

Modular Coil Design Update

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Tasks to be completed prior to start of preliminary design

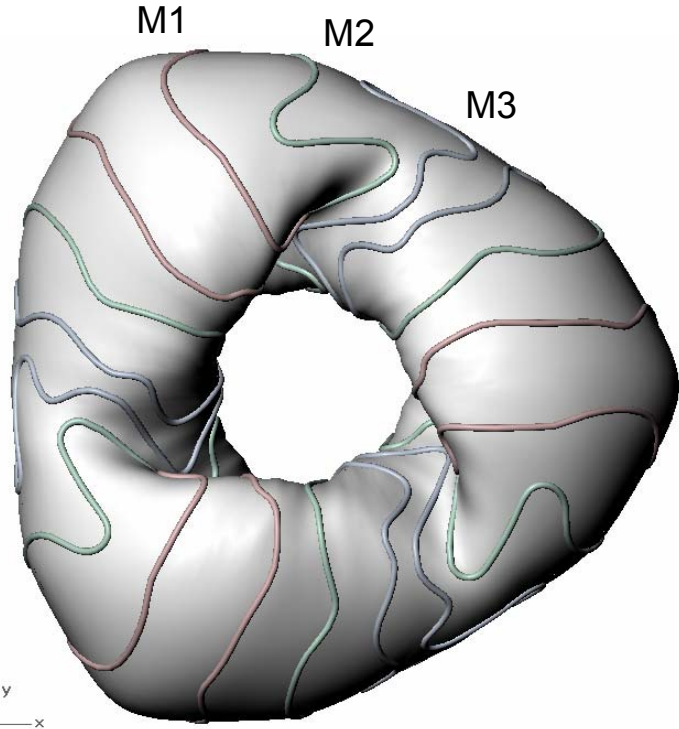
- Revise geometry of modular coils and winding forms
 - What is optimum size of winding pack?
 - What is best way to create models using ProE?
- Incorporate design changes since CDR
 - Multi-cable conductor
 - Cooling scheme
 - Coil bracket design
 - Poloidal electrical break
 - Coil-to-coil interface (bolted joints, wings)
 - Assembly features, clearances
- Revise winding form R&D models and drawings

Status:

- Most design changes have been tested on CDR models (RFP package)
- Process of updating coil geometry to Case M47 has begun
- Tasks to be completed with re-issue of drawings in mid-January

