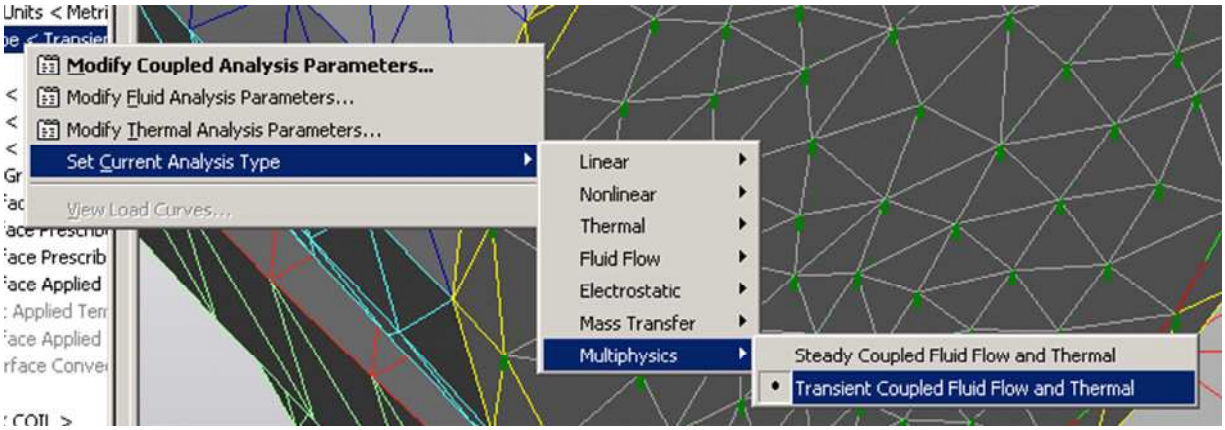
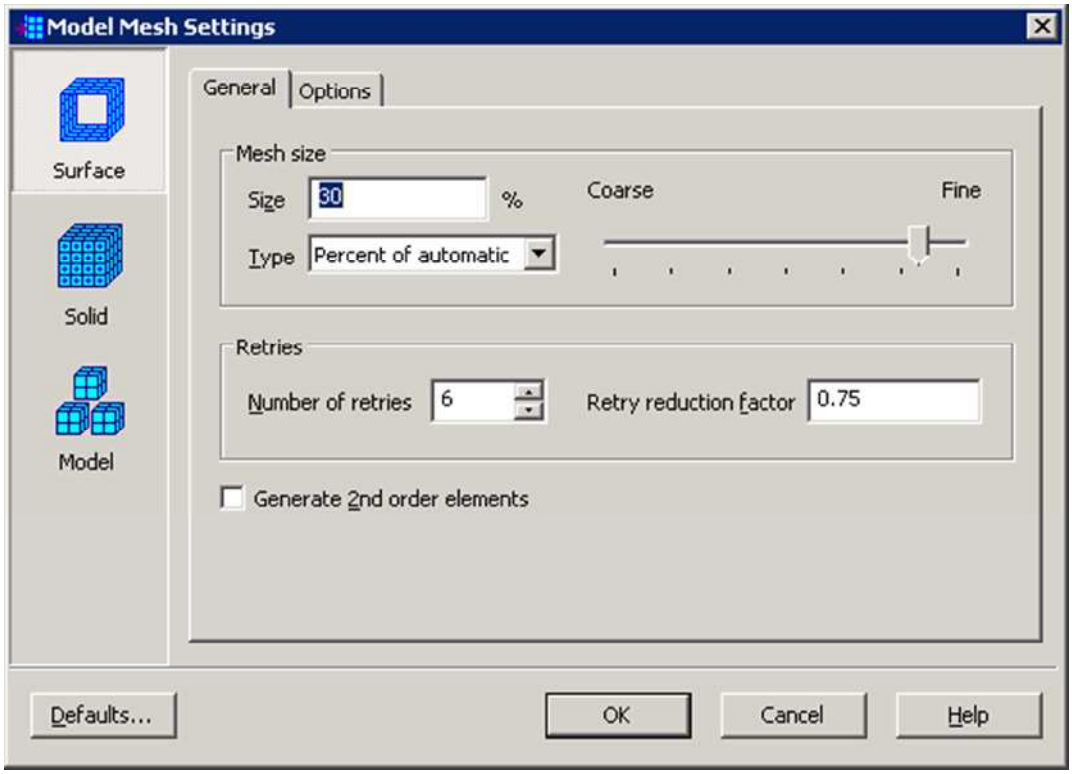
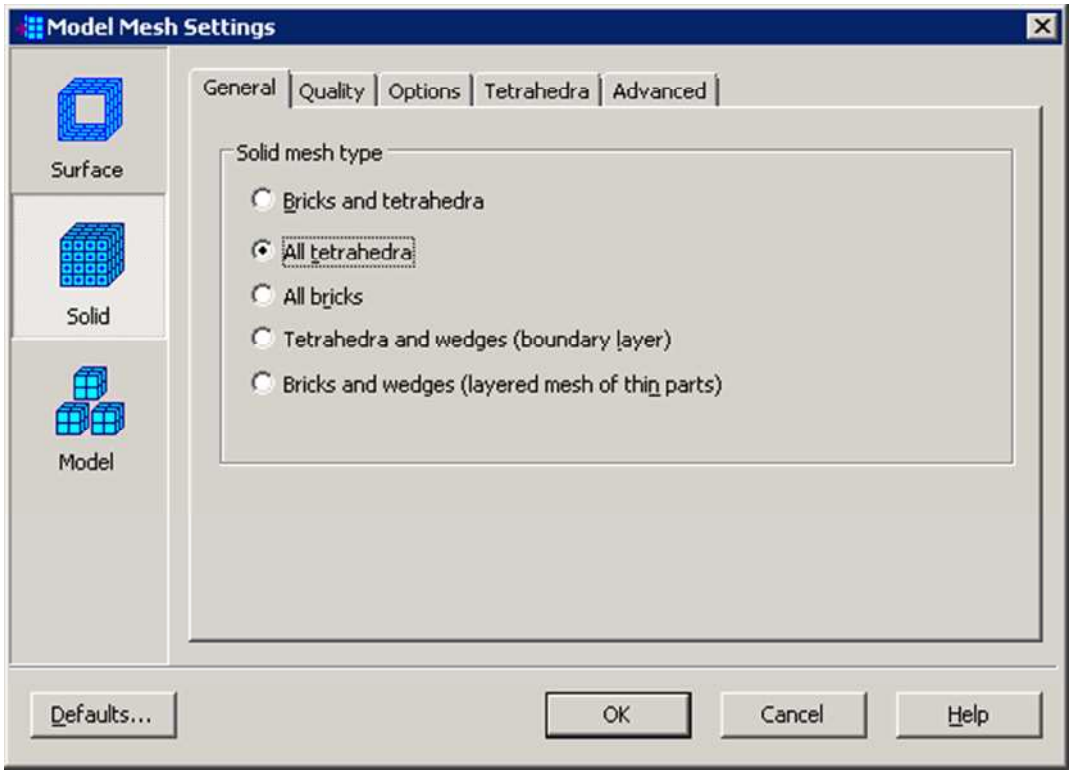
