FGT/HFT Integration

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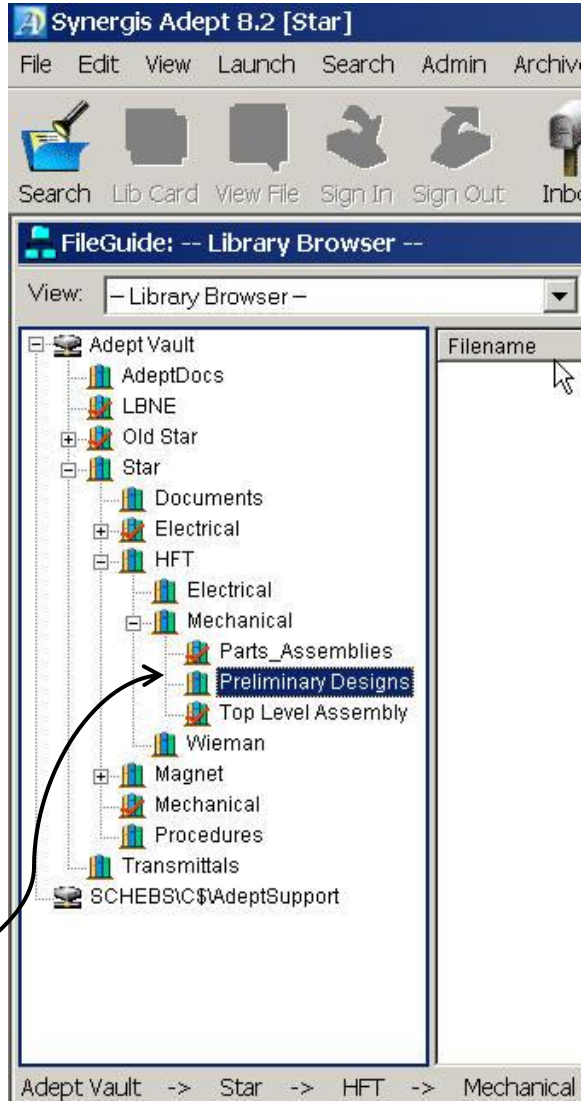
ADEPT – current status

Most MCAD files have been uploaded to ADEPT:

1. ***PXL***
2. ***FGT***
3. ***MSC***
    1. ***Fixtured assemblies still required***
4. ***IDS***
5. ***IST***
6. ***SSD***
7. ***Beampipe***
    1. ***Multiple versions exist, however, the one that's in Adept will be considered current. It still needs to be checked against the production drawings from Brush Wellman***
8. ***Wide Angle Hall***

- ***These files are all located in a Library Structure (i.e. Folder Structure) as given by the STAR Upgrade Drawing Hierarchy***
  - ***This hierarchy is located in its own library called 'ID Documents'***
  - ***Replaces the old 'Preliminary Designs' library***

