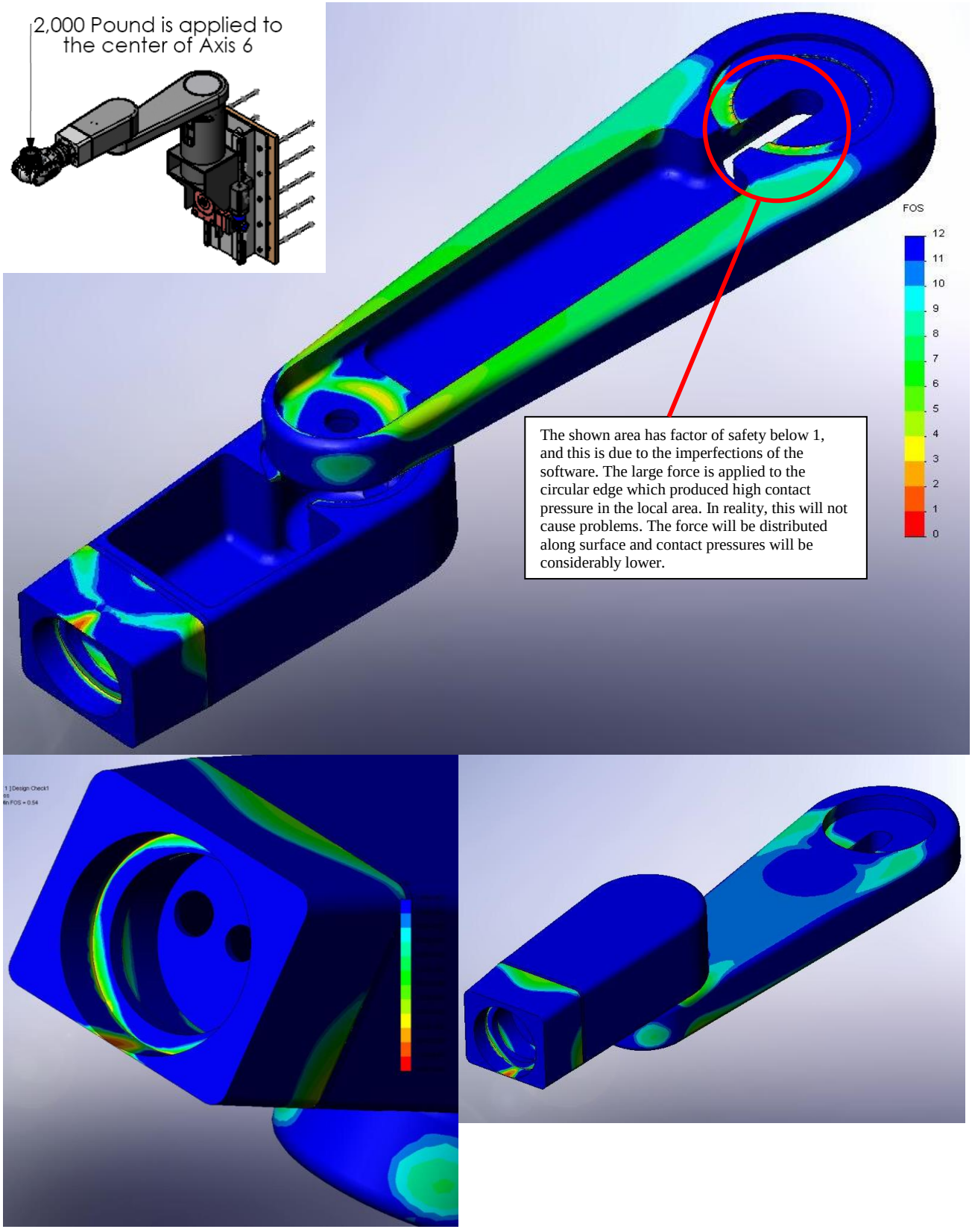
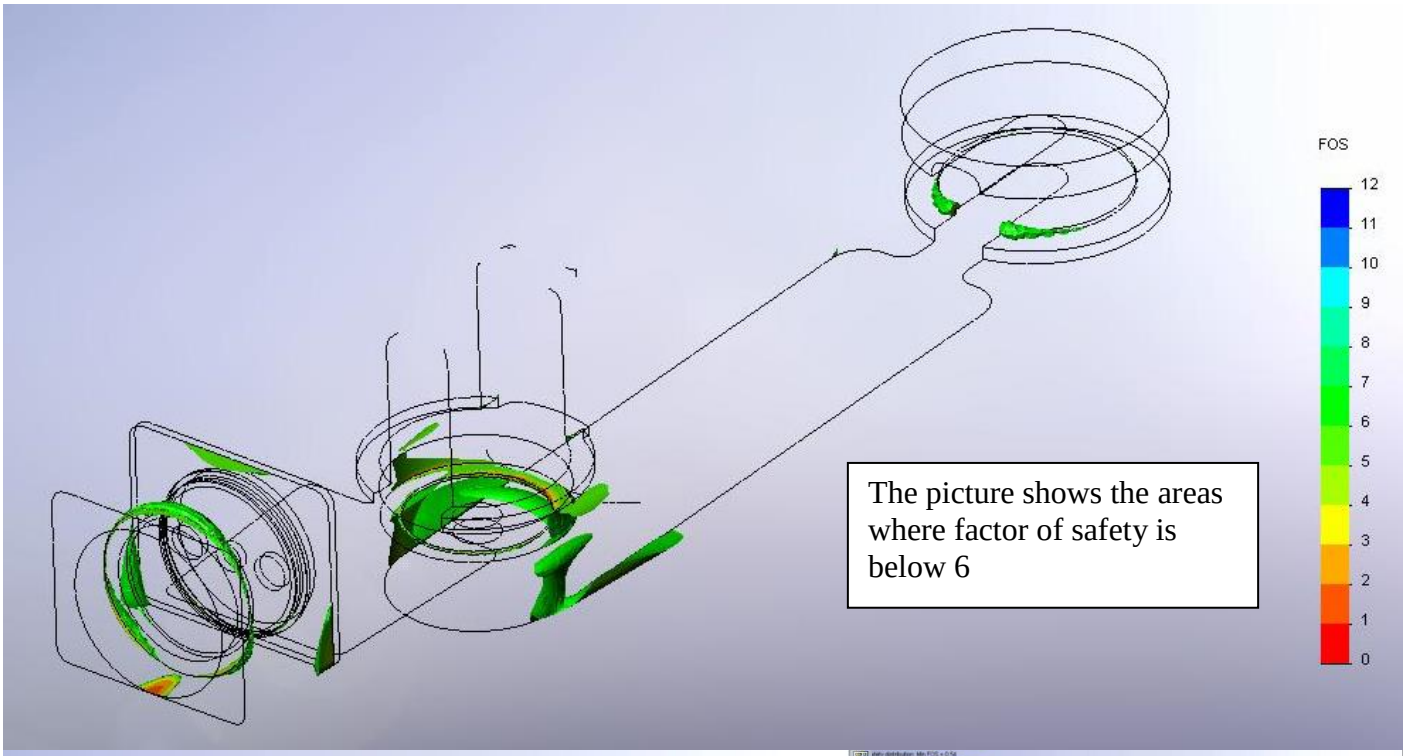
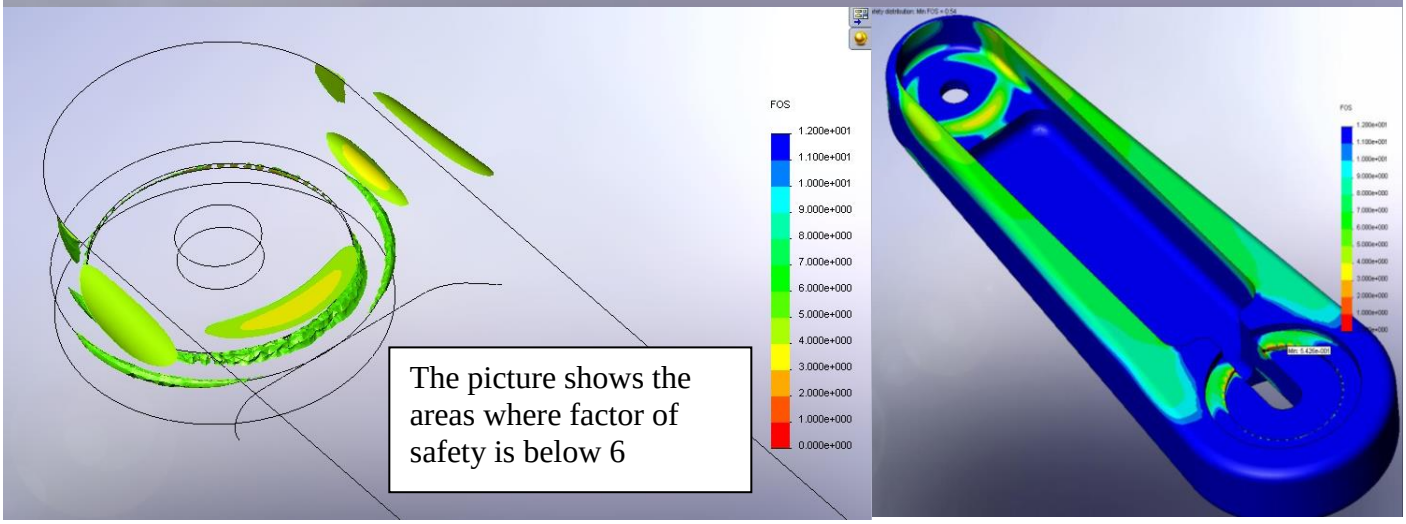
FEA Results for 6852-10000PPS Assembly