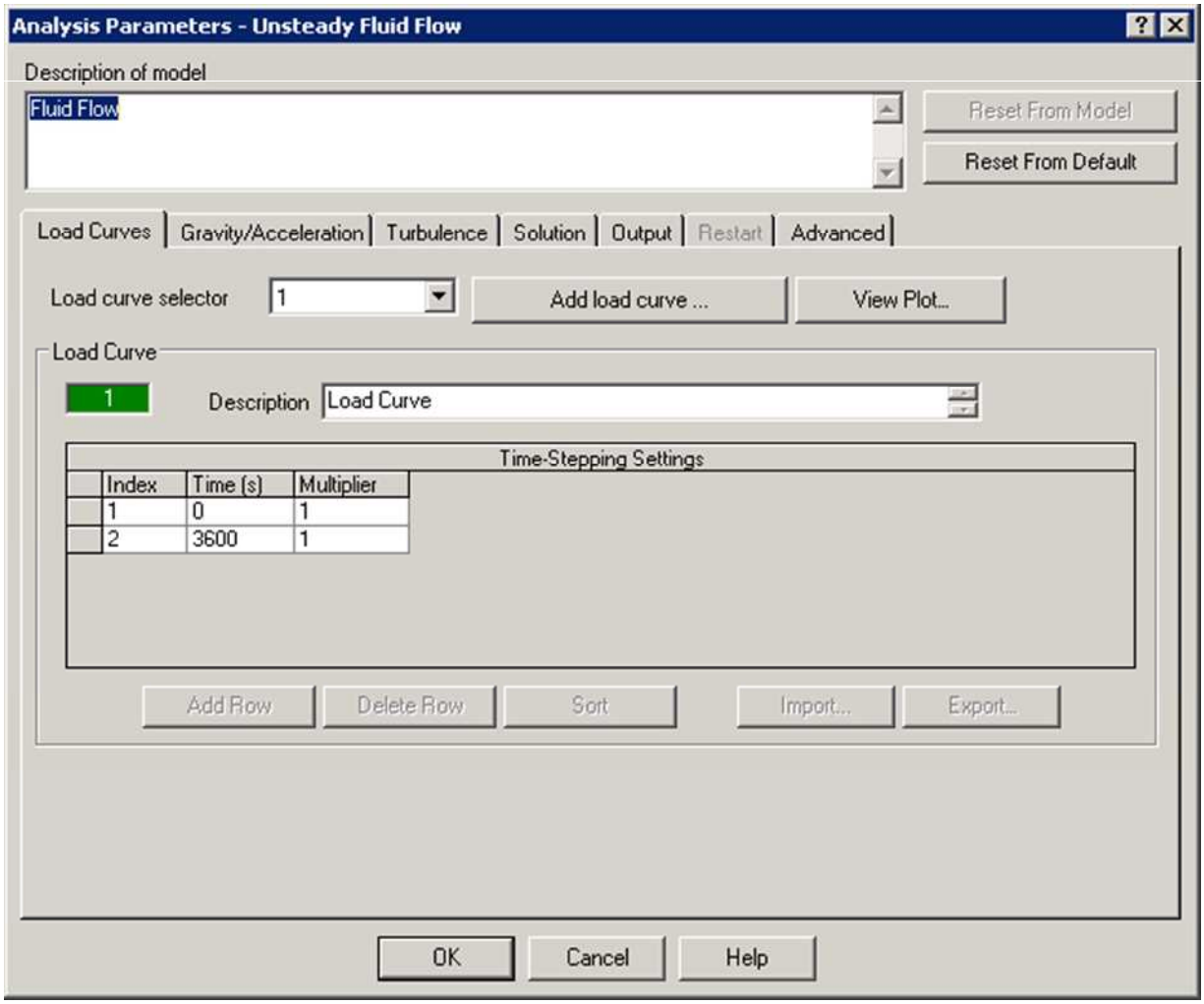
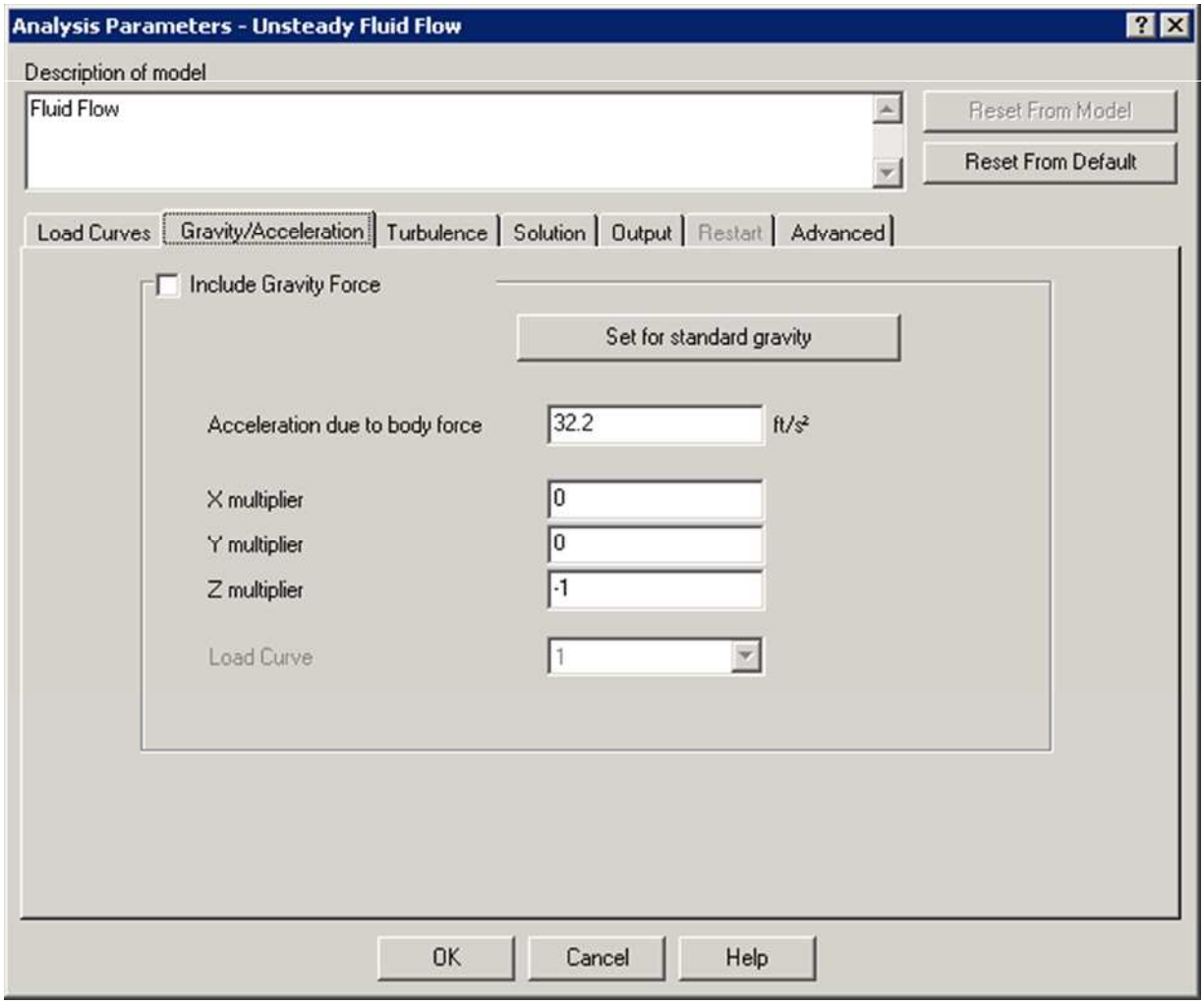
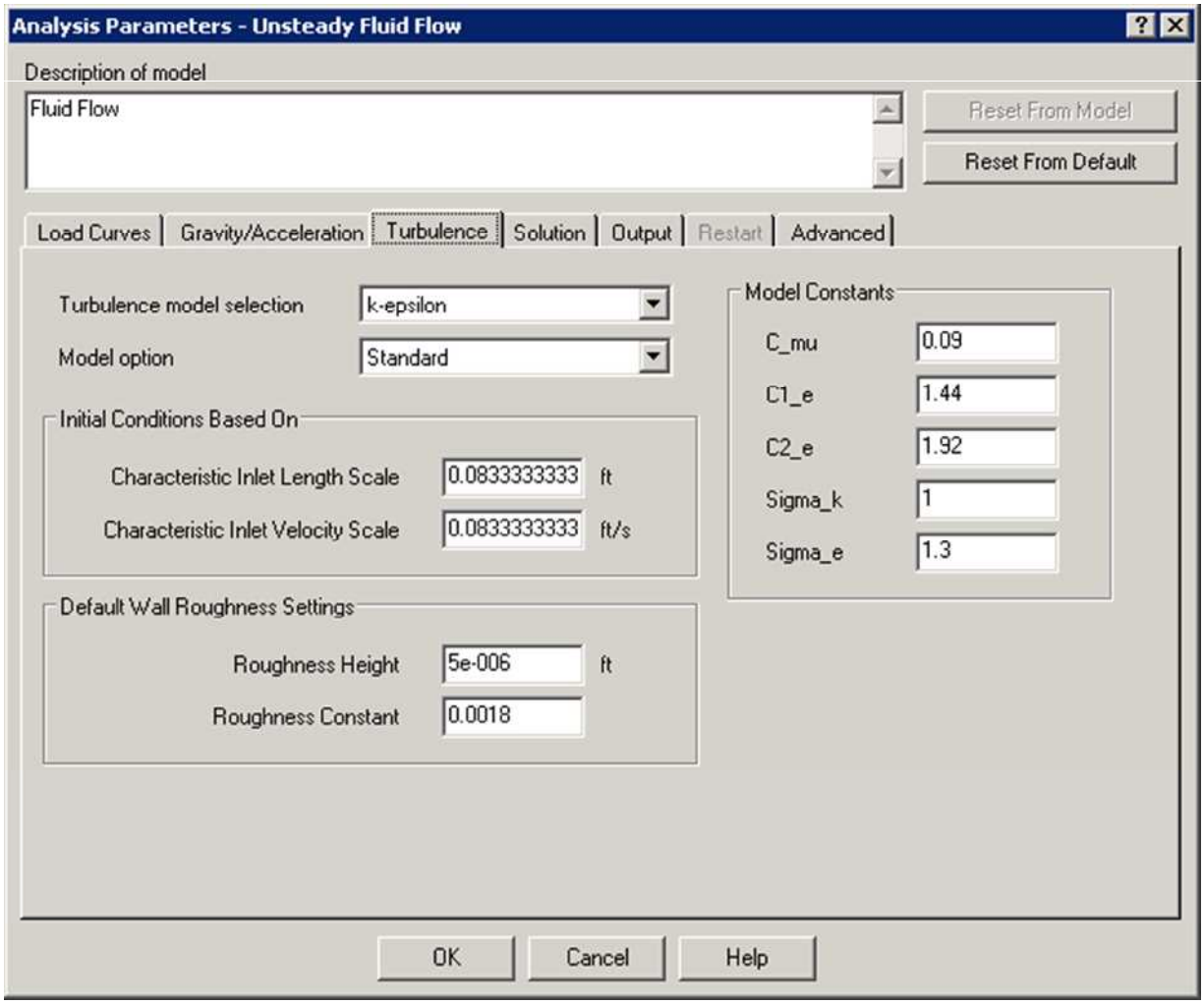

