

# ***FEMAP v10.0.2 New Features and Corrections***

## ***Updates and Enhancements***

### **Interfaces - NX Nastran**

- Updated version of NX Nastran included with FEMAP with NX Nastran to version 6.1
- Updated Analysis Monitor to be able to handle NX Nastran 6.1 monitor files

### **Interfaces - Nastran**

- Updated reading of OP2 files to support results files larger than 4GByte

### **Interfaces - TMG**

- Updated version of TMG interfaces for FEMAP to “version 6.0, build 470”

### **User Interface**

- Added “guard bytes” around preferences so that if memory becomes totally corrupted it will not overwrite the FEMAP.INI file with values which are not valid
- Modified certain aspects of FEMAP to allow for more complete localization to Chinese, Japanese, and other languages.
- Removed Modify, Update Other, Surface Divisions command

### **API**

- Updated version of WinWrap used by the API Programming window

## ***Corrections***

### **Coordinate Systems**

- Corrected problem that filled in wrong defaults for vector if “snap to node” was on and coordinate systems were repeatedly created using one of the Axes creation options.

### **Geometry**

- Fixed problem deleting Composite Curves when the associated Surface or Solid was deleted.

### **Graphics**

- Prevent facetting of curves if a point is missing from Femap curve definition, which is not normal, but can happen in rare occasions.
- Fixed graphics issue related to using the Modify, Scale, Solid command.

### **GUI - Dockable Panes**

Meshing Toolbox

- Fixed problem using the Mesh Locate Toolbox to edit solid meshes (Tet and Hex).

#### API Programming

- Fixed loss of focus when you hit Ctrl+C to copy the API Programming Window and other panes.

#### Interfaces - FEMAP Neutral

- Fixed problem reading the property data block from neutral files from Femap 9.2 and earlier which caused Femap to issue errors where they didn't really exist.
- Fixed issue in Tosca code for Neutral file when importing Neutral file. Neutral files were written properly, but could not read past first analysis manager case

#### Interfaces - NX Nastran

- Added support for NXN 6.0 Advanced nonlinear datablocks for CQUAD8, CTRIA6
- Fixed problem reading the Nastran f06 file when contact separations (SEPDIS) were requested which caused Femap to go into an infinite loop which could end without ending the FEMAP process.
- Fixed BCTPARAM NCHG to allow zero to be written.
- Made NXSTRAT ICMODE default solution dependent.
- Fixed problem writing BCTSET when using the Portion of Model to Write option in the NASTRAN Bulk Data Options section by evaluating the group before the case control is written.
- Fixed problem when writing Nastran files when Improve Single Field Precision option was on in File, Preferences. Was writing too many real fields when creating CONM2 entries

#### Interfaces - Nastran

- Fixed import of NSM for PBEAML and PBARL.

#### Interfaces - Dyna

- Fixed problem writing LS-Dyna nodal velocities that sometimes caused Femap to write loads improperly
- Fixed improper \*SECTION\_SHELL ELFORMIDs for formulations of shell elements. If a formulation below "4..C0 Triangular" on the drop-down list was used, the formulation actually written was off by 1.

#### Interfaces - ABAQUS

- Fixed problem writing node groups using the DEFINE command. Femap was always writing element sets when writing FEMAP groups as sets.

#### Interfaces - Geometry

- Added missing Solid Edge Moniker code which fixes matching of previous solid/assembly when updating during read

- Enabled “Read Inactive Layers”, “Points”, “Curves”, “Surfaces” and “Bodies” options to CATIA V5 translator. Previously, these were in the translator, but not available to turn on and off.
- Several issues have been resolved in the CATIA V4, CATIA V5, Pro/Engineer, IGES, STEP, and Parasolid geometry interfaces

## **Meshing**

- Fixed reporting of problems when meshing fails in certain instances. Previous versions of Femap reported the Node ID where it failed, but in v10 and above meshing the mesh is not saved unless it actually succeeds. Therefore the node IDs Femap was reporting do not exist, thus now the coordinates where the failure occurred are reported instead.
- Fixed problem when using new meshing to mesh curve-only boundary surface where no mesh sizes were set on the curves. Both mapped and free meshes were not working as expected
- Fixed problem in new meshing when meshing surfaces that had associativity to nodes that did not exist.
- Fixed problem of “Midside Nodes” and “Midside Nodes on Geometry” options not persisting between surface meshing commands.

## **Materials and Properties**

- Fixed issue of shear center offset values swapping on End B of a non-tapered beam after Shape button was pressed, but no changes were made in the Cross Section Definition dialog box.
- Fixed issue of the Reference Point being greyed in the Cross Section Definition dialog box when creating NASTRAN sections (PBEAML and PBARL).

## **User Interface**

- Fixed issue in output transformation dialog boxes where the main dialog boxes were not hidden when trying to select a vector, making it very difficult to choose a vector graphically from the screen

## **Preferences**

### **Library/Startup**

- Corrected a problem that caused FEMAP to unexpectedly close when trying to open a new model if a startup basic script was set to be run on a new model after all current models had been closed.

## **API**

- Fixed API docs for parametric space and added missed methods, HasPole(), RationalParamToXYZ()

# ***FEMAP v10.0.1 New Features and Corrections***

## ***Updates and Enhancements***

### **Connection Properties, Regions, and Connectors**

- Added ability to have zero (0) as the rigid reference node for NXN SOL601.

### **Groups and Layers**

- Improved “Group, Operations, Generate Solids” to also include elements on the surfaces, curves and points of solids

### **GUI - Dockable Panes**

#### Data Table

- Added “Save to a File” command
- Added “Save Rows” command to context sensitive menu.

### **Properties**

- Added “Section Evaluation” option in “Cross Section Definition” dialog box for Beam, Bar, and Curved Beam properties.
- Added PBEAML/PBARL option to “Section Evaluation” for use with PBEAML/PBARLs properties.

### **API**

- Added InsideXYZ to Surface Object

## ***Corrections***

### **Connection Properties, Regions, and Connectors**

- Fixed issue in BCTPARAM REFINE default.

### **Groups and Layers**

- Corrected problem in Group, Operations, Generate Superelements. Previously, the command included elements that touched the boundary of a superelement in the residual group rather than in the superelement group.

### **GUI - Dockable Panes**

#### Meshign Toolbox

- Added ability to auto compress loads,bcs, connection regions then delete mesh in the Meshing Toolbox.

#### Program File

- Corrected problem that caused error message if you tried to save a program file with no filename extension, and without changing the file type on Windows XP. Now properly adds .PRO

## **Interfaces - Nastran**

- Fixed issue writing initial conditions from the master case when all loads were in subsequent subcases.

## **Loads and Boundary Conditions**

- Updated “Load, Expand” and “Constraint, Expand” to default to “Compress” if expanded loads/ constraints are in the active set, otherwise defaults to “Expand”.

## **Listing**

- Updated the List Destination dialog box to show longer filenames
- Fixed problem in List Surface that caused some surfaces with a “linked” meshing approach to list extra values in addition to the Linked surface ID.
- Updated “List, Geometry, Curve” to list points on all curves connected to solids, not just straight lines.

## **Meshing**

- Fixed problem in merging nodes that randomly caused some solids to fail hex meshing

## **API**

- Updated API Type Library to return specific interfaces rather than generic IDISPATCH interfaces - should help programming in Python and Matlab

# ***FEMAP v10.0 New Features and Corrections Updates and Enhancements***

## **Windows Vista**

- FEMAP is now supported on 32-bit and 64-bit versions of Windows Vista. Many issues from previous “unsupported” versions of FEMAP with regards to Windows Vista, such as entity picking and proper use of the Model Info tree have been addressed.

## **Analysis Manager**

- Added Analyze Multiple option. This accesses a multi-select dialog box which allows you to pick any number of Analysis Sets and run them one after another.

## **Connection Properties, Regions, and Connectors**

- Updated Connection Regions to support 2-D contact in NX Nastran Solution 601.

### Connection Property - NX Linear tab

- Moved Normal Penalty Factor and Tangential Penalty Factor from the Contact Property (BCTPARAM) section to the Common Contact (BCTPARAM) and Glue Parameters (BGPARM) section.
- Moved Shell Z-Offset from Glued Contact Property (BGSET and BGPARM) section to Contact Property (BCTPARAM) section.
- Removed Penalty Factor from Glued Contact Property (BGSET and BGPARM) section.
- Replaced Num Allow Contact Changes with Convergence Criteria and Num For Convergence in the Contact Property (BCTPARAM) section. Together, these two values create the NCHG field on the BCTPARAM entry.
- Added Contact Inactive to the Contact Property (BCTPARAM) section. Creates the CSTRAT field on the BCTPARAM entry.
- Added Penalty Factor Units to Common Contact (BCTPARAM) and Glue Parameters (BGPARM) section. Creates the PENTYP field on the BCTPARAM or PGPARM entry.

### Connection Property - NX Adv Nonlin tab

- Added Glued Contact Property (BGSET) section with Extension Factor option. Extension Factor enters a value in the EXTi field specified on the BGSET entry for the contact pair “i”. Specifies an “extension factor” for the target region.
- Removed the Time Activation section and moved Birth Time and Death Time options to the General section.
- Added Friction Delay option to Standard Contact Algorithm section.
- Moved all options found in the Rigid Target Contact Algorithm section except Normal Modulus to a the Old Algorithm (RTALG=1 on NXSTRAT) section of the NX Adv Nonlin Rigid Target Algorithm dialog box, which is accessed by clicking the Rigid Target Options button. Normal Modulus is found in Common Options.

- Added Penetration Cutback and Max Penetration options to the Old Algorithm (RTALG=1 on NXSTRAT) section of the NX Adv Nonlin Rigid Target Algorithm dialog box.
- Added Max Tensile Contact Force (TFORCE), Max Sliding Velocity (SLIDVEL), Oscillation Check (OCHECK), Contact Gap (GAPBIAS), and Offset Method (OFFDET) options to the Current Algorithm (RTALG=0 on NXSTRAT) section of the NX Adv Nonlin Rigid Target Algorithm dialog box.

#### Connection Property - NX Explicit tab

- Renamed Rigid Contact Algorithm section to Old Rigid Contact Algorithm section.
- Added Current Rigid Target Algorithm section with Max Sliding Velocity (SLIDVEL), Contact Gap (GAPBIAS), and Offset Method (OFFDET) options.

#### Entity Select dialog box

- Added “Combined Curves” options (Default, All Points/Curves, Points/Curves Eliminated by Combined Curves, and Combined Curves Only) to the Pick Menu in the standard Entity Selection dialog box. Only one mode can be selected at any given time.
- Added “Boundary Surfaces” options (Default, All Curves/Surfaces, Curves/Surfaces Eliminated by Boundary, and Boundary Surfaces Only) to the Pick Menu in the standard Entity Selection dialog box. Only one mode can be selected at any given time.
- Added “Add Connected Fillets” option to the Pick Menu in the standard Entity Selection dialog box.
- Added “Add Tangent Surfaces” option to the Pick Menu in the standard Entity Selection dialog box.
- Updated direction of mouse wheel for Query Pick list to follow direction of mouse wheel.

#### Functions

- Added dynamic XY plotting of functions to the Function Definition dialog box.

#### Geometry

- Added Geometry, Curve - From Surface, Offset Curve/Washer command.
- Added Geometry, Curve - From Surface, Pad command.
- Added Geometry, Curve - From Surface, Point to Point command.
- Added Geometry, Curve - From Surface, Point to Edge command
- Added Geometry, Curve - From Surface, Edge to Edge command.
- Added Geometry, Surface, NonManifold Add command.
- Added Geometry, Surface, Recover NonManifold Geometry command.
- Added Geometry, Midsurface, Offset Tangent Surfaces command.
- Added “Measure Distance” icon button to Geometry, Midsurface, Automatic command
- Added “Ok to Consolidate Properties by Thickness?” question to Geometry, Midsurface, Assign Mesh Attributes command after the material has been chosen
- Added “Cleanup Mergable Curves” option to Geometry, Solid Stitch command

- Added Modify, Update Other, Solid Facetting command.
- Added option to Modify, Project, Point along Vector and Modify, Project, Node along Vector commands to project in both directions along the vector.

## **Groups and Layers**

- Improved Group, Operations, Add Related Entities to include coordinate systems used as definition coordinate systems for Coordinate Systems in the selected group and include reference nodes on beams when the nodes are related to elements, properties, or materials in the selected group.

## **GUI - Toolbars**

### Panes Toolbar

- Added Meshing Toolbox icon

### Curves on Surfaces Toolbar

- Added Curve Washer, Curve Pad, Split Between Points, Split Point to Edge, and Split Edge to Edge icons.
- Updated Curve Split at Points icon to be Curve Split at Locations icon.

### Select Toolbar

- Improved Select Related mode to include coordinate systems used as definition coordinate systems for other selected Coordinate Systems
- Improved Select Related mode to include reference nodes on beams when the nodes are related to elements, properties, or materials

## **GUI - Dockable Panes**

### Meshing Toolbox - new for version 10

- Added Entity Locator
- Added Feature Suppression Tool
- Added Feature Removal Tool
- Added Combined/Composite Curve Tool
- Added Combined/Boundary Surface Tool
- Added Mesh Sizing Tool
- Added Mesh Locate Tool
- Added Mesh Quality display options.

### Data Table

- Added “Transformed To” capability for listing nodal and elemental output.
- Updated using Show When Selected. Entities already chosen will now highlight when Show When Selected is turned on and un-highlight when turned off.

### Model Info Tree

- Updated using Show When Selected. Entities already chosen will now highlight when Show When Selected is turned on and un-highlight when turned off.

#### Entity Editor

- Added “Transformed To” capability for displaying nodal output and elemental output.
- Added support for Load Definition and Constraint Definition information.
- Added support for Rotor Region information.
- Added support for Layup ID information.

#### Status Bar

- Added the ability to customize what entity types appear on the Status Bar.

