# **FGT/HFT** Integration

J. Bessuille 11 May, 2010

#### 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

	🖀 Cisco AnyConnect VPN Client 📃 💷 💽	
	🗞 Connection 🕕 Statistics 릚 About	
	ahaha 👘	
Note: New gateway server	CISCO	
vpngateway.bnl.gov	Connect to: vpngateway.bnl.gov -	SoftToken ST-1     Image: Control of the second secon
	Username: ibessuil	Secure Password: 746-5995
This is your BNL NT domain login	Password:	
		Secure Password TECHNOLOGY
		Use 'Secure Password' as one-time password
	Connect	
	Please enter your username and password.	

## ADEPT – using Firefox thru VPN

Connection Settings			×					
Configure Proxies to	Access the Internet							
No proxy	No proxy							
Auto-detect proxy settings for this net <u>w</u> ork								
O Use system pro	xy settings							
Manual proxy c	onfiguration:							
HTTP Proxy:	192.168.1.140	Port:	3128 🌲					
	$\boxed{V}$ Use this proxy server for all proto	cols						
SS <u>L</u> Proxy:	192.168.1.140	P <u>o</u> rt:	3128 📩					
ETP Proxy:	192.168.1.140	Po <u>r</u> t:	3128 🔺					
<u>G</u> opher Proxy:	192.168.1.140	Port:	3128 🛓					
SO <u>C</u> KS Host:	192.168.1.140	Por <u>t</u> :	3128 🛓					
	SOCKS v4							
<u>N</u> o Proxy for:	localhost, 127.0.0.1							
	Example: .mozilla.org, .net.nz, 192.16	8.1.0/24						
Automatic prox	y configuration URL:							
http://security	.bnl.gov/proxy/cfd.pac		R <u>e</u> load					
	OK Cance		Help					

Additional help  $\rightarrow$  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

Paths Filter: View All	•					
ADEPTWorkArea	Filename	Status	Date System	Library Folder	Owner	Sub Project
ibessuil 🥏	₹ 🥵 Beam pipe middle Al Section.SLDPRT	New	03/16/2010		Bessuille, Jason	
STAR Experiment	Beam pipe 3inch.SLDPRT	Duplicate	03/16/2010		Bessuille, Jason	
	🛛 🥵 Beamp Pipe Conical Taper.SLDPRT	Duplicate	03/16/2010		Bessuille, Jason	
	🖓 🧐 Assem2.SLDASM	New	05/04/2010		Bessuille, Jason	
	Conflate_Rotatable_4inch.SLDPRT	Duplicate	03/16/2010		Bessuille, Jason	
	E HFBOLT 0.3125-18x2x0.875-N.SLDPRT	New	01/14/2010		Bessuille, Jason	
	E 4 HNUT 0.3125-18-D-N.sldprt	New	01/14/2010		Bessuille, Jason	
	Bake Out Heater Cover Tape.SLDPRT	Duplicate	03/16/2010		Bessuille, Jason	
	Bake Out Insulation Conical.SLDPRT	Duplicate	03/16/2010		Bessuille, Jason	
	6 Insulation Termination Split Ring 40mm.SLDPRT	Duplicate	03/16/2010		Bessuille, Jason	
	Bake Out Heater Conical SLDPRT	Duplicate	03/16/2010		Bessuille, Jason	
	🖵 🤏 Mount Ring 3inch.SLDASM	Duplicate	05/04/2010		Bessuille, Jason	
	E Bake Out Insulation 40mm.SLDPRT	New	03/16/2010		Bessuille, Jason	
	🖵 🤏 Beam pipe 40mm AlBe.SLDASM	New	05/04/2010		Bessuille, Jason	
	Bake Out Heater Large.SLDPRT	Duplicate	03/16/2010		Bessuille, Jason	
	Conflat_Blank_4inch.SLDPRT	New	03/16/2010		Bessuille, Jason	
	Conflate_Bolt_Flange_4inch.SLDPRT	Duplicate	03/16/2010		Bessuille, Jason	
	Part1.SLDPRT	New	03/16/2010		Bessuille, Jason	
	🗆 🧐 Beam Pipe Assembly STAR Upgrade Helicoflex.SLD	AS New	05/04/2010		Bessuille, Jason	
	🛛 🔥 Beam pipe Be Section.SLDPRT	New	03/16/2010		Bessuille, Jason	
	E Superior FW 0.3125.sldprt	New	01/14/2010		Bessuille, Jason	
	🖵 🤏 Beam pipe Tapered Extension asm.SLDASM	New	05/04/2010		Bessuille, Jason	
	Support Ring Split 3inch.SLDPRT	Duplicate	03/16/2010		Bessuille, Jason	
	Bake Out Heater Cover Tape Conical.SLDPRT	Duplicate	03/16/2010		Bessuille, Jason	
	Helicoflex 2.5inch Flange.SLDPRT	Duplicate	03/16/2010		Bessuille, Jason	

