

IAEA Special Event

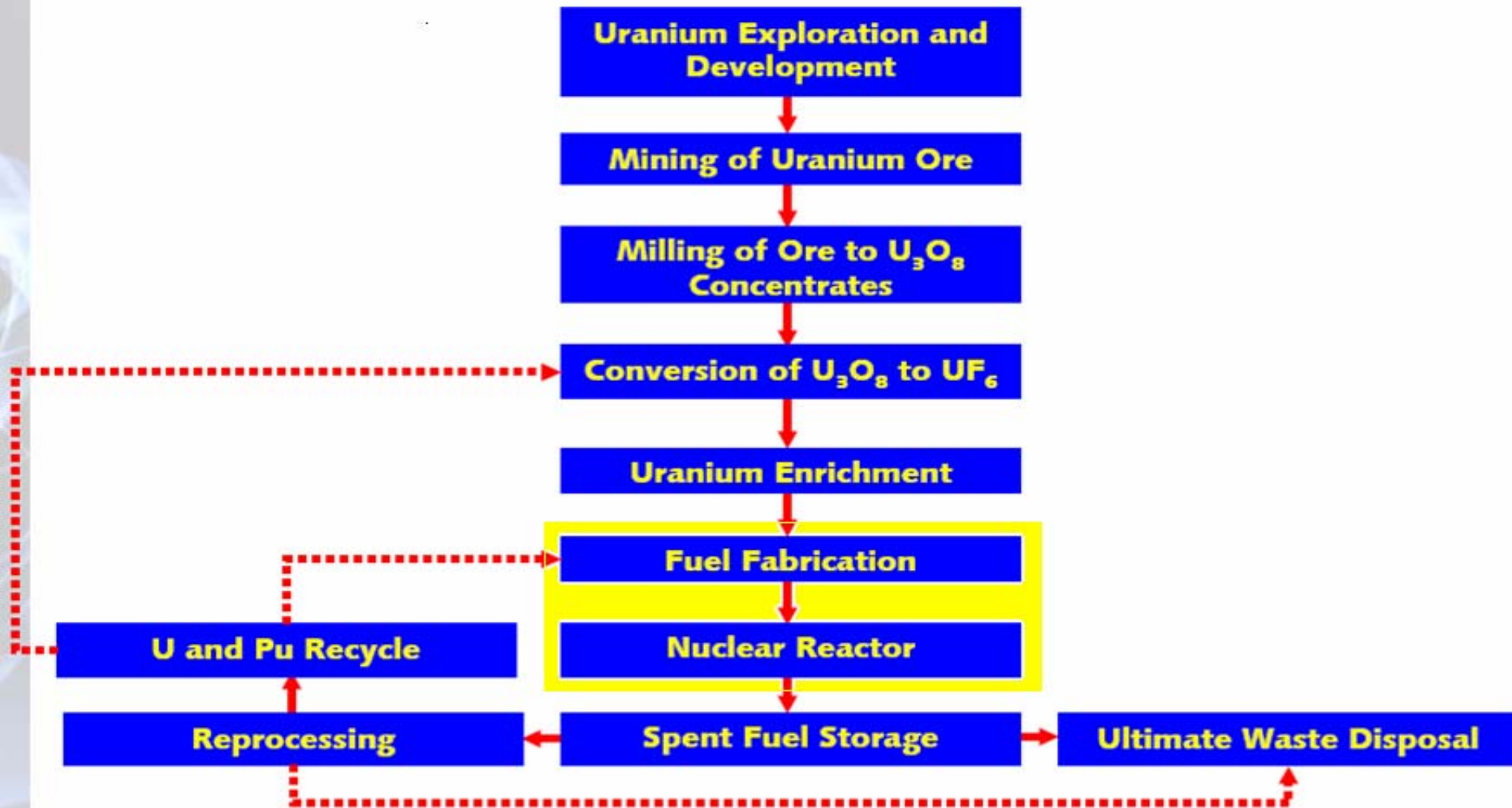
19 – 21 September, 2006

Technical Issues

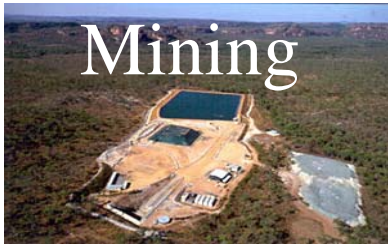
Per Brunzell
Westinghouse
Sweden



Nuclear Fuel Cycle



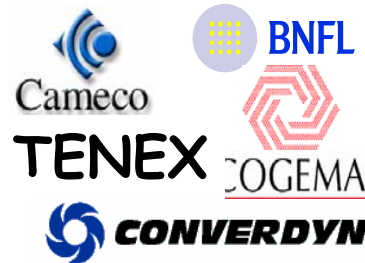
Uranic industry players



Mining



Conversion



Enrichment



NC&S  BNFL



Transport



EDLOW
INTERNATIONAL
COMPANY

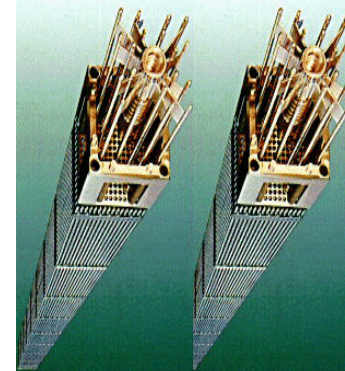
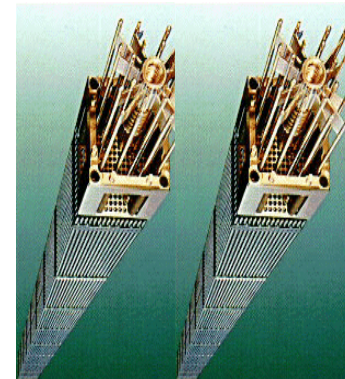
34, twenty tonne dump trucks full of uranium ore are required to make 4 fuel assemblies



