

# Shielding Requirements for Outboard PF Coils of ARIES-ST

Laila El-Guebaly

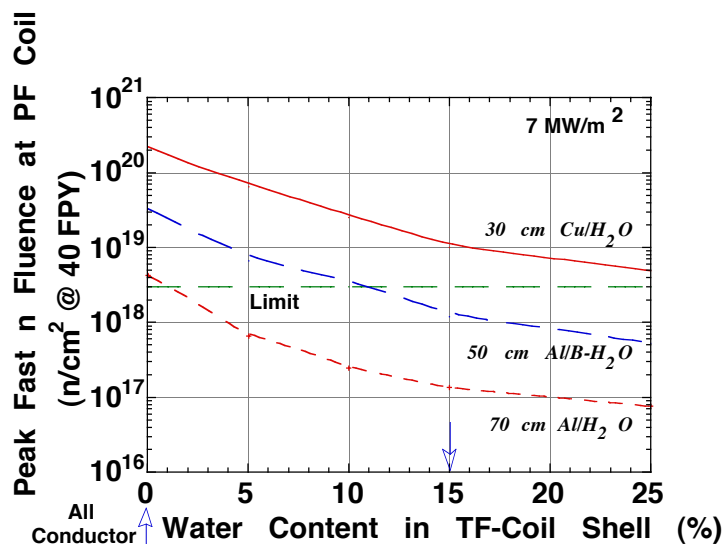
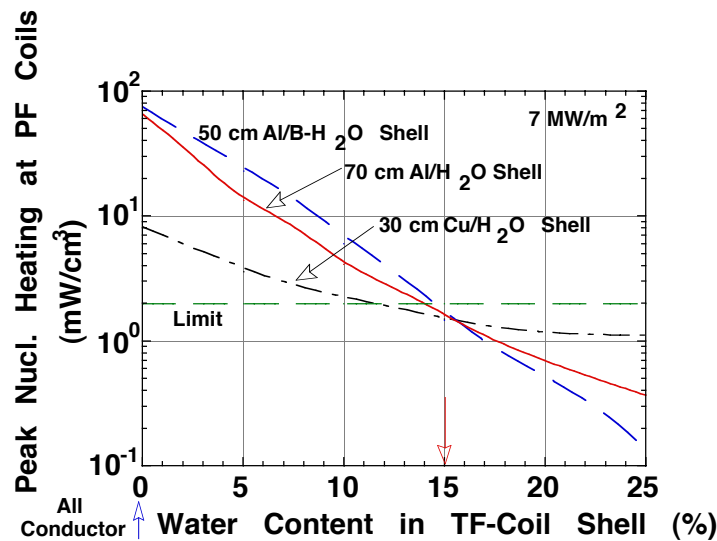
Fusion Technology Institute  
University of Wisconsin - Madison

ARIES Project E-Meeting  
16 March 1999  
UCSD

# Radiation Damage to PF Coils Located Outside TF-coil Shell (Dec. 98 Presentation)

- PF coils 1,2 are well protected by HT and LT divertor shields
- Outboard blanket and TF-coil shell protect PF coils 3,4,5. One of following options should be considered to satisfy PF magnets radiation limits:

30 cm thick Cu/H<sub>2</sub>O (85/15) TF-coil shell  
 50 cm thick Al/B-H<sub>2</sub>O (85/15) TF-coil shell  
 70 cm thick Al/H<sub>2</sub>O (85/15) TF-coil shell (reference)



# Radiation Damage to PF Coils Located Inside TF-coil Shell

- The 1 m thick LiPb blanket is not sufficient to protect PF coils
- Need additional 25 cm thick LT water-cooled FS shield to meet PF magnet radiation limits
- 55% water content in shield satisfies both fluence and heating limits (3e18 n/cm<sup>2</sup> for NbTi and 2 mW/cm<sup>3</sup>, respectively).