Modify Coupled Analysis Parameters...
Modify Fluid Analysis Parameters...
Modify Thermal Analysis Parameters...
Set Current Analysis Type
View Load Curves...
Linear
Nonlinear
Thermal
Fluid Flow
Electrostatic
Mass Transfer
Multiphysics
Steady Coupled Fluid Flow and Thermal
Transient Coupled Fluid Flow and Thermal

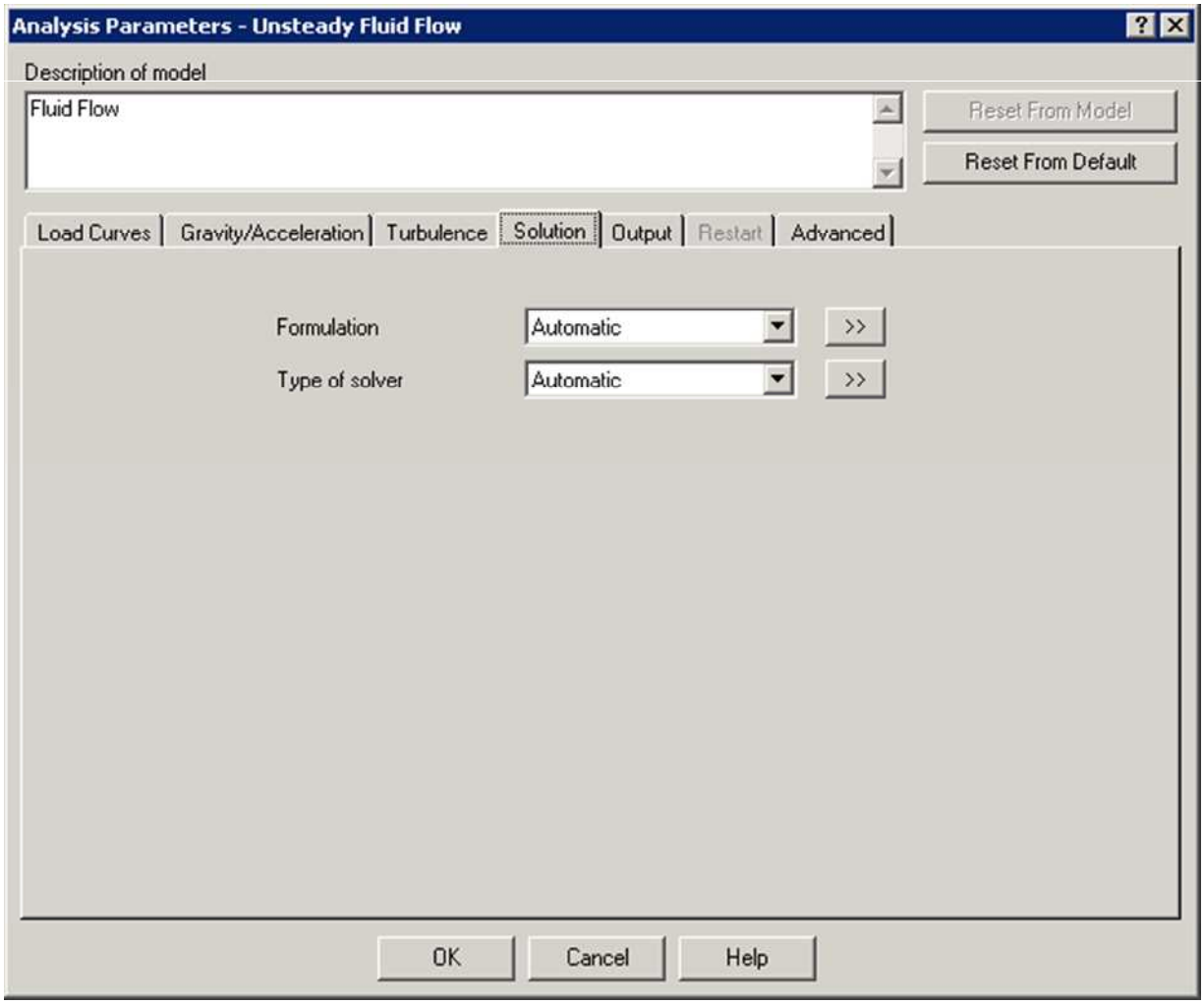

Model Mesh Settings
Surface
Solid
Model
General
Options
Mesh size
Size
30
%
Coarse
Fine
Type
Percent of automatic
Retries
Number of retries
6
Retry reduction factor
0.75
Generate 2nd order elements
Defaults...
OK
Cancel
Help

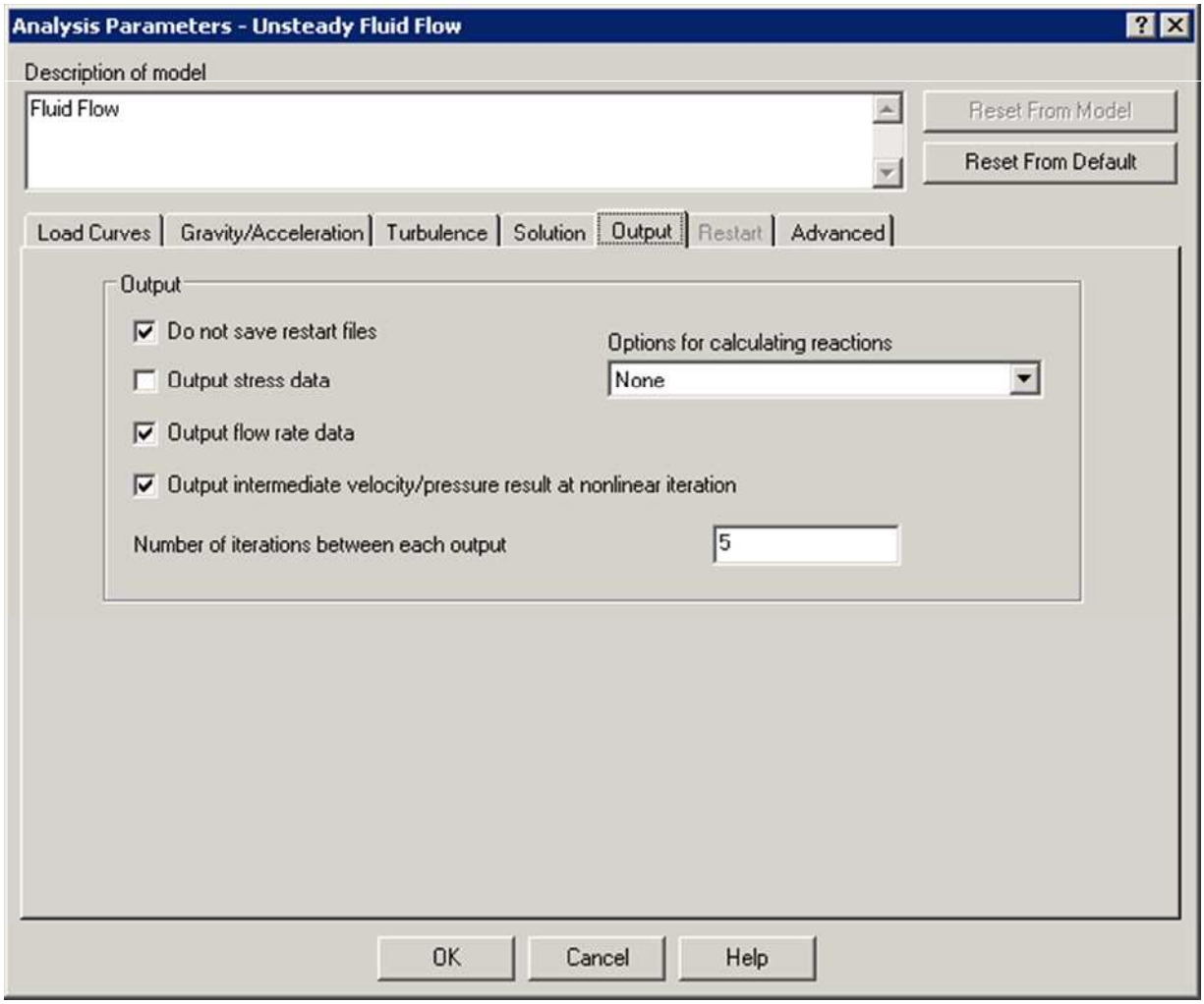

Model Mesh Settings
Surface
Solid
Model
General
Quality
Options
Tetrahedra
Advanced
Solid mesh type
Bricks and tetrahedra
All tetrahedra
All bricks
Tetrahedra and wedges (boundary layer)
Bricks and wedges (layered mesh of thin parts)
Defaults...
OK
Cancel
Help

