

Summary

G. H. Neilson
NCSX Project Manager

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There Has Been Substantial Progress This Year

Developed Tools, e.g. for...

- Evaluating and reducing magnetic surfaces.
- Evaluating coil-set flexibility.
- Targeting objectives (e.g., transport, current density) in plasma and coil design.

Gained Understanding, e.g. of...

- Coil topologies: pros and cons of several options.
- System requirements for startup, through simulations.
- Conductor design allowables, through small-scale tests.
- Key engineering issues, solutions, through machine configuration studies.

Greatly Improved the Design....

- Better magnetic surfaces.
- Better confinement.
- Reduced coil current density and complexity.
- Access for heating, diagnostics, and pumping.

Design Decisions

Plasma Configuration

- The 3-period configuration will make a sound foundation for a physics experiment design.
- Coil studies for the 2-period case will be done in next few days to see if it is a more promising option.
- Both need more work on surfaces: reducing islands, free-boundary reconstruction from coils.

Coil Configuration

- Two coil topology options can satisfy compulsory physics requirements. Choice in September will come down to differences in cost/benefit.
- Understanding the coil capabilities to provide good surfaces for a range of plasmas is the most critical task.

Vacuum Vessel, PFC, Heating, and Diagnostic Configuration

- Have a reasonable handle on these.

Assessment

By deciding wisely and focussing resources appropriately, we can meet the September milestone to update the reference plasma-coil configuration, and have a successful Physics Validation Review in December.

We can expect there to be some open issues at the PVR, though FESAC PoP readiness issues must be resolved.

To support start of engineering (Title I) design in FY-2003, we need to establish feasibility of the most critical systems and achievable cost and schedule targets at a “Design, Cost, and Schedule Review” (DCSR) in April, 2001.

There is time (1.5 yr.) for conceptual design improvements between DCSR and start of Title I design.