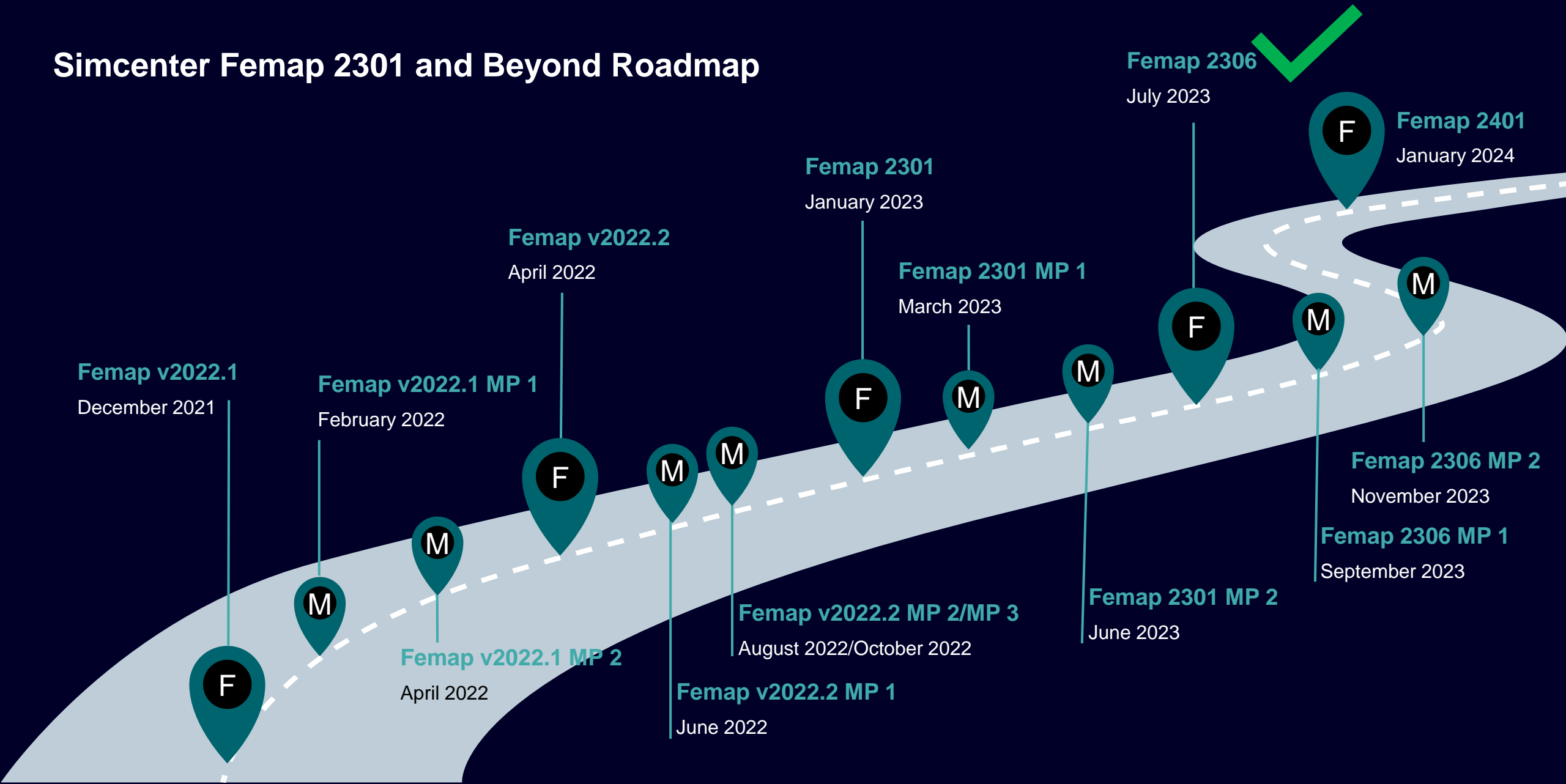




Simcenter Femap

What's New in 2306

Simcenter Femap 2301 and Beyond Roadmap





What's new **Simcenter Femap 2306**

Teamcenter Integration

Geometry

Preprocessing

Meshing

Performance Improvements

Analysis and Solver Support

Postprocessing

Miscellaneous and API

Simcenter Femap 2306

Teamcenter Integration

Users can now specify multiple Teamcenter Server Environments via the PDM -> Teamcenter -> Sign In command

Server Definition items can be Added, Removed, Moved Up, and Moved Down in the Edit Teamcenter Server Environments dialog box

Once added, each server is then available in the drop-down


Sign In To Teamcenter

* User ID:

* Password:

Group:





Role:

* Server: 

Clear

- Exton
- Pune
- Mumbai

Edit Teamcenter Server Environments

	Server Name	Server URL	
1	Exton	http://10.102.49.227:80/tc	
2	Pune	http://10.134.69.59:80/tc	
3	Mumbai	http://10.134.69.180:80/tc	
<input type="text"/>			



What's new **Simcenter Femap 2306**

Teamcenter Integration

Geometry

Preprocessing

Meshing

Performance Improvements

Analysis and Solver Support

Postprocessing

Miscellaneous and API

Simcenter Femap 2306

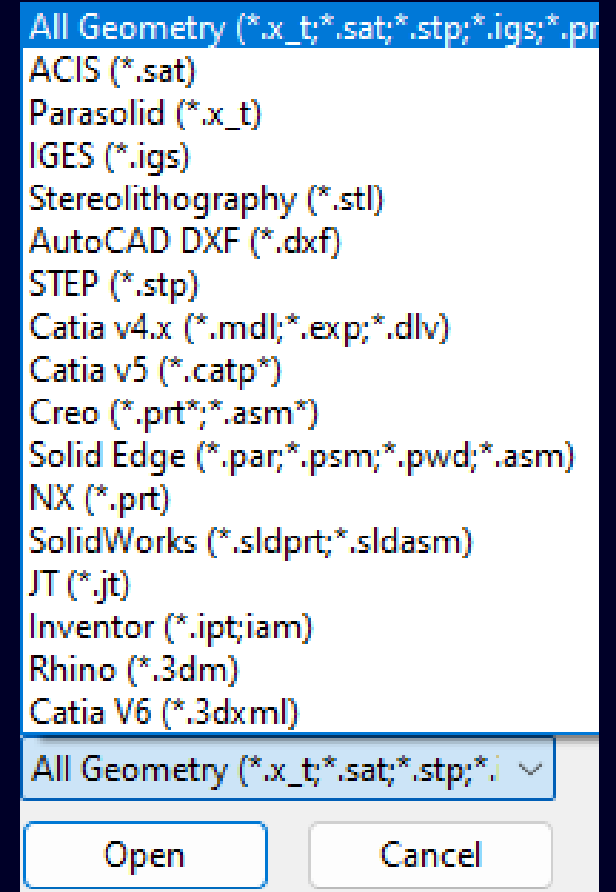
Geometry – CAD Data Translators

CAD Data Translators migrated to Siemens standard PLMXML components, which offers:

- New Catia v6 translator! – Supports .3dxml file
- New Inventor translator! – Supports .ipt and .iam files
- New Rhino translator! – Supports .3dm file
- Catia v5 translator now part of the base product!

Benefits

- Same User Interface for all translators
- Standard Siemens PLMXML Components are well maintained
- Easier for FEMAP development to keep CAD translators up to date





What's new **Simcenter Femap 2306**

Teamcenter Integration

Geometry

Preprocessing

Meshing

Performance Improvements

Analysis and Solver Support

Postprocessing

Miscellaneous and API

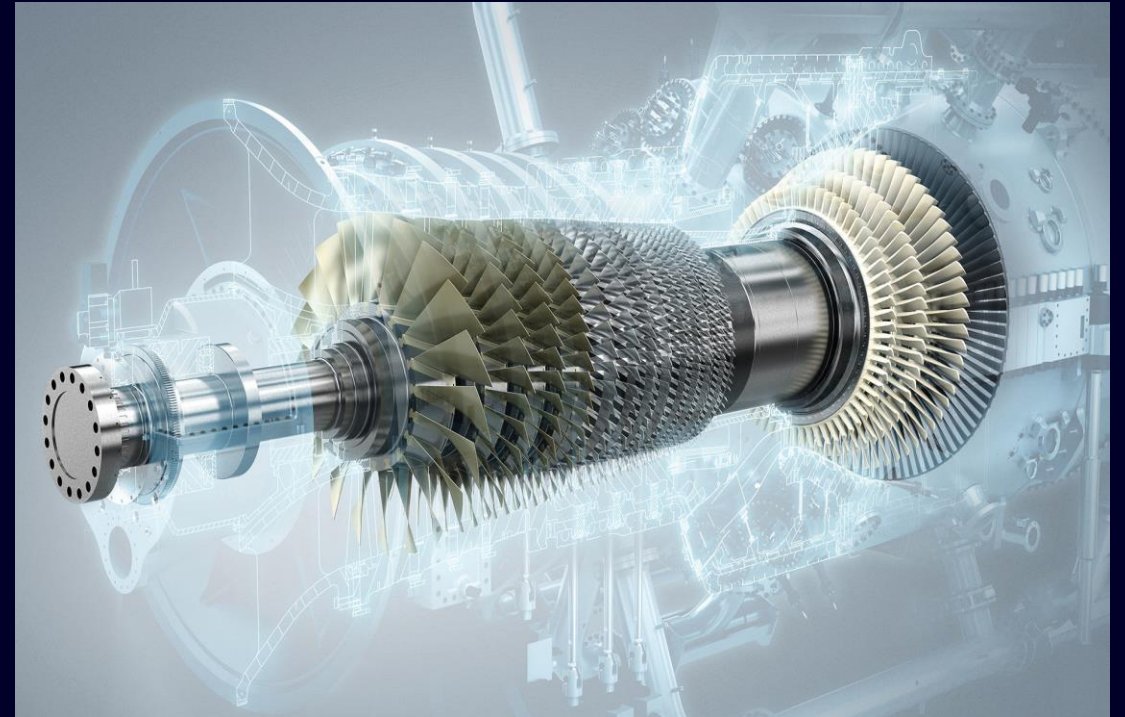
Simcenter Femap 2306

Preprocessing – Rotor Dynamics

Simcenter Rotor Dynamics (SOL 414) is ...

A dedicated solution to Rotor Dynamics analysis

- An established, recognized rotor dynamics technology, SAMCEF (ROTORS)
- Best-in-class and complete rotor dynamics capabilities
- Uses Simcenter Nastran input format
- Flexible modelling & smart solutions for industry-sized problems
- Dedicated streamlined workflows and scenarios
- Ease-of-use & short learning curve
- Tokenable solution (Enterprise Nastran)



Simcenter Femap 2306

Preprocessing – Rotor Dynamics

Rotor Dynamics analysis in Simcenter Nastran (SOL 414) is now supported

New Element/Property Types

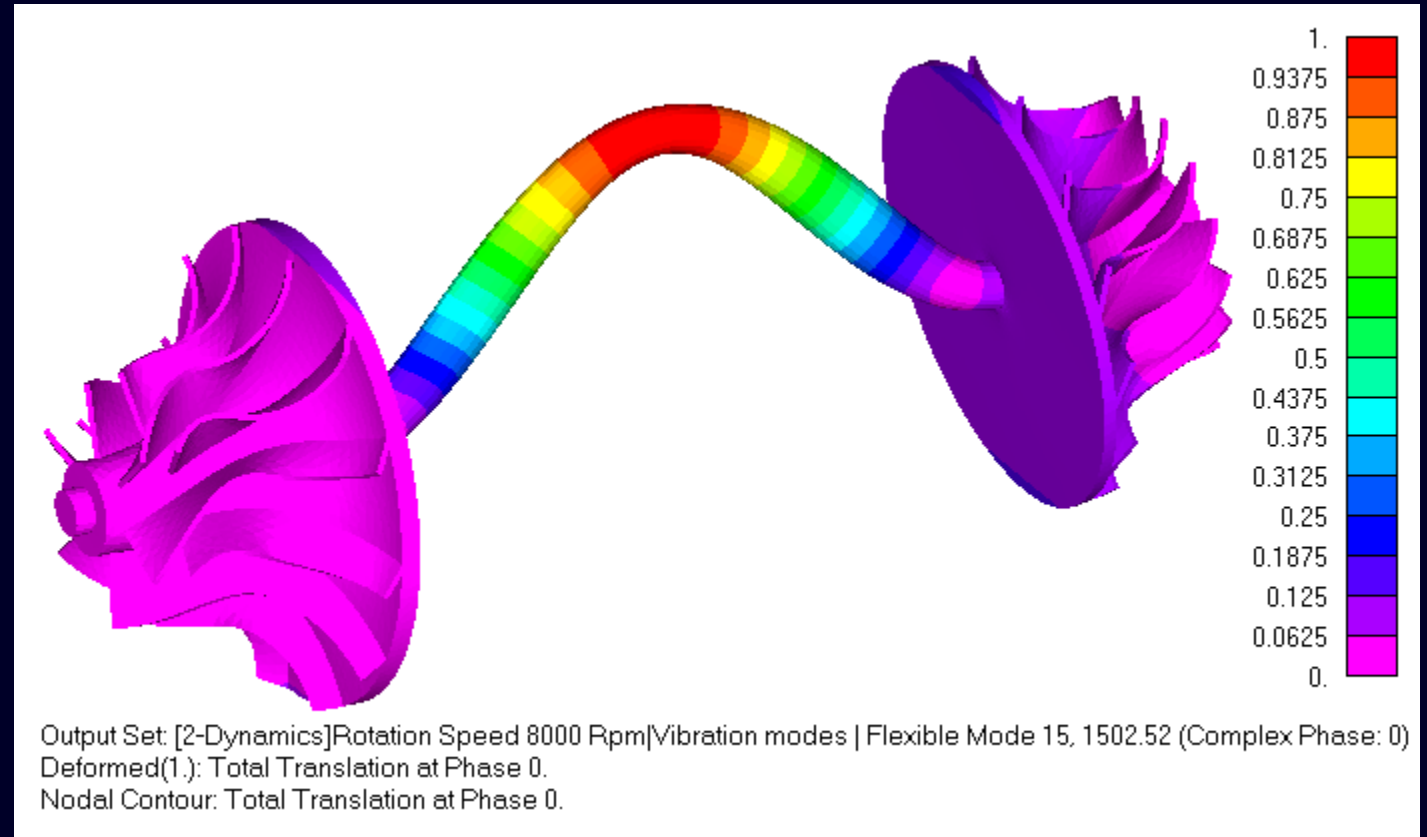
- Bearing
- Gear
- Fourier

New Rotor Dynamics Entity Types

- XY Plot Definitions
- Bearing Speeds
- Rotational Speeds

New Load Types

- Unbalance Mass
- Unbalance Moment



Simcenter Femap 2306

Preprocessing – Rotor Dynamics Element/Property Types

Bearing Element – writes CBEAR2 entry

- Defined by two nodes and a coordinate system

Bearing Property – writes PBEAR2 entry with TYPE field set to BEAR

- Constant stiffness, damping, and/or mass
- Option to have functionally-dependent stiffness, damping, and/or mass
 - Rotor Speed – writes ROTF flag
 - Frequency – writes FREQ flag
 - Time – writes TIME flag
- Hysteretic Damping – writes HYST and corresponding value
- Proportional Damping – writes AVIS and corresponding value

Define Property - BEARING Element Type

ID: 1 Title: Material: Color: 110 Layer: 1 Elem/Property Type...

Dependency Type: 0..No Dependency

Damping Coefficients:
☐ Hysteretic Damping (HYST) 0.
☒ Proportional Damping (AVIS) 0.

Stiffness (Kij) Stiffness (FKij) Damping (Cij) Damping (CKij) Mass (Mij) Mass (FMij)

Stiffness Matrix Value Entries (11,12,...,21,22,...,row,col)

	1	2	3	4	5	6
1	0.	0.	0.	0.	0.	0.
2	0.	0.	0.	0.	0.	0.
3	0.	0.	0.	0.	0.	0.
4	0.	0.	0.	0.	0.	0.
5	0.	0.	0.	0.	0.	0.
6	0.	0.	0.	0.	0.	0.

