

# NCSX Engineering Telecon

January 10, 2001

# The road to a \$55M machine

- Best estimate costs for the current (1.7m) machine are ~79M\$ in FY99\$
- Guidance from the Director's Office is to reduce the cost by ~30% to \$55M
- The plan is to make reductions of this order across the board, but maybe more in WBS1
- The required reductions in WBS1 will require a reduction in size (by 20% to 1.4m) and toroidal field (by 25% to 1.5T)

# WBS1 – Stellarator Core

Scale plasma and coil centroid location by 0.8

Use same configuration for starters, modify as appropriate

Reiersen will update requirements and technical data on Web by COB 1/11

Develop a model of the device to the level of detail required for costing and to show plausibility

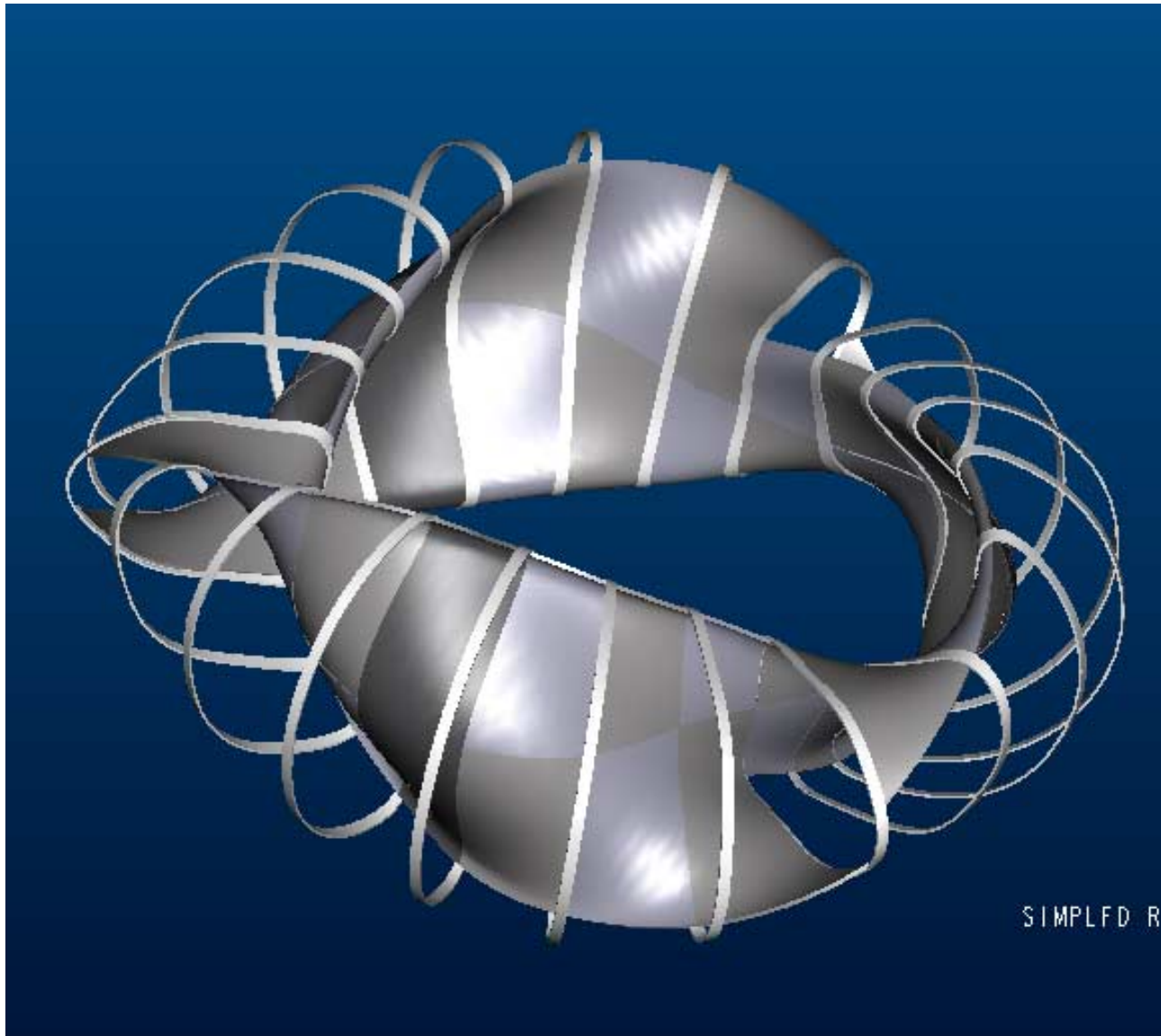
Demonstrate that access (NB, RF, diagnostics, personnel) requirements can be met

# WBS11 – PFCs

Adopt internal liner bakeable to 350C with its own heating/cooling circuit

Bake VV to 150-200C (pain threshold for diagnostics, seals, etc.)

Use large CFC panels where required on Day One – higher fabrication cost but reduced design, installation, and contingency?



# WBS12 – VV

Reduced size VV

Make NB ports as large as possible

Will likely require horizontal beam scrapers

Reduced bakeout temperature might allow SS instead of Inconel – is this advisable?