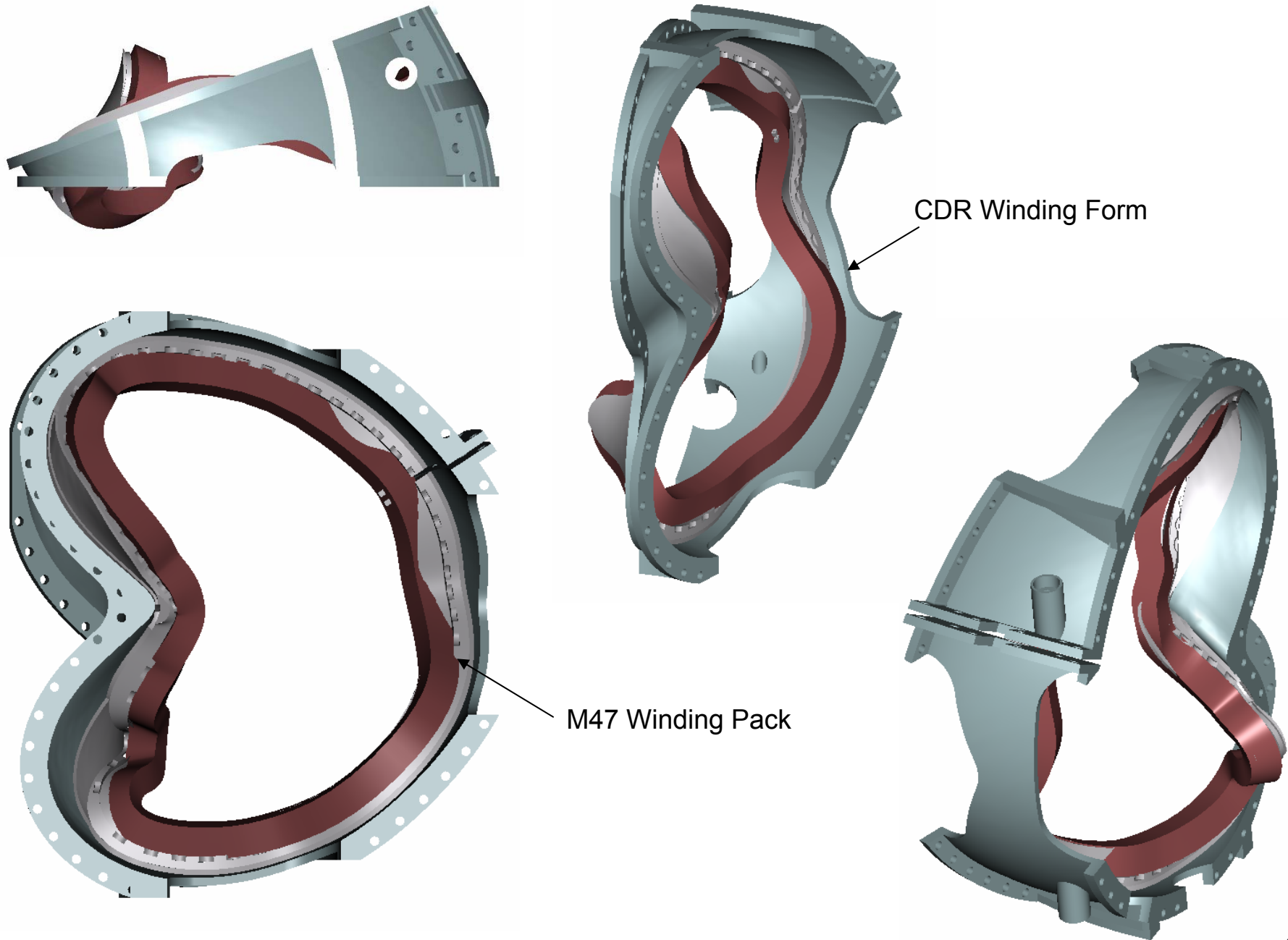
Modular coil geometry to be based on Case M47

- Coil filament file is “wb2c.5.z04_231”
- Winding surface designation is “082502”

