



AERO

SMART TOOLS FOR SMART COMPANIES

ASSET ECONOMIC RISK OPTIMIZATION (AERO)

ISL Analytics' Performance Accelerator
Product Suite

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SMART TOOLS FOR SMART COMPANIES: ASSET ECONOMIC RISK OPTIMIZATION (AERO)

ISL Analytics' AERO (Asset Economic Risk Optimization) application is an analytic tool that optimizes asset replacement by applying a risk-based approach to generate a prioritized multi-year replacement plan. It evaluates asset health, intervention costs, consequences of failure and other information to determine the optimal time for replacement or other interventions of ageing infrastructure. AERO provides management with a 'best practices', repeatable, data-driven methodology. It enables improved, defensible capital spending decisions on asset replacement and refurbishment and facilitates transparent discussions with regulators and other key stakeholders. AERO delivers these insights by combining predictive analytics, asset optimization, and data visualization.



PREDICTIVE ANALYTICS



ASSET OPTIMIZATION



DATA VISUALIZATION



AERO

The utility industry is facing a major challenge: a growing number of critical assets are rapidly approaching end of life. To respond to this challenge, utilities need to properly prioritize the replacement of these assets while maximizing system reliability and minimizing overall cost. AERO supports this by evaluating each asset's probability of failure, based upon age and condition, the replacement costs, and the consequences of failure, and then calculates the optimal time of replacement for each asset.

WHY DO YOU NEED IT?



EVALUATE ASSET HEALTH WITH A DATA DRIVEN APPROACH

- Use available data, such as historical failures, asset condition, reliability projections, tests, customer surveys and the tacit knowledge of subject matter experts to determine asset health.



CREATE OPTIMIZED ASSET SPENDING PLANS AND MANAGE RISK OVER LONGER TERM

- Integrate asset health indexing, consequence of failure, and the cost of intervention to make a long-term projection of required spending and to help prioritize near-term projects where resources are limited. AERO relies on data driven analytics to create optimized asset spending plans and help you manage risk over longer term planning horizons.
- Evaluate alternative spending options to find the best solution – repair versus replace, automation, reconfiguration, etc.



IMPROVE AND EXPEDITE DECISION MAKING

- Facilitate “deep-dive” analyses, thus streamlining and reducing the time from problem identification to well-targeted interventions.
- Focus on key probability of failure, age and condition, replacement cost, and consequences of failure data per asset class to drive effective and efficient decision making.
- Harness the application’s automated calculation factors, analyses, and data visualizations to provide deep insights into asset replacement planning, both near and longer term.



IMPROVE COMMUNICATIONS WITH CLEAR AND TRANSPARENT OUTPUTS

- Use automated outputs to communicate asset replacement funding decisions and risk projections to planners, executives and other stakeholders.
- Demonstrate the rigorous, transparent process to regulators.
- Drive democratization of data.



SUPPORT REGULATORY FILINGS WITH INCREASED TRANSPARENCY

- Support regulatory filings with increased transparency of asset replacement decisions by utilizing the data driven AERO approach and resulting spending recommendations. Arguments based on these analyses have proven to be persuasive to executive management, key stakeholders and regulators, especially since assumptions and methods can be refined and updated on an ongoing basis as new information is received.



INTEGRATE KEY DATA SETS INTO A SEAMLESS ENVIRONMENT

- Migrate data and information contained within separate and disparate systems into a seamless repository for efficient asset health, probability and consequence of failure, and replacement cost analyses. Our consultants assist with the automation and validate the results.
- Create and export new data (i.e., effective asset age, risk factors, vulnerability, predictive outcomes, planning priorities, etc.) for use in other systems.



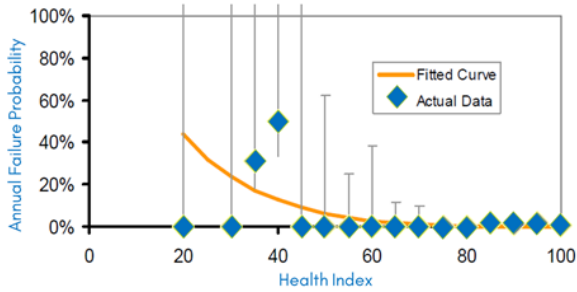
USE SUBJECT MATTER EXPERTS TO ENSURE SUCCESS

- Leverage ISL Analytics for both its world class asset management software solutions and expert management consulting team. Our management consultants provide you with guidance in developing and configuring the models to meet your requirements.
- Draw on ISL Analytics' rich industry knowledge and change management experience to support you through every step.