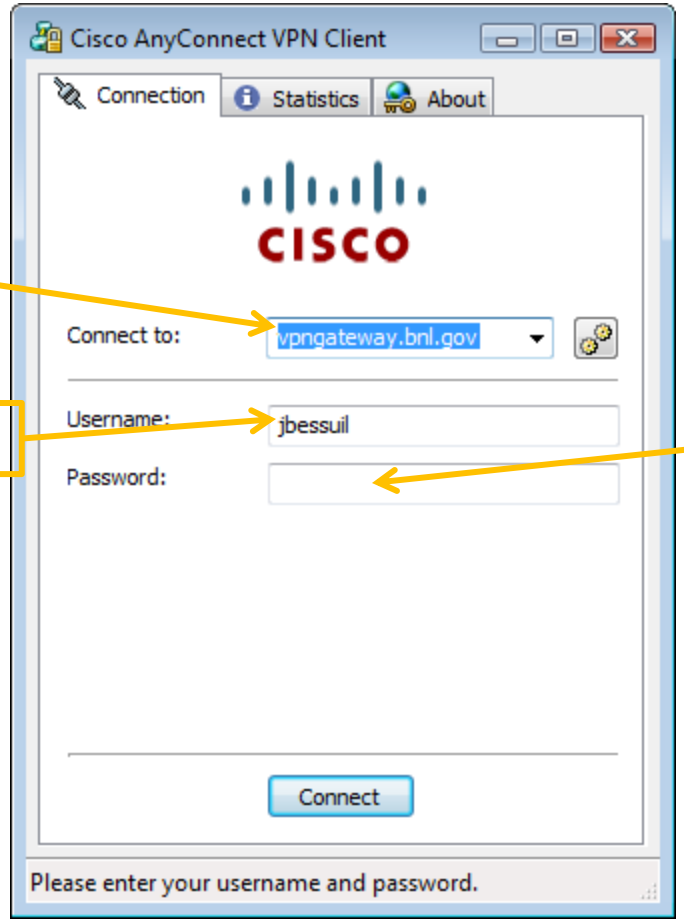


ADEPT – VPN login

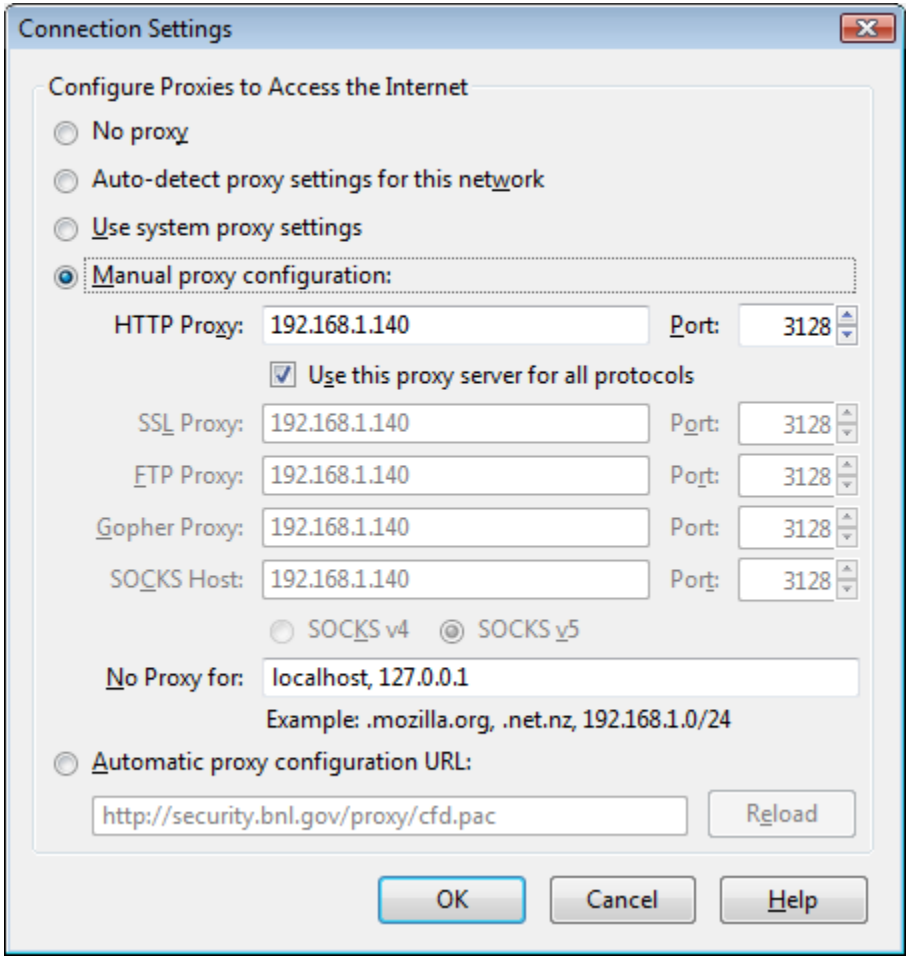
- VPN Password provided by CryptoCard software
  - If challenged by server, go to options→resynchronize (in CryptoCard). This generates a new key that should be entered in the 'Answer' field
- Adept help and binary files on BNL network at \\adept.b459.bnl.gov