1x 30B Cylinder



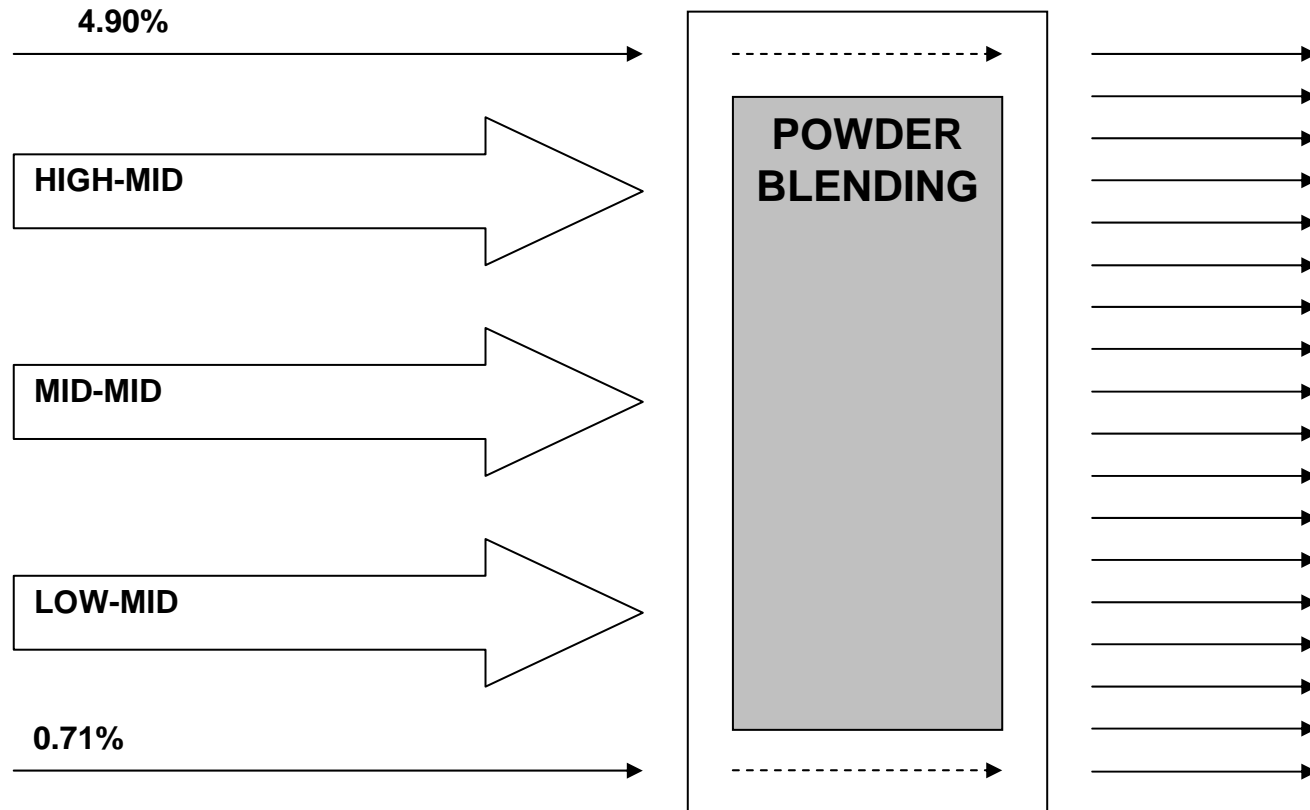
1.5tonne U as
 UF_6 @ 4.95%



LEU - One ASTM spec. for UF₆