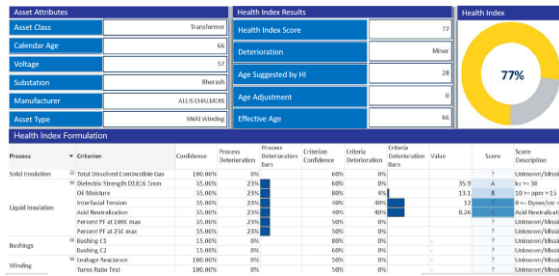


AERO AT A GLANCE

CORRELATING HEALTH INDEX & FAILURE PROBABILITY



CALCULATING ASSET HEALTH INDEX & EFFECTIVE AGE



CREATING AN OPTIMIZED ASSET REPLACEMENT PLAN



CURRENT INDUSTRY STATUS

The electric and gas utility industry is faced with many issues which are negatively impacting its ability to maintain reliable assets. To respond to these issues, utilities need to ensure they are spending their limited O&M and Capital dollars where they can provide the greatest impact. This requires balancing the benefit of delaying costs as long as possible with the cost due to risk of failure as assets age and their condition degrades. AERO uses data such as asset condition, failures, and consequences to produce streams of risk, capital, and O&M costs to support decision-making on maintaining, repairing, and replacing assets.

THE CHALLENGE

At most utilities, the approach to identifying assets at end of life is a technical one where they replace or rehabilitate them when their condition is poor or their age reaches the "expected service life" for the asset type in question. The problem with this approach is that it does not consider risk in a quantitative way; it is subjective and qualitative, relying heavily on the opinions of technical experts.

THE SOLUTION

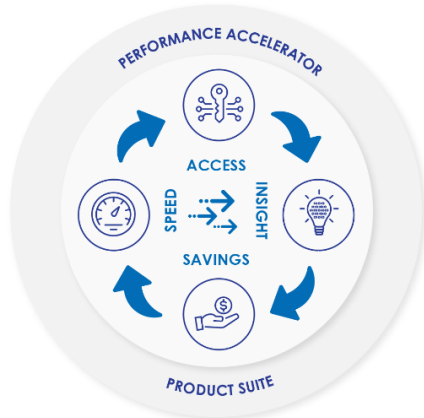
ISL Analytics' AERO application harnesses data visualization and analysis as well as powerful integration technology to enable more effective decision making. It applies a risk-based approach to the replace vs. repair decision, and it supports replacement prioritization based on a cost/benefit analysis. Optimal timing for individual asset replacement is established, considering the full range of costs of failure (e.g.; Safety, O&M, Capital Investment, Risks, Customers, and Environmental costs). By formulating asset class specific health indices, your utility can adjust actual age to effective age, identify common failure modes while defining consequences, and perform economic analysis of the expected consequence cost of failure vs. cost of intervention.



PHILOSOPHY BEHIND ISL ANALYTICS' PERFORMANCE ACCELERATOR PRODUCT SUITE

Digitalization => Powerful 'Mega Trend'

Clients recognize that improved asset condition, risk, reliability, and operational cost & productivity information is the next frontier for better asset management decisions, greater stakeholder transparency and trust, and ultimately strengthened regulatory proposals. Data Governance is key to effectiveness of collecting, accessing, analyzing and interpreting this information.



Companies are not just being asked to accept digitalization, but to **EMBRACE** it. This means companies must:

- Drive toward **greater data access** (democratization of data), **data accuracy**, and **usefulness**.
- Leverage the IoT, pilot and practice with **low cost** and **lightweight BI solutions** that can provide most of the insights of large scale applications, but **much faster** and at dramatically **lower costs**.
- Capture benefit of **new insights** and **culture & behavior change**, without the ponderously slow and frightfully expensive overheads of large enterprise systems. This means **FLEXIBLE** technology solutions!

ISL Analytics' Performance Accelerator Product Suite has been specifically designed to help asset intensive companies drive and embrace digitalization. Our lightweight, low cost Product Accelerator Solutions deliver operational and predictive analytics of big data, focusing on SPEED, ACCESS, INSIGHT, & SAVINGS. We help strengthen situational awareness, enable real time asset management, optimize reliability, quality, productivity and costs, and leverage artificial intelligence and machine learning (our new frontier).

IT'S A NO REGRETS MOVE!

INFRASTRUCTURE LAB'S INNOVATION LAB: SMART TOOLS FOR SMART COMPANIES

ISL Analytics develops software solutions and tools to help solve challenges, complementing our consulting services. Our broad industry experience and expertise, combined with in-house developers, results in solutions that are practical and meet real industry needs. These solutions are designed to be "right-sized" for you – configured to meet your current needs and budget, and then grow with your process and data availability over time. We also continually evolve our offerings based on market feedback and observations from our product and consulting staff.

ISL ANALYTICS' CLIENT INDUSTRIES

ISL Analytics provides breakthrough consulting services and cutting-edge tools to utilities and other asset intensive industries.



ELECTRICITY

DISTRIBUTION,
TRANSMISSION,
GENERATION



GAS

DISTRIBUTION,
TRANSMISSION,
STORAGE



WATER

STEAM/CHILLED,
WASTE-WATER,
PRODUCTION/
DISTRIBUTION



TRANSPORT

AIRPORTS,
RAIL,
METRO

AERO IN ACTION: A CLIENT CASE STUDY

AERO IN ACTION

THE COMPANY

A private, regulated utility in the Northwest US, serving over 800,000 customers and a population of nearly 2 million centered around a mid-sized city.

