

Mr. Nunes has 15 years of experience providing consulting services in the areas of load forecasting, power supply resource planning, financial planning and analysis, and economic modeling. In particular, he has been responsible for numerous load forecasts in support of power supply decisions, certificate of need and other regulatory filings, wholesale and retail rate planning, and budgeting for a variety of electric utilities and regulatory agencies throughout the United States.

Mr. Nunes has been involved in numerous resource planning efforts, evaluations of power supply options, including joint power supply arrangements, and negotiations regarding power supply contracts. This work has incorporated the simulation of the utilities' power supply arrangements and typically uses scenario planning and probabilistic analytical techniques to assess the range of potential results and clients' risk exposure.

Mr. Nunes has also provided consulting services related to electric utility cost of service, wholesale and retail rate studies, and the preparation of annual budgets. In addition, he has been responsible for the preparation of numerous Consulting Engineer's reports for Official Statements and annual reports required by bond resolutions.

Although his work has focused on municipal and cooperative utilities and joint action agencies, Mr. Nunes has also provided consulting services to regulatory agencies, merchant power plant developers, solid waste collection agencies, local governments, and large industrial manufacturers.

### Expert Witness and Litigation Support

- **Expert Witness** – Southern California Edison; California; served as an expert witness to the California Public Utilities Commission, Department of Ratepayer Advocates in response to Southern California Edison's (SCE) General Rate Case (GRC Test Year 2009); provided a review and independent analysis of SCE's load forecasts and associated distribution and transmission capital projects; prepared written testimony. R. W. Beck's written testimony is filed under CPUC, Docket A.07-11-011, Exhibit DRA-14-C.
- **Litigation Support** – Florida Municipal Power Agency (FMPA); Florida; sponsored written testimony in Florida Public Service Commission proceedings on behalf of FMPA in support of certificate of need filings for the Taylor Energy Center, a large coal-fired power project under development in north Florida (since cancelled), and Cane Island 4, a natural gas-fired combined cycle project under development in central Florida. In addition, Mr. Nunes assisted in the preparation of similar



written testimony related to an earlier combined cycle power project, the Treasure Coast Energy Center.

## Load Forecasting

Mr. Nunes has been responsible for numerous long-term electric load forecasts and related analyses for various municipal utilities, joint-action agencies, and cooperatives. These efforts have included the development of forecasting processes from the ground up and the supervision of other staff, including client staff, in prosecuting portions of the analytical work. Mr. Nunes has taken a lead role in the development of forecasting techniques and historical data analyses to develop base-line forecasts and the sensitivity of those forecasts to varying economic and weather assumptions. His load forecasting and related experience includes:

- **Load Forecast Audit** – California Energy Commission (CEC); California; provided a review and independent analysis of CEC’s load forecasting methodology, assumptions, and overall forecasting process; included a review of CEC’s end use and econometric methodologies across several customer classes and all of the major utilities in California.
- **System Load Forecast** – Pedernales Electric Cooperative, Texas; responsible for the preparation of a power requirements study for a cooperative utility in central Texas in support of a distribution system planning study. The projections relied on econometric models of customer counts and energy usage by major retail rate classification, and included multiple scenarios related to the uncertainty in population and economic growth in the central Texas region. The results also incorporated estimates of weather-related volatility of seasonal peak demand.
- **System Load Forecast** – City of Alexandria Municipal Power & Light, Louisiana - responsible for the development of a system load forecast to support a distribution system planning study and various power supply and related evaluations. Results included a multiple scenarios related to the addition of a large industrial customer and a potential large, mixed-use development. A separate analysis was performed to estimate the sensitivity of seasonal peak demand to the range of potential peak weather conditions.
- **System Load Forecast** – City of Gillette Municipal Power Department, Wyoming; responsible for the development of a system load forecast to support a distribution system planning study. The forecast was based on an econometric approach relating net energy requirements and residential customers to population and economic activity in the region and weather variables. An initial forecast was generated based on economic projections provided by a third party. However, based on an input from the utility staff and a review of information regarding expected developments, a revised forecast was developed using independent projections of population and economic activity based on an econometric analysis of the impact of natural resource extraction activity in the region and forecasts of extraction activity obtained from the Energy Information Administration.
- **Load Forecasting System Development** – Florida Municipal Power Agency, Florida; developed and implemented a load forecasting system for Florida Municipal Power Agency (FMPA) to prepare annual load forecasts for its All Requirements Project, consisting of 15 member utilities. Using this system, Mr. Nunes has managed the preparation of FMPA’s annual load forecast over several years. This forecast entails a separate forecast for each of the 15 members generally based on a regression analysis of energy usage by customer classification for each member system. Forecast results include several scenarios intended to represent a specific range of uncertainty for multiple variables.