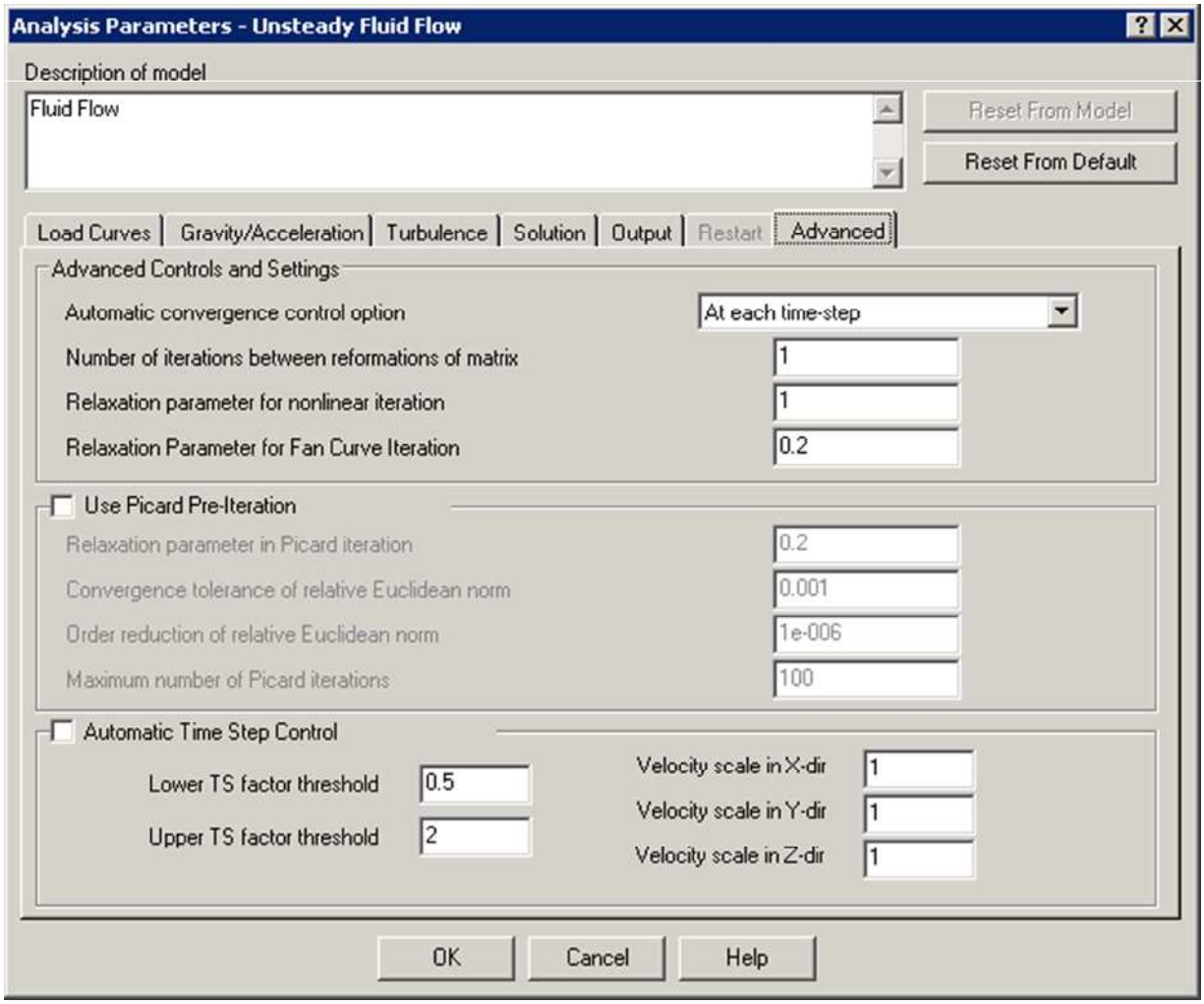

Analysis Parameters - Unsteady Fluid Flow
Description of model
Fluid Flow
Reset From Model
Reset From Default
Load Curves
Gravity/Acceleration
Turbulence
Solution
Output
Restart
Advanced
Load curve selector
1
Add load curve ...
View Plot...
Load Curve
1
Description
Load Curve
Time-Stepping Settings
Index
Time (s)
Multiplier
1
0
1
2
3600
1
Add Row
Delete Row
Sort
Import...
Export...
OK
Cancel
Help

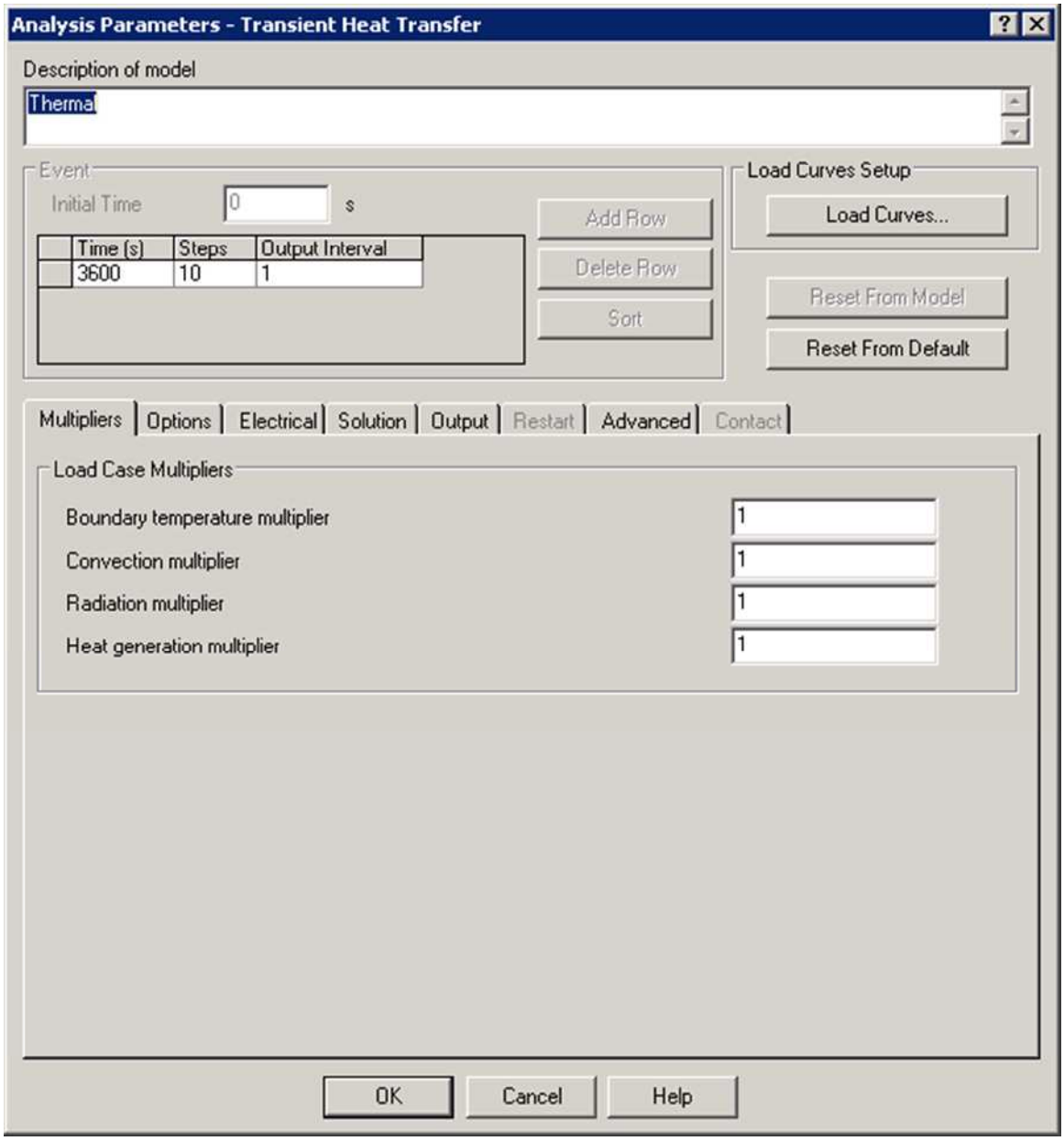

Analysis Parameters - Unsteady Fluid Flow
Description of model
Fluid Flow
Reset From Model
Reset From Default
Load Curves
Gravity/Acceleration
Turbulence
Solution
Output
Restart
Advanced
Include Gravity Force
Set for standard gravity
Acceleration due to body force
32.2
ft/s²
X multiplier
0
Y multiplier
0
Z multiplier
-1
Load Curve
1
OK
Cancel
Help