Defaults

fxy Default All Load... Save... Copy... OK Cancel

Simcenter Femap 2306

Preprocessing – Rotor Dynamics Element/Property Types

Gear Element – writes CGEAR entry

- Defined as two nodes at center of two gears (separate rotors) and two coordinate systems

Gear Property – writes PGEAR entry

- Module of Gear – pitch diameter of gear divided by number of teeth
- Gear A/Gear B
 - Number of Teeth – must be > 0
 - Pitch Cone Angle – in degrees
 - Helix Angle (deg)
- Pressure Angle (deg)
- Mesh Stiffness Coefficient (optional) – if not specified, gears are considered rigid

Define Property - GEAR Element Type

ID: 1 Title: Material: Color: 110 Layer: 1 Elem/Property Type...

Gear Data

Module of Gear	0.	Pitch Cone Angle of Gear A	0.
Number of Teeth on Gear A	1	Pitch Cone Angle of Gear B	0.
Number of Teeth on Gear B	1	Helix Angle of Gear A (deg)	0.
Pressure Angle (deg)	0.	Helix Angle of Gear B (deg)	0.
Mesh Stiffness Coefficient	0.		

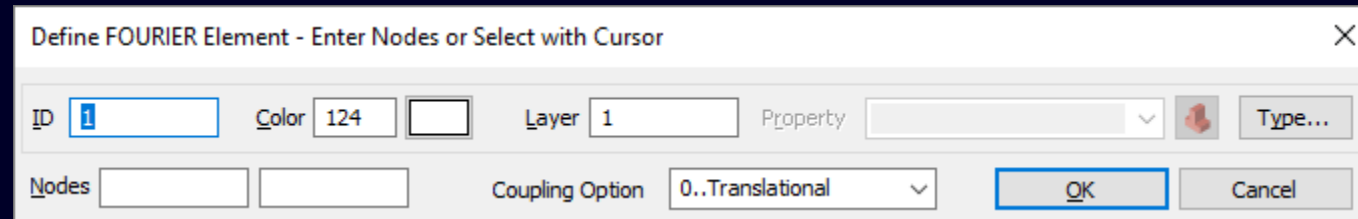
Load... Save... Copy... OK Cancel

Simcenter Femap 2306

Preprocessing – Rotor Dynamics Element/Property Types

Fourier Element – writes FOU3 entry

- Connects a 3-D node with six DOF (Node A) to a 2-D node of a Fourier multi-harmonic (axisymmetric) element (Node B)
- Coupling Option – writes appropriate value to OPT field on FOU3 entry
 - Translational (OPT = 1) – Nodes A and B must be coincident, translational DOFs are coupled
 - Rigid Translational (OPT = 2) – Node A must be a symmetry axis and Nodes A and B must have the same axial coordinate which creates a rigid connection between the translational DOF of the 3D node and the Fourier node
 - All DOFs (OPT = 5) – Similar to Rigid Translational, except all six DOFs are coupled, which allows the Fourier disk to deform (i.e., connection is not rigid)
- Can also be used in SOL 402



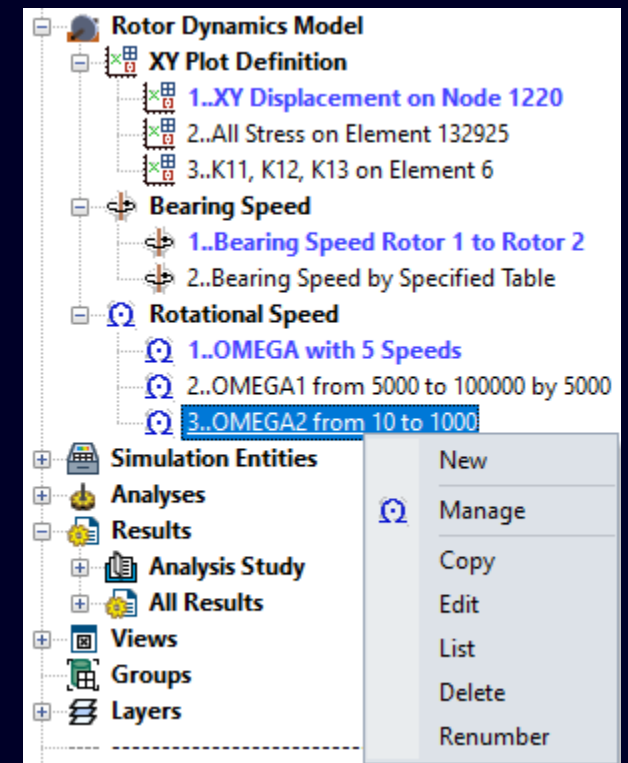
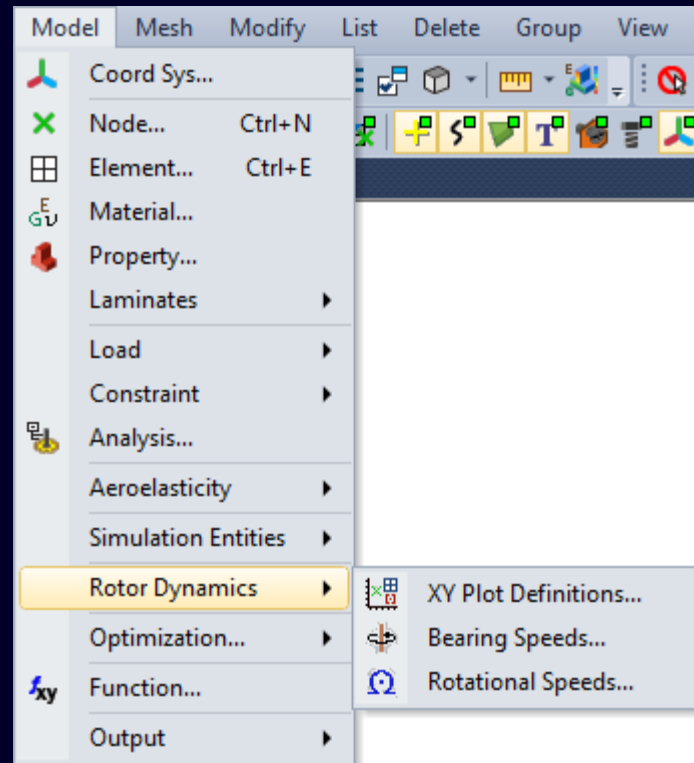
Fourier Property – none

Simcenter Femap 2306

Preprocessing – Rotor Dynamics Entity Types

The new Rotor Dynamics Entity Types can be accessed in two ways:

- Model -> Rotor Dynamics... menu
 - In all cases, these commands display the dedicated Manager dialog box for the entity type
- Model Info tree – Context-sensitive menus for each entity type offer ability to:
 - Create a New Entity
 - Display Manager for Entity Type
 - Copy Selected Entities
 - Edit Selected Entities
 - List Selected Entities
 - Delete Selected Entities
 - Renumber Selected Entities



Simcenter Femap 2306

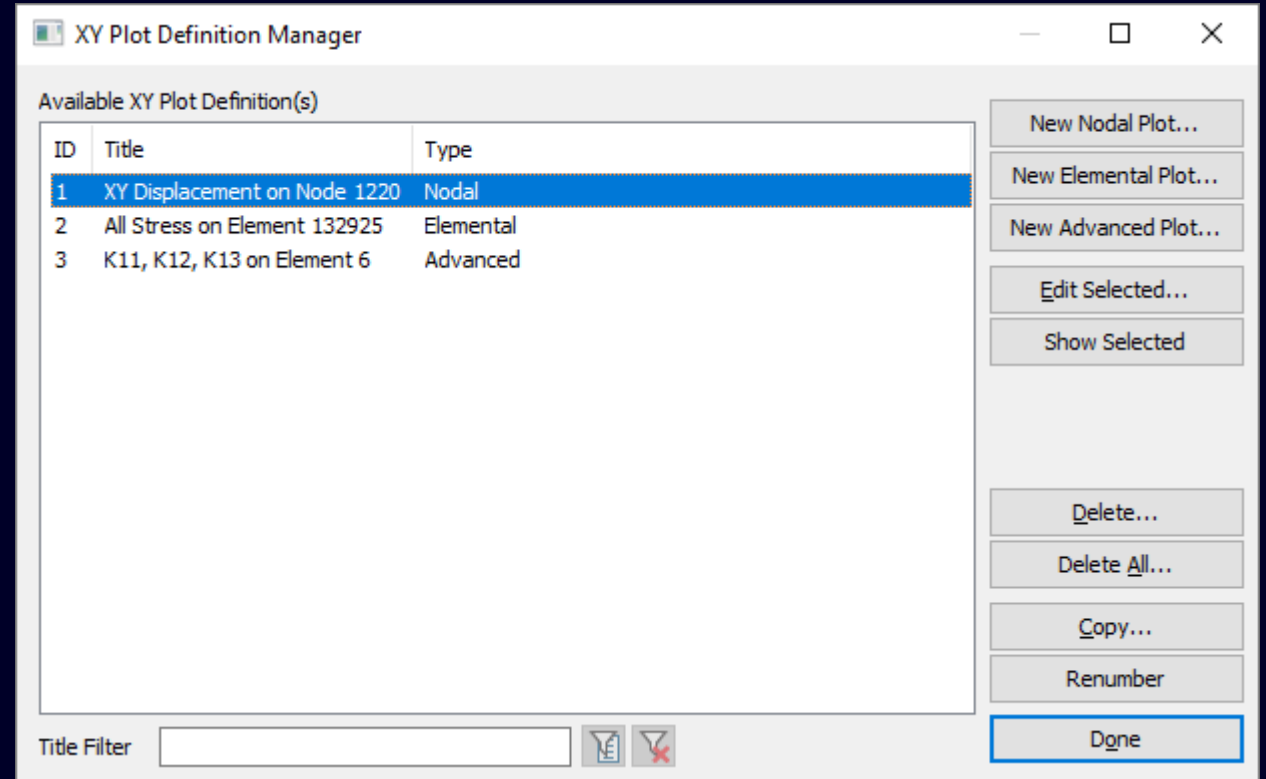
Preprocessing – Rotor Dynamics Entity Types

XY Plot Definition – Defines an XY plot request for Nodal, Elemental, or Advanced output

- Writes both OUTMGT Case Control and corresponding OUTMGT Bulk Data entries

XY Plot Definition Manager

- *New Nodal Plot*
- *New Elemental Plot*
- *New Advanced Plot*
- *Edit Selected*
- *Show Selected*
- *Delete and Delete All*
- *Copy*
- *Renumber*



Simcenter Femap 2306

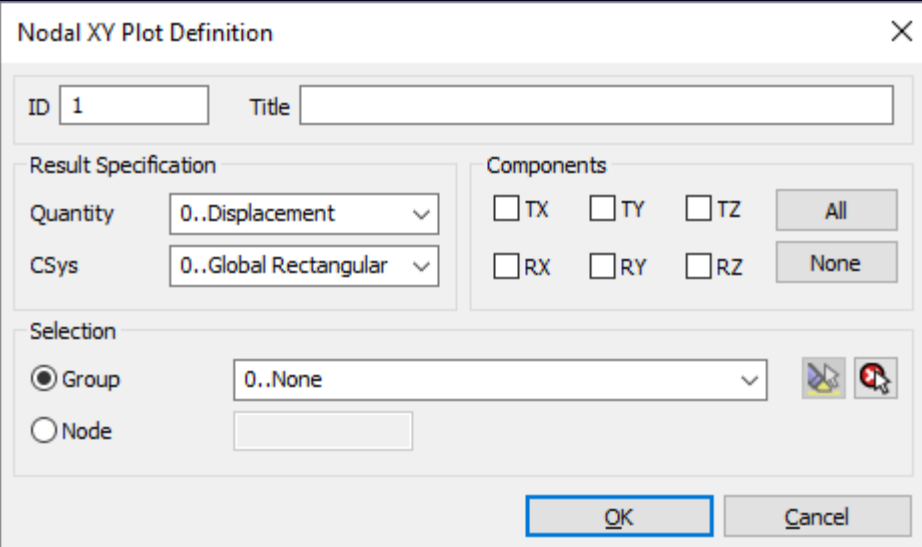
Preprocessing – Rotor Dynamics Entity Types

Nodal XY Plot – writes NODE or NODGRP to TYPE field of OUTMGT Bulk Data entries along with corresponding values for other fields based on selected Components, Coordinate System, and Quantity

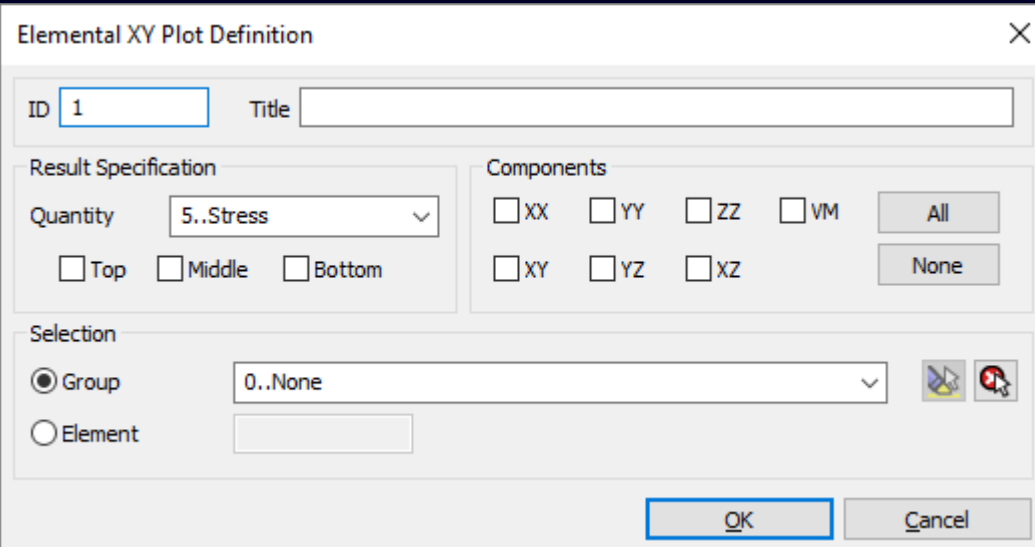
- Displacement (DISP)
- Velocity (VELOC)
- Acceleration (ACCEL)
- Reaction Force/Moment (REAC)
- Elliptic Orbit Parameters (ORBTP)

Elemental XY Plot – writes ELEM or ELEMGRP to TYPE field of OUTMGT Bulk Data entries along with corresponding values for other fields based on selected Components and Quantity

- Stress (STRESS – Top, Middle, and/or Bottom)
- Force (FORCE – Top, Middle, and/or Bottom)



The Nodal XY Plot Definition dialog box is used to configure a nodal plot. It includes fields for ID (1) and Title. The Result Specification section has Quantity set to 0..Displacement and CSys set to 0..Global Rectangular. The Components section has checkboxes for TX, TY, TZ, RX, RY, and RZ, with 'All' and 'None' buttons. The Selection section has radio buttons for Group (selected) and Node, with a dropdown menu set to 0..None. There are also selection icons and OK/Cancel buttons.



The Elemental XY Plot Definition dialog box is used to configure an elemental plot. It includes fields for ID (1) and Title. The Result Specification section has Quantity set to 5..Stress, with checkboxes for Top, Middle, and Bottom. The Components section has checkboxes for XX, YY, ZZ, VM, XY, YZ, and XZ, with 'All' and 'None' buttons. The Selection section has radio buttons for Group (selected) and Element, with a dropdown menu set to 0..None. There are also selection icons and OK/Cancel buttons.

