Remarks on Fusion Nuclear Technology and Materials

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Panel on Direction of the Future of Fusion Technology
Oakbrook, Illinois October 8, 1990

Status of Fusion Nuclear Technology and Materials

It Could Be Better

- Serious Detailed Technical Planning

  We Now
  - Understand the Issues
  - Have a Plan to Resolve the Issues

  What is missing? Implementation

- Sharp decline in funding over the past several years in world major programs prevented the establishment of comprehensive serious programs.

US	:	Sharp decline
USSR	:	Weak, weaker
Japan	:	New initiatives on hold
Europe	:	Impressive enhancement

Recent Progress

Despite the sharp decline in funding, significant recent progress has been made.

(Thanks to previous investments, effective management of resources and broad technical capabilities from outside fusion.)

- Tritium Release from Solid Breeders
  - Tritium Inventory Likely to be Low
- Advances in Modelling MHD Effects in LM
- Conceptual and Experimental Advancement of Schemes to Reduce MHD Effects in LM
- Experiments Reduced Uncertainties in Predicting TRITIUM BREEDING
- New Experimental Techniques for Measuring Radioactivity, Decay Heat and Nuclear Heat
- Use of DT Point Neutron Source as a Line Source
- Proposed Designs and Materials for Low Activation

Future Directions?

Emphasize Areas Crucial to:

- Tritium Self Sufficiency
- Improved:

  Performance/Economics
  Safety and Environmental Impact

FNT and Material R&D
Must be Substantially Enhanced

Specifics for FNT and Materials R&D

- Driver Blanket on ITER with Credible R&D Now

- Serious Test Program on ITER with a Serious R&D Now

  - International Collaboration

- Near Term R&D (Examples Only)

  - In-Pile Experiments on Solid Breeders
  - Out-of-Pile Experiments for Thermal Control and Thermomechanical Testing
  - Measure Nuclear Heating, Radioactivity
  - Etc.

- Plan 14 MeV Neutron Source for Structural Materials