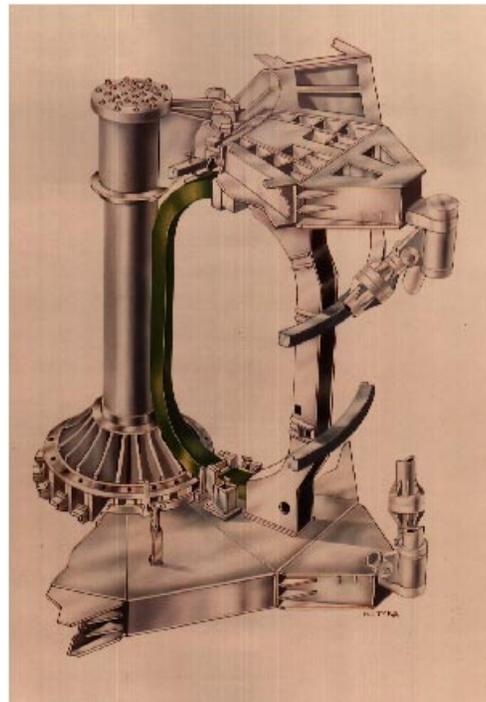


Feasibility of Converting the PBX TF Coil System from 20 to 18 Coils

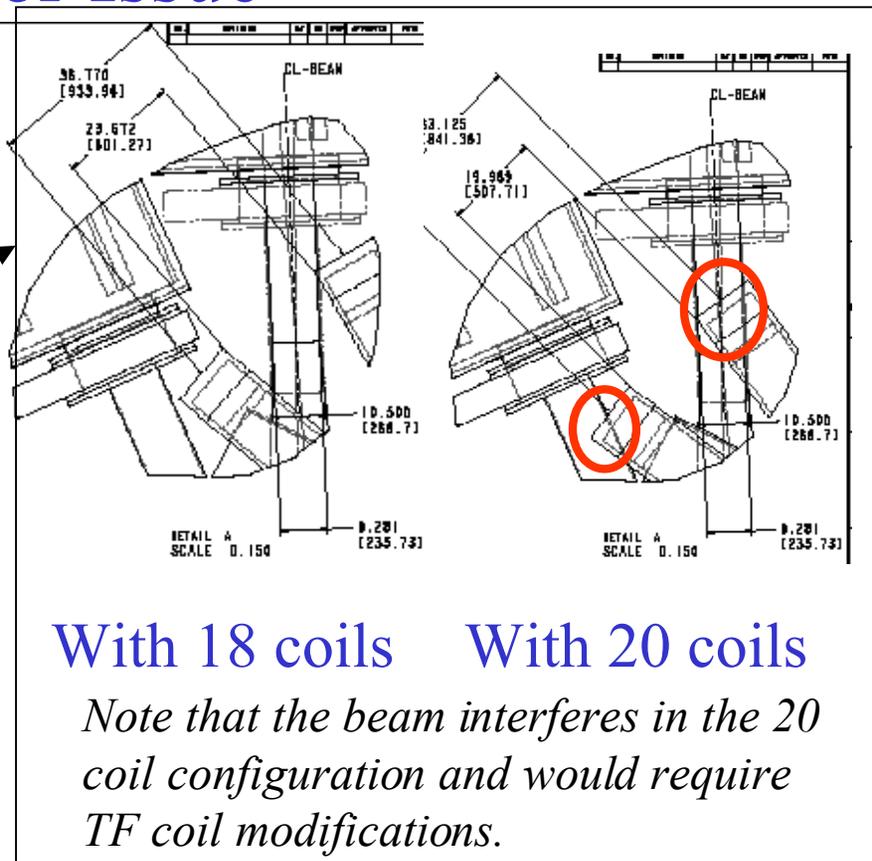
M. Cole (ORNL); P. Heitzenroeder (PPPL)



Conversion is Feasible, but Cost vs. Benefit is the Major Issue

Cost: Very Roughly \$0.7-1.0M

- Benefits:
 - Better neutral beam access
 - Better compatibility with $m=3$ stellarator winding
 - symmetric TF / stellarator field patterns
 - symmetry benefits hardware design, also.
 - Slightly larger TF bays for better diagnostics, assembly access.