1. FEA Results for Manipulator hands (6852-14000 subassembly and 6852-16001 Link Arm)

The material used for Arms: Aluminium 6061-T6 (tensile strength=35000PSI)
Load applied to the KUKA Wrist: 2000lb (Factor of safety 5)







CONCLUSION:

The factor of safety for the design Manipulator Arms is significantly over 1 in all areas of the subassembly (except for the areas explained in above pictures). The design of the all parts and selected materials will allow proper function of the product within the applied conditions and loading.

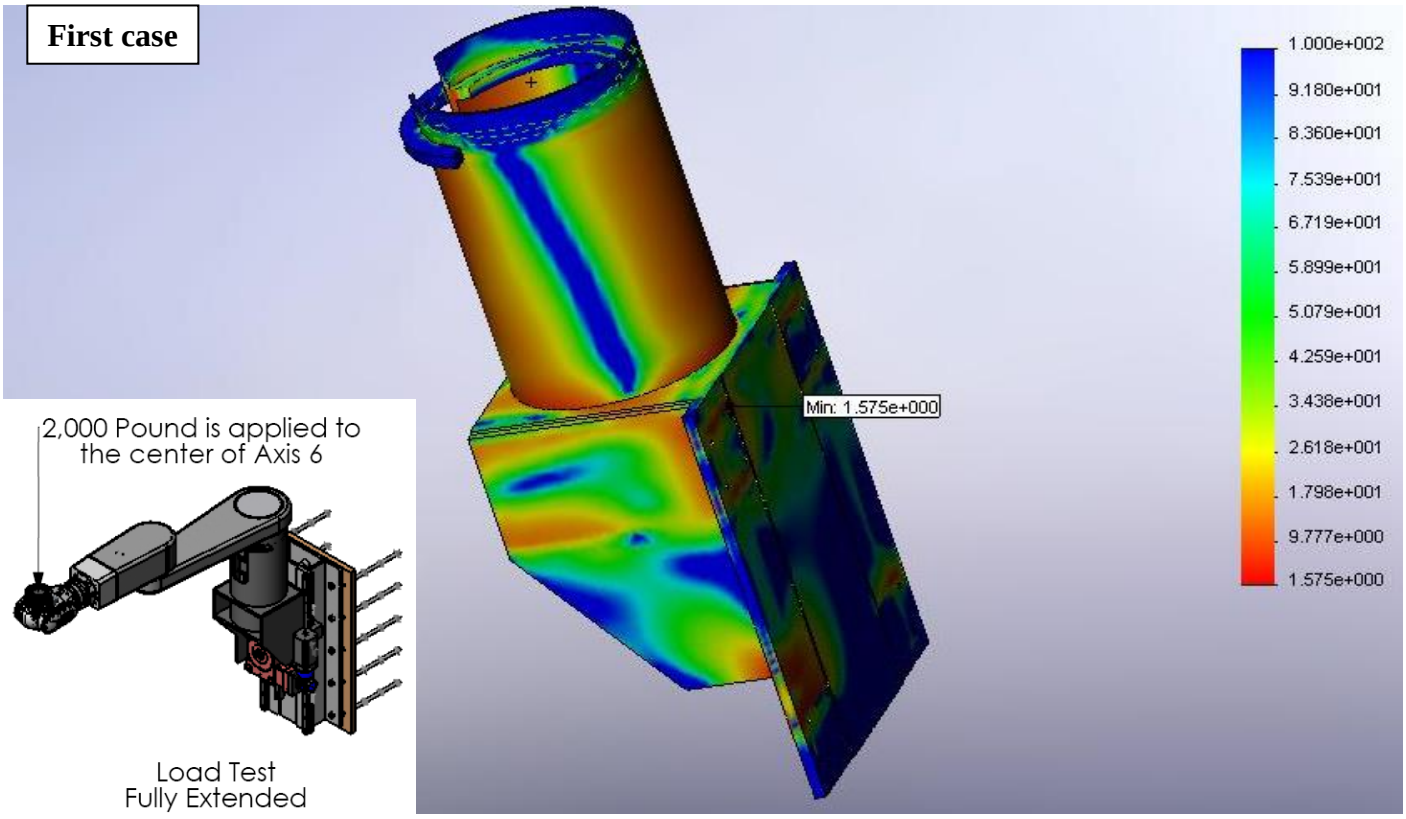
2. FEA Results for Vertical slide (6852-12004 6852-12004 Carraige Weldment Sub-Assembly)

The material used for all parts: Plain Carbon Steel (tensile strength=32000PSI)

