

# Asset Life Cycle Analysis (ALCA)<sup>TM</sup>: Forecasting an Asset Strategy

## Evaluating strategies to account for aging asset infrastructure failures and understanding the cost and reliability impacts

As large portions of the electric infrastructure are past or nearing the end of their useful lives, utilities are increasingly focusing on understanding the issue of aging assets. More specifically, utilities have focused both on analyzing the financial implications of large-scale asset replacements, and also on developing different strategic options for minimizing the consequences of inevitable asset failures. As a result of variations in environmental and operational exposures and a lack of historical data, however, utilities have had difficulty producing a repeatable process and methodology that allows decision makers to compare alternative strategies in dealing with these aging assets.

In 2005, a major North American utility sponsored a meeting of utilities to discuss the aging assets problem. As a result of that meeting, a consortium of 21 utilities asked Davies Consulting, Inc. (DCI) to research current methods for asset life cycle analysis and provide a defensible method to measure aging asset life cycles. DCI ultimately developed a methodology to analyze historical asset failure data, created a library of predictive asset failure frequency curves, and built a web-based and analytically rigorous simulation model that allows users to evaluate the implications of strategic decisions for managing aging assets.

Using historical asset data provided by participating utilities, DCI performed a rigorous statistical analysis of asset failures and developed a methodology to develop failure curves for any power delivery asset. Using this methodology, DCI created a library of stratified failure probability curves for seven distribution assets: poles, underground cables, distribution power transformers, reclosers, padmount switches, breakers and air break switches.

Although failure curves provide insight into specific asset failure profiles, without more analysis, a utility will still encounter challenges in evaluating strategies to address the predicted failures. In order to provide the consortium with a mechanism to address various replacement and maintenance strategies at the system level, DCI developed the Asset Cycle Analysis Model (ALCA)<sup>TM</sup>, a dynamic, web-based simulation model that applies failure curves to individual utility inventories for each asset class and projects financial and reliability outcomes for each strategy.

ALCA gives utility decision makers the ability to forecast the near- and long-term financial and system performance outcomes of strategic asset replacement and maintenance decisions. The strategies that can be modeled in the ALCA



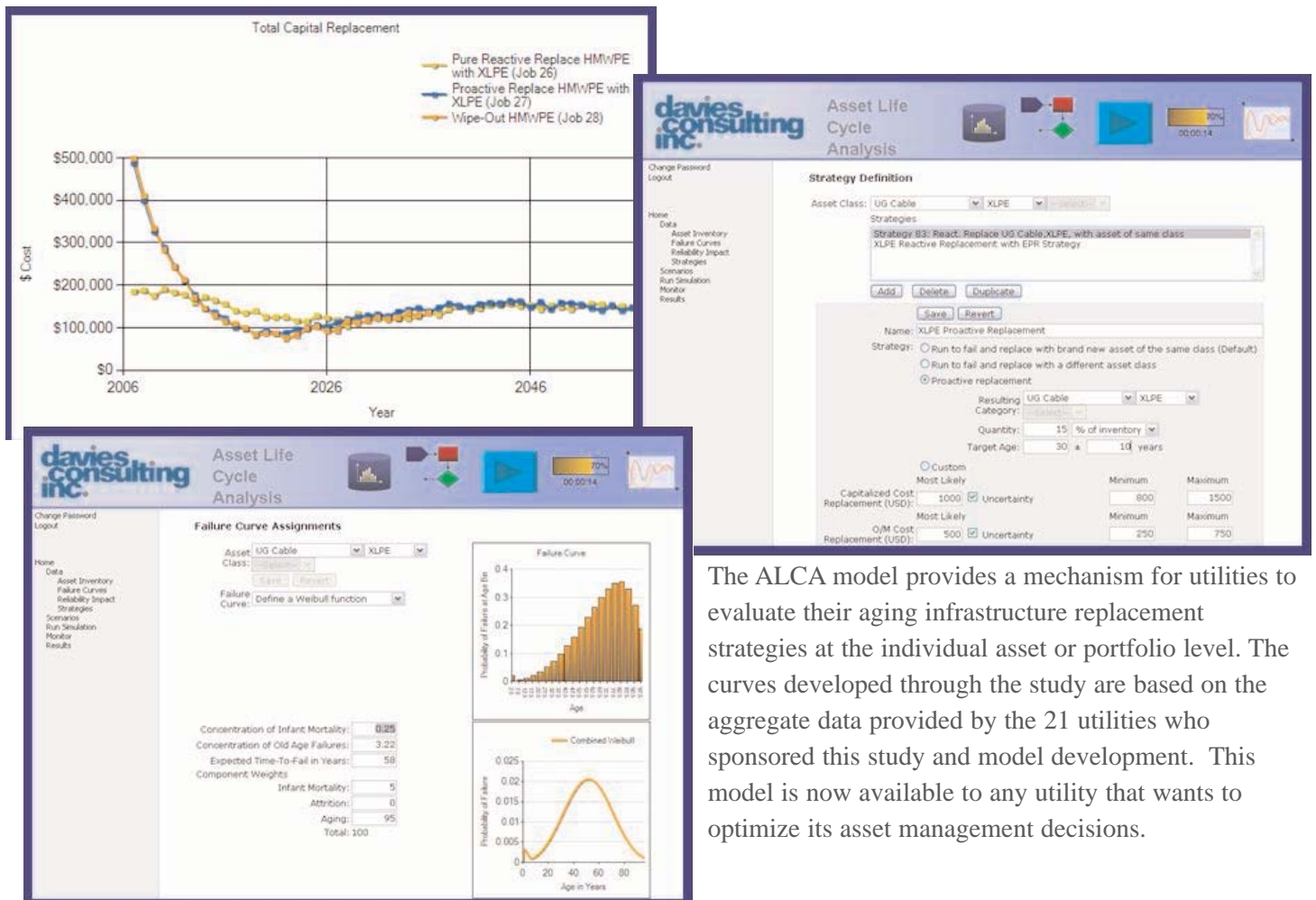
### **About Davies Consulting, Inc.**

*Davies Consulting, Inc. (DCI) is an international strategy and management consulting firm dedicated to working with clients to establish sustainable competitive advantage and deliver superior value to their shareholders and customers.*



model include: run the asset to failure; replace the failing asset with an identical asset; replace the failing asset with different asset; maintain (extend life) of the asset; or any combination of the above. The user can either analyze strategies for individual asset classes or simultaneously model multiple strategies across asset classes. The intuitive graphical user interface allows for easy data upload, analysis, and reporting. Some of the reports that the model produces include the: inventory change over time, Capital and O&M cost projections, and the SAIFI and SAIDI values for each strategy. The model is scalable and flexible to allow for the addition of new asset classes, failure curves, and custom strategies. Each company's individual data is held confidential within the model; however, the library of industry curves is accessible to all the users and can be used for those assets for which a utility may not have sufficiently robust data.

### ALCA Screen Shots and Report



The ALCA model provides a mechanism for utilities to evaluate their aging infrastructure replacement strategies at the individual asset or portfolio level. The curves developed through the study are based on the aggregate data provided by the 21 utilities who sponsored this study and model development. This model is now available to any utility that wants to optimize its asset management decisions.

For further information on the ALCA model or any other DCI energy services, please contact us at 301-652-4535, via e-mail at [energy@daviescon.com](mailto:energy@daviescon.com), or visit our website at [www.daviescon.com](http://www.daviescon.com).