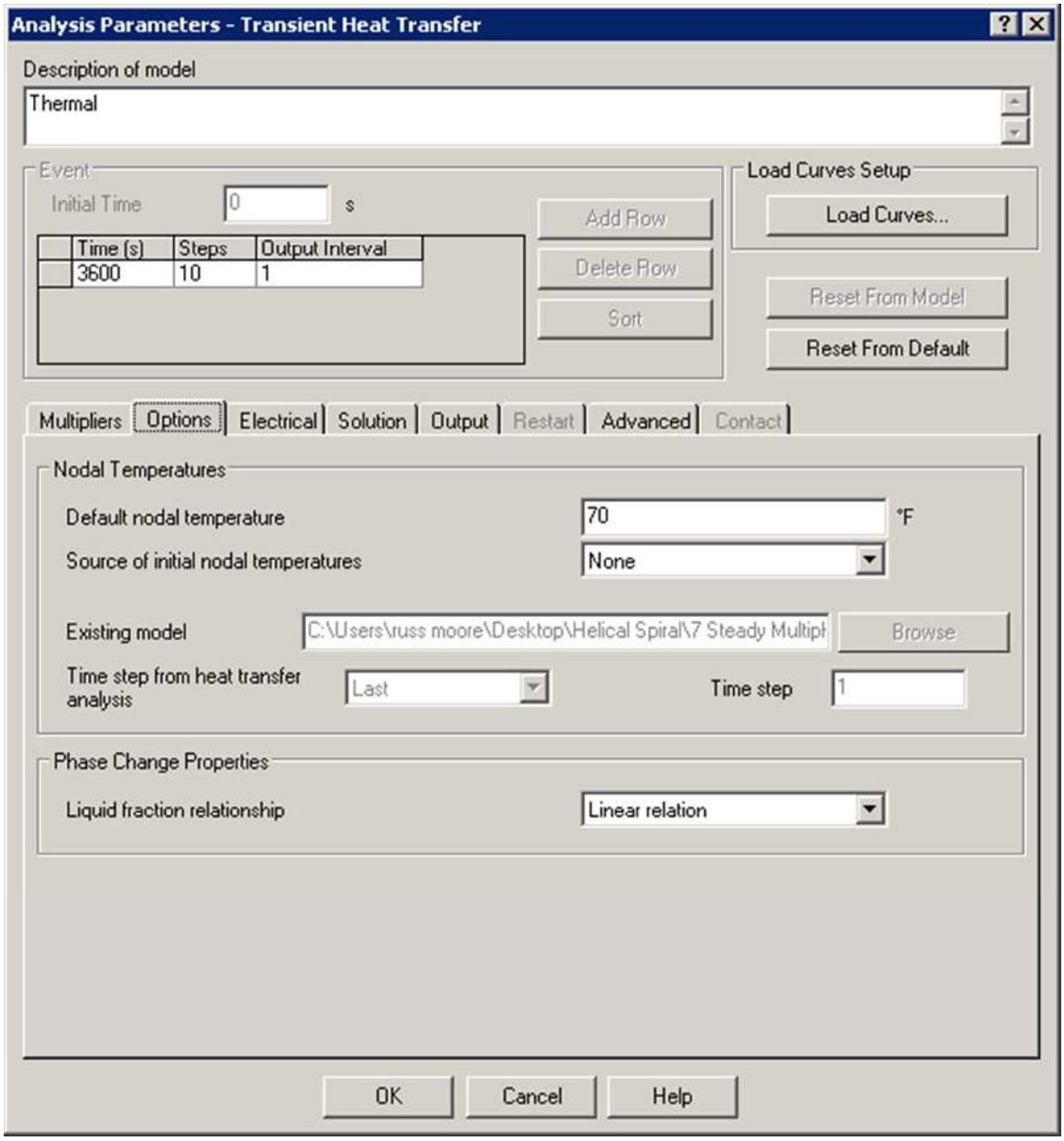

Analysis Parameters - Unsteady Fluid Flow
Description of model
Fluid Flow
Reset From Model
Reset From Default
Load Curves
Gravity/Acceleration
Turbulence
Solution
Output
Restart
Advanced
Turbulence model selection
k-epsilon
Model option
Standard
Initial Conditions Based On
Characteristic Inlet Length Scale
0.0833333333
ft
Characteristic Inlet Velocity Scale
0.0833333333
ft/s
Default Wall Roughness Settings
Roughness Height
5e-006
ft
Roughness Constant
0.0018
Model Constants
C_mu
0.09
C1_e
1.44
C2_e
1.92
Sigma_k
1
Sigma_e
1.3
OK
Cancel
Help

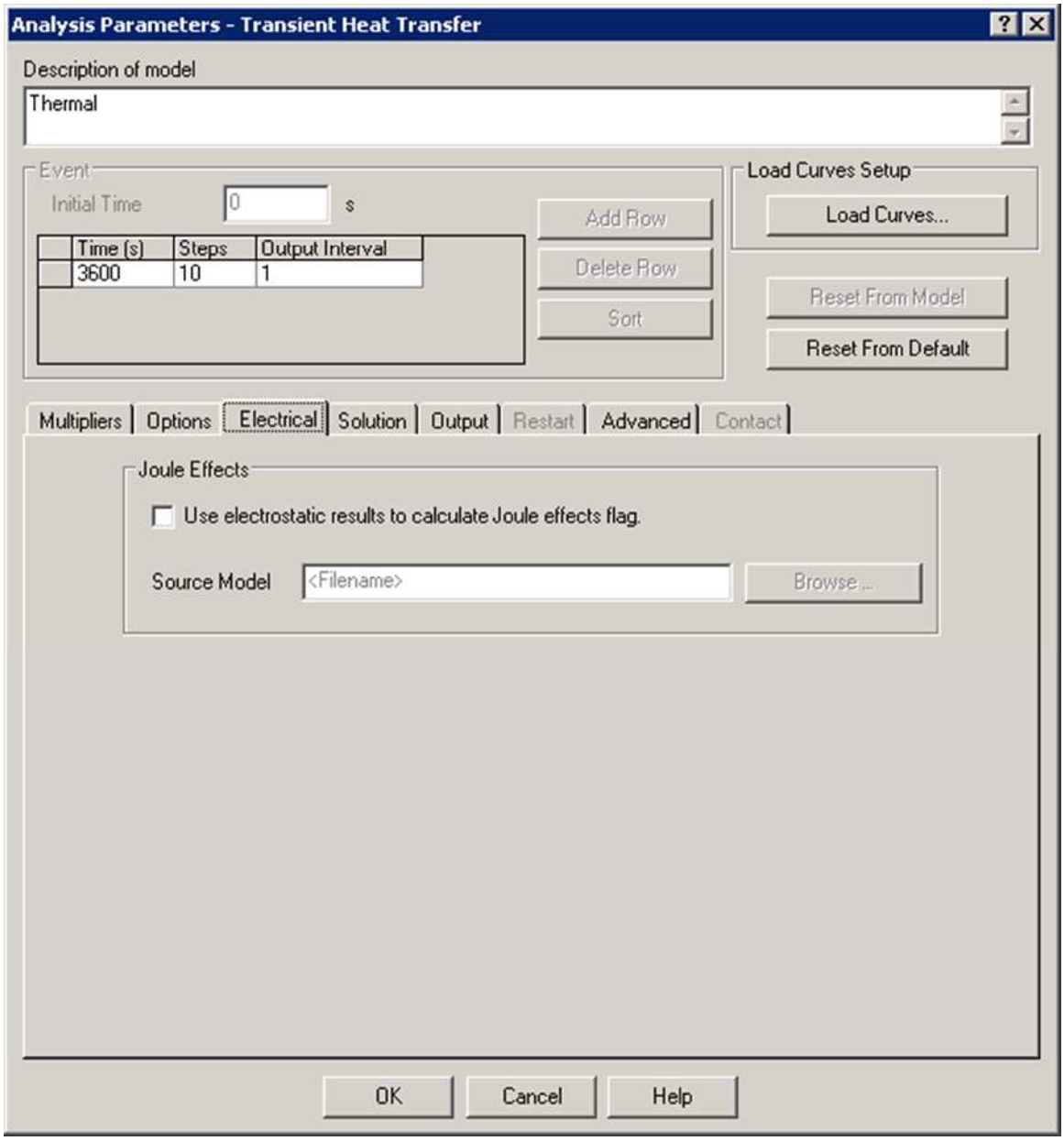

Analysis Parameters - Unsteady Fluid Flow
Description of model
Fluid Flow
Reset From Model
Reset From Default
Load Curves
Gravity/Acceleration
Turbulence
Solution
Output
Restart
Advanced
Formulation
Automatic
>>
Type of solver
Automatic
>>
OK
Cancel
Help

