

## *Interface LIMIT – NX Nastran*

Importing the.bdf-file into LIMIT-CAE :

- ✦ NX Nastran (.dat; **must be ,long'- or ,short'-Format!**)

## Specification of the interface

- ✨ **Maximum nodenumber respectively elementnumber :**
  - Windows 64 bit (x64): 50000000
- ✨ **Maximum number of nodes :**
  - Windows 64 bit (x64): 6000000
- ✨ **Maximum number of elements :**
  - Windows 64 bit (x64): 6000000
- ✨ **These LIMITS can be changed by the user. See document LIMIT\_2019, section: *Redimensioning of Arrays***
- ✨ **Coordinate systems:**
  - Nodes
    - Definition in the global coordinate system
    - Definition using CORD1R orCORD2R (RECTANGULAR)
  - Result data must exist in the global system (Solids) respectively in the default elementsystem (shells).

**Following elements can be analyzed:**

✨ **Solids:**

- CTETRA (4 nodes) (not suitable for stress assessment)
- CPENTA (6 nodes) (less suitable for stress assessment)
- CHEXA (8 nodes) (less suitable for stress assessment)
- CTETRA (10 nodes) => stress gradient available
- CPENTA (15 nodes) => stress gradient available
- CHEXA (20 nodes) => stress gradient available

✨ **Shells:**

- CQUAD4
- CQUAD8
- CTRIA3
- CTRIA6

## Solid assessment :

- ✨ **Goal of a LIMIT FKM proof of strength :**
  - Assessment of surface stresses (2D-tensors)
  - Popular method and conservative
- ✨ **Free surfaces :**
  - Are necessary for the consideration of stress gradients normal to the surface
  - Are identified by the software LIMIT
  - Can be generated by covering the solids with 2D-elements (skin) in the preprocessor.
- ✨ **2D-skin elements can be assessed as well**
  - But without supporting effect => conservative
  - This leads to considerable less data
- ✨ **Supporting effect is only possible with solids!**
  - Results of a 3D analysis with good element quality and fine meshing are more precise than results of 2D-skin elements.

**Modifications for OP2-Output:**

**(without these adjustments the assessment doesn't work!)**

- ✨ **sort: SORT1**
- ✨ **Data format: REAL**
- ✨ **Yield criteria: VONMISES**
- ✨ **Position: BILIN (necessary for analyzing the gradient) or CORNER**

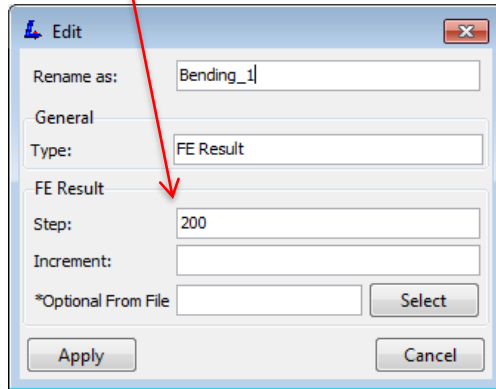
e.g. **STRESS(SORT1,REAL,VONMISES,CORNER)=ALL**

**Note: LIMIT can average corner values, which is activated with the key \*CENTER\_STRESS**

- ✨ **Geometry must be written to .op2-file:**      **PARAM, POST, -1**  
   **PARAM, OGEOM, YES**

## Addressing FE Results in the LoadManager:

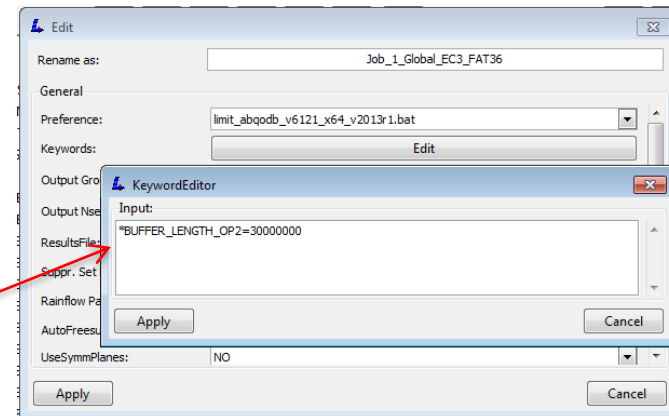
- ✨ The Step refers to the SUBCASE number in the input deck



```

$* NX Step: Subcase - Static Loads
1
SUBCASE 200
LABEL = Subcase - Static Loads 1
LOAD = 101
$*
    
```

- ✨ Maximum SUBCASE number is limited to **1000000** but can be increased in JobManager > Edit > Keywords > Edit: e.g. \*BUFFER\_LENGTH\_OP2=30000000



**Possible reasons for errors:**

- ✨ If the .bdf-file contains the line ,PARAMOMACHER=YES', parts of the .op2-file are written in double precision. That leads to an abortion during reading the .op2-file
- ✨ No geometry written to .op2-file. See previous slide.



Last slide