Simcenter Femap 2306

Preprocessing – Rotor Dynamics Entity Types

Advanced XY Plot – writes ELEM or ELEMGRP to TYPE field of OUTMGT Bulk Data entries along with corresponding values for other fields based on selected items on Stiffness, Mass, Damping, and/or Results tabs in lower portion of dialog box

Selected in Analysis Set Manager for available Rotor Dynamics Analysis Types

- SOL 414,103 – Eigenvalue Analysis (Only when there is a transient response subcase)
- SOL 414,111 – Harmonic Analysis
- SOL 414,129 – Transient Analysis

```
$ Femap XY Plot Definition 1 : XY Displacement on Node 1220
OUTMGT      100      NODE      1220      DISP      X
$ Femap XY Plot Definition 1 : XY Displacement on Node 1220
OUTMGT      100      NODE      1220      DISP      Y
$ Femap XY Plot Definition 2 : All Stress on Element 132925
OUTMGT      100      ELEM      132925      STRESS      ALL
$ Femap XY Plot Definition 3 : K11, K12, K13 on Element 6
OUTMGT      100      ELEM      6      CBEAR2
+          K11          1      K12          1      K13          1
```

Advanced XY Plot Definition

ID 1 Title

Result

Quantity 7..Bearing Parameters

Selection

☒ Group 0..None

☐ Element

Stiffness Mass Damping Results

Bearing Parameters

☐ K11☐ K12☐ K13☐ K14☐ K15☐ K16

☐ K21☐ K22☐ K23☐ K24☐ K25☐ K26

☐ K31☐ K32☐ K33☐ K34☐ K35☐ K36

☐ K41☐ K42☐ K43☐ K44☐ K45☐ K46

☐ K51☐ K52☐ K53☐ K54☐ K55☐ K56

☐ K61☐ K62☐ K63☐ K64☐ K65☐ K66

AllNone

OKCancel

Simcenter Femap 2306

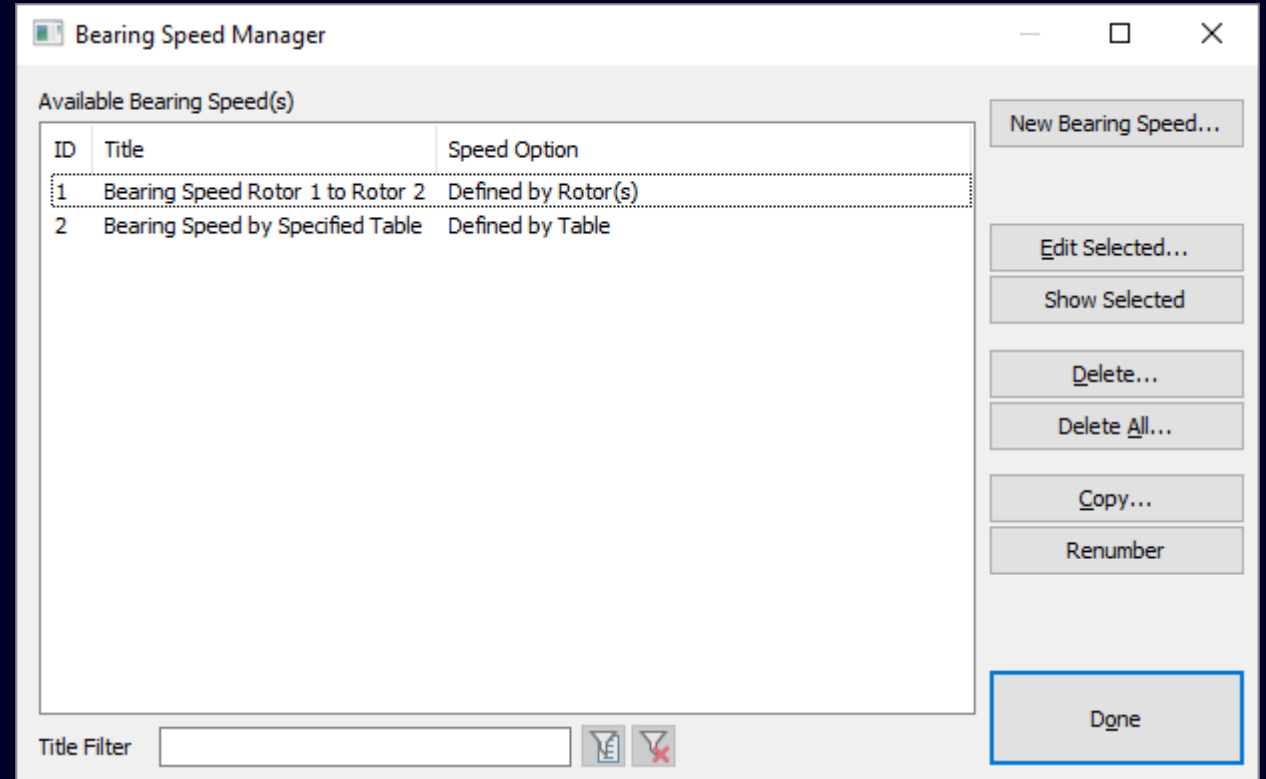
Preprocessing – Rotor Dynamics Entity Types

Bearing Speed – Connect Rotor Regions to Bearings when Bearing Properties are speed-dependent (Dependency Type = “1..Rotor Speed”)

- Writes SPEBE2 Bulk Data entries which can be used with CBEAR2 which have the TYPE field on PBEAR2 set to BEAR or USER (not currently supported in Femap)

Bearing Speed Manager

- *New Bearing Speed*
- *Edit Selected*
- *Show Selected*
- *Delete and Delete All*
- *Copy*
- *Renumber*



Simcenter Femap 2306

Preprocessing – Rotor Dynamics Entity Types

Bearing Speed – individual SPEBE2 entry written for each Bearing element that is selected in *Definition* section

Speed Option section defines possible user inputs

- *Select Rotor Region(s)* – Select 1 or 2 rotors from the *Rotor Specification* section
 - *Rotor Region 1* – writes ID to RID1 field
 - *Rotor Region 2* – writes ID to RID2 field
 - *Rotating in the Same Direction* option
 - When on, writes CORO to DIREC field
 - When off, writes COUN to DIREC field

Note: If only single rotor is selected, DIREC field is ignored

- *Specify Table* – choose function in *Bearing Speed* section
 - Writes ID of function to SPEED field

Note: DIREC field to be ignored, as bearing speeds are explicitly defined by function

The screenshot shows the 'Bearing Speed' dialog box with the following fields and options:

- ID:** 1
- Title:** Bearing Speed Rotor 1 to Rotor 2
- Definition:** Bearing Elements: 1 Elements
- Speed Option:** ☒ Select Rotor Region(s) ☐ Specify Table
- Rotor Specification:**
 - Rotor Region 1: 1..Nastran ROTORG 1
 - Rotor Region 2: 4..Nastran ROTORG 2
 - ☒ Rotating in the Same Direction
- Bearing Speed:** Variation Table: 0..None
- Buttons:** OK, Cancel

Simcenter Femap 2306

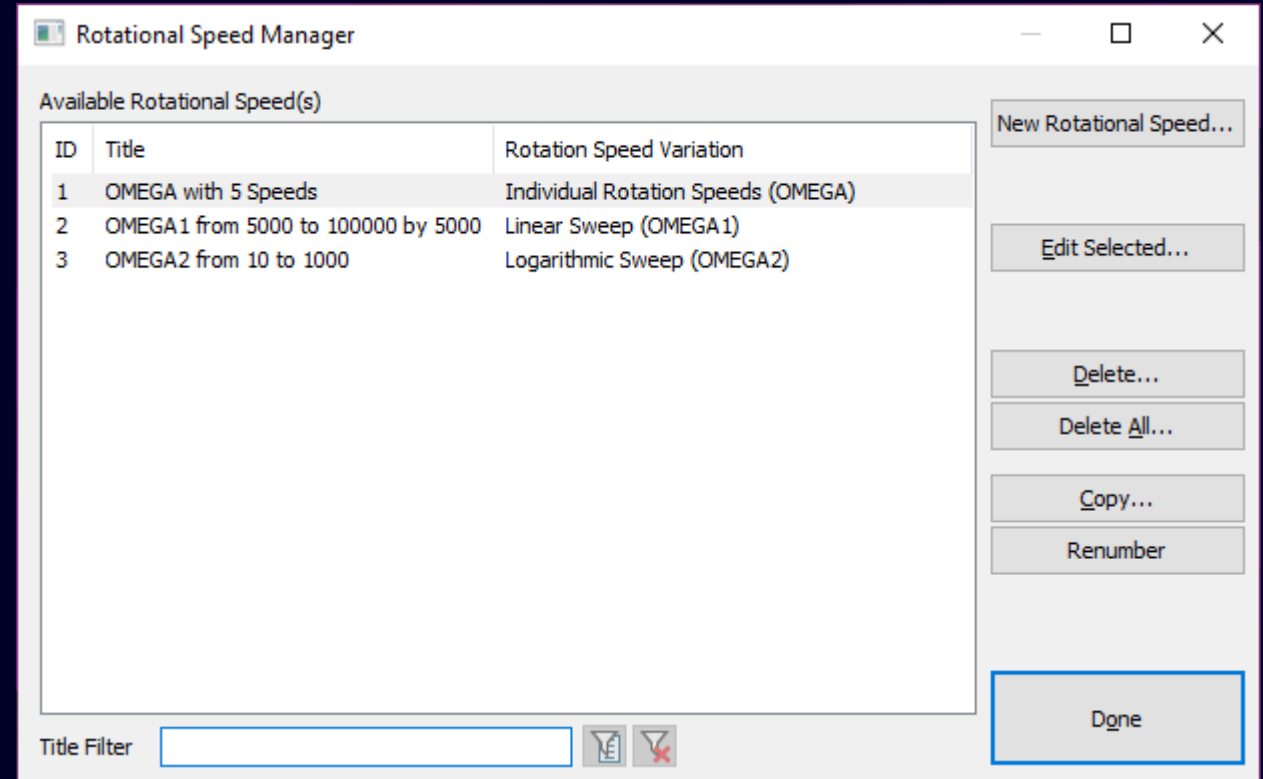
Preprocessing – Rotor Dynamics Entity Types

Rotational Speed – Allows definition of rotation speeds in 3 different forms for use in Complex Modal analysis (SOL 414,110)

- Writes OMEGA, OMEGA1, or OMEGA2 entries with appropriate values
- Rotational Speeds are selected via *Select Rotational Speed(s)* dialog box available only for subcases with Analysis Type set to “2..Rotor Complex Modal”

Rotational Speed Manager

- *New Rotational Speed*
- *Edit Selected*
- *Show Selected*
- *Delete and Delete All*
- *Copy*
- *Renumber*



Simcenter Femap 2306

Preprocessing – Rotor Dynamics Entity Types

Rotational Speed – entry written to input file depends on option selected for *Variation Type* in *Definition* section

- *Individual Rotation Speeds (OMEGA)* – writes OMEGA entry
 - Values in Y column of *Function* selected in *Rotational Speed Table* section are written to Wi fields
- *Linear Sweep (OMEGA1)* – writes OMEGA1 entry
 - *First Rotational Speed* – value written to W1 field
 - *Rotational Speed Increment* – value written to DW field
 - *Number of Increments* – value written to NDW field
- *Logarithmic Sweep (OMEGA2)* – writes OMEGA2 entry
 - *First Rotational Speed* – value written to W1 field
 - *Last Rotational Speed* – value written to W2 field
 - *Number of Increments* – value written to NDW field

Rotational Speed

ID: 1 Title: OMEGA1 from 5000 RPM to 100000 RPM

Definition

Variation Type: 1..Linear Sweep (OMEGA1)

Rotational Speed Table

Function: 0..None

Increment Specifications

First Rotational Speed: 5000

Rotational Speed Increment: 5000

Number of Increments: 19

OK Cancel

Simcenter Femap 2306

Preprocessing – Rotor Dynamics Load Types

The Model -> Load -> Nodal command can be used to create two new load types specific to Rotor Dynamics:

- Unbalance Mass
- Unbalance Moment


Both types:

- Require a *Rotor Region* be selected
- Allow a function to be specified as a *Speed Table* (option)
- Can only be used for SOL 414,111 (Subcase only) or SOL 414,129 by selecting them via *Boundary Conditions*
- Are written to UNBA Bulk Data entries referenced by ULOAD Case Control entry in specified case

Create Loads on Nodes

Load Set 1 Untitled

Title

Color 10  Layer 1

Rotor Region 0..None

Speed Table 0..None

Velocity
Rotational Velocity
Acceleration
Rotational Acceleration

Temperature

Heat Flux
Heat Generation

Static Fluid Pressure
Total Fluid Pressure
General Scalar
Steam Quality
Relative Humidity
Fluid Height Condition
Unknown Condition
Slip Wall Condition
Fan Curve
Periodic Condition

Unbalance Mass

Unbalance Moment

Direction

☒ Magnitude Only

☐ Vector

☐ Along Curve

☐ Normal to Plane

☐ Normal to Surface

Specify...

Method

☒ Constant


☐ Variable

☐ Data Surface

Advanced...

Load

Value Time/Freq Dependence Data Surface

Mass 0. 0..None 

Eccentricity 0.

Phase 0.

OK Cancel

Simcenter Femap 2306

Preprocessing – Rotor Dynamics Load Types

Unbalance Mass

- Rotor Region – writes ID to RID field
- Speed Table – writes ID of function to SPEED field
- Mass – writes value to MASS field
- Eccentricity – writes value to ECC field
- Phase – writes value to PHASEF field
- Time/Freq Dependence – writes ID of vs Time function to VBAL field

Note: If values for MASS, ECC, and VBAL are all specified, MASS and ECC are ignored by solver

Create Loads on Nodes

Load Set 1 Untitled

Title

Color 10 Layer 1

Rotor Region 0..None

Speed Table 0..None

Velocity
Rotational Velocity
Acceleration
Rotational Acceleration

Temperature

Heat Flux
Heat Generation

Static Fluid Pressure
Total Fluid Pressure
General Scalar
Steam Quality
Relative Humidity
Fluid Height Condition
Unknown Condition
Slip Wall Condition
Fan Curve
Periodic Condition

Unbalance Mass
Unbalance Moment

Direction

☒ Magnitude Only
☐ Vector
☐ Along Curve
☐ Normal to Plane
☐ Normal to Surface

Specify...

Method

☒ Constant
☐ Variable
☐ Data Surface

Advanced...

Data Surface

Load

	Value	Time/Freq Dependence
Mass	0.	0..None
Eccentricity	0.	
Phase	0.	

OK Cancel

Simcenter Femap 2306

Preprocessing – Rotor Dynamics Load Types

Unbalance Moment

- Rotor Region – writes ID to RID field
- Speed Table – writes ID of function to SPEED field
- Moment – writes value to MOMENT field
- Angle – writes value to THETA field
- Phase – value written to PHASEM field
- Time/Freq Dependence – writes ID of vs Time function to MBAL field

Note: If values for MOMENT, THETA, and VBAL are all specified, MOMENT and THETA are ignored by solver

Create Loads on Nodes

Load Set 2 Unbalance

Title

Color 10 Layer 1

Rotor Region 0..None

Speed Table 0..None

Velocity
Rotational Velocity
Acceleration
Rotational Acceleration

Temperature

Heat Flux
Heat Generation

Static Fluid Pressure
Total Fluid Pressure
General Scalar
Steam Quality
Relative Humidity
Fluid Height Condition
Unknown Condition
Slip Wall Condition
Fan Curve
Periodic Condition

Unbalance Mass
Unbalance Moment

Direction

☒ Magnitude Only
☐ Vector
☐ Along Curve
☐ Normal to Plane
☐ Normal to Surface

Specify...

Method

☒ Constant
☐ Variable
☐ Data Surface

Advanced...

Data Surface

Load

	Value	Time/Freq Dependence
Moment	0.	0..None
Angle	0.	
Phase	0.	

