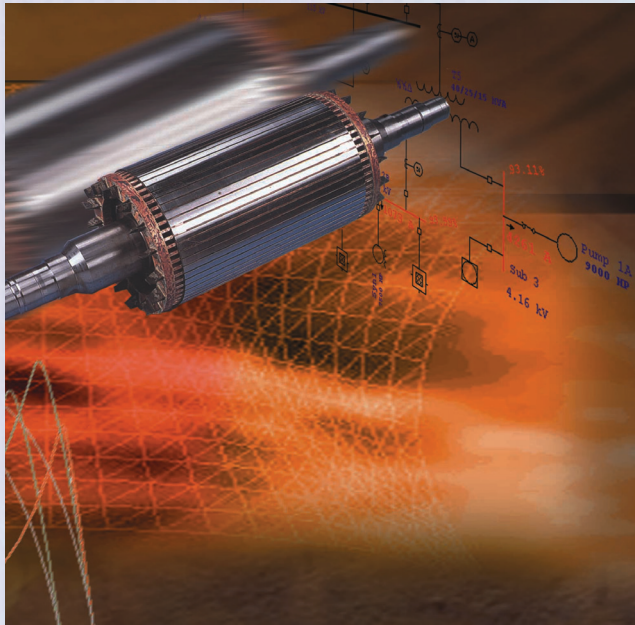


Motor Acceleration

Intuitive, Intelligent, Incomparable



Advanced Technology in Motor Evaluation & Simulation

The Motor Acceleration module enables engineers to thoroughly evaluate the impact of load changes to electric power systems. Motor Acceleration is fully capable of starting one motor or transitioning an entire power system to another state. Sequence-start a series of machines using static or dynamic models, operate Motor Operated Valves (MOVs), and simulate the switching actions of Load Tap Changers. Advanced plotting and time varying graphical display enable engineers to quickly evaluate results and make decisions.

Dynamic Motor Acceleration

Static Motor Starting

Voltage Flicker

Motor & Load Dynamic Models

Conventional & Soft Starting Devices

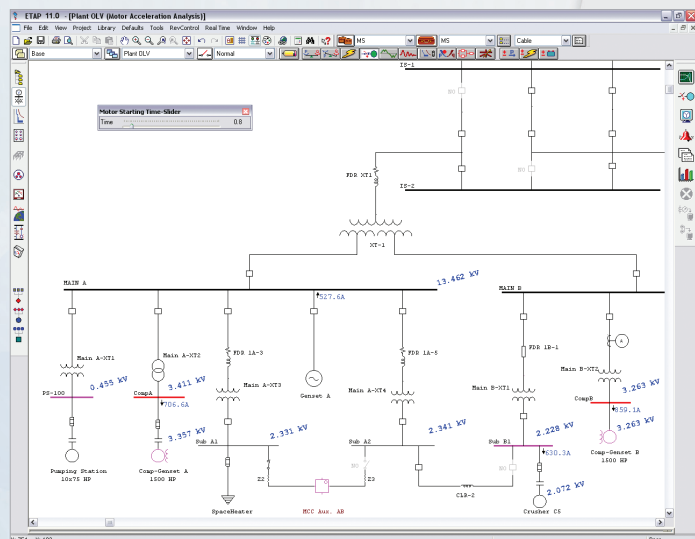
VFD Frequency Control Motor Starting

Multi-Sequence Starting

Load & Generation Transitioning

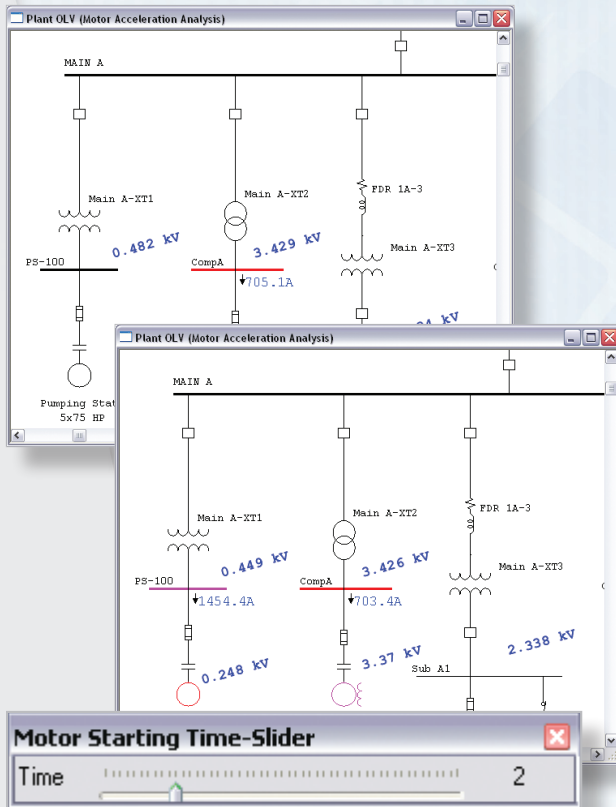
Comprehensive Alarm & Warning

Motor Operated Valve (MOV) Simulation



Accelerate Multiple Motors: Start multiple motors using unlimited sequence of events

