

Requirements Issues

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Last updated: January 24, 2002

Preface

- It is imperative that design requirements be defined well in advance of finalizing the conceptual design in order to have consistency
- The purpose of this document is to identify open issues related to requirements to determine what should be done prior to the CDR
- There is VERY little time left to make changes that Engineering can respond to in time for the CDR

Upcoming milestones

Project Milestones	Start	Finish
Equilibria for reference scenarios defined		25-Jan
Manufacturing studies of modular coils and vacuum vessel completed		11-Feb
Review GRD	4-Feb	15-Feb
Technical data completed and subsystem interface requirements established		15-Feb
Review of technical basis of conceptual design	4-Mar	22-Mar
Review cost and schedule estimates	25-Mar	5-Apr
Project plans completed		5-Apr
Review CDR documentation	8-Apr	19-Apr
Finalize CDR documentation	22-Apr	26-Apr
Print CDR documentation, send to reviewers	29-Apr	3-May
Review and finalize CDR presentations	6-May	15-May
Print CDR presentations	16-May	20-May
NCSX CDR	21-May	23-May

GRD technical issues

1. Finalize initial diagnostic and heating complement consistent with initial experimental objectives
 - Identified as issue at PVR (II-5, IV-8), tracked at project level
 - GHN/MZ to finalize initial diagnostic and heating requirements. This MUST be done well in advance of the CDR
2. Define constraints derived from re-using PBX test cell
 - Includes door size, floor loading, lift height, lift weights, etc.
 - Chrzanowski
3. Re-define reference scenarios (if necessary) as motivated by simulations, review of volt second requirements, need for controlled rampdown, etc.
 - Engineering will generate current waveforms, PS requirements, coil temperatures, LN2 boil-off, etc. based on the current prescription of waveforms and equilibria to be provided by Pomphrey next week

General requirements issues (2)

5. Provide coil constraints to physics for scenario and flexibility modeling
 - Reiersen to provide constraints based on 24-kA conductor limit. Limits that include stress considerations will not be available in time for scenario and flexibility modeling.
6. Refine requirements for flexibility (and maximum plasma current) based on assessment of design impacts
 - Present plans are to design the machine for the reference scenarios and to assess the capability to meet the flexibility requirements. This is the motivation for Item 5 above.
 - Will not be addressed by Engineering at the CDR
7. Add more dimensions to flexibility space as required to fulfill NCSX experimental objectives (currently only 3 dimensions)
 - Will not be addressed by Engineering at the CDR

General requirements issues (3)

8. Establish PFC requirements for initial configuration
 - Capability for ohmic operation required
 - Nelson and Mioduszewski to resolve