OK Cancel



What's new **Simcenter Femap 2306**

Teamcenter Integration

Geometry

Preprocessing

Meshing

Performance Improvements

Analysis and Solver Support

Postprocessing

Miscellaneous and API

Simcenter Femap 2306

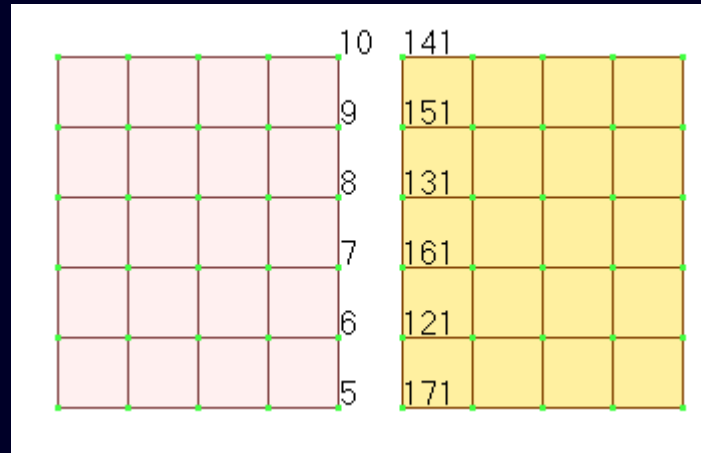
Meshing – Mesh -> Region Enhancement

The Mesh -> Region command has been in Femap for a very long time, but was enhanced to a large extent for 2306

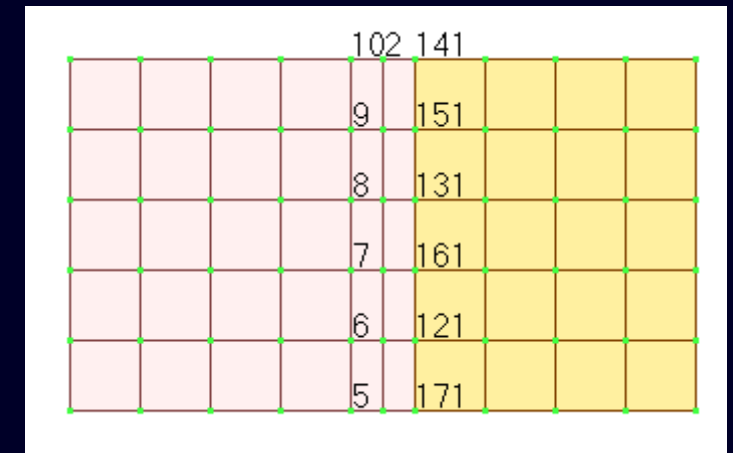
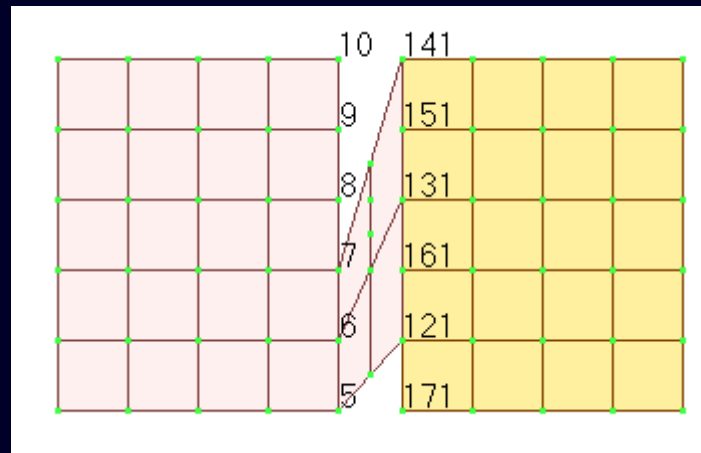
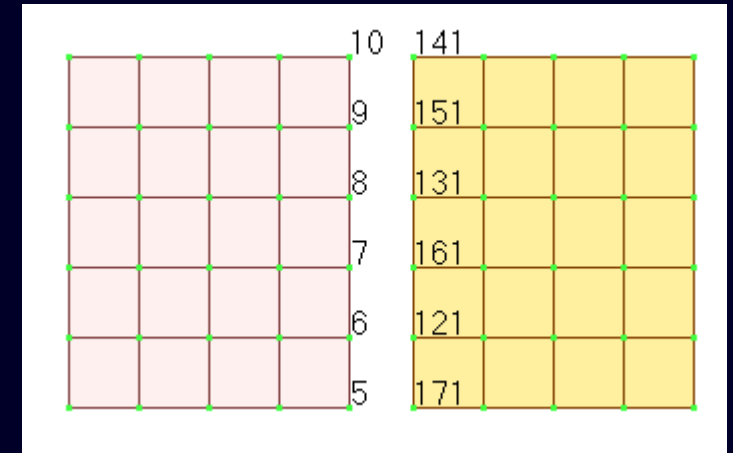
In previous versions, the node numbering needed to be in a very specific order for the command to create appropriate elements between the two sets of selected nodes (“Region 1” and “Region 2”)

In 2306, the only requirement that remains is that the same number of nodes be selected for “Region 1” and “Region 2”.

2301 – Box Pick Regions



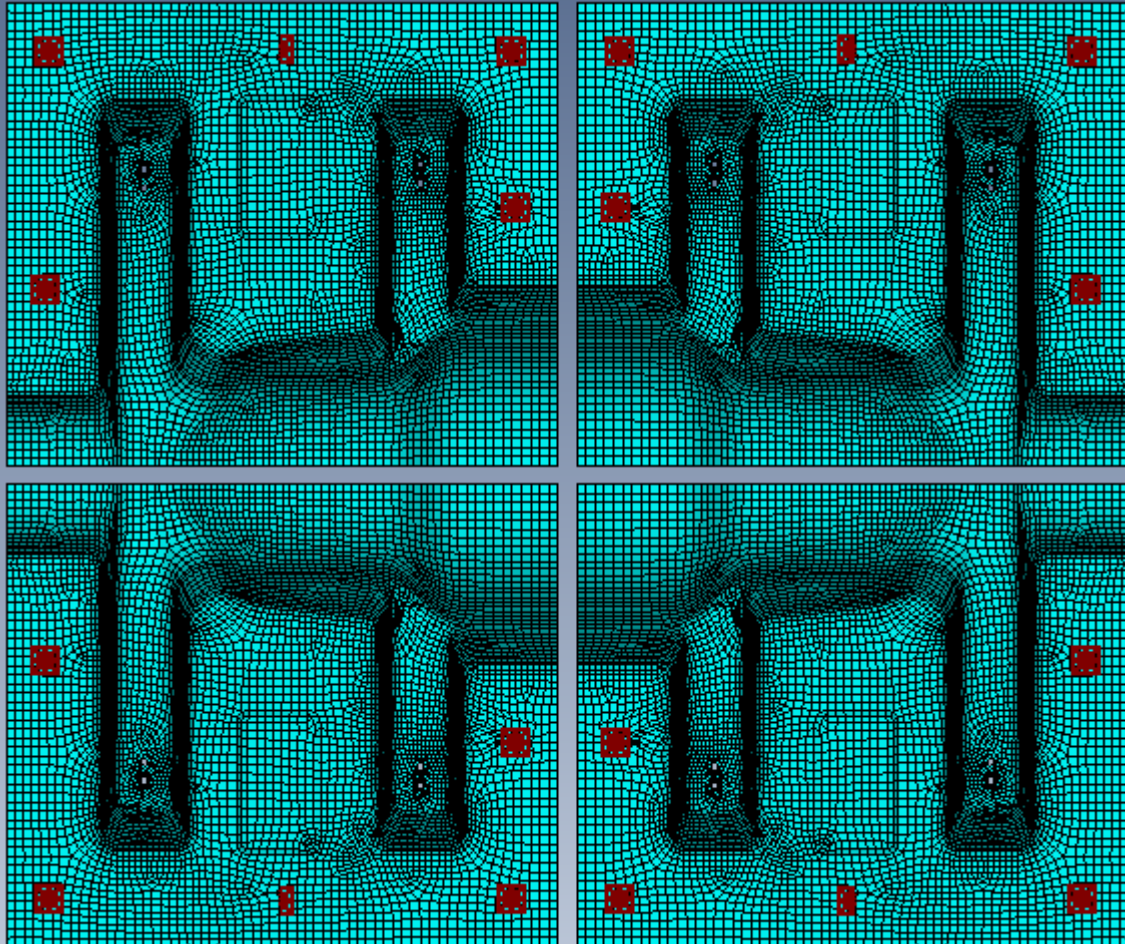
2306 – Box Pick Regions



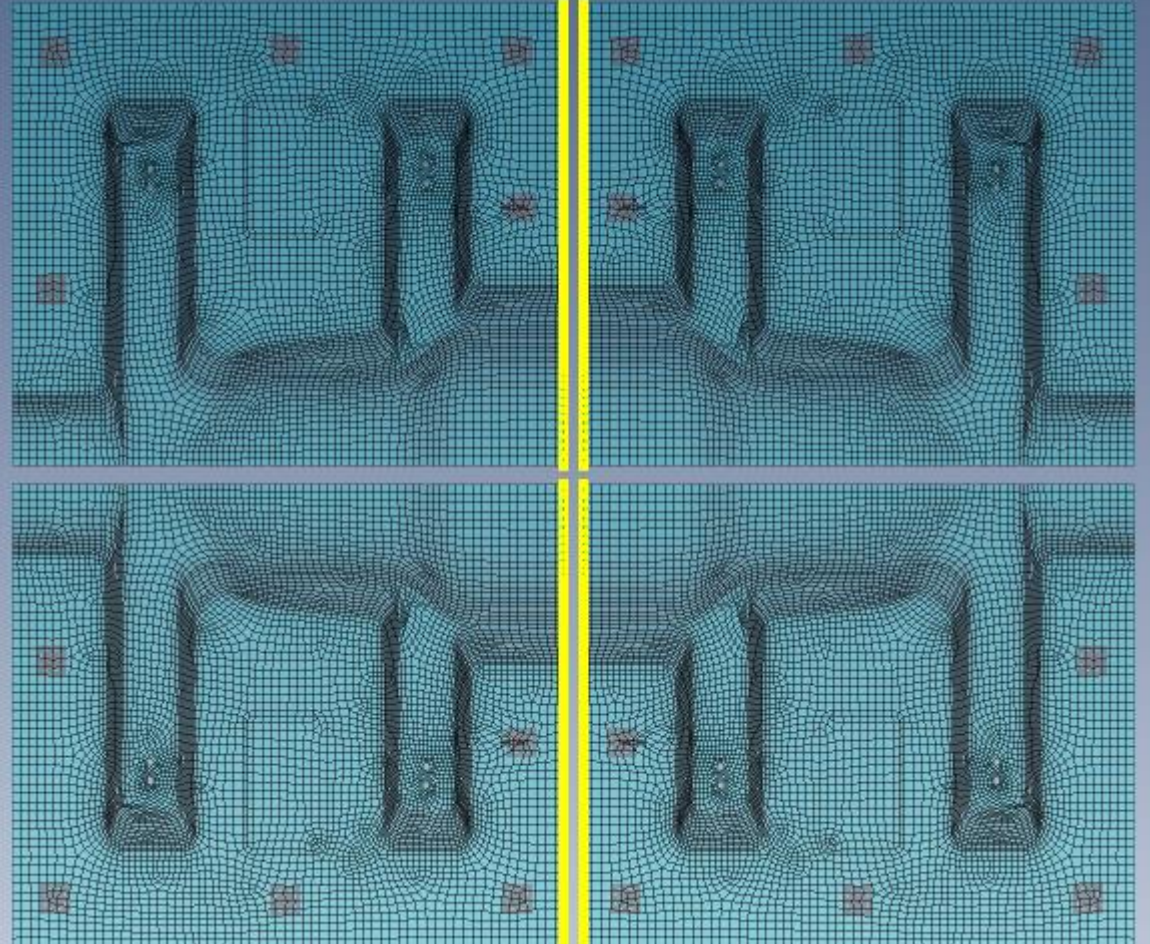
Simcenter Femap 2306

Meshing – Mesh -> Region Enhancement

Starting Model – No Geometry



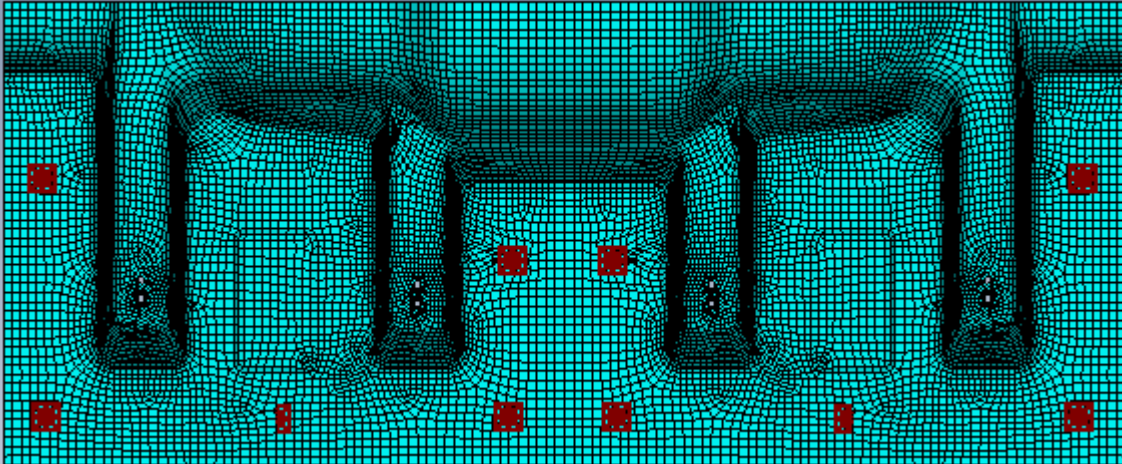
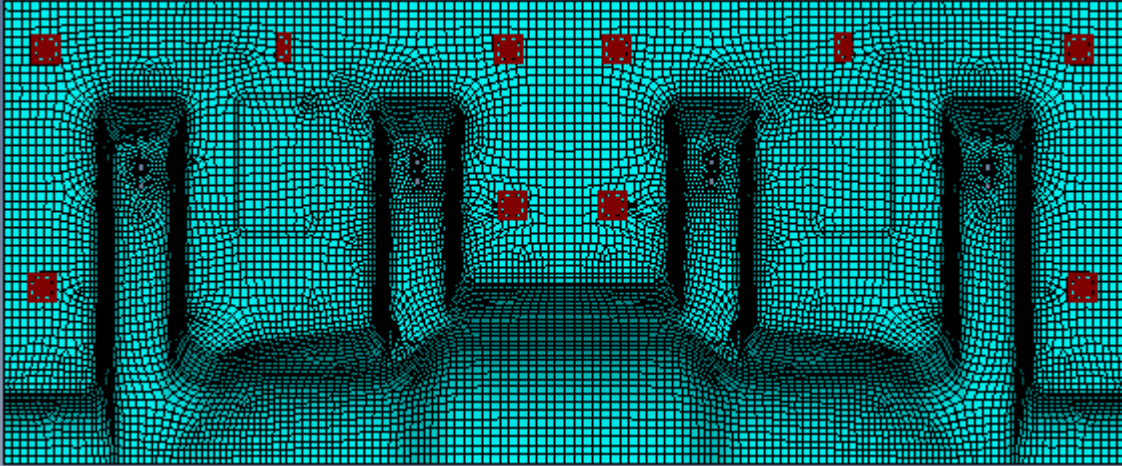
Regions Selected Vertical Middle Area



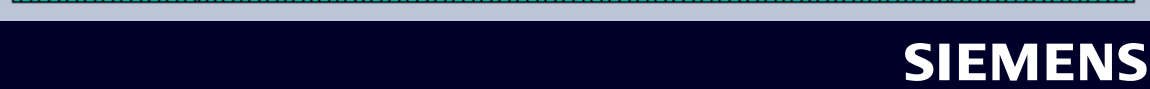
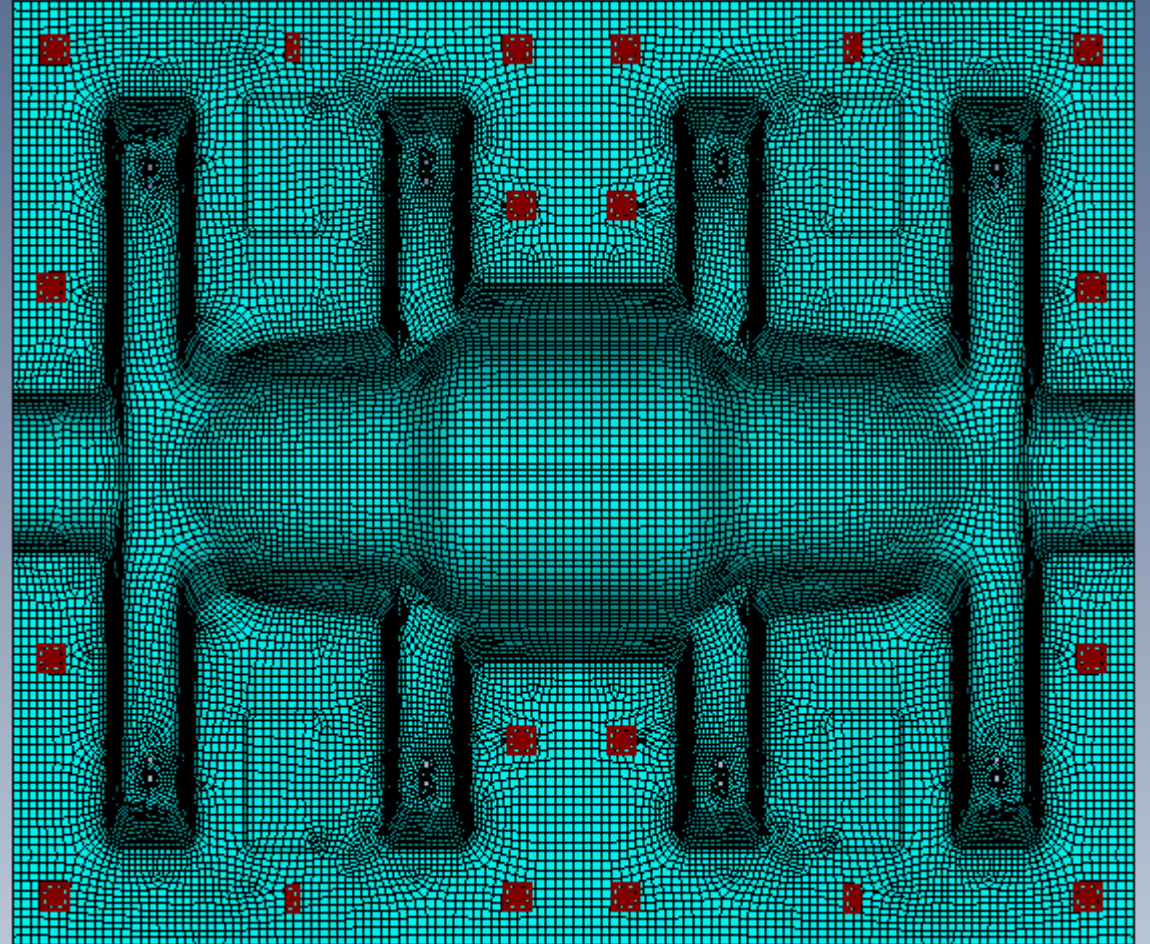
Simcenter Femap 2306

