

SMR 1273 - 2

**WORKSHOP ON PLASMA DIAGNOSTICS AND
INDUSTRIAL APPLICATIONS OF PLASMAS**

12 - 13 OCTOBER 2000

***THE ROLE OF THE IAEA IN PLASMA PHYSICS
AND RELATED SCIENCE***

Thomas DOLAN

**Head, Physics Section, Division of Physical and Chemical Sciences
Department of Nuclear Sciences and Applications
Wagramer Strasse 5, P.O. Box 100, A-1400 Vienna, Austria**

These are preliminary lecture notes, intended only for distribution to participants.



IAEA Fusion Research Activities

Thomas J. Dolan
International Atomic Energy Agency

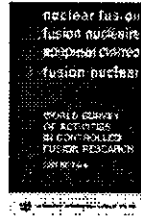
Workshop on Plasma Diagnostics and Industrial Applications of Plasmas

ICTP, Trieste
12-13 October 2000



1

49 Fusion Research Countries/Organizations



Argentina	Australia	Austria	Bangladesh
Belarus	Belgium	Brazil	Bulgaria
Canada	Chile	China	Colombia
Czech	Denmark	EU	Finland
France	Georgia	Germany	Greece
Hungary	India	Iran	Ireland
Israel	Italy	Japan	Kazakhstan
Korea	Malaysia	Mexico	Netherlands
Norway	Pakistan	Poland	Portugal
Romania	Russia