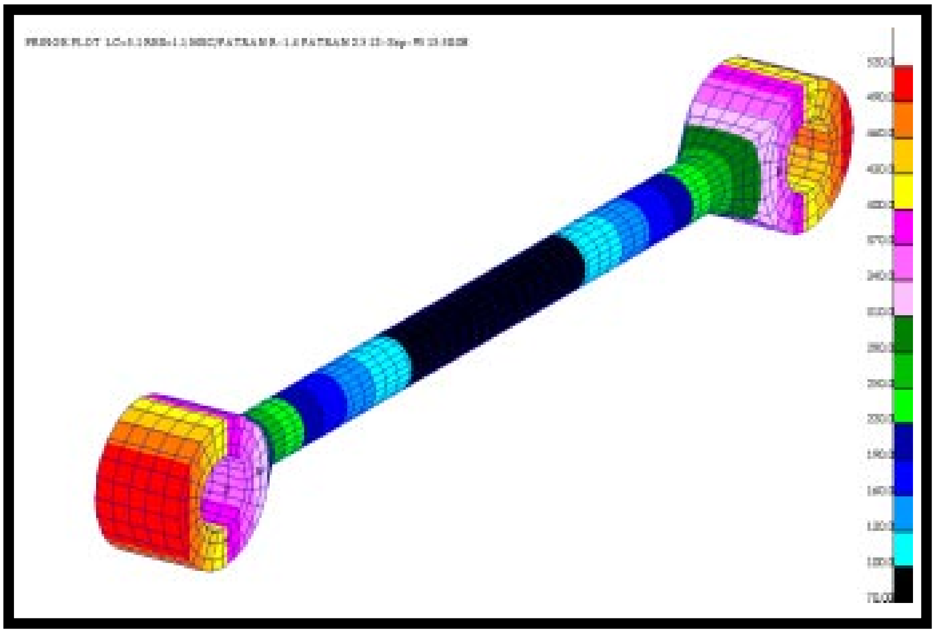
LESSON 15

Importing Results using a Results Template



Objectives:

- Write a custom nodal and displacement results template.
- Import a Patran 2.5 Neutral File model.
- Import a Patran 2.5 Results File.
- Perform simple post processing to view newly imported results.

Exercise Description:

In this exercise you will first create two results templates that will allow you to import a set of nodal results and displacements. The results files used in this exercise contain scalar (temperature) and tensor (stress components) results. The template created in this exercise will allow the user to easily import a custom set of results that would otherwise not be supported. Often times users can make use of results templates to import results from in-house analysis codes or custom results that would not otherwise be supported.

Once the results have been imported, the user will perform simple results manipulation to demonstrate the results import capability. The results display include fringe plots using Results as well as viewing the displacements via a simple animation using Insight.

Files:

In this exercise, you will be using several files. All the files used in this exercise are listed below. Each listing includes the file, where it originated, its format (text/binary) and summary information as to how it relates to this exercise.

File	Format	Description
mscnastran_op2_nod.res_tmpl	text	A PATRAN supplied template used to read in MSC/NASTRAN nodal results that are in PATRAN 2.5 nodal results format. This file is text and is located in <P3 installation directory>/patran3/res_templates/. This file is used as a starting point to make P302_nod.res_tmpl.
mscnastran_dis.res_tmpl	text	A PATRAN supplied template used to read in MSC/NASTRAN displacement results that are in PATRAN 2.5 displacement format. This file is text and is located in <P3 installation directory>/patran3/res_templates/. This file is used as a starting point to make P302_nod.res_tmpl.

P302_nod.res_tmpl	text	This text file is created in this exercise and is used to read in the ASCII PATRAN 2.5 results file. This file maps the results from the results file, tierod.nod, onto the model, tierod.out
P302_dis.res_tmpl	text	This text file is created in this exercise and is used to read in the ASCII PATRAN 2.5 displacement file. This file maps the displacements from the displacement file, tierod.dis, onto the model, tierod.out.
tierod.db	binary	This is a PATRAN database (binary) created new for this exercise. The model, tierod.out, and the results files, tierod.nod and tierod.dis are read into this database and post processed.
tierod.out	text	A PATRAN 2.5 Neutral file (text) containing the finite element model that is imported into the PATRAN database. This file is supplied for this exercise.
tierod.nod	text	A PATRAN 2.5 nodal results file (text) that is imported into the PATRAN database. This file is supplied for this exercise.
tierod.dis	text	A PATRAN 2.5 displacement results file (text) that is imported into the PATRAN database. This file is supplied for this exercise.