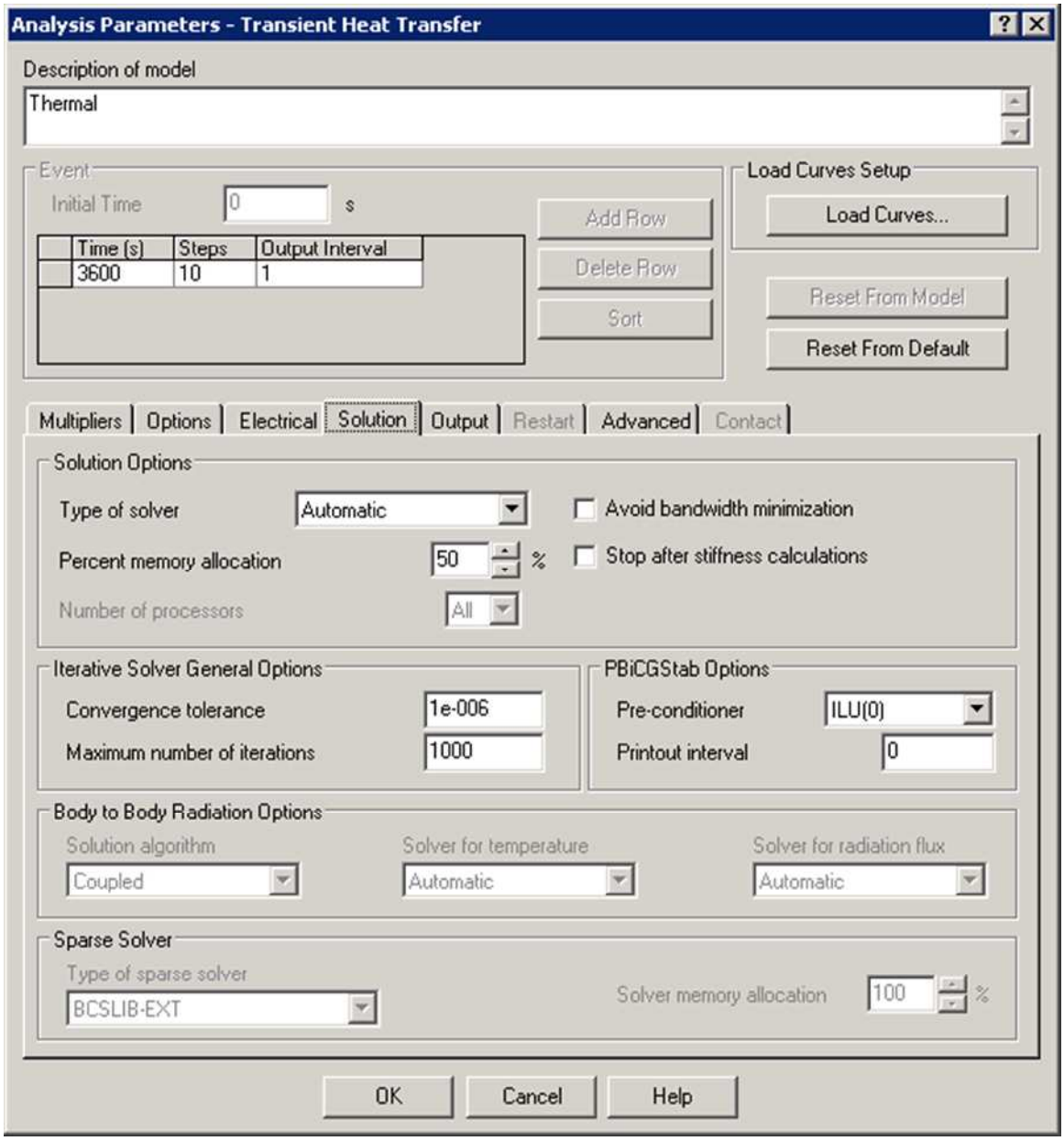

Analysis Parameters - Unsteady Fluid Flow
Description of model
Fluid Flow
Reset From Model
Reset From Default
Load Curves
Gravity/Acceleration
Turbulence
Solution
Output
Restart
Advanced
Output
Do not save restart files
Output stress data
Output flow rate data
Output intermediate velocity/pressure result at nonlinear iteration
Options for calculating reactions
None
Number of iterations between each output
5
OK
Cancel
Help

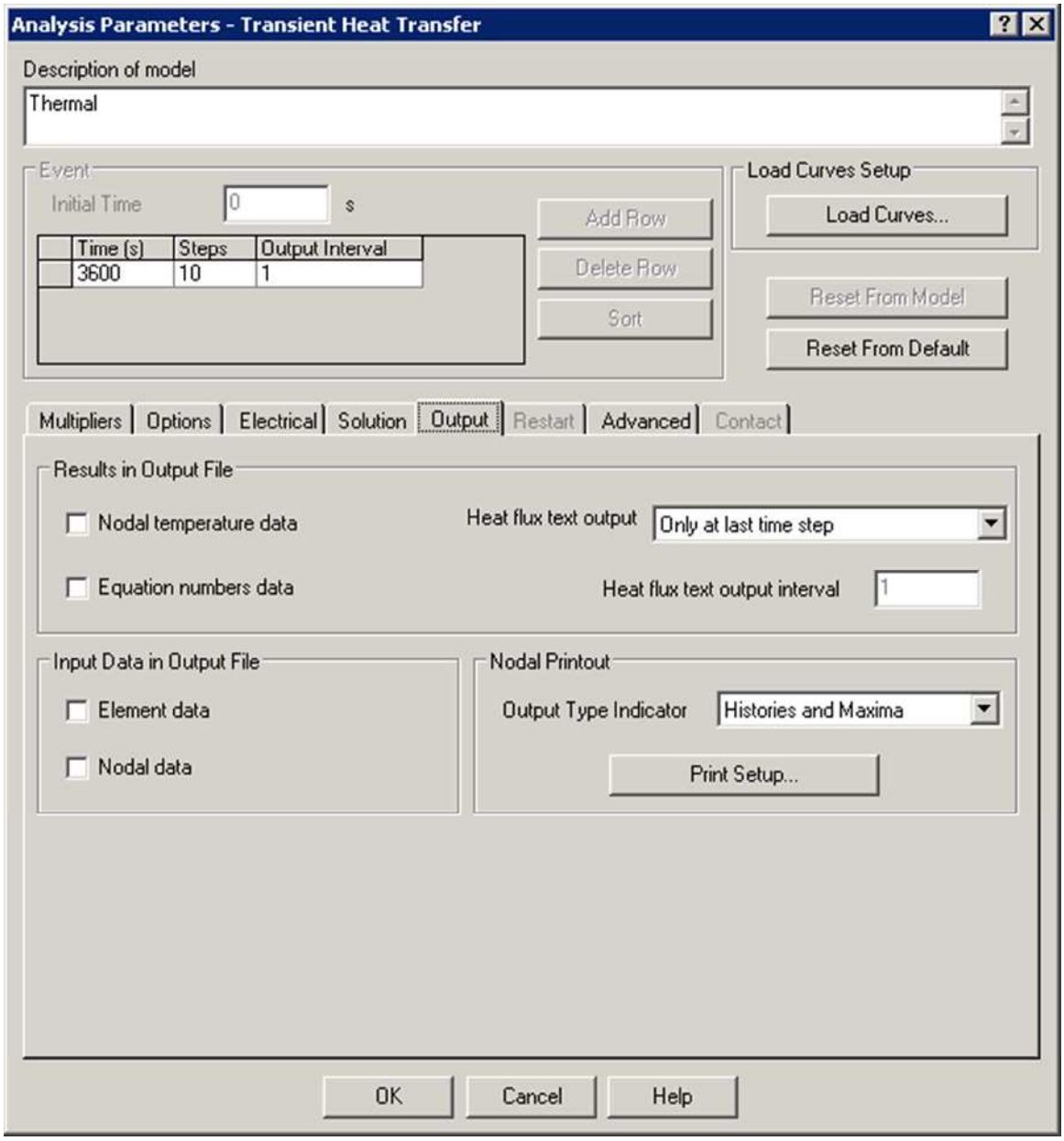

Analysis Parameters - Unsteady Fluid Flow
Description of model
Fluid Flow
Reset From Model
Reset From Default
Load Curves
Gravity/Acceleration
Turbulence
Solution
Output
Restart
Advanced
Advanced Controls and Settings
Automatic convergence control option
At each time-step
Number of iterations between reformations of matrix
1
Relaxation parameter for nonlinear iteration
1
Relaxation Parameter for Fan Curve Iteration
0.2
Use Picard Pre-Iteration
Relaxation parameter in Picard iteration
0.2
Convergence tolerance of relative Euclidean norm
0.001
Order reduction of relative Euclidean norm
1e-006
Maximum number of Picard iterations
100
Automatic Time Step Control
Lower TS factor threshold
0.5
Upper TS factor threshold
2
Velocity scale in X-dir
1
Velocity scale in Y-dir
1
Velocity scale in Z-dir
1
OK
Cancel
Help