Another Issue: 10 Rib Symmetry MUST be retained on the Upper & Lower Umbrella Structures

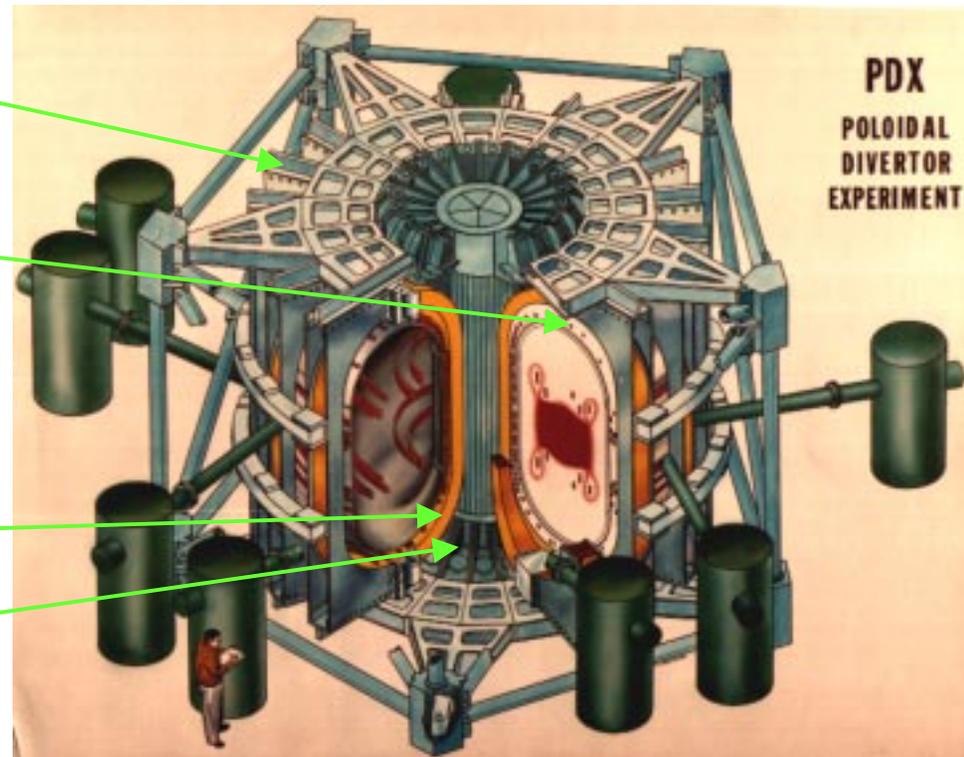
- Upper & lower PF umbrellas must remain as 10 rib structures because of fixed interfaces with the monolithic solenoid. This will affect vertical access in some locations.
- Outer cage can be changed to 9 ribs to not impede . horizontal access.