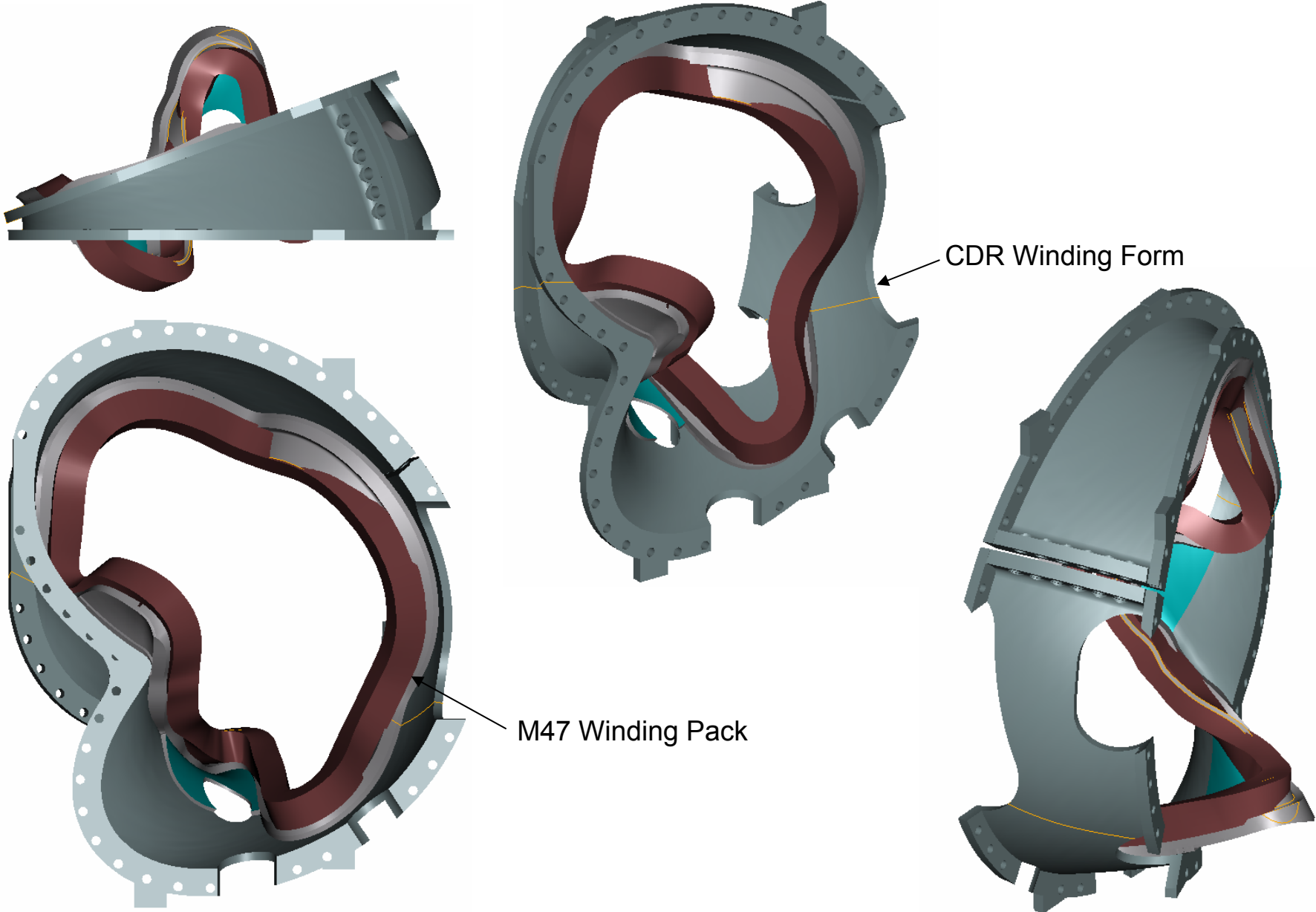


coils.wb2c.5.z04_231 (cdr)									
Coil ID	M1		M1		M2		M3		M3
V-Toroidal			0.09		0.26		0.43		
Length (in)			290 (291)		284 (282)		261 (258)		
Min Bend Rad (in)			4.5 (4.3)		4.2 (4.2)		4.1 (4.2)		
Max Bend Rad (in)			139 (410)		529 (909)		2457 (484)		
Min WS Radius (in)	3.5 (1.9)								
Min Plasma Dist (in)			tbd (7.5)		tbd (7.1)		tbd (8.9)		
Max Plasma Dist (in)			tbd (29)		tbd (24)		tbd (20)		
Min Coil-Coil Dist (in)		7.5 (7.3)		6.3 (6.9)		6.4 (6.4)		6.7 (6.5)	
Max Coil-Coil Dist (in)		36 (36)		37 (38)		31 (31)		27 (24)	
Nom Coil Current (kA)			690 (694)		693 (655)		536 (551)		

