

C Priorities,

Planning,

New Direction

AC Materials Panel,

FNSF,

Neutron-Materials,

PFC Ta

Example of grand challenge: tritium science and technology

Wide range of interacting time and length scales

Diverse facilities can address issues at various TRLs.

Need to move along to level 4 - 6 sooner than later

Focus on “front-runner” approaches

What are the requirements for being the front-runner?

Which PFC areas should the US take a leading role?

Which areas need enhancement?

Which medium scale facilities are highest priority?

Input to FNSF

How far towards a Power Plant in the step after ITER?

What do we need to do / can we do in advance?

PFC technology test stands?

More powerful linear PMI device?

Heat from plasma flow or from $k\nabla T$?

Long pulse, high power, hot walls DD PMI device?

Interaction of PWI and H-mode physics (JET)?

Powerful point neutron source?

Does neutron irradiation directly affect PMI?

International context?

Output from FNSF

What do we need from FNSF?

Duty cycle and pulse length?

How far do we need to go in PB_p/R ?

Synergistic effects?

RAFM steels

ODS steels

Tungsten (new in last few years – good!)

Silicon carbide

Functional materials

Are these the right priorities from PFC perspective?

Are functional materials studies meeting PFC needs?

Are there more opportunities for informing confinement experiments from lab facilities?

Do we understand gross vs. net erosion of solids?

1.3 nm/sec (at low power, Moly) = 4 cm/FPY (!)

What about W fuzz?

Understanding/controlling Li chemistry

Where does how much lithium go vs. parameters?

Understanding plasma response, self-shielding?

How best to move lithium around?

(CPS fast free-surface flow TEMHD)

What character of melting can ITER tolerate?

Are we pursuing the best tools for ELM control?

ELM coils, pellet pacing, QH mode / EHO control,
I Mode...

Can advanced shapes (Snowflake, Super-X) be
implemented in reactors and/or FNSF?

What if Demo is a stellarator?

What about local high-heat-flux regions of first wall?

Is ITER the right device for these studies?

PFC/PMI around launching structures, etc.?

Can we contribute to the discussion on ITER's choice

Lithium safety training?

Handbook for lithium?

Lithium inventory in various designs?

Tritium inventory and removal?

Lithium on divertors vs. first wall?

Should we do work on Sn, SnLi? Gallium?

More modeling of Li in SOL?

Including plans for re-collection?

Hydrogenic retention vs. temperature?

Connection to IFE liquid walls?

Lithium roadmap?

ARIES-type study?

Coolant and thermal efficiency?

Substrates??