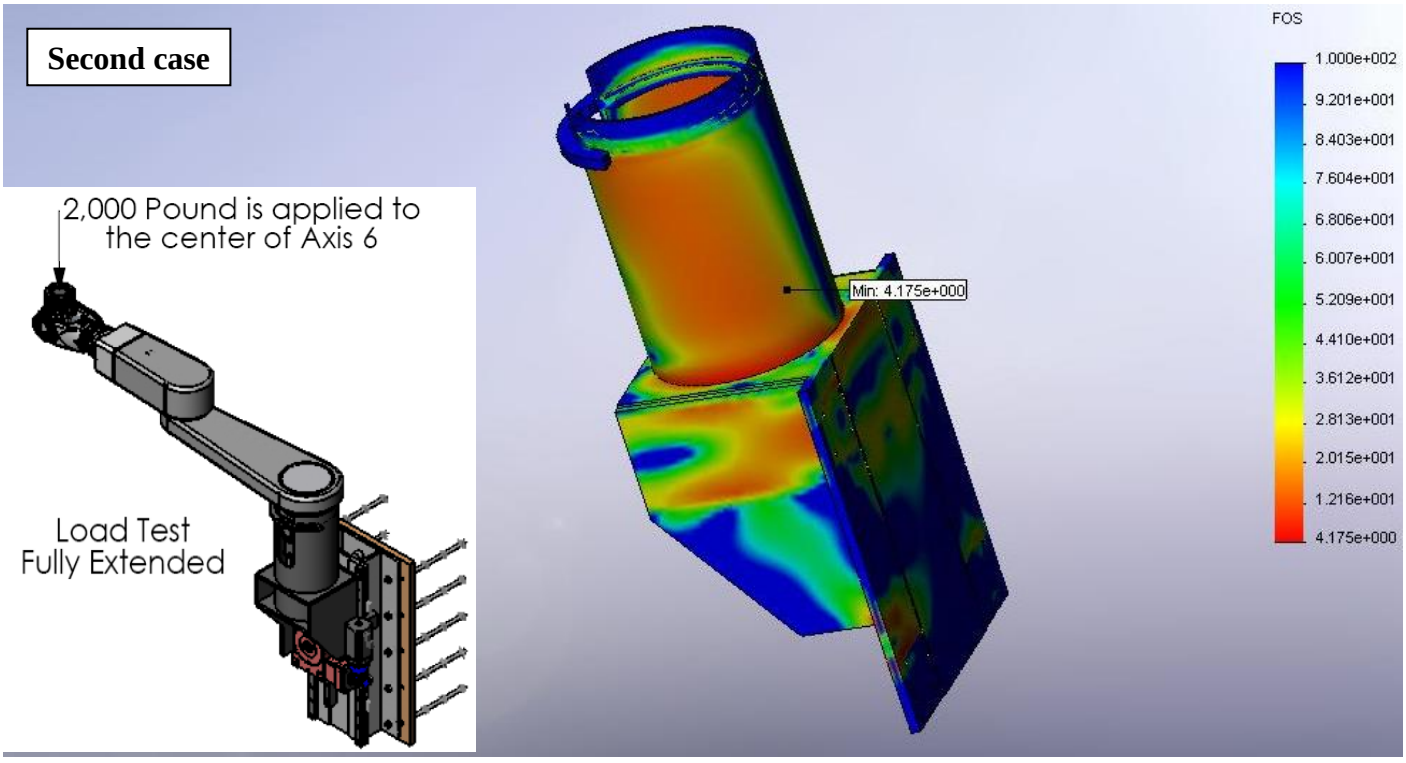
Load applied to the KUKA Wrist: 2000lb (Factor of safety 5)

Calculations based on two positions of the Manipulator arms:

First case



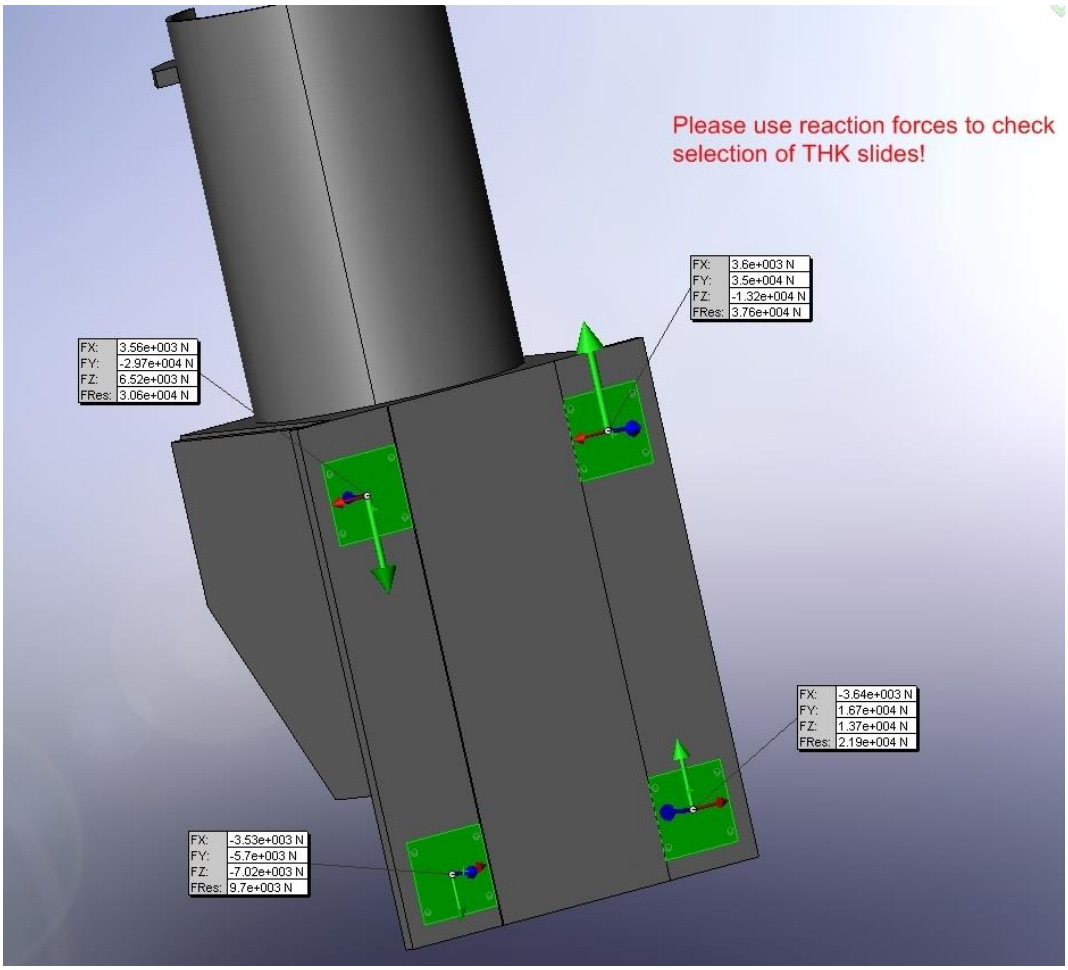
Second case

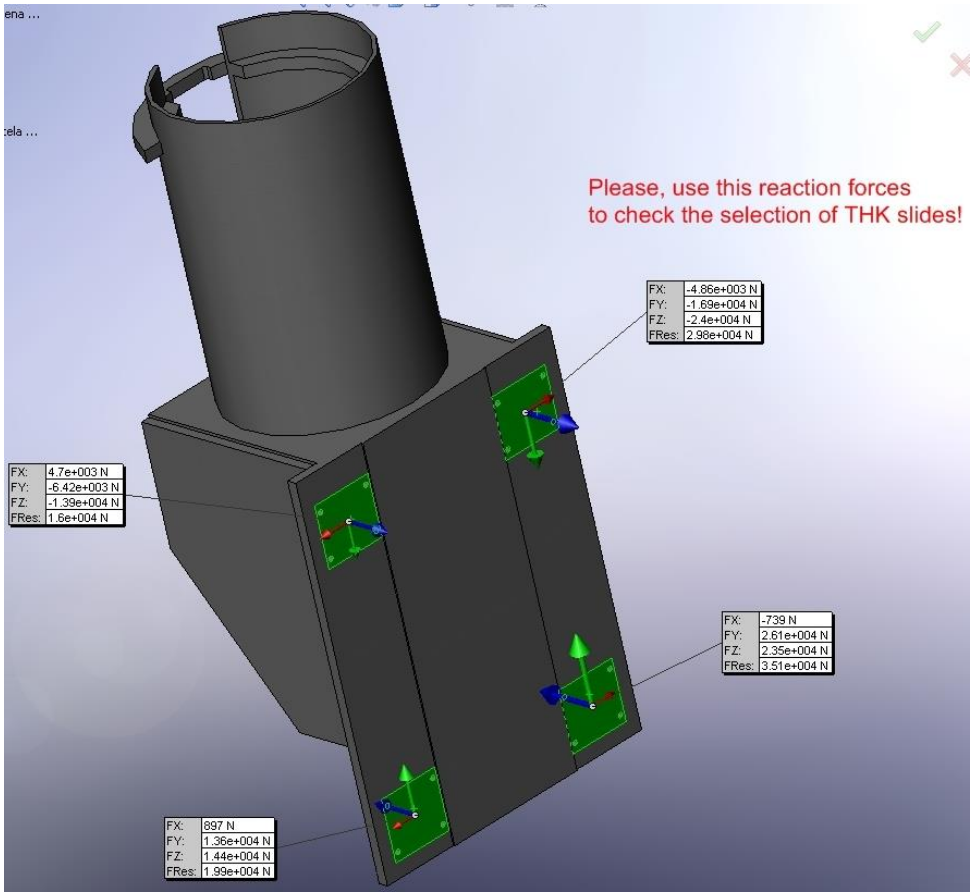


CONCLUSION:

Minimum value for factor of safety is 1.57 in the first case, and 4.17 in second. The design of the all parts and selected