Meshing – Mesh -> Region Enhancement

Horizontal Gaps in Mesh Skipped



Mesh Fully Connected by using Mesh -> Region Again





What's new **Simcenter Femap 2306**

Teamcenter Integration

Geometry

Preprocessing

Meshing

Performance Improvements

Analysis and Solver Support

Postprocessing

Miscellaneous and API

Simcenter Femap 2306

Performance Improvements – Graphics

Data Structures were defined and modified to allow Unified Graphics Architecture (UGA), first introduced in 2301, to be able to handle Nodes and Elements in an upcoming version

Improved performance of dynamic rotation in larger models which essentially had a property defined for each element in the model

- One example was a model that had 2 Million 10-noded tetrahedral elements and 2 million properties which went from rotating at 5 frames/second to between 30-40 frames/second on the same hardware (6X-8X improvement)



What's new **Simcenter Femap 2306**

Teamcenter Integration

Geometry

Preprocessing

Meshing

Performance Improvements

Analysis and Solver Support

Postprocessing

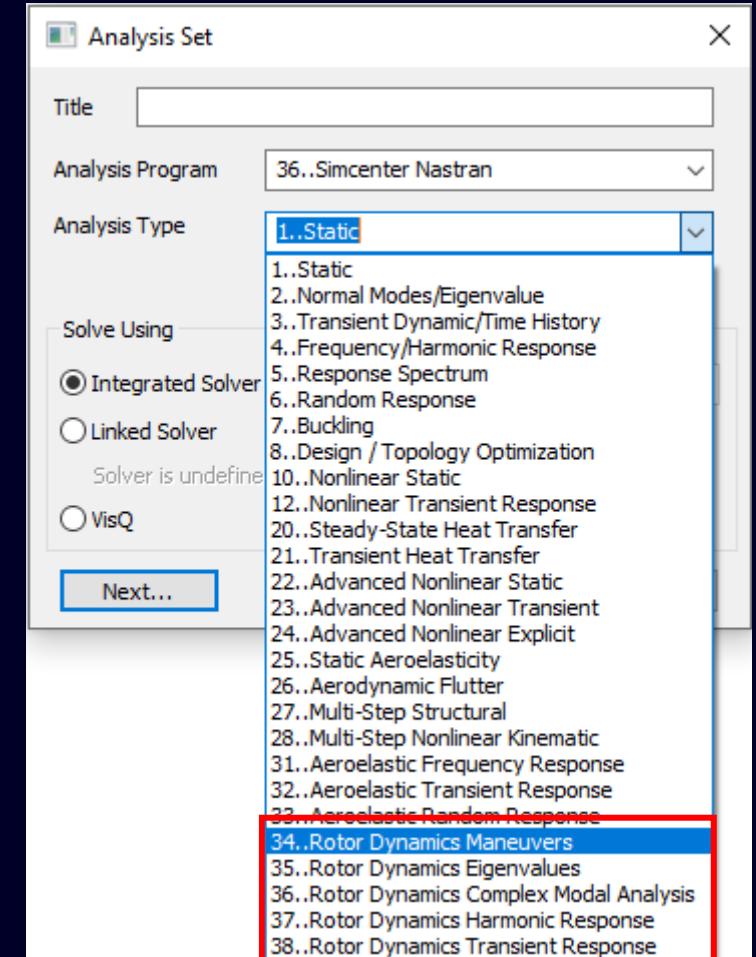
Miscellaneous and API

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

Five new analysis types for Rotor Dynamics have been added for Simcenter Nastran

- “34..Rotor Dynamics Maneuvers” (SOL 414,101) – Linear static analysis with rotational forces
- “35..Rotor Dynamics Eigenvalue Analysis” (SOL 414,103) – Compute modes of the rotating system at rest
- “36..Rotor Dynamics Complex Modal Analysis” (SOL 414,110) – Find critical speeds and stability of rotating system
- “37..Rotor Dynamics Harmonic Response” (SOL 414,111) – Model rotating system under synchronous/asynchronous frequency-dependent excitation
- “38..Rotor Dynamics Transient Response” (SOL 414,129) – Direct solution to model rotating system under time-dependent excitation



Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

Much like other types of analysis, each type of Rotor Dynamics analysis requires specific inputs

New and updated dialog boxes available for all SOL 414 analysis types include:

- *NASTRAN Rotor Dynamics Options* – New!
- *Rotor Modeling Assembly Selection* – New!
- *Boundary Conditions* – Unique for Rotor Dynamics

Other new dialog boxes that may be used for specific type of SOL 414 analysis include:

- *Select XY Plot Definition(s)*
- *Select Rotational Speed(s)*

The screenshot shows the 'NASTRAN Rotor Dynamics Options' dialog box. It has a title bar with a close button (X). The dialog is divided into two main sections: 'ROTOR DYNAMICS' and 'Parameters'. In the 'ROTOR DYNAMICS' section, there is a checked checkbox for 'Activate Rotor Dynamics Solution Options'. Below this, several parameters are listed with their corresponding values in dropdown menus or text boxes: 'Rotor Speed Variation Type' is '1..Linear by Steps', 'Start Value (RSTART)' is '0.', 'Step Size (RSTEP)' is '0.', 'Number of Steps (NUMSTEP)' is '0', 'Reference System (REFSYS)' is '1..Rotating', 'Rotor Speed Input Unit (RUNIT)' is '0..RPM - Rev/Min', 'Whirl Direction Threshold (ORBEPS)' is '1.E-6', '.f06 Output (ROTPRT)' is '0..None', and 'Freq Resp Analysis Type (SYNC)' is '0..Synchronous'. The 'Parameters' section has four checkboxes: 'FHPOST', 'FHPNST', 'DFREQ', and 'RDMTRAK'. To the right of these checkboxes are text boxes containing values: '5..2D and 3D Results', '12', '1.E-4', and '0.9'. At the bottom of the dialog, there are four buttons: 'Prev...', 'Next...' (which is highlighted with a blue border), 'OK', and 'Cancel'.

Parameter	Value
Activate Rotor Dynamics Solution Options	<input checked="" type="checkbox"/>
Rotor Speed Variation Type	1..Linear by Steps
Start Value (RSTART)	0.
Step Size (RSTEP)	0.
Number of Steps (NUMSTEP)	0
Reference System (REFSYS)	1..Rotating
Rotor Speed Input Unit (RUNIT)	0..RPM - Rev/Min
Whirl Direction Threshold (ORBEPS)	1.E-6
.f06 Output (ROTPRT)	0..None
Freq Resp Analysis Type (SYNC)	0..Synchronous
FHPOST	<input type="checkbox"/>
FHPNST	<input type="checkbox"/>
DFREQ	<input type="checkbox"/>
RDMTRAK	<input type="checkbox"/>

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

The *NASTRAN Rotor Dynamics Options* dialog box is used to specify the Rotor Dynamics Solution Options as well as Parameters used for certain types of analysis

Activate Rotor Dynamics Solution Options – when on, entries in specified in ROTORD section are written to input file

ROTORD section – writes first two lines of ROTORD entry

- *Rotor Speed Variation Type* – Used to limit available inputs for reference rotor speed
 - “0..Constant” – reference rotor speed remains constant, thus only Start Value (RSTART) can be entered
 - “1..Linear by Steps” (Default) – Enter values for *Start Value (RSTART)*, *Step Size (RSTEP)*, and *Number of Steps (NUMSTEP)* to define varying rotor reference speed
 - “2..Function of a Sweeping Parameter” – Rotor speed defined in another manner (OMEGAI, FREQI, or TSTEPi)

NASTRAN Rotor Dynamics Options

☒ Activate Rotor Dynamics Solution Options

ROTORD

Rotor Speed Variation Type: 1..Linear by Steps

Start Value (RSTART): 0.

Step Size (RSTEP): 0.

Number of Steps (NUMSTEP): 0

Reference System (REFSYS): 1..Rotating

Rotor Speed Input Unit (RUNIT): 0..RPM - Rev/Min

Whirl Direction Threshold (ORBEPS): 1.E-6

.f06 Output (ROTPRT): 0..None

Freq Resp Analysis Type (SYNC): 0..Synchronous

Parameters

☒ FHPOST: 5..2D and 3D Results

☒ FHPNST: 12

☒ DFREQ: 1.E-4

☒ RDMTRAK: 0.9

Prev... Next... OK Cancel

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

ROTORD section – writes first two lines of ROTORD entry

- *Start Value (RSTART)* – value written to RSTART field
- *Step Size (RSTEP)* – value written to RSTEP field
- *Number of Steps (NUMSTEP)* – value written to NUMSTEP field
- *Reference System (REFSYS)* – Frame of Reference
 - “0..Fixed” – specifies “fixed” frame of reference and writes ‘FIX’ to REFSYS field
 - “1..Rotating” (Default) – specifies “rotating” frame of reference and writes ‘ROT’ to REFSYS field

NASTRAN Rotor Dynamics Options

☒ Activate Rotor Dynamics Solution Options

ROTORD

Rotor Speed Variation Type: 1..Linear by Steps

Start Value (RSTART): 0.

Step Size (RSTEP): 0.

Number of Steps (NUMSTEP): 0

Reference System (REFSYS): 1..Rotating

Rotor Speed Input Unit (RUNIT): 0..RPM - Rev/Min

Whirl Direction Threshold (ORBEP5): 1.E-6

.f06 Output (ROTPRT): 0..None

Freq Resp Analysis Type (SYNC): 0..Synchronous

Parameters

☒ FHPOST: 5..2D and 3D Results

☒ FHPNST: 12

☒ DFREQ: 1.E-4

☒ RDMTRAK: 0.9

Prev... Next... OK Cancel

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

ROTORD section – writes first two lines of ROTORD entry

- *Rotor Speed Input Unit (RUNIT)* – selects units for rotor speed input, written to RUNIT field
 - “0..RPM – Revs/Min” (Default) – writes ‘RPM’ characters
 - “1..CPS – Cycles/Sec” – writes ‘CPS’ characters
 - “2..HZ – Hertz” – writes ‘HZ’ characters
 - “3..RAD – Radians/Sec” – writes ‘RAD’ characters
- *Whirl Direction Threshold (ORBEPS)* – threshold value for detection of whirl direction written to ORBEPS field

NASTRAN Rotor Dynamics Options

☒ Activate Rotor Dynamics Solution Options

ROTORD

Rotor Speed Variation Type: 1..Linear by Steps

Start Value (RSTART): 0.

Step Size (RSTEP): 0.

Number of Steps (NUMSTEP): 0

Reference System (REFSYS): 1..Rotating

Rotor Speed Input Unit (RUNIT): 0..RPM - Rev/Min

Whirl Direction Threshold (ORBEPS): 1.E-6

.f06 Output (ROTPRT): 0..None

Freq Resp Analysis Type (SYNC): 0..Synchronous

Parameters

☒ FHPOST: 5..2D and 3D Results

☒ FHPNST: 12

☒ DFREQ: 1.E-4

☒ RDMTRAK: 0.9

Prev... Next... OK Cancel

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

ROTOR section – writes first two lines of ROTORD entry

- *.f06 Output (ROTPRT)* – controls output written to .f06 file by specifying value for ROTPRT field
 - “0..None” (Default) – writes 0, prints nothing
 - “1..Generalized Matrices” – writes 1, prints:
 - Generalized matrices
 - Final nonlinear bearing values at each frequency/time
 - “2..Eigenvalue Summary/Eigenvectors” – writes 2, prints:
 - Eigenvalue summary and eigenvectors at each RPM
 - Intermediate nonlinear bearing values at each iteration
 - “3..Both” – writes 3, prints combination of 1 and 2
- Freq Resp Analysis Type (SYNC) – option for frequency Response analysis
 - 0..Asynchronous – writes value of 0 to SYNC field
 - 1..Synchronous (Default) – writes value of 1 to SYNC field

NASTRAN Rotor Dynamics Options

☒ Activate Rotor Dynamics Solution Options

ROTOR

Rotor Speed Variation Type: 1..Linear by Steps

Start Value (RSTART): 0.

Step Size (RSTEP): 0.

Number of Steps (NUMSTEP): 0

Reference System (REFSYS): 1..Rotating

Rotor Speed Input Unit (RUNIT): 0..RPM - Rev/Min

Whirl Direction Threshold (ORBEPS): 1.E-6

f06 Output (ROTPRT): 0..None

Freq Resp Analysis Type (SYNC): 0..Synchronous

Parameters

☒ FHPOST: 5..2D and 3D Results

☒ FHPNST: 12

☒ DFREQ: 1.E-4

☒ RDMTRAK: 0.9

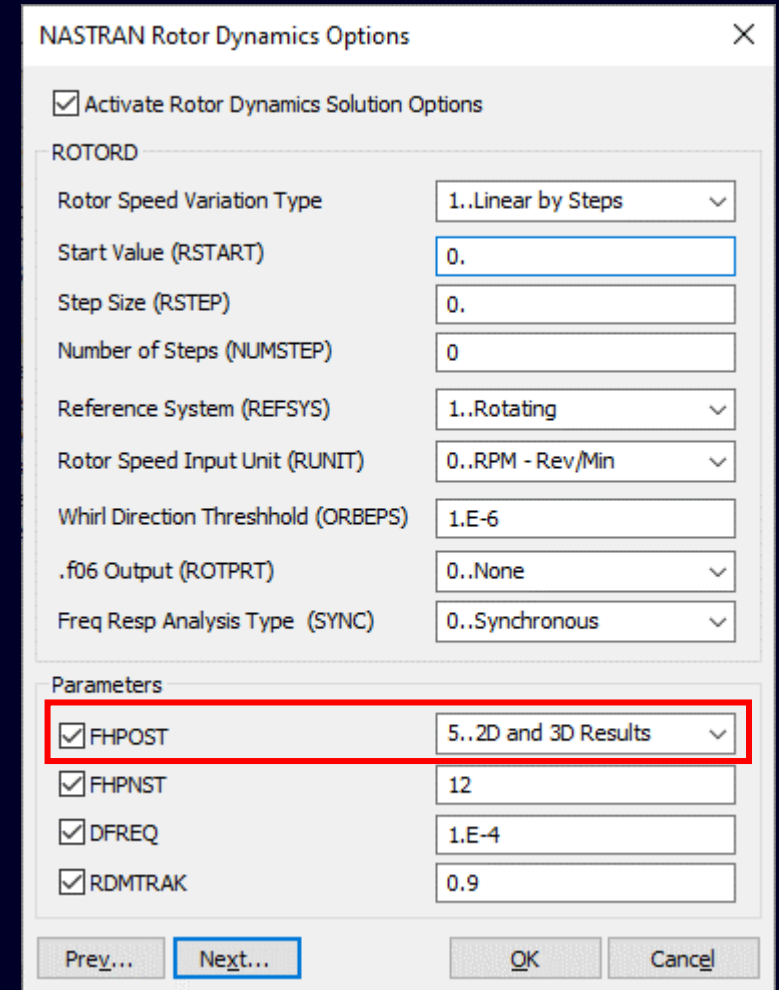
Prev... Next... OK Cancel

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

Parameters section

- FHPOST – Specifies the results output option when the axisymmetric Fourier elements are requested with the FHAR Case Control Command by writing PARAM,FHPOST
- “1..2D and 3D Results + 3D Recombination” – writes value of 1, which Requests 3D harmonic results for the axisymmetric Fourier elements at incremental angle locations around the complete 360 degree circumference by using FHPNST parameter to define the angle increments per 90 degrees. In addition, writes out all output requested by option “5..2D and 3D Results”
- “4..2D Results” – writes value of 4, which requests 2D results on the modeled axisymmetric geometry
- “5..2D and 3D Results” (Default) – writes value of 5, which requests 2D results on the modeled axisymmetric geometry and 3D results on the modeled solid element geometry



NASTRAN Rotor Dynamics Options

☒ Activate Rotor Dynamics Solution Options

ROTOR D

Rotor Speed Variation Type: 1..Linear by Steps

Start Value (RSTART): 0.