Quickly Evaluate Results & Make Decisions



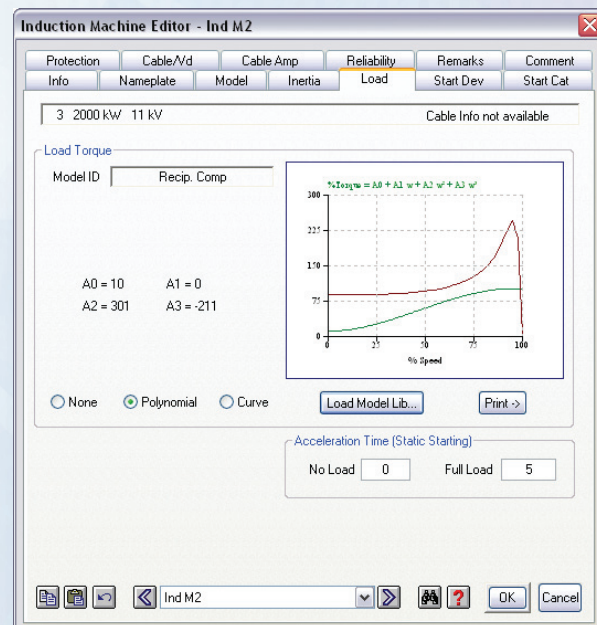
Motor Starting Time Slider: View time domain results graphically

Capabilities

- Accelerate / stop multiple motors
- Dynamically model motors & loads
- Create unlimited sequence of events
- Compare the response from various motor starters
- Simulate load ramping of starting motor
- Transition loading of entire system
- Vary generator / grid operating parameters
- Visualize results with extensive alerts & warnings
- Simulate transformer LTCs / voltage regulators
- Simulate MOVs with five operating stages

Comprehensive Modeling

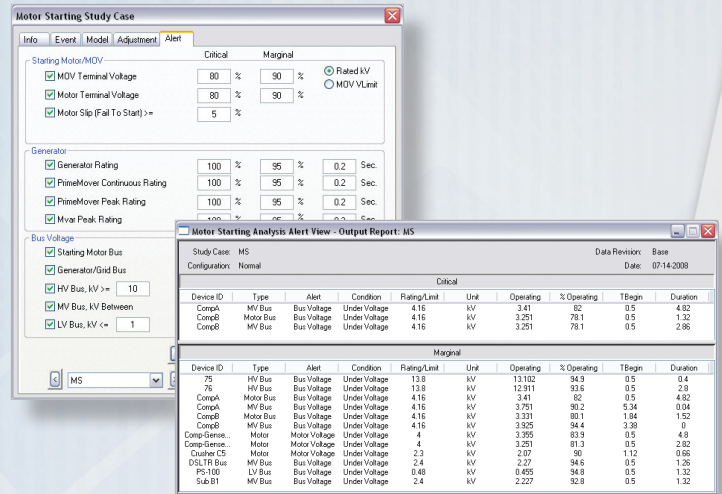
- No voltage or system connection limitations
- Induction / synchronous motor dynamic models
- Typical & user-defined load models
- Global or individual LTC time delays
- Transformer phase shift
- Motor acceleration with VFD & soft starters
- Starting devices: auto-transformer, capacitor, rotor / stator R or X, Y/ Δ , partial winding, etc.
- Voltage, current, or torque controlled soft starters
- Five levels of automatic error checking



Dynamic Modeling: Complete modeling of machines and connected load

Reporting

- Graphical display of time-varying results
- Auto-alert abnormal conditions with marginal or critical levels
- Graphically display buses with marginal or critical voltage levels
- Comprehensive plots with operation details
- Export one-line diagrams including results to third party CAD systems
- Export to your favorite word processing program



User-Defined Alerts: Automatically flag marginal and overstressed devices

Automatic Result Validation / Alert

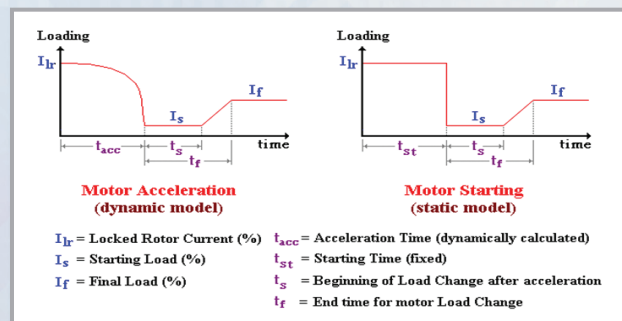
- Motor start failure
- Under-voltage for starting motor / MOV
- Under-voltage buses per bus type & voltage level
- Overloaded generator & prime mover
- User-defined marginal & critical alert limits

Libraries & Models

- Double-cage (dependent circuit)
- Double-cage (independent circuit)
- Single-cage (without deep-bar)
- Single-cage (deep-bar)
- Characteristic motor model
- Polynomial & characteristic load models