Note: New gateway server vpngateway.bnl.gov

This is your BNL NT domain login



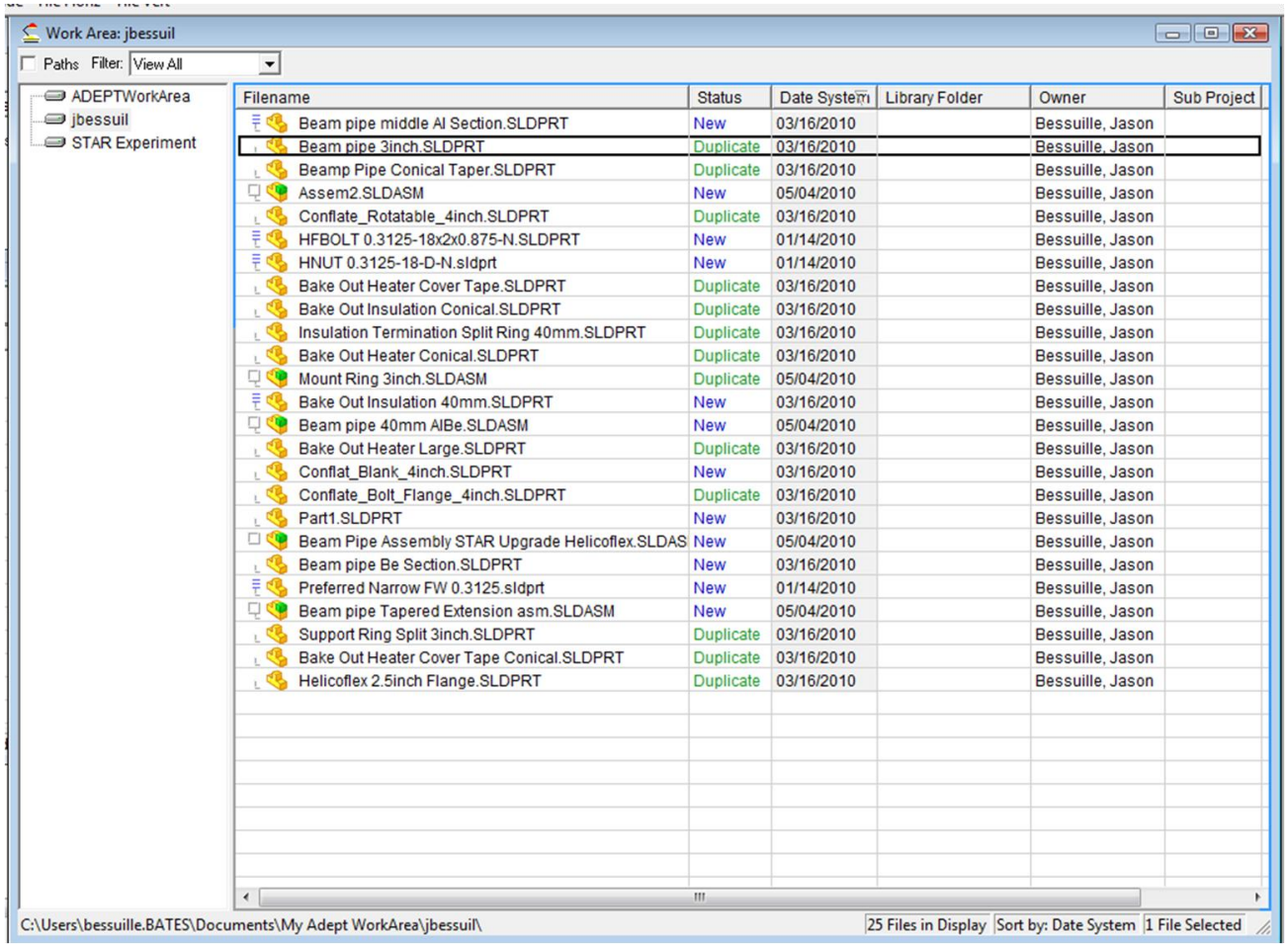
ADEPT – using Firefox thru VPN



Additional help → BNL ITD Help desk: 631-344-5522

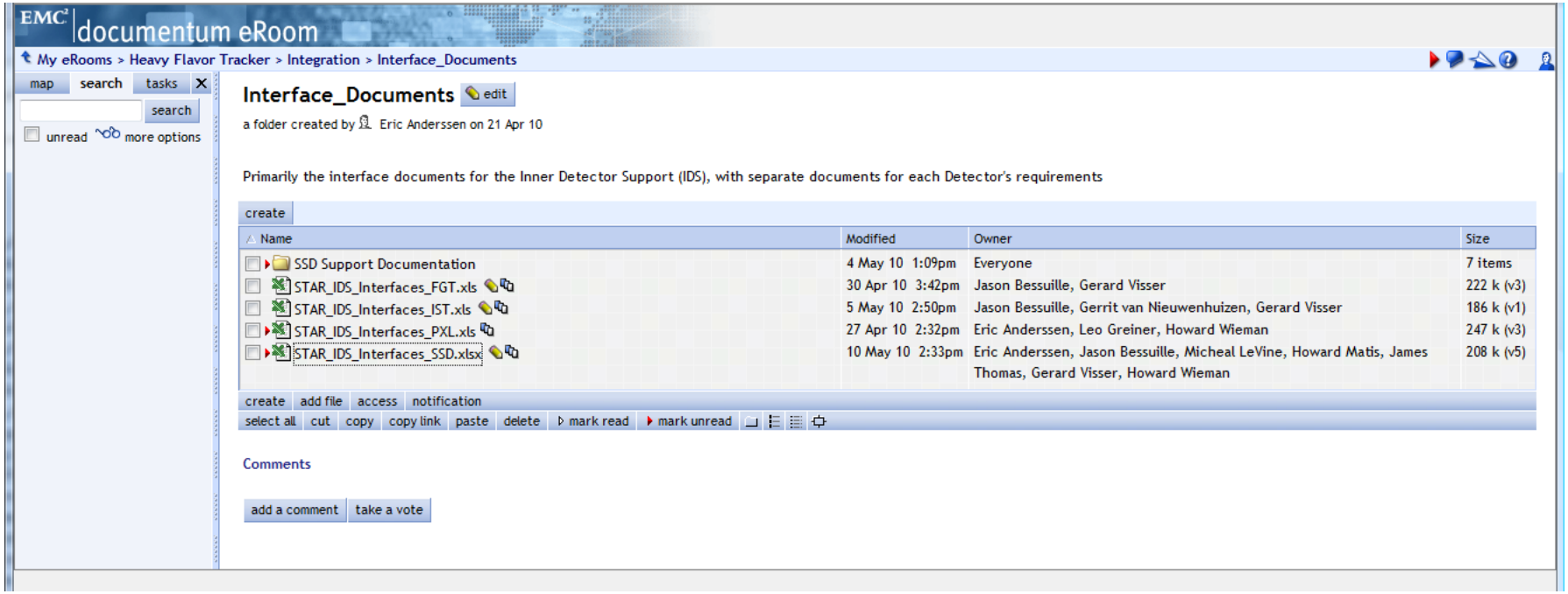
ADEPT – work area

- Files you sign out will be saved on your computer in your ‘Work Area’
  - This is also where you must place new files for signing in
  - Location determined by ADEPT settings
  - You can batch edit library cards for files **in your work area** by selecting them and hitting ***CTRL+B***