Step Size (RSTEP): 0.

Number of Steps (NUMSTEP): 0

Reference System (REFSYS): 1..Rotating

Rotor Speed Input Unit (RUNIT): 0..RPM - Rev/Min

Whirl Direction Threshold (ORBEP5): 1.E-6

.f06 Output (ROTPRT): 0..None

Freq Resp Analysis Type (SYNC): 0..Synchronous

Parameters

☒ FHPOST: 5..2D and 3D Results

☒ FHPNST: 12

☒ DFREQ: 1.E-4

☒ RDMTRAK: 0.9

Prev... Next... OK Cancel

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

Parameters section

- **FHPNST** – Specifies the number of angle increments in a 90-degree quadrant in which the software computes the 3D harmonic results for axisymmetric Fourier elements, which allows users to view the non-axisymmetric results on a full revolute mode
 - Writes PARAM,FHPNST with entered value
 - Default value is 12, which is minimum value for FHPNST
 - Used in conjunction with “1..2D and 3D Results + 3D Recombination” option specified for FHPOST
- **DFREQ** – Specifies threshold for the elimination of duplicate frequencies (or rotational speeds) on all FREQi (or OMEGAi) entries, by writing PARAM,DFREQ with entered value
- **RDMTRAK** – Specifies threshold value for mode tracking in SOL 414,110, writes PARAM,RDMTRAK with entered value

NASTRAN Rotor Dynamics Options

☒ Activate Rotor Dynamics Solution Options

ROTORD

Rotor Speed Variation Type: 1..Linear by Steps

Start Value (RSTART): 0.

Step Size (RSTEP): 0.

Number of Steps (NUMSTEP): 0

Reference System (REFSYS): 1..Rotating

Rotor Speed Input Unit (RUNIT): 0..RPM - Rev/Min

Whirl Direction Threshold (ORBEPS): 1.E-6

.f06 Output (ROTPRT): 0..None

Freq Resp Analysis Type (SYNC): 0..Synchronous

Parameters

☒ FHPOST: 5..2D and 3D Results

☒ FHPNST: 12

☒ DFREQ: 1.E-4

☒ RDMTRAK: 0.9

Prev... Next... OK Cancel

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

The *Rotor Modeling Assembly Selection* dialog box is used to select which Rotor Region(s) in model will be considered during the analysis, with minimum number of Rotors being 1 and maximum number being 10

Each *Rotor #*, *Function*, and *Value* combination is used to write lines 3 through 12, as needed, on the ROTORD entry

Rotor Region Selection section

- *Rotor 1* through *Rotor 10* – writes ID of selected Rotor Region to appropriate RIDi field

Note: *Rotation Axis (Z Axis)*, *Freq for Overall Damping (W3)*, *Freq for Material Damping (W4)*, and *Rotational Force Applied* on Rotor Region are written to RCORDi, W3_i, W4_i, and RFORCEi fields, as needed

Rotor Region Selection	
Rotor 1 *	1..Nastran ROTORG 1
Rotor 2	4..Nastran ROTORG 2
Rotor 3	0..None
Rotor 4	0..None
Rotor 5	0..None
Rotor 6	0..None
Rotor 7	0..None
Rotor 8	0..None
Rotor 9	0..None
Rotor 10	0..None

Rotor Speed Multiplier	
Function	Value
0..None	1.
0..None	1.
0..None	1.
0..None	1.
0..None	1.
0..None	1.
0..None	1.
0..None	1.
0..None	1.
0..None	1.

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

Rotor Speed Multiplier section

- *Function* – when specified, writes ID of selected function to appropriate SPEEDi field as an integer
- If Step Size (RSTEP) value in *NASTRAN Rotor Dynamics Options* dialog box is:
 - Non-Zero – defines values of the multiplier as a function of reference rotor speed
 - 0 – defines values of the rotor speed as a function of the sweeping parameter with sweeping parameter specified as OMEGAi for SOL 414,110, FREQi for SOL 414,111, or TSTEPi for SOL 414,129
- *Value* – if function is not specified, writes value to appropriate SPEEDi field as real number, which is a multiplier of all reference rotor speeds

Rotor Modeling Assembly Selection

Rotor Region Selection	
Rotor 1 *	1..Nastran ROTORG 1
Rotor 2	4..Nastran ROTORG 2
Rotor 3	0..None
Rotor 4	0..None
Rotor 5	0..None
Rotor 6	0..None
Rotor 7	0..None
Rotor 8	0..None
Rotor 9	0..None
Rotor 10	0..None

Rotor Speed Multiplier	
Function	Value
0..None	1.
0..None	1.
0..None	1.
0..None	1.
0..None	1.
0..None	1.
0..None	1.
0..None	1.
0..None	1.
0..None	1.

Prev... Next... OK Cancel

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

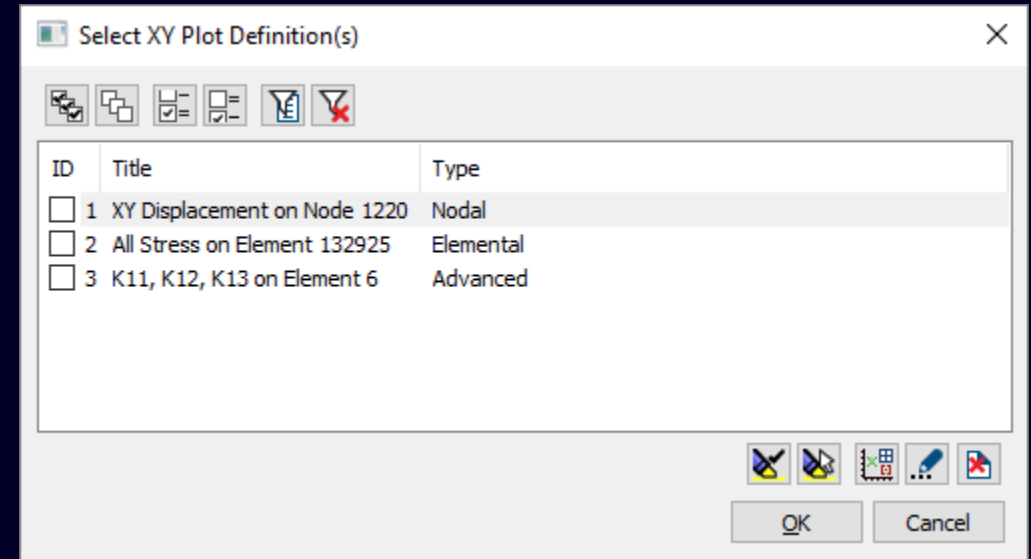
The *Select XY Plot Definitions* dialog box is used to select which XY Plot Definition entities will be written to the input file as OUTMGT entries

Available for:

- SOL 414,103 (Eigenvalue Analysis)
- SOL 414,111 (Harmonic Response)
- SOL 414,129 (Transient Response)

For convenience, this dialog box contains:

- Common icons used throughout Femap for selection and filtering of “named entities”
- Additional icons to highlight Nodes and Elements referenced by XY Plot Definition entities in the graphics window as well as create, edit, and delete XY Plot Definition entities



Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

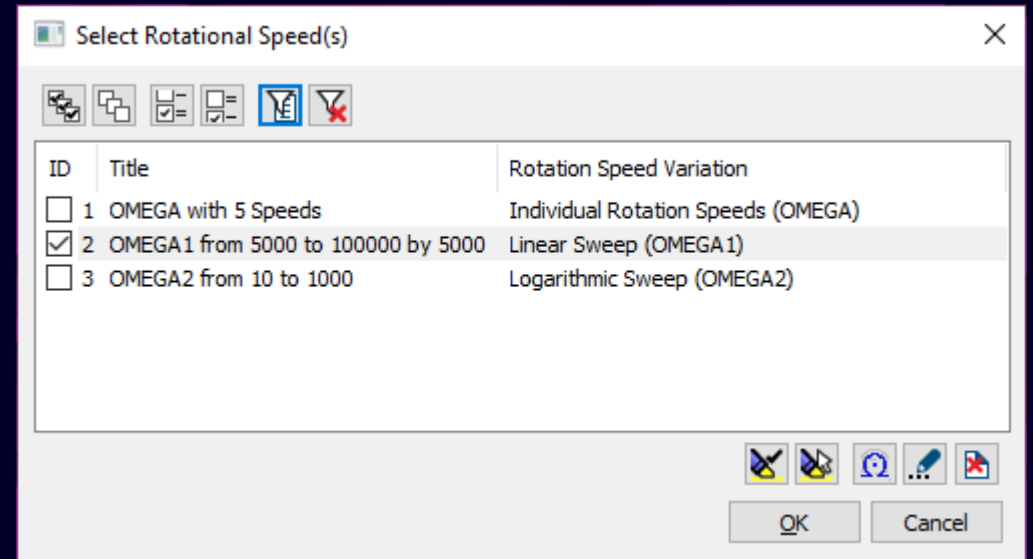
The *Select Rotational Speeds* dialog box is used to select which Rotational Speed entities will be written to the input file as OMEGA, OMEGA1, and/or OMEGA2 entries

Available for:

- SOL 414,110 (Complex Modal Analysis) once a Subcase with *Analysis Type* set to “2..Rotor Complex Modal” has been created

For convenience, this dialog box contains:

- Common icons used throughout Femap for selection and filtering of “named entities”
- Additional icons to create, edit, and delete Rotational Speed entities



Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

The *Boundary Conditions* dialog box has been updated to add Load Sets and other options specific for SOL 414 Analysis Types

- Static Load Sets – used to select a load set containing static loads
- Dynamic Load Set – used to select a load set containing dynamic excitations
- Unbalance Load Set – used to select a load set containing Unbalance Mass and/or Unbalance Moment loads
- Fourier Multi-Harmonics (a,b,c THRU d) – used to request/remove certain harmonics for an analysis (text entry)

Boundary Conditions

Primary Sets

Constraints: 1..NASTRAN SPC 1

Constraint Equations: 0..From Constraint Set

Static Load Set: 0..None

Dynamic Load Set: 0..None

Initial Temperature Set: 0..None

Temperature Load Set: 0..From Load Set

Unbalance Load Set: 0..None

Fourier Multi-Harmonics (a,b,c THRU d)

☐ Harmonics to Request

☐ Harmonics to Remove

Glue Sets

☒ All Connectors

☐ Connection(s): 0..None

☐ None

Glue Property: 0..None

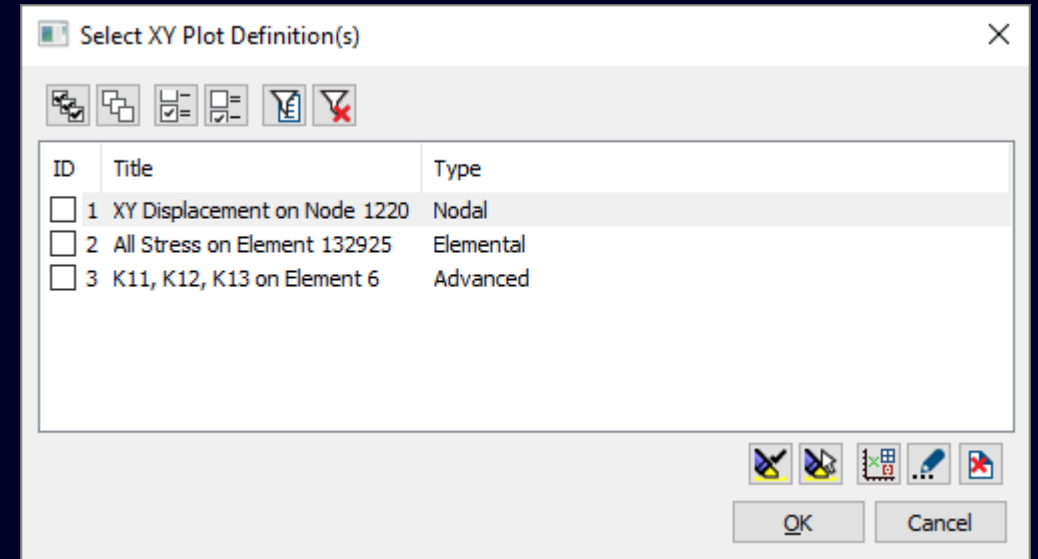
Prev... Next... OK Cancel

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

Available Input Summary:

- *Options* section
 - For all SOL 414 Analysis Types
 - *NASTRAN Executive and Solution Options*
 - *NASTRAN Bulk Data Options*
 - *NASTRAN Rotor Dynamics Options*
 - *Rotor Modeling Assembly Selection*
 - For all SOL 414 except SOL 414,101
 - *NASTRAN Dynamic Analysis*
 - For all SOL 414 except SOL 414,101 and SOL 414,110
 - *Select XY Plot Definition(s)*
 - For SOL 414,129 Only
 - Strategy Parameters (NLCNTLG) – Added *Axisymmetric Harmonic Coupling Options* specifically for this analysis type



Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

Available Input Summary:

- *Global Requests and Conditions* section
 - For all SOL 414 Analysis Types
 - *Boundary Conditions*
 - *NASTRAN Output Requests*
 - For SOL 414,129 Only
 - *Strategy Parameters (NLCNTL2)*

The screenshot shows the 'Boundary Conditions' dialog box with the following settings:

- Primary Sets**
 - Constraints:** 1..NASTRAN SPC 1
 - Constraint Equations:** 0..From Constraint Set
 - Static Load Set:** 0..None
 - Dynamic Load Set:** 0..None
 - Initial Temperature Set:** 0..None
 - Temperature Load Set:** 0..From Load Set
 - Unbalance Load Set:** 0..None
- Fourier Multi-Harmonics (a,b,c THRU d)**
 - Harmonics to Request:** (empty field)
 - Harmonics to Remove:** (empty field)
- Glue Sets**
 - All Connectors:** (selected radio button)
 - Connection(s):** 0..None
 - None:** (unselected radio button)
 - Glue Property:** 0..None

Buttons at the bottom: Prev..., Next..., OK, Cancel.