### Interfaces - FEMAP Neutral

- Removed option for choosing Binary and Formatted in File Format Section. All Neutral files are Formatted.
- Updated Neutral Read and Write for v10.0 changes

### Interfaces - Nastran

- Added support for “-2..Automatic(Statics)” for INREL to the PARAM section of the NASTRAN Bulk Data Options dialog box.
- Added support for SUPORT1 to the Boundary Conditions dialog box.
- Added support for Fastener elements (CFAST) and properties (PFAST).
- Added support for spring/damper elements (CELAS1 and CDAMP1) which use a property (PELAS and PDAMP). Controlled via the Spring/Damper element formulation.
- Added Beam/Bar Cross-Section Dimensions as comments when Nastran input file is written. When a Nastran file with these comments is imported into FEMAP, the Beam/Bar Cross-Section Dimensions will be filled-in.
- Added support for reading Nastran Free-Field Auto Continuation (long entries with or without embedded continuation fields and large-field free field).
- Added support for reading CMETHOD from the case control

### Interfaces - NX Nastran

- Added support for triangle and quadrilateral axisymmetric elements (CTRAX3, CTRAX6, CQUADX4, and CQUADX8), which were new for NX Nastran version 6.
- Added option for “Extended Solution Status Monitoring”. Writes SYSTEM(442)=-1 to the \*.dat file. This option is on by default and the feedback it produces is used by the NX Nastran Analysis Monitor.
- Added BOLTFAC to the PARAM section of the NASTRAN Bulk Data Options dialog box.
- Added “Gaps as Contact” to the “Plate, Beam, and Rigid” section of the NASTRAN Bulk Data Options dialog box. Writes out a BCSET entry in Case Control. Also added support for reading SYSTEM CELL 412 in the System Cell field of the Analysis Manager. This is the override to have gaps written as normal gaps even when using Contact.

- Added Support for CQUADR and CTRIAR Composite Stress and Strain output from the op2.
- Added “Large Strain Form” (ULFORM), “Incompatible Mode for 4 Node Shells” (ICMODE), “Max Disp/Iteration” (MAXDISP), and “Drilling DOF Factor” (DRILLKF) options to the Analysis Options section of NXSTRAT Solver Parameters dialog box.
- Added “Bolt Force Increments” (BOLTSTP), “Convert Dependency to True Stress” (CVSSVAL), and “Allow Element Rupture” (XTCURVE) options to the Other Parameters section of NXSTRAT Solver Parameters dialog box.
- Added “Line Search Lower Bound” (LSLOWER) and “Line Search Lower Bound” (LSUPPER) options to the Line Search Setting section of NXSTRAT Iterations and Convergence Parameters dialog box.
- Added “Do not allow Consistent Contact Forces” (TNSLCF) and “Use Old Rigid Target Algorithm” (RTALG=1) options to the Contact Control section of NXSTRAT Iterations and Convergence Parameters dialog box.
- Changed “Segment Type” (CSTYPE) options from “0..Old” and “1..New” to “0..Linear Contact” and “1..Element based” in the Contact Control section of NXSTRAT Iterations and Convergence Parameters dialog box.
- Added support for 2-D Contact, usually used in analysis with axisymmetric elements.
- Added support for Glued Contact.
- Added Contact Control section to NXSTRAT Solver Parameters dialog box. Added “Segment Type” (CSTYPE) and “Use Old Rigid Target Algorithm” (RTALG=1) to this section.
- Added Other Parameters section to NXSTRAT Solver Parameters dialog box. Added “Convert Dependency to True Stress” (CVSSVAL) and “Allow Element Rupture” (XTCURVE) options to this section.
- Added support for Initial and Final contact separation distance, which were new for version 6.0.
- Added reading of the SVDSPC from the Nastran command.

## **Interfaces - Ansys**

- Added support for MPC184 rigid beam/link elements. Specified using element Formulation.
- Added support for output from rigid elements (Rigid Axial Force, Rigid Y Moment, Rigid Z Moment, Rigid Y Shear Force, Rigid Z Shear Force, and Rigid Torsional Moment)

## **Interfaces - DYNA**

- Added support for 10-noded tetrahedral elements. Also, added “16..10 Node Tetrahedron - EQ 16” and “17..10 Node Composite Tetrahedron” formulations.
- Added support for Rigid and Interpolation elements. Writes \*CONSTRAINED\_NODAL\_RIGID\_BODY (Rigid) and \*CONSTRAINED\_INTERPOLATION (Interpolation) entries.

## **Interfaces - Geometry**

- Added support for direct geometry import of SolidWorks parts and assemblies. Supports from SolidWorks 2000 - SolidWorks 2009.

- Changed CATIA V5 direct geometry translator. CATIA V5 versions R7 to R18 are supported. Reading of CATParts and CATProducts created using versions prior to R7 is not supported
- Added support for Parasolid 20.0
- Added support for Solid Edge with Synchronous Technology (version 21)
- Added support for NX 6
- Added support for Pro/Engineer Wildfire 4
- Added support for ACIS 19, Service Pack 1

## **Loads and Boundary Conditions**

- Modified Directional Pressure loads to no longer be affected by choosing a particular element face.
- Added option to apply nodal constraints using the “-1..Use Nodal Output System” option when choosing a coordinate system.
- Updated Load Definitions. If a geometry load is applied to multiple curves at the same time, a double load will not be created on shared nodes.
- 

## **Meshing**

- Added 3 new patterns to Mesh, Editing, Interactive
- Added “Offset from Reference Point” option to Modify, Update Elements, Line Element Offsets.
- Added “Spring Elements” option to the Connection Type section of the Mesh, Connect, Unzip and Mesh, Connect, Coincident Link commands.
- Updated Mesh, Remesh, Convert Facets command to include capability to associate facets/nodes with the original geometry.
- Removed “Quad Mesh Layer Options” option from Mesh, Mesh Control, Size on Solid.
- Added “Suppress Short Edges” option to Mesh, Mesh Control, Size on Surface.
- Removed “Quad Mesh Layer Options” option from Mesh, Mesh Control, Size on Surface. This capability was improved and is now the Quad Edge Layers “mesh attribute” which can be specified before meshing using Mesh, Mesh Control, Attribute on Surface or during the meshing process using Mesh, Geometry, Surface.
- Added and updated many options found in the Mesh, Geometry, Surface command.
- Added new options for meshing surfaces which have already been meshed.
- Added Initial Size Ratio option to the Automesh Solids dialog box.
- Updated Adjust Nodal Precision option is to be on by default.
- Added Recovery Mesher (Use only if Standard Mesher fails) option to the Solid Automeshing Options. This option should ONLY be checked if the standard mesher has already failed.
- Added Update Data Table with Mesh Quality option to the Solid Automeshing Options.
- Updated the feedback sent to the Messages window during tet-meshing. FEMAP will produce status messages while the tetrahedral meshing is occurring and provide feedback on element numbers and quality.
- Added Offset from Reference Point to Modify, Update Elements, Line Element Offsets
- Updated Mesh, Extrude, Element Face command to automatically delete plot-only elements that it creates on the selected element faces.

## **Mesh Associativity**

- Added the Modify, Associativity, Automatic command to attempt to automatically associate existing mesh to geometry.

## **Output and Post-Processing**

- Added Transformation buttons for Deformation Vector and Contour Vector in the Select PostProcessing dialog box of the View, Select command. These allow for “on-the-fly” transformations of current output vectors.
- Added several options to the Model, Output, Transform command.

## **Properties**

- Modified the Weld property to be the Weld/Fastener property.
- Added switch to specify if the property will used with CWELD (Weld) or CFAST (Fastener) elements. All Weld property inputs are the same as before.
- Added property inputs for CFAST (Fastener) elements.

## **Tools**

### Check, Coincident Elem...

- Added choice between Quick Check (Just Corners) and Full Check.
- Added Check Rigid Element option.

### Check, Distortion...

- Added “Nastran Warping” and “Combined” Element Checks
- Added Permanent and Reset buttons to the Check Element Distortions dialog box.

## **User Interface**

- Implemented support of the Astroid 3D controller from Spatial Freedom.
- Added support to create GIF, Animated GIF, TIFF, and PNG files when using File, Picture, Save command.
- Improved Curve and Surface facetting to more accurately display geometry.
- Renamed Weld Elements and Properties to Weld/Fastener
- Added automatic database recovery from failure during save (same as manual from File Preferences, but asks automatically when you start FEMAP)
- Added capability when reading files to detect that the file is open and locked by another application and then give option to Retry or Cancel the read.
- Added automatic Window Regenerate to end of Model, Load, Expand and Model, Constraint, Expand commands.
- Improved length-based spacing, distance along, and other length-based curve functions to perform better when highly nonlinear parametric domains exist on curves.

## Preferences

### Views

- Removed preference for Autoplot Created/Modified Geometry. FEMAP needs to do this in order to function properly.

### Render

- Added preference for XOR Picking Graphics.
- Added preference for Dialog Refresh.
- Added preference for Block Size.

### User Interface

- Updated how Load Layout works when loading a layout from an older version of the software into a newer version. If a \*.LAYOUT file is loaded into a newer version of the software, only “Shortcut Keys” and “User Commands” will be updated, while “Menus and Toolbars” and “Panels” will not.

### Geometry/Model

- Added “Construction Geometry - when used” preference.
- Added Output Orientation button which accesses the Current Output Orientation dialog box.
- Added Element Distortion button which accesses the Element Distortion Preferences dialog box.
- Added Pre-v10 Tet Meshing and Pre-v10 Surface Meshing preferences.

### Interfaces

- Added Improve Single Field Precision option.

### Colors

- Added preference for setting the default color of Combined Curves.

### Spaceball

- Added preference for Print Debug Messages.

## API

- Added NasExecSolutionMonitor, NasBulkInrelVal, NasBulkGapsAsContact, NasBulkBoltFact, and NasBulkBoltFactVal to AnalysisMgr object
- Added NasNXStratMaxDisp, NasNXStratBoltstp, NasNXStratCvssval, NasNXStratXtcurve, NasNXStratRtalg, NasNXStratTnslcf, NasNXStratDrillkf, NasNXStratLslower, and NasNXStratLsupper to AnalysisMgr object.
- Added InternalToBoundary and InCombinedCurve to Curve object.
- Added InternalToBoundary, attrTopology, attrMesher, attrMappedLevel, attrMapSubdivisions, attrMapEqualOnly, attrMapAltTri, attrMapRightBias, attrMapSplitQuads, attrMapAngleDeviation, attrMapMinCornerAngle, attrMidsideGeom, attrMidsideAngle, attrMinBetween, attrMaxAspect, attrQuickCutNodes, attrQuickCutAngle, attrSmoothLaplacian, attrSmoothIter,

attrSmoothTolerance, attrConnectEdgeNodes, attrConnectEdgeNodeTol, attrOffsetFrom, attrInitialized, and attrPostMeshCleanup to Surface object

- Added RotateCSys, TransformDeformMode, TransformDeformCSys, TransformDeformX, TransformDeformY, TransformDeformZ, TransformNodalMode, TransformNodalCSys, TransformPlateMode, TransformPlateCSys, TransformPlateDOF, vTransformPlateVector, TransformPlateVector, TransformSolidMode, and TransformSolidCSys to View object.
- Added Info\_OrientSolidIsoOutput, Info\_OrientSolidAnisoOutput, Info\_OrientSolidHyperOutput, Info\_OrientTria3StressOutput, Info\_OrientTria3StrainOutput, Info\_OrientTria3ForceOutput, Info\_OrientTria6StressOutput, Info\_OrientTria6StrainOutput, Info\_OrientTria6ForceOutput, Info\_OrientQuad4StressOutput, Info\_OrientQuad4StrainOutput, Info\_OrientQuad4ForceOutput, Info\_OrientQuad8StressOutput, Info\_OrientQuad8StrainOutput, Info\_OrientQuad8ForceOutput to the Global Properties of the main FEMAP application object.
- Added Pref\_ReadTabSize, PickBoundaryInternalMode, and PickCombinedCurveInternalMode to the Global Properties of the main FEMAP application object.
- Added SelectID, NextInSet, FirstInSet, and Count methods to the Common Entity Properties object
- Added OutputVectors method to the OutputSet object
- Added AnalyzeMultiple method to AnalysisMgr object
- Added GetMeshLoc, GetMeshLocXYZ, IsSmoothEdge, Surfaces, SurfacesAsSet, ElementsAsSet, NodesAsSet, Normal, IsCombinedCurve, GetCombinedCurves, CombineCurves, CombineCurvesAsSet, and Facets methods to Curve object
- Added AddOutput method to DataTable object
- Added GetCentroid, GetEdgeNodes, GetFaceNodes, and IsParabolic methods to Elem object
- Added Add method to Group object
- Added GetPly, SetPly, GetAllPly, and SetAllPly methods to Layup object
- Added InCombinedCurve, NodesAsSet, Curves, CurvesAsSet, and SurfacesAsSet methods to Point object
- Added SharedDelete, JumpToEnd, Size, Time Created, TimeWritten, and TimeAccessed methods to Read object
- Added RemoveNotCommon, RemoveNotCommonToGroup, RemoveGroup, Debug, IsSetAdded, ConvertToAllSurfaces, ConvertToBoundarySurfaces, ConvertToBoundarySurfacesOnly, ConvertToInternalSurfaces, ConvertToAllCurves, ConvertToCombinedCurves, ConvertToCombinedCurvesOnly, ConvertToInternalCurves, IsArrayAdded, HasCommon, and RemoveArray methods to Set object
- Added CurvesAsSet, SurfacesAsSet, ElementsAsSet, and NodesAsSet methods to Solid object
- Added Current method to Sort object
- Added NormalAtXYZ, NormalBox, BoundarySurfaces, AdjacentSurfaces, BoundarySurfacesAsSet, AdjacentSurfacesAsSet, CurvesAsSet, PointsAsSet, EndPointsAsSet, ElementsAsSet, NodesAsSet, and Solid methods to Surface object.
- Updated Curves and Surfaces methods of Solid Object.
- Updated Curves and Points methods of Surface Object.
- Added feAppModelDefragment
- Added feGetElementEdges
- Added feElementFreeEdge

- Added feElementFreeFace
- Added feSurfaceNormalDeviation
- Added feAddToolbarSubmenuSubmenu
- Added feBoundaryAddSurfaces
- Added feCoordVectorPlaneIntersect
- Added feSurfaceConvert
- Added feGroupMoveToLayer
- Added feBoundaryFromPoints
- Added feAutoMeshAssociativity
- Added feSolidStitchNoCleanup
- Added feAppVersion
- Modified feFilePictureSave to support new file types available in File, Picture, Save.
- Modified feOutputTransform to support new options available in Model, Output, Transform.
- Modified feRename to allow renumbering of Layups, Connectors, Regions, Connection Properties, Functions, Analysis Sets, and Layers.
- Modified feDelete to allow deleting of Layups, Analysis Sets in the Analysis Manager, Connection Properties, and Connectors.

