

# NCSX Meeting Action Items

## May 5-6, 1999

- **From Previous Meetings**
  - **Plasma Configuration (Reiman)**
    - Vertical Stability - Vertical stability is just starting to be analyzed and could affect the design => Redi previously presented status of work to date. Next step is benchmarking of CAS3D and then performing vertical stability calculations on C82 (Reference Configuration).
    - Modify workplans by adding a task to develop backup plasma configurations to C82 in case one is needed to relieve coil current density problems. In particular, C85 needs to be worked on to make it into a self-consistent configuration (stable at chosen beta,  $I_p$ , and profile shapes). It should retain most of the reduction in coil surface current density achieved in going from C82 to C85.
    - Workplan tasks on bootstrap, ballooning, kink, vertical stability, robustness, and PIES should focus on C82. Priorities may have to be adjusted somewhat to accommodate the configuration development work requested in item#1.
    - Exploration of higher aspect-ratio configurations ( $R/a \sim 4$ ) is of interest to understand if it is a route to relieving coil design problems. *Provide by PVR.*
  - **Coil Concepts & Tools (Hirshman)**
    - Work on C82. Get current densities into the box for reference operating scenarios. Reference coil design milestone is April 30. *Now planned by end of May.*
  - **Transport and Requirements (Zarnstorff)**
    - Recent calculations show factor  $\sim 4$  reduction due to non-axisymmetric harmonics. Previous analyses saw no reductions. Codes are giving different results. Resolve reasons for differences.
    - Review stellarator experience with non-ECH startup scenarios and identify possible requests for experiments.
    - Check current ramp-rate requirements (2 MA/s?).
    - Issue volt-second memo.
    - Perform transport and energetic particle analyses on reconstructed C82 plasmas.
    - Provide guidance on  $j(r)$  profiles (shapes and amplitudes of the various components) to be used in the plasma configuration design and flexibility work. (Memo). *Now expected by may 14<sup>th</sup>.*

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- Provide guidance on variables (and their ranges) for flexibility and robustness studies. (Memo)
- Physics requirements milestone is April 30. *Need to document in requirements document.*
- **Engineering (Reiersen)**
  - Support structure time constant. Confirm that 25 ms time constant requirement can be met in reference design. Include impact of cooling tubes - Nelson.
  - Magnetic permeability of shell.
    - [a] Determine B-H curve for 958. Assess impact at plasma – Nelson.
    - [b] Consider inconel as a possible solution – Nelson.
    - [c] Research stellarator (e.g., W7-AS, HSX) design practice, esp. analysis. Follow-up on permeability inquiries to Japan (JL) and Germany (PG) – Goranson/Lyon.
- **Program (Lyons)**
  - Prepare a stellarator handout (e.g., a "5-pager") for FESAC. *Draft circulated for comment.*
  - Scope edge physics requirements and analysis needs; determine power and particle handling strategy. *Peter Mioduszewski presentation to be made in weekly meetings.*
- **This Meeting**
  - **Plasma Configuration (Reiman)**
  - **Coil Concepts & Tools (Hirshman)**
  - **Transport and Requirements (Zarnstorff)**
    - Determine if VV operating temperature of 100°C is satisfactory – Zarnstorff.
    - Assemble working group on Eddy Current issues and agree on analysis requirements – Zarnstorff.
    - Analyze transport for C93 – Mynick.
  - **Engineering (Reiersen)**
    - Review scenario specifications for S/C study and update study if necessary – Reiersen.
    - Define winding curvature limit (in-surface) - Nelson/Williamson.
    - Resolve issues related to cryostat envelope requirements and surface condensation. – Nelson.

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- Define NBI scenarios (number of beams, tangency radius, and interface with inboard first wall) for 20 TF coils. Include impact of cooling tubes.
- **Project Control (Simmons)**
  - Define document numbering/filing system, circulate for comment, and then implement.
  - Set procedures for electronic presentations in PPPL conference rooms.
- **Project Management (Neilson)**
  - Develop PVR outline by May 31<sup>st</sup>.
  - How reactor relevant is C82 vis-à-vis current profile (bootstrap)?
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