

**Helium-cooled Refractory Alloys FW/Blanket HHF concept
(APEX team 98-99 tasks, July 1998)**

Nygren

Tasks	Person(s)	Due date	Status (11/98)
1. Next iteration of FW/B neutronics and thermalhydraulics design, including FW thickness variation	Youssef/ Wong	November 98	Active, 1 st iteration
2. FW/B/HHF components CAD configuration	Nelson/Wong/ Nygren	November 98	Active, 1 st iteration
3. Coolant routing transition zone concept	Wong/Nelson	November 98	Active, 1 st iteration
4. CCGT design review and identification of high temperature material options*	Wong	February 99	Active
5. HHF components thermal/hydraulics*	Nygren	February 99	Active
6. HHF refractory material test plan and analysis	Nygren	February 99	Active
7. HHF components review and selection of reference design (e.g. porous medium versus helical tape)	Nygren/Wong	April 99	on-schedule
8. FW/B/HHF loops pressure drop estimate	Wong	April 99	on-schedule
9. Power conversion options	Sze/Wong	April 99	on-schedule
10. Materials compatibility & irradiated properties*	Zinkel/Ghoniem	April 99	on-schedule

11. FW design, 2-D and 3-D analysis	GA	August 99	on schedule
12. Identify He impurity control system	Ulrickson	August 99	?
13. Tritium migration	Sze/Willms	August 99	on schedule
14. Safety, decay heat, LOCA and LOFA anlysis	McCarthy /Mogahed	August 99	on schedule
15. Preliminary understanding and solution approach to material/coolant loop/power conversion issues	Nygren/Wong	August 99	on schedule
16. Preliminary approach on FW/plasma interaction issues	Wong	August 99	on schedule

He-cooled Refractory Issues

(Nygren)

1. Compatibility - Oxygen in V/W system
 - a. Oxygen source term & passivation of V
 - b. Helium cleanup in bimetallic system* primary task: credible O-management scheme

2. Piping Design - simplify
 - * a. Reexamine reliability data (APT info)
 - * b. Limit secondary containment, if possible
 - c. Reduce number of pipes/welds
 - d. Identify feasible W-V transition
- primary

3. FW Heat Management - thermal str.
 - * a. Heat transfer analysis (stress/constraint)
 - b. Fabrication (credible path)
- primary