## ***Corrections***

### **Licensing**

- Corrected problem that caused a hidden FEMAP process to remain after you exited with File, Exit command if you were using network licensing and did not have a valid license. FEMAP was checking for a license during exit and hung the process.

### **Analysis Manager**

- Fixed problem when a Nastran Static Analysis Set is created, then the Analysis Type is changed to Normal Modes. FEMAP was not removing the Load Set and Initial Conditions boundary conditions, which are not available for Normal Modes analysis.

### **Connection Properties, Regions, and Connectors**

- Fixed problem migrating Contact properties to Connection Properties. The Contact properties for NX, Sinda, Ansys, Marc were not being migrated properly.
- Fixed problem reading Connection Regions from the neutral file. The ID offsets were ignored.
- Fixed problem when renumbering Coordinate Systems. The reference csys in Connection Regions were not being renumbered.
- Fixed problem when renumbering Materials. The Material references in Connection Properties were not being renumbered.
- Fixed problem when renumbering Load Sets. The Load Set references in Rotor connection regions were not being renumbered.

## Groups and Layers

- Corrected problem with Group->Operations->Add Related that added extra entities into each group if you selected multiple groups for a single command

## GUI - Dockable Panes

### General Pane corrections

- Corrected how entities are deleted from the Model Info tree when pressing the delete key. Previously they were not using the proper procedure so undo did not work when using delete key.

### Model Info tree

- Fixed problem deleting multiple Data Surfaces from the tree when one was loaded in the Data Surface Editor. Femap asked if it was "OK to delete" for each Data Surface instead of once for all selected
- Corrected several issues with next/prev in Model Info tree. When deleting entities, did not properly show/hide prev. Changed titles of next/prev from IDs to Next/Previous. Fixed proper hide/show of Next/Prev as you moved up and down list. No longer show CSys 0,1,2 always - just at the beginning. Added functionality of double clicking Next/Prev to move in list, not just right mouse menu.

### Data Surface Editor

- Fixed problem deleting multiple Data Surfaces from the tree when one was loaded in the Data Surface Editor. Femap asked if it was "OK to delete" for each Data Surface instead of once for all selected
- Fixed problem interpolating using the arbitrary data surface when using a coordinate system other than Global Rectangular
- Changed setting of local CSys so coordinate picking in dialogs is in that local CSys.

### Entity Editor

- Corrections to entries in Editor Help for Nastran.
- Fixed problem editing a RSPLINE element from Entity Editor, where the element lists were being mishandled.
- Fixed problem editing a Geometric Boundary Condition from the Load Definition.

### Program File

- Stopped remembering "Previous Commands" while program file is running, so "Previous Command" reruns program if run from toolbar.
- Multi-select list boxes did not properly record/playback if a pick was made to clear the box after a selection was made and focus changed. This occurred in commands like Model, Load, Combine where more load sets and factors were repeatedly picked without leaving the dialog.

## Interfaces - FEMAP Neutral

- Fixed error FEMAP v9.3+ unable to read neutral files from versions between v4.1 and v5.0 if they contained laminate properties.
- Only write TMG records to neutral file when writing the analysis model (not geometry model) and only if no group

## Interfaces - Nastran

- Fixed problem requesting Random output. Added support for NX5.0 and MSC 2004 NORPRINT, RPRINT, RPUNCH. This caused problems in FEMAP since random output was written to the f06 file, which causes Femap to skip reading of the op2 file completely.
- Fixed problems reading the op2 file when unsupported composite output existed. FEMAP sometimes could skip supported output in addition to the unsupported output.
- Enhanced FEMAP to support reading up to 50,000 time steps from the f06 and now issues a error when exceeding the number of supports steps.
- Changed entry length limit from MAX\_STR\_LEN to 1000.
- Fixed problem when skipping the UM field on RBE3's.
- Fixed problem reading AUTOSPC,NO that caused Femap to write out two AUTOSPC entries when file was exported out again.
- Corrected reading of PCOMP if all plies are specified in a single column. Previously aborted reading as soon as it encountered a missing ply.
- Corrected several issues with checksum on Nastran files when using INCLUDE files - had a problem with spaces at the front or back of a line, tabs and blank lines.
- Corrected reading of Nastran OP2 file from Design Optimization analyses. Previously some results data could be missed.
- Fixed problem when writing only entities in a group to Nastran. No geometry based BC we being written.
- Fixed problem writing Design Optimization constraints for CTRIA elements.
- Corrected problem reading op2 files with time steps smaller than 1E-7. Changed to 1E-15, so FEMAP can read the time steps it can write.
- Fixed reading of PWELD elements which were reading properly, but issuing error messages indicating they had been skipped.
- Fixed problem writing LOAD card. When applying only a GRAV load an extra load field was written on the LOAD entry.
- Fixed problem where density for MAT4, MAT5, MATHP, MATHE, MAT10 were not being converted with WTMASS during import of Nastran files.
- Corrected problem where Femap was incorrectly reading End B of a PBEAML.
- Added error if Initial Yield Stress was zero for a plastic material using Von Mises or Tresca criterion.

## **Interfaces - NX Nastran**

- Fixed problem where Femap was incorrectly finding ADINA messages C O R R E S P O N D I N G D I S P L A C E M E N T and L O A D V E C T O R M U L T I P L I E R in the f06 and causing the op2 to fail to read.
- Fixed problem in SOL 701, where TSTEP was not written when only an Initial Conditions boundary conditions set was chosen.
- Fixed problem writing BOLTFOR in SOL 601. FEMAP was using the dynamic loads set rather than the one specific to bolt load, which is setup when writing the case control.
- Fixed problem writing BCTPARAM entry. REFINE and INIPENE were being written to the glue set. Only affected BCTPARAM when no other options were written.
- Changed reading of NXN results. The output destination defined in the analysis case will now be used to determine where FEMAP should read results from. Warnings will still be read from f06 but if PRINT is not explicitly selected then results will be read from other output files regardless if any valid output exists in f06 file, expect XY PRINT data, which will still be read.
- Suppressed writing of METHOD field of TSTEPNL.

## **Interfaces - NEi Nastran**

- Fixed the problem where FEMAP was not writing out the proper DPHASE entries for frequency response analysis when translating to NEi Nastran

## **Interfaces - Ansys**

- Corrected problem writing Transient, NLTransient, Transient heat transfer and Frequency response. A solve command was being written at the end of these solutions which caused Ansys to sometime overwrite the good results that were calculated from the analysis.
- Corrected a problem writing elemental convection loads, where the bulk temperature was written to the wrong face.
- Fixed problem reading Ansys elements when no real constants were required for that element type.

## **Interfaces - Abaqus**

- Fixed problem reading element continuation lines when the data line contained a single fixed format item.

## **Listing**

- Corrected listing of Geometry loads to list in definition CSys instead of global CSys
- Corrected "Curve using Point" listing method to work properly for all solid curves. Previously, only selected curves that referenced points in the point list.
- Corrected problem that caused listing of Constraint Definitions to fail if you had the List, Destination set to Printer.

## Loads and Boundary Conditions

- Fixed problem setting nodal output Csys to 1 or 2 for constraint expansion when Arbitrary in CSys option is used.
- Fixed problem when multiple Constraint Definitions were defined on the same geometric entity. Constraints are deleted but the Constraint Definition was not updated.
- Fixed problem expanding nodal temperatures with a data surface. If load evaluated to zero it was not being saved properly.
- Fixed problem editing face of a Surface Load from the Load Definition.

## Meshing

- Fixed problem where a mesh consisting of parabolic beams is created, then converted to linear elements. The converted linear beams would not be written to NX Nastran.
- Corrected an issue introduced in v9.3.1 that prevented Modify, Move By, Offset Element from working.

## Tools

### Check, Coincident Curves

- Updated Tools, Check, Coincident Curves command to properly renumber boundary surfaces and update the reversed state when they contain curves that are being merged. Previously the boundaries were deleted.

### Check, Sum Forces

- Corrected issue where pressure loads were being summed incorrectly. This error would occur when applying corner pressures to the triangular faces of solid tetrahedral or wedge elements.

## User Interface

- Corrected a problem that could leave the progress bar displayed after aborting a mesh on a bad surface/boundary.
- Fixed Element checking to automatically zero extra nodes if fixup is allowed - previously prevented copying rigid elements that had a second node set.
- Expanded width of strings allowable in error, Print... so long errors like in Measure Distance do not get truncated.
- Removed error messages for zero length elements that are valid for that element type
- Stop ESC key from ending Message Boxes that don't have the Cancel button - previously ended Yes/No boxes with Yes.
- Modified custom tools menu so that it processes like a regular command and the tree gets updated

## Preferences

- Fixed a problem when a user chooses a new library. If the library fails to load because it is the wrong type Femap was still saving the bad library path to the preferences.

## **API**

- Corrected a problem with API method `feRenumber` and `feRenumberOpt` when you tried to renumber Solids or Volumes that would corrupt the database (did not renumber the `Solid_Volume` records)
- Corrected `GetTitleIDList` so that it can retrieve the global coordinate system IDs and titles.
- Corrected problem in `DataTable` API that created extra rows if you called `AddColumn` with duplicate IDs in the array that you passed.
- Corrected problem with `feMoveTo`. New coordinates were previously required to be in `Global Coordinates`, not in the specified coordinate system as documented.
- Fixed API problem where the `Set` object did not persist in some cases when using the `select` or `add` methods.
- Fixed several problems which caused the `Outline` property (shape of the beam property when using a `General Cross-Section`) of the `Property` object to not work.
- Fixed problem in `feMoveOffset` that caused it to fail if you did not use `Set 1`.

# ***FEMAP v9.3.1 New Features and Corrections***

## ***Updates and Enhancements***

### **64-Bit Version**

- Upgraded FEMAP to run on 64-bit operating systems.

### **Database and Performance**

- Added function to compute memory usage percent. Previously, you would need to specify a number of parameters in the preferences based on a certain amount of memory.

### **Geometry**

- Added "Copy in Same Location" option to all geometry copy commands
- Improved Solid Add to work with various combinations of adjacent solids that previously did not fully add because of the order they were combined.
- Updated Radial Copy of Points/Curves/Surfaces to do either spherical or cylindrical about a vector
- Updated Geometry, Scale, Solid and Modify, Scale, Solid commands to allow scaling in 3 individual directions instead of using 1 uniform scale factor.

### **Groups**

- Added option to Group, Operations, Generate Material, Generate Property and Generate ElemType to create either one group with all selected entities or multiple groups one for each selected entity.

### **GUI - Dockable Panes**

#### Data Table

- Added access to the Data Table via the FEMAP API in order to create customized tables in the Data Table.

#### Data Surface Editor

- Added Messages indicating when location evaluated to zero.
- Added Table copy from Data Surface editor
- Added New interpolation commands for row column and to force weighted or bi-linear interpolation.

#### Model Info Tree

- Added Group commands to tree menus for Solids, Properties, and Materials
- Added Automatic Add to the Group Menu in Model Info tree
- Added support for editing Data Surface titles from the Model Info tree.
- Added context menu to the root of the Connections branch in Model Info tree.

#### Entity Editor

- Added Coefficient of Thermal Expansion to the Entity Editor and Data Table

## **Interfaces - FEMAP Neutral**

- Added *Read Groups* and *Read Views* options to File, Import, FEMAP Neutral command.

## **Interfaces - Nastran**

- Added reading CBUSH to ground.

## **Interfaces - NX Nastran**

- Added support for the Shell Thickness (OSHT1) output from Solution 601/701
- Added support for Linear Contact in Modal Analysis (SOL 103)

## **Interfaces - MSC Nastran**

- Added support for reading CTE on rigids
- Added support reading MSC RBAR1 as RBE2 and
- Added support reading RIGID=LAGRAN case control commands.

## **Interfaces - Ansys**

- Added support for reading major Poisson's ratio PRij from Ansys

## **Interfaces - Geometry**

- Added Support for Parasolid 19.0

## **Layups**

- Added Layup Viewer
- Added Total Thickness to the Layup Manager Dialog Box.

## **Listing**

- Added List, Output, Force Balance Interface Load command
- Added ability to list nodal output in a specified coordinate system to the List, Output, Results to Data Table command

## **Meshing**

- Added "Copy in Same Location" to all mesh copy commands
- Added 4 new patterns to Mesh, Editing, Interactive
- Added 1 new pattern to Mesh, Editing, Split
- Added Regenerate display at end of Mesh, Editing, Interactive command
- Added the Radial method to Mesh, Extrude... commands
- Added Bias to Standard Extrusion in the Mesh, Extrude... commands
- Updated Radial Copy of Nodes/Elements to do either spherical or cylindrical about a vector.

## **Tools**

### **Stress Wizard**

- Added the ability to choose an assembly made up of multiple solids for use with the Stress Wizard. The Connect, Automatic command is run after import with the default values for contact detection and Glued Contact. This allows for a static analysis to be run on many assemblies.
- Added the ability to change the material associated with any desired solids of an assembly in Step 1
- Added a button to Step 4 which allows the use of the View, Advanced Post, Dynamic Cutting Plane command.