## 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

map search tasks X	Tracker > Integration > Interface_Documents Interface_Documents Sedit			● � � @				
unread <sup>vob</sup> more options	a folder created by ${\mathfrak Q}_{-}$ Eric Anderssen on 21 Apr 10							
	Primarily the interface documents for the Inner Detector Support (IDS), w	vith separate documents for each Det	tector's requirements					
	△ Name	Modified	Owner	Size				
	SSD Support Documentation	4 May 10 1:09pm	Everyone	7 items				
	🔲 🕷 STAR_IDS_Interfaces_FGT.xls 💊 🕰	30 Apr 10 3:42pm	Jason Bessuille, Gerard Visser	222 k (v3)				
	🔲 💐 STAR_IDS_Interfaces_IST.xls 💊 🕰	5 May 10 2:50pm	Jason Bessuille, Gerrit van Nieuwenhuizen, Gerard Visser	186 k (v1)				
	STAR_IDS_Interfaces_PXL.xls 🕰	27 Apr 10 2:32pm	Eric Anderssen, Leo Greiner, Howard Wieman	247 k (v3)				
	□ ▶ 街 STAR_IDS_Interfaces_SSD.xlsx 💊 🐿	10 May 10 2:33pm	Eric Anderssen, Jason Bessuille, Micheal LeVine, Howard Matis, James Thomas, Gerard Visser, Howard Wieman	208 k (v5)				
	create add file access notification							
	select all cut copy copy link paste delete 🕨 mark read 🕨 mark unread 🗀 🔚 🛱							
	Comments							

#### Interfaces - FGT

						Survey requireme	ents		
Mechanical						based on sigma	of		
tolerar	ices rela				measurement				
Build Posit	ion								
		Direction	Mechanical Tolerance	Relative to	Survey Tolerance	Relative to	Notes	5	Ref
Element to be p	ositioned	-	+/- mm	-	σmm	-			
Survey marker on b housing	bearing	x	1.00	WSC	0.500	ТРС			
Survey marker on b housing	bearing	Y	1.00	WSC	0.500	TPC			
Support disk back s	urface	Z	1.00	WSC	0.250	TPC			4
Support disk back s	urface	z	0.50	next suppor disk	0.500	TPC			
Support disk back s	urface	Rx	1.00	Beamline	0.250	Beamline	at maximum	ı radius	4
Support disk back s	urface	Ry	1.00	Beamline	0.250	Beamline	at maximum	ı radius	4
Readout plane		Rz		WSC		ТРС			
Stability						J			

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



#### **FEA**

MSC represented by simplified solid, **rigid** part Mass properties and CG taken from original MSC Assy Includes weight of IST and Pixel ٠ Affixed to IDS at three points West connection to WSC Middle connection to ESC East connection to ESC small stiffening plate main flange stiffening plate

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small backing ring

FGT/HFT Integration - J. Bessuille

#### 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 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> 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.