONY

OF

JASON DE STIGTER

ON BEHALF OF

EVERGY MISSOURI METRO

Kansas City, Missouri
August 2026

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REBUTTAL TESTIMONY

OF

JASON DE STIGTER

CASE NO. ER-2026-0143

I. INTRODUCTION AND PURPOSE OF TESTIMONY

Q. Please state your name and business address.

A. My name is Jason D. De Stigter, and my business address is 9400 Ward Parkway, Kansas City, Missouri 64114.

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

A. I am employed by 1898 & Co. as a Director and lead the Utility Investment Planning team. 1898 & Co. is the business and technology consulting division of Burns & McDonnell.

Q. Please generally describe the work of 1898 & Co.

A. 1898 & Co. is the business and technology consulting division of Burns & McDonnell. 1898 & Co. is a global team of over 600 consulting professionals serving asset-intensive industries that include power, manufacturing, oil and gas, transportation, and water. Burns & McDonnell was established in 1898 and serves multiple industries, including the electric power industry. Burns & McDonnell is a family of companies comprising more than 13,000 engineers, architects, construction professionals, scientists, consultants, and entrepreneurs, with more than 75 offices across the country and throughout the world.

Q. Please briefly describe your educational background and professional experience.

A. I received a Bachelor of Science degree in Engineering and a Bachelor of Arts degree in Business Administration from Dordt College, now called Dordt University. Prior to joining 1898 & Co., I served as a Principal Consultant at Black & Veatch in their Asset

Management Practice, where I performed risk and resiliency studies. I am a registered Professional Engineer in the State of Kansas. My full resume is attached hereto as Schedule JDD-1.

I have approximately 19 years of experience providing consulting services to electric utilities. Through my work at 1898 & Co., I have developed extensive experience in asset management, capital planning and optimization, risk/resiliency assessments and analysis, asset failure analysis, and business-case development for electric utilities. I have been involved in numerous studies modeling risk for utility clients, including economic analyses for several multi-billion-dollar capital projects and large utility systems. In my role as a Director of Utility Investment Planning, I have worked on and overseen risk and resiliency consulting studies on a variety of electric T&D assets. I have a focus on developing risk and resiliency-based investment models for large capital projects/programs.

Q. Have you previously provided testimony before the Missouri Public Service Commission?

A. I have not testified before the Missouri Public Service Commission. Since 2019 I have testified in 19 proceedings before 9 different regulatory commissions involving utility investment planning, risk analysis, resilience planning, and business case development. A complete list of testimonies I have provided before other regulatory bodies is included with Schedule JDD-1.

Q. Please describe your role with respect to the lateral reconductoring program and AssetLens at issue in this case?

A. 1898 & Co. supported Evergy in the configuration and implementation of AssetLens for Evergy's distribution system. In that role, my team and I supported the development and application of the analytics that underlie AssetLens, including analytics used to evaluate asset risk, customer impacts, lifecycle costs, investment benefits, and benefit-cost information.

With respect to the lateral reconductoring program, AssetLens provides a platform for Evergy to view and apply the results of those analytics to identify and prioritize potential investment opportunities. I did not make Evergy's final project approval, budgeting, procurement, engineering, or construction decisions. Those decisions remain with Evergy. My role in this testimony is to explain the analytical framework supporting AssetLens and respond to the characterizations of that framework presented by Public Counsel witnesses Paul J. Alvarez and David C. Shapley.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of my rebuttal testimony is to respond to certain assertions and recommendations made by Public Counsel witnesses Paul J. Alvarez and David C. Shapley regarding Evergy Missouri Metro's lateral reconductoring program and Evergy's use of AssetLens.

Q. Please summarize your rebuttal testimony.

A. My testimony rebuts several assertions relied upon by Witness Alvarez and Witness Shapley to support their recommendation that Evergy's lateral reconductoring program should be disallowed. Specifically, my testimony demonstrates that:

1. AssetLens is not the subjective scoring tool described by Witness Alvarez. Rather, it is a software platform that allows Evergy to view and apply the results of risk-informed investment planning analytics.
2. The suggestion that AssetLens was designed to justify accelerated equipment replacement or favor Burns & McDonnell is unsupported and does not reflect how the analytics function or how Evergy makes investment decisions.
3. The analytics underlying AssetLens incorporate the same fundamental elements of risk-informed benefit-cost analysis that Witness Alvarez advocates, including the evaluation of probability of failure, consequence of failure, lifecycle risk, investment benefits, project costs, and benefit-cost information.
4. AssetLens reflects a more complete view of best practice than Witness Shapley describes. Best practice for distribution investment is not limited to replacing individual assets one at a time upon an inspection or test failure; prudent planning also captures the construction and unit-cost efficiencies of addressing assets together within a common geographic area and the opportunity to redesign portions of the system—considerations Witness Shapley does not address.

Accordingly, my testimony demonstrates that the analytical framework supporting AssetLens is materially different than the characterization presented by Witness Alvarez and Shapley and provides a reasonable basis for supporting Evergy's investment planning decisions. Based on that analysis, I recommend that the Commission reject the

disallowances proposed by Witness Alvarez and Witness Shapley and allow Evergy's investment in the lateral reconductoring program. The remainder of my rebuttal testimony is organized around these four items, addressing each in turn.

II. SUBJECTIVE SCORING MISCHARACTERIZATION

Q. How does witness Alvarez characterize AssetLens?

A. Witness Alvarez characterizes AssetLens as a software package that uses several dimensions or scores[1] to prioritize laterals for reconductoring. He suggests that because the outputs are described as scores, and because he does not view those scores as dollar-denominated benefits[2], the process does not support a true benefit-cost analysis.

Q. Do you agree with that characterization?

A. No. I do not. Witness Alvarez's characterization does not accurately reflect the analytical framework supporting AssetLens. The characterization focuses on the existence of scores and rankings within AssetLens while overlooking how those values are developed and utilized within the broader investment planning process. It is also inconsistent with information available in the record of this proceeding describing the methodology utilized within AssetLens, as well as analytical concepts that have been discussed in other regulatory proceedings involving 1898 & Co.'s utility investment-planning methodologies. AssetLens is not simply a scoring tool filled out by utility personnel. Rather, it is a software platform that allows Evergy to view and apply the results of sophisticated and robust analytics that evaluate probability of failure, consequence of failure, lifecycle risk, investment benefits, project costs, and benefit-cost information.

[1] Direct Testimony of Paul Alvzrez, Page 13, lines 17-21
[2] Direct Testimony of Paul Alvzrez, Page 13, line 25 and Page 14, lines 1-2

Q. Witness Alvarez characterizes AssetLens as utilizing subjective scoring and "riskiness" to justify lateral reconductor projects.[3] What is your response to this claim?

A. This is a mischaracterization. The characterization does not reflect information provided in discovery regarding how the analytics supporting AssetLens are performed. It is also inconsistent with descriptions of these same analytical concepts that have been presented in prior regulatory proceedings in which Alvarez and other representatives of The Wired Group reviewed, evaluated, and provided testimony regarding 1898 & Co.'s utility-investment-planning methodologies. As discussed below, Evergy's response to OPC Data Request 5010 and other supporting materials describe an analytical framework that is materially different than the subjective scoring process described by Witness Alvarez.

Q. What information in discovery did he not incorporate?

A. Most notably, Evergy's response to OPC Data Request 5010. The response explains that AssetLens does not utilize employee-entered benefit-driver scores. Instead, Evergy provided asset, connectivity, outage, customer, cost, budget, discount rate, and inflation data that were used within the AssetLens Analytics Engine to calculate project benefits and priorities.

The response further explains that the AssetLens Analytics Engine forecasts asset deterioration using Iowa Survivor Curves (a widely used asset-life and depreciation forecasting methodology), evaluates different failure types for each asset class, applies consequence values to those failure types, and calculates project benefits using a consequence-of-failure framework. The response also explains that the model calculates

[3] Direct Testimony of Paul Alvzrez, Page 13, lines 17-21

lifecycle costs under both a status quo scenario and an investment scenario and uses those results to calculate project benefit-cost ratios.

Importantly, the response to DR 5010 states that employees do not input asset or project scores into AssetLens. Rather, the analytical results are calculated within the model using utility data and the analytical methodologies described in the response. That information is directly relevant because it describes how the analytics supporting AssetLens are performed.

Q. Do you agree with the description of the AssetLens Analytics Engine provided in OPC Data Request 5010?

A. Yes, I do. Evergy prepared and submitted the response. However, 1898 & Co. provided Evergy with publicly available documentation describing the analytical methodology referred to in DR 5010 as the AssetLens Analytics Engine. That documentation describes the underlying analytical framework incorporated within AssetLens and served as the basis for the methodology discussion included in the response. The analytical methodology described in DR 5010 is the same methodology whose results are calculated by the AssetLens Analytics Engine and visualized within AssetLens.[4]

Q. Is the description provided in DR 5010 an accurate summary of the AssetLens Analytics Engine?

A. Yes. The description provided in DR 5010 is an accurate summary of the analytical framework supporting AssetLens. The response describes the primary concepts used to

[4] Throughout DR 5010, the term "score" is used to describe certain outputs displayed within AssetLens. As described in the response, these outputs are calculated within the model using utility data, asset deterioration modeling, failure-type profiles, and consequence calculations. Employees do not input asset or project scores into AssetLens.

evaluate and prioritize investment opportunities. DR 5010 provides a summary of how those analytics are performed within the model.

For a more detailed explanation of those same analytical concepts, I have sponsored Schedule JDD-2. This exhibit provides additional details regarding the analytical calculations, methodologies, and benefit-cost framework underlying the model, including an example calculation. When reviewed together, DR 5010 and Schedule JDD-2 describe the same underlying methodology at different levels of detail.

It is also important to understand the distinction between the analytical engine and AssetLens itself. The analytical engine is currently referred to as the Integrated Resilience, Reliability, and Risk Investment Model. Historically, portions of this capability were referred to as the AssetLens Analytics Engine. The Integrated Resilience, Reliability, and Risk Investment Model performs the underlying analytics used to evaluate investment opportunities.

AssetLens is the software platform used to visualize, organize, and apply those analytical results. In simple terms, the Integrated Resilience, Reliability, and Risk Investment Model performs the analytics, and AssetLens displays and manages the results. As a result, the analytical concepts described in DR 5010 are the same concepts illustrated in Schedule JDD-2, even though the terminology used to describe the analytical engine has evolved over time.

Q. Has witness Alvarez seen this explanation of 1898 & Co.'s analytics?

A. Yes. Witness Alvarez has participated in prior regulatory proceedings involving 1898 & Co.'s utility investment planning methodologies. In those proceedings, Witness Alvarez

and other representatives of The Wired Group reviewed, evaluated, and provided testimony regarding the same types of analytical concepts discussed in this proceeding.

In addition, 1898 & Co. has conducted technical conferences in multiple regulatory proceedings where intervenors and their consultants were provided detailed explanations of the analytical framework, including asset deterioration modeling, failure probabilities, consequence assessment, risk evaluation, and benefit-cost analysis. Witness Alvarez attended many of those sessions. Those are the same analytical concepts summarized in DR 5010 and further illustrated in Schedule JDD-2.

Q. Why is that relevant to your rebuttal testimony?

A. It is relevant because the analytical concepts discussed in this proceeding are not new. Witness Alvarez and representatives of The Wired Group have previously reviewed, evaluated, and provided testimony regarding these same types of asset deterioration, risk, consequence-of-failure, and benefit-cost methodologies. Accordingly, I disagree with the characterization that AssetLens is simply a subjective scoring tool because that characterization is inconsistent with how these analytical concepts have been explained in this proceeding, in OPC Data Request 5010, and in other proceedings where these methodologies have been discussed in detail.

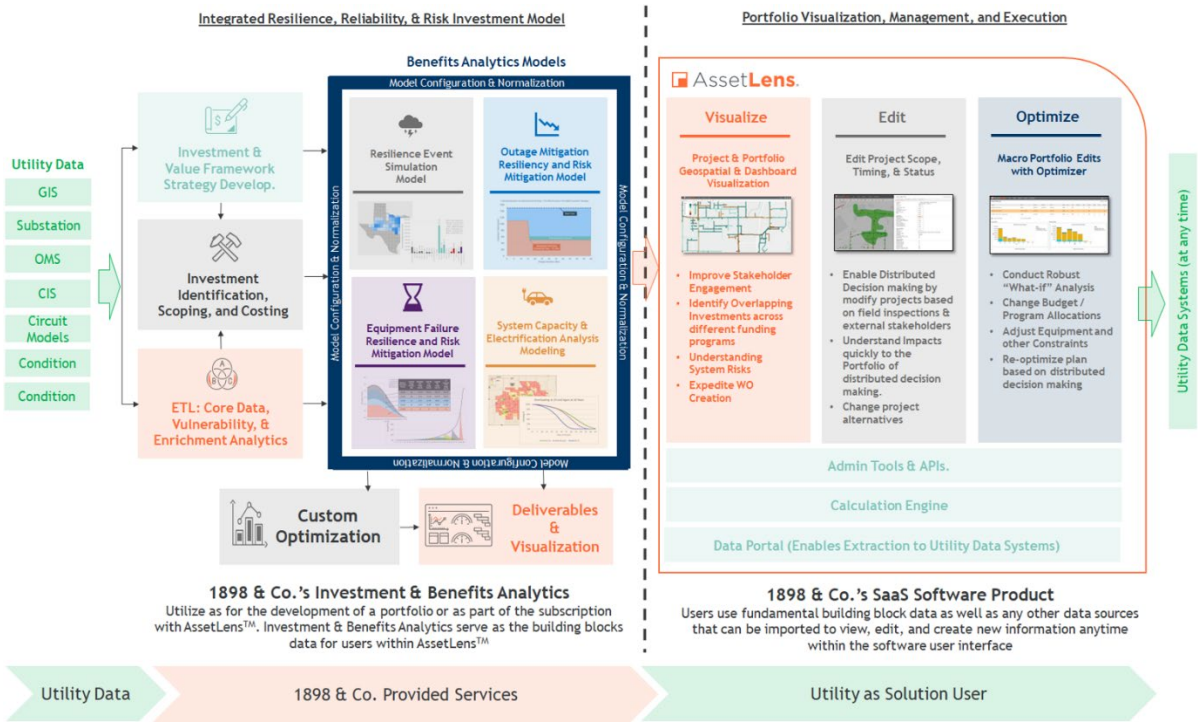
Q. In these cases, the analytics are referred to as the Integrated Resilience, Reliability, and Risk Investment Model. Evergy is utilizing AssetLens. What is the difference?

A. 1898 & Co.'s investment planning solution includes two related, but distinct, components. The first component is the underlying analytical engine. Historically, this capability was referred to as the AssetLens Analytics Engine. Today, it is referred to as the Integrated Resilience, Reliability, and Risk Investment Model. This is the component that performs

the investment planning analytics and calculates the expected benefits, costs, risks, and benefit-cost results associated with potential investments.

The second component is AssetLens. AssetLens is the software platform used to visualize, organize, review, and apply the analytical results produced by the Integrated Resilience, Reliability, and Risk Investment Model. AssetLens allows utility personnel to review project information, supporting analytics, benefit-cost information, project status, and other planning data within a single platform. Figure II-1 provides a conceptual illustration of this relationship. The left side of the figure shows the Integrated Resilience, Reliability, and Risk Investment Model analytical framework that develops the investment analytics. The right side shows AssetLens, which presents those analytics to utility users and supports planning, portfolio management, and execution activities. Stated simply, the Integrated Resilience, Reliability, and Risk Investment Model performs the analytics and AssetLens displays and manages the resulting information. AssetLens is the software platform. The Integrated Resilience, Reliability, and Risk Investment Model is the analytical engine that supports the functionality within that platform.

Figure II-1 – 1898 & Co's Investment Planning Solution



Q. Why the difference?

A. The difference exists because utilities have different planning, technology, and operational needs. Some utilities engage 1898 & Co. to perform the underlying investment planning analytics and develop a portfolio of recommended investment opportunities. In those situations, the utility may incorporate the analytical results into its own systems, planning tools, and work management processes. In that application, only the Integrated Resilience, Reliability, and Risk Investment Model analytical framework is required.

Other utilities want a dedicated platform to review project information, visualize analytical results, manage investment portfolios, support project development, and track execution activities. In those situations, AssetLens provides those additional capabilities.

Regardless of the implementation approach, the underlying analytical framework remains the same. The analytics are configured using utility-specific data, asset information, customer information, and business requirements, but the fundamental

approach used to evaluate investment opportunities does not change. AssetLens does not replace the analytical framework. Rather, it allows utility personnel to view, organize, and apply the results generated by that framework.