Manned access through auxiliary port adjacent to NB port on boom/crawler?

# WBS13/14 – TF/PF

- Reduced size
- Explore eliminating PF4 – NP flexibility studies suggest it is not required

# WBS15 - Cryostat

- Need to work out credible design concept with a representative cost
- Nature and location of port interfaces are critical



# WBS16/17 – Machine structure and modular coils

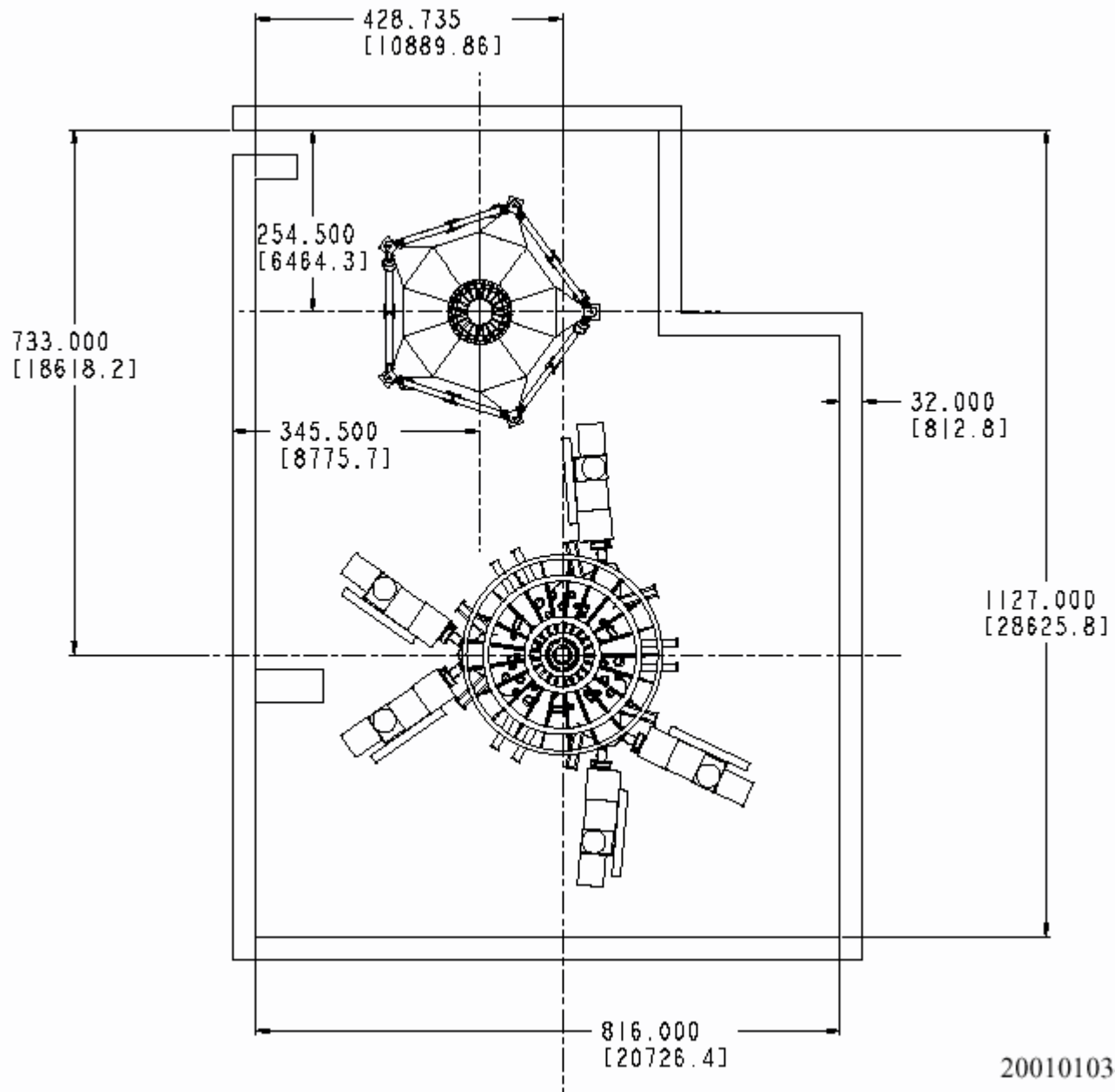
- Reduced size, thinner sections should help reduce costs – keep 1017 coil set
- Explore alternatives to I-beam (T-section, L-section) as a means of reducing cost
- Ditto for 2D machining options
- Adopt fully potted coil as baseline? Use spring plates to allow thermal growth?

# WBS18 – Trim coils

- Need representative concept ASAP
- Based on curing 3/5 and 3/6 islands only?
- Use existing PBX-M power supplies

# Other WBS elements

- Reduce number of NB in TPC to 2 (was 4)
  - Need not be installed on Day One
- Reduce initial diagnostic complement
- Explore reducing number of circuits on Day One from 10 (4 modular, 5 PF, 1 TF) to perhaps 6 (1 modular, 4 PF, 1 TF)
- Explore the option of not disassembling PBX



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