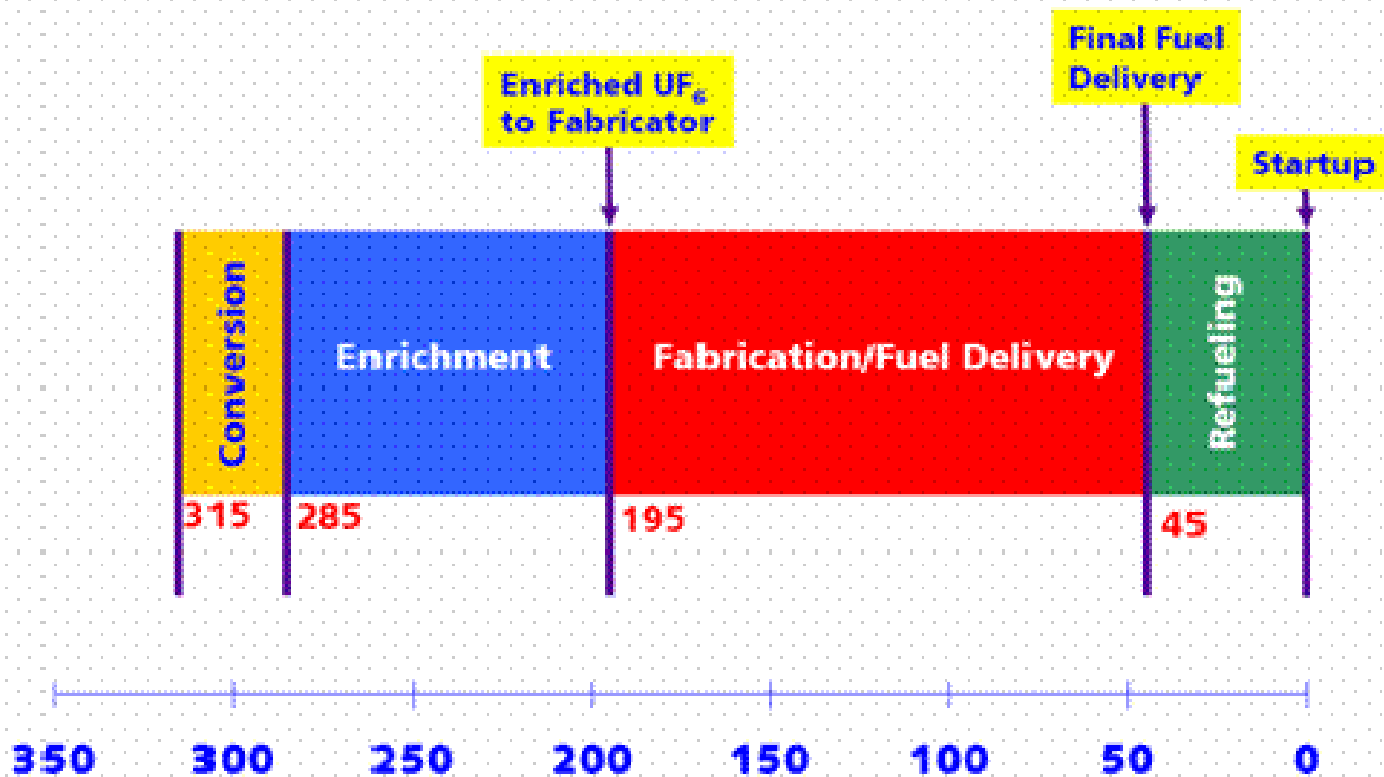
UF₆ Enrichments

Pellet Enrichments

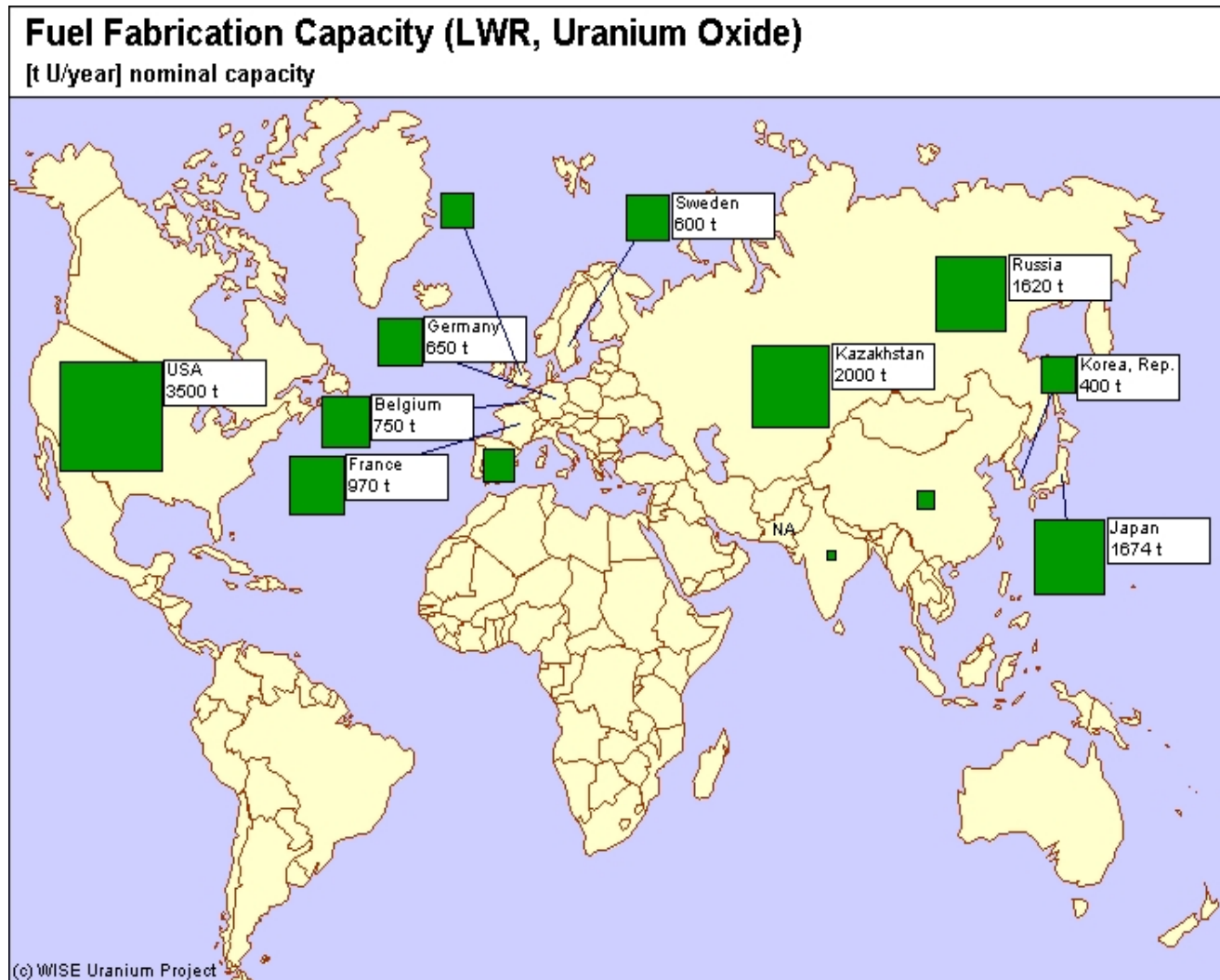


