

# Optimal Power Flow

## Secure Objective Controlled

The Optimal Power Flow module is an intelligent load flow that employs techniques to automatically adjust the power system control settings while simultaneously solving the load flows and optimizing operating conditions within specific constraints. Optimal Power Flow uses state-of-the-art techniques including an interior point method with barrier functions and infeasibility handling to achieve ultimate accuracy and flexibility in solving systems of any size.

# Objective Analysis to Meet Your Needs

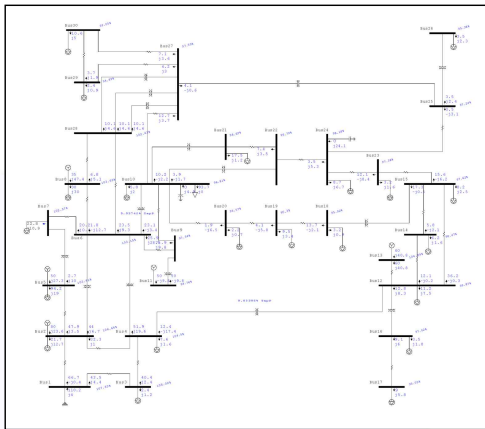
optimal power flow

## Key Features

- Multiple Objectives Simultaneously**
- Interior Point Method**
- Minimize Power Losses**
- Active Power Optimization**
- Reactive Power Optimization**
- Infeasibility Handling**

## Flexible Operation

- Comprehensive objectives & constraints
- Accurate AC model
- Increase system efficiencies
- Reduce operating costs
- Improve electrical system performance
- Increase reliability
- Strengthen security
- Short-term & long-term planning
- State-of-the-art interior point algorithm
- Logarithmic barrier functions (handles equality & inequality constraints)
- Controlled solution parameters



## Minimize Electricity Costs

- Unlimited Buses\* & Elements
- No Voltage Limitations
- Looped & Radial Systems
- Integrated 1-Phase, 3-Phase, & DC Systems
- Multiple Generators & Grid Connections
- Multiple Isolated Sub-Systems
- Customizable Libraries
- Graphical Display of Results on One-Line Diagrams
- Customizable Font Types, Sizes, Styles, & Colors
- Customizable Display of Ratings & Results
- Graphical Display of Equipment Impedance & Grounding
- Automatic Error Checking
- Graphical Display of Overstressed Devices
- Graphical Display of Over/Under Voltage Buses
- Dynamically Adjust Display of Results

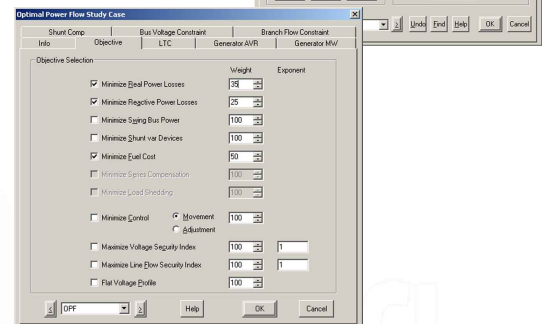
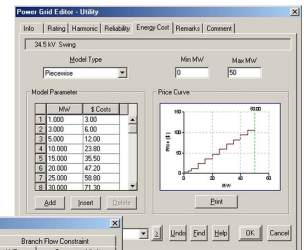
\*Maximum number of energized buses during calculations is license dependent.

## Objectives

- Minimize system real & reactive power losses
- Minimize generation fuel costs
- Minimize system energy costs
- Maximize system performance
- Optimize power exchange with other systems (on-site generation, utilities, IPP's, & power grids)
- Minimize load shedding
- Minimize generator fuel cost or heat rate with different cost models & fuel profiles
- Control generator's MW (governor) & MVAR (AVR) settings within the specified limits
- Control voltage regulators (transformer tap positions) within the specified limits
- Size capacitors within the specified limits
- Maximize voltage & flow security indices
- Determine control settings

## Capabilities

- Component & operating constraints
- Transmission line interface limit constraints
- Bus constraint with weighting factors
- Branch flow constraint with weighting factors
- Control limit constraints
- Diverse operating conditions
- Multiple loading categories
- Global & individual bus diversity factors
- Multiple demand factors
- Unlimited configurations
- Different nameplate data
- Smooth function of any variables
- Produce results with incredible speed
- User-controlled infeasibility handling



## Reporting

- Flag critical & marginal cable temperatures
- Report all physical & calculated optimal settings
- Use Crystal Reports® for full color, customizable reports
- Export output reports to your favorite word processor
- Graphical display of results
- Report altered changes



10 CFR 50 Appendix B • 10 CFR 21 • ANSI/ASME N45.2-1977 • ASME NQA-1  
ISO 9001 A3147 • ANSI/IEEE Std 730.1-1989 • CAN/CSA-Q396.1.2-89