Suggested Exercise Steps:

- Copy the **$P3_HOME/res_templates/ mscnastran_op2_nod.res_tmpl** to your home directory and call it **P302_nod.res_tmpl**.
- Copy the **$P3_HOME/res_templates/ mscnastran_dis.res_tmpl** to your home directory and call it **P302_dis.res_tmpl**.
- Using Jot(SGI), xedit(SUN), vuepad (HP) or vi (reference Appendix C for specifics on editors) to modify the **P302_nod.res_tmpl** and the **P302_dis.res_tmpl** template file.
- Start up MSC/PATRAN and open a new database (**tierod.db**).
- Import the model using the PATRAN 2.5 Neutral file import,

the file is **tierod.out**.

- Import the nodal results by first referencing the results template file, **P302_nod.res_tmpl** and then importing the results file, **tierod.nod.**
- Import the displacement results by first referencing the results template file, **P302_dis.res_tmpl** and then importing the displacement file, **tierod.dis**.
- Under Results, make a "Basic" fringe plot by selecting the first load case, then selecting the temperature results.
- Under Results, make a "Basic" fringe plot by selecting the first load case, then selecting Von Mises stress results.
- Under Results, make a "Basic" deformed plot by selecting the second load case and selecting translation displacements.
- Under Insight, create a displacement tool and enable animation under results selection, animation attributes.
- Next, animate the deformed shape under Insight Control.
- Close the database and quit p3.

Detailed Exercise Procedure:

Copy Result Files

1. Copy the PATRAN nodal result file **mscnastran_op2_nod.res_tmpl** from the **$P3_HOME directory** and call it **p302_nod.res_tmpl** as follows:

In your xterm window, type in:

```
cp /patran/patran3/res_templates/mscnastran_op2_nod.res_tmpl
p302_nod.res_tmpl
```

2. Copy the PATRAN displacement result file **mscnastran_dis.res_tmpl** from the **$P3_HOME directory** and call it **p302_dis.res_tmpl** as follows:

In your xterm window, type in:

```
cp /patran/patran3/res_templates/mscnastran_dis.res_tmpl
p302_dis.res_tmpl
```

Edit the Result File

3. Using Jot(SGI), xedit(SUN), vuepad (HP) or vi (reference Appendix C for specifics on editors), modify the file **p302_nod.res_tmpl** as follows:

Firstly, change the KEYLOC to 8.

KEYLOC = 8

Secondly, delete all the lines following the KEYLOC statement up to but not including the **/* Hexa type results */** statement.

Then, modify the template such that column 7 is a scalar result (TYPE=scalar) with a primary label (PRI) named "Nodal" and a secondary label (SEC) of "Temperature" for element type (KEY) of 67 (MSC/NASTRAN HEXA’s).

```
/* Hexa type results */
    TYPE = scalar
    KEY = 67
    COLUMN = 7
    PRI = Nodal
    SEC = Temperature
```

Delete all remaining lines until you reach **TYPE = tensor.**

Modify the template such that column 1, 2, 3, 4, 5 and 6 are nodal tensor results (TYPE = TENSOR) with a primary label (PRI) of "Stresses" and a secondary label (SEC) of "Components" for element type 67. The nodal tensor results are in the element coordinate system (CTYPE = ELEMENT).

```
TYPE = tensor
KEY = 67
COLUMN = 1,2,3,4,5,6
PRI = Stresses
```

SEC = Components
CTYPE = element

Delete all lines until the end of the file. Make sure the last line of the file is **TYPE = END** to indicate termination of nodal results. Save the file in your home directory.

4. Now open up the file **p302_dis.res_tmpl** and it should appear as shown below.

TYPE = vector
COLUMN = 1,2,3
PRI = Displacements
SEC = Translational
CTYPE = nodal

TYPE = vector
COLUMN = 4,5,6
PRI = Displacements
SEC = Rotational
CTYPE = nodal

Again, make sure the last line of the file is **TYPE = END** to indicate termination of nodal results. Save the file in your home directory and quit the editor.

Open a New Database

5. In your xterm window type **p3** to start P3/PATRAN. After that, create a new database named **tierod.db.**

File/New...

New Database Name:	**tierod**
OK	

Import the Model

In the *New Model Preference* form set the following:

Tolerance:	◆ **Default**

Analysis Code: **MSC/NASTRAN**

Analysis Type: **Structural**

OK

6. Import the model using the Patran 2.5 Neutral file import.

File/Import...

Object: **Model**

Source: **Neutral**

Neutral Files **`tierod.out`**

Apply

Answer **Yes** to question from application NEUTOLD.

