Attachment [7] – Risk Assessment of Proposed Changes

ECP-004-014 can simply be described as a group of offsets developed in response to fixed price proposals for the MCWF and VVSA that were significantly higher than the budgeted cost and in the case of the MCWF, significantly later in delivery. The offsets were designed to maintain the TEC at $86.3M; preserve the First Plasma (CD-4) schedule; preserve adequate cost and schedule contingency for the work remaining; and not introduce additional technical risk.

The MCWF and VVSA fixed price contracts will actually retire a great deal of the cost risk associated with the MIE project. The nature of several of the offsets is to eliminate them from the scope of the MIE project capabilities that are not required for CD-4. These changes can only reduce cost, schedule, and technical risk. However, there are changes in which the designs have been significantly modified.

The CD-4 coil power requirements will be met using the C-site instead of the D-site power supplies. With one exception, these power supplies are in use and known to be in good operating condition. There is plenty of time to bring the remaining power supply into operational condition. In that regard, the cost risk for the C- and D-site should be comparable in terms of percent of the work remaining. Schedule-wise, there is probably reduced risk because the C-site power supplies will not be shared with a major experiment like NSTX, which could constrain reconfiguration efforts during NCSX construction. Technically, the C-site option introduces a small but additional risk because the design is less mature than the D-site option (although preliminary analyses have shown this option to be viable).

The cryogenic cooling supply design has been simplified from a closed loop to a once-through design. No additional cost or schedule risks are apparent. Again, the once-through option is less mature than the recirculating option which might introduce a small, additional technical risk.

The VV heating/cooling system has been eliminated from the MIE project. Eddy current heating techniques, which have been used in the past on tokamaks, will be used to heat the vacuum vessel to 150C for bakeout. The analyses required to establish the viability of this approach have not be completed, so there is a finite risk that technical problems with this approach may arise. If so and if they cannot be mitigated, then the VV heating/cooling system may have to be added back into the MIE project, representing a small cost risk to the project.

A bottoms-up assessment of the contingency shows that the contingency required is about equal to the contingency provided. Likewise, the schedule contingency has been reduced by only two weeks, from 5½ months to 5 months. However, there are subtleties that need to be recognized. Going to three winding stations provides scheduling flexibility that should reduce schedule risk. However, the schedule has been recovered by [1] going to 2-shift operation for winding the final six modular coils; [2] limiting the coil handling trials to using a single Type B coil instead of a fully assembled 3-coil module; [3] doing field period assembly on a 2-shift basis with three field periods being assembled concurrently, and [4] reducing the time allotted for startup by several months through

minimizing operations with the device at room temperature and completing many startup tasks during the construction period. This eliminates almost any elasticity left in the schedule which translates into higher schedule risk.