- **System Load Forecast** – Florida Keys Electric Cooperative, Florida; responsible for the preparation of a power requirements study for a cooperative utility in south Florida in support of a distribution system planning study. The study addressed several issues of special significance to the region, including a high proportion of seasonal residents, very restrictive growth management policies, and periodic threats from hurricane events. The projections relied on econometric models of customer counts and energy usage by major retail rate classification, and incorporated detailed models of weather's influence on load to generate ranges of load projections encompassing the range of potential weather.
- **System Load Forecast** – Central Minnesota Municipal Power Agency, Minnesota; responsible for a load forecast for Central Minnesota Municipal Power Agency (CMMPA), which was prepared to support a certificate of need filing for Big Stone II, a large coal-fired power project under development in South Dakota. In addition, Mr. Nunes assisted in the preparation of written testimony in a proceeding before the Minnesota Public Utilities Commissions on behalf of CMMPA.
- **Short-term Load Forecasting System Development** – NCMPPA, North Carolina; developed and implemented a short-term forecasting system to support NCMPPA's surplus energy sales program. Designed system to produce hourly load forecast for the combined agency and, using generation assumptions from agency ownership entitlements to nuclear generation, to produce forecasts of surplus energy available for sale. Based forecasts on daily weather conditions, daytype variables, and expected load growth. Developed model extension to allow for uncertainty with respect to weather conditions and unit outages to support medium-term and firm forward sales.

## Power Supply Planning and Analysis

Mr. Nunes has provided consulting services in the area of power supply resource planning to a variety of electric utilities and independent power plant developers throughout the United States. This work has involved the use of both third party and customized power supply simulation and optimization software. Typical methodologies incorporated risk analysis through probabilistic and stochastic methodologies and the evaluation of potential resource plans to minimize both cost and risk.

- **Contract Negotiation** – City of Alexandria Municipal Power and Light, Louisiana; responsible for the analysis of power supply proposals and alternative options; analyses included evaluating power supply alternatives using an optimization model and a risk analysis incorporating numerous uncertainties in the arrangements and in several important variables; produced several load forecast scenarios to support both the power supply evaluation and a separate transmission and distribution planning effort
- **Nuclear Expansion Analysis** – CPS Energy, Texas; supported a CPS Energy effort to develop and update a power supply risk analysis and decision model. Applied the risk analysis framework to develop qualitative and quantitative risk assessments. Projected annual bus bar costs, total revenue requirements and risk profiles for nuclear, coal, integrated gasification combined cycle (IGCC), combined cycle (CC) and Solar generation alternatives. Developed projections of total revenue requirements under alternative generation plans.
- **Power Supply Plan** – American Municipal Power (AMP)-Ohio; developed long-range power supply plans for more than 125 members of AMP-Ohio. Developed load forecasts for each member and constructed a risk-adjusted power supply expansion portfolio by member. Constructed a discrete production cost model in support of capacity subscriptions for several

large planned coal, combined cycle and hydroelectric generating units. Utilized R.W. Beck's proprietary stochastic resource planning model.

- **Power Supply Plan** – Michigan Coordinated Energy Partnership Committee, Michigan; developed long-range power supply plans for 17 members of the Michigan Municipal Electric Association. Gathered and developed technical data regarding individual member system and resources. Developed risk-adjusted power supply expansion portfolios by member and for various combinations of members. Utilized a stochastic power supply planning approach, which generates stochastic projections of fuel and power prices, utility loads, and corresponding power costs for multiple portfolios of power supply resources. Developed alternative possible portfolios of resources and identified the power supply portfolios resulting in the lowest costs and risk to each member over the 20-year study period.

### Conference Presentations

Methods to Address Load Forecast Uncertainty. Presented at the Edison Electric Institute, Load Forecasting Group; St. Petersburg, Florida; November 2007.

Model Specification and Price Elasticity: Am I Missing Something? Presented at the Electric Utility Forecasters' Forum, Orlando, Florida; October 2006.

Forecast Ranges: Moving Away from the "One Forecast". Presented at the Electric Utility Forecasters' Forum, Miami Beach, Florida; October 2005.