Summary of Plasma Facing Component Issues
Identified at the FIRE Physics Workshop
May 1-3, 2000

1. Examine attached inner divertor cases (may be necessary to run a single null case)

2. Reconsider up/down balance (can this be maintained, and to what accuracy, time-averaged)

3. Is there a detached outer divertor solution in the UEDGE modeling?

4. Examine the effect of deposition in the spaces between the rods. Also, what are the effects of disruption energy (100 microsec) rather than CW thermal energy on rod surface/edge state?

5. Study the peaking factors due to MHD effects on plasma shape and interaction with the divertor plates

6. Examine the possibility of magnetic sweeping on the divertor plates

7. What is the allowed operating range for delta, kappa, li, etc [kappa, delta impacts target and/or baffle strike geometry. li affects PF currents to achieve a given kappa, delta] ?

8. Study the effect of surface ripples and JxB forces on the disruption melt layer. Is there a 'progressive' damage mechanism?

9. What is the operating temperature for Be at the baseline operating conditions? Is there adequate margin for disruptions or wall contact event (from loss of PF control) without melting? Is 'fast shutdown' (killer pellet) need to avoid serious melting from wall contact?

10. Evaluate the heat load due to lost alpha's on the outboard mid-plane.

11. Determine the need for guard limiters for ICRF antennas.

12. What is the pulse length capability of the PFC(s) (targets, baffle, FW, limiters, ….?

13. What is the impact of ELMs on PFCs?

14. Why choose Be for the first wall?

15. What issues are there in regard to W migration? Are there possible in-machine sources for C "contamination?"

16. Calculate the core impurity radiation due to Be, W, Ne or other gases added for divertor detachment.

17. Determine the diagnostic integration with the first wall and divertor.

18. What is the T retention in PFC materials? (Also see 15 above)

19. Evaluate runaway electron heat loads and effects (need TSC scenario for runaway electron current channel evolution).

20. What wall temperatures and coolant temperatures are recommended?

21. Need to calculate '2-D' effect (redistributed energy) of disruption Thermal quench energy on outer + inner targets + baffle. What fraction of incident thermal quench energy ends up on targets? Where on the first wall does the rest go?

Summary of Disruption Issues
Identified at the FIRE Physics Workshop
May 1 - 3, 2000

1. Continue to evaluate non-axisymmetric forces from halo currents

2. Complete evaluation of motion of melted material from disruptions (extent/breadth of melt-affected zone determined by energy redistribution, see 21 above)

3. Run more disruption cases (VDE, variation of halo parameters, etc.)

4. Study the existence of a "neutral point" for double null plasmas. (Neutral point exists, but the question is: can we expect to be able to hold plasma at neutral point sufficiently well to avoid large VDE/halo current? This is a control/PF question (see below)

5. Study options for feedback control and power supply control during disruptions

6. There is a need for thermal and current quench data and also vertical instability/stability data from double null disruptions.