## **User Interface**

- Added "32-bit" and "64-bit" version indicators to the Help About dialog
- Added Demo/Edu/Dealer strings to title bar
- Added Total and Available memory listings to List Model Info and Help About
- Cleanup leftover nodes/elements when surface mesh fails on planar surface
- Made OK the default button for the Coincident Node Preview dialog
- Made "Start Text"/"End Text" in analysis definition dialog boxes all fixed pitch font
- Supported EMDAC in addition to Wecan
- Updated UI for Rotation Center/Axis toolbar to properly show the top icon based on the rotation mode selected.

## **Preferences**

- Added bar to preferences for amount of cache used currently
- Added multi-model memory setting for OpenGL
- Added Spaceball Preferences Tab
- Updated preference to always read nonlinear stress/strain without asking to OFF by default.
- Updated Layout and Shortcut Key save/load to use XML format (\*.LAYOUT file) and allow for options in data to transfer

## **API**

- Added Data Table object to the API.
- Added BoundingBox methods to Curve, Surface and Solid objects
- Added CurrentID property to Set Object.
- Added GetFromSet and FindMaxMin methods to the Output object.
- Added feSelectOutput method to the application object
- Added feConnectAuto method for automatic connection generation
- Added feMeshAttachNodes
- Added GetOutputListAtSet, GetScalarAtNodeSet, GetVectorAtNodeSet, GetScalarAtElemSet and GetElemWithCornerSet to the Output object
- Added feOutputProcessConvert
- Added GetRowValues() to the Data table API

- Added CoordDialogMethod, VectorDialogMethod, PlaneDialogMethod parameters, feCoordPickByMethod, feVectorPickByMethod, fePlanePickByMethod methods and zCoordDefinition, zVectorDefinition and zPlaneDefinition lists.
- Added IsEmpty to Set object
- Added MaxNormalDeviation method
- Added MaxNormalDeviation method to the surface object
- Added MapOutputFromModelToLocation() to MapOutput object
- Added Total Thickness to the Layup object.
- Added feLicenseIsAvailable and feLicenseMethod
- Added AddAllExcept method to the Set object
- Added feFileReadNeutral2( ) API method
- Added feAppModelContents( ) api method
- Updated ApiVariantSize( ) to handle variants that were created by the WinWrap Basic Array statement
- Updated ArcCircleInfo method of Curve object to work with Solid curves
- Updated DataTable SetColumnPosition to be able to move columns before or after other columns

## ***Corrections***

### **GUI - Dockable Panes**

#### General Pane corrections

- Corrected how entities are deleted from the Model Info tree when pressing the delete key. Previously they were not using the proper procedure so undo did not work when using delete key.
- Corrected problem when Entity Editor and Model Info tree were in "stacked" configuration. When clicking on the Data Table while on "top" would activate the Entity Editor fields from behind.
- Corrected problem that added Header entity to selection after certain commands in the Model Info tree

#### Data Table

- Fixed sorting of CheckBox and ID..Title fields in DataTable. Previously sorted as text, not as their numeric values

#### Data Surface Editor

- Fixed problems using the Interpolate command. Negative values were not respected in some vector cases.
- Fixed problems calculating the tolerance used in locating points in the 2 point and multi point curve data surface.
- Fixed problem evaluating 4point bilinear and parametric surfaces.
- Fixed problem when creating DS with large number of rows > 40,000 that caused FEMAP to crash.
- Fixed problem reading neutral file of 2D tabular data surface.
- Fixed problem in undo when using Data Surfaces

#### Entity Editor

- Corrected a problem that caused the toolbar in the Entity Editor window to not contain part of a dialog box when you opened a dialog over it
- Fixed problem with the Analysis Type field from the output set object.
- Fixed problems with Contour Type and Contour Data Conversion controls in the entity editor for views.
- Fixed problem with the dependent rigid list in the editor and report window.

### **Interfaces - Nastran**

- Corrected problems used to read/write MATHE for Nastran.
- Corrected a problem with unit conversion of the rotational DOF values for CBUSH
- Fixed a number of Hyperelastic stress/strain issues - supported Grid/Gauss point locations for linear solids, added support for several element types/output locations
- Fixed problem loading the Advanced Load Set Options for Dynamic analysis dialog box. The problem caused the option for cluster around to be changed to spread around modes when entering the dialog box.

### **Interfaces - NX Nastran**

- Corrected issue with graying Rotor Dynamics Excitation order when switching to Fixed Reference System, but leaving the selected radio button which then generated invalid ROTORD. Also corrected default read for this field.
- Corrected a problem with writing wide-field versions of NXSTRAT, BCTPARA, BCTPARM and BGPARM. Depending on the number of parameters, you would not get the proper wide-field pair.
- Fixed problem introduced in FEMAP 9.3 that caused Gluing not to be written for SS heat and Transient heat.

### **Interfaces - NEi Nastran**

- Fixed the problem where FEMAP was not writing out the proper DPHASE entries for frequency response analysis when translating to NEi Nastran

### **Interfaces - Ansys**

- Corrected problem that caused FEMAP to write bottom location incorrectly for laminates.
- Corrected problem reading and writing the Ansys beam shear deformation constants SHEARZ, SHEARY.
- Fixed problem reading laminates from Ansys. FEMAP was not saving the layup.
- Fixed problem reading symmetric layup flag and adjusting bottom surface value with symmetric layup.

### **Interfaces - Abaqus**

- Corrected problem writing spherical coordinate system for \*TRANSFORM \* ORIENTATION also fixed reading of Cylindrical and spherical coordinate systems in these cards.

- Corrected problem reading elements when the property was defined on a different ELSET from the \*ELEMENT generation.
- Corrected the problem where FEMAP was not reading the DENSITY option from the \*BEAM GENERAL SECTION keyword.

## **Layups**

- Corrected problem where plies and global plies did not have material references renumbered when materials were renumbered
- Corrected a problem that caused bad output to be written if you had zero materials, pressed Compute, and did not have the Entity Info Window open.
- Corrected a problem that caused Material drop-down in Layup Manager to have duplicate copies of materials after you pressed "Load" to load a layup from the library

## **Listing**

- Corrected bug in List, Output, Results to Data Table that prevented "Select Similar Layer/Ply/Corner Vectors" working
- Changed listing of Beam cross section shapes to only list those dimensions that are used, and with the correct titles

## **Loads and Boundary Conditions**

- Corrected error when editing load definitions. If you had multiple loads in different definitions on the same Node/Elem/Geometry, then you edited the first definition, the loads in the other definitions were sometimes updated to be the same values.
- Fixed problem expanding elemental surface loads with a Data Surface, loads were never calculated when solid elements had faces on multiple loaded surfaces.
- Improved Delete, Model, Mesh to not delete loads and constraints on nodes that were on the boundary of the selected elements (also on other elements and therefore the nodes were not deleted). Previously everything was deleted from all nodes attached to the selected elements.
- Corrected a problem that prevented elemental Distributed Loads from being applied in the Global Z direction (worked in v9.2, broken in v9.3)

## **Meshing**

- Corrected a problem that could cause a mapped mesh on a surface to crash if certain patterns of curves were suppressed.
- Updated Hex Meshing to not create a new property if there is a Solid Property available, even if it is not active. Now works just like tet meshing

## **User Interface**

- Corrected a problem with the legend max/min on Beam Diagrams if a Group was displayed. The legend was calculated with Auto-Group, and the Beam Diagram Default Direction was set to one of the "Reverse End B" options.

- Corrected problem when Layers were defined to limit a group, they were not used to limit Solids that were included.
- Corrected a problem in Undo that could occur with Multiple consecutive Undos and multiple blocks per page in the cache.
- Changed Edit CSys to automatically reset the coordinate mode to at coordinates. Previously if you were in "On Node" or "On Point" you could not edit coordinate systems and simply hit return to get back the same locations.
- Corrected a problem that caused model to be lost if you ran out of disk space during a save which was prompted by File Exit.
- Corrected problem that caused automatic titles for property types that have shapes (Beams, Bars, Curved Beams...) to be Untitled if you did not define a shape
- Corrected error that caused FEMAP to hang if you typed an invalid value in the Nastran Output Request Destination
- Corrected a problem reading Optimization results - was previously labelling cases with the "before optimization" titles, but results were "after optimization". Now reads both before and after into separate cases.
- Corrected a problem that caused crash if you imported a CSV file with more items in the header than in the subsequent rows.
- Corrected a problem that allowed you to exit without saving (and lose your model) if you first cancelled a Save As
- Fixed error in V9.3 that left behind non-deletable but unattached nodes on triangular surfaces where it tried a fan mesh and failed.
- Fixed problem editing a spring element with BUSH formulation. The Element Dialog box that was being displayed did not have orientation or offsets available.
- Fixed Contour/Criteria buttons on Post Toolbar to automatically pick an output vector if none were previously selected.
- Prevent Freebody displays from being calculated if there are no results to display
- Prevent asking to save in ReadOnly Mode when we close FEMAP
- Updated display to not show the "Use Reference Point" Check box for a number of element types (curved tube, curved beam, spring/damper, gap) that did not use offsets
- Updated Current Directory handling to remember the current directory for each model and switch with the model activation. Also initializes all file dialogs to the current directory. This is a return to behavior of FEMAP v8.31 and before.

## **Preferences**

- Corrected problem where startup program/api would run if you double-clicked an existing model to start FEMAP even though "run for every new model was set" - now only runs for new models

## **API**

- Corrected problem that caused curve object to generate custom mesh sizes unless you explicitly set MeshMaxParam(0) = 1.0

- Corrected error in NextEmptyID and PrevEmptyID for CSys object - previously could return CSys 1 and 2 as empty IDs, when they are reserved.
- Updated SelectID set method to properly handle case of requesting CSys when no user-defined CSys exist, even though Global CSys always exist.
- Corrected bug in API Set Object when adding rule by element topology.

# ***FEMAP v9.3 New Features and Corrections***

## ***Updates and Enhancements***

### **Color Palette**

- Moved color palette to be model dependent (and now saved with the model)
- Moved User Contour Palette to be view dependent, now saved with model. Also revised Preferences for "Color" and "Libraries" by moved User Contour Palette Library to "Color" with Palette (and added browse buttons)
- Added Transparency to title in Palette dialog

### **Connection Properties, Regions, and Connectors**

- Added support for BGPARM (Glue Parameters)
- Changed Glue/Contact distances to match the connection sizes
- Added Fluid Regions, Bolt Regions, and Rotor Regions
- Added Enable/Disable of Fluid, Bolt and Rotor Regions
- Changed Modify, Edit, Region to ask for and edit multiple regions, not just one.
- Added "Show Expanded" for Connection Regions - shows regions that are defined by nodes/elements if selected in a multi-pick with other real expandable segment.
- Added option to turn on/off free surface of Fluid Region.
- Added reading of MFLUID and ELIST from Nastran
- Supported MPRES in output requests to get MPRES output into the OP2 (DMAP ALTER)

### **Elements - Rigid**

- Added highlighting for nodes in rigid element selection list
- Added Thermal Expansion on Rigid Elements
- Added View Option to turn on/off independent and dependent markers, as well as DOFs

### **Geometry**

- Added Geometry, Solid, Thicken
- Added Geometry, Surface, Remove Hole
- Solid Titles/Names now persist across Geometry, Solid, Cleanup and across writing a Parasolid transmit file

### **Groups**

- Updated Group, Elements, Material; Group, Properties, Material; Group Materials, On Property; and Group, Materials, on Elements commands to handle the extra material IDs and the material IDs on layups of laminates
- Added function for multi-select titled entities, updated Group Evaluate to allow evaluation of multiple groups
- Added Group Operations "Booleans" and "Add Related" commands.
- Added Group Commands for Regions - using Node, Elem, Curve, Surf, Prop

- Allow output vectors to be reloaded to those in selected set on set changes in Group, Operations, Generate with Output
- Added ability to create groups from entities on layer
- Added capability to Group, Operations, Add Related and Select Related in the Selector to start with selecting just a layup
- Added new group definition for Elements by All Nodes.
- Update Group from Superelements to use that for all but the residual structure
- Ask question about Groups from Layers - condense or not
- Changed name of Add Related to Add Related Entities.
- Removed Group Operations And, Or, Exclusive Or and Not commands.
- Removed "Evaluating Group..." when evaluate always is on - happens many times just moving the mouse around if the group is displayed

## GUI - Toolbars and Icons

### New 9.3 Toolbars

- Added Custom Tools functionality
- Added Dockable Panes toolbar (Panes)

### Icon Buttons

- Added "create function" buttons to load dialogs - load definition, body loads, heat loads and dynamic loads
- Added creation of New to Modify Update Elements Property ID, Material ID, and Modify Update Other Node Def CSys, Node Output CSys, Point Def CSys and CSys Def CSys

### Load Toolbar

- Added Bolt Preload to the Loads Toolbar

### Select Toolbar

- Added Export Neutral to Selector Action
- Added Coordinate Picking, Around Point, Around Vector, and Around Plane to Selector Actions
- Added automatically turning on "Select Multiple" when you choose "Select Related" on selector,

### View Toolbar

- Added commands for quick use of Element Colors, Property Colors or Material Colors
- Added quick-drop-down command to turn on/off thickness and cross section
- Added view center/rotation center commands and menus
- Added View Rotation Single Axis and Model Axes commands

### Customizing Toolbars

- Added 110 new custom icons for Customize command
- Added option to turn off menu icons

Icons for many commands were added (Many in Modify... commands)

## **GUI - Dockable Panes**

### Data Table

- Added "List Output Nodal Changes to Data Table" command (Relative Deformations)
- Added capability to add mass properties when you have properties or materials in the data table
- Added Copy Rows and Copy Columns to Data Table
- Added Set Value and Set Title fields to List Output Summary to Data Table
- Clear Report selection when adding rows (eliminates top line being highlighted when you add first row)
- Added wrapping for titles in output dump report, also added lookup for vector titles when the vector is not available in the first set selected
- Added multiline header to report

### Entity Editor

- Added editing of nodal point coordinates in the definition system and a separate display of the coord in the active system.
- Added ability to edit the definition csys and edit the coordinates in that system, changing systems will transform the edited values dynamically.

