Status of the ITER Project

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October 2006
What is ITER Today?

• ITER ("the way" in Latin) is the essential next step in the development of fusion.

• Objective - to demonstrate the scientific and technological feasibility of fusion power.

• The world’s biggest fusion energy research project.

• An international collaboration.
The Mission

- Up to steady state fusion power production.
- Plasma makes 10x more power than needed to run it.
- Optimise plasma behaviour.
- Have dimensions comparable to a power station.
- Produce about 500 MW of fusion power.
- Demonstrate or develop all the new technologies required for fusion power stations, except materials endurance.
- Obtain license for construction and operation.
- Operate for about 20 years.
- Cost about €5bn to construct (over 9 years) and €5bn to operate (about 20 years) and decommission.
Construction Cost Sharing

C
“Contributions in Kind”
Major systems provided
directly by Parties

B
Residue of systems,
jointly funded,
purchased by
ITER Project Team

A
Systems suited only to Host Party industry
- Buildings
- Machine assembly
- System installation
- Piping, wiring, etc.
- Assembly/installation labour

Overall costs shared according to agreed
evaluation of A+B+C

Overall cost sharing:
EU 5/11, Others 6 Parties 1/11 each,
Overall contingency up to 10% of total.
General Roles & Responsibilities for Construction

• ITER IO
  – Planning/Design
  – Integration / QA / Safety / Licensing / Schedule
  – Installation
  – Testing + Commissioning
  – Operation

• Parties – DA
  – Detailing / Designing
  – Procuring
  – Delivering
  – Support installation

• IO and all Parties plus Fusion Community work together on ITER. ITER IO coordinates and participates in the program (e.g.: TBM).
Status of the ITER Organisation

• Presently there are still three JWS: IPP-Garching, JAEA-Naka and CEA-Cadarache
  – Garching, Naka, will be closed by the end of the year.
  – Many people already transitioning to Cadarache on an interim basis with the intent to become employees as soon as possible.

• Final ITER agreement underway:
  – Agreement accepted by negotiators April 1st.
  – Documents were initialed May 24th.
  – Documents should be signed on Nov 21st.
  – ITER Organisation should then become a legal entity and should execute all functions.
ITER Organisation

Management Advisory Committee

Science and Technology Advisory Committee

Safety/Security
Environment, Safety/Health, Permits, QA Audit, Security

Administration
- Finance
- Contracts/Procurements
- Human Resources
- Public Relations

Fusion Science and Technology
- Science
- Technology

DG

Office of DG/DDG’s ITER Council Secretariat
Legal Support

Technical Advisory Group

Project Office
- Technical Integration
- QA and Safety
- Project Management

ITER Council

PDDG

Civil Construction and Site
- Site and Facility
- Civil Construction

Field Teams
- Field Team Leader
- Staff (QA, C&S, Audits, etc.)
- Technical Support

Domestic Agencies
- China
- Europe
- India
- Japan
- Korea
- Russian Federation
- USA

Tokamak
- Magnet
- Vessel
- Internal Components

Central Engineering & Plant Support
- Central Engineering
- Heat Removal System
- Fuel Cycle
- Ventilation/Detritiation
- Electrical Supply

Control, Heating & Diagnostics
- CODAC
- Diagnostics
- Heating and Current Drive Systems
Integrated Project Schedule

- ITER IO
- License to Construct
- Tokamak Assembly Starts
- First Plasma

2005 - 2016:
- 2005: Construction License Process
- 2006: Bid, Contract, Excavate
- 2007: Tokamak Building
- 2008: Other Buildings
- 2009: Tokamak Assembly
- 2010: Vendor’s Design, Magnet, Vessel
- 2011: PFC Fabrication Start
- 2012: TFC CS, First Sector, Complete VV
- 2013: Complete Blanket/Divertor, Install PFC Cryostat
- 2014: Install CS, First Sector
- 2015: Last TFC, Last Sector
- 2016: COMMISSIONING
Near Term Targets

- Clearing of the construction site and preparation for road and utility connections (Spring 2007).
- Design review also involving physics community leading to revised baseline in Spring 2007 for approval by ITER Council.
- Finalising technical specifications for calls for tender for vacuum vessel, superconducting coils, building & excavation design.
- Submission of Preliminary Safety Report (by end 2007).
  - Development of a consistent Integrated Project Schedule (IPS) and Procurement/Party Funding Commitment schedule.
Staff Ramp Up Projection

Staff Ramp Up IO Team

- Sum PPY: 1800
- Sum Support: 2760
- Sum Total

Calendar Year

Number

0 100 200 300 400 500 600 700


Kaname Ikeda, October 2006
Participation in ITER

• Attract the best qualified people to the IO - send us your CV (see ITER web site).
• Share responsibility for success with the Domestic Agencies by ensuring joint aim is mutual success on time and within budget.
• Involve all Parties’ fusion researchers actively in preparing for ITER operation, as well as in developing diagnostics, heating and current drive systems, and test blanket modules.
• Encourage researcher’s ownership of the ITER design by participation in the design finalisation process through the design review.
Conclusions

• The Parties are aware of their budget and staffing obligations and are making progress in implementing them.
• The project team is building up in Cadarache.
• The design review has begun in September which will strengthen involvement of all stakeholders, DAs and project team members.
• ITER Organisation and Domestic Agencies need to be established as soon as possible to effectively execute all tasks of the construction project.