
Planning Issues

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We have a problem

- **We are quickly falling behind schedule versus our plan**
 - **We are 50% of the way from the PVR to Sept 1 and we are nowhere near to having completed 50% of the work planned**
- **We are a bit (10%) ahead in spending versus our plan**
 - **We only have half the money we had left after the PVR to complete the work in FY01**
 - **Additional spending authorizations (Boozer, Isaev, and Hudson) will add to the planned \$300K overrun**
 - **We cannot spend more FY02 money on FY01 tasks if we are going to have a successful CDR in April '02**
- **We need to revise our plans**

Engineering needs

- **A reference core design for the CDR**
 - **Modular coils**
 - **Nothing HAS to be fixed on the reference (1017) coil design**
 - **Would like to make it cheaper and easier to manufacture**
 - **What physics characteristics HAVE to be fixed?**
 - **A more flexible PF/TF is in the pipeline**
 - **VV/PFC issues are being worked (ref. Nelson)**
 - **May impact coil modular coil design**
- **Most of all, we need requirements**
 - **Not an obvious priority in physics planning**
 - **Need to finalize well in advance of the CDR**
 - **Schedule requirements review in September?**

VV/PFC requirements

- **Modular coils are located off the VV surface**
- **The VV surface will be located based on...**
 - **Divertor and SOL envelope requirements**
 - **Bolted joint envelope requirements**
 - **RF launcher envelope requirements**
 - **Plasma shape flexibility requirements**
- **Ref. Nelson talk**

Reference scenario requirements

- **Update coil geometry/currents**
- **Validate scenario definition**
 - Are the states (S1, S2, and S3) appropriate?
 - Is the physics performance (stability, transport, surface quality) acceptable with the specified coil currents?
 - Is it a stable path?
 - Do we need a controlled termination of the plasma?
 - Are the volt-seconds requirements correct?
- **Can we reduce the number of scenarios?**
 - **Simplify to 1.7T (3MA/s) and Day One (1.7T and 2MA/s)?**

Flexibility requirements

- Flexibility requirements presently set on the basis of equilibria achievable in VMEC
- **Need to refine specification of flexibility**
 - Limit tangency points to HHF surfaces, respect SOL
 - Use actual (perhaps better) PF coils, not multipoles
 - Apply volt-second constraints
 - Apply limits on coil currents based on I^2t , power supply, and stress considerations
 - **Define coil currents for actual coils**

Summary

- **We need a new plan**
- **It must...**
 - Be consistent with **limited resources** remaining in FY01
 - **Focus on fixing things that are broken and developing requirements**
 - Apply Sinnis' axiom – Better is the enemy of good
 - Have **reasonable expectations**
 - Apply Neilson's axiom – Things always take longer with stellarators than we figure
 - Be a **unified and auditable plan**, showing engineering and physics tasks, deliverables, and due dates
 - Be **tracked** on a regular basis