materials will allow proper function of the product within the applied conditions and loading.

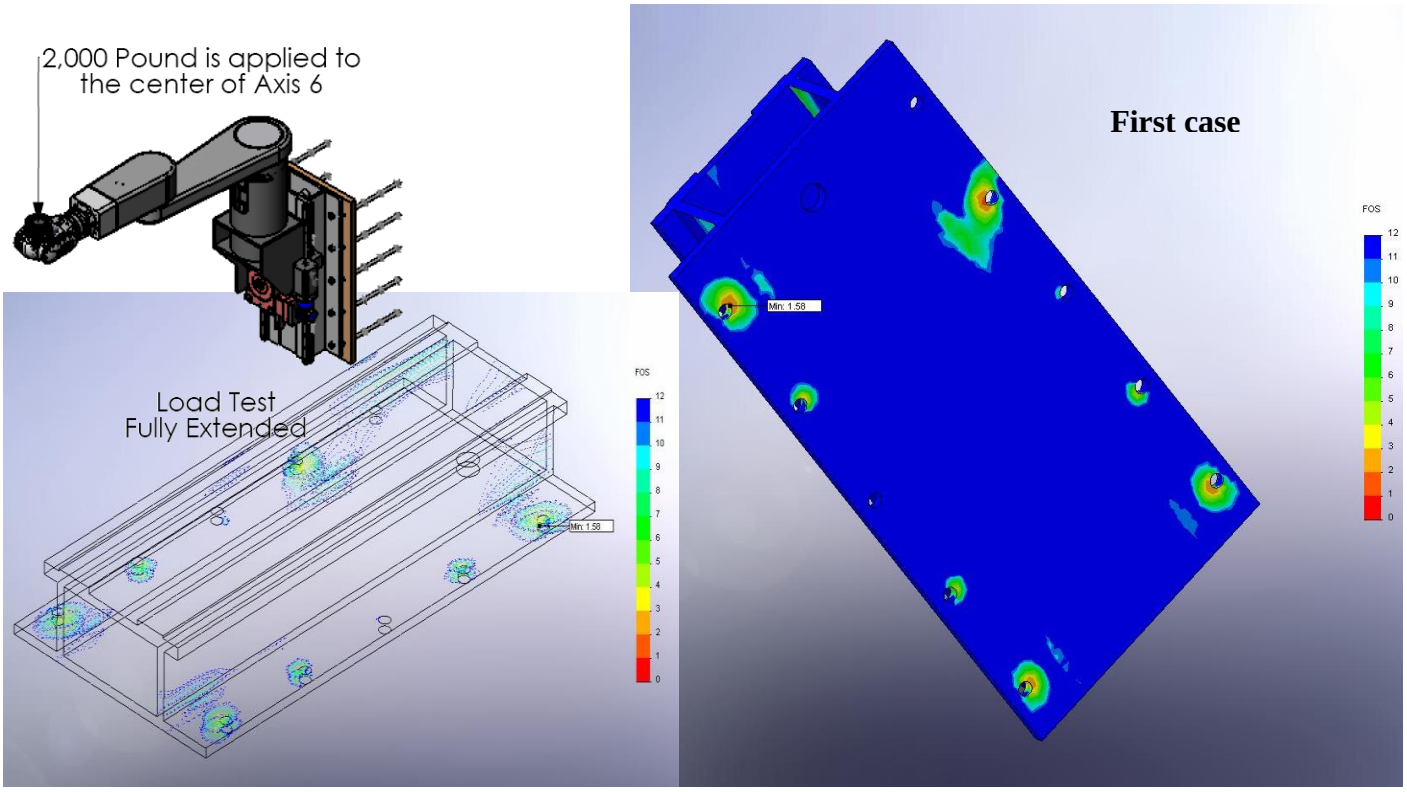
Based on the reaction forces showed on pictures below, the selection of THK slides should be checked.