Many Components Would Have to be Modified

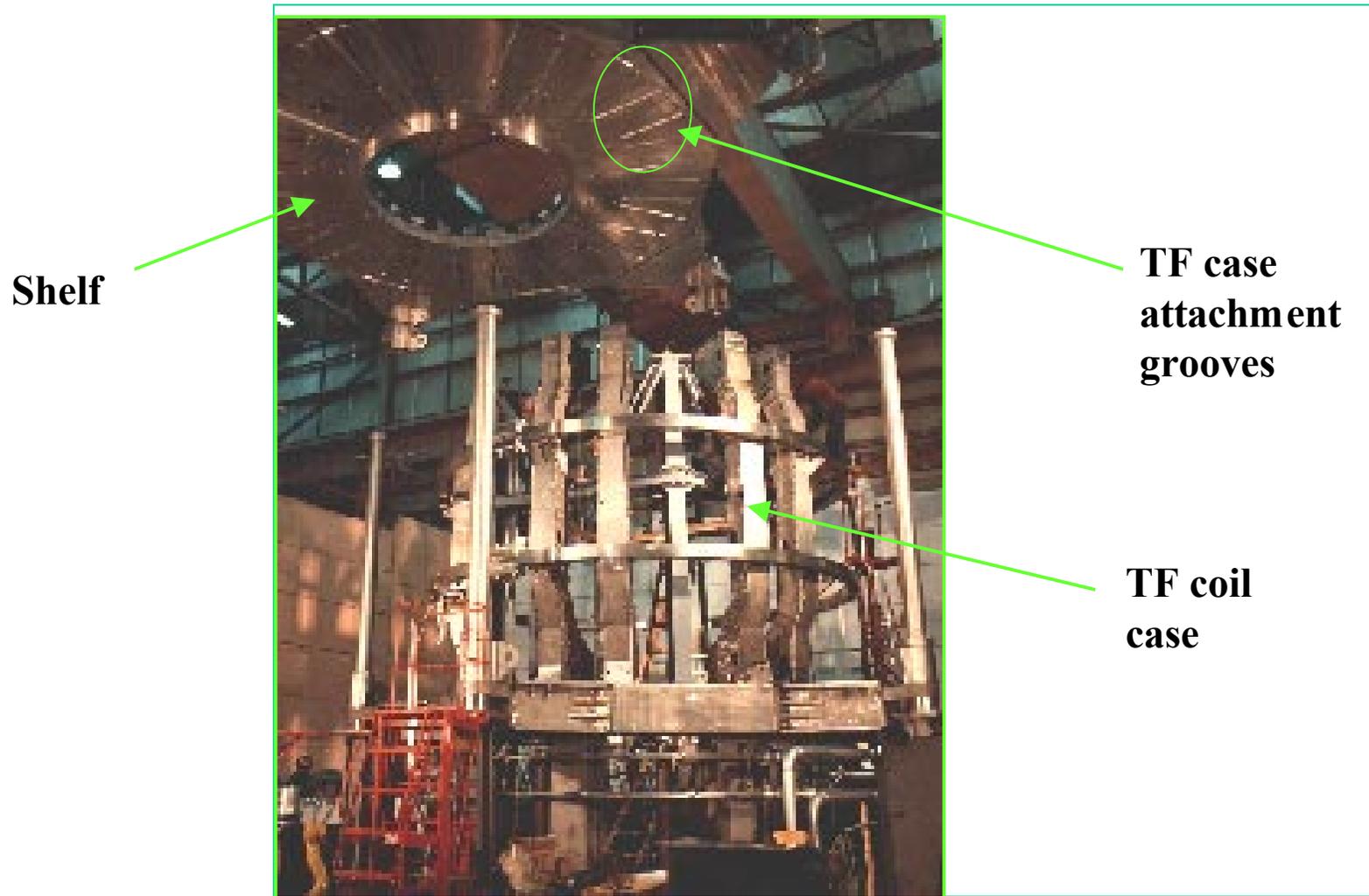
- *Modifications required:*

- the upper & lower shelves
- the PF umbrella structure & supports;
- the TF coil to coil connection bus/cancellation loop;
- the PF and TF bus feeds and hydraulic lines;
- the TF coil spacer shims;
- the center column/thrust hub assembly

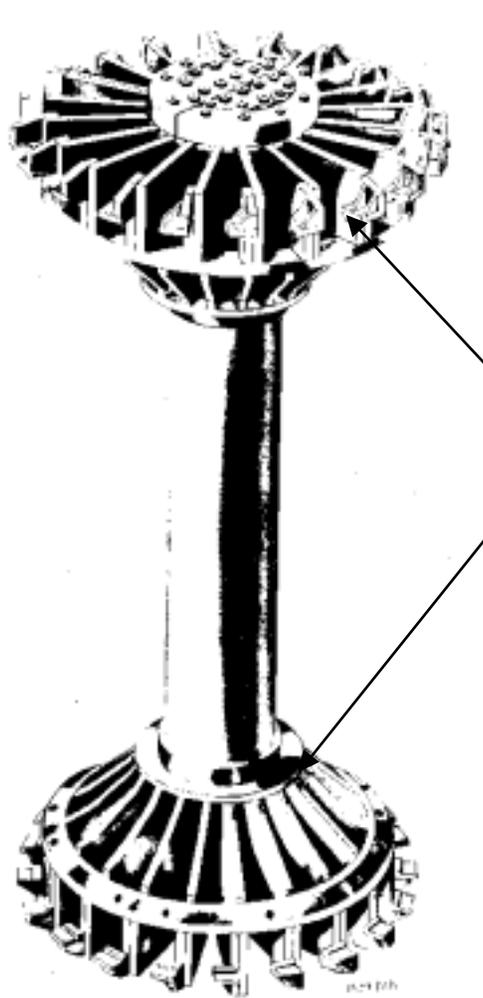
- *A stress analysis would have to be performed.*