Change the Display

7. Change the display of the model as follows:

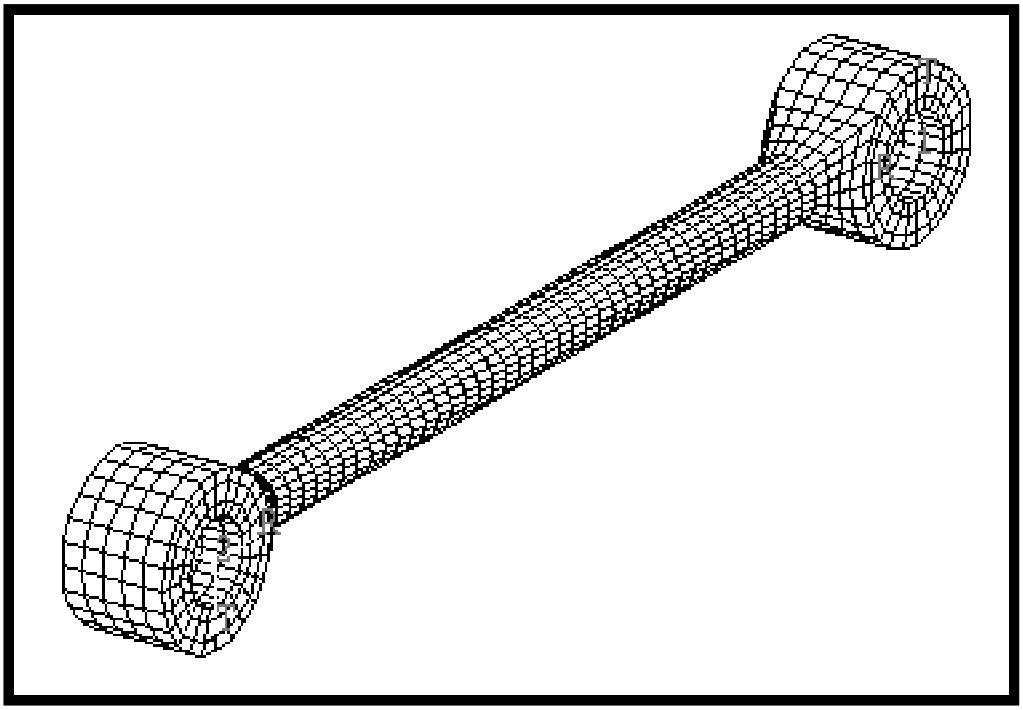
Select the following icons:

Hide All Entity Labels

Iso 1 View

Hidden Line style

Your model should appear as shown below.



Import the Results

8. Import the nodal results file.

First, import the nodal result template as follows:

File/Import...

Object:	**Results**
Format:	**PATRAN 2.nod...**

At this time, a *Template for PATRAN 2.5 Import Results* form should appear on the screen. Enter the following in this form:

Filter	**./*.res_tmpl**
Filter	
Files	**p302_nod.res_tmpl**
OK	

Then, import the nodal result file as follows:

PATRAN 2 .nod Files:	**`tierod.nod`**

Apply

9. Import the displacement results file.

First, import the displacement result template as follows:

File/Import...

Object:	**Result**
Format:	**PATRAN 2 .dis...**

Again, a *Template for PATRAN 2.5 Import Results* form should appear on the screen. Enter the following in this form:

Filter	**./*.res_tmpl**

Filter

Files	**`p302_dis.res_tmpl`**

OK

Then, import the displacement result file as follows:

PATRAN 2 .dis Files:	**`tierod.dis`**

Apply

Notice that a warning message should appear on the screen stating that *No results were found for Displacement, Rotational*. Answer **OK** to clear the message.

The results have been imported into the database and it is now ready for postprocessing.