### Model Info Tree

- Added Loads and BC to tree
- Added Combine Load/BC Definitions to tree
- Added Icons for some Load/Constraint tree commands
- Added Load Tree Context Menus
- Added Nodal on Face for Loads and Constraints in Tree
- Added Bolt Preload to Load Definition context menu in tree
- Added Data Surfaces to Tree
- Added Show Expanded on Connection Regions
- Prevented Shift-Selection in tree from processing multiple notify/highlight messages
- Added when highlighting properties, if no elements are assigned to the property it will show geometry using the property as a meshing attribute
- Properly highlight loads and constraints when in the Selection list in the tree
- Added "Add Related" to Group Context menu in tree.
- Updated to keep track of pages that were deleted so the tree can be properly updated on a Redo.
- Added Load Set Copy and Constraint set copy to the right mouse menus. Also corrected problem with Constraint Set Copy that caused Node counters to not be updated to reflect the new set
- Added Regenerate command when changing groups from tree so that contours are updated

### Program File

- After IF statement program files now wait for timer - it allows other things to happen, like an API to run and set some condition

- Added program file support for Layup dialog controls
- Allow <USER> or <PAUSE> program file commands to work with File Open dialogs
- Supported Multi-select list boxes in program files, and corrected problem replaying
- Program files that used dialog boxes with no underline in OK

#### Data Surface Editor - new for 9.3

- Allows you to create 7 different types of Data Surfaces which can be used to create variable loading conditions
- Data Surface Editor Model dependent - one control per model
- Update Entity ID, Update Coordinate, and Update Vector on context-sensitive menu

### GUI - Entity Selection

- Added method to node picking to select nodes referenced by constraint equations
- Implemented Coordinate Picking, Around Point, Around Vector and Around Plane
- Enhanced Copy and Copy as List to both export the net selection, not the ranges in the box.
- Made Previous and Pick->Paste honor the Add, Remove, and Exclude settings

### Interfaces - FEMAP Neutral

- Added Color Palette to the neutral file (Block 942)
- Added control over groups and views when writing neutral files
- Updated Neutral Read and Write for v9.3 changes

### Interfaces - Nastran

- Changed a few items specifying MSC.Nastran to MSC/MD Nastran
- Supported checksums for NASTRAN files with INCLUDE files.
- Added ability to define 2 scratch directories and sizes for Nastran
- Added DDAM Analysis Support in Nastran (NX and MSC/MD)
- Added direct access to NASTRAN command for setting system cells
- Added ELRESCS option to NX Nastran 601/701 NXSTRAT to request solid results in elemental/material csys
- Added PARAM,NOFISR - to suppress output of Failure Indices and Strength Ratios to the F06
- Added support for Complex Modes in Nastran
- Added support for Initial Conditions (temperatures) and TEMP(INIT) in Nastran Static Analysis
- Added support for MATT8 - temperature dependence for 2D Orthotropic materials
- Added support for MFLUID, added MPRES support to F06
- Added complex eigenvalue support to reading F06
- Added support for NASTRAN Composite Strength Ratios.
- Added reading of Max Failure Index from OP2, and support for PARAM,SRCOMPS
- Added support for Stiffened modes in Nonlinear analysis (supports large deflection, follower forces...).
- Added support for writing and reading NASTRAN SUBCOMs

- Added writing property titles for PBUSH, PVISC, BFRIC, PLPLANE, PWELD
- Initial implementation of Superelement support - added SEID to node record, node options to set it, Update SEID command, added to Groups and Selection method, Added group Operations superelement command, added Nastran write support on GRID card, added NASTRAN read support of SEID on GRID/GRDSET, and read of SESET
- Initial support for BOLTLTD, BOLTFOR, BOLT in Nastran, limited Bolt Regions to include only Beam and Bar elements
- Supported checksums for NASTRAN files with INCLUDE files.
- Supported include files in case/exec
- Supported MATHE for both NX and MSC Nastran
- Supported Multi-case buckling analysis in Nastran
- Improved reading of various contact issues in Nastran Read - none that failed with our files, but would fail if contact came at beginning of file
- Added INTORD and REFINE for NX Nastran BCTPARAM and BGPARM
- Added generation of 1P and 2P functions for Rotor Dynamics
- Added overall damping (Param,G) support for complex modes
- Added SORT1 for 601\_TRANSIENT because ADINA changed default to SORT2
- Do not write DLOAD case control for transient heat to NASTRAN if you do not have any transient loads
- Initial implementation of Rotor Dynamics support for NX Nastran
- Added option to Nastran Bulk End Text to put it before or after ENDDATA
- Updated Random OP2 postprocessing to support changes in NX5 - added PARAM,RPOSTS1,1 and new changes to OP2 results
- Turned off computation of standard output vectors for random analysis
- Supported new "3D iterative solver" for Sol 601
- Modified ADINA restart so that the restart control in the Nastran executive control is in sync with the NXSTRAT dialog box.
- Added copying the ADINA restart file to the .dat directory and renaming it to the current jobname.res then set the dbs keyword on the command line.
- Enhanced the Preview Input functionality so switches in the executive control will be honored when writing via the preview file for Memory, Output Directory, Save database for restart do restart
- Added the ability to recognize between Solid Von Mises and Octahedral output and store data in their respective vectors.
- Added ability to read Superelement output from XDB
- Enhanced the XDB interface to enable turning off reading of individual cases as well as individual time steps within those cases.
- Added the ability to define initial conditions for Advanced Nonlinear Static. This will allow a user to define a initial temperature load and specify it as a initial condition which will then write the TEMP(INIT) case control.

## **Interfaces - Nei Nastran**

- Added support for NEi/Nastran's version of DDAM

- Added BSCONP RBE3 contact option to Connection Property

### **Interfaces - Ansys**

- Added Compress\_Contact\_Segment before the expand during export. Did not seem to be causing any problems but certainly could if the segments were not properly compressed and there was not any apparent reason why a compress was not done in the first place.

### **Interfaces - Dyna**

- Added Material Angle for plates/composites for Dyna

### **Interfaces - I-DEAS**

- Added writing of Groups to I-DEAS universal
- Supported reading Nastran files generated by I-DEAS where groups are defined as Sets with PARAM,G### commands to specify nodes and elements in each group

### **Interfaces - PATRAN**

- Added support for reading Points, Lines/Curves, Patch/Surface and Named Components/Groups (PATRAN Neutral file)

### **Interfaces - Geometry**

- Added option to skip updating material data when geometry is updated.
- Support added for Parasolid 18.1, ACIS 16, Solid Edge 19, NX 4, Catia V5 R 17, and Pro/E Wildfire 3

### **Layups - new for 9.3**

- Initial implementation of Layups for Laminate Properties
- Added new Layup Editor with layup and global ply API classes
- Added New Layup to laminate property dialog
- Added Layup Library
- Added Layup to tree, added delete and list of layups
- Added Layups to Group and Selector, New Group types include Layups by ID, Layup by Matl, Layup on Prop, Elem by layup and prop by layup. Also added highlighting of layups from tree and layups to select related/copy in selector

### **Libraries**

- Added delete capability into Load from Library dialog box

### **Licensing**

- Added automatic waiting and checkout of network licenses when initial licensing fails

## Listing

- Added missing titles for mesh attached to geometry when listing group definitions
- Added commands to List Load Definitions and Constraint Definitions
- Update List Load to not fail if no nodes/elements/points... were available and you selected loads on those along with others.
- Added command to list output results to the data table (List, Output, Results to Data Table)
- Added element IDs to Chk\_Twist messages when importing

## Loads and Boundary Conditions

- Added new dialogs for Load and BC Combine
- Added user titles for Load Combine and Constraint Combine.
- Added BC Definition creation for Copy and Combine
- Added Delete Load/BC Definition commands.
- Added functional dependence for body accelerations and rotations. Removed requirement for coincident vector for RFORCE rotation and accelerations
- Updated Loads so that variable loads are propagated when you edit with update all.
- Added option to rebuild to delete orphaned loads and bc
- Added "Rotating About Vector" to body loads to automatically set rotational velocity and acceleration components around a vector
- Added Edit Load Definition and Edit Constraint Definition to menu
- Also added face selection by free face for loads on mesh
- Clear the current face ID when you switch between Front and Back Face - to truly indicate that you have to re-pick the face after the radio button change.
- Initial implementation of Bolt Preloads
- Made center of rotation on body loads pick-able from screen
- Removed Reference Temperature from Body Loads unless you have FEMAP Structural as your default solver
- Bolt preloads not selected automatically for list or delete and keep going with error message if something does not exist

## Meshing

- Added option to Modify, Move By, Radial Nodes and Modify, Move By, Radial Elements to move cylindrically around a vector, not just spherically
- Allow "loop" feature suppression to work on sheet bodies
- Added extra pass at end of tet meshing to cleanup interior midside nodes
- Changed setting size of small features to an option in Solid and Surface mesh size dialogs - automatically uses mesh size if turned off.
- Changed Edge Members of line elements to require both nodes be selected. Previously only one node was required so you got extra elements if you selected a "corner" node - which was different than the solid-face mode for the same command.

- Prevent Unrefine and Remesh of line elements

## **Modify Menu**

### Project

- Added commands to Project Onto Vector and Project Onto Plane for nodes and points.

### Update Elements

- Updated commands on menu to be more descriptive and rearranged for better grouping
- Added command to reverse direction of line elements
- Added command to set Rigid Element CTE
- Changed command name Update Element Remove Cross Section

### Renumber

- Added Renumber of Connection Prop, Connection Region, Connections and Functions
- Added Renumber Layers
- Added Renumber Analysis Sets.

## **Output and Post-Processing**

- Added Contour Group to Contour Options dialog box
- Supported MPRES in output requests and automatically added DMAP ALTER to get MPRES output into the OP2
- Added function to automatically renumber output from v92 to v93 ID ranges, also added function to API to allow same
- Modified Delete Output Entry to ask for range of output sets and vectors and delete individual results from all selected
- Added computation of frequency and damping coefficient in title for complex modes output
- Added a "Complex Mode Shape" vector ignore during expand.

## **Preferences**

- Converted File Preferences to Multi-Row tabs
- Added ability to recover from scratch directory (if it is up to date).
- Added browser for default View from View Library
- Added preference for length-based mesh sizing.
- Added preference for tooltip delay and duration
- Added preferences for controlling Show Entities defaults in new models
- Added Units drop down for File Preferences Geometry Scale Factor
- Fixed bug if you had a startup basic script and had the "every new model" option checked it would not work at startup
- Moved User Contour Palette to be view dependent, now saved with model - was simply a global variable that was never saved. Also revised Preferences for "Color" and "Libraries" - moved User Contour Palette Library to "Color" with Palette (and added browse buttons)

- Saved size of main window when exit - no longer always start maximized - obeys icon startup preference
- Added preference to keep NextID increasing during rebuild
- Added preference to always read nonlinear stress/strain from Nastran
- Enabled 32-bit/64-bit Nastran switch in preferences

## Properties and Materials

### Properties

- Added new PCOMP options for Membrane Only, Bending Only, Smearred and Smearred Core

### Materials

- Added function drop-downs to materials and capability to create functions
- Handled putting materials that reference functions of functions into the material library.
- Supported MATHE for both NX and MSC Nastran
- Supported MATG gasket material
- Added MAT10 (fluid material) as an "other" material

## Tools

### Parameters

- Updated Tools Parameters dialog layout, Added option to Merge Tolerance for specified or automatic, and never update the values automatically.
- Added graying to Tools Parameters based on automatic/specified merge tolerance

### Variables

- Changed delete variables to select multiple variables (update underlying multi-select to support variables)

### Check, Coincident Nodes

- Updated Check Coincident Nodes to add preview (off by default) and options for which to keep
- Added dialog to Coincident Node/Point Merge for Showing Merge List, Keep List or both

### Check, Distortion

- Added "Jacobian" Element Check

## User Interface

- Added longer titles and automatic titling. Updated title length to 79 characters.
- Added minimum size limits to resizable dialogs
- Added Regenerates to Modify Rotate By, Rotate To, Move By, Move To, Align and Project commands
- Added Resizing to many dialog boxes
- Added error message if you create line elements with colinear orientation in Edge members
- Added adjustable drop-downs on combo boxes

- Added capability to save and load keyboard shortcut definitions
- Added context help to all of the standard dialogs (select, coord, vector, plane and palette)
- Added Help to Customize Dialog
- Added Methods to standard selection dialog box for Connections, Connection Properties, and Regions, and several for Elements, Props,...
- Made all set activate (Load, BC, Solid, Output Set, Layer, Output Vector) dialog boxes resizable
- Prevent overwriting a model that is currently open in same session
- Prevented pick from filling in XPT(-1) or XND(-1) if the entity selected did not exist - just fills with coordinates.
- Removed command line options for MSC, UAI, CSA, VR, SSS, CFD, and WECAN
- Renamed Spring Elements to Spring/Damper
- Save Position of undocked Analysis Monitor
- Support of dialog placement for multiple monitors
- Updated for longer title lengths, and added new single-precision data blocks
- Updated List push button on standard selection dialog to bring up a multi-select list instead of a single selection.
- Changed dialog title "Face Selection for Elemental Loads" to "Face Selection" because it is used other places
- Changed File, Open to work properly on Vista
- Updated Combo box drop-downs for Windows 2000. If controls were not high enough no drop-down was shown.
- Improved support of Spaceball graphics interface devices.
- Changed Default Message Font and Program font to Segue for Vista

## API

- Added API enum for access to indices in View Options properties
- Added APIs for new preferences
- Added App.feWindowSetRect. Removed vu.WindowLeft, WindowRight, WindowTop, WindowBottom.
- Added zMessageColor enum and changed color for feAppMessage to that instead of regular colors.
- Added App.feWindowTitle to set window tab title and view title
- Also added feProjectOntoVector and feProjectOntoPlane API commands
- Added enum zDataType as index for Info\_MinID, InfoMaxID...
- Added feAppEventCallback and EventLParam to enable easier access to FEMAP events.
- Added feConnectionRegion as equivalent name to feContact
- Added feModifySuperelementID method
- Added GetTitleIDList( ) and ParseTitleID( ). Can be used to fill combo and list boxes in API and parse the results back into an ID
- Added NextEmptyAction()
- Added Clear() to delete all contents
- Added Text String Highlighting color

- Added SelectAllOnLayer to the Group object
- Added API feVectorPerpendicular
- Added echo of errors to messages window
- Added feGetElementFaces to API
- Added many new properties to AnalysisMgr API.
- Added SelectMultiID() to Set object
- Added ResetNextLoad, NextLoad, ResetNextLoadDef, NextLoadDef to the Load Set object. Added same functions to BC Set Object. Added the Load Definition and BC Definition objects
- Added Thermal Expansion on Rigid Elements
- Added User Graphics to API, and support for multi-dimensioned arrays
- API Connection Region added "GetEntities" method
- API method feGroupCombine
- Exposed Selector via API
- Update Set Entity Select method to always end up with a set that contains what was displayed in the dialog
- Updated API Type Library to show BOOL as Boolean (VARIANT\_BOOL).