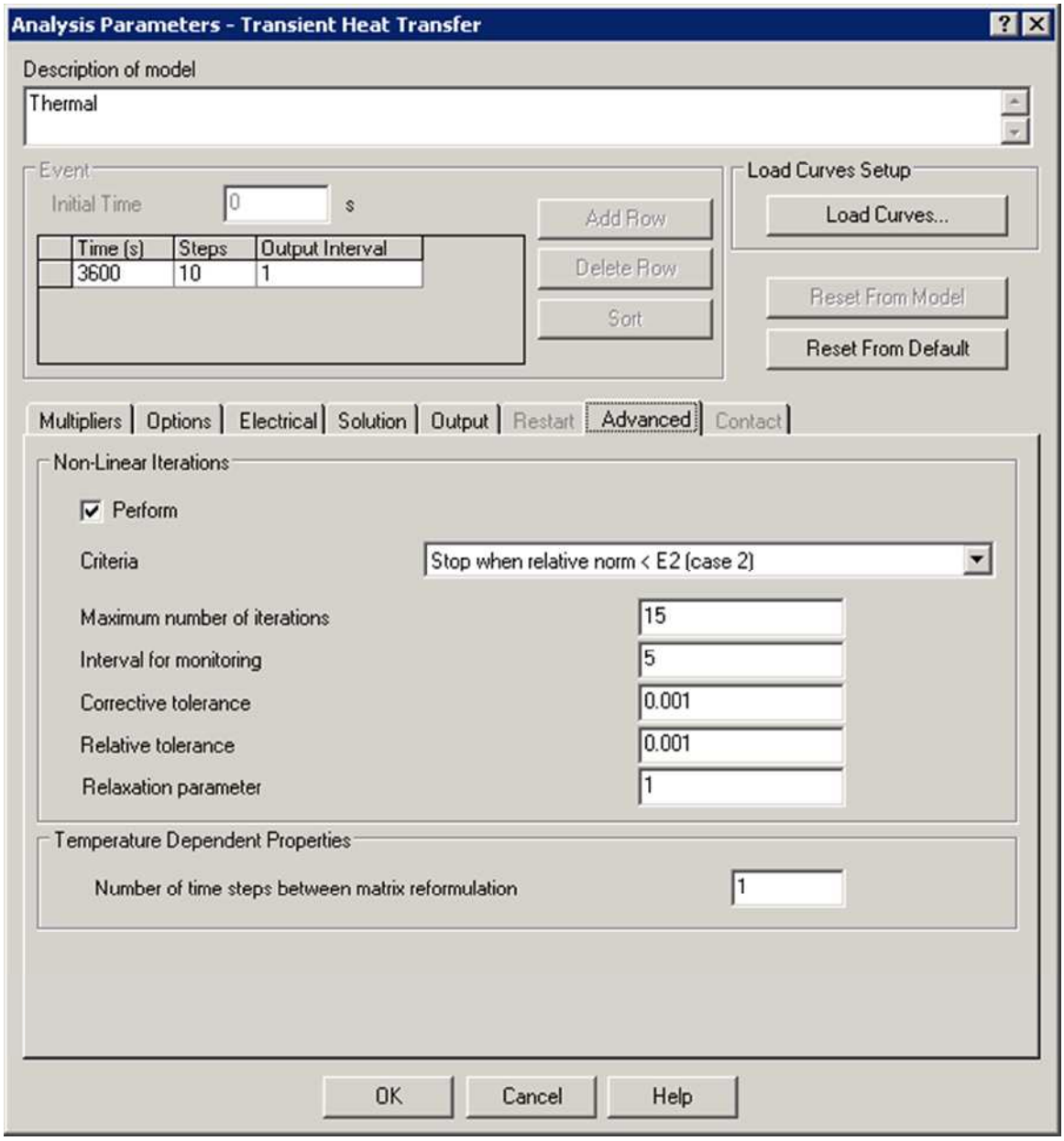

Analysis Parameters - Transient Heat Transfer
Description of model
Therma
Event
Initial Time
0
s
Time (s)
Steps
Output Interval
3600
10
1
Add Row
Delete Row
Sort
Load Curves Setup
Load Curves...
Reset From Model
Reset From Default
Multipliers
Options
Electrical
Solution
Output
Restart
Advanced
Contact
Load Case Multipliers
Boundary temperature multiplier
1
Convection multiplier
1
Radiation multiplier
1
Heat generation multiplier
1
OK
Cancel
Help

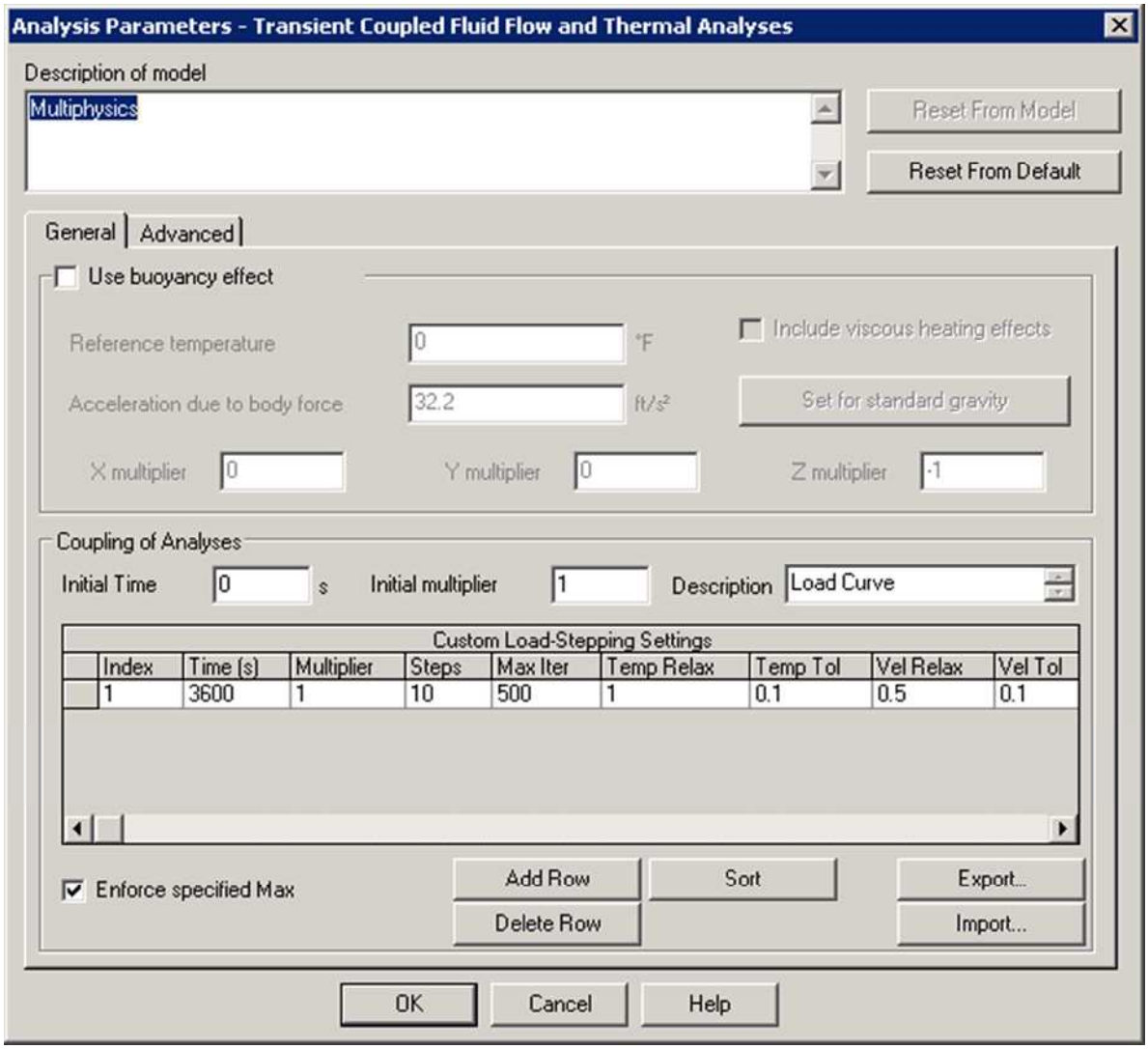

Analysis Parameters - Transient Heat Transfer
Description of model
Thermal
Event
Initial Time
0
s
Time (s)
Steps
Output Interval
3600
10
1
Add Row
Delete Row
Sort
Load Curves Setup
Load Curves...
Reset From Model
Reset From Default
Multipliers
Options
Electrical
Solution
Output
Restart
Advanced
Contact
Nodal Temperatures
Default nodal temperature
70
°F
Source of initial nodal temperatures
None
Existing model
C:\Users\russ moore\Desktop\Helical Spiral\7 Steady Multiph
Browse
Time step from heat transfer analysis
Last
Time step
1
Phase Change Properties
Liquid fraction relationship
Linear relation
OK
Cancel
Help

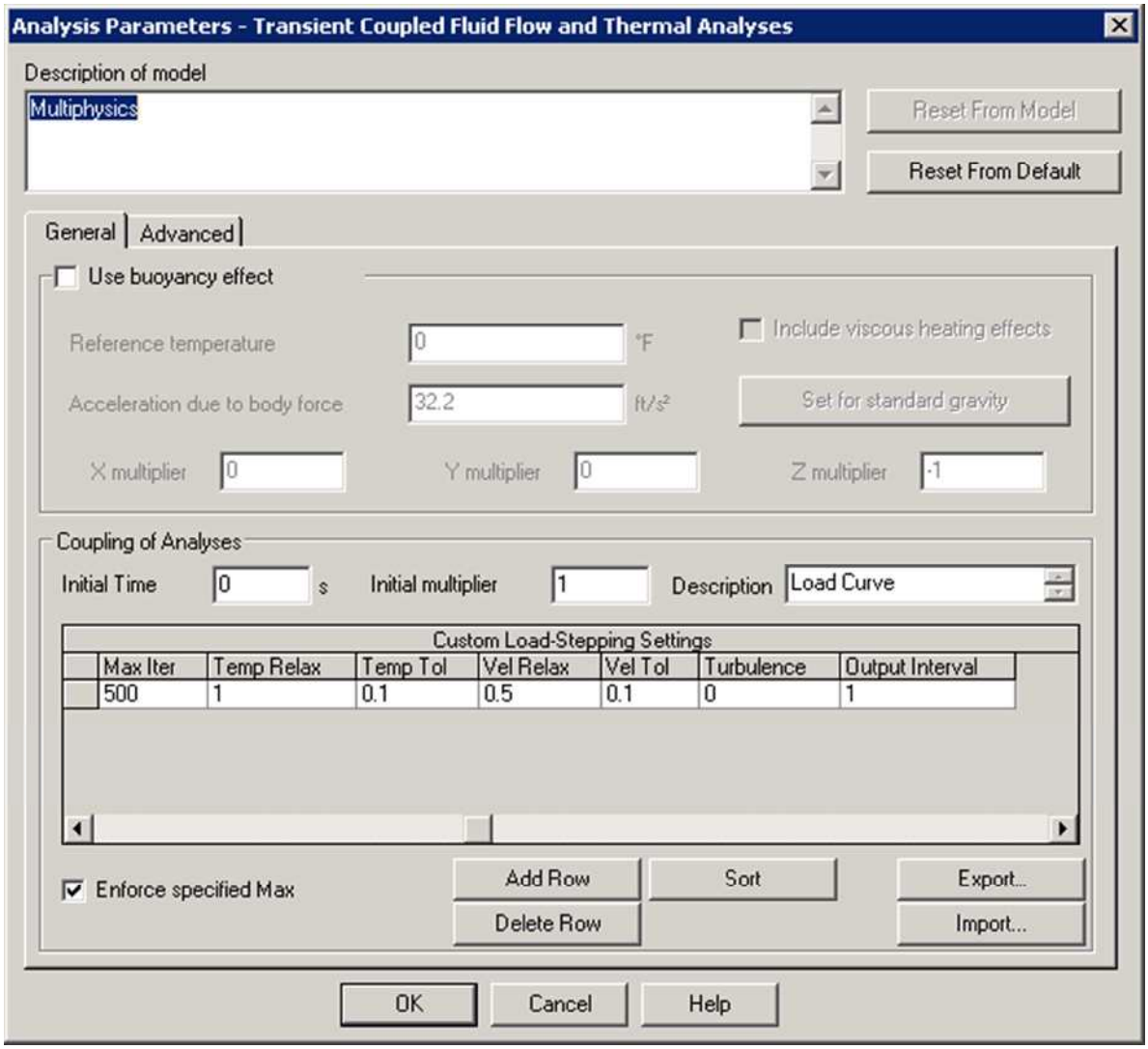

Analysis Parameters - Transient Heat Transfer
Description of model
Thermal
Event
Initial Time
0
s
Time (s)
Steps
Output Interval
3600
10
1
Add Row
Delete Row
Sort
Load Curves Setup
Load Curves...
Reset From Model
Reset From Default
Multipliers
Options
Electrical
Solution
Output
Restart
Advanced
Contact
Joule Effects
Use electrostatic results to calculate Joule effects flag.
Source Model
<Filename>
Browse ...
OK
Cancel
Help