Display the temperature Distribution

10. Display the temperature distribution on the model as follows:

◆ **Results**

Action:	**Create**
Object:	**Quick Plot**

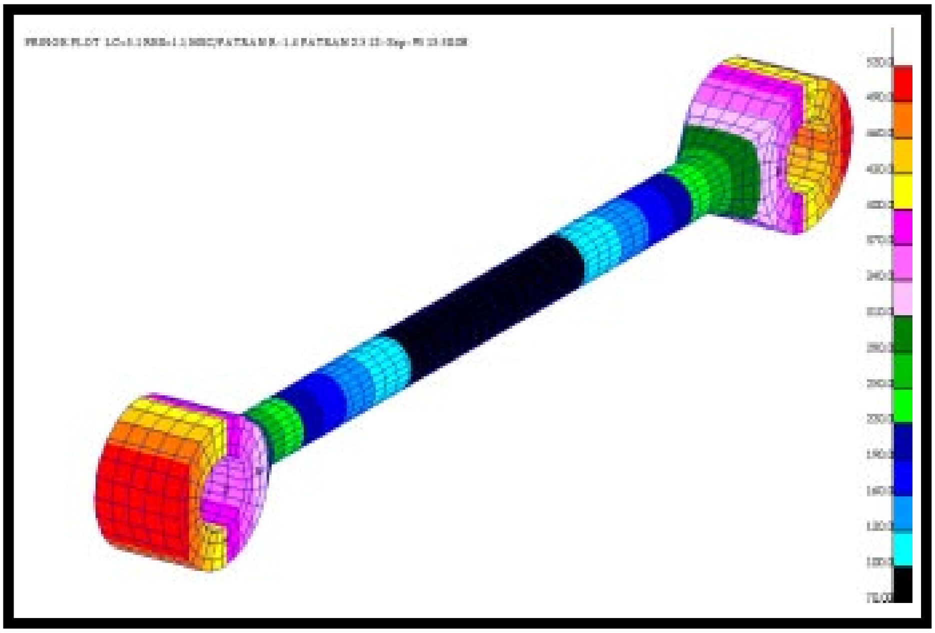
Click on the **Select Results** icon

Select Result Cases: **ACME ANALYSIS...Nodal**

Select Fringe Result: **Nodal, Temperature**

Apply

The temperature distribution of the model is shown below.



Display the Stress Distribution

11. Display the stress distribution on the model as follows:

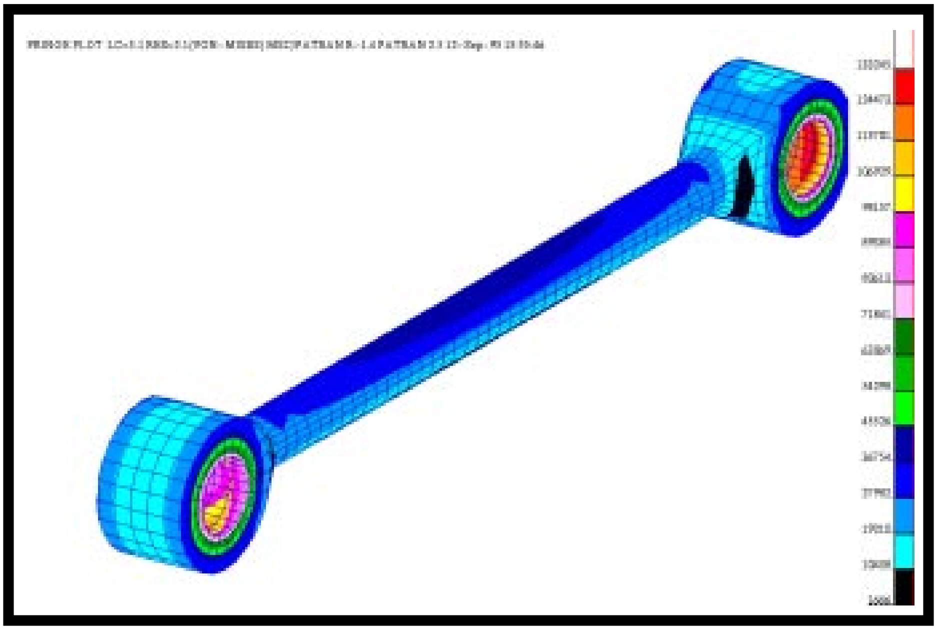
Select Result Cases: **ACME ANALYSIS...Nodal**

Select Fringe Result: **Stresses, Components**

Result Quantity: **Von Mises**

Apply

The stress distribution of the model is shown below.