Fuel Supply Schedule

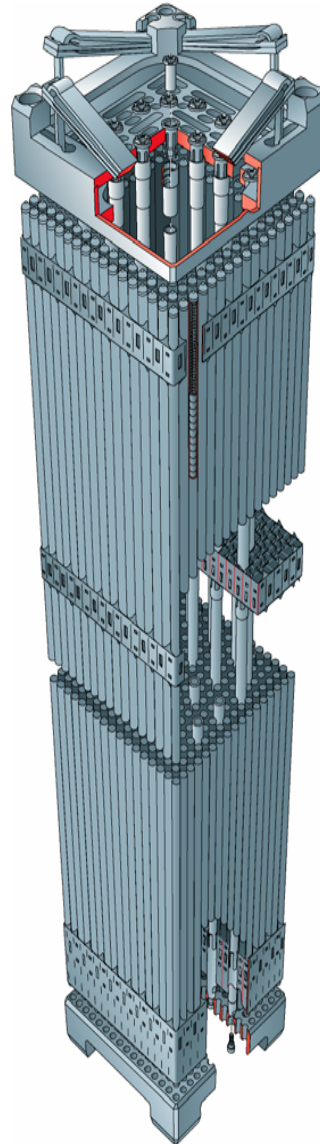
Material Flow Diagram (Days)