## ***Corrections***

### **Connection Properties, Regions, and Connectors**

- Corrected problem with reflected/copied elements still having counters from previous connections and being nondeletable
- Reversed direction of connection regions generated by Connect Surfaces command

### **Geometry**

- Fixed bug in Geometry, Spline, Tangents command. Order of arguments were confused.

### **Graphics**

- Corrected problem during criteria display of solid elements with criteria limits on. Previously, FEMAP would only show free face element faces. Now all elements which meet specified criteria are shown.

### **Groups**

- Automatic Add into groups did not work reading Nastran files because incremental plot records were not created. Turned them back on if you are automatic adding to a group
- Fixed problem automatically adding load and bc entities to group with Automatic Add. FEMAP was using Load record ID instead of entity ID that was loaded.

## **GUI - Dockable Panes**

### **Model Info Tree**

- Fixed a problem with Next/Prev in the tree when you had gaps in numbering. Previously did not step properly

- Corrected crash when editing a load from tree in a non-active load set
- Corrected error that prevented the copy button to work when you edited a property from the tree
- Fixed graying for several other tree commands.

#### Data Table

- Fixed bug that caused output displayed in corner 1 to be corrupt if the element was loaded and the contour type was elemental.

#### Entity Editor

- Fixed a problem where you could not select coordinates when creating a csys from the entity editor.

### GUI - Entity Selection

- Corrected a problem when picking into a combo box. Previously if you selected an item from the list, then picked, the pick would update the control, but it would then reset based on the selection in the list. It now clears the selection first.

### Interfaces - Nastran

- Corrected handling of reading include files with no path
- Corrected stiffened modes in Modal - grayed loads in master case, not in subcases
- Corrected location of BGSET in Case Control in Random and Response Spectrum analyses when you requested XYPLOT/XYPRINT output - moved before those requests as reqd.
- Corrected problem reading nonlinear plate stresses from F06 file. Was improperly calculating MinPrin stress in some cases (positive values were zero) because it was using 3D calculation because an empty Z Stress value was read from the header
- Corrected problem reading complex modal output and real/imaginary constraint output from XDB
- Corrected problem reading coordinate system of the PLOAD3, PLOAD4 cards. FEMAP was renumbering the csys but never updating the surface load record with the new system (i.e., directed pressures were wrong).
- Corrected anomaly that causes FEMAP to incorrectly read buckling output from the .op2 file when multiple subcases exist where more than one Eigenvalue was requested in each subcase.
- Corrected anomaly in the switch for Single/Double sided contact (NSIDE) when going to Sol 601. This made it impossible to define double sided contact. Due to the bug in #2 the Penetration Depth was written when the Double sided Contact was checked even though this option is not available for NSIDE = 2.
- Corrected problem reading nonlinear Plane strain output from XDB and op2.
- Fixed problem reading PSOLID when the CORDM field was blank. FEMAP incorrectly read it as aligned to the element rather than the basic system.
- Fixed problem writing CBUSH FEMAP would write zeros instead of blanks to the CBUSH orientation fields when no orientation vector, node, or csys had been defined.
- Fixed problem where set id defined for BGSET, BCSET case control commands was too large
- Fixed problem reading CQUADR and CTRIAR output when corners were not requested

## Interfaces - Dyna

- Fixed problem where FEMAP was incorrectly writing the Circular Tube cross section for a beam. When defining the cross section for a Circular Tube in FEMAP the Radius that is defined is actually OD of the tube. The ID is calculated with  $2 * (\text{Radius} - \text{Thickness})$ . Given the above convention FEMAP was writing the OD wrong for LS-DYNA(Field TS1, TS2 of \*SECTION\_BEAM).

## Interfaces - MARC

- Corrected a problem saving the marc parameters dialog box the processor switch and the Parallel BETA were broken.
- Corrected issue where contact property field from the Marc model Definition was still referencing regular properties. Updated to load Connection Property

## Licensing

- Corrected a crash that occurred if you got a licensing failure dialog (no dongle) during startup and rolled the mouse wheel while that dialog was displayed.

## Loads and Boundary Conditions

- Fixed "hang" that occurred if you tried to combine a case back onto itself (loads)
- Corrected convention for pressures on corners of solid elements - they now properly follow the order of the right hand rule around the outward face normal. Previously they went in inward normal RHR order. This caused them to be written incorrectly to Nastran, Ansys... Also corrected problem in Nastran read that allows you to pick any solid face corner for the first load to start the varying pressures from
- Corrected problem in edit load when applying changes in coordinate system to multiple nodal load, the loads were not properly transformed to the correct CSys.
- Corrected problem when editing multiple temps and updating with same value - previously temps were marked as expanded geom loads and were later lost
- Fixed Reflect nodal loads, fixed reflect loads on geometry (no extra loads)

## Meshing

- Corrected problem if you hex mesh sized a solid, without overwriting previous mesh spacing, and that spacing was defined by a custom mesh size, then the bias was never set (0.0) and the mesh was distorted.
- Corrected problem that made property undeletable if it was created by Geometry->Midsurface->Assign Mesh Attributes
- Hid Update Mesh Sizing button when meshing from elements
- No longer create (keep) a dummy PLOT PLANAR property when you tet or hex mesh.
- No longer lose "Use Meshing Attributes" if you create a property while meshing surfaces

- Corrected problem with Mesh, Rotate... commands. When rotating loads the rotation angle was not updated for subsequent repetitions.

## **Output and Post-Processing**

- Calculation of the Total Velocity was missing from the FEMAP standard vector calculator.

## **Preferences**

- Fixed bug if you had a startup basic script and had the "every new model" option checked it would not work at startup

## **Properties and Materials**

### Properties

- Corrected handling of element formulation. Does not zero accidentally when moving in Element/Property Type dialog. When copying, reflecting, splitting, editing, the original formulation is preserved.
- Corrected bug in fix-up for negative shear areas that ended up causing the centroid to be incorrect.

### Materials

- Corrected bugs with Thermal Expansion and Thermal Conductivity properties - orthotropic props were in wrong slots.

## **References**

- Corrected problem with File, References - said SE file was not available if it was open in SE

## **User Interface**

- Corrected a bug that prevented replay from working from FEMAP if the path to the picture had spaces.
- Corrected a crash if you put more than 80 characters into an edit field in a dialog
- Corrected bug in printing that prevented proper selection of paper sizes and copies. Also removed v8.3 toolbar bitmaps from the resources
- Corrected bug when reading SPCADD which caused constraints to have no color or layer.
- Corrected error that occurred with 1 cache block and re-accessing that block after it was just deleted. It was still found, but was never in the directory lists. Should never be seen by previous users, found it during rebuild of tree control after undo.
- Corrected problems with Preview in Entity Selection dialog that erased the range list after you hit Preview and then transferred Methods
- Fixed Error if you had "save dialog positions" and closed a maximized dialog. The next time you tried to display that dialog it would "hang". Actually the dialog box was there but not visible - if you hit Esc or Return, you would get out and could continue
- Corrected sliding of combo drop-downs on multiple monitor configurations

## **API**

- Sent commands that start an API from the API window through the main command loop so that it checkpoints the command and you can undo just the execution of the API, and not the previous command
- Fixed problem with multi-selection list from wInit\_GetRange
- Fixed problem with XYZtoParam method of Surface object, previously did not return rationalized parameters
- Fixed problem that prevented indices on vector/matrix properties from exceeding 32767 if accessed from Excel using the type library. (were declared as short)
- Fixed problem when calling clear on a Set object - it was no longer held exclusively
- Corrected a problem with counters on nodes when using the API to create list-base (rigid, slide line..) elements
- Fixed feSplineTangent. Order of arguments were confused.

## ***FEMAP v9.2 New Features and Corrections***

### ***Updates and Enhancements***

#### **64-Bit Support**

- FEMAP v9.2 is still a 32-bit application, however this release can be run on 64-bit Windows. The dongle-based licensing has been updated to support the 64-bit platform.
- This release also includes both 32-bit and 64-bit versions of NX Nastran. If you are using NX Nastran for FEMAP on a 64-bit platform, the 32-bit FEMAP can still use the 64-bit NX Nastran.

#### **Preferences**

- Added a preference for running a Startup Program File/ Basic Script/ Executable either just at startup or for every new model.
- Removed Disk\_Undo Preference.
- Added Preferences for Nastran solver including control of memory, output directory and scratch directory.
- The Workplane is no longer displayed by default.

#### **Tools**

- Tools, Distance has been enhanced to return the measured components in both global and the active coordinate system.

#### **Geometry**

- Added capability to extend surfaces

#### **Connections**

- Changed contact elements and properties to Connections, and moved them to the top level of the menu. This makes Connections more accessible and properly separates them from element types.
- Added automatic detection of connections between solids of an assembly. Also added automatic creation of connections between two or more surfaces.
- Added connections and connection properties to the Model Info tree along with capability to enable/disable connections.
- Added a Connection Property Library

#### **Meshing**

- To improve the workflow for tet meshing, the initial dialog for mesh sizing has been removed. Unsized curves are now automatically sized with default sizes, and an "Update Mesh Size" button has been added to the meshing dialog. This reduces the number of dialogs if you use default sizing, and if you need custom sizing, it allows you to update the size multiple times until you are satisfied

## **Loads, Constraints, and Results**

- Added ability to create loads in a model by mapping results from a different model. The meshes in the two models can be dissimilar. Mapping is done by location. Currently temperature and displacement results are supported.
- Added the ability to quickly apply the same changes to many loads or constraints in the Edit commands. After editing the first Load/Constraint, you now have an option to apply the same conditions to all selected entities, rather than needing to manually edit each one.

## **Modify Project**

- Added commands to project points and nodes along a vector onto selected surfaces.

## **Analysis Set Manager**

- Added Support for LS-DYNA3D in the Analysis Set Manager.
- Added ability to preview ANSYS, ABAQUS, MSC.MARC, LS-DYNA input files from the Analysis Set.

## **Interfaces - FEMAP Neutral**

- Added an option to Neutral Read to always create new output sets (not overwrite)

## **Interfaces - Nastran**

- Added support for NX Nastran 4.1: LSEARCH, CSTYPE parameters on NXSTRAT card, AUTOSPC Singular Value Decomposition (SVD) option, and BGSET for “Glued” Contact
- Added the ability to read CQUADR/CTRIAR Z-offsets.
- Added ability to run NL Heat transfer with only an Initial Condition.
- An enhancement was made when Femap is writing radiation boundary conditions. A warning message will be issued by Femap if it is unable to create the necessary plot only plate elements to define the radiation condition.
- Added the ability to request extended error messages from the Executive/Solution options section of the Analysis Set Manager.
- Added the ability to set the amount memory to be used in the solution from the Executive/Solution options section of the Analysis Set Manager.

## **Interfaces - Nei Nastran**

- Added support for MAXAD, TMAX, TMIN, MAR, and WO contact options on the BSCONP card.

## **Interfaces - MSC.Marc**

- Fixed a problem reading results files from version 2003. Femap has been enhanced to read output from versions 2003 and 2005.

## **Interfaces - ABAQUS**

- Fixed problem reading analytical rigid surfaces.
- Fixed a problem writing Quad and Tria elements when formulation was set to 3..Thin Shell(5-DOF/ Node, Small Strain )and Warping flag. Previously wrote S4R when it should have been S4RS and W and S3R when it should have been S3RS
- Improved reading of contact output, where Femap will attempt to match the output vector label to the actual contact pair label in Femap

## **Interfaces - Other Analysis Programs**

- Interfaces to many analysis programs that have not been actively supported have been hidden in this release. They can re-enabled thru File Preferences, however these interfaces are no longer supported and may be removed in the future.

## **Interfaces - Geometry**

- Due to contractual changes with Spatial Technologies, and the extremely low customer demand, the VDA interface has been removed and is no longer supported.
- A new interface has been developed to import NX parts and assemblies.
- Automatically support Pro/E Wildfire file naming convention which appends version number extensions (for example, fn.prt.4)

## **Groups and Layers**

- Added ability to create layers from Groups. Added Group Operations Move to Layer command, and updated the Group Operations Generate Solids command

## **Graphics**

- Added a View transparency option that allows you to make your model transparent without changing entity colors. This is often good for selection when you are trying to pick entities either inside or on the back of a model.
- Also added a new transparent highlighting mode where the model becomes transparent and only the highlighted entities are solid.
- The undeformed model is no longer displayed in default deformed views.
- All floating point numbers drawn in the graphics window (except workplane axes) are now controlled by the exponent and number of digit settings on the View Options, PostProcessing, Contour/Criteria Legend dialog.
- Contour vectors can now be labeled with their value. This is controlled by the labeling options on the View Options, PostProcessing, Vector Style dialog.
- Animate-MultiSet and Trace with scaled actual deformation now output individual frame maximum deformation and overall maximum deformation.