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

Available Input Summary (Subcase):

- For all SOL 414 Analysis Types
 - *Analysis Case* – see specific SOL 414 analysis types
 - *Boundary Conditions*
 - *NASTRAN Output Requests*
- For SOL 414,101 (Maneuvers)
 - *Analysis Case* – No Analysis Types – No additional dialog boxes
- For SOL 414,103 (Eigenvalue Analysis)
 - *Analysis Case* – 3 Analysis Types:
 - “1..Static Loads, Constraints”
 - “2..Rotor Eigenvalues” – *NASTRAN Modal Analysis*
 - “3..Transient Preload” – *Strategy Parameters (NLCNTL2) and Subcase # Time Step*

Analysis Case

Case ID: 1

Subtitle:

Label:

Manual Control

☐ Skip Standard

☐ Start Text Inside Case

Start Text (Off)

End Text (Off)

Prev... Next... OK Cancel

Analysis Case

Analysis Type: 2..Rotor Eigenvalues

Case ID:

Subtitle:

Label:

Manual Control

☐ Skip Standard

☐ Start Text Inside Case

Start Text (Off)

End Text (Off)

Prev... Next... OK Cancel

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Rotor Dynamics

Available Input Summary (Subcase):

- For SOL 414,110 (Complex Modal Analysis)
 - *Analysis Case – 2 Analysis Types*
 - “1..Static Loads, Constraints”
 - “2..Rotor Complex Modal” – *NASTRAN Modal Analysis and Select Rotational Speed(s)*
- For SOL 414,111 (Harmonic Response)
 - *Analysis Case – 2 Analysis Types:*
 - “1..Static Loads, Constraints”
 - “4..Rotor Harmonic” – *NASTRAN Dynamic Analysis, NASTRAN Modal Analysis, and Strategy Parameters (NLCNTL2)*
- For SOL 414,129 (Transient Response)
 - *Analysis Case – No Analysis Types – Strategy Parameters (NLCNTL2) and Subcase # Time Steps*

Analysis Case

Analysis Type: 2..Rotor Complex Modal

Case ID: 1..Static Loads, Constraints, 2..Rotor Complex Modal

Subtitle:

Label:

Manual Control

☐ Skip Standard

☐ Start Text Inside Case

Analysis Case

Analysis Type: 4..Rotor Harmonic

Case ID: 1..Static Loads, Constraints, 4..Rotor Harmonic

Subtitle:

Label:

Manual Control

☐ Skip Standard

☐ Start Text Inside Case

Simcenter Femap 2306

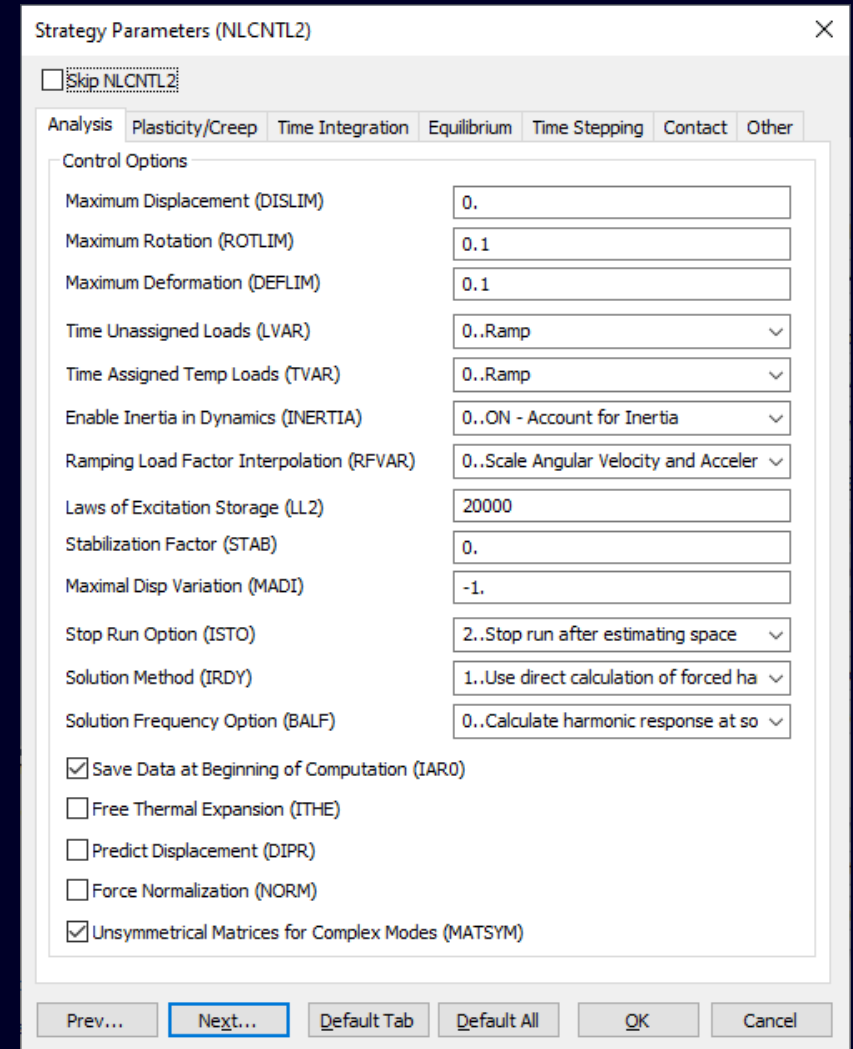
Analysis and Solver Support – Simcenter Nastran – SOL 402

Updated name of “Control Options” in Analysis Set Manager tree structure to “Strategy Parameters”

Changed name of dialog box to “Strategy Parameters (NLCNTL2)” and enhanced it to feature tabs (formally):

- *Analysis* (Analysis Control – 2 places)
- *Plasticity/Creep* (Plasticity and Creep Control)
- *Time Integration* (Time Integration)
- *Equilibrium* (Equilibrium Iteration and Convergence)
- *Time Stepping* (Time Stepping and Viscous Material Options)
- *Contact* (Contact)
- *Other* (Internal Restart and Diagnostic)

Added *Default Tab* and *Default All* buttons



Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – SOL 402

Additions and Updates for Multi-Step Kinematics (SOL 402) in Analysis Set Manager

- *Strategy Parameters (NLCNTL2) – Analysis tab*
 - Added *Store Run Option (ISTO)* drop-down
 - Added *Solution Method (IRDY)* drop-down
 - Added *Solution Frequency Option (BALF)* drop-down
- *Strategy Parameters (NLCNTL2) – Equilibrium tab*
 - Added *Relaxed Force Tol (PRDR)* value
 - Added *Relaxed Energy Tol (PRDE)* value
- *Strategy Parameters (NLCNTL2) – Other tab*
 - Added *Storage Cycle for Element Stress (IA4)* value
 - Added *Complex Eigenvalue Frequency Step (IA12)* value
- *Strategy Parameter (NLCNTLG)*
 - Added *Check Initial Stiffness (KINI)* option – can be used in SOL 414 as well

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – SOL 402

Updated name of “Control Options” in Analysis Set Manager tree structure to “Strategy Parameters”

Changed name of dialog box to “Strategy Parameters (NLCNTL2)” and enhanced it to feature tabs (formally):

- *Analysis* (Analysis Control – 2 places)
- *Plasticity/Creep* (Plasticity and Creep Control)
- *Time Integration* (Time Integration)
- *Equilibrium* (Equilibrium Iteration and Convergence)
- *Time Stepping* (Time Stepping and Viscous Material Options)
- *Contact* (Contact)
- *Other* (Internal Restart and Diagnostic)

Added *Default Tab* and *Default All* buttons

Simcenter Femap 2306

Analysis and Solver Support – Simcenter Nastran – Response Spectrum Application

Added support for Simcenter Nastran's ability to use the *Relative Method* instead of the *Large Mass Method* for *Base DOF*

Relative Method – writes RSPLOC entry

- *RSPLOC Set* – Constraint set containing nodes where spectrum is to be applied by writing nodes constrained in any DOF to the GIDi fields
- *CSys* – writes ID of coordinate system to CID field
- *Direction* – integer corresponding to selected option written to DIR field

When used, ID of RSPLOC is then written to a RSPLOIDi field on the RSAPPLY entry (support added in Femap 2301)

The screenshot shows the 'NASTRAN Response Spectrum Application' dialog box. The 'Base DOF' section is highlighted with a red border. In this section, the 'Relative Method' radio button is selected, and the 'RSPLOC Set' is set to '3..RSPLOC DOF'. Other settings in the dialog include 'Spectrum Function ID' set to '11..DTI Table, Single Axis', 'Scale Factor' set to '1.', 'Modal Combination Method' set to '5..DSUM', 'Earthquake Duration' set to '1.', and 'Modal Damping Damping Func' set to '10..Modal Damping Function'. The 'Next...' button is highlighted with a blue border.

Simcenter Femap 2306

Analysis and Solver Support – Nastran and ABAQUS

Simcenter Nastran and MSC Nastran

- Added support to write/read Femap Layup Titles to/from comments in input files
- Added support to write 0.0 for stiffness values to Spring/Damper properties (“K” values on PBUSH) as this is viable for these solvers

ABAQUS

- Improvements to exporting load and constraint definitions
 - Consistently create *NSET and *ELSET from load definitions and constraint definitions
 - Create accurate *NSET and *ELSET for load definitions and constraint definitions applied on different geometric entities such as points, curves, and/or surfaces
 - Appropriately export load Definitions on elements, curves, and points as *CLOAD and *DLOAD
 - *NSET and *ELSET are referenced in *BOUNDARY, *CLOAD, and *DLOAD to reduce input file size
- Improvements to exporting and importing *TIE keyword

Simcenter Femap 2306

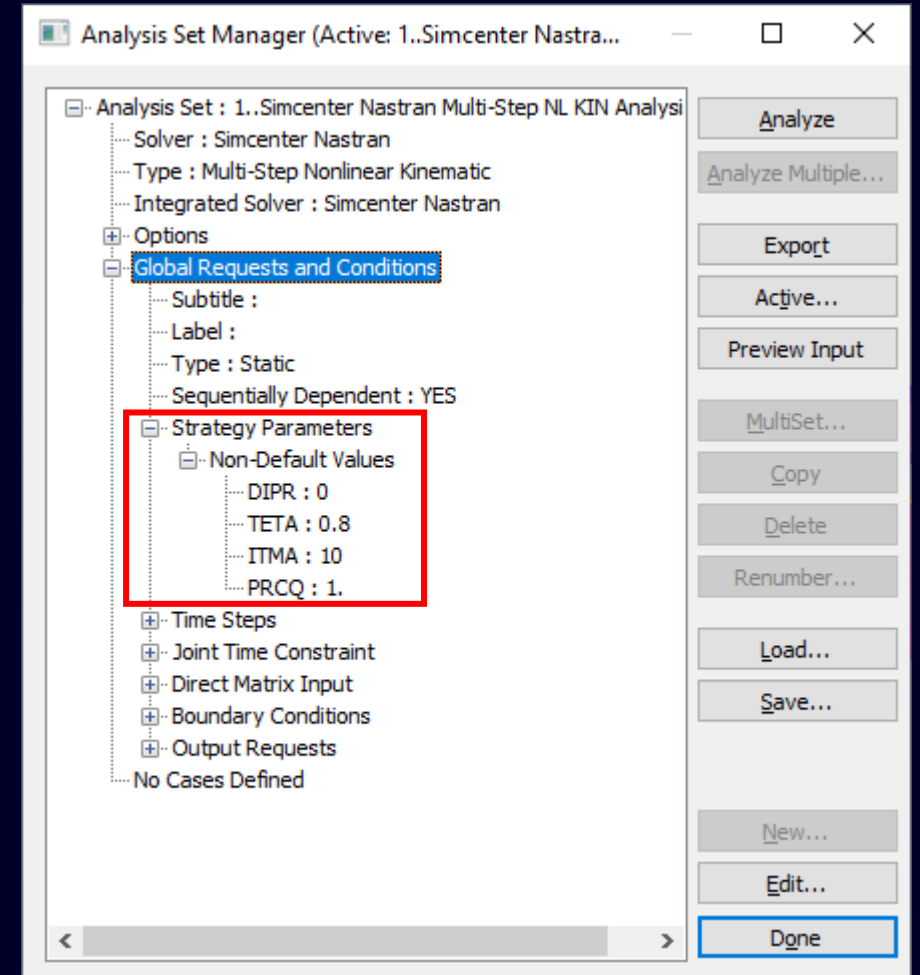
Analysis and Solver Support – Analysis Set Manager

Analysis Set Manager

Added *Non-Default Values* branch under *Strategy Parameters* which only displays non-default values specified in the *Strategy Parameters (NLCNTL2)* dialog box for Analysis Types:

- “28..Multi-Step Nonlinear Kinematic” (SOL 402)
- “38..Rotor Dynamics Transient Response” (SOL 414,129)

Note: Similar functionality is planned for other Analysis Types in future releases, beginning with “27..Multi-Step Structural” (SOL 401)





What's new **Simcenter Femap 2306**

Teamcenter Integration

Geometry

Preprocessing

Meshing

Performance Improvements

Analysis and Solver Support

Postprocessing

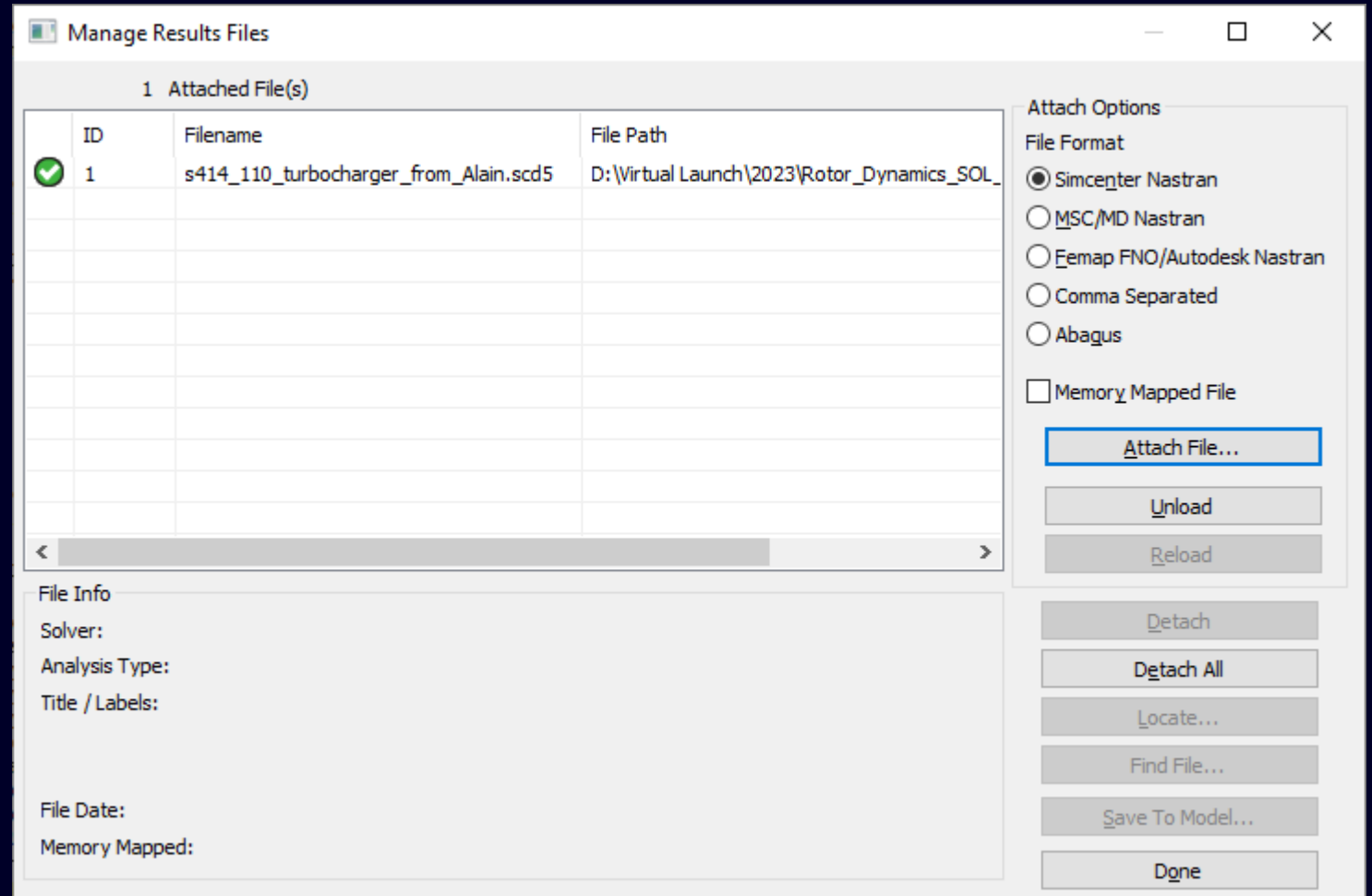
Miscellaneous and API

Simcenter Femap 2306

Postprocessing – Support for results from Simcenter Nastran SOL 414 analysis types

Overview of working with results generated by Simcenter Nastran SOL 414 analysis

- **VERY IMPORTANT:** SOL414 does NOT generate an OP2 results file, thus support was added for attaching to the Simcenter Data File (SCD5) generated by SOL 414
- SCD5 is based on the HDF5 file format
- SCD5 is the only output file which can currently be used for post-processing SOL414 results in Femap