Q. Can you provide an image of what benefit-cost information is shown in AssetLens?

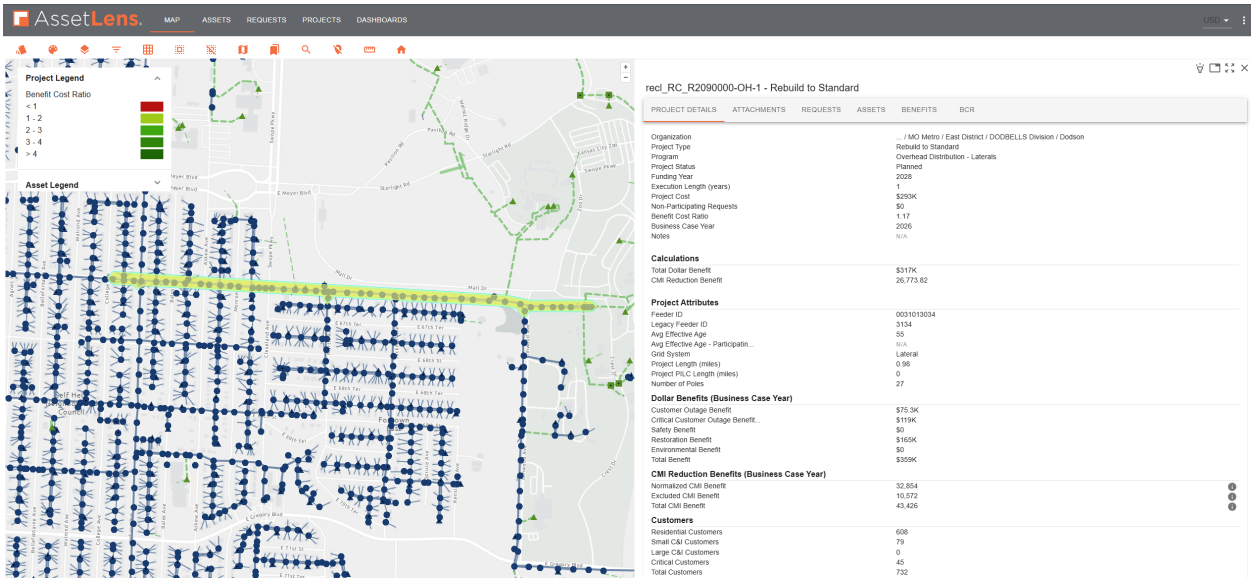
A. Yes. Figure II-2 provides an example of information displayed within AssetLens for a potential investment project. The figure includes project cost information, projected benefits, benefit-cost ratios ("BCRs"), customer impact information, risk-reduction information, asset information, and supporting project details.

The significance of this figure is that AssetLens displays substantially more information than a simple project score or ranking. Users can view the underlying project information, associated benefits, project costs, benefit-cost metrics, customer impacts, and other supporting information used to evaluate the investment opportunity.

The figure also illustrates the distinction discussed above between the analytical engine and the AssetLens platform. The underlying analytics calculate the investment benefits, costs, risk reduction, and benefit-cost metrics. AssetLens then makes those results available to utility planners, engineers, and decision-makers through a single interface.

As shown in the figure, AssetLens allows users to review the supporting analytical results behind a project recommendation. It is not simply a list of projects ranked by a subjective score. Rather, it serves as a platform to visualize and apply the results of the underlying risk-informed benefit-cost analysis.

Figure II-2 – Screenshot of AssetLens Project Example



Q. What is your overall response to witness Alvarez's characterization of AssetLens?

A. Witness Alvarez's characterization does not reflect the analytical framework supporting AssetLens. Evergy's response to OPC Data Request 5010, along with Schedule JDD-2, describes an analytical framework that performs risk-informed benefit-cost analysis and calculates the results displayed within AssetLens. The record also shows that AssetLens is the software platform through which those analytical results are visualized and applied. Accordingly, I do not agree with the characterization that AssetLens is merely a subjective scoring tool.

III. INSINUATED BIAS FOR BURNS & MCDONNELL BENEFITS

Q. Witness Alvarez suggests that AssetLens may be designed to justify accelerated equipment replacement. How do you respond?

A. I disagree with that implication. AssetLens is not designed to justify every possible project or to accelerate equipment replacement for its own sake. AssetLens is used to support investment decision-making by helping Evergy evaluate where investment is expected to

provide benefits in excess of costs and where it is not. That distinction is important. A benefit-cost framework is not a mechanism to justify all spending. It is a mechanism to distinguish between investment opportunities. If expected benefits do not exceed expected costs, the results should reflect that.

Q. Witness Alvarez insinuates that Burns & McDonnell and 1898 & Co. are biased in favor of capital spending because 1898 & Co. is part of Burns & McDonnell, an engineering and construction firm. What is your response?

A. There is absolutely no such bias. 1898 & Co. applied data- and engineering-based analytics to assist Evergy in evaluating potential distribution investments. The purpose of that work was to support investment decision-making, not to direct capital spending to Burns & McDonnell or any other engineering or construction firm. The analytical framework is designed to identify where investment is expected to provide benefits in excess of costs and where it is not. That is the opposite of a biased process designed to justify all capital spending. A properly structured benefit-cost analysis distinguishes between stronger and weaker investment opportunities.

Q. Has Witness Alvarez raised similar insinuations regarding 1898 & Co.'s analytics in other proceedings?

A. Yes. In proceedings involving Baltimore Gas and Electric[5] and DTE Electric Company[6], Mr. Alvarez asserted that 1898 & Co.'s analytical models were developed to "justify" utility capital spending decisions and expressed concerns that 1898 & Co.'s affiliation with Burns & McDonnell could create bias in the analytical results.

[5] Maryland Public Service Commission Case No. 9692
[6] Michigan Public Service Commission Case No. U-21860

Those allegations are similar to the implications raised in this proceeding. In each case, however, the analytics were developed to support utility investment decision-making through the evaluation of risk, costs, customer impacts, and expected benefits. I am not aware of evidence demonstrating that the analytics were designed to favor Burns & McDonnell, direct work to Burns & McDonnell, or predetermine investment outcomes.

Moreover, these issues have been discussed extensively in prior proceedings through testimony, discovery, and regulatory review. As a result, Mr. Alvarez is familiar with the analytical approaches developed by 1898 & Co. and the manner in which those approaches are applied to support investment planning.

Q. Why do you disagree with that type of insinuation in this case?

A. I disagree because that insinuation fundamentally mischaracterizes both the purpose of the analytics and how utility investment decisions are made. The analytics are designed to evaluate potential investments. They do not determine who performs engineering work, who performs construction work, or whether a particular project ultimately proceeds. Their purpose is to provide information that utilities may consider as part of their investment decision-making processes.

Moreover, if the objective were to direct work to a particular company, there would be no need to analyze and compare competing investment opportunities, estimate project benefits and costs, or identify projects that may not be economically justified. The framework exists to support objective evaluation and prioritization, not to predetermine investment outcomes. The suggestion that the analytics were intentionally structured to create opportunities for Burns & McDonnell is incorrect and unsupported.

Q. Does AssetLens determine who performs engineering or construction work?

A. No. AssetLens does not award engineering or construction contracts. It does not assume that Burns & McDonnell, 1898 & Co., or any other firm, will perform engineering or construction work associated with the projects. Evergy remains responsible for engineering review, project scoping, budgeting, procurement, contracting, and execution decisions. AssetLens supports planning and prioritization. It does not replace Evergy's procurement or project execution processes. In addition, Witness Alexander discusses discovery responses showing that neither Burns & McDonnell nor 1898 & Co. had been awarded distribution work associated with projects identified through AssetLens.

Q. How do your professional obligations inform your work?

A. As a Professional Engineer, I must abide by professional and ethical obligations. Those obligations include providing objective, technically supportable analysis, and disclosing conflicts of interest where they exist. I take those obligations seriously. My role is to provide analytical support that helps utilities, regulators, and stakeholders evaluate whether potential investments are expected to provide benefits in excess of costs. The work performed here was directed to that purpose and suggesting otherwise without basis is inappropriate.

Q. What is your conclusion regarding this claim?

A. The claim is unsupported. AssetLens does not exist to direct work to Burns & McDonnell or any other engineering or construction firm. It is a planning and decision-support platform used to help utilities like Evergy evaluate investment opportunities. The analytics supporting AssetLens are intended to identify where investment is expected to provide customer benefits in excess of costs and where it is not. That is an appropriate framework

for capital investment planning and is inconsistent with the suggestion that AssetLens was designed to justify accelerated equipment replacement or favor Burns & McDonnell construction work.

IV. ASSETLENS AS RISK-INFORMED BENEFIT-COST ANALYSIS AND USEFUL FOR INVESTMENT DECISION MAKING

Q. Does AssetLens implement the type of framework that Witness Alvarez recommends?

A. Yes. The analytics underlying AssetLens implement the same fundamental concepts that Witness Alvarez recommends. A risk-informed benefit-cost analysis should estimate the probability of an adverse event, estimate the consequence of that event, estimate the risk reduction associated with investment, and compare the value of that risk reduction to the cost of the investment. AssetLens does each of those things.

Q. Please explain that comparison.

A. The comparison is straightforward. The table below provides an overview for each core element and how it is included in the underlying analytics within AssetLens.

Risk-Informed BCA Element	AssetLens Analytical Equivalent
Probability of adverse event	Likelihood of failure using survivor curves and failure profiles
Consequence of adverse event	Customer outage, restoration, critical customer, safety, environmental, and collateral consequences
Risk reduction from investment	Difference between status quo lifecycle risk and investment scenario lifecycle risk
Dollar valuation of consequences	Monetized customer outage and restoration impacts, with other consequence categories included as applicable
Comparison to cost	Project-level BCR
Prioritization	BCR-informed prioritization with engineering review

Q. What is the significance of that comparison?

A. The significance is that Witness Alvarez recommends risk-informed benefit-cost analysis, while at the same time characterizing AssetLens in a way that overlooks the risk-informed benefit-cost analysis already embedded in the platform's underlying analytics. The disagreement is not about whether risk-informed benefit-cost analysis is useful. It is useful. The disagreement is about whether AssetLens reflects that type of analysis. AssetLens does.

Q. What are the benefits of 1898 & Co.'s approach to evaluating investments using AssetLens and the underlying analytics engine?

A. This approach has several benefits:

1. **It is comprehensive.** 1898 & Co. evaluated nearly all the assets on Evergy's Electric overhead distribution overhead system to identify opportunities for investments. By considering and evaluating the entire overhead distribution system on a consistent basis, the results of the analytics provide confidence that portions of Evergy's distribution assets are not overlooked for potential customer benefit.
2. **It is customer focused**. 1898 & Co.'s approach involved breaking Evergy's system into protection zones with a known number and type of customers. Protection zones are established based on the nearest upstream protective device. The failure of a single asset downstream of a protective device can cause a customer outage in that protection zone. Thus, aggregating assets into protection zones and evaluating investment activities at that level enabled the evaluation to provide a direct link between investments in

vulnerable infrastructure and the benefits to customers. This is demonstrated in the example screenshot of AssetLens shown in Figure II-2 above.

3. **It is asset centric.** The granularity of modeling at the asset level and identifying for replacement of vulnerable equipment allows Evergy to invest in portions of the system that provide the most value to customers, as measured by the monetization of the reduction in the frequency and duration of customer outages and avoided system restoration costs. With the number of assets in the Evergy system and the numerous types of failure events that impact the service area, careful choices must be made to prioritize investments.

4. **It drives Consistency**. The modeling calculates benefits consistently for all investment activities, estimating both the monetized avoided customer outages and avoided reactive costs. The model carefully normalizes for a more accurate comparison of potential benefits between investment types. This provides additional confidence in the BCA across the Evergy distribution programs.

5. **It is rooted in the causes of equipment failures**. The model incorporates how assets fail and their different drivers as well as consequences. The detailed data streams and algorithms within the model are aligned with how assets fail. Additionally, it incorporates additional drivers of asset consequence for rear-lot infrastructure and makes allowances for

geography. This aligns the modeling to engineering based principles of infrastructure failure.

6. **It is practical.** This approach balances robust historical data with Evergy's operational expertise to estimate benefits for investments that will have a practical impact. Data-only approaches may identify solutions that work in theory but not in practice. This approach balances the two approaches to identify investments that will have a practical impact.

Q. Have any commissions publicly commented on the 1898 & Co. planning process and analytics utilized within AssetLens?

A. Yes, the Public Utility Commission of Texas has utilized 1898 & Co. modeling approach and model to approve over $4 billion of System Resiliency Plans (SRP) for six different utilities: Oncor, Entergy Texas, El Paso Electric, Southwestern Public Service Company, American Electric Power, and Texas-New Mexico Power (TNMP). At the first open hearing meeting, October 24, 2024, to discuss the first system resiliency plan for Oncor, Commissioner Jimmy Glotfelty, said the following about 1898 and Co.'s analytic model: "First I want to say, coming right out of the box, I was impressed with the analytics behind what 1898 [and Co.] put together.....but the fact that they are steeped in utilizing data and models to help solve and slice and dice the data to figure out where to go and what to do I think is a valuable tool." ("Open Meeting at 9:30 AM October 24th ," 01:32:12-1:32:45)[7] At the following open hearing meeting on November 14th, 2024, Commissioner Glotfelty reiterated his support of 1898 and Co.'s analytic model saying: "I believe that the consulting firm that they [Oncor] used, 1898 [and Co.] grounded this plan in metrics and in data. I think

[7]Open Meeting at 09:30 AM. (2024). Public Utility Commission of Texas. Retrieved April 14, 2025, from https://www.adminmonitor.com/tx/puct/open_meeting/202410242/.

that is an important lesson to heed or to follow when we are giving out this much money carte blanche." ("Open Meeting at 9:30 AM November 14th," 00:57:05-00:57:34)[8] These public comments show that the 1898 & Co. modeling approach and model (the same one I utilize in this proceeding) have provided confidence to the Texas Public Utility Commission to approve over $4 billion of electric distribution investment in hardening, pole inspections, distribution automation, telecommunication enhancements, technology implementation, and physical / cyber security investment.

V. NARROW DEFINITION OF BEST PRACTICES FOR CAPITAL INVESTMENT PLANNING

Q. What is Witness Shapley's opinion on the best practice for investment in distribution laterals?

A. Witness Shapley's position is that the only sound basis for repairing or replacing distribution equipment is the result of an objective test or inspection. In his view, equipment that fails an objective test or inspection should be repaired or replaced, while equipment that passes is sufficiently safe and reliable to remain in service; and he treats replacement undertaken for any other reason as "discretionary" and, absent a project-specific benefit-cost analysis, imprudent.[9] In effect, Witness Shapley defines best practice for distribution investment narrowly—as condition-based replacement of individual assets, one at a time, triggered solely by an inspection or test failure.

Q. Do you agree with this definition for best practice?

A. No. I agree with Witness Shapley that objective inspection and testing are important, and they are a necessary component of any sound asset management program. My

[8]Open Meeting at 09:30 AM. (2024). Public Utility Commission of Texas. Retrieved April 14, 2025, from https://www.adminmonitor.com/tx/puct/open_meeting/20241114/.

[9] Direct Testimony of David C. Shapley, Page 5, lines 11-15.

disagreement is with the narrowness of his definition. Witness Shapley treats condition-based, one-asset-at-a-time replacement as the only prudent way to invest in the distribution system, and on that basis, he characterizes Evergy's programmatic investments as discretionary and imprudent. That definition is incomplete. It omits at least two considerations that are central to prudent capital planning for distribution infrastructure: first, the construction and unit-cost efficiencies that are realized by replacing multiple assets together within a common geographic area; and second, the opportunity to redesign a portion of the system when a critical mass of aged or non-standard assets serving the same customers is addressed at one time. Witness Shapley's testimony does not account for either consideration.

Q. Please explain the construction efficiencies that Witness Shapley's definition overlooks.

A. Replacing distribution assets one at a time, only as each individual asset fails an inspection or test, is a unit cost inefficient way to invest in the grid. Distribution construction carries substantial fixed and mobilization costs that are largely incurred on a per-project or per-location basis, regardless of how many assets are addressed once crews are mobilized to a location. When a utility scopes and executes the replacement of many assets at one time within a single geographic area, those fixed costs are spread across a larger body of work, and the average, or unit, cost of the installed infrastructure declines. This is a well-understood construction efficiency and a legitimate consideration in prudent investment planning.[10] By confining replacement to individual assets as they fail objective tests, the definition Witness Shapley advances forgoes these efficiencies and, over time, would tend

[10] Direct Testimony of Jason D. De Stigter, Michigan Public Service Commission Case No. U-21860, Page JDDS-8, lines 10-16.

to increase the average cost of distribution infrastructure borne by customers. Witness Shapley does not address this trade-off anywhere in his testimony.

Q. You also referred to an opportunity to redesign portions of the system. Please explain.

A. Yes. When a critical mass of older or non-standard assets is concentrated in one area and collectively serves the same group of customers, addressing those assets together creates an opportunity that one-for-one replacement cannot: the opportunity to redesign that portion of the system rather than simply replace aging components in kind. Examples include relocating facilities from rear-lot or back-of-property locations to the front of the street to improve access and reduce restoration times, and updating the segment to current construction standards—such as pole height, cross-arm and framing standards, and span (pole-to-pole) distances—so that the rebuilt portion of the system is more resilient, easier to maintain, and better positioned for future load and reliability needs.[11] These are design decisions that become available only when a segment is addressed comprehensively. Under Witness Shapley's definition, each of these assets would be evaluated and replaced only upon its own individual test or inspection failure, and the system would be rebuilt to its existing—and often outdated—design. Witness Shapley either ignores or does not describe these considerations.

Q. What do you conclude regarding Witness Shapley's definition of best practice?

A. I conclude that Witness Shapley's definition of best practice is too narrow to support the disallowances he recommends. Objective inspection and testing are important, and I do not suggest otherwise. But prudent distribution investment planning also weighs the construction and unit-cost efficiencies of addressing assets together within a common

[11] Direct Testimony of Jason D. De Stigter, Michigan Public Service Commission Case No. U-21860, Pages JDDS-11 through JDDS-12 and Page JDDS-15.

geographic area and the opportunity to redesign portions of the system where a critical mass of aged or non-standard assets serves the same customers—considerations that a purely condition-based, single-asset replacement approach cannot capture. Because Witness Shapley's analysis does not account for these considerations, it does not provide a complete or reliable basis for concluding that Evergy's investments were imprudent.

Q. Are the considerations you described unique to Evergy?

A. No. In my experience working with electric utilities across the country, utilities routinely consider factors beyond the results of individual inspections or tests when developing capital investment plans. These factors include construction and mobilization efficiencies, customer impacts, system design considerations, reliability improvements, risk reduction, and opportunities to modernize portions of the system. The considerations I have described are not unique to Evergy and are consistent with practices I have observed directly and indirectly at utilities throughout the industry.

VI. CONCLUSION

Q. Please summarize your rebuttal testimony.

A. My rebuttal testimony demonstrates that Witness Alvarez's principal criticisms of AssetLens are not supported by the record in this proceeding. Specifically, my testimony has shown:

1. **AssetLens is not a subjective scoring tool.** The characterization of AssetLens as a subjective scoring process overlooks the analytical framework described in Evergy's response to OPC Data Request 5010 and the methodologies further described in Schedule JDD-2. The analytical concepts underlying AssetLens are not new. These methodologies have

been discussed in prior regulatory proceedings and technical conferences involving Witness Alvarez and other representatives of The Wires Group.

2. **AssetLens was not designed to justify accelerated equipment replacement or favor Burns & McDonnell.** AssetLens is a planning and decision-support framework used to evaluate investment needs. It does not determine procurement, contractor selection, or project execution decisions.

3. **The analytics underlying AssetLens utilize risk-informed benefit-cost analysis.** The framework evaluates asset deterioration, probability of failure, consequence of failure, lifecycle risk, investment benefits, project costs, and benefit-cost information to support investment decision-making.

4. **Witness Shapley's definition of best practice is too narrow to support his recommended disallowances.** Objective inspection and testing are important, but prudent distribution investment planning also weighs the construction and unit-cost efficiencies of addressing assets together within a common geographic area and the opportunity to redesign portions of the system—considerations Witness Shapley's testimony does not address.

Q. What is your overall conclusion?

A. For the reasons discussed throughout my rebuttal testimony, I disagree with Witness Alvarez's characterization of AssetLens and the conclusions he draws from that characterization. The record demonstrates that AssetLens incorporates risk-informed benefit-cost analysis and provides Evergy with a data-driven and technically supportable framework for evaluating and prioritizing distribution investments.

Q. What is your recommendation to the Commission?

A. Based on the analysis and findings described throughout my rebuttal testimony, I recommend that the Commission reject the disallowances proposed by Witness Alvarez and Witness Shapley and allow Evergy's investment in the lateral reconductoring program. The recommendations of OPC witnesses rely heavily on assumptions that equipment should remain in service until failure or objective test results require replacement. EMM evaluates asset condition, reliability risk, safety, concerns, maintenance history, operational requirements, and long-term lifecycle considerations when making replacement and investment decisions. AssetLens provides Evergy with a risk-informed, benefit-cost-based framework that reflects sound investment-planning practice, and the record demonstrates that the program was evaluated and prioritized on that basis. For these reasons, the investment is reasonable and should be allowed for recovery.

Q. Does this conclude your rebuttal testimony?

A. Yes.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of Evergy Metro, Inc. d/b/a Evergy Missouri Metro's Request for Authority to Implement A General Rate Increase for Electric Service	))))	Case No. ER-2026-0143

AFFIDAVIT OF JASON D. DE STIGTER

STATE OF MISSOURI)
) **ss**
COUNTY OF JACKSON)

Jason D. De Stigter, being first duly sworn on his oath, states:

1. My name is Jason D. De Stigter. I work in Kansas City, Missouri, and I am employed as Director, Utility Investment Planning at Burns & McDonnell.

2. Attached hereto and made a part hereof for all purposes is my Rebuttal Testimony on behalf of Evergy Missouri Metro consisting of twenty-six (26) pages, having been prepared in written form for introduction into evidence in the above-captioned docket.

3. I have knowledge of the matters set forth therein. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded, including any attachments thereto, are true and accurate to the best of my knowledge, information and belief.

Jason D. De Stigter

Subscribed and sworn before me this 11 day of August 2026.

Notary Public

My commission expires: Nov 24, 2028

TOSHA J MAUPIN
Notary Public - Notary Seal
STATE OF MISSOURI
Jackson County
My Commission Expires: Nov. 24, 2028
Commission # 24994113

1898 & Co.

Jason De Stigter, PE

Director - Utility Investment Planning



Education

B.S. / Engineering
B.A. / Business Administration

Registrations

- Professional Engineer (KS)

9 years with 1898 & Co.
19 years of experience

Visit my LinkedIn profile.

Jason leads the Utility Investment Planning business line at 1898 & Co., part of Burns & McDonnell. In this role, Jason is responsible for business development, marketing, staff training and development, solution and product development, and overall project delivery within the business line. The Utility Investment Planning business line supports electric utilities in developing long-term investment plans and portfolios to meet one or all of the following objectives: 1) aging infrastructure, 2) reliability, 3) resilience or system hardening, and 4) electrification. The business line owns solutions and tools around each of its offerings to produce data-driven decisions. Jason is the main architect and solution developer of the data-driven analytic solutions for each of the four offerings.

Jason has 19 years of extensive experience in performing business case evaluations on a variety of project types, helping utility clients with difficult investment decisions. Jason also has a deep financial and economic analysis background and specializes in business case evaluation, risk assessment and management for utility clients. Jason has extensive experience modeling risk for utility industry clients. His modeling experience includes developing complex and innovative risk analysis models using industry-leading risk analysis software tools employing Monte Carlo simulation and Optimization algorithms. His experience includes performing risk and economic analysis engagements for several multi-billion-dollar capital projects and large utility systems for aging infrastructure, system resilience, reliability and distribution automation, and electrification. Jason also serves as an expert witness for many of these engagements, supporting the full regulatory process.

1898 & Co.

TESTIMONY/REGULATORY FILING EXPERIENCE

Utility Company	Regulatory Agency	Docket No. | Year	Subject
DTE	Michigan Public Service Commission	U-22046 | 2026 Direct Testimony (pg. 668-709) Filing/Sponsoring Report (pg. 34-252)	Program Benefit Cost Analysis
El Paso Electric (EPE)	Public Utility Commission of Texas	59137 | 2026 Testimony & Exhibits	System Resiliency Plan (SRP) 2027-2029
Tampa Electric Company (TEC)	Florida Public Service Commission	20250016-EI | 2025 Direct Testimony Filing/Sponsoring Report (pg. 115-198)	2026 – 2035 Storm Protection Plan (SPP)
DTE	Michigan Public Service Commission	U-21860 | 2025 Direct Testimony (pg. 636-667) Filing/Sponsoring Report (pg. 37-172)	Program Benefit Cost Analysis
Southwestern Public Service Company (SPS)	Public Utility Commission of Texas	57463 | 2024 Direct Testimony (pg. 470-519) Filing/Sponsoring Report (pg. 129-282) Rebuttal not needed Approved by Commission with minor modifications	System Resiliency Plan (SRP) 2025-2027
AEP Texas	Public Utility Commission of Texas	57057 | 2024 Direct Testimony (pg. 481-499) Filing/Sponsoring Report (pg. 55-175) Rebuttal not needed Approved by Commission with minor modifications	System Resiliency Plan (SRP) 2025-2027
Cleco	Louisiana Public Service Commission	U-37479 | 2024 Direct Testimony Filing/Sponsoring Report Rebuttal Testimony Case was settled	Resilience Investment and Benefits Study
Texas-New Mexico Power	Public Utility Commission of Texas	56954 | 2024 Direct Testimony (pg. 746-771) Filing/Sponsoring Report (pg. 435-645) Rebuttal Testimony (pg. 1-19) Approved by the Commission with minor modifications	System Resiliency Plan (SRP) 2025-2027
Ohio Power Company (AEP Ohio)	Public Service Commission of Ohio	24-787-EL-RDR | 2024 Direct Testimony (pg. 1-13) Filing/Sponsoring Report (pg. 27-50)	gridSMART® Phase 3 DACR Project
Entergy Texas	Public Utility Commission of Texas	56735 | 2024 Direct Testimony (pg. 52-71) Filing/Sponsoring Report (pg. 84-193)	Texas Future Ready Resiliency Plan (Phase 1)
FirstEnergy Pennsylvania Electric Company	Pennsylvania Public Utility Commission	R-2024-3047068 | 2024 Rebuttal Testimony Not Publicly available	Enhanced Vegetation Management Program Benefit Cost Analysis
Oncor	Public Utility Commission of Texas	56545 | 2024 Direct Testimony (620-649) Filing/Sponsoring Report (pg. 229-460) Rebuttal Testimony Approved by Commission with minor modifications	System Resiliency Plan (SRP) 2025-2027
Baltimore Gas & Electric	Maryland Public Service Commission	9692 | 2023 1898 Technical Report (No. 1 Apte Direct Testimony pg. 137-276) Rebuttal Testimony (No. 71) Oral Testimony	2024 – 2026 Mutli-Year Plan (MYP): Resilience Investment Plan
Southern Indiana Gas and Electric Company	Indiana Utility Regulatory Commission	45894 | 2023 Direct Testimony Rebuttal Testimony Waived on providing Oral Testimony	CIE South Transmission Distribution Storage System Improvement Charge (TDSIC) Plan
Entergy New Orleans	New Orleans City Council	UD-21-03 | 2022 *Testimony not provided, case is still pending	2023-2033 Storm Resiliency Plan

Utility Company	Regulatory Agency	Docket No. | Year	Subject
Entergy Louisiana	Louisiana Public Service Commission	U-36625 | 2022 Direct Testimony Filing/Sponsoring Report LPSC Approved First 3 Years of the Plan	2023-2033 Storm Resiliency Plan
Tampa Electric Company (TEC)	Florida Public Service Commission	20220048-EI | 2022 Direct Testimony (412-485) Filing/Sponsoring Report (141-222) Oral Testimony Provided	2022 – 2031 Storm Protection Plan (SPP)
Oklahoma Gas and Electric Company (OG&E)	Oklahoma Corporation Commission	202100164 | 2022 Direct Testimony (1-45) Filing/Sponsoring Report (46-181) Rebuttal Testimony Not in Public Domain	Grid Enhancement Business Case for 2020 & 2021 Investment
Tampa Electric Company (TEC)	Florida Public Service Commission	20200067-EI | 2020 Direct Testimony (549-623) Filing/Sponsoring Report (100-180) Rebuttal Testimony (72-105)	2020 – 2029 Storm Protection Plan (SPP)
Indianapolis Power & Light Company (now AES Indiana)	Indiana Utility Regulatory Commission	45264 | 2019 Direct Testimony Filing/Sponsoring Report Rebuttal Testimony Oral Testimony Provided	Indianapolis Power & Light Company Transmission Distribution Storage System Improvement Charge (TDSIC) Plan

Additionally, Jason testified in front of the State of Alaska Senate and House Resource committees on project economics and challenges of the AKLNG project.

PROJECT EXPERIENCE

Program benefit Cost Analysis / DTE Electric Company (DTE)

Michigan / 2024-2025

Project director and Witness for conducting a benefit cost analysis of four grid modernization programs totaling over $4 billion in DTE Electric's 2025 rate case before the Michigan Public Service Commission (Case No. U-21860). The work applied 1898 & Co.'s Integrated Resilience, Reliability, and Risk Investment Model to quantify customer-centric benefits, including avoided restoration costs and monetized customer minutes interrupted (CMI). The study evaluated Pole and Pole Top Maintenance & Modernization, Strategic Undergrounding, Distribution Automation, and Grid Automation Telecommunications. The analysis produced circuit- and substation-level benefit cost ratios (BCRs) for over 2,700 circuits and 600 substations. A major focus was the Grid Automation Telecommunications assessment comparing public LTE and private LTE/fiber alternatives. Results showed that the Private LTE/Fiber option provided the greatest customer value, with an expanded-use-case BCR of 2.86 and over $80 million in life-cycle savings, establishing it as DTE's long-term "North Star" communications strategy. 1898 & Co. authored the Program Benefit Cost Analysis Report (Exhibit A-28, Schedule R3) and provided testimony and ongoing regulatory support for DTE's rate case proceedings.

System Resiliency Plan (SRP) Analysis & Investment Study – Benefit-Cost Analysis / Southwestern Public Service Company (SPS)

Texas / 2024-2025

Project director and Witness for SPS distribution resiliency investments under 16 TAC §25.62 using its Integrated Resilience & Risk Investment Model; scope covered Texas assets only. Focus areas: Distribution Overhead Hardening, System Protection Modernization (mainline and lateral reclosing), and Communication Modernization. Methods: NOAA event history linked with OMS and GIS, DOE ICE monetization, and Monte Carlo event simulation to estimate restoration cost and CMI reductions and compute BCR. Results: proposed SRP portfolio of about $418.8M with ~$1.431B quantified benefits, average BCR 3.4; Overhead Hardening BCR 4.7 with ~58% CMI improvement on treated circuits; Mainline Automated Reclosing BCR 4.2 with ~37% CMI improvement.

System Resiliency Plan (SRP) Analysis & Investment Study – Benefit Cost Analysis / Texas New Mexico Power (TNMP)

Texas / 2024

Project director and Witness for performing a cost benefit evaluation of resiliency investments for TNMP's System Resiliency Plan (SRP) for $750 million of distribution investment over the 2025 to 2027 time horizon. The project utilized 1898 & Co.'s Integrated Resilience & Risk Investment Model to develop and prioritize projects on a cost benefit perspective. The model employed data-driven analyses and robust algorithms to calculate the resilience benefit of over 10,500 potential resilience investments in terms of the range of reduced restoration costs and customer minutes interrupted (CMI). The modeling included building the relationships between NOAA weather data, historical OMS records, and GIS infrastructure data to understand the relationship between various weather events (thunderstorms, ice storms, blizzards, heat events, etc.) the number of customers impacted and the infrastructure vulnerability. The model then utilized this relationship to forecast future events and estimate the life-cycle impacts of not investing in the distribution system and with investments. 1898 & Co. evaluated distribution overhead hardening investments, protection modernization, vegetation management, and flood mitigation. The results of the project included a protection zone and circuit level benefit cost results for all 10,500 protection zones and 337 circuits on TNMP's system. The 1898 & Co. resilience benefit assessment report and Jason written testimony were included in the filing. 1898 & Co. is supporting the regulatory process to include responding to data requests and interrogatories.

Storm Resilience Investment Study – Benefit-Cost Analysis / Cleco Power LLC

Louisiana / 2025–2034

Project director and Witness for the Storm Resilience Model to prioritize T&D hardening. The scope evaluated 43,155 candidate projects across feeders, laterals, transmission, and substations. The optimized plan totaled about $509.7 million nominal (about $435.4 million in 2024 dollars) and was set near the point of diminishing returns around $485–$500 million. Methods integrated NOAA storm history, OMS and GIS assets, customer types, accessibility and terrain factors, surge risk, and ICE-based outage cost monetization within Monte Carlo simulation to estimate avoided restoration costs and customer minutes interrupted. Results projected about 14% lower restoration costs and about 26% lower storm CMI over 50 years with a portfolio benefit-cost ratio near 1.1. Sequencing was driven by benefit-cost ranking and execution constraints.

Distribution Automation Circuit Reconfiguration Phase 3 Benefit Cost Analysis / AEP Ohio

Ohio / 2024-2025

Project director and Witness for performing a cost benefit evaluation for potential distribution automation circuit reconfiguration (DACR) investments across the AEP Ohio system. The project evaluated nearly 1,500 circuits across the system for investments in recloser deployment, new tie lines, and reconductoring. It also considered the effectiveness of each scheme. The evaluation identified over 330 circuits where the customer benefits are in excess of costs. The 1898 & Co. investment benefits cost assessment report and Jason written

testimony were included in the initial filing. 1898 & Co. is supporting the regulatory process to include responding to data requests and interrogatories.

Enhanced Vegetation Management Benefit Cost Analysis Evaluation/ FirstEnergy Pennsylvania Electric Company

Pennsylvania / 2024

Project director and Witness for performing a scenario benefit cost evaluation for FirstEnergy Pennsylvania's Enhanced Vegetation Management program that is part of their rate case. The evaluation estimated the monetized customer benefits based on historical outage records for a range of improvement scenarios. The evaluation showed that an improvement of approximately 20-25 percent in vegetation related outages provides benefits in excess of costs for customers. Jason provided rebuttal testimony.

System Resiliency Plan (SRP) Benefit Cost Analysis and Plan Development / Oncor

Texas / 2024-Current

Project director and Witness for performing a cost benefit evaluation of resiliency investments for Oncor's System Resiliency Plan (SRP) for $3.4 billion of distribution investment over the 2025 to 2027 time horizon. The project utilized 1898 & Co.'s Integrated Resilience & Risk Investment Model to develop and prioritize projects on a cost benefit perspective. The model employed data-driven analyses and robust algorithms to calculate the resilience benefit of over 175,000 potential resilience investments in terms of the range of reduced restoration costs and customer minutes interrupted (CMI). The modeling included building the relationships between NOAA weather data, historical OMS records, and GIS infrastructure data to understand the relationship between various weather events (thunderstorms, ice storms, blizzards, heat events, etc.) the number of customers impacted and the infrastructure vulnerability. The model then utilized this relationship to forecast future events and estimate the life-cycle impacts of not investing in the distribution system and with investments. 1898 & Co. evaluated hardening investments, modernization, inspections, and vegetation management. The results of the project included a substation level benefit cost results for all 850+ substations on Oncor's system. The 1898 & Co. resilience benefit assessment report and Jason written testimony were included in the initial filing. Jason supporting the regulatory process to include responding to data requests and interrogatories. Jason also provide rebuttal testimony. The parties have a settlement agreement that is pending commission approval.

10 Year Storm Resiliency Plan / Entergy Louisiana

Louisiana / 2022-Current

Project director for developing and providing justification for Entergy Louisiana's 2024-2033 10-year Storm Resiliency Plan for its transmission and distribution system to mitigate the impact of major events. The project utilized 1898 & Co.'s Storm Resilience Model to develop and prioritize projects on a cost benefit perspective. The model employed data-driven analyses and robust algorithms to calculate the resilience benefit of over 150,000 storm hardening projects in terms of the range of reduced restoration costs and customer minutes interrupted (CMI). The Storm Resilience Model organized the system into 50 mile by 50 mile system sections and models 49 storm events against each section and estimates which parts of the system will fail in each storm event. The model evaluates each project before and after hardening for both an overhead hardening and underground conversion. The model further utilizes Stochastic Model to simulate storm events and calculate resilience benefits. Finally, the model performs budget optimization to identify ideal investment levels and prioritize projects. The 1898 & Co. resilience benefit assessment report and Jason written testimony were included in the filing. Jason is supporting the regulatory process to include responding to data requests and interrogatories.

Storm Protection Plan Resilience Benefits Assessment / Tampa Electric Company (TECO)

Florida / 2022-2031

Project director and Witness for a resilience-based benefit-cost analysis using the Storm Resilience Model to prioritize grid hardening. The model integrated NOAA storm history, OMS and GIS data, vegetation and pole condition, wind exposure, accessibility, substation flood risk, and ICE outage cost monetization to estimate avoided restoration costs and customer minutes interrupted under P50–P95 scenarios. The optimized plan is about $1.6 billion, with most capital in lateral undergrounding and feeder hardening and targeted spend on transmission, substations, and site access. Modeled outcomes show roughly one-third lower restoration costs and about a 46% reduction in storm CMI over 50 years at a competitive cost per CMI avoided. Feeder hardening delivers most CMI reduction; lateral undergrounding drives most restoration cost savings. Scope spans nearly 100 circuits and over 4,000 laterals totaling about 1,100 miles, sequenced by benefit-cost ranking and execution constraints.

Resiliency Multi-Year Plan / Baltimore Gas & Electric

Maryland/ 2022-2023

Project director for developing distribution resiliency portfolio of overhead hardening and underground conversions for Baltimore Gas & Electric. Jason led the effort to identify and justify investments for the 2024 through 2026 time horizon. The project utilized 1898 & Co.'s Resilience Investment Model to develop and prioritize projects on a cost benefit perspective. The model employed data-driven analyses and robust algorithms to calculate the resilience benefit hardening projects and alternatives in terms of the range of reduced restoration costs and customer minutes interrupted (CMI). The output of the analysis included three years of specific distribution investments in overhead hardening and underground conversions and the benefits for those projects. 1898 & Co. provided a technical

report that was included as an exhibit to BGE's witness. 1898 & Co supported the discovery process, provided rebuttal testimony, and testified on the stand in August 2023. The case was decided in December 2024. The resilience investment will be evaluated separate from the MYP.

Transmission Distribution Storage System Investment Charge Plan Development/ Southern Indiana Gas and Electric

Indiana / 2021-2024

Project director for developing the portfolio of investment projects for a Southern Indiana Gas and Electric, a CenterPoint company. Jason is leading the effort to identify and justify investments in transmission, substation, and distribution systems over the next 5 years. The evaluation leveraged 1898 & Co.'s AssetLens Analytics Engine, an asset investment planning tool to evaluate the life-cycle benefits of replacing Transmission and Distribution (T&D) infrastructure and deploying smart devices across the distribution system. The analysis leveraged utility datasets (GIS, OMS, distribution circuit models, asset management systems, condition records, customer counts and profiles) inside the engine's aging infrastructure and reliability analytics. The project included data cleansing, organizing, linking, and transformation and configuration of the holistic risk framework across poles, conductor spans, line transformers, breakers, power transformers, relays, and other assets classes. Jason submitted direct and rebuttal testimony, supported the discovery process. He was waived from oral testimony. Southern Indiana Gas & Electric got their full TDSIC plan approved.

Distribution Automation Plan Development / Confidential Client

Midwest / 2022-Current

Project director for developing and providing justification for a distribution automation circuit configuration investment portfolio for a Midwest Investor-Owned Utility. The evaluation utilized 1898 & Co.'s reliability and distribution automation analytics model inside our AssetLens Analytics Engine, an asset investment planning tool to evaluate the life-cycle benefits of replacing Transmission and Distribution (T&D) infrastructure and deploying smart devices across the distribution system. The analytics model estimates the expected benefit of deploying distribution automation to every circuits factoring in scheme effectiveness due to tie-line constraints and conductor capacity. The business case monetized the outage improvement and estimated the project cost to include new reclosers, associated communications upgrades, new tie lines, and conductor upgrades. Jason will serve as the expert witness and sponsor the technical report. The case is expected to be filed in May 2023.

Grid Investment Plan Benefits Assessment / Confidential IOU

Midwest / 2022 - 2023

Project director for development of the benefits assessment for a $2.6 billion grid investment plan. The plan includes investments in distribution circuit upgrades, distribution automation, substation rebuilds, capacity rebuilds, and low voltage conversions to improve reliability and resilience, manage long-term costs, modernize for the future, and decrease risk. The engagement include mapping investments to the underlying asset infrastructure, calculating the benefits using the AssetLens Analytics Engine analytics models, and developing the business case for over 6,000 different investment activities across 6 programs. The analysis and results are formalized within a technical report that will be submitted within the public record.

Grid Enhancement Investment Plan Benefits Assessment / Oklahoma Gas & Electric

Oklahoma / 2021-2022

Project director for development of the benefits assessment for OG&E's 2020 and 2021 Grid Enhancement Plan. The plan includes investments in distribution circuit upgrades, distribution automation, and substation rebuilds totaling nearly $250 million. Jason organized the business case framework including the linkage of investments to benefits approaches and calculating the life-cycle benefits in terms of decreased customer outages and avoided restoration costs. Jason also served as the expert witness for the benefits assessment and has provided direct testimony sponsoring the technical report, supported interrogatories and data requests, and provided rebuttal testimony. OG&E settled the case in June 2022.

2022-2031 Storm Protection Plan Resilience Assessment / Tampa Electric Company

Florida / 2021-2022

Project director for supporting the development of TEC's 2022-2031 10-year Storm Protection Plans for its transmission and distribution system in accordance with Florida Statute 366.96. This project is an update to the original 2020-2029 10-Yr Storm Protection Plan. The project utilized 1898 & Co.'s Storm Resilience Model to develop and prioritize projects on a cost benefit perspective. The model employed data-driven analyses and robust algorithms to calculate the resilience benefit of over 20,000 storm hardening projects in terms of the range of reduced restoration costs and customer minutes interrupted (CMI). The Storm Resilience Model models nearly 100 storm events and estimates which parts of the system will fail in each storm event. The model evaluates each project before and after hardening. The model further utilizes Stochastic Model to simulate storm events and calculate resilience benefits. Finally, the model performs budget optimization to identify ideal investment levels and prioritize projects. The 1898 & Co. resilience benefit assessment report and Jason written testimony were included in the filing. Jason supported

the regulatory process to include responding to data requests and interrogatories. Jason testified in hearings in Tallahassee in early August 2022. The commission approved nearly all of TEC investment plan.

Long-term Portfolio Development / Public Service New Mexico

New Mexico / 2021-Current

Project director for developing the portfolio of investment projects for Public Service New Mexico (PNM). Jason led the effort to identify and justify investments in PNM's transmission, substation, and distribution systems over the next 20 years. The evaluation leveraged 1898 & Co.'s AssetLens Analytics Engine, an asset investment planning tool to evaluate the life-cycle benefits of replacing Transmission and Distribution (T&D) infrastructure and deploying smart devices across the distribution system. The analysis leveraged PNM datasets (GIS, OMS, distribution circuit models, asset management systems, condition records, customer counts and profiles) inside the engine's aging infrastructure and reliability analytics. The project included data cleansing, organizing, linking, and transformation and configuration of the holistic risk framework across poles, conductor spans, line transformers, breakers, power transformers, relays, and other assets classes. The evaluation organized all PNM's assets into over 20,000 projects. The risk framework allowed for the calculation of benefit in financial terms across each of the 20,000 projects from, specifically the mitigated reactive and restoration costs and the monetization of customer outages. Finally, the project included budget optimization to identify the point of diminishing returns to provide valuable management insights into the level of needed investment in the system over the next 20 years. The overall investment level is confidential. PNM is currently executing the projects that resulted from the evaluation and moving their overall investment levels to manage system risk.

2020-2029 Storm Protection Plan Resilience Assessment / Tampa Electric Company

Florida / 2019-2020

Project director for supporting the development of TEC's 2020-2029 10-year Storm Protection Plans for its transmission and distribution system in accordance with Florida Statute 366.96. The projects utilized 1898 & Co.'s Storm Resilience Model to develop and prioritize projects on a cost benefit perspective. The model employed data-driven analyses and robust algorithms to calculate the resilience benefit of over 20,000 storm hardening projects in terms of the range of reduced restoration costs and customer minutes interrupted (CMI). The Storm Resilience Model models nearly 100 storm events and estimates which parts of the system will fail in each storm event. The model evaluates each project before and after hardening. The model further utilizes Stochastic Model to simulate storm events and calculate resilience benefits. Finally, the model performs budget optimization to identify ideal investment levels and prioritize projects. Tampa Electric Company $1.5 billion 10-year plan was approved in September 2020. The 1898 & Co. resilience benefit assessment report and Jason written testimony were included in the filing. Jason supported the regulatory process to include responding to data requests and interrogatories. He also provided rebuttal testimony. Tampa Electric settled with the interveners.

Grid Investment Business Case / Confidential IOU

Southeast / 2021

Project director for development of a business case for all grid investment planned projects over the next 10 years. Business case evaluated both mitigated life-cycle reactive and restoration costs and monetization of customer outages. Investments included traditional rebuilds for reliability and resilience purposes, distribution automation, communications, and deployment of new technologies. The business case was used for internal executive management approvals.

Distribution Investment Plan Development with AssetLens / Evergy

Missouri and Kansas / 2019-Current

Project director for configuration and implementation of AssetLens for Evergy's distribution system across multiple states and jurisdictions. AssetLens is an asset investment planning software developed by 1898 & Co. to 1) automate project identification in T&D systems using typical utility data set and 2) provide business justification for all projects in life-cycle NPV benefit terms. The software ingests a range of datasets to include GIS, OMS, distribution circuit models, asset management systems, condition records, customer counts and profiles and performs the necessary cleansing, transformation, and linking. Jason led the effort to configure the risk framework analytics that estimate the risk adjusted life-cycle costs and customer impact for all T&D asset classes including poles, pole tops, primary conductor spans, primary underground sections, secondary cable, line transformers, manholes, conduit, splices in manholes, network assets and more. The analytics employ a risk-based methodology across a range of failure types (various probabilities and consequences) to calculate the annual risk costs for a Status Quo and Investment scenario. Life-cycle risk costs include a range of reactive and restoration costs and the monetization of customer outages. The evaluation organized assets into over 100,000 potential projects and scheduled investments to maximize benefit given budget, schedule, and other technical constraints. The overall investment level is confidential. AssetLens visualizes the project plan geospatially providing specific assets for replacement with the business case results for each project. Evergy's distribution engineering teams has been using AssetLens to develop work orders and executive the project plan. It was also used to support their regulatory filing to the Missouri commission.

Distribution Automation Plan Development / Confidential IOU

Central Midwest / 2021-Current

Project director for development of a distribution automation investment plan for the next 5 years. The project involved using GIS and outage records to circuits that would provide the most benefit from the deployment of reclosers. The effort included estimating the number of devices for each circuit and placement of devices for the first few years of the plan. The business case results include the estimated decrease in customer outages and monetization of the outages for an investment business case. The utility is currently developing work orders for 2022 projects.

Overhead and Underground Business Case Development / Confidential IOU

Upper Midwest / 2021-Current

Project director for development of a business case comparing overhead rebuilds to a new modern standards or undergrounding. The business case was performed from a life-cycle cost perspective and impact to customers over a range of events to include extreme weather. The business case evaluated a range of areas of the system to include urban, rural, and suburban. The result of the evaluation may be used for responding to regulators requests.

Long-term Investment Plan Development / Confidential IOU

Midwest / 2021

Project director for identification and justification of distribution circuit and substation investments for a long-term investment plan. The evaluation utilized the AssetLens Analytics Engine to evaluate a range of investment options across the grid, establish 'ideal' investment levels, and provide direction to the 'ideal' split of investment across the system. The utility utilized the study to help develop their long-term investment plan for executive management approval and regulatory strategy.

Distribution Automation Business Case Pilot / Confidential IOU

Midwest / 2021

Project director for a pilot study on distribution automation project identification and justification. The evaluation performed 8760 modeling to understand system overloading constraints to performing automated load transfer schemes. The constraints analysis was utilized in the business case assessment to understand the percentage of time the scheme could operate and provide benefits to customers and if there was a business case to make other grid investments to unlock potential overloading constraints.

Distribution Reliability Investment Plan Development with AssetLens / Confidential IOU

Midwest / 2020-Current

Project director for development of a 10-year distribution investment plan focused on improving overall system reliability and delivery of AssetLens. The data and analytics-based planning approach included the cleansing, organizing, transformation, and linking of GIS, OMS, distribution circuit models, customer data, and condition information. The planning analytics included evaluation of the benefits and costs of rebuilding each protection zone, over 40,000, across they system. Benefit profiles included the mitigated reactive and restoration costs and decreased customer outages monetized using the DOE ICE Calculator. The project also included budget optimization to identify the long-term need for investment. The overall investment level is confidential. The client's distribution engineering team is currently utilizing the AssetLens solution to build work orders from the projects identified. The client is also moving toward the more 'ideal' long-term investment levels to manage system risk.

Long Term Electric Transmission and Distribution Capital Plan / Indianapolis Power & Light

Indiana / 2017-2019

Project manager for developing IPL's asset risk model. The asset risk model includes transmission circuit, substation, and distribution circuit assets. The asset risk model was used to identify and prioritize asset replacements for nearly $750 million of the $1.2 billion filing. Jason developed an innovative approach for modeling distribution circuit risk down to the span level. For the risk model, Jason developed an integrated and holistic probability and consequence of failure framework to evaluate any asset consistently. The approach has allowed IPL to prioritize investment across transmission and distribution and substations and circuits. The analysis included using Burns & McDonnell's proprietary capital optimization algorithm to group assets into projects and prioritize projects to maximize risk reduction benefit. Burns & McDonnell prepared two reports that are part of IPL's public record filing. Jason also provided written (direct and rebuttal) and oral testimony. The entire plan (100%) was approved in February of 2020.

Grid Modernization Engineering Study / Entergy

Louisiana/Mississippi/Arkansas/Texas / 2016–2019

Entergy is embarking on a new approach to electric distribution planning, design and engineering to meet the future needs of its customers. The new approach includes developing modernize electric distribution equipment, engineering and design, and construction standards to drive value throughout the supply chain from material purchasing, inventory, system design, and construction. Additionally, the grid modernization approach leverages a modern holistic distribution asset and capital planning

process with associated tools (DNV GL's Synergy) to facilitate efficient and robust performance and risk assessment of Entergy's electric distribution system. The approach identifies the portfolio of issues facing a family or cluster of distribution feeders and then develops the ideal portfolio of projects to address to improve feeder performance, cost, and risk.

Project manager for the business case evaluation and capital project prioritization aspects of Grid Modernization Engineering Study for Entergy. For the portfolio of projects, Jason developed a robust business case methodology that calculates risk reduction benefits, reliability improvement, and operational efficiency (i.e. fewer truck rolls) to justify each capital investment.

Entergy intends to use the results of the engineering study to propose a list of grid modernization project to consider for regulatory approval and funding. Additionally, these projects and the holistic planning approach will be the first step in an evolutionary change to build Entergy's grid of the future, ready for the next generation of consumers and system performance.

69 kV Wood Pole Replacement Program Evaluation / Salt River Project (SRP)

Phoenix, Arizona / 2017–2018

Project manager for evaluation of the 'ideal' level of 69 kV wood pole replacement SRP should execute each year. The effort includes development of an asset risk model, including risk framework, and various replacement strategies that maximize risk reduction while also maintaining overall budget levels. The final outcome will include the risk mitigated for the whole portfolio over 30 years for a range of budget levels to identify an 'ideal' overall investment rate.

PRIOR EXPERIENCE

Capital and Operations & Maintenance (O&M) Budget Prioritization / Tulsa Metropolitan Utility Authority (TMUA) Utility Enterprise Initiative

Tulsa, Oklahoma / 2013-2016

Project manager for the Capital Prioritization and Optimization task of TMUA's Asset Management implementation initiative, Utility Enterprise Initiative. He used a 'Project Prioritization and Optimization' solution for several water and wastewater projects as part annual cycle phased approach (executed three of four phases). Jason was responsible for leading workshops with engineering and maintenance staff, developing business case approaches for each water/wastewater project, performing Monte Carlo and optimization simulations, and developing strategies for the Utility's capital improvement plan (CIP) during a period of tight budget constraints to minimize rate increases. TMUA was working toward codifying the process and tool into their own annual budget and rates process. As such, Jason was responsible for developing users guide documentation and holding training on the process and tool for TMUA.

2017 Executive Asset Management Plan Alternatives Evaluation / Washington Suburban Sanitation Commission (WSSC)

Laurel, Maryland / 2015

Project manager for alternatives evaluation to support WSSC in the development of their 2017 Enterprise Asset Management Plan Business Case. Effort included developing forecasted 30-year capital plans optimizing on level of service, risk and cost. WSSC utilized the results of the evaluation to develop long term forecasts of capital improvements for communication to decision make Capital Prioritization Pilot Project / Salt River Project (SRP)

Project Prioritization / Salt River Project

Arizona / 2013-2014

Subject matter expert for this pilot study for SRP to prioritize and optimize several electrical generation, transmission and distribution planned investments. Allowed SRP management the opportunity to further develop and improve upon their current budget processes and to consider adopting the solution enterprise-wide. Jason's responsibilities included developing business case approaches for several of the pilot study projects and supporting workshops.

Long Term Electric Transmission and Distribution Capital Plan / Duke Energy

Indiana / 2014-2015

Subject matter expert and manager for development of a risk-based electric T&D capital plan that included Duke's long-term electric transmission and distribution (T&D) investments. This work provided evidence of how Duke's investments in its system provided risk reduction benefits and focused spending on high risk assets. As a capital prioritization and risk subject matter expert, he also developed capital plan profiles and resulting risk reduction solutions which were key to showing the value of the 7-year capital plan.

Long Term Electric Transmission and Distribution Capital Plan / Northern Indiana Public Service Company (NIPSCO)

Indiana / 2013-2014

Subject matter expert for development of a long-term $1 billion plus capital plan for NIPSCO's electric T&D infrastructure. A system risk model was developed to analyze and score asset risk across the T&D system for NIPSCO. The model highlighted the risk reduction benefits achieved through NIPSCO's long-term asset replacement program, which is focused on addressing high-risk assets that are nearing the end of their useful life.

Capital Prioritization System Master Plan / Hetch Hetchy Water and Power

California / 2009, 2011, 2012

Primary consultant for this system master plan, developing the analysis and prioritization of recommended capital and O&M projects for the Hetch Hetchy power, transmission and civil asset system. The process utilized a risk-based approach to economically schedule investments to maximize risk reduction given a certain budget constraint. The Hetch Hetchy Reservoir system lies within the scenic Yosemite National Park and provides electricity and water storage for the San Francisco Public Utility Commission.

Capital Project Prioritization with Risk Assessment / Colorado Springs Utilities

Colorado Springs, Colorado / 2008

Primary analyst on an innovative capital project prioritization process for Colorado Springs Utilities' Raw Water System. The engagement applied the Strategic Value Creation process to quantify the physical and financial parameters of capital and O&M projects identified for the utility's raw water system. A wide variety of projects and risk were then prioritized to develop the system capital improvement plan while considering utility risk tolerance, budget constraints and other planning criteria. Monte Carlo simulations were used to quantify the physical and financial parameters of each individual project, and the projects are evaluated and ranked using a consistent and transparent approach.

Jason was responsible for performing the Monte Carlo analysis, understanding the risks of each CAPITAL and O&M project, and prioritizing the projects to reduce the overall risk to the client.

Alaska Liquefied Natural Gas (AKLNG) Economic and Risk Analysis / State of Alaska Departments of Natural Resources and Revenue

Alaska / 2013-2016

Project manager responsible for economic and risk analysis for the AKLNG project on behalf of the State. In this role, Jason developed analysis to explore various project questions and negotiating position to better understand the perspective of each project sponsor and the best position for the State. He routinely developed materials to present to the commissioners of the departments or Natural Resources and Revenue, the State of Alaska legislature, negotiating teams, and the governor's office. On a few occasions, Jason has testified to the state of Alaska legislature of the economics and risks associated with the AKLNG project.

Deep Tunnel Sewerage System (DTSS) Phase 2 Resiliency Assessment / Singapore Public Utilities Board (PUB)

Singapore / 2014-2015

Subject matter expert for an alternative's resiliency assessment of several deep tunnel sewerage systems alternatives for Singapore PUB. In his role for this engagement, Jason created an innovated approach to evaluating the resiliency of several tunneling alternatives including total risk weighted level of service and cost over the asset's life cycle. The assessment identified several key risks impacting each alternative then quantifying the likelihood and the level of service and cost impacts of each risk. Employing Monte Carlo simulation, the risk cost and discount to level of service scores were calculated to develop a range of potential benefit cost ratios for each alternative. Singapore PUB utilized the process and results to identify a preferred alternative and move forward with key design decisions.

Kirkwood Penstock Risk Evaluation / Hetch Hetchy Water and Power

California / 2014

Project manager for a risk assessment of HHWP's critical Kirkwood Penstock which over 80% of San Francisco Bay's water supply moves through. The risk assessment following guidelines set out by the United States Bureau of Reclamation including a failure modes and effects analysis applying a qualitative scoring-based approach to evaluate the likelihood and consequence of failure for each failure mode. HHWP utilized the results of the evaluation to prioritize investment needs to ensure reliability of this critical asset.

Business Case Evaluation and Risk Analysis / Hampton Roads Sanitation District (HRSD, Wastewater Utility)

Virginia / 2011-2012

Business case evaluation and lead risk consultant for this long-term evaluation of the business case and associated risk of alternative wastewater system master plans. Working with Hampton Roads' senior management team, Jason evaluated the economics and risk of alternative strategic long-term wastewater system expansion plans related to biosolids management, which involved hundreds of millions of dollars in capital and O&M expenditures. This developed a long-term strategy that is now being used to optimize short- and long-term implementation plans for HRSD's wastewater system.

Conveyance Alternative Risk Assessment / Metropolitan Water District

California / 2010

Primary consultant for this engagement which analyzed several water conveyance options for the California State Department of Water Resources. This analysis was focused on capital cost and schedule risk of different multi-billion-dollar canal and tunnel conveyance alternatives. Jason was the risk specialist for the Environmental team for the risk assessment workshop. Utility decision-makers utilized

the results to more fully understand the risk inherent in each alternative to decide on a preferred alternative.

Integrated Water Power Plant Economic and Regulatory Assessment / Public Authority for Electricity and Water of Oman

Oman, Middle East / 2009-2010

Primary analyst for the economic and regulatory (tariff) modeling of a new, highly efficient integrated water & power plant. Jason's responsibilities included performing economic and tariff modeling of several different desalination and power plant alternatives and presenting final results to the Chairman of the Public Authority for Electricity and Water of Oman.

AGIA Economic and Risk Modeling / State of Alaska Department of Natural Resources (DNR)

Alaska / 2009-2010

Primary analyst for this economic and risk modeling assignment for the State of Alaska DNR. Analysis included modeling and evaluation of different natural gas pipeline project risk factors, as well as risk mitigation measures the state has within its control. The results of the analysis assisted the State of Alaska in negotiations with other pipeline stakeholders.

Black & Veatch's Energy Market Perspective Emissions Modeling

Overland Park, Kansas / 2012-2013

As part of Black & Veatch's annual release of its Energy Market Perspective, Jason developed a fundamental economic model to calculate emissions prices based on the EPA's Cross State Air Pollution Rule.

Commercial Modeling and Analysis / Alaska Gasline Development Corporation (AGDC)

Anchorage, Alaska / 2010-2011

Lead consultant for ongoing commercial and tariff modeling for AGDC's analysis of in-state pipeline alternatives. This modeling included sensitivity and scenario analysis, midstream tariff modeling, and stakeholder cash flow analysis.

Black & Veatch's Energy Market Perspective

Overland Park, Kansas / 2009-2011

The Energy Market Perspective developed by Black & Veatch uses an integrated market modeling approach to develop price forecasts for energy and natural gas prices. The modeling team, which included Jason, developed forecasts for CO2 taxes, energy demand and peak demand, generation retirements, generation expansion, renewables buildout and transmission expansion. Using these forecasts, the integrated market model used an interactive process of a production cost model for electric prices and a fundamental market model for natural gas prices.

Jason's principal responsibilities included developing forecasts, running and understanding the production cost model for a large region in the United States, and drawing conclusions for the region. The main forecasts Jason developed included energy and peak demand, generation retirements, generation expansion, and transmission expansion. Furthermore, Jason was responsible for developing the final report for the regional perspective.

Alaska Gasline Inducement Act (AGIA) Net Present Value (NPV) and Risk Analysis / State of Alaska Departments of Natural Resources and Revenue

Alaska / 2007-2008

In 2007, the state of Alaska passed the Alaska Gasline Inducement Act (AGIA). This act created a framework for the State to issue a license to build a 1,400 mile pipeline to transport natural gas from the North Slope of Alaska to either the North American market or elsewhere.

Uncertainty for a project of this size (over $30 billion) is understandably significant. In order to quantify this significant uncertainty, risk analysis was performed explicitly with the NPV model to evaluate the level of project risk to the various stakeholders due to various assumptions such as commodity prices, capital cost escalation, project schedule uncertainty, and reserve risk.

Jason performed economic, risk and financial analysis for several different stakeholders for the proposed projects and several sensitivities and alternative scenarios. Jason's main responsibilities included model development/creation, Monte Carlo risk modeling, and understanding risk for each stakeholder. He also performed financial analysis, data validation, and report and presentation support.

Socioeconomic Analysis, Riverbend Unit 3 and Fermi Unit 3 Nuclear Licensing Project / Entergy and Detroit Edison

Louisiana and Michigan / 2007-2008

Senior analyst served as an economist for a detailed socioeconomic analysis associated with the construction and operating license application (COLA) process for Entergy and Detroit Edison. He was responsible for developing population distributions; population projections; demographic characteristics to include age, sex, race and income; transient population distributions; and community characteristics for the surrounding area. Jason was also responsible for writing and reviewing significant portions of the COLA

Market and Economic Analysis / Termobarranquilla

Colombia, South America / 2007-2008

As a senior analyst, Jason provided market analysis, economic analysis and a discounted cash flow model to evaluate the worth of the Termobarranquilla power plant after an energy market restructuring in Colombia. He was responsible for developing an energy market model, economic dispatch model, discounted cash flow model and writing the report.

Taylor Energy Center Need for Power Application / Various Clients

Florida / 2006

Jason performed production costing, economic analysis and other support to facilitate the completion and filing of the Taylor Energy Center (TEC) Need for Power Application (NFP). The NFP provided a determination of the most cost-effective capacity addition to satisfy forecasted capacity requirements for the four separate utilities participating in the project while maintaining consistency with the Florida Public Service Commission statutory requirements. The analysis considered self-build and purchase-power alternatives.

Portfolio of Wind Farms and Coal Fired Plants / Sembcorp Industries Pte Ltd.

China / 2011

Lead consultant to Sembcorp Industries Pte (buy-side), in support of their potential acquisition of an equity position in a Chinese investment company (confidential). This engagement required due diligence site visits and technical and commercial review of a wind portfolio and coal fired generation plant in Shanxi Province, Hebei Province, and Inner Mongolia Autonomous.

Water and Wastewater Utility Independent Engineer's Report / Confidential Client

2011

Primary consultant assisted and prepared an independent engineer's report for a confidential client seeking to divest its portfolio of water and wastewater utilities. The report provided an overview of the systems, the major sources of supplies, rates, and environmental and regulatory issues. Major facilities were evaluated to document the condition of specific utilities. A final report was prepared and delivered to the client for use in its divestment proceedings.

Combined Cycle Due Diligence / Confidential Client

California / 2011

Jason was involved with the technical due diligence of 1,000 megawatt (MW) combined-cycle power plant in the state of California. Jason was responsible for reviewing maintenance and performance reports on plant equipment and safety along with O&M and energy management agreements. Jason also developed the corresponding report sections that summarized the results of the analysis.

Engineer's Report / Philadelphia Gas Works (PGW)

Philadelphia, Pennsylvania / 2010-2011

Lead consultant on the engineer's reports developed for PGW's last two revenue bond issues for $165 million and $150 million, respectively. Proceeds from the bond issues funded needed capital improvements to PGW's distribution system and LNG facilities. The engineer's report summarized the findings of a study of PGW's facilities, management, operations, gas supply, rates and marketing, and customer service, and assessed the financial feasibility of the bond issue.

E.ON US Portfolio Due Diligence, Various Coal, Gas and Hydroelectric Power Plants / E.ON

Kentucky, United States / 2010

Jason performed technical due diligence for the potential sales of approximately 9,500 MW coal, gas and hydroelectric generating assets in the state of Kentucky. Jason was responsible for reviewing maintenance and performance reports on plant equipment and safety along with O&M and energy management agreements. Jason also developed the corresponding report sections that summarized the results of the analysis.

Technical Due Diligence / Con Edison Development, Inc.

2007

Jason performed a technical due diligence assessment of certain power generation facilities in the northeast United States. He was responsible for developing power plant performance sections of the assessment and reviewing O&M, power purchase, maintenance, gas supply, oil supply, electrical interconnection and water supply agreements.

PUBLICATIONS AND PRESENTATIONS

- *Asset Management: A Framework for Maximized Value*, published and featured in Burns & McDonnel's quarterly BenchMark article in 2020. (Video and quoted)
- How IPL Created an Optimized Capital Plan to manage risk across the entire T&D system, published and presented at the 2020 DistribuTECH conference. (Co-Author)
- How IPL solved the challenges of modeling linear assets in their asset risk model by leveraging GIS, published and presented at the 2020 DistribuTECH conference. (Co-Author)
- Capital Planning for Grid Modernization, Building the Grid of Tomorrow, 2018 EUCI course presenter. (Co-presenter)
- *Changing the Way the Grid's Future is Planned*, published Burns & McDonnell white paper in 2017. (Co-Author)
- Monetizing Risk Helps Tulsa Optimize Capital Investments, published in the July 2016 Journal American Water Works Associate (JAWWA). (Co-Author)

- Monte Carlo Simulations Take The Chance Out Of Investment Decisions, published in the April 2016 Breaking Energy. (Co-Author)
- Monetizing Risk – Capital Investment Prioritization and Optimization for Tulsa Metropolitan Utility Authority, published at the 2016 Utility Management Conference. (Co-Author)
- Priorities: Getting the Most From Your Capital Improvement Plan, published in the May 2015 Florida Water Resources Journal. (Author)
- Monetizing Risk – A Capital Investment Prioritization and Optimization Model, presented and published at the 2015 Texas Water Conference. (Co-Author/Presenter)
- How to Get More Reliability Bang from Your Capital Spending Buck, presented and published at the 2014 Florida Water Resources Conference. (Co-Author/Presenter)
- Triple Bottom Line and Monte Carlo Simulation: Business Case Evaluation Methodologies and Testing Sensitivities: Understanding Economic Models and Uncertainty in Results, presented at the 2013 WEFTEC conference workshop titled "WERF Barriers to Biogas Workshop: Learn to Use the Right Economic Methodologies to Evaluate Cost-Saving Projects". (Presenter)
- The Challenge of Regulatory Compliance and Multiple Facility Upgrades – A Progressive System Approach, presented and published at the 2012 WEFTEC conference proceedings. (Co-Author)
- Asset Management and Maintenance Strategies – Balancing Costs and Risk, poster presentation and published at Hydrovision 2011 conference. (Co-Author)

Illustrative AssetLens Analytics Methodology

This exhibit contains excerpts from a report previously filed in a utility regulatory proceeding. The excerpts are provided for illustrative purposes to describe analytical concepts incorporated within the AssetLens platform, including asset deterioration modeling, probability of failure estimation, consequence assessment, risk evaluation, and investment scenario analysis. The exhibit is intended to provide background regarding the analytical methodologies that are used within AssetLens and is not intended to present Evergy-specific assumptions, analyses, model inputs, or results.

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DTE Electric Company Program Benefit Cost Analysis Report

Michigan Public Service Commission

Case No. U-21860

Schedule R3

Witness: De Stigter

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3.3 Equipment Failure Mitigation Modeling Approach

The Equipment Failure Mitigation modeling approach calculates the benefits of replacing existing infrastructure. It utilizes a resilience, reliability, and risk-based planning approach to forecast the probability-weighted consequence of failure for a range of failure types. The failure types are based on how assets fail over their lifecycle, including inspection-based failures. Consequences are estimated for a range of factors but fall into two main categories. The first category is reactive or restoration costs. The second category is customer-based outages. This category is the monetization of customer outages in the event of an asset failure based on the DOE ICE calculator described in Section 3.2 above.

Additionally, the approach calculates each asset's lifecycle reactive costs and customer outage costs for two scenarios. The first is a Status Quo scenario where the asset is not proactively replaced; the second scenario is the Investment scenario in which the asset is upgraded proactively to the new equipment standard. The benefit of replacing infrastructure is the difference between the two scenarios, the avoided risk and resiliency lifecycle costs. This approach was used to evaluate the PTMM program for both poles and pole tops. The Strategic Undergrounding program BCA also leverages many of the components of this approach. The Grid Automation Telecommunication utilizes the probability of surviving approach for edge device replacements.

The following sub-sections outline the approach in further detail. The section uses an example 40-year-old wood pole on the backbone to show the benefit calculations.

3.3.1 Probability of Surviving

Many of the asset classes included within DTE's PTMM Plan are typically replaced before failure-causing outages. This replacement is because the consequence of failure typically exceeds utilities' risk tolerance levels, especially safety risks. For this reason, utilities actively inspect the assets, perform testing, and collect real-time condition information. When assets exceed a condition tolerance, they are proactively replaced subject to detailed engineering evaluations, budgeting considerations, and prioritization of needs. Survivor curves or End-of-Life curves can be utilized to approximate the probability of an asset not surviving over time.

Each asset class designated was assigned an Iowa Survivor Curve inside the Equipment Failure Mitigation Model. Figure 3-3 shows an example End-of-Life (Iowa Survivor Curve) for wood poles. Wood poles are expected to have an average service life of between 62 and 70 years. Average service life of 62 years for high vegetation areas and up to 70 years for no vegetation areas. Figure 3-4 shows the approach to calculate the annual probability of not surviving for a 40-year-old wood pole asset.

Figure 3-1: Example Survivor Curve for Wood Poles

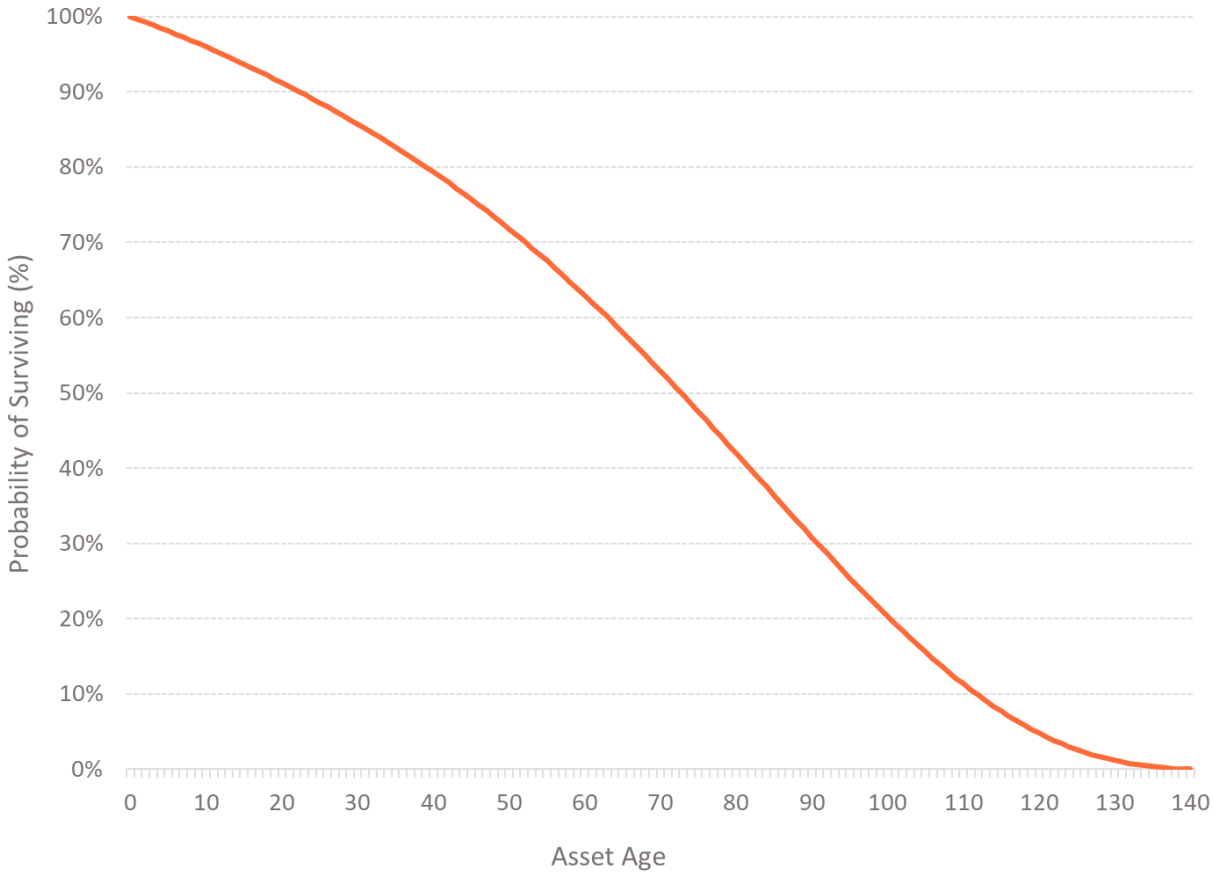
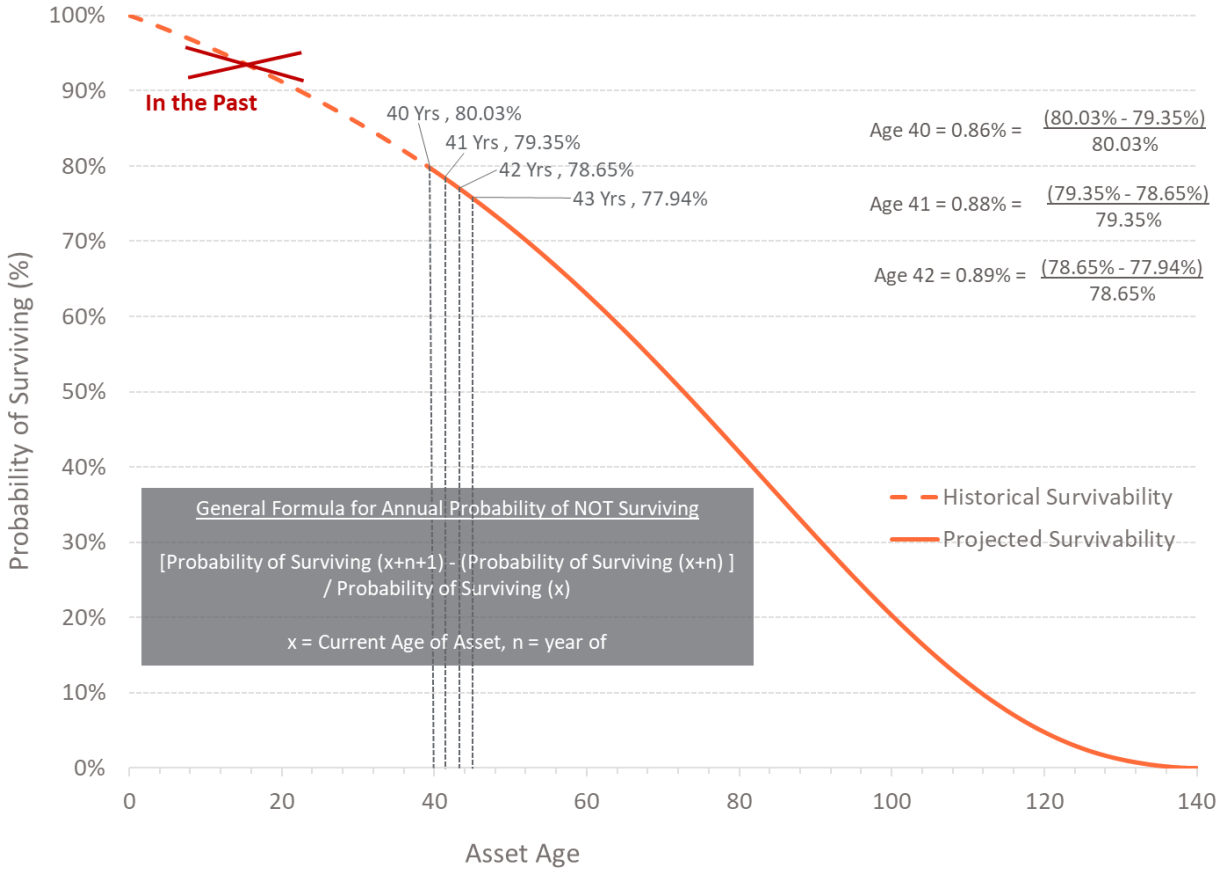


Figure 3-2: Annual Probability of Not Surviving Example - 40-Year-Old Wood Pole



The survivor curves allow for the calculation of the annual probability of an asset not surviving over time. The curves produce a probability density function where the total probability is 100%. The curves are used to forecast the probability of not surviving based on an asset's condition-based age. Figure 3-5 shows the annual probability of not surviving for a range of wood pole ages based on the mathematical approach shown in Figure 3-4. The figure shows that, as assets get older, the 100% probability of not surviving each successive year is distributed over fewer years, thereby increasing the annual probability of failure for older assets.

Figure 3-3: Survivor Curves to Annual Probability of Not Surviving Profiles for Wood Poles

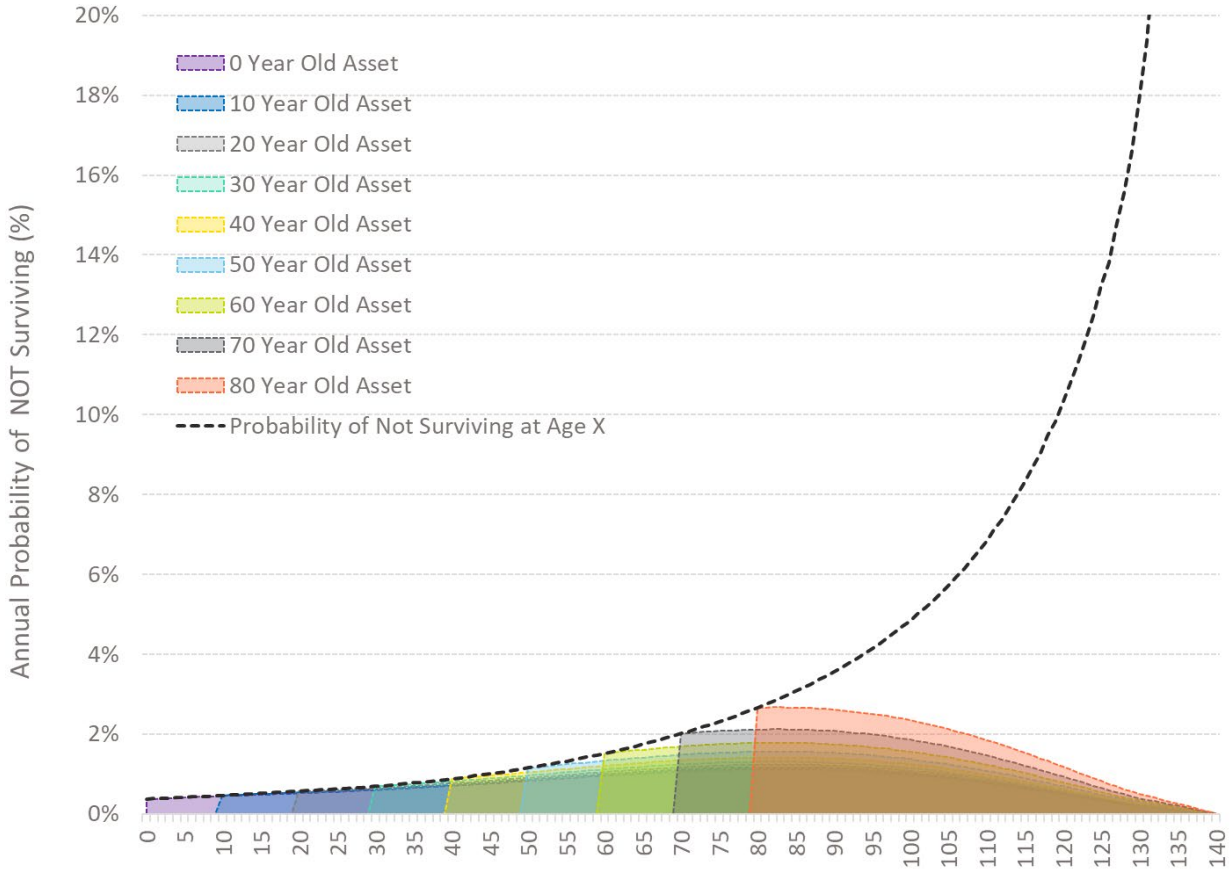
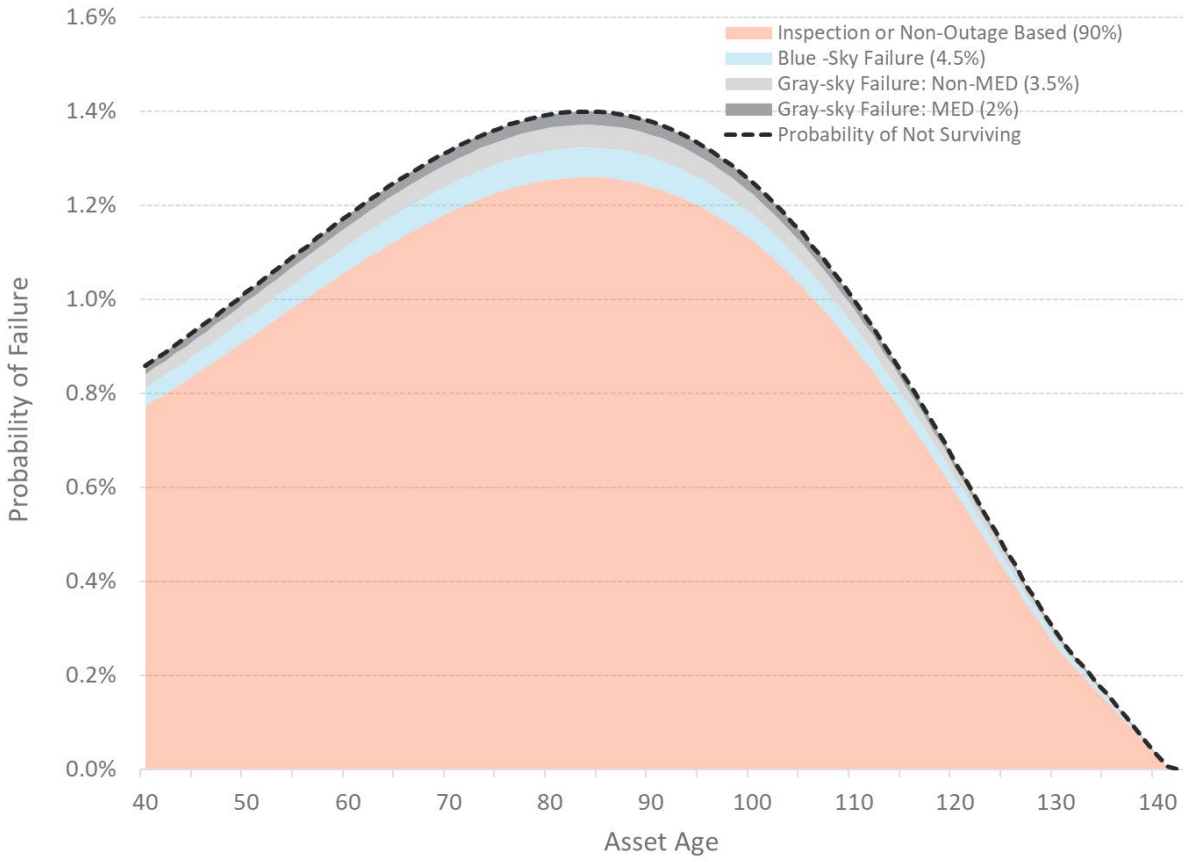


Figure 3-5 also shows the probability of not surviving at each age (Probability of Not Surviving at Age X). Each asset class survivor curve produces a different representation of failure rate profiles as assets age. The Equipment Failure Mitigation model calculates the probability of not surviving for each asset included in the evaluation.

3.3.2 Failure Types and Probability of Failure

The previous section, Section 3.3.1, described the approach to forecast an asset's annual probability of not surviving over time. Assets fail to survive a year for many wide-ranging reasons. For example, a wood pole may be replaced due to failed inspection or after a major storm event. 1898 & Co. has developed a library of failure type profiles for T&D infrastructure assets. That library is codified within the Equipment Failure Analytics Engine, a proprietary and confidential software developed by 1898 & Co. Figure 3-6 shows the probability of failure profile for each failure type for the example 40-year-old wood pole.

Figure 3-4: Failure Types and Probability of Failure for 40-Year-Old Wood Pole



For wood poles, the most common expected failure type is an inspection-based failure where the pole is inspected by the utility and determined not to meet minimum engineering standards. As the figure shows, this failure type is expected to occur 90% of the time.

3.3.3 Consequence of Failure

For each failure type, the risk framework library inside of Equipment Failure Mitigation Model includes a range of consequence types based on expected impact should the asset fail. Table 3-2 shows the range of consequence types evaluated and the asset classes that they apply to. The table also shows the avoided cost type. The framework puts a monetary value to each of these consequence factors.

Table 3-1: Consequence Types and Asset Class

Consequence	Avoided Cost Type
Customer Outages	Customer Outage
Equipment Failure Costs	Reactive

3.3.3.1 Customer Outage Impact

One of the main consequences of failure across all asset classes is the impact to customers. When assets fail, the protection schemes activate to protect the system against fault currents, limiting customer outages. The protective interventions cause customers outages for the time it takes to restore the system. The relationship between assets and customers was established for all circuit assets (see Sections 2.1 and 2.3).

For each asset and failure type, the expected duration of the outage was estimated based on typical restoration times. For example, the expected duration to replace a wood pole during a blue-sky type of event is approximately 3 to 4.5 hours since crews are likely readily available. The duration of a major gray sky event can be much longer since crews are constrained and access can be challenging, especially for rear-lot infrastructure. The duration to replace a wood pole during a gray-sky event is estimated at approximately 7 hours for poles with street access and approximately 8.5 hours for poles without street access.

Based on the expected duration of each failure type for each asset and expected customers impacted (Section 2.3), including accounting for customer type, the approach calculates the risk-weighted CMI for each asset. This risk-weighted CMI is monetized using the DOE ICE Calculator (see Section 3.2) to estimate each asset's risk-weighted $CMI over time.

3.3.3.2 Equipment Failure Costs

When assets fail before being proactively replaced, it creates an urgency to repair or replace the asset to minimize the impact to the customer. The level of urgency is generally proportional to the failure types outlined in Figure 3-7. This urgency results in a level of effort that is not without cost. These additional costs are captured under the category of equipment failure costs. The magnitudes of these costs are different depending on the failure type. Crews are generally available during “normal operations” (non-storm) failure types, but capital efficiencies are lost as the mobilization is generally for only one asset. During the various “gray sky” (storm/medium severity) failure types, overtime is generally authorized to restore electric power as soon as possible. During a major “gray sky” failure (storm/catastrophic failures), crews from neighboring utilities are often utilized to minimize the impact to the customer. These costs can be significant. For these types of events, it is not uncommon for the cost of replacement to be more than double the cost of proactive replacement.

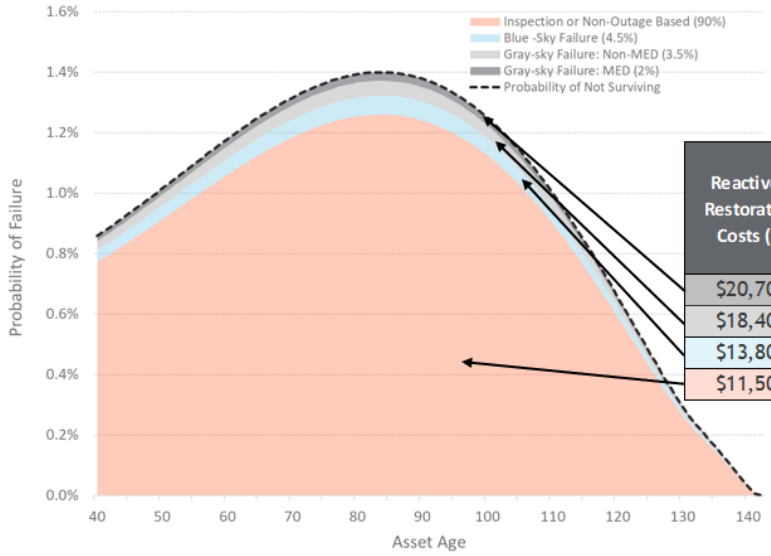
Equipment Failure costs were estimated for all asset categories and all failure types. Combined with the annual probabilities for each failure type, these values are used to calculate the failure cost profiles for all assets.

3.3.4 Status Quo Risk & Resiliency Profile

As discussed above, the evaluation calculates the resilience, reliability, & risk cost profile over time for two scenarios, the Status Quo Scenario, and the Investment Scenario. The Status Quo scenario assumes the asset is not proactively replaced and could incur risk costs over time. To calculate the Status Quo Risk & Resiliency costs over time, the probability of failure for each failure type is multiplied by the cost consequence for each failure type. Figure 3-7 depicts this approach for the 40-year-old wood pole example on a backbone with approximately 400 customers. The figure shows the number of residential, small C&I, and large C&I customers for this example.

Figure 3-8 and Figure 3-9 show the Status Quo resilience, reliability, & risk costs for reactive and restoration costs and customer outage costs, respectively. The profiles are based on multiplying the probabilities of failure in Figure 3-7 by the economic consequence values and applying the escalation and discount rate from above. Figure 3-8 and Figure 3-9 each show the percentage of total costs for each failure type. Figure 3-10 is the sum of Figure 3-8 and Figure 3-9 for each year, and shows the total resilience, reliability, & risk costs for the 40-year-old wood pole.

Figure 3-5: Status Quo Resilience, Reliability, & Risk Calculation 40-Year-Old Wood Pole



Reactive / Restoration Costs ($)	Residential (360) Outage Costs ($)	Small C&I (36) Outage Costs ($)	Large C&I (4) Outage Costs ($)	All Customers (400) Outage Costs ($)
$20,700	$14,879	$486,756	$286,084	$787,719
$18,400	$6,268	$206,208	$140,356	$352,832
$13,800	$3,773	$84,996	$67,392	$156,161
$11,500	$0	$0	$0	$0

Figure 3-6: Status Quo Reactive Costs Profile - 40-Year-Old Wood Pole

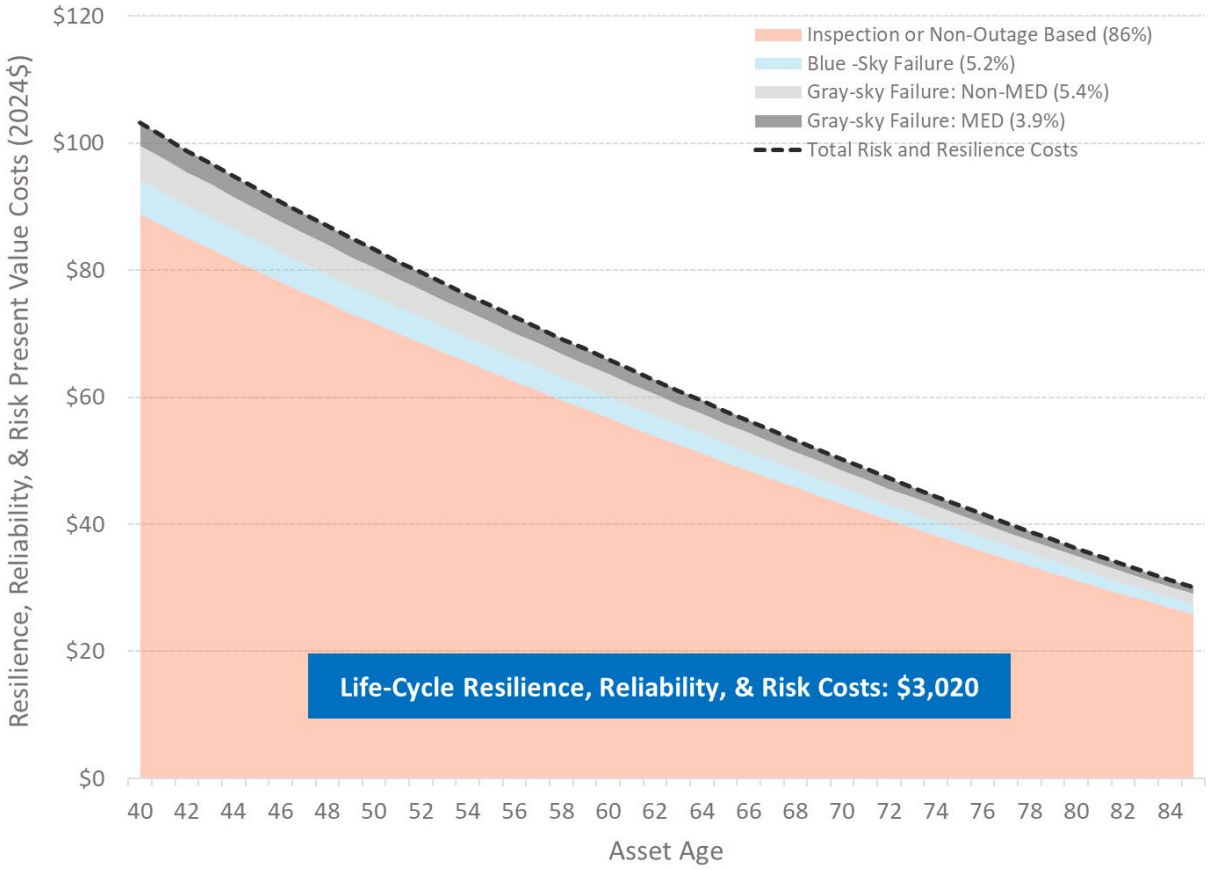


Figure 3-7: Status Quo Customer Costs Profile - 40-Year-Old Wood Pole

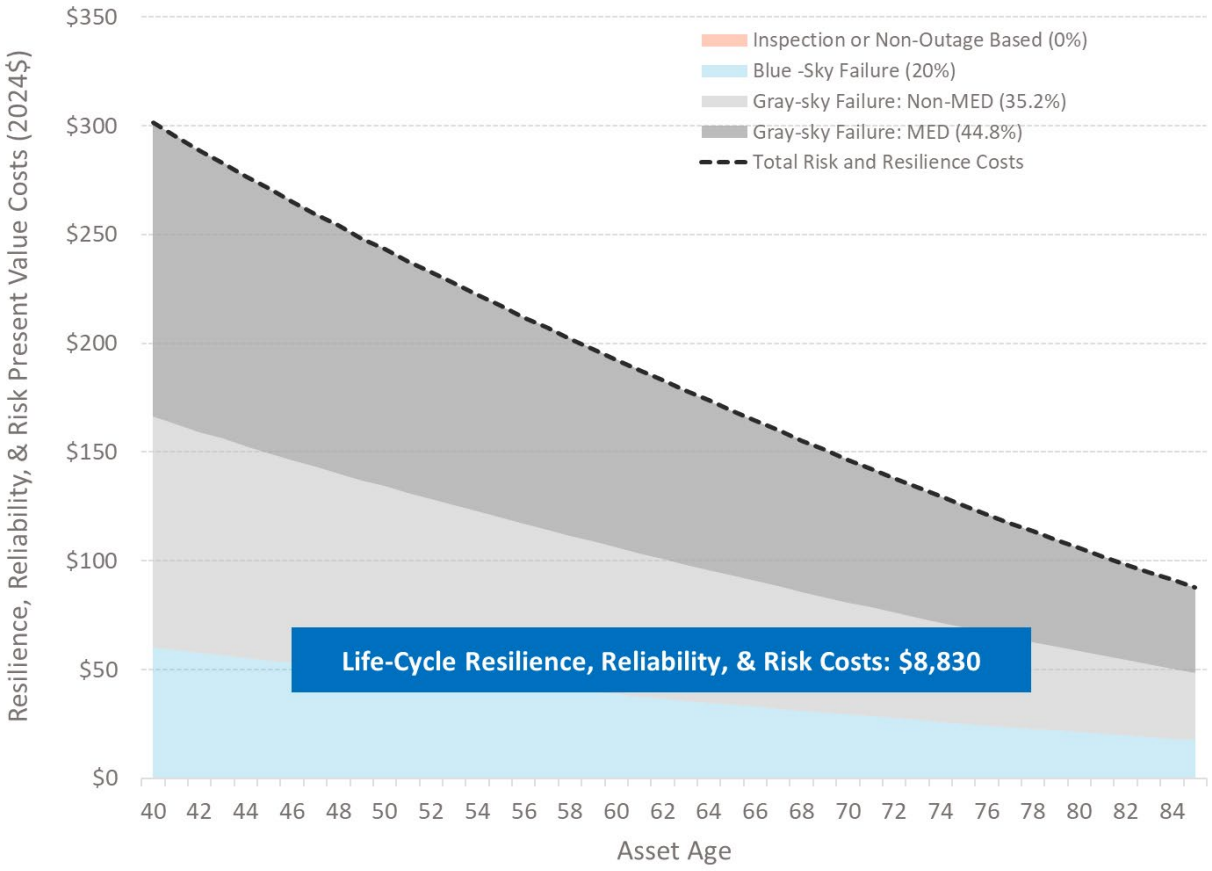
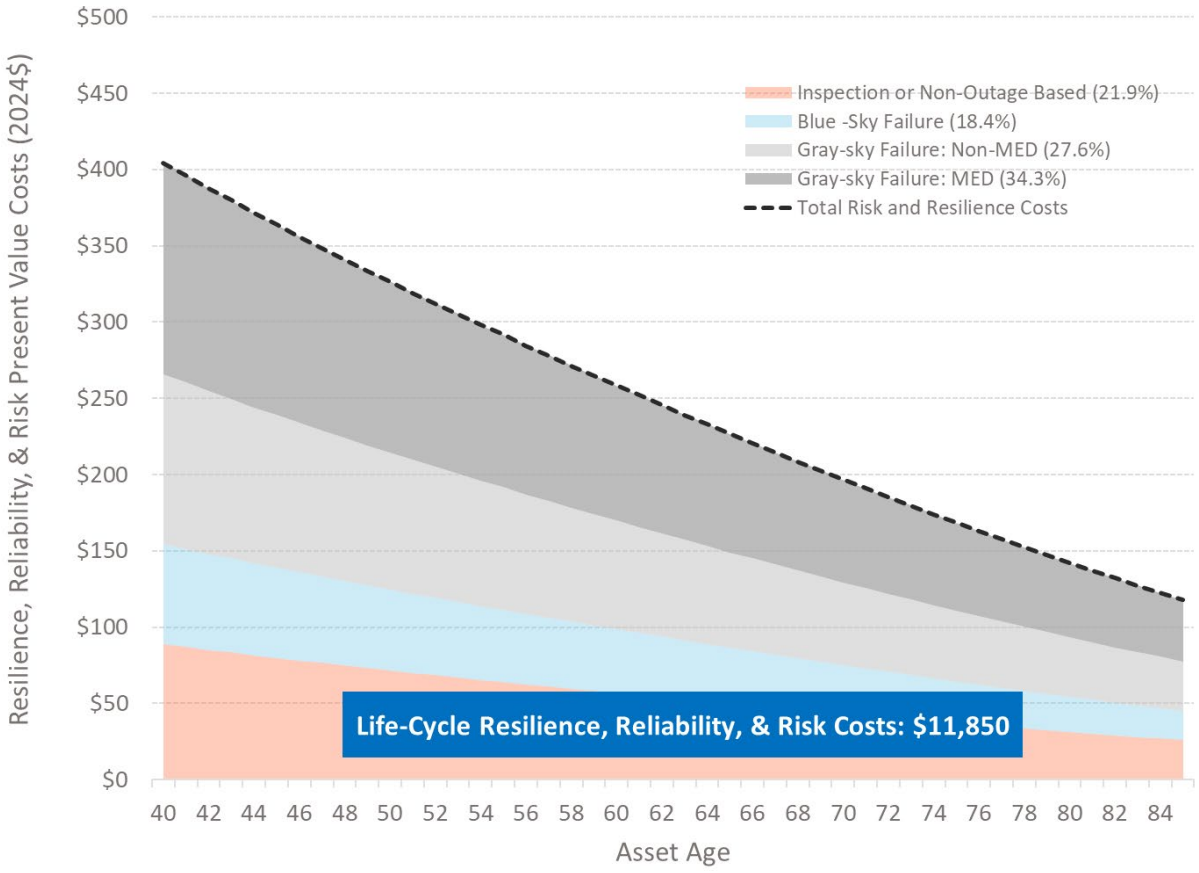


Figure 3-8: Status Quo Total Costs Profile - 40-Year-Old Wood Pole



3.3.5 Avoided Risk, Reliability, & Resiliency Cost-Benefit Calculation

The second scenario evaluated for each asset is the Investment Scenario. This scenario assumes the asset is replaced. By replacing the asset, the near-term failure probabilities decrease since the asset is now 0 years old. In some cases, the failure types change with the replacement, such as wood cross arms that are replaced with fiberglass cross arms. The avoided resilience, reliability, and risk benefit for infrastructure upgrades is the difference between the Status Quo and Investment scenarios.

Figure 3-11 and Figure 3-12 show the failure probabilities of the Status Quo and Investment scenarios for the example 40-year-old wood pole. Over the next 50 years, for the 40-year-old wood pole, there is a 60% probability of not surviving. If the wood pole is replaced there is approximately a 28% probability of not surviving over the same 50-year time horizon. The figures also show the life-cycle probabilities for each failure type.

Figure 3-9: Status Quo Probability of Failure Profiles

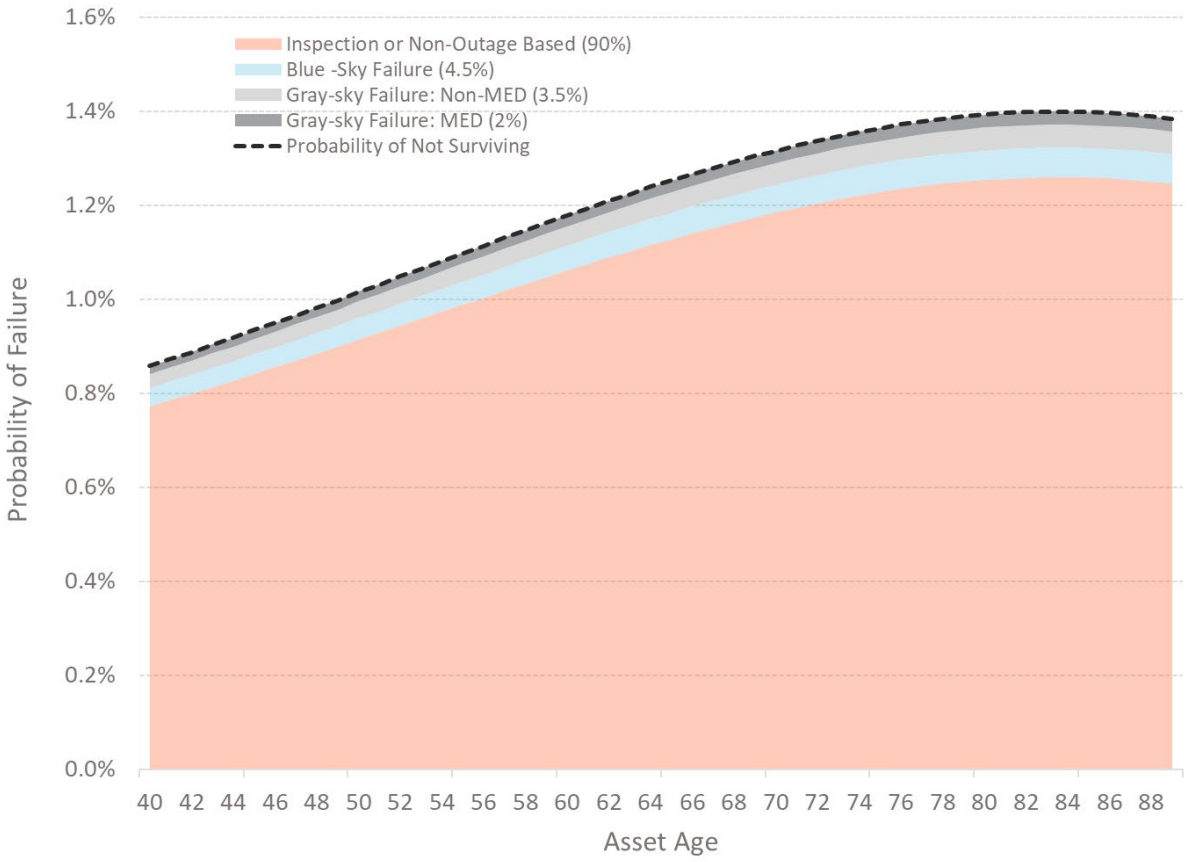


Figure 3-10: Investment Scenario Probability of Failure Profiles

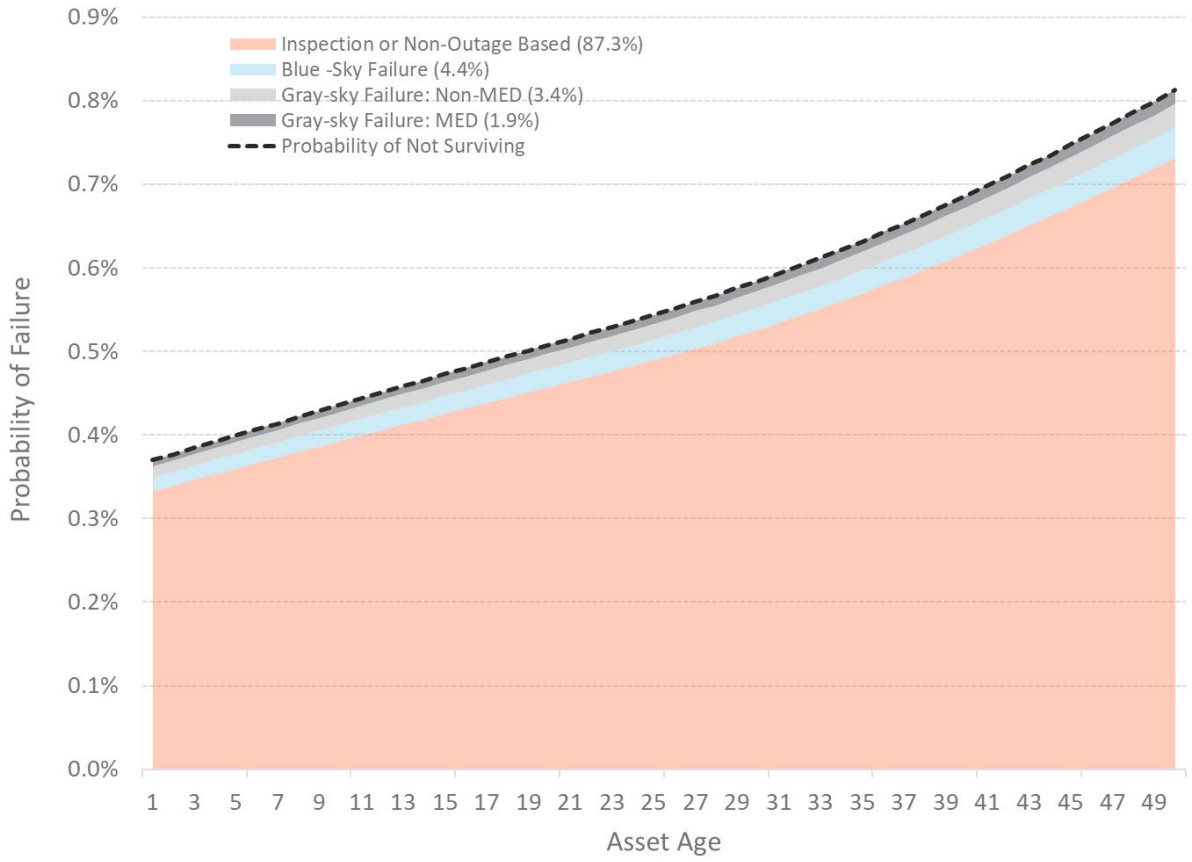


Figure 3-13 and Figure 3-14 show the companion resilience, reliability, and risk cost profiles for the Status Quo and Investment scenarios. Figure 3-15 shows the total values from Figure 3-13 and Figure 3-14 and the annual difference (Status Quo – Investment). The annual difference is the avoided annual costs for replacing the 40-year-old wood pole. In the first 40 years of the profile, the avoided costs are positive with the remaining negative. The life cycle avoided cost benefit is approximately $6,500 (present value dollars) for replacing the pole. If the pole were younger, the annual avoided costs would turn negative sooner and make the project less beneficial.

Figure 3-11: Status Quo Risk, Reliability & Resiliency Cost Profiles

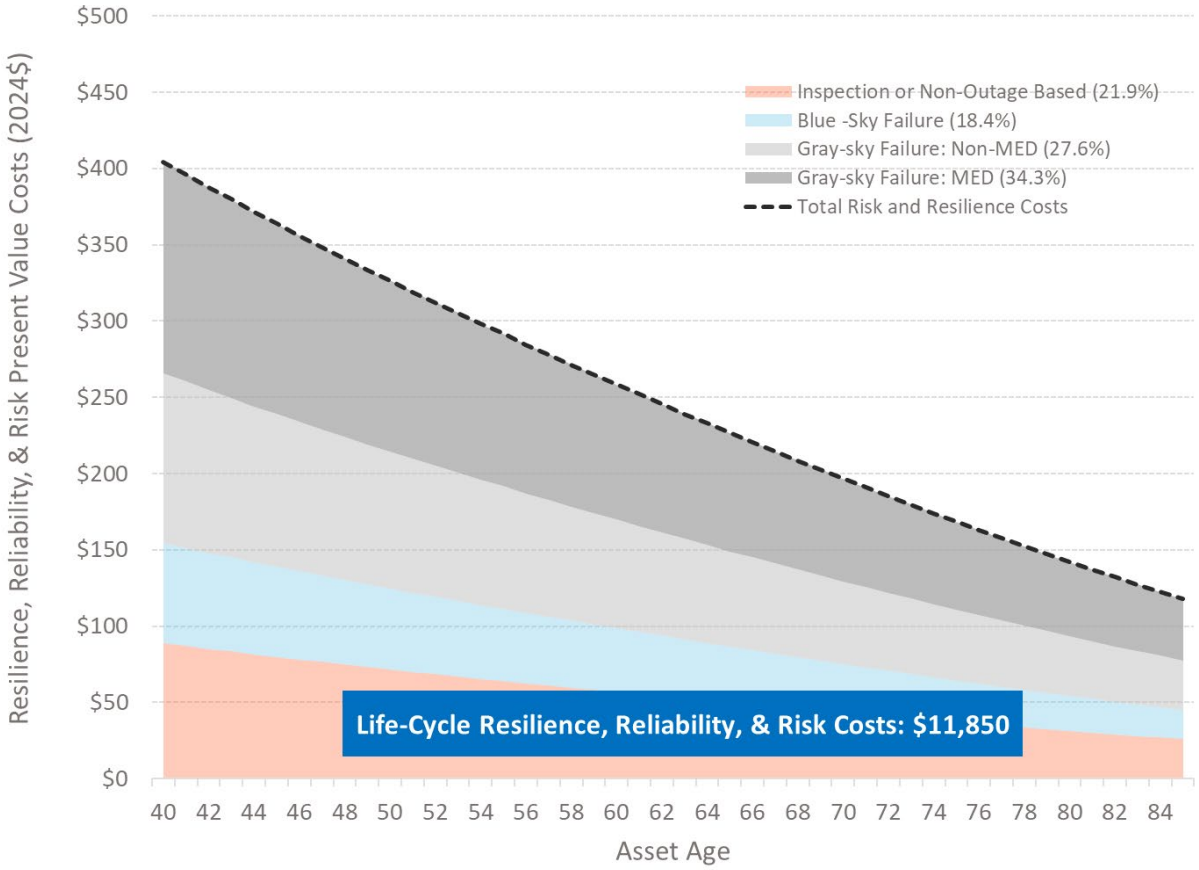


Figure 3-12: Investment Scenario Risk, Reliability, & Resiliency Cost Profiles

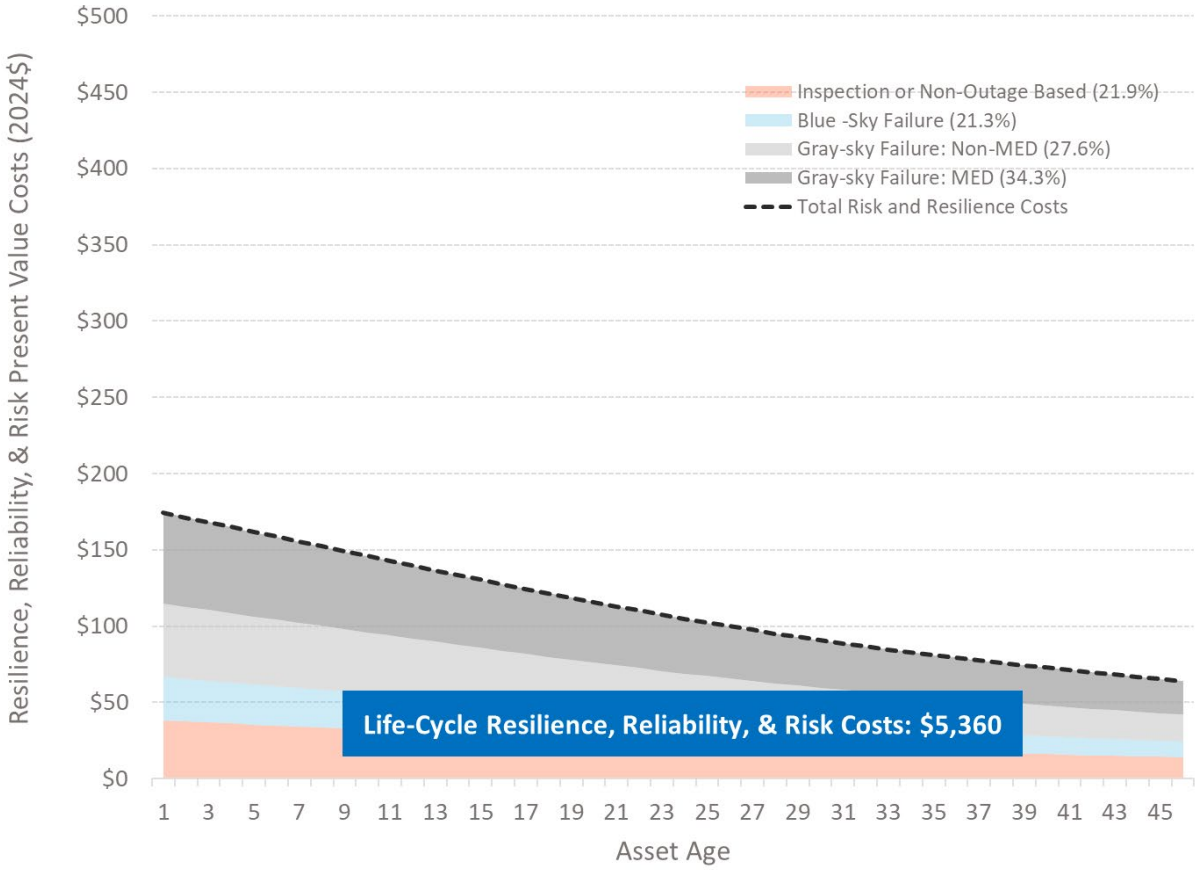
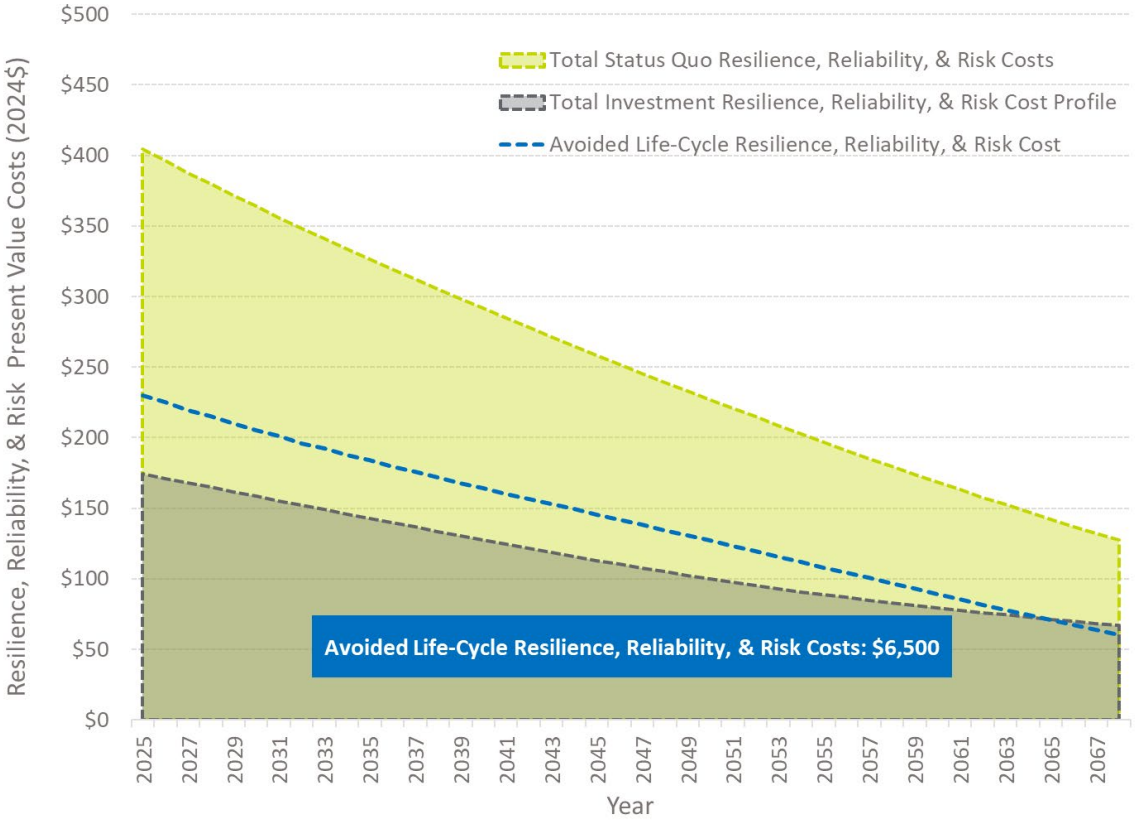


Figure 3-13: Avoided Risk, Reliability, & Resiliency Cost-Benefit



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