Brief Comments on ITER

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Do NOT Overemphasize Ignition

- What is Important to Learn about Physics and Technology is to produce:
  - Substantial Fusion Power
  - Q ~ 10
  - Long Pulse

- The present ITER design will produce, at least, hundreds of MWs at high Q with hundreds of seconds pulses
  - This is what we need in the next step
  - And It Is Exciting

Opinion: Obsession with ignition can drive the program the wrong way

ITER is Important for Nuclear Testing

The ITER capabilities were determined only by plasma science objectives and engineering constraints. However, these capabilities provide an excellent opportunity to investigate the Critical Nuclear Science & Technology Issues.

- 1 GW fusion power provides a respectable wall load
- High Wall Load and Long Pulse are essential for Nuclear Testing

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Fusion Research's ultimate objective is still ENERGY

- Do not underestimate the importance of Nuclear Testing
  It is absolutely Critical for Fusion's Feasibility and Attractiveness
- Nuclear Testing does <u>not</u> add to the cost of ITER
  Plasma Physics (particularly insistence on ignition) is the Cost Driver

The Present ITER Design is the Product of Very Substantial Intellectual and Financial Investments by the World Community Over a 20-year Period

USA:	EPR, TNS, FED
EU:	NET (several design generations)
Japan:	FED (several design generations)
International:	INTOR, ITER-CDA

- The present ITER design built on experience from all these designs and developed the necessary details.

We must emphasize:

- Operational flexibility
- Engineering robustness
- Maintainability

What will happen after construction:

- Plasma is not a fixed component.
  The operating point can be changed as often as we like
- In contrast, hardware components are "permanent" or "semi-permanent"

Key issues:

- How often will components fail?
- How well and how fast can the machine recover from a failure (through component replacement or in-situ repair) ?