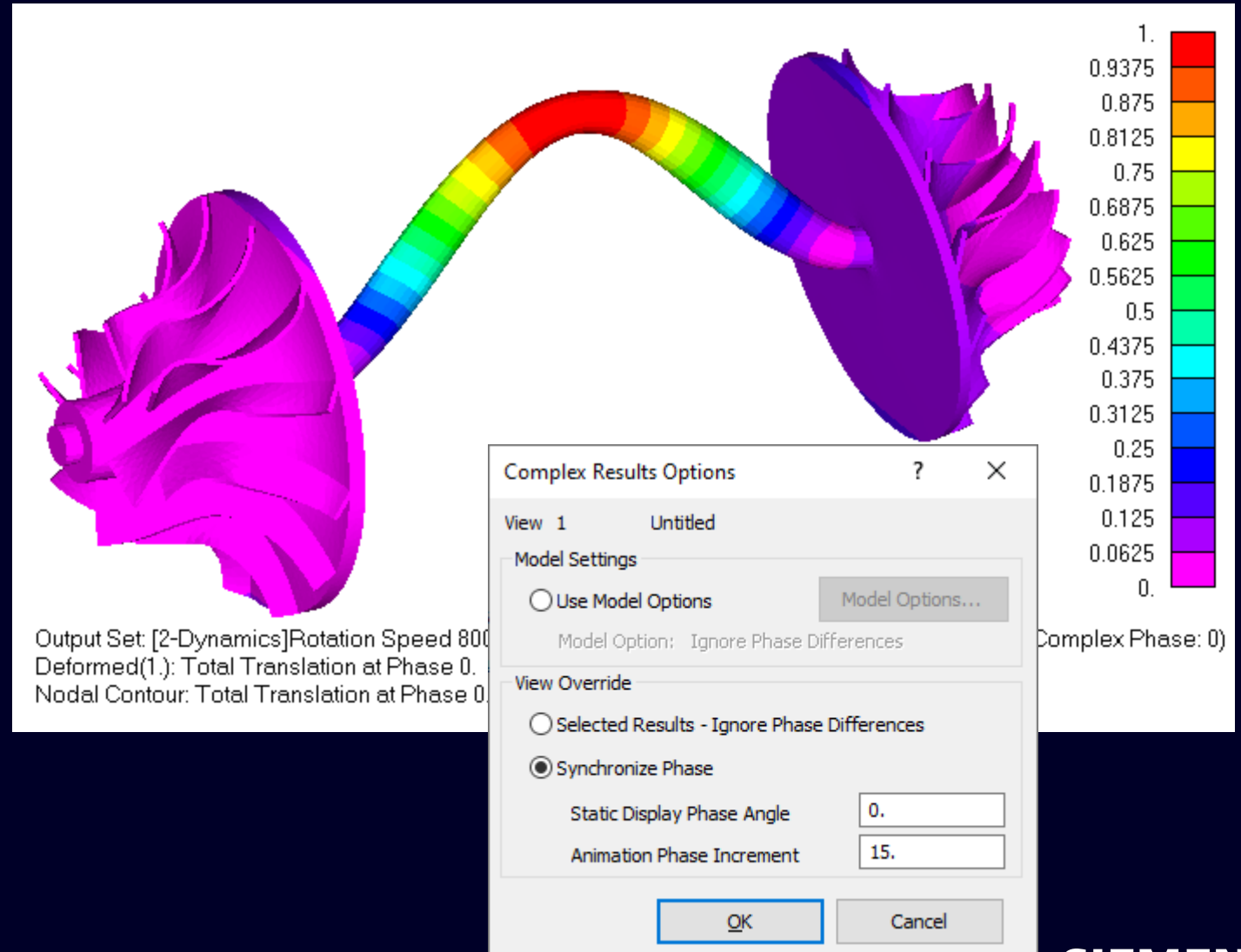


Simcenter Femap 2306

Postprocessing – Support for results from Simcenter Nastran SOL 414 analysis types

The SCD5 results file contains two types of results which are stored in Femap:

- Results for nodes/elements which are stored within Output Sets as Output Vectors which can be plotted in the graphics window
- Typically, the results from SOL 414 are displayed a contoured plot, either deformed or animating, based on options specified in Complex Results dialog box

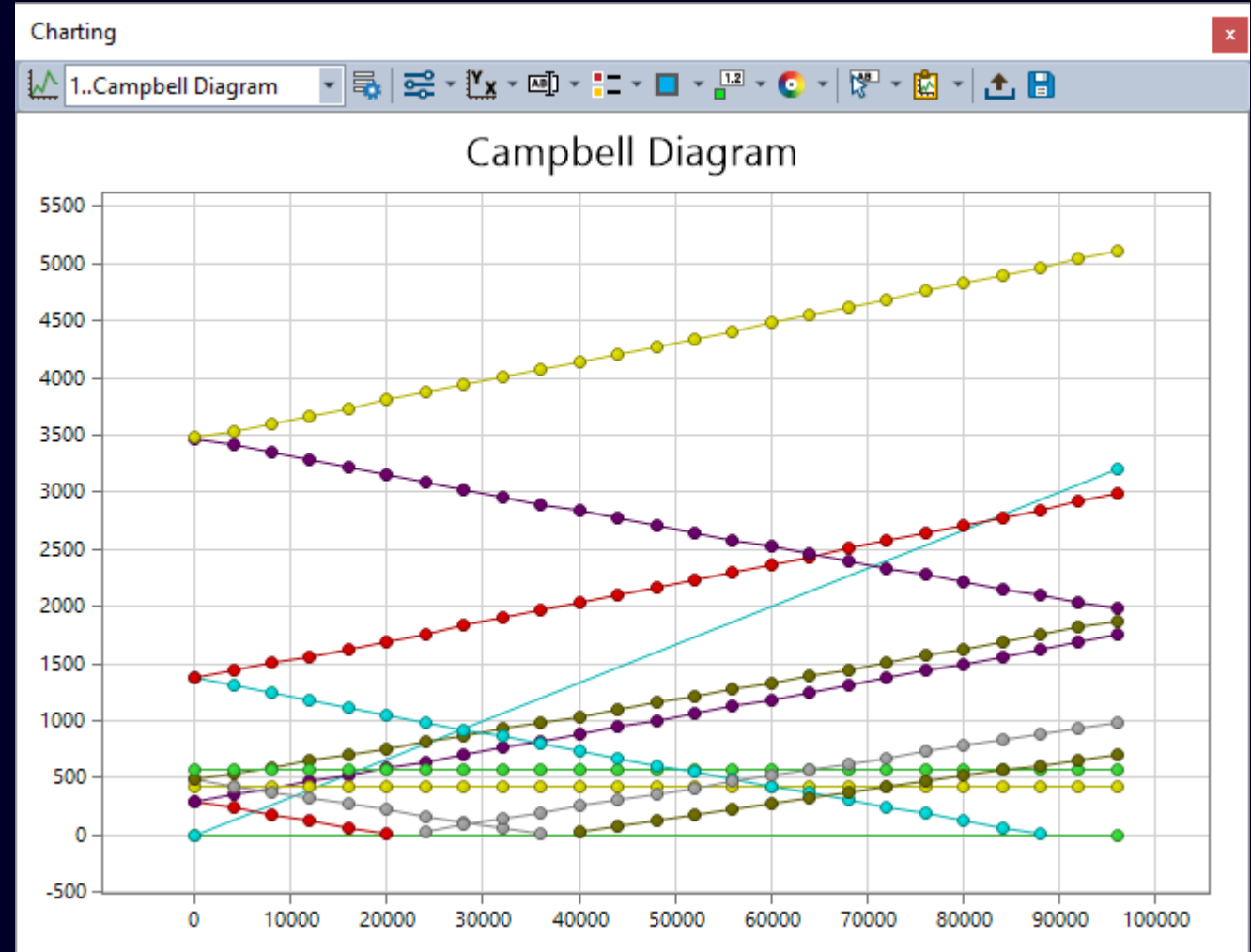


Simcenter Femap 2306

Postprocessing – Support for results from Simcenter Nastran SOL 414 analysis types

The SCD5 results file contains two types of results which are stored in Femap:

- Results in XY format which are stored as Femap functions which can be viewed in the Charting pane
- Typically, specific functions are selected to generate a “Campbell Diagram”, which can be used to determine critical speeds, among other things.
- Lines with 2 points originating at 0,0 are 0P (Green) and 2P (Cyan)
- All other lines are “EigenFrequency vs Rotation Speed” for various modes





What's new **Simcenter Femap 2306**

Teamcenter Integration

Geometry

Preprocessing

Meshing

Performance Improvements

Analysis and Solver Support

Postprocessing

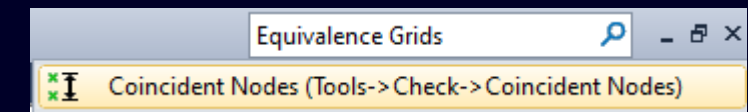
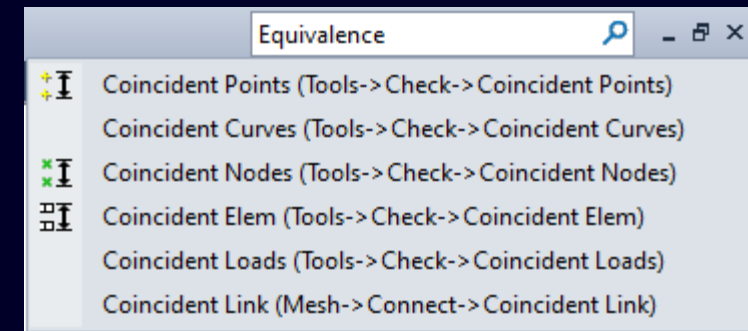
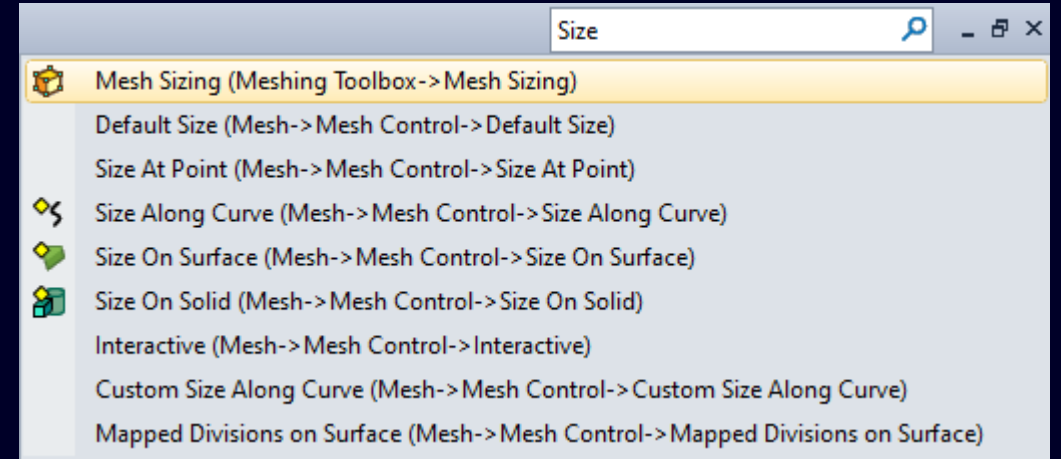
Miscellaneous and API

Simcenter Femap 2306

Miscellaneous – Command Finder Enhancements

Command Finder Enhancements

- Search now includes commands found in Dockable Panes
- If selected command is located within a Pane, the Pane becomes visible
- If selected command is located with a particular “Tool” within a “Toolbox”, that tool will be opened and “pulsate” a few times to draw user’s attention
- Search now includes “keywords” which are known to be the nomenclature found in other CAE applications
 - For instance, “Equivalence” and “Grids”



Simcenter Femap 2306

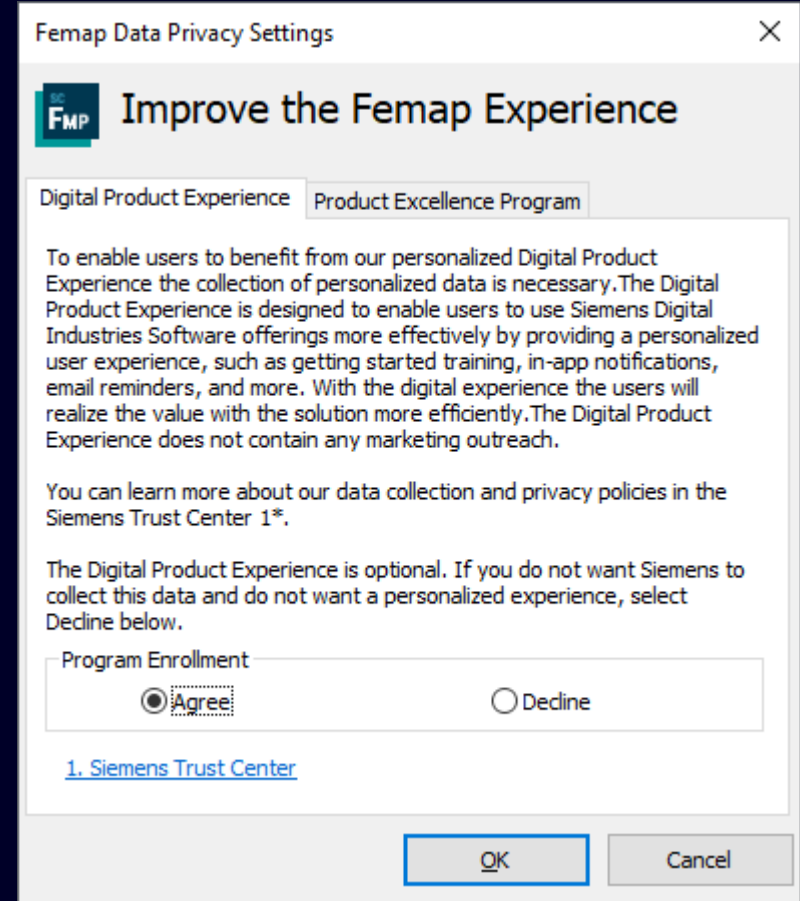
Miscellaneous – Digital Product Experience & Product Excellence Program

Help Improve the Femap Experience by choosing Program Enrollment options in Help -> Data Privacy

Enhancements to comply with new data privacy laws

Femap collects information about how our customers use the product to help improve product features and user experience

- No proprietary or personally identifiable information is collected
- Participation is completely optional
- Does not affect product performance



The screenshot shows a dialog box titled "Femap Data Privacy Settings" with a close button (X) in the top right corner. The dialog has two tabs: "Digital Product Experience" (selected) and "Product Excellence Program". Below the tabs, there is a paragraph explaining the Digital Product Experience and its benefits. Below this, there is a link to the Siemens Trust Center. At the bottom, there is a "Program Enrollment" section with two radio buttons: "Agree" (selected) and "Decline". At the very bottom, there are "OK" and "Cancel" buttons.

Femap Data Privacy Settings

Improve the Femap Experience

Digital Product Experience | Product Excellence Program

To enable users to benefit from our personalized Digital Product Experience the collection of personalized data is necessary. The Digital Product Experience is designed to enable users to use Siemens Digital Industries Software offerings more effectively by providing a personalized user experience, such as getting started training, in-app notifications, email reminders, and more. With the digital experience the users will realize the value with the solution more efficiently. The Digital Product Experience does not contain any marketing outreach.

You can learn more about our data collection and privacy policies in the Siemens Trust Center 1*.

The Digital Product Experience is optional. If you do not want Siemens to collect this data and do not want a personalized experience, select Decline below.

Program Enrollment

☒ Agree ☐ Decline

[1. Siemens Trust Center](#)

OK Cancel

Simcenter Femap 2306

API – New functionality

Added GeometryInterface Object to provide access to all Geometry translators using a single Object

Rotor Dynamics

- Added Objects for new Rotor Dynamics entity types (XY Plot Definition, Bearing Speed Definition, and Rotational Speed Definition)
- Updated Element and Property Objects to support Bearing, Gear, and Fourier Element/Property types
- Updated Analysis Manager and Analysis Case Objects for new options, dialog boxes, etc
- Updated LoadMesh Object for unbalance loads

Simcenter Femap 2306

API – New functionality

Added `feFileMessageSelectAll`, `feFileMessageClear`, and `feFileMessageSave2` to perform actions in the Messages dockable pane

Added `feSurfaceRuled2` to access all available options of the Geometry -> Surface -> Ruled / Between Curves command

Added `feMeshSizeSurface2` to access all available options of the Mesh -> Mesh Control -> Size On Surface command

Added `Pref_ViewLogoTransparent` to set the “Transparent Logo” option on the “Views” tab of File -> Preferences

Try Simcenter Femap for free

30-day free trial



Join the Simcenter Femap Community



Explore — Browse our different **blogs** dedicated to each solution, read our articles and hear about the latest news.



Share — Ask questions in our **forum**, get answers, connect with other users, and benefit from their experience.



Learn — Find the information you need in the **knowledge base** and improve your skills.

[siemens.com/plm/community/simcenter](https://www.siemens.com/plm/community/simcenter)