Interfaces .docs

- Are currently being managed by eRoom (eroom2.lbl.gov)
  - Allows versioning and access control
  - SSD group set good example by including all supporting documents here as well



Interfaces - FGT

Mechanical tolerances relaxed

Survey requirements based on sigma of measurement

Build Position

Element to be positioned	Direction	Mechanical Tolerance	Relative to	Survey Tolerance	Relative to	Notes	Ref
	-	+/- mm	-	σ mm	-		
Survey marker on bearing housing	X	1.00	WSC	0.500	TPC		
Survey marker on bearing housing	Y	1.00	WSC	0.500	TPC		
Support disk back surface	Z	1.00	WSC	0.250	TPC		4
Support disk back surface	Z	0.50	next support disk	0.500	TPC		
Support disk back surface	Rx	1.00	Beamline	0.250	Beamline	at maximum radius	4
Support disk back surface	Ry	1.00	Beamline	0.250	Beamline	at maximum radius	4
Readout plane	Rz		WSC		TPC		

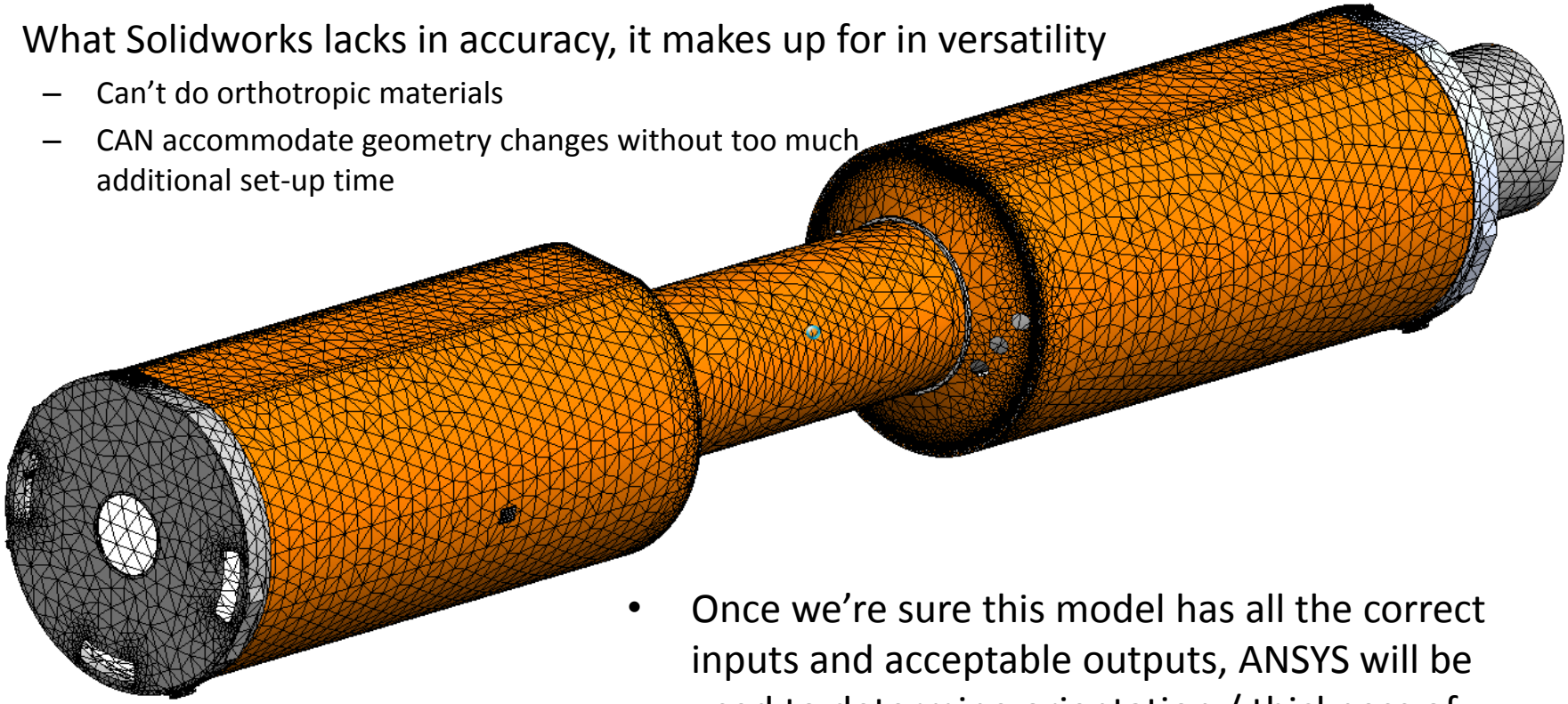
Stability

Element to be positioned	Direction	Short Term	Relative to	Long Term	Relative to	Notes	Ref
	-	RMS mm	-	mm	-		
Entire Detector	X,Y	0.10	IP				
	Z	1.00	IP				

