

Minutes of the APEX Steering Committee Meeting on 11 May 2000 at ANL

Participants: Abdou, Berk, Kaita, Mattas, McCarthy, Morley, Nelson, Rognlien, Sawan, Sze, Ulrickson, Wong, Ying, Youssef, Zinkle

The steering committee met in the evening of May 11. The first part of the meeting was devoted to discussing several administrative issues. The set of technical questions presented by Mohamed Abdou was discussed. These are aimed at enhancing project technical progress. These questions which include general questions as well as task specific questions were further discussed in the general discussion session on May 12. Several decisions were made and are given below.

- Task leaders were asked to send a reminder to the APEX core team at least a day before the monthly scheduled task conference call. The importance of promptly sending the conference call summary was reemphasized.
- The effectiveness of the March E-meeting was discussed. The consensus was that the showstations did not work well. The next E-meeting will be scheduled for August 15 and August 17. We will have 3 hours in each day to allow for discussion. Presenters should send their presentations as attached pdf files to the core list. M. Youssef will post the presentations on the web for access during the conference call.
- The next project meeting will be hosted by SNL at Albuquerque in the week of November 13. Both ALPS and APEX meetings will be scheduled during that week.
- There will not be a full report for this year's activities. We will rely on the progress reports (midyear and end of year). All APEX papers published during the year will be collected and distributed at the end of the year. In addition, all APEX presentations, reports and papers are posted on the web.
- The primary criteria for innovative chamber technology concepts to be considered in APEX include the high power density capability (peak neutron wall load $> 10 \text{ MW/m}^2$ and peak surface heat flux $> 2 \text{ MW/m}^2$). The figure of merit for attractiveness is proportional to the product of the neutron wall load, energy multiplication, power conversion efficiency, and availability. Based on the suggestion made by Siegfried Malang, it was decided that the following statement be added:
"APEX will explore concepts with lower power density capabilities if they provide significant improvement in power conversion efficiency or other major features"
- Due to the limitation on the Flibe free surface temperature, it was decided that no further engineering design effort (task III) would be spent on concepts with Flibe liquid wall. However, work will continue on items that impact the Flibe maximum allowable surface temperature. That includes vapor pressure measurement, modeling of plasma-liquid surface interaction, and free-surface heat transfer. The design work

done to date on the CLIFF-flibe concept will be documented this summer by the task III group.

- Task III will start addressing the engineering issues for concepts with thin liquid Li wall. Concepts utilizing SnLi liquid walls will be considered later when experimental data become available. Dai-Kai Sze will develop a work plan for task III to address the engineering issues of a thin Li wall concept.
- Given the limited resources in APEX, the effort in task II will focus primarily on thin LW but keep some limited areas that are relevant to thick LW (e.g., waste management).
- The stabilizing shell requirement for APEX needs to be addressed particularly with liquid metal walls. Using structural shells with feedback stabilization in addition to the LM wall will be addressed. The location and required conductance of these shells will be determined. This will include coupling plasma MHD models with flowing LM MHD models.
- The assessment of LW impact on waste management is starting and results will be reported in the August electronic conference call.
- A committee was formed to address the scope of exploration of LW in alternate confinement concepts. Recommendations regarding the alternate concepts to be considered and the level of effort needed in this area are to be made. Members of this committee are Moir, Kaita, Ulrickson, Morley, Ying, Kotschenreuther, and Wong.
- Other plasma devices can be considered in task I in addition to NSTX. Possible devices include C-mod and D-III-D. An effort will be made to form working groups within the institutes where the devices are located to help advocating introduction of LW in these devices by addressing the benefits to the device and clarifying the risk issues.
- Effort on the FliHy experiment will continue. It will help with verification of Flibe modeling required for addressing the surface temperature limits. It will also look at the nozzles used for establishing the LW.
- Task IV will continue addressing the critical issues of the boiling Li blanket and the capillary cooled FW. The critical issues of transpiration cooled blanket will be considered. Other advanced solid wall concepts will be explored. Reduction of the power density capability requirement will open the door for more solid wall concepts. Recommendations will be made in the November project meeting.
- An effort to increase visibility of APEX will be initiated. This includes preparing brochures on APEX. An APEX presentation will be planned for the VLT-PAC meeting at ORNL in June. APEX talks will be planned at ORNL, GA and MIT.