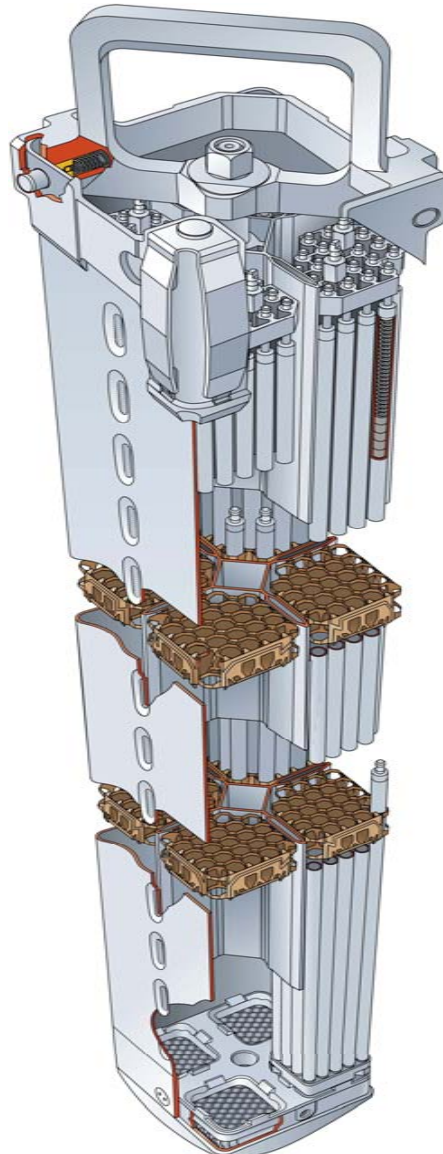
LWR Fuel Fabrication



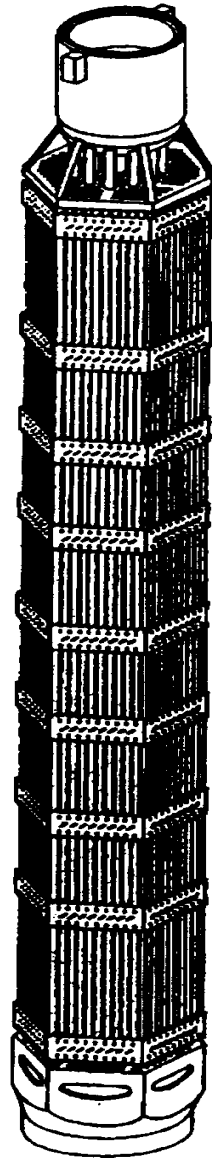
PWR Fuel Assembly



BWR Fuel Assembly



VVER-1000 Fuel Assembly

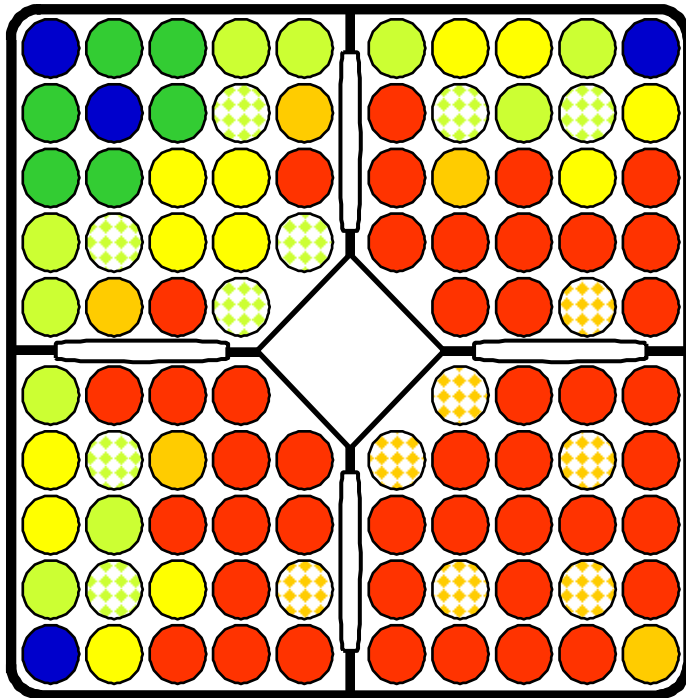


LWR Fuel Design Requirements

- Mechanical Compatibility
- Thermal Hydraulic Compatibility
- Cycle Specific Requirements
- Reactor Core Design
- Materials
- Licensing Requirements

All fuel bundles must be tailor-made!

BWR Enrichment Distribution



- 1.60 wt% U-235
- 2.60 wt% U-235
- 3.40 wt% U-235
- 3.90 wt% U-235
- 4.40 wt% U-235
- 4.90 wt% U-235
- 3.40 wt% U-235, 3.50 wt% Gd₂O₃

Conclusion

- UF6 can be "banked" (ASTM Spec, Blending)
- Finished Fuel Assemblies difficult to bank
(Reactor and cycle specific designs, Licensing issues)