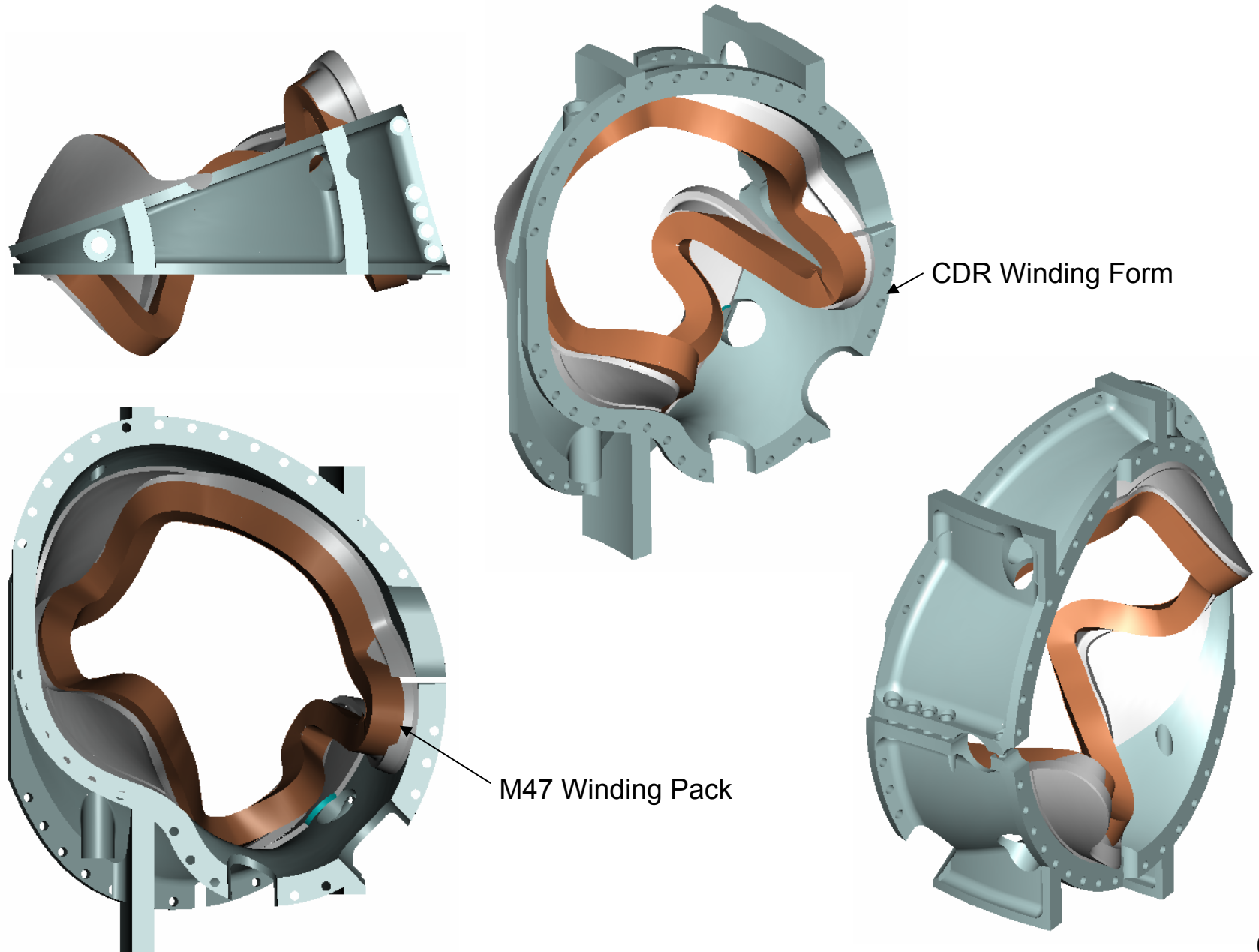
Modular Coil M1, CDR vs M47



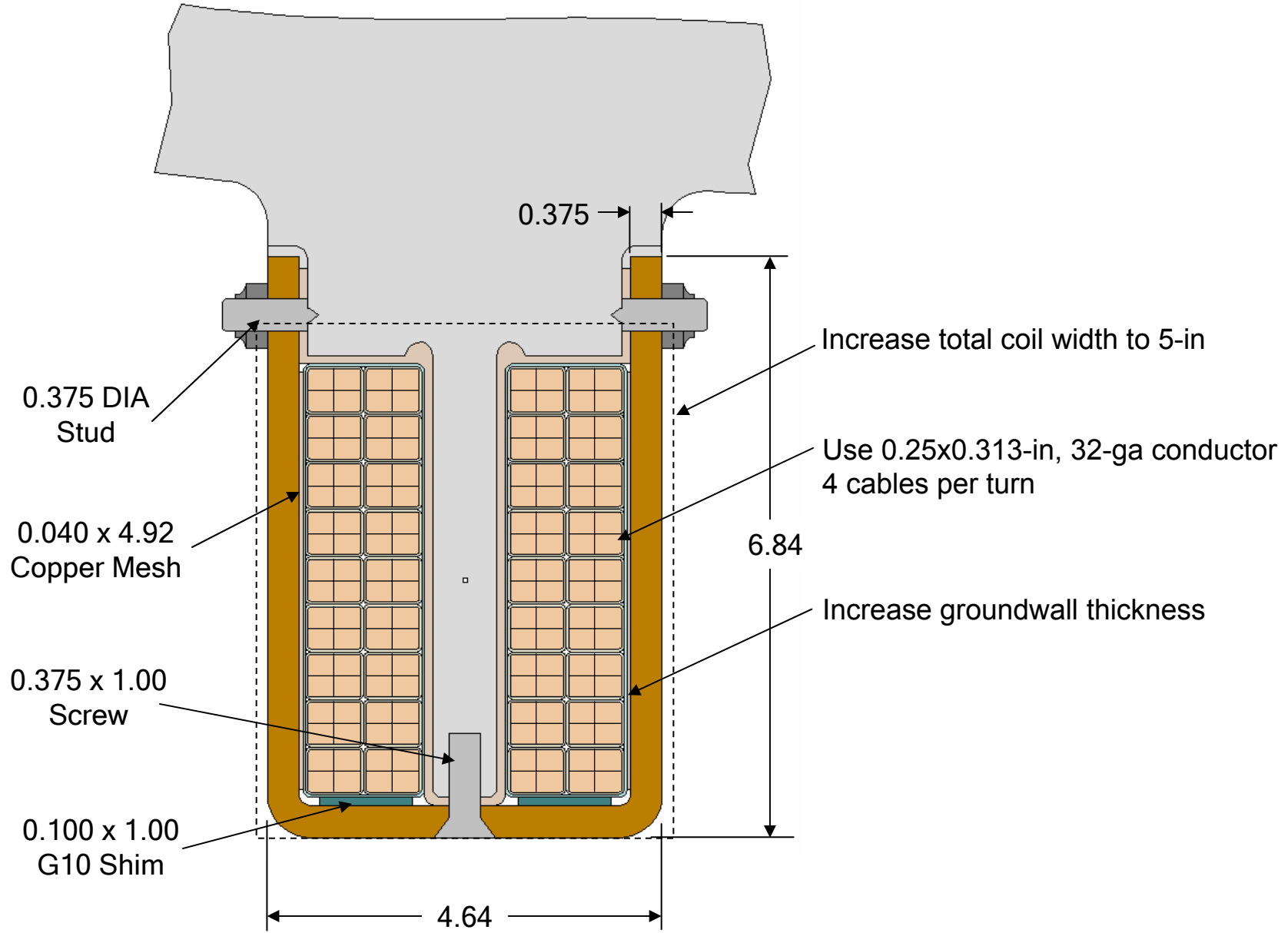
Modular Coil M2, CDR vs M47



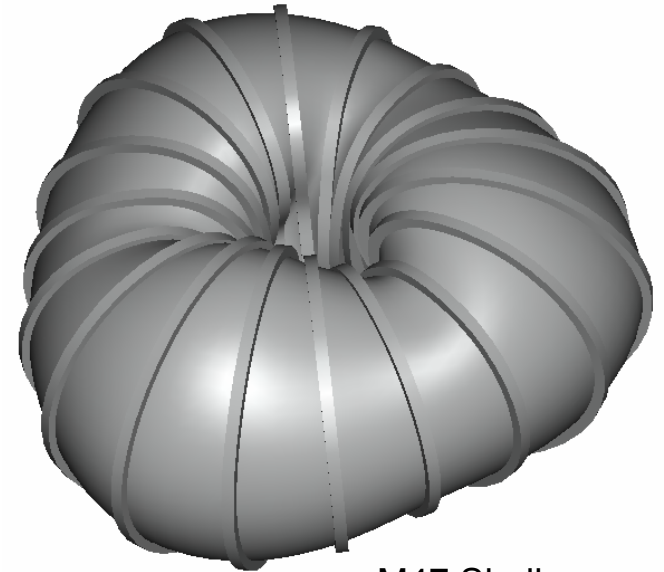
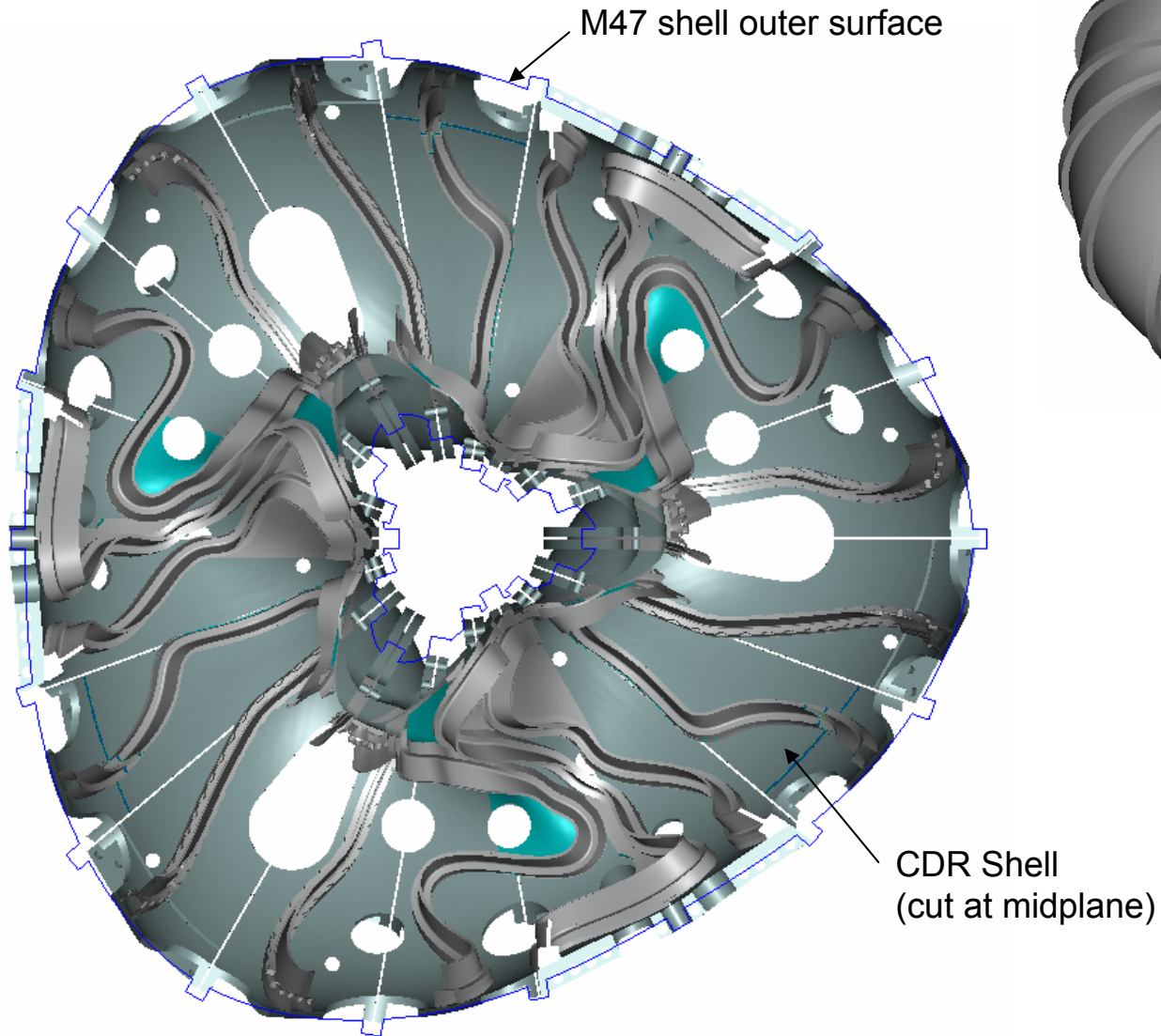
Modular Coil M3, CDR vs M47



Winding pack modifications



Structural shell modifications



Summary / issues

- Highest priority is to establish mod coil geometry interfaces:
 - radial build to plasma, incl vessel tolerance and RF envelope
 - interface with TF and PF coils
- Need to fix problems with previous ProE models:
 - merge tee and shell into single part
 - improve modeling of wing, shell-to-shell interface
 - consistent use of fillets and rounds
- Must address EM/structural model early in process
 - use ProE surfaces to get hex element mesh
- Incorporating post-CDR changes should be easier this time