RMS vibration of FGT still drives the stability of the IDS

FEA

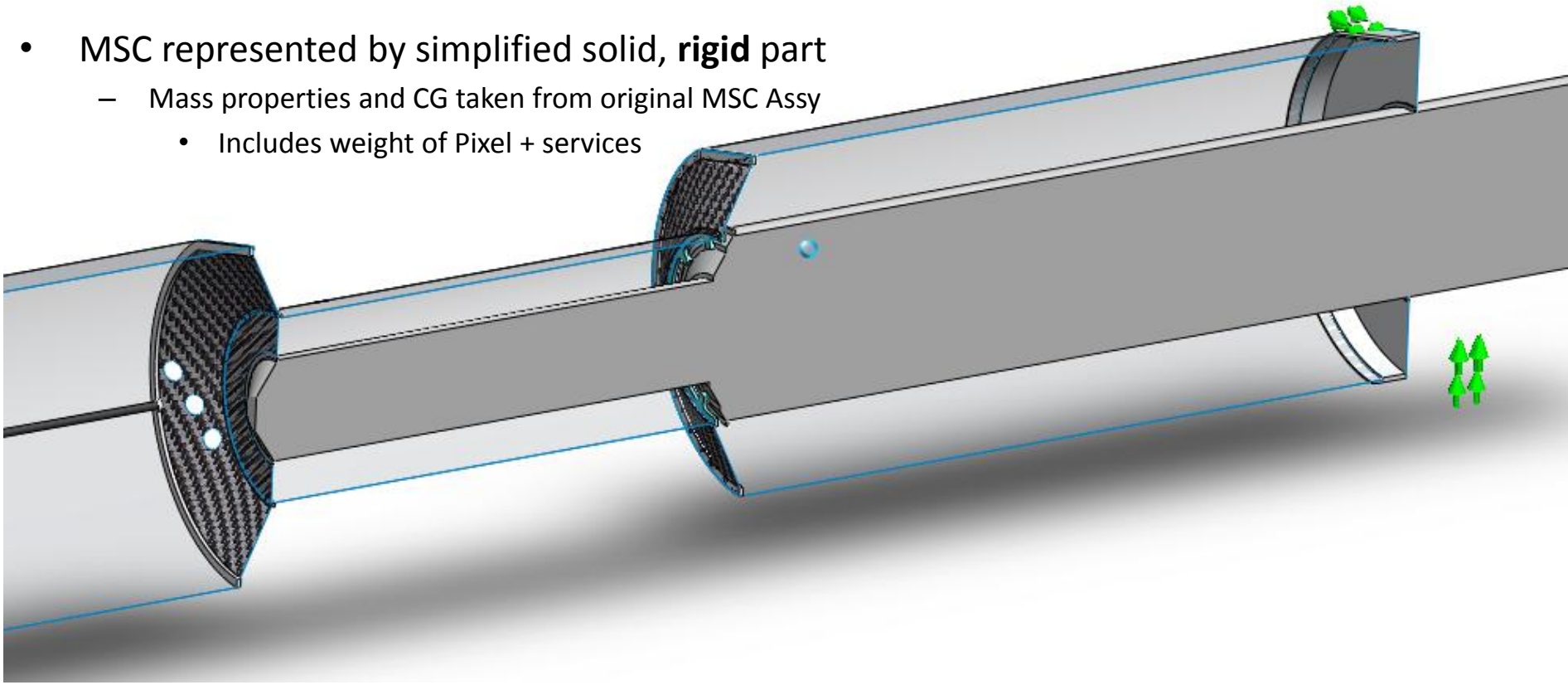
- Goal is to perform a first order statics analysis using Solidworks Simulation
  - Evolution of last year's FEA
  - Incorporates all the detector and services loads from interfaces documents
- What Solidworks lacks in accuracy, it makes up for in versatility
  - Can't do orthotropic materials
  - CAN accommodate geometry changes without too much additional set-up time



- Once we're sure this model has all the correct inputs and acceptable outputs, ANSYS will be used to determine orientation / thickness of orthotropic components