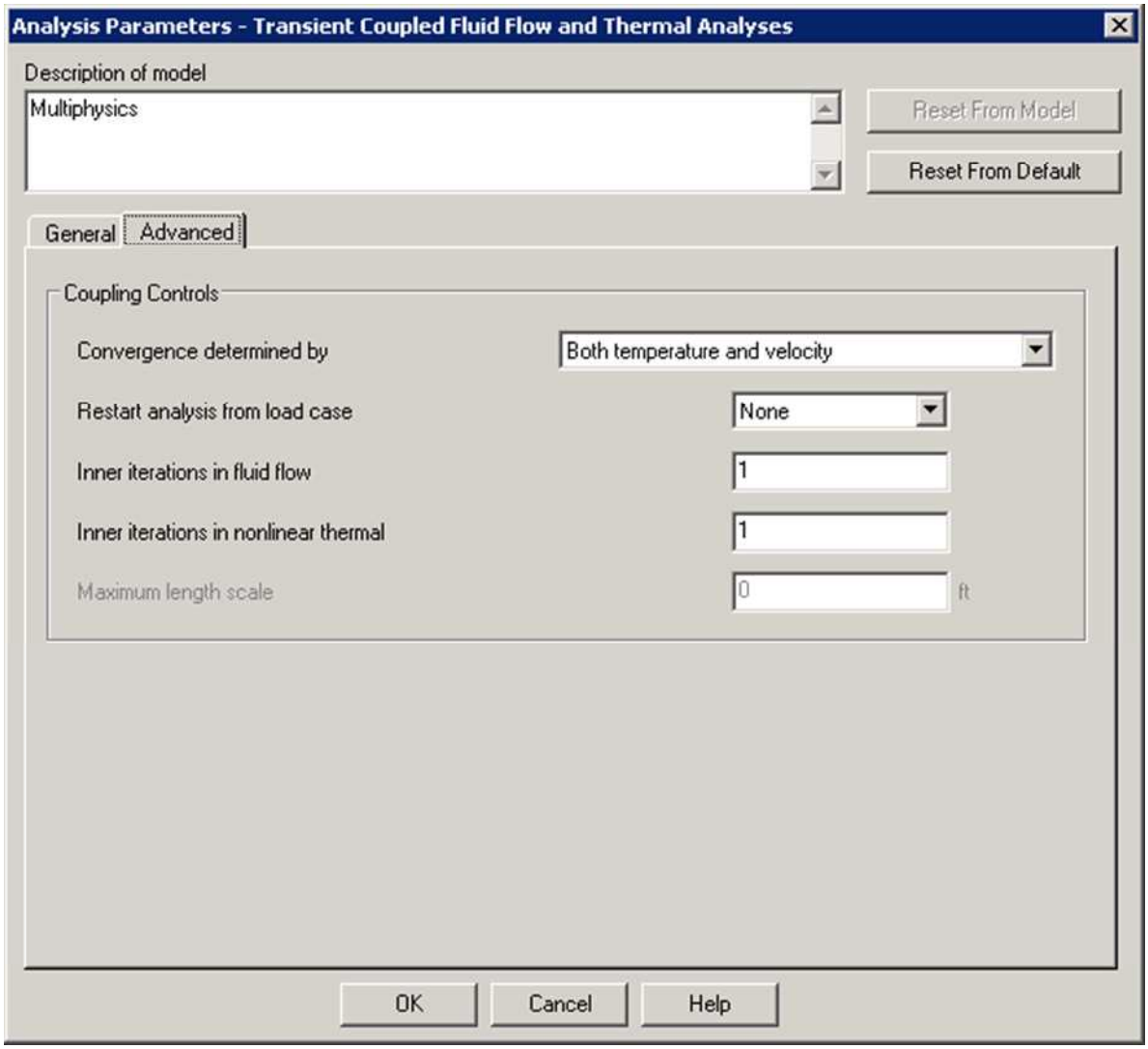

Analysis Parameters - Transient Heat Transfer
Description of model
Thermal
Event
Initial Time
0
s
Time (s)
Steps
Output Interval
3600
10
1
Add Row
Delete Row
Sort
Load Curves Setup
Load Curves...
Reset From Model
Reset From Default
Multipliers
Options
Electrical
Solution
Output
Restart
Advanced
Contact
Solution Options
Type of solver
Automatic
Avoid bandwidth minimization
Percent memory allocation
50
%
Stop after stiffness calculations
Number of processors
All
Iterative Solver General Options
Convergence tolerance
1e-006
Maximum number of iterations
1000
PBiCGStab Options
Pre-conditioner
ILU(0)
Printout interval
0
Body to Body Radiation Options
Solution algorithm
Coupled
Solver for temperature
Automatic
Solver for radiation flux
Automatic
Sparse Solver
Type of sparse solver
BCSLIB-EXT
Solver memory allocation
100
%
OK
Cancel
Help


Analysis Parameters - Transient Heat Transfer
Description of model
Thermal
Event
Initial Time
0
s
Time (s)
Steps
Output Interval
3600
10
1
Add Row
Delete Row
Sort
Load Curves Setup
Load Curves...
Reset From Model
Reset From Default
Multipliers
Options
Electrical
Solution
Output
Restart
Advanced
Contact
Results in Output File
Nodal temperature data
Equation numbers data
Heat flux text output
Only at last time step
Heat flux text output interval
1
Input Data in Output File
Element data
Nodal data
Nodal Printout
Output Type Indicator
Histories and Maxima
Print Setup...
OK
Cancel
Help


Analysis Parameters - Transient Heat Transfer
Description of model
Thermal
Event
Initial Time
0
s
Time (s)
Steps
Output Interval
3600
10
1
Add Row
Delete Row
Sort
Load Curves Setup
Load Curves...
Reset From Model
Reset From Default
Multipliers
Options
Electrical
Solution
Output
Restart
Advanced
Contact
Non-Linear Iterations
Perform
Criteria
Stop when relative norm < E2 (case 2)
Maximum number of iterations
15
Interval for monitoring
5
Corrective tolerance
0.001
Relative tolerance
0.001
Relaxation parameter
1
Temperature Dependent Properties
Number of time steps between matrix reformulation
1
OK
Cancel
Help


Analysis Parameters - Transient Coupled Fluid Flow and Thermal Analyses
Description of model
Multiphysics
Reset From Model
Reset From Default
General
Advanced
Use buoyancy effect
Reference temperature
0
°F
Include viscous heating effects
Acceleration due to body force
32.2
ft/s²
Set for standard gravity
X multiplier
0
Y multiplier
0
Z multiplier
-1
Coupling of Analyses
Initial Time
0
s
Initial multiplier
1
Description
Load Curve
Custom Load-Stepping Settings
Index
Time (s)
Multiplier
Steps
Max Iter
Temp Relax
Temp Tol
Vel Relax
Vel Tol
1
3600
1
10
500
1
0.1
0.5
0.1
Enforce specified Max
Add Row
Sort
Export...
Delete Row
Import...
OK
Cancel
Help


Analysis Parameters - Transient Coupled Fluid Flow and Thermal Analyses
Description of model
Multiphysics
Reset From Model
Reset From Default
General
Advanced
Use buoyancy effect
Reference temperature
0
°F
Include viscous heating effects
Acceleration due to body force
32.2
ft/s²
Set for standard gravity
X multiplier
0
Y multiplier
0
Z multiplier
-1
Coupling of Analyses
Initial Time
0
s
Initial multiplier
1
Description
Load Curve
Custom Load-Stepping Settings
Max Iter
Temp Relax
Temp Tol
Vel Relax
Vel Tol
Turbulence
Output Interval
500
1
0.1
0.5
0.1
0
1
Enforce specified Max
Add Row
Delete Row
Sort
Export...
Import...
OK
Cancel
Help


Analysis Parameters - Transient Coupled Fluid Flow and Thermal Analyses
Description of model
Multiphysics
Reset From Model
Reset From Default
General
Advanced
Coupling Controls
Convergence determined by
Both temperature and velocity
Restart analysis from load case
None
Inner iterations in fluid flow
1
Inner iterations in nonlinear thermal
1
Maximum length scale
0
ft
OK
Cancel
Help