Short-Term Market Simulation Software

PROBE is a powerful short-term market simulation tool designed for efficient analysis of electricity markets and decision support for market operators. PROBE was developed to closely model ISO/RTO day-ahead markets and provide short-term unit commitment capabilities for non-ISOS. PROBE also performs real-time and longer-term market simulation, and provides flexibility in modeling across regulated and deregulated markets.

Accurate, Efficient, and Transparent

PROBE development started in 2001, and refinement continued over 10 years with the support of the five largest ISOs. The ability to work closely with market design experts at each ISO resulted in detailed modeling and an unparalleled resemblance to production full scale power systems and actual market results.

PROBE utilizes advanced security constrained unit commitment and economic dispatch algorithms to arrive at a least-cost solution. The proprietary algorithms are specifically designed for energy market optimization, and unlike other products on the market, PROBE does not rely on expensive third-party “black box” solvers. The result is a unique product that solves with extraordinary speed and accuracy while providing unprecedented transparency in commitment and dispatch decisions.

Flexible Across Industry Applications

The functionality available makes PROBE an ideal product for simulation and analysis purposes at a wide range of energy-related organizations:

- Five ISOs and additional internal and external market monitors have trusted PROBE for ten years to perform day-ahead market support, market analysis, testing new market designs prior to formal implementation, outage analysis, and congestion management.
- Non-ISO control centers utilize PROBE as a support tool for unit commitment decisions.
- Several Market Participants currently use PROBE to reproduce day-ahead markets for market studies, bidding strategies, investment analysis, and to formulate policy decisions.
- Planners and operators use PROBE for outage analysis, transmission planning, and congestion management.
Selected Simulation Features and Capabilities

- Leader in Market Modeling
  - Detailed co-optimization of energy and ancillary services
  - Full transmission model and conventional N-1 contingency analysis
  - All generator constraints (run times, ramp rates, etc.)
  - Market products such as virtual trading, demand response, and penalty pricing
  - Ability to utilize both planning and EMS level models

- Extensive Reporting and Analysis
  - Excel-based reports on every aspect of dispatch, pricing, and powerflow solution
  - On-demand chart, comparison, and output detail
  - Transparency in commitment and dispatch decisions

- Unique Study Capabilities

  In addition to PROBE’s modeling and analysis core strengths, PROBE offers additional valuable capabilities such as:
  - On-the-fly model building: Hourly transmission network changes may be entered in an outages/overrides input file and new hourly load flow models will be built on the fly
  - Day-ahead to real-time analysis: Ability to pass day-ahead commitment to real-time and compare results of two markets for studies such as forecast error, revenue analysis, and intra-day analysis of RT events
  - Batch mode interface: PowerGEM’s convenient batch mode interface with multi-core processing enabled one user to run 1200+ market scenarios in two hours

User Feedback and Press

- PJM reports $200M in savings in 2011 using PROBE's “perfect dispatch”; visit PJM.com for details
- “PROBE’s day-ahead to real-time study features enable us to study the impact of wind variability and forecast error on actual market operations and prices.”
- ISO-NE reported to FERC in 2012 that PROBE outage analysis has resulted in improved outage coordination and significant savings.