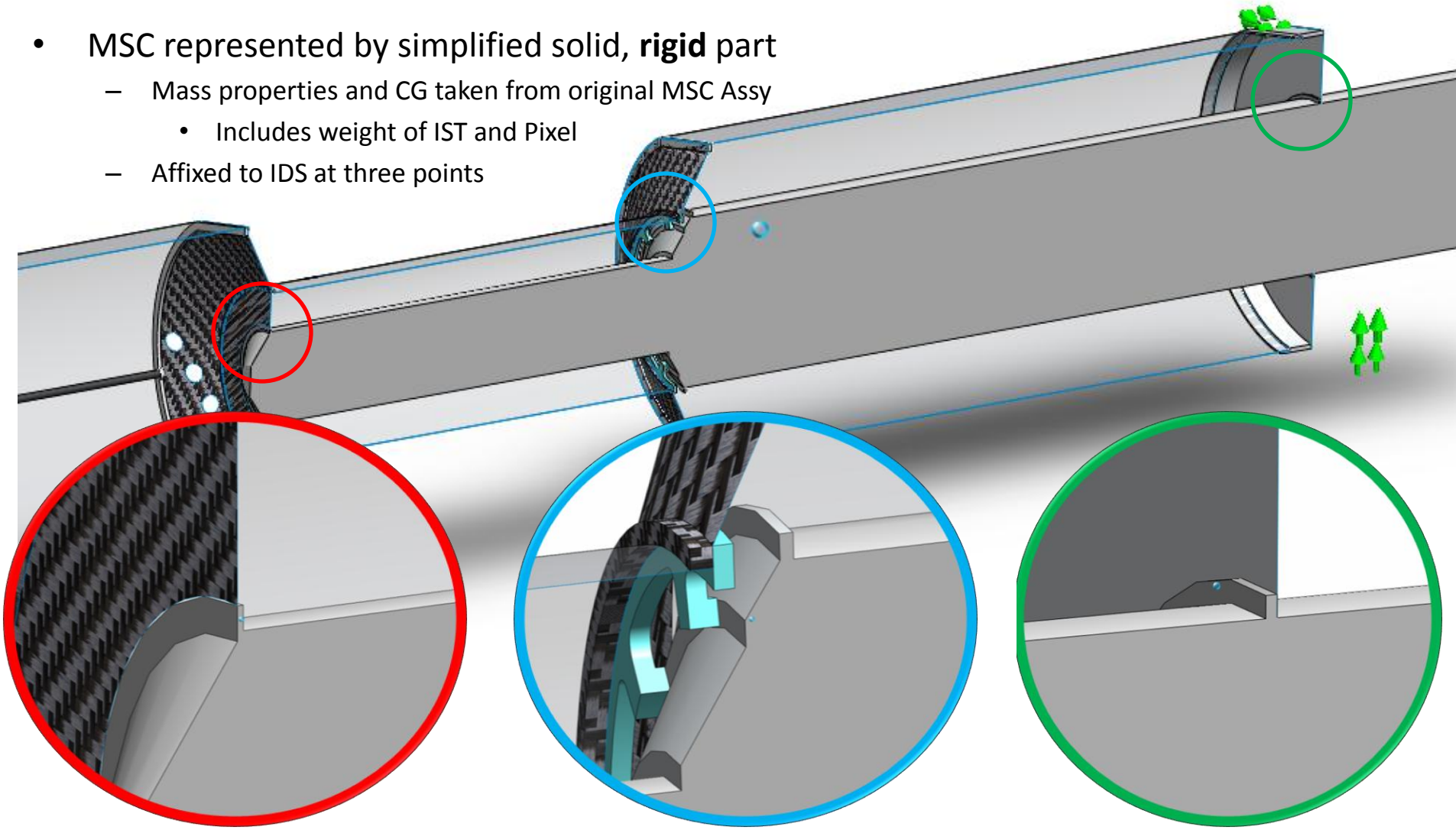
FEA

- MSC represented by simplified solid, **rigid** part
  - Mass properties and CG taken from original MSC Assy
    - Includes weight of Pixel + services



FEA

- MSC represented by simplified solid, **rigid** part
  - Mass properties and CG taken from original MSC Assy
    - Includes weight of IST and Pixel
  - Affixed to IDS at three points