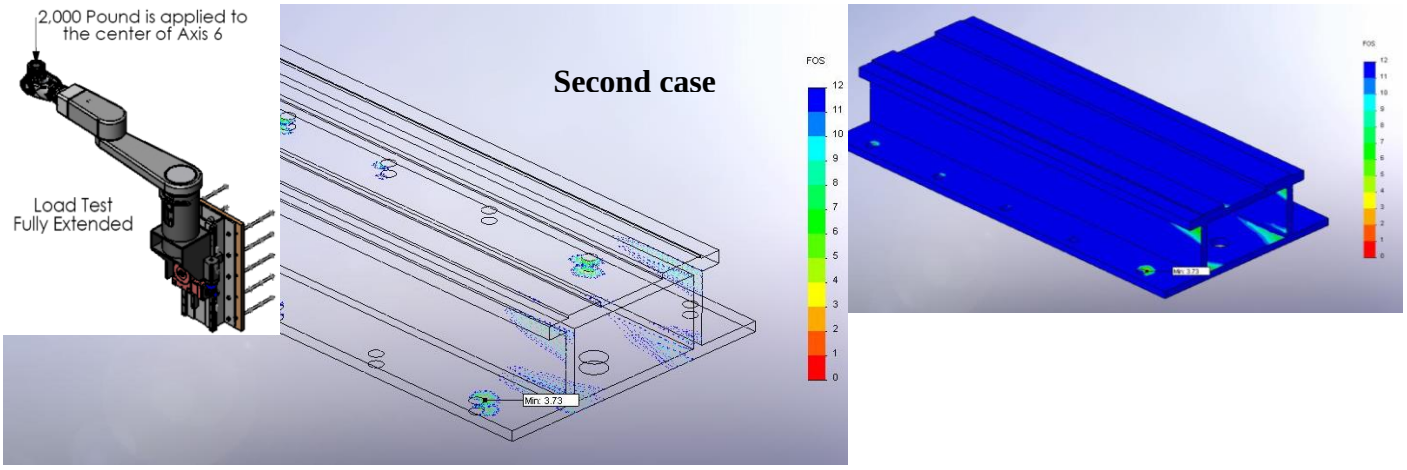




3. FEA Results for 6852-12009 MOUNTING PLATE WELDMENT

The material used for all parts: Plain Carbon Steel (tensile strength=32000PSI)
Load applied to the KUKA Wrist: 2000lb (Factor of safety 4)
Calculations based on two positions of the Manipulator arms:



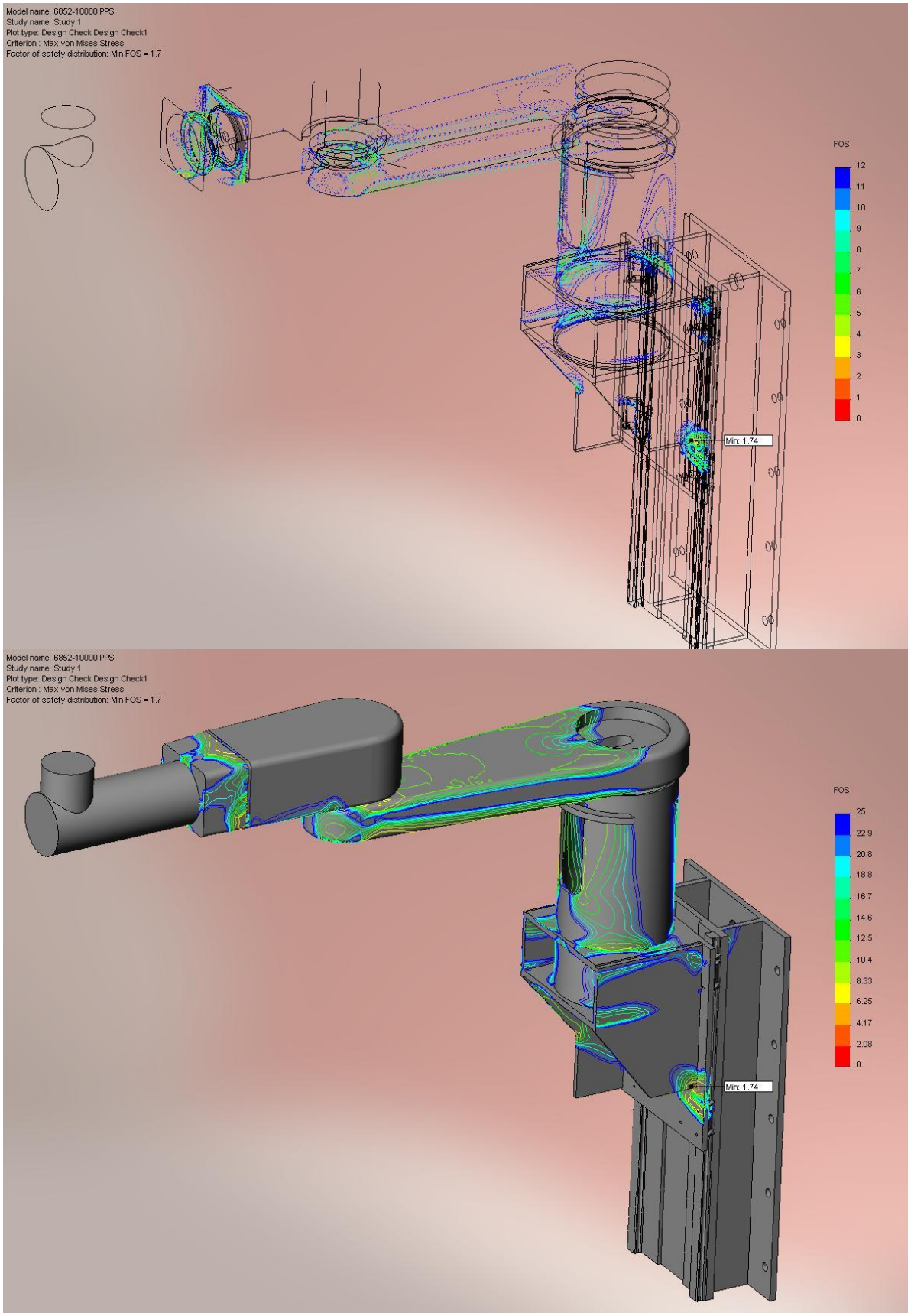


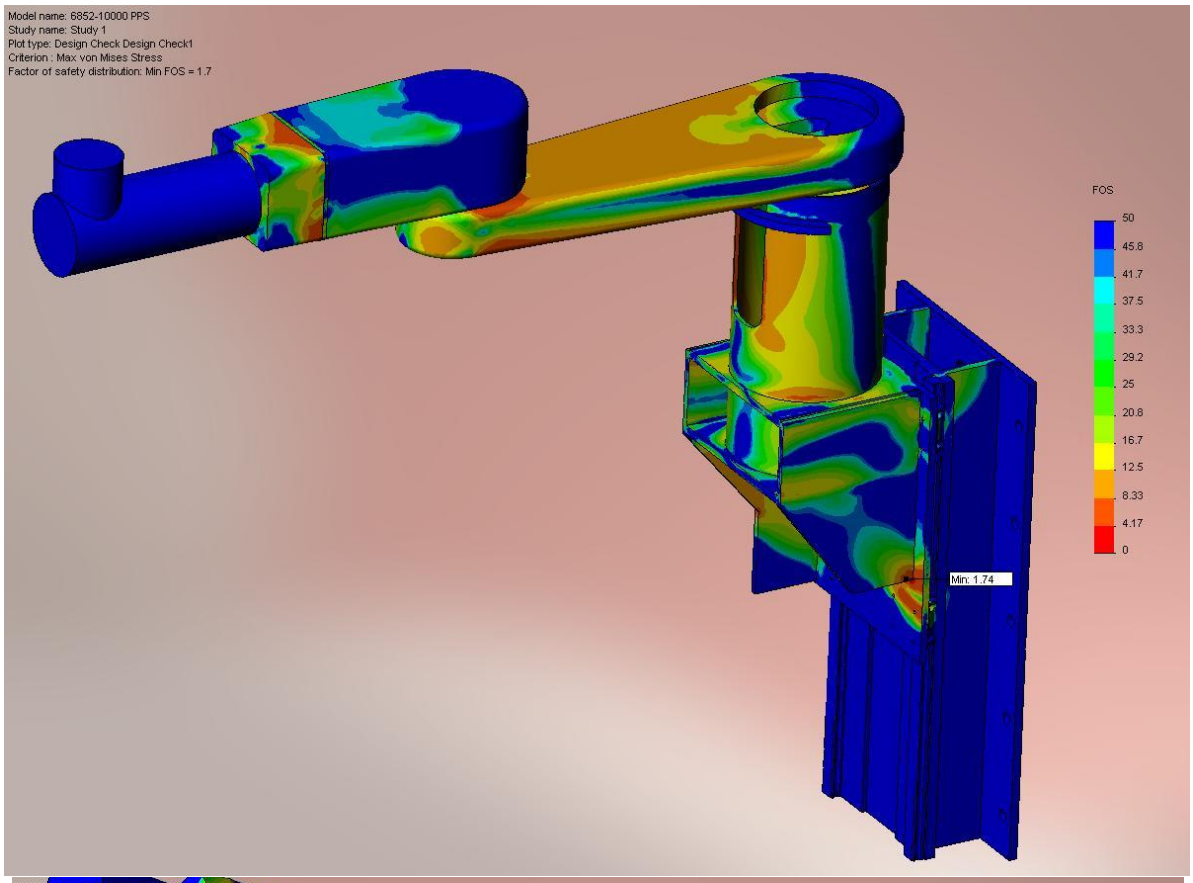
CONCLUSION:

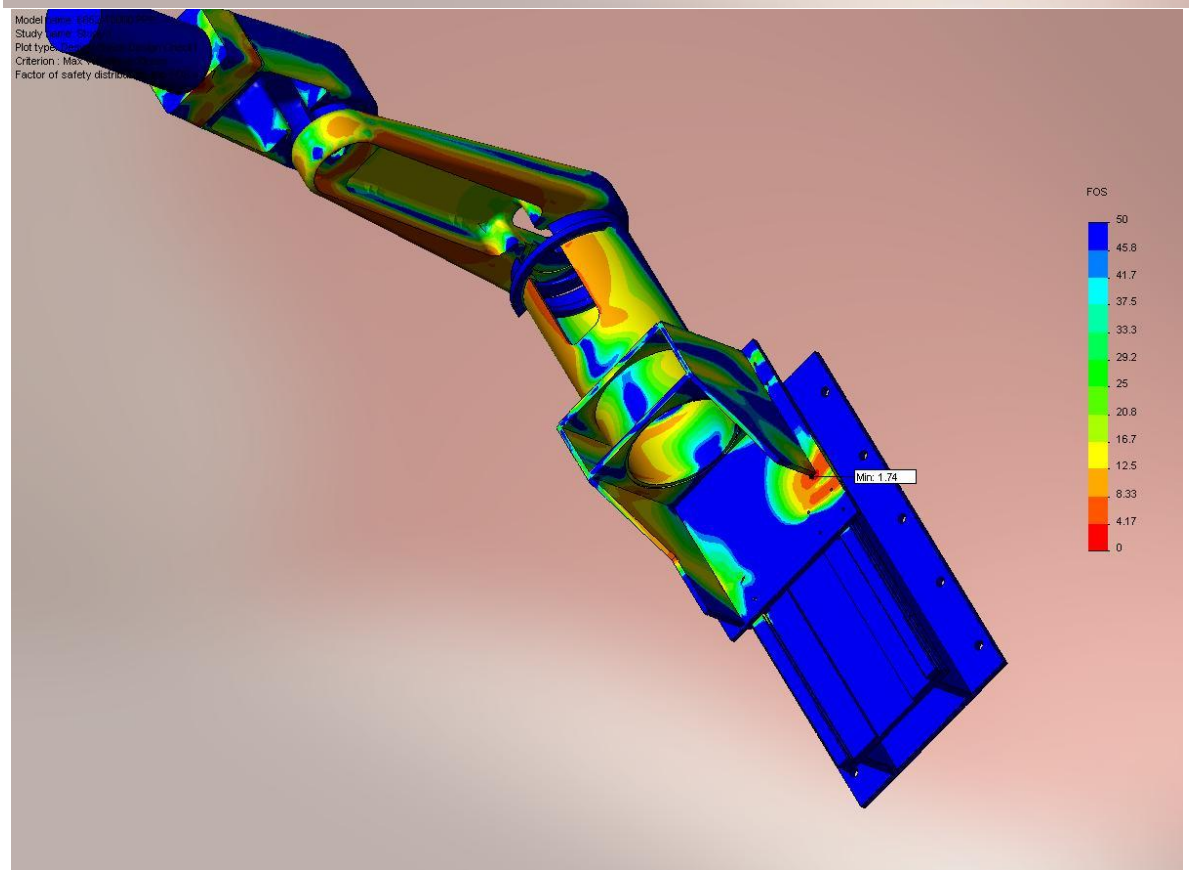
Minimum value for factor of safety is 1.58 in the first case, and 3.73 in second. The design of the all parts and selected materials will allow proper function of the product within the applied conditions and loading.

4. FEA Results for 6852-10000PPS Assembly

Next few slides shows the results for the complete assembly, where we can see that the minimum value for factor of safety is 1.74. The operating and loading conditions are the same as in the above analyzes. The design of the all parts and selected materials will allow proper function of the product within the applied conditions and loading.




Model name: 6852-10000 PPS
Study name: Study 1
Plot type: Design Check Design Check1
Criterion : Max von Mises Stress
Factor of safety distribution: Min FOS = 1.7
FOS
50
45.8
41.7
37.5
33.3
29.2
25
20.8
16.7
12.5
8.33
4.17
0
Min: 1.74


FOS
50
45.8
41.7
37.5
33.3
29.2
25
20.8
16.7
12.5
8.33
4.17
0
Min: 1.74