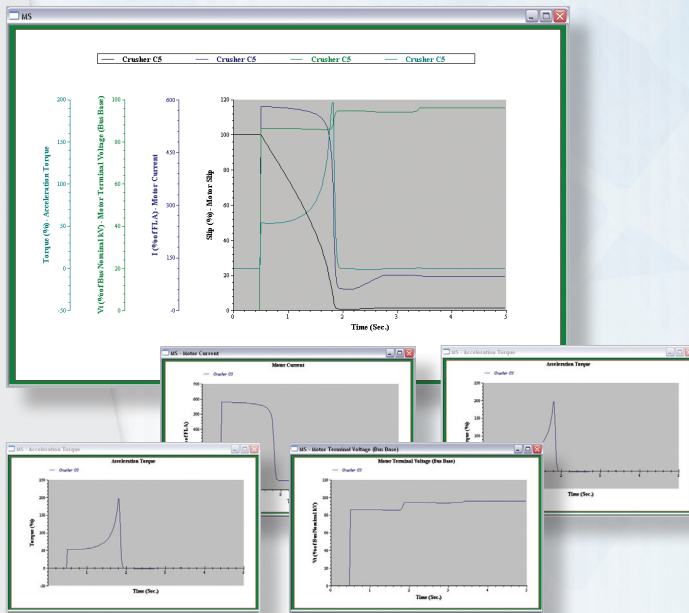
Project:	ETAP PowerStation Example 3	ETAP	Page: 1						
Location:	Lake Forest, California	6.0 DC	Date: 07.14.2008						
Contract:	OT11234567890		SN: ETAP-GTI						
Engineer:	Operation Technology, Inc.	Study Case: MS	Revision: Base						
Filename:	Example3		Config: Normal						
This info is printed on top of every output report, 1st remark line. (120 characters)									
% Alert Settings									
Starting Motors/MOV									
MOV Terminal Voltage	≤ 80.00	90.00 (Vntr. rate)							
Motor Terminal Voltage	≤ 80.00	90.00 (Vntr. rate)							
Failed to Start, Slip Rept	≥ 5.00								
Generator/Engine/Exciter Rating									
Generator Rating	100.00	95.00	0.00 (Min. Span (Sec.))						
Engine Continuous Rating	100.00	95.00	0.00						
Engine Peak Rating	100.00	95.00	0.00						
Exciter Peak Rating	100.00	95.00	0.00						
Bus Voltage Group									
Starting Motor Bus	VBus ≤ 80.00	90.00	0.00 (Min. Dip Width (Sec.))						
Grid/Generator Bus	VBus ≤ 92.00	95.00	0.00						
HV Bus, kV ≥ 10.00	VBus ≤ 90.00	95.00	0.00						
MV Bus, 10.00 > kV > 1.00	VBus ≤ 90.00	95.00	0.00						
LV Bus, kV ≤ 1.00	VBus ≤ 90.00	95.00	0.00						
Critical Report									
DeviceID	Type	Alert	Condition	Rating/Limit	Unit	Operating	% Operating	T Begin	Duration
CompA	MV Bus	Bus Voltage	Under Voltage	4.16	kV	3.40	82.0	0.500	4.820
CompB	Motor Bus	Bus Voltage	Under Voltage	4.16	kV	3.251	78.1	0.500	1.320
CompB	MV Bus	Bus Voltage	Under Voltage	4.16	kV	3.251	78.1	0.500	2.860

Comprehensive Reporting: Customizable output reports using Crystal Reports®



Realistic Operation: Simulate load and generation transitioning

Comprehensive & Reliable Tools for System Analysis



Flexible Plots: View results as individual or combined plots

Plots

- Motor
- MOV
- Static Load
- Capacitor
- Generator
- Bus
- Slip / Speed
- Terminal / bus voltage
- Torque
- Electrical power
- Mechanical power
- Terminal / Line Current
- Generator / grid current, power, & power factor
- Frequency
- Volts per Hertz

Customized Results

- Include multiple axes
- Display multiple motors simultaneously
- Zoom to any detail
- Export data to Microsoft® Excel
- Change text & axes
- Line, bar, 3-D, & scatter plots

Features

- Multiple motor / load acceleration / stop & sequencing
- Switch on / off static loads & capacitors
- Open / close MOVs with five operating stages
- Include transformer LTC / voltage regulator action
- Generator / grid operating parameters & load profiles
- Multiple loading conditions & generation levels
- Different loading categories for pre-start conditions
- Motor load ramping
- Group actions
- Individual actions
- Start / stop by group
- Group start globally or by individual bus
- Start, stop, & restart in a single run
- Fast bus transfer using load transitioning
- Unlimited actions in each event
- Unlimited events in one simulation
- Unlimited simulations stored in study cases
- Change & rerun studies instantly
- Motor nameplate library
- Motor circuit model library
- Motor characteristic model library
- Polynomial based load model library
- Curve based load model library
- Integrated with motor parameter estimation
- Automatic alert & warnings
- Simulate motor starters including soft-starters
- VFD for starting & running operation
- Comprehensive & flexible plots & reporting
- Execute multiple preset simulations at one-click with Study Wizard