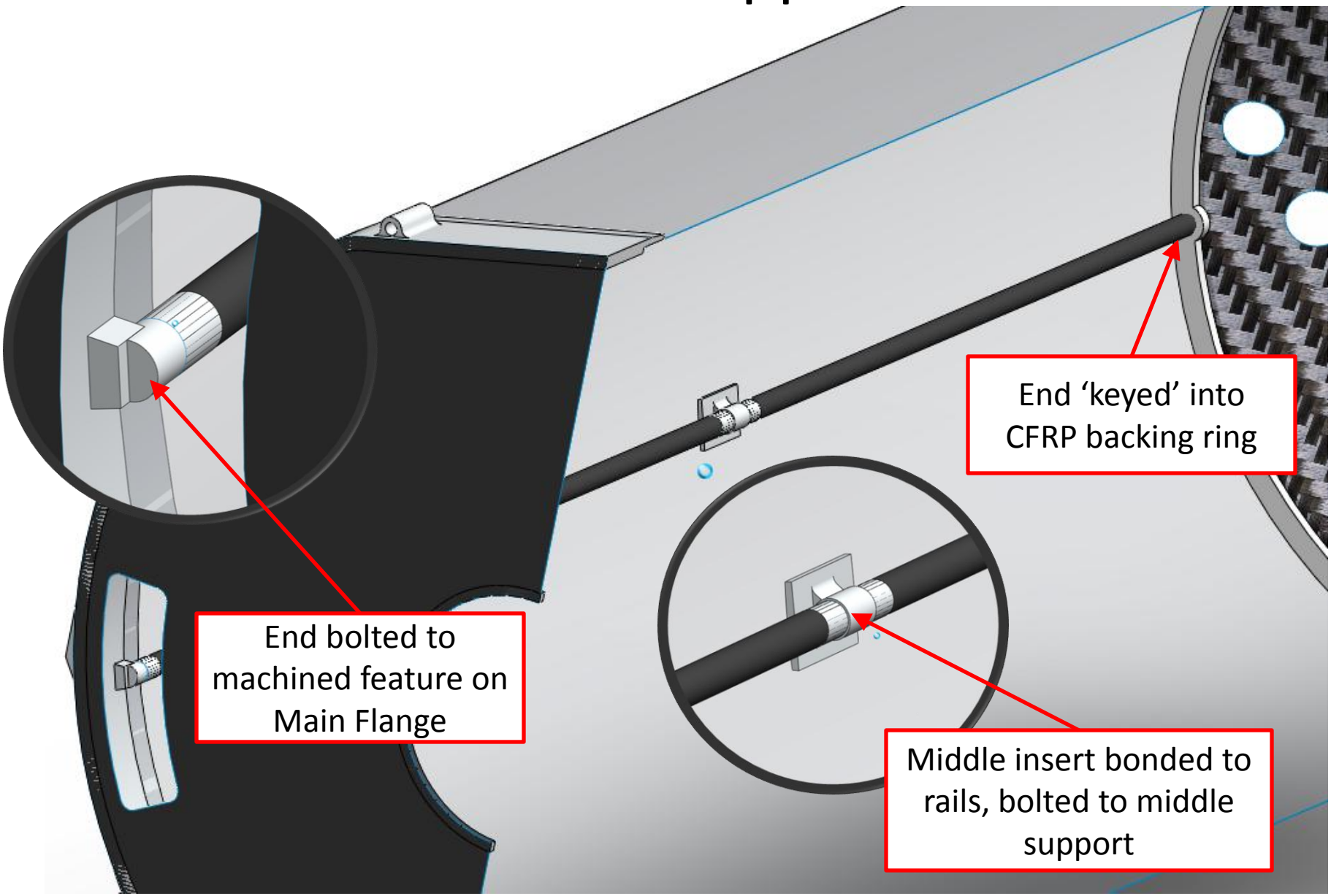


West connection to WSC small stiffening plate

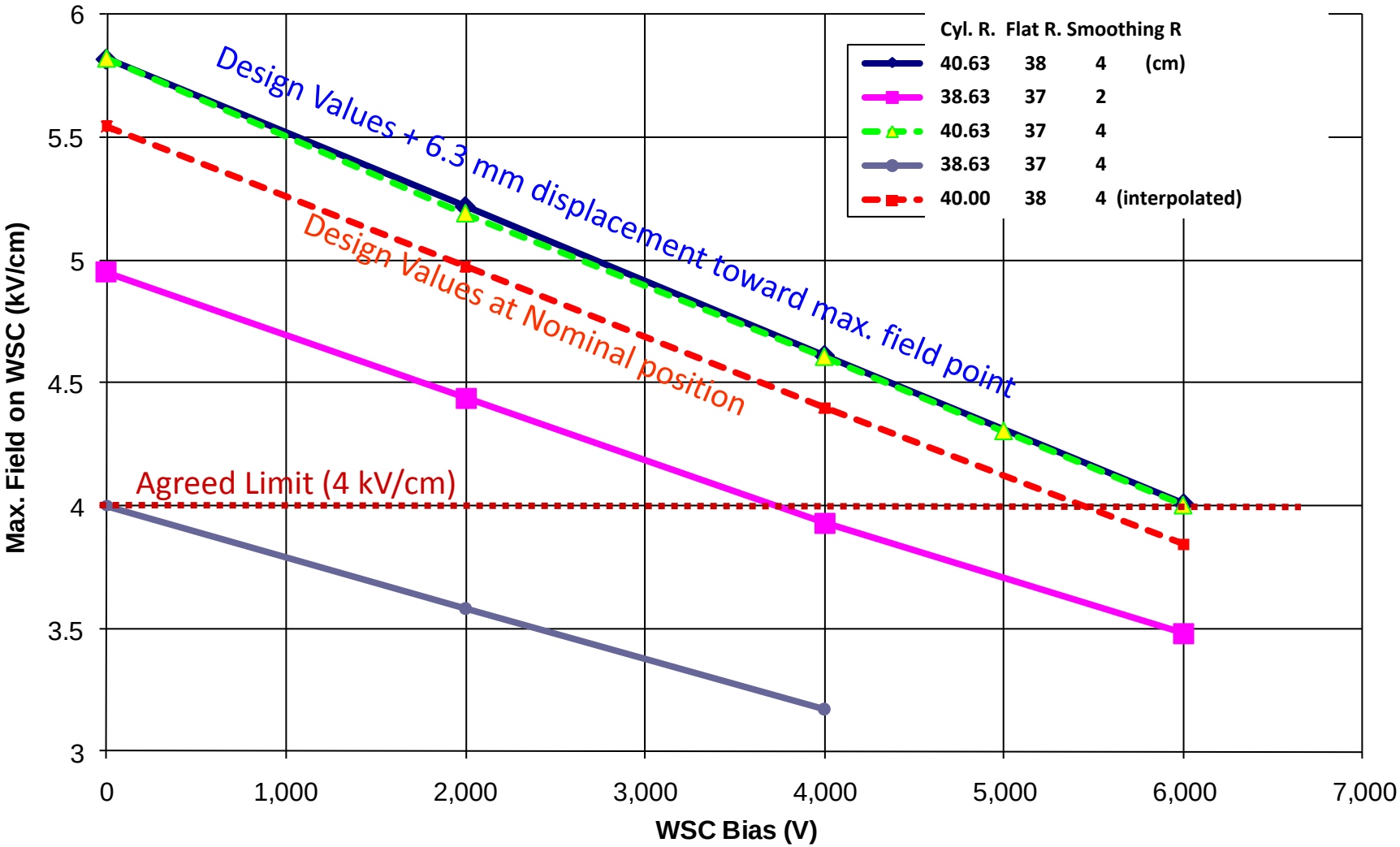
Middle connection to ESC small backing ring