Shelf/ TF Coil Interface

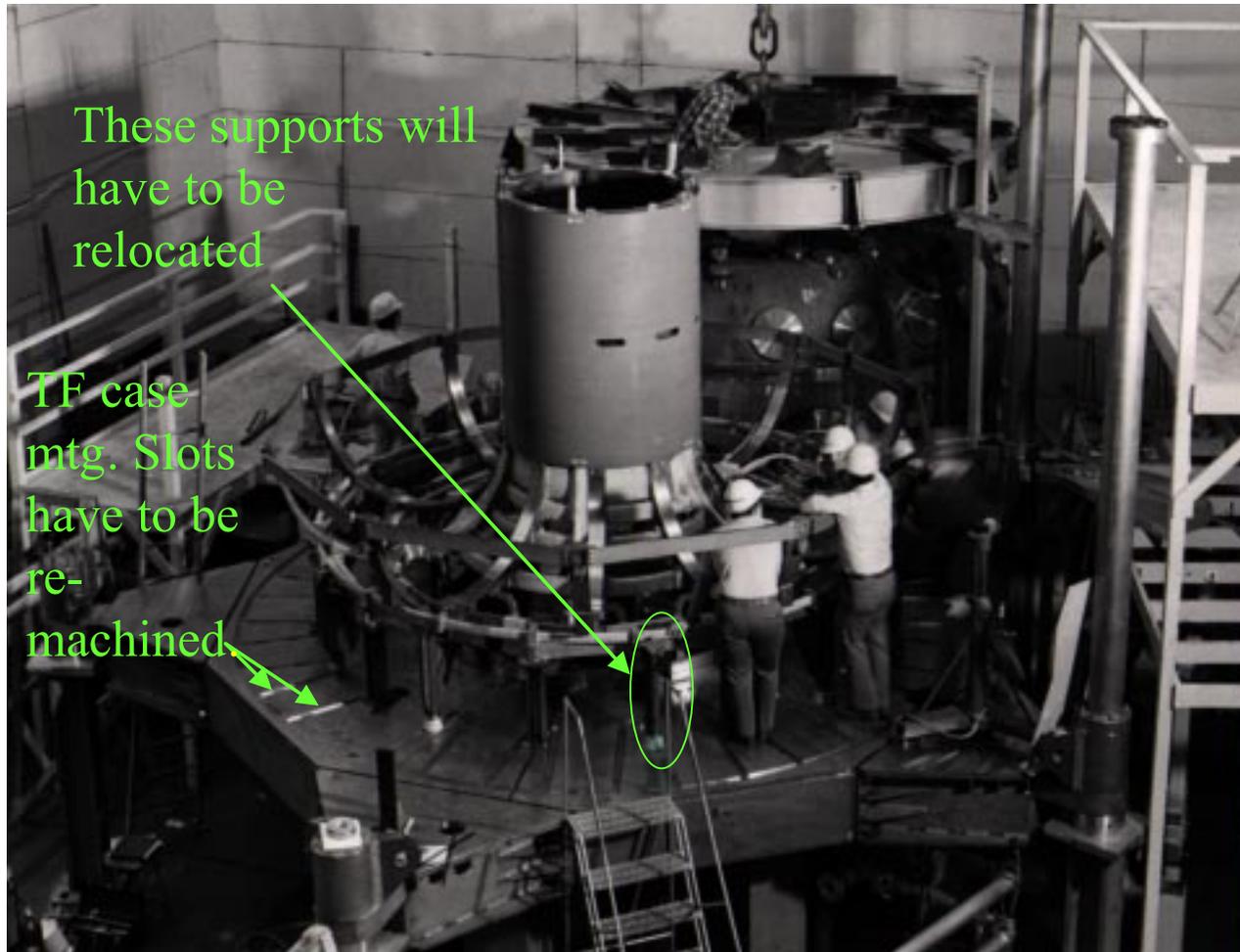


Thrust Hub Modifications



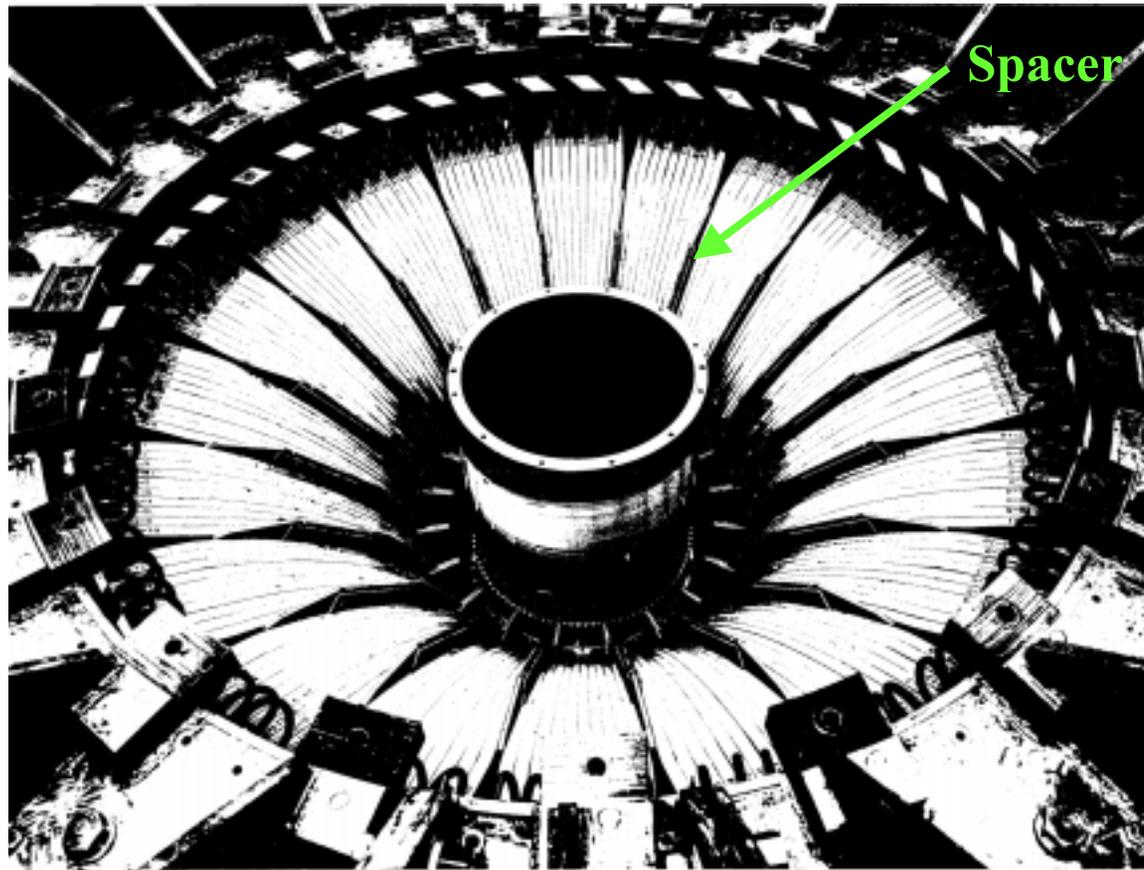
Both hubs would be modified to interface with 18 TF coils.

Umbrella Structure/Shelf Interface



3/29/99

TF Coil Spacers Will Have to be Re-Designed



3/29/99

Conclusion & Recommendations

- **Conclusion:** Conversion can be done, but will require modification to a number of parts and relocation of many bus bars and hydraulic lines.
- **Recommendation:** If the benefits support a decision to proceed, a detailed study should be undertaken to better quantify the costs.