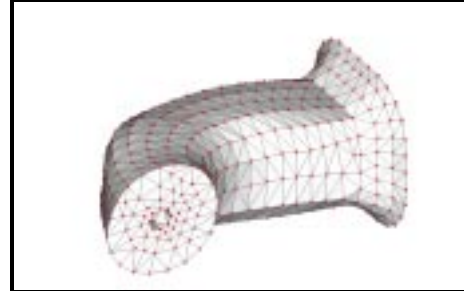


## *Linear Static Analysis w/ Partial Data Recovery*



### Objectives:

- Open up a previous exercise model.
- Load and constrain the part.
- Analyze the model and perform partial data recovery with only displacement results.
- Prepare the database for restart

### Model Description:

N4W is able to analyze a complete model and allow you to recover only the results that you need on a specific region of the model, therefore saving substantial time on especially large models.

N4W also has a "restart" feature which allows various essential model information to be used again to rerun an analysis. The restart feature can save valuable time, since a majority of the analysis time is used to generate the matrices which can be stored and reused.

In this particular exercise, a "cold\_start" will be initiated using loads and boundary conditions specified in figure 35.1. For the sake of file/time management, only displacement data will be recovered and post-processed. Additionally, matrices generated during the initial "cold\_start" will be retained for later usage. These matrices will be used in workshop 40 for recovering stress results and again in workshop 41 for recovering results using different loading.

**Figure 35.1 - Cold\_Start model**



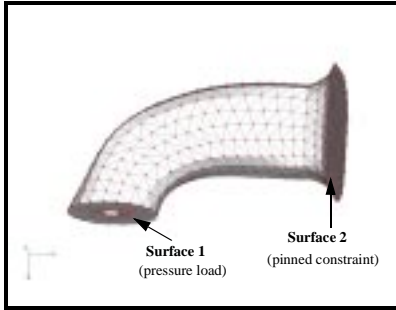
**Exercise Procedure:**

1. Start up MSC.Nastran for Windows V4.0 and open up the model from Workshop 12.

Double click on the icon labeled MSC.Nastran for Windows V4.0.

File name:

Figure 35.2 - Surfaces to be loaded and constrained



2. Unpost the nodes from the display for a better view.

Quick Options... <Ctrl+Q>  
 Node

3. Turn "off" Automatic Add.

Group/Operations/Automatic Add...  
 None

View/Select...  
 Group:  None

4. Next, create the load condition.

Model/Load/On Surface...  
 Title:

Select Surface 1 as indicated on Figure 35.2.

Entity Selection:

(highlight)   
 Pressure:

View/Regenerate <Ctrl+G>

5. Create the constraint.

Model/Constraint/On Surface...  
 Title:

Select Surface 2 as indicated on Figure 35.2.

Entity Selection:

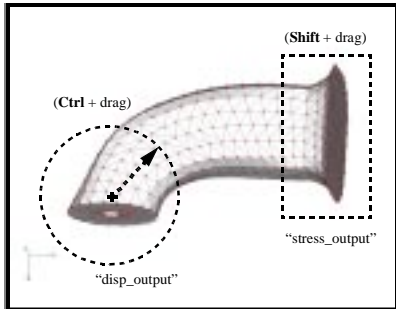
Pinned - No Translation

View/Regenerate <Ctrl+G>

The model is essentially ready to be analyzed, but we will take an extra step in order to minimize the output. N4W is able to analyze a complete model and allow you to recover only the results that you need on a specific region of the model, therefore saving substantial effort on data management.

6. In order to recover results for a specific region only, we must group the regions.

Figure 35.3 - Groups for analysis results



We want to recover only displacements at the loaded end and later we will recover only stresses at the constrained end. For displacement results, you must group the nodes of the desired region. For stress results, you must group the elements. The next exercise will recover the stress results.

Group/Set...  
 ID:   
 Title:

Group/Node/ID...

Circle pick the nodes at the loaded end of the model as indicated on Figure 35.3. It does not matter exactly how many nodes you pick as long as you select the approximate region.

Group/Set...

ID:   
 Title:

Group/Element/ID...

Box pick the elements at the constrained end of the model as indicated on Figure 35.3. It does not matter exactly how many elements you pick as long as you select the approximate region.

7. Rename the file as another name.

File/Save As...  
 File name:

8. Analyze the model and recover only displacements at the loaded end.

File/Export/Analysis Model...

Go to the directory C://Temp

File name:

**Run Analysis**

N4W has a "restart" capability which allows the matrices, to be used again to rerun an analysis. The restart feature can save valuable time, since a majority of the analysis time is used to generate the matrices. In the workshop 40, we will only recover the stresses using the restart.

● **Save Databases for Restart**

Set Definition:

Group: (pull-down)

\*\*Turn off all Output Requests except Displacement.

**Displacement**      ● Set

The display should be similar to the following menu.



"OK to Save Model Now?"

When the MSC.Nastran Manager is through running, MSC.Nastran will be restored on your screen. The *Message Review* form will appear. If the analysis ran successfully without any fatal errors, continue.

9. Check how long the analysis took to run and make a note of it.

Open the corresponding .f04 file in Windows Notepad and scroll to record the last entry in the CPU SEC of the analysis.

CPU SEC \_\_\_\_\_

10. View the results of the analysis.

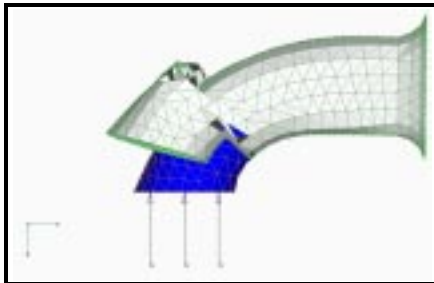
View/Select... <F5>

Deformation Style: ● **Deform**

Output Set: (pull-down)

Deformation: (pull-down)

Figure 35.4 - Deformed model



For this analysis, we requested N4W to show displacement on Group Set2, **disp\_output**.

This concludes the exercise.

File/Save

File/Exit