East connection to ESC main flange stiffening plate

FEA – WSC Support Rails



Maximum Field on WSC

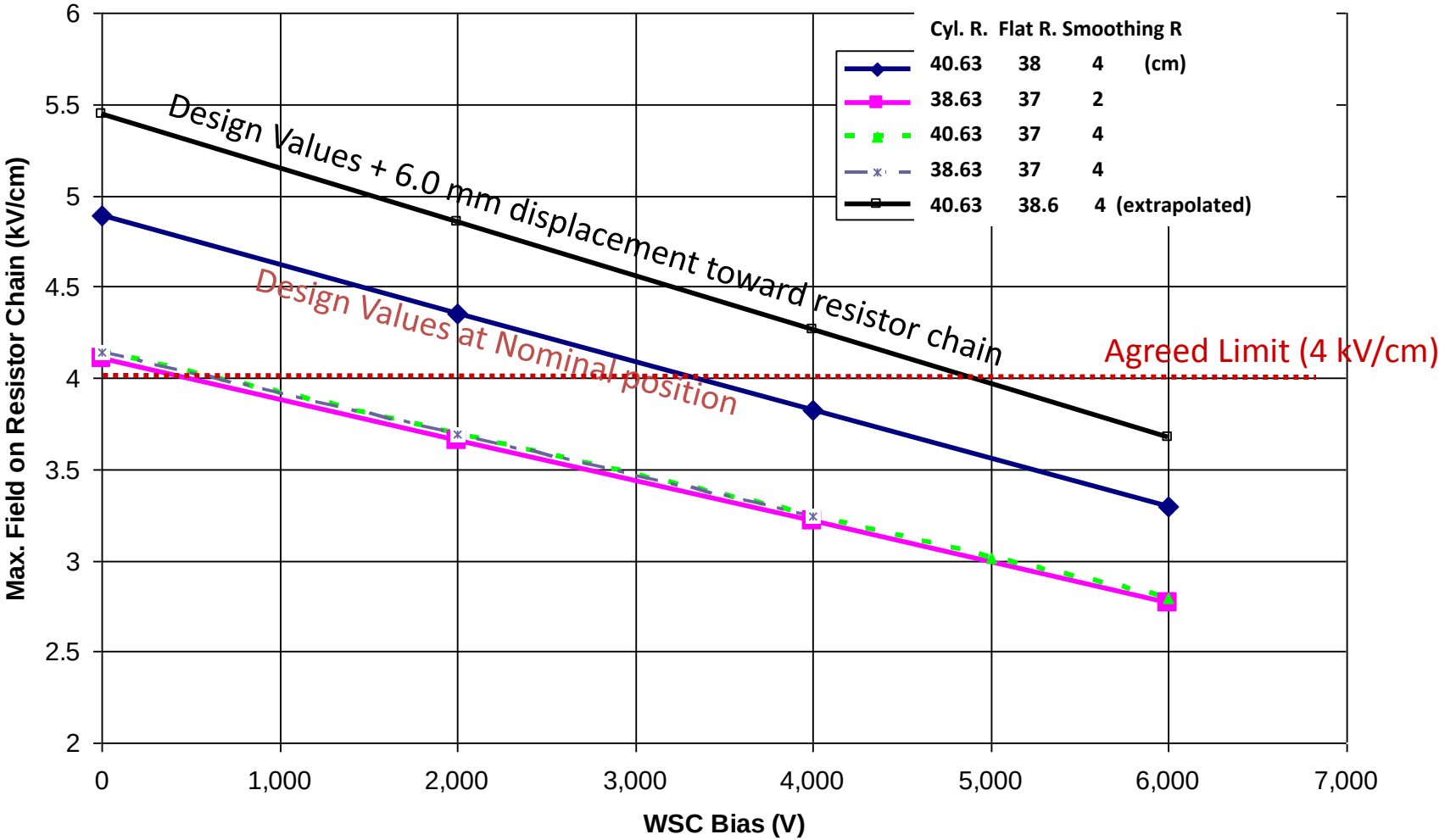


Maximum field on the WSC vs. WSC bias for the parameter sets studied (shown in key)

Also plotted (dashed red) is the interpolation to the design values, for the WSC centered in the IFC

Since the first and third sets are the same, it can be seen that changing the distance to the flat for a given cylinder radius does not change the maximum field (it just changes the phi location of the compound corner where the maximum occurs. Therefore, set 1 corresponds to offsetting the WSC radially by 6.3 mm in the worst direction – toward the maximum field point.

Maximum Field on Resistor Chain



Maximum field on the Resistor Chan vs. WSC bias for the parameter sets studied (shown in key)
As the 2nd, 3rd and 4th sets show, the max. field on the resistor chain does not depend on the cylinder radius, so the first set (dark blue) may be used to represent the design parameters with the WSC centered in the IFC
Also plotted (black) is the extrapolation to the design values with the WSC displaced radially in the IFC by 6mm toward the resistor chain. **The resistor chain maximum field is always well below the WSC maximum field, so it is that value that determines the required bias.**