



3X-960223-CLN-01

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FROM: C NEUMEYER
SUBJECT: MINUTES OF MEETING ON WBS 3

The following is a summary of the 2/28/96 meeting.

Status:

- 1) A draft SRD has been produced for WBS 5.
- 2) Walk throughs of the C-site power supply buildings (ESAT, OH, MG) have been conducted with the cognizent engineers.

Issues:

- 1) Preliminary analysis indicates that existing C-site OH rectifier cannot supply OH waveform given in preconceptual design documentation.
- 2) Existing C-site OH rectifier is of obsolete design and not reliable or maintainable; need to find alternative. It may be possible to use the HF and VC rectifiers from TFTR (2kV/24kA each).
- 3) Based on OH waveform given in preconceptual design documentation, will need resistor insertion (OH Interruptor) during plasma initiation, and system for reversing the polarity of the rectifiers.
- 4) The existing ESAT rectifiers are rated for 1.8 second pulse duration. It is not known what their 5 second rating is. The manufacturer has been contacted for design information concerning the thyristors and heat sinks in order that a thermal simulation can be performed.
- 5) Taking the maximum current required from each PF circuit from all of triangularity/elongation flexibility points, the existing ESAT rectifiers cannot supply the system in a fixed configuration, if it is assumed that the 1.8 second rating can be applied to the required current. If 5 second operation requires a derating, the situation will be worse. It may be possible to demonstrate, however, that the ESAT rectifiers can be reconfigured in a unique way for each flexibility point such that the ampacity requirements can be satisfied.
- 6) Assuming that all PF currents must ramp to their maximum values (per 5) above) in 200mS, the voltage and power requirement exceeds that of the ESAT PF rectifiers. Spec

- 3) Vacuum pumping / gas load requirements need to be specified to WBS 3.
- 4) It would be desirable to have two RGAs. This should be assumed for the baseline until such time that budget pressure precludes it.
- 5) The requirement for helium glow discharge was discussed. It was decided that the NSTX machine must accommodate this mode, the gas delivery system must be able to supply the gas, the PFC's designs may be impacted (minimum edge radii criteria), but WBS 3 does not need to provide probes or power supplies. These will fall under the responsibility of operations, if required.
- 6) The requirements imposed on the cooling systems are yet to be specified (heat loads, pressures, flow rates, etc.).
- 7) The requirement for boronization was discussed. It was decided that the NSTX machine must accommodate this mode, but WBS 3 does not need to supply any equipment. Instead this will fall under the responsibility of operations.

Major Components of the Design Effort:

- 1) Thermal analysis of bakeout and resultant heating of Vacuum Vessel and components attached thereto (by others; results to feed into design of WBS 3).
- 2) Vacuum pumping calculations.
- 3) Cooling system calculations.
- 4) Bakeout heating calculations.
- 5) General arrangement drawings.
- 6) Flow diagrams (energy, mass, etc.)
- 7) Process & Instrumentation Diagrams (P&IDs)
- 8) Design of I&C interface

Deliverables for Engineering Review:

- 1) SRD / SDD for WBS 3
- 2) Cost Estimate
- 3) Flow diagrams (as available budget permits)

Other Items Discussed:

None

cc: * = meeting attendee

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M Ono*	R Parsells*	E Perry	J Robinson*	J Spitzer
R Wilson	NSTX File			