Make a Deformed Plot

12. Make a deformed plot of the model as follows:

Select Result Cases: **ACME ANALYSIS...Displ**

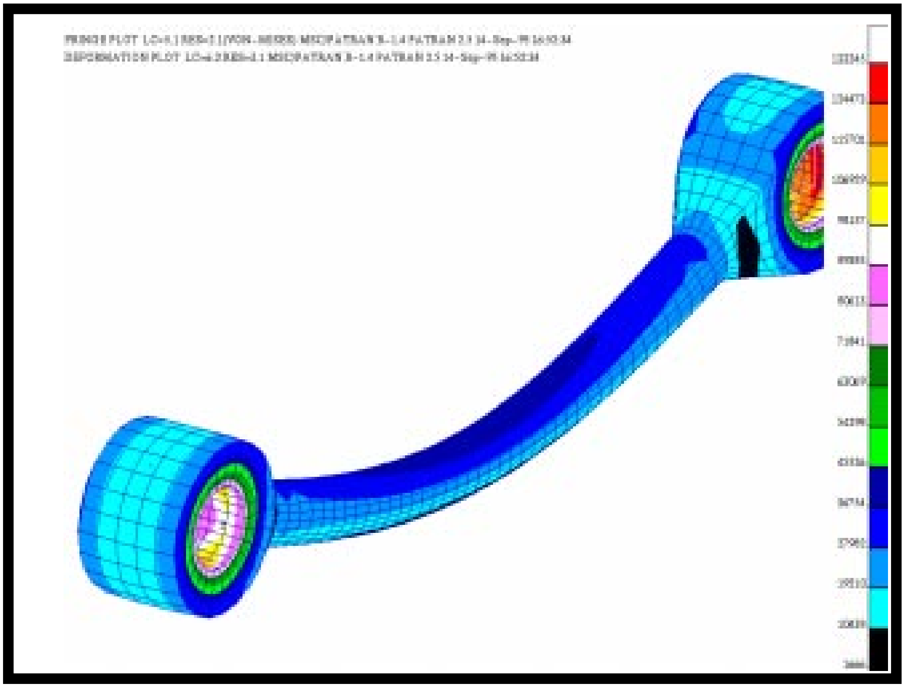
Select Deformation Result: **Displacements,...**

Select the **Deform Attributes** icon

☐ **Show Undeformed Entities**

Apply

The deformed plot of the model is shown below.



Animate the Deformation of the Model

13. Next, create a displacement tool and enable animation of the deformation as follows:

First, go under **insight** and perform the following:

◆ **Insight**

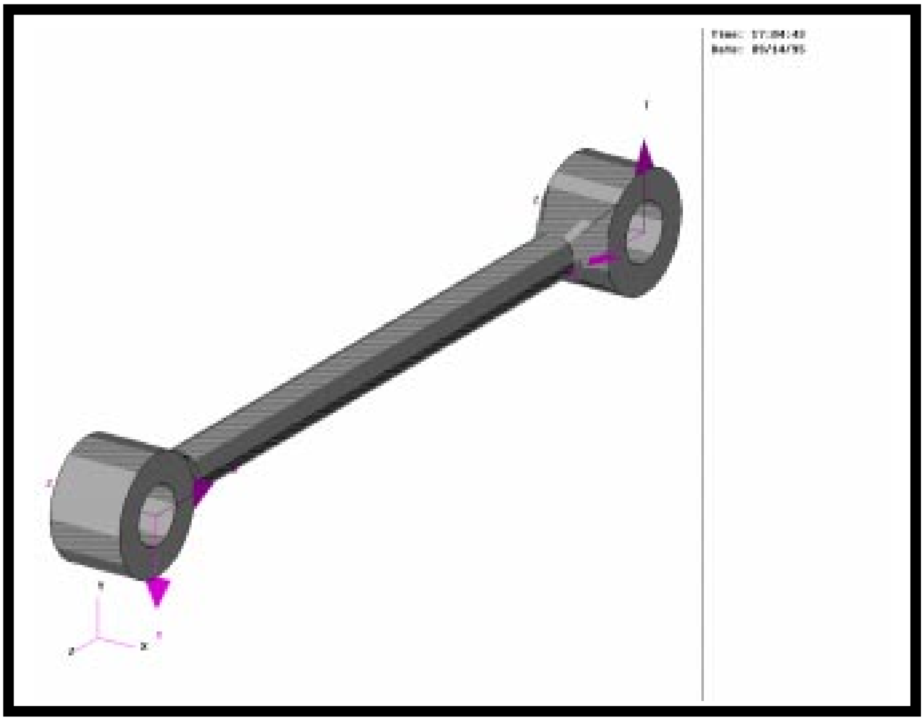
Preferences/Insight...

Display Method: **Shaded**

Apply

Cancel

Your model should appear as follows:



Next go under **Insight Control** and apply the following:

Insight Control/
Modal Animation...

Result Selection...

Current Load Case(s) **6.2-ACME ANALYSIS...**

Update Results

Deformation Result **3.1-Displacements,...**

OK

Animate

The model will start to animate in the graphics window. When you are ready to stop the animation, click on **Cancel** on the *Modal Animation* form and respond **Yes**, when prompted *Do you wish to clear the current animation?*

14. Close the database and quit p3 to complete this exercise.