## User Interface

- Updated a number of dialog boxes to use a tabbed style. This includes File Preferences, Materials and Connection Properties.
- To more closely follow Windows conventions, "Browse" buttons that searched for files or directories have been changed to "..."
- Improved selection in "Pick Front" mode on Rigid and Slide Lines - it now considers all nodes, not just the master node.
- Added a checkbox to the Delete confirmation dialog box to never ask for confirmation. Also added to File Preferences (to turn this option back on)
- Added a toolbar for turning on/off entity display - like View Quick Options
- Added ability to show surface and element normals from the highlighter in the Model Info tree and Data Table.
- Added alternate keyboard accelerator tables for API and Program file development.
- Added several buttons to the standard selection dialog that let you choose entities from a list or preview your selection.
- Added "Update Selection" to the context menu of the Data Table
- Simplified the toolbar layout that is initially displayed. Only the Model, View and Selector toolbars are now displayed. All toolbars are still available, just not displayed initially.

## API

- Fixed API feFileMessageSelect, replaced global constant Message\_LineNumber with feFileMessageLineNumber function
- Added feAddToolbarSubmenu, feAddToolbarSubmenuCommand, feAddToolbarSubmenuUserCommand
- Added new entity types for Connections, Connection Regions and Connection Properties
- Added AddContact, SetOutputType, SetOffset, GetOffset, SetRigidType and IsRigidType methods to the Connection Region object.
- Added new Sort object. This is much like a Set, but allows additional data to be stored with each ID and allows the IDs to be sorted based on the attached data.
- Added Match and SelectOutputVectorID methods to the Set object.
- Added ClearNodeList method to the Element object
- Added IsPlane, IsCylinder, IsSphere, IsCone, IsTorus, Conical, Toroidal and Spherical methods to the Surface object. Modified the calling syntax of the Planar method to match the syntax of the new methods.
- Added numerous attributes to the Analysis Set Manager object to support the new Dyna Interface.
- Added numerous global attributes for the new Preferences.
- Removed the feFileReadVda method since the VDA geometry interface has been removed from Femap.

## ***Corrections***

### **Tools, Model and Views**

- Corrected a problem that allowed nodes to be merged even though they were used on the same constraint equations.
- Corrected a problem in Tools Mass Properties where the automatic mass element generation was creating a property with an X-direction mass and no mass for the y or z direction.
- Fixed Output from Load for vector output so that component results have proper subcomponents set so they deform in the proper direction.
- Fixed loss of hidden/visible layers if you turned on "All Views" and "Show All Layers"

### **Interfaces - Geometry**

- Added an option to Neutral Read to always create new output sets (not overwrite)

### **Interfaces - Nastran**

- Corrected a problem where the Contact slave and master surfaces were reversed.
- Corrected a problem reading contact BCTSET card. This caused Femap to only read the first contact pair defined in the input file.
- Corrected a problem writing contact BSURF when model contained Laminates, Bending, or Membrane elements.
- Corrected a problem that caused Initial conditions to not be available for Sol 701
- Corrected a problem that caused the NX FRIC parameter on the BCTSET card not to be written.
- Corrected problem reading XDB files from transient analysis with multiple subcases that caused some time steps to be skipped in the subcases.
- Fixed a problem reading XDB files where filename length was greater than 80 characters. The limit has been increased to 255 characters.

### **Analysis Set Manager**

- Fixed problem deleting cases from an Analysis Set that is not active. This corrupted the start/end text and contact table.

### **Graphics**

- Contact regions on shell top and bottom faces are now drawn correctly when shells are drawn with thickness.
- Centered Solid Contour Vector arrows are now drawn correctly centered.
- Fixed Spaceball issue when orienting and hitting Ctrl-G at the same time - incorrect graphics images were drawn.
- Constraint equations now drawn in groups.
- Corrected length of freebody resultant force. In previous releases, these arrows could be drawn extremely large.
- Criteria with Line Contour now correctly just contours the edges of the elements and does not fill the elements.

## **User Interface**

- Prevented accelerator keys that accessed View commands from acting in View command Dialog boxes - these could potentially cause a crash.
- Fixed problem deleting Analysis Sets from the Model Info tree that caused fields in a newly created set to be improperly initialized.
- Fixed a problem in the Entity Editor that corrupted groups if the group title was modified.
- Fixed problem in the Entity Editor that caused a crash when the entity Title field was too long.
- Corrected a mislabeled field in Entity Editor for Materials.
- Fixed a problem in Data Table that caused Femap to crash when viewing a LS-DYNA one-way contact property.
- Fixed a problem in the Entity Editor / Data Table that caused output displayed for corner 1 to be corrupt if the element had a load applied and the contour type was elemental.

## **API**

- Fixed numerous problems with the Group Object that corrupted groups if you used the same object to retrieve and store multiple groups.
- Fixed problem with the Element Object that caused problems if you used the same object to retrieve a "list-based" element (rigid or slide-line), then later created other non-"list-based" elements with that object.

# ***FEMAP v9.1 New Features and Corrections***

## ***Updates and Enhancements***

### **Model Management**

- Added the File, References command which can notify you when files (Geometry, FE Model or Results) that you have imported into your model have been updated or changed, and might need to be re-imported.
- Added the File, Save All command to save all open models in a single command.
- Improved File, Timed Save to automatically save all models, not just the active one.

### **Printing**

- Updated the Print command to allow you to specify paper orientation and number of copies directly in the Print dialog, without having to go into Printer Setup.
- Added options to Print the Entity Info, Data Table, Program File and API Programming windows.

### **Program Files**

- FEMAP commands and keystrokes can now be recorded and replayed in a new Program Files docking pane. This pane can also be used for editing and debugging Program Files. It provides commands to single-step lines and set breakpoints during replay. Program files are now recorded in a more readable fashion, including highlighted comments showing and delimiting each command. Program files can also be assigned to buttons on the toolbars or menu using the existing Customization (User Commands) capability. Added the File, Save All command to save all open models in a single command.
- Added the #method command to the existing Program File syntax. This allows program files to predetermine the Method / Type used for coordinate, vector, plane, element/property and material dialog boxes.
- Improved the #silent command so that it will not conflict with the "Remember Dialog Positions" preference.
- Added the FNI and FNV commands which can be used to retrieve interpolated values from functions.

### **Tools**

- Updated Tools, Check, Coincident Nodes to allow the "Alternate Merge Nodes" to also contain nodes that were specified in the original list of nodes to be checked. Also prevented this check from merging nodes that were contained on a constraint equation.

### **Entity Editor**

- Added a button to Clear the editor.
- Added ability to display nodal output for Node entity in a selected coordinate system.
- Enhancements were made to the Entity Editor to improve moving between fields and expansion of categories.

### **Data Table**

- Added the ability to choose which Coordinate System nodal output will be displayed in the Data Table.

## **Properties and Materials**

- Added buttons in the Section Property calculator for General Sections to flip the cross section horizontally or vertically after loading it.
- Added Modify, Color, Property Transparency and Material Transparency to set the transparency level of selected properties and materials.

## **Meshing**

- When meshing line elements which are defined using the Section Property calculator (Beam, Bar...), using the Mesh, Between command, the reference point (if defined) is automatically used to create element offsets - just as it is when meshing on geometry.
- Added automatic merging of nodes at the endpoints of curves when you mesh multiple curves simultaneously - just as nodes on the boundaries of surfaces are merged when meshing multiple surfaces.
- Added Paving of elements around edges of surfaces

## **Graphics**

- Added capability for displaying Background and Logo Bitmaps
- Added numerous options for controlling the style of background shading
- Added dynamic highlighting during selection for Text and Coordinate Systems
- Added Preference for "BitBlit Delay" which can solve OpenGL problems on some inexpensive graphics boards.
- Updated the Palette dialog box so that linestyles and patterns can be seen even when you pick a very dark (or black) color

## **Geometry Interfaces**

- Added export interface to JT
- Added a direct interface to CATIA V5 files that supports parts and assemblies.
- Added a new direct interface to Solid Edge that supports Parts, Assemblies, and Sheet Metal files. This interface also provides access to design and/or simplified bodies, part colors and material information. The ability to associatively update the models has also been improved

## **Analysis Interfaces - NX/Nastran**

- Now confirms that the output directory (if specified) is a valid, accessible directory
- Added TABLEM1 support for Advanced Nonlinear Solution 601
- Added support for linear contact in statics.
- Added support for Advanced Nonlinear Explicit Solution 701.
- Added ability to define AUTOMPC parameter in the Analysis Set.

## **Analysis Interfaces - Nastran**

- Added support for reading Hyperelastic nodal output from the op2 and f06 file.
- Added support for reading CPENTA output from the xdb file.
- Added element forces to available Random XYPlot output requests.
- Added weld element CWELD.
- Added support for z-offsets for CQUADR/CTRIAR elements.

### **Analysis Interfaces - I-DEAS**

- Added support for I-DEAS NX Groups (DataSet 2477)

### **Analysis Interfaces - ANSYS**

- Added support for ANSYS 10.0.

### **Analysis Interfaces - NEiNastran**

- Added Reversion options for the Tension Only Shell element.
- Added support for Effectiveness factors F3, F4 for PSHEAR.

### **Post Processing**

- Added the List, Output, Summary to Data Table command. This command allows you to quickly find max/min values across multiple output sets and vectors, envelope data, find critical data for selected properties, materials, and subsets of selected nodes and elements.
- Updated List, Output, Unformatted so that summary data reflects only the selected nodes/elements and not the entire output vector.

### **User Interface**

- Updated Ctrl+C accelerator to copy whichever window/pane is active to the clipboard. Previously it only copied the active graphics window. Now, if input focus is in the Messages, Entity Editor, Data Table, Entity Info, Program File, or API Programming panes, data from those panes will be copied - otherwise, it will still copy the active graphics window.
- Added Preferences to define alternate pan and zoom keys, mouse wheel directions, and Shift/Ctrl key usage for Dynamic Pan and Zoom. Also added Preference to use certain accelerators for Top/Bottom/Left/Right and Isometric Views, rather than their traditional FEMAP usage.
- Added new Help Commands for the Entity Info, API Programming and Program Files panes
- Added ability to show the full model path in the tabs for views rather than just the short model name.
- Added the "Entity Info" window which automatically displays the same information that the Entity Selector "Show Tooltips" command did, without the delays necessary for a tooltip, and without overwriting the graphics area.
- Added a context menu for Text entities which allows you to create, edit, list and delete text.
- Updated the Model Info tree to only display a limited number of items of each category. This can significantly improve performance if you have thousands of entities of one type. Options are added to the tree to show the next or previous group, whenever less than the full number of entities are displayed. The number of entities in the tree is controlled by a preference.

- Added Ctrl+Shift+U accelerator to tile/maximize the graphics window
- Changed the Entity selection dialog box that is used to select single entities with titles to be resizable - this allows you to increase the size of the dialog box if you have a large number of properties, materials, ...
- Removed a few confirmation questions that slowed down mesh sizing and copying group rules.

## **API**

- Added the API Programming window, which provides a Basic environment which you can use to develop, edit, debug and run API programs without needing an external Basic compiler.
- Significantly enhanced the Type Library to provide better usability with auto-completion and tooltips. Added numerous "enum" definitions to provide lists of available values. Also, now properly registers the Type Library so it is immediately available.
- Added access to the "Text" entity.
- Added GetFaceNormal, GetFaceCentroid and GetFaceArea methods to the element object.
- Added GetValue method to the Function object which interpolates the function.
- Added feWindowMinimize, feWindowMaximize, feWindowRestore, feWindowTileHorz, feAppLockDraw, feAppUnlockDraw, feWindowRedraw, feWindowRegenerate, feWindowShow, feWindowActivate, feWindowTile and feWindowCascade methods
- Added AddArray methods to the LoadMesh, LoadNTemp, LoadETemp and BCNode objects which allow creation of multiple entities from one call.

## ***Corrections***

### **User Interface**

- Fixed context sensitive help for commands in drop-down menus on the toolbars.
- Corrected a problem that prevented context-sensitive (right mouse) menu commands to fail or not be available if the Model Info pane was not displayed.
- Fixed a problem that prevented models that were saved with multiple open Views from properly maximizing when the model was reopened.
- Fixed a problem with the splash screen that caused FEMAP to disappear from the screen, but continue to run, if you dropped a FEMAP Neutral file onto the program icon.
- Corrected a problem in the Entity Editor where the output displayed for midside nodes was incorrect when performing a nodal contour.
- Corrected a problem in the Entity Editor where Load Set options were unable to be saved without first defining the Ambient Element field in the Thermal Analysis category.
- Corrected a problem with Undo when in the Interactive Mesh Editing command.
- Corrected a problem which caused the Delete command from the Model Info window Layer context menu to delete groups rather than layers.

### **Interfaces - NX/Nastran**

- Corrected a problem that caused plate corner fiber distances to be placed in the wrong output vector
- Corrected PBEAML for tapered beams.

- Corrected a problem writing the Response Spectra Correlation Table that caused FEMAP to only write the first node to the DTI SPSEL card.
- Corrected problem reading output from the op2 for the QUAD4 Fully Nonlinear Hyperelastic element.
- Corrected a problem that caused composite stress and strain output to be skipped when reading the xdb file.
- Corrected problem with the Tension only plate properties in the Entity Editor.
- Corrected a problem where FEMAP did not write the RESVEC parameter in Optimization, NL Static and Modes solution sequences.
- Corrected problem reading CBUSH elements that caused FEMAP to issue warnings when no orientation vector was defined even though an orientation was not necessary.
- Corrected problem for Advanced nonlinear analysis (SOL 601) where FEMAP did not write contact conditions when no load set had been defined.

## **Interfaces - ABAQUS**

- Corrected a problem that caused PRINT entries to be written in ABAQUS Explicit analysis.
- Fixed a problem where multiple mass elements referenced a single FEMAP property. FEMAP would only write one mass element per property.
- Corrected a problem writing \*EXPANSION where the ZERO option was not written when the coefficient of thermal expansion was function dependent.
- Corrected a problem writing the \*SECTION POINTS command for beam cross-section. FEMAP was not correctly calculating the point positions when a beam offset was used.

