



# ITER Engineering Design Activities

## ITER Technical Characteristics

### Performance

Fusion power amplification > 10 with inductive current drive (ignition not precluded).  
 Fusion power amplification > 5 using non-inductive current drive.  
 Typical fusion power level ~ 500 MW.

### Testing

Integrate and test all essential fusion reactor technologies and components.

### Design

Use existing technology and physics database to give confidence but be able to access advanced operational modes.  
 Operation equivalent to a few 10000 inductive pulses of 300-500 s.  
 Average neutron flux > 0.5 MW/m<sup>2</sup>.  
 Average fluence > 0.3 MWA/m<sup>2</sup>.

### Operation

Address all aspects of plasma dominated by alpha particle (helium) heating through burning plasma experiments.  
 Low fluence functional tests of DEMO-relevant blanket modules early; high reliability tests later.  
 Device operation ~ 20 years. Tritium to be supplied from external sources.

## Main Plasma Parameters and Dimensions

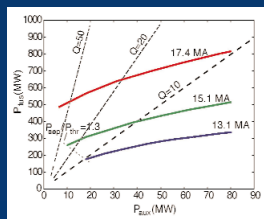
Total fusion power	500 MW (700MW)
Q = fusion power/auxiliary heating power	≥ 10
Average neutron wall loading	0.57 MW/m <sup>2</sup> (0.8 MW/m <sup>2</sup> )
Plasma inductive burn time	≥ 300 s
Plasma major radius	6.2 m
Plasma minor radius	2.0 m
Plasma current (I <sub>p</sub> )	15 MA (17.4 MA)
Vertical elongation @95% flux surface/separatrix	1.70/1.85
Triangularity @95% flux surface/separatrix	0.33/0.49
Safety factor @95% flux surface	3.0
Toroidal field @6.2 m radius	5.3 T
Plasma volume	837 m <sup>3</sup>
Plasma surface	678 m <sup>2</sup>
Installed auxiliary heating/current drive power	73 MW (100 MW)

### Central Solenoid Model Coil Project

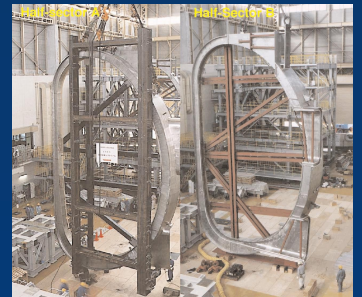


Central Solenoid

### Range of Performance (Inductive)



### Vacuum Vessel Sector Project



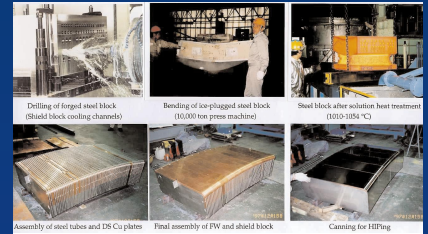
Vacuum Vessel

### Toroidal Field Model Coil Project



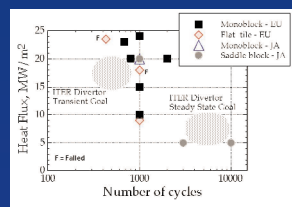
Toroidal Field Coil

### Blanket Module Project



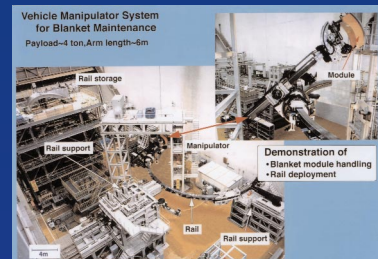
Blanket Module

### Divertor Cassette Project

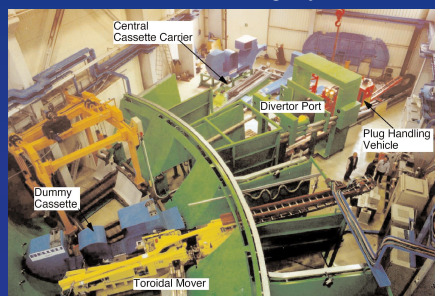


Divertor

### Blanket Module Remote Handling Project



### Divertor Remote Handling Project



Target Cost ~\$4B (US 1/00)  
 Construction Timescale ~8 years

- Current Status & Plans:**
- Finalise design by end of Engineering Design Activities (7/01)
  - Conduct Coordinated Technical Activities to underpin negotiations on Construction Agreement and Site Selection (12/02)
  - Construction begins in 2003.