THE CHALLENGE

The Client's Transmission and Distribution business line created a new Strategic Asset Management group in 2012. Their first task was to create a gap assessment and strategic plan, which was completed immediately. A key element of this plan was the development of capabilities and supporting tools for risk assessment and spending justification for work arising from the T&D business line.

THE SOLUTION

The Strategic Asset Management Group evaluated multiple proposals and selected the AERO methodology to be the cornerstone of its risk-based aging infrastructure evaluation capability. The approach was implemented over several years through an interactive, consulting-based approach. Important goals of this approach include the following:



Customization

The methodology incorporates institutional knowledge and strategic goals specific to the Client and its customers.



Customer focus

The methodology incorporates institutional knowledge and strategic goals specific to the Client and its customers.



Data-driven

Available data, such as historical failures, asset condition, reliability projections, customer surveys, and the tacit knowledge of subject-matter experts are foundational.



Transparency

Assumptions and methods can be reviewed and continually improved.

In addition to the base asset-level AERO methodology, the Client team also developed an Integrated Planning Tool, which uses the cost streams from AERO along with other relevant inputs, such as non asset-related failures, to evaluate complex, multi-asset projects. Examples of such projects include energy storage, capacity increase, feeder automation, testing of line transformers for PCB, and neighborhood-level cable replacement or injection.

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There is widespread acknowledgment by utilities and their regulators that planning is needed to avoid getting behind and facing increasing risk of failure or a bow-wave of replacements that is difficult to manage. Less discussed is the possibility of overreacting and replacing assets too soon, although this error is also likely without a reliable approach to making replacement decisions. To add complexity, there are also changes in standards and opportunities for upgrade that must be factored in.

*-Darin Johnson,
Industry Expert*

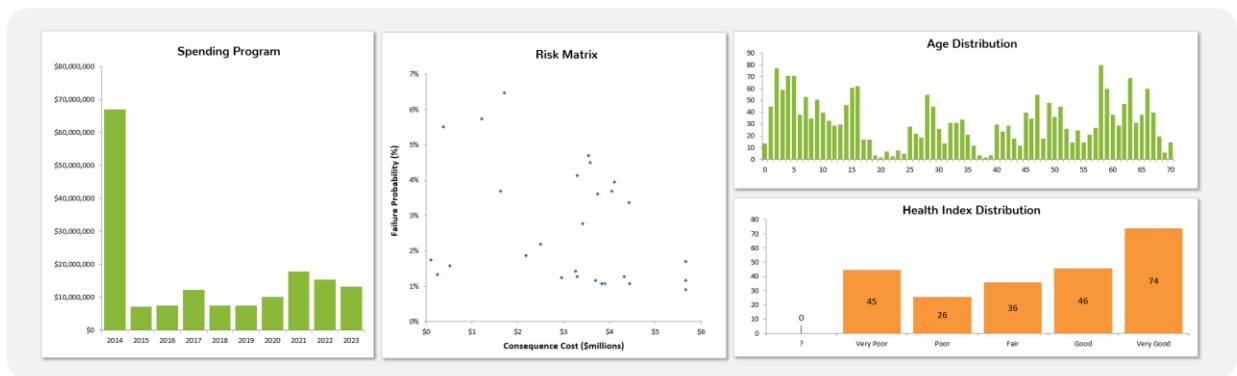
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**AERO TACKLES ALL
ANGLES OF ECONOMIC
LIFECYCLE REPLACEMENT
ANALYSES WITH A
PROVEN QUANTITATIVE
METHODOLOGY.**

THE RESULTS

Using the AERO application at this Client resulted in:

- Acceptance of decision-making and justification by executives and the Public Utilities Commission.
- Identification of high-risk assets, feeders, and substations, targeted for intervention; these programs are underway.
- Evaluation and justification of large-scale programs where appropriate, including replacement of PCB transformers, underground cable, and oil circuit breakers.
- Comparison of spending options to find the best solution – repair versus replace, automation, reconfiguration.
- Evaluation of dissimilar projects on equal footing; projects for aging infrastructure, upgrade, and capacity are compared in consistent terms.
- Integration of outputs from AERO and the IPT with ISL Analytics' Spend Optimization Suite, which is used by T&D for portfolio management.



AERO DEPLOYMENT & ROI

DEPLOYMENT APPROACH

Our proven methodology enables you to deploy AERO in a few manageable steps over a 2-5 month period, depending on the number of asset classes being analyzed.



10x
In 5 years

WHAT ABOUT ROI?

Improvements in decision-making and smarter use of limited capital investments will drive nearly immediate returns, with payback often being realized in 3 to 6 months. Additional benefits of establishing a more reliable asset health database, enabling proactive data-driven planning, and graphical presentation of results will add to the overall return.



Contact us for more information or a demonstration

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The word "AERO" is written in a bold, blue, sans-serif font. It is centered within a white circular background that has a subtle gradient and a slight shadow, giving it a three-dimensional appearance. The circle is positioned at the top of a large, stylized graphic that resembles a wing or a pair of arms reaching out, with blue and grey diagonal stripes.

AERO