## **Modeling**

- Corrected a bug in Modify, Rotate To, Nodes, Elements and Points that prevented them from working properly
- Corrected a bug in copying mesh sizes, loads and constraints when Solids are copied.
- Fixed problem in Modify, Rotate To, Coordinate Systems that caused FEMAP to crash.

## **API**

- Corrected a problem in feAddToolbarUserCommand that prevented icons from being saved after exiting FEMAP
- Corrected a problem in feSetToolbarCommandBitmap that prevented transparent bitmaps from being properly colored.
- Fixed bug in feSurfaceTrimWithCurves which did not correctly use the specified set of curves
- Fixed feCheckElemFixup - it did not properly get the list of elements to check
- Corrected feMeshTetSolid to return FE\_FAIL if the mesher aborts
- Corrected feSplineBlend
- Corrected feLayerPut if you tried to use the active layer color
- Corrected the "Expand" method of the BCSet object that caused it to fail if you had "advanced" (not just fixed and/or pinned) geometric constraints.
- Corrected feViewVisible (and feWindowVisible) that prevented it from reactivating hidden views

# ***FEMAP v9.0.1 Updates and Corrections***

## **Analysis Set Manager**

- Removed Analysis Set Manager data from a neutral file "group" write

## **ABAQUS**

- Corrected a problem where FEMAP did not correctly match the element and property when the ELSET field was not defined on the \*ELEMENT card.
- Corrected a problem where FEMAP incorrectly wrote the \*SURFACE card for ABAQUS Explicit.

## **ANSYS**

- Added support for reading ANSYS 9.0 results files
- Corrected problems launching ANSYS directly from FEMAP.

## **MARC**

- Corrected a problem reading Contact Data from T16 for Contact Bodies that use Control Points, but no trimming curves to define the contact surface (IBODTYP=4, ITRIM=0)

## **NX Nastran**

- Added Support for reading NX Nastran 3.0 TFLAG field (Alternate Method for Specifying Shell Thickness) field for shells.
- Added support for reading output for the NX Nastran 3.0 QUADR, TRIAR

## **MSC Nastran**

- Corrected a problem with XYPRINT, the PSDF request code was incorrect for CQUADR with no corners.

## **Geometry Interfaces**

- Updated to ACIS Release 14.0.
- Updated Unigraphics interface, supporting NX.
- Updated Pro/E interface to support Wildfire 2.0.
- Added Support to read in Pro/E Assembly files through the Pro/E interface.
- Added proper conversion and reading of ACIS from FEMAP Neutral File
- Added ACIS Renumbering and Neutral file Translation
- Added NonMergeable Curve capability (Modify, Update Other, NonMergable Curve command)
- Added support for transferring colors from X\_T, and options to choose whether you want it
- Added Solid Edge Entity Map
- Added support for reading XMT files with disjoint bodies

## **File Management / Database**

- Added ability to close multiple models open at the same time in a FEMAP session with one command: File, Close All.

## **Preferences**

### All Preferences

- Implemented context-sensitive help for each of the Preference sub-dialogs

### Render Graphics

- Added Search Depth option to optimize memory usage of the graphics data structures for models with a very large number of “similar but not identical” entities.
- Added support for using Smooth Textures in 2D Mapping.

### Libraries

- Removed Menu from the list of Libraries

## **GUI - Toolbars and Icons**

### Select Toolbar

- Updated Solid picking to stop properly in the Selector when all solids were selected

### Model Toolbar

- Added Analyze icon to the Model Toolbar

### View Toolbar

- Added Filled Edges command to the View Style icon drop down menu
- Added new icons for Fill, Shading, and Filled Edges on View Style icon drop down menu

### Icons for the following commands were added:

- File, Close All
- View, Advanced Post, Dynamic Cutting Plane
- View, Advanced Post, Dynamic IsoSurface
- View, Advanced Post, Dynamic Streamline

## **GUI - Dockable Panes**

### Messages

- Corrected scrolling problem related to some commands causing the list in the window to scroll back to the beginning of the list instead of continuing in the current position.

### Entity Editor

- Added support for Advanced Thermal mode in the Entity editor.
- Made multiple corrections to help strings in the Entity Editor.

- Corrected problem that caused FEMAP to crash when a large number of layers were viewed in the Entity Editor
- Added the ability to the Entity Editor categories to remember their last expanded/contracted state.
- Added missing Entity Editor Field - Ambient Element on the Heat transfer Loads
- Corrected a problem in Entity Editor where the orientation vector selection did not properly display the last vector.

#### Data Table

- Corrected a problem that caused the ID field in the Data Table to be incorrect for nodal /elemental thermal loads.
- Corrected problem where nodal and geometric thermal loads incorrectly displayed a -1 in the ID column in the data table.
- Corrected problem in Data Table where entities with no titles blank labels rather than the standard FEMAP "Untitled".
- Corrected a problem in the Data Table where in some cases the columns may not line up properly.
- Added missing tooltip for "Show When Selected" icon in report window
- Added Element Mass Properties to the Data Table

#### Model Info Tree

- Added Layers as a category in the tree
- Added a context sensitive menu for Layers category (Show All Entities, Show Visible Entities Only, Make Visible, Make Hidden, New, Activate, Manage, List, and Delete commands)
- Added automatic entity activation when you double click in the tree
- Added "View Active" to Group Context Menu
- Added "Add to Selection" on the Group Context Menu

#### **GUI - Entity Selection**

- Added Pick->Copy As List in standard entity selection.
- Enhanced Copy and Copy as List to both export the net selection, not the ranges in the box.
- Made Previous and Pick->Paste honor the Add, Remove, and Exclude settings

#### **Output**

- Added deleting a range of output vectors to Delete, Output, Vector command

#### **Geometry**

- Enhanced the Geometry, Curve - From Surface, Project command to be able to choose any number of surfaces on different solids for a selected curve to be projected in a normal direction. The Geometry, Curve -From Surface, Project Along Vector command has also been given this capability.

## Materials

- Added warning message to unit conversion to warn when Hyperelastic materials are not fully converted.

## Meshing

- Added checking to determine if a surface has already been meshed. If the user tries to mesh the surface again, FEMAP will issue a warning message and then the user can decide to mesh any selected meshed surfaces again or only mesh non-meshed surfaces which are currently selected.

## API

### Overall API

- Updated Type Library generation to include all inherited interfaces.
- Corrected bug that caused model groups to become corrupted when you used the API to copy (Get->Put(newID)) groups

### Changes to API Output Object

- Added GetOutputListAtID
- Corrected problem with mixed quad/tri corner output in GetElemWithCorner

### The following methods have been modified:

- feMeasureMeshMassProp (Removed blank line being written when it was called with no printing)

### The following methods have been added:

- feCurveProjectOntoSurfaces
- feReNumberOpt
- feCoordArrayTransform2( )
- feLicenseExpiration
- feRunCommand
- feFileProgramRun - enables the user to run FEMAP program files (.prg files).

## Graphics

- Corrected problem where beams not drawn if contour display but beam diagram option set to contour only
- Corrected problem where workplane is moved away from the origin and model, it can be clipped during dynamic rotation
- Added symbol to spring element so springs on coincident nodes can be detected
- Corrected problem when using fast pick for coordinate systems
- Corrected crash when aligning view to workplane
- Corrected problem in coloring elements by property or material if the element does not have a property

# ***FEMAP v9.0 Updates and Corrections***

## **Analysis Set Manager**

- Speed Improved to the Analysis Set Manager Preview command.
- Corrected a problem copying the start and end text of each analysis section.
- Added support to List-Destination-File so that the command List - Model – Analysis can be written to a file.

## **ABAQUS**

- Added the ability to define both mass and inertial properties on the same FEMAP Property.

## **ANSYS**

- Corrected a problem where the ANSYS LINK10 element would fail to be written when the Initial Strain was set to zero. A option for Compression Only Gap has been added to enable this fix.

## **MARC**

- Corrected multiple problem writing DIST LOADS command.
- Added support to the Analysis Case Manager for the FOLLOW FOR command to treat increments as Total Load.
- Corrected a problem writing the Rotational Velocity body load. Previously it was only possible to define the body load in the master case which caused the load to be doubled. The ability to define the body load in just the subcase has been added to correct this problem.
- Corrected a problem reading Tet element results from Marc when both Hex and Tet elements exist in the model.
- Corrected a problem where nodal results from a MSC.Marc t16 file were incorrectly imported into FEMAP when multiple coordinate systems existed.
- Corrected a problem writing definition of Beam to Beam contact.

## **NASTRAN**

- Corrected Problem graying the GROUNDCHECK options.
- Removed writing of PARAM, LSTRN it is no longer needed to request strain output.
- Corrected a problem writing the line continuation field for the CBUSH element.
- Corrected a problem reading nonlinear transient results from the op2 file. In some cases FEMAP was incorrectly reading the time steps if Slide Line elements were present.
- Corrected a problem writing Radiation loads on the edges of elements. FEMAP was incorrectly defining the orientation node.
- Added the ability to selectively read results from the XDB file.
- Corrected a problem with the Tools-Convert command where rotational stiffness of the PBUSH property is not converted correctly.
- Corrected a problem importing a Nastran deck with a PARAM, WTMASS value, where the PBEAML and PBARL nonstructural masses were not scaled properly

## **DYNA**

- Corrected a problem writing \*CONTACT\_TIEBREAK\_SURFACE\_TO\_SURFACE.
- Corrected a problem writing the \*DAMPING\_GLOBAL that caused DYNA to abort.

## **Geometry Interfaces**

- Updated to ACIS Release 13.0.
- Updated to Parasolid 16.1.
- Updated Solid Edge Interface to 16.0.
- Updated Unigraphics interface, supporting NX.
- Updated CATIA v5 interface to V5 R9 and R10 via Elysium interface.
- Corrected a problem writing IGES files that caused FEMAP to fail to write the file and issue no error messages.
- Corrected a problem that caused geometry to become corrupt when Renumbering Splines.
- Added command ( Geometry, Curve – From Surface, Split at Points )to split a surface along a parametric curve positioned by user defined points.
- Added command ( Geometry, Solid Remove Face ) to remove face(s) from a existing solid.

## **File Management / Database**

- Added ability to open multiple models in a single FEMAP session.

## **Preferences**

### Messages and lists

- Deleted Borders and size section (Create with Title Bar, Max Text, Status Color, Scroll Back Lines, and Window Lines).
- Added field to set Max Text Lines
- Changed Font to Message Font
- Added Listing Font drop down list to set a specific font for listing operations
- Added Command Color to control the color of commands in the Messages Window
- Added Bold check boxes to all colors to allow font to be in Bold type

### Render Graphics

- Removed Render Method section
- Removed Rotate Animation, Rotate with Edges, and Fast Curve Picking from Render Options section

### Menus and Toolbars

- Removed Show (startup only) section
- Removed Auto pop-up Previous Menu and Menu Help from Menus and Dialog Boxes section
- Added options to Menu and Toolbar Preferences to load and save toolbar positions.
- Added option to Menu and Toolbar Preferences to animate the fly-out of the dockable window panes.

### Database

- Removed Use Model Scratch File from Database Options section

- Added Alternate Section Property Calculation to the Meshing and Properties section which allows FEMAP to use an Alternate method for calculating property values for a beam cross-section
- Removed Message File from the Scratch Disks section

#### Geometry

- Added Automatically Adjust Geometry Scale Factors option

#### Libraries

- Removed Toolbox from the list of Libraries

### Output

- Corrected a problem that caused Error Estimate to not use corner vectors for elemental results.

### Geometry

- Corrected a problem that caused the command Geometry- Curve Spline-Multiple Curves to sometimes fail when creating spines on edges of solid surfaces.
- Corrected a problem that caused FEMAP to create a extra solid when selecting one solid for advanced geometry cleanup.

### Properties

- Corrected a problem where the property ID's in Contact Segments are not renumbered when using the command Modify-Renumber-Property.

### Meshing

- Added Auto Boundary Small Surf option in the ( Mesh, Mesh Control, Size On Solid ) command. When this option is selected FEMAP looks for small surfaces within the tolerance and combines them prior to meshing.

### API

The following methods have been removed:

- feToolCursorPosition
- feAppEmbedGraphics
- feAppEmbedMessages
- feAppMenu

The following methods have been modified:

- feFilePictureSave
- feFileNew
- feFileOpen
- feFileReadNeutral
- feToolUnitConvert
- feVectorUnit
- feDeleteAll

The following methods have been added:

- feFileClose
- feToolUnitConvertFactors
- feAppSetModel
- feAppGetModel
- feAppSetModelByName
- feAppCountModels
- feAppGetAllModels
- feAppRegisterAddInPane
- feAppManageToolbars
- feAppManagePanels
- feAppManageStatusBar
- feAppManageGraphicsTabs
- feGetToolbars
- feGetToolbarCommands
- feGetToolbarSubCommands
- feAddUserCommand
- feGetUserCommands
- feDeleteUserCommand
- feGetMenuCommands
- feGetMenuCommand
- feSetToolbarVisible
- feSetToolbarCommandVisible
- feSetToolbarCommandTitle
- feResetToolbar
- feAddToolbar
- feDeleteToolbar
- feAddToolbarCommand
- feAddToolbarUserCommand
- feSaveToolbarLayout
- feLoadToolbarLayout
- feGetToolbarCommand
- feSetToolbarCommandBitmap
- feAppGetActiveView
- feAppSetActiveView
- feAppGetAllViews
- feAppEmbed

## **Graphics**

- Corrected a problem that caused contour vector orientations and magnitudes to change when render model was turned on and off.
- Corrected a problem displaying offsets for Mass elements when the offsets have been defined in a local coordinate system.
- Corrected a problem that caused FEMAP to crash in certain instances when contouring results in a model with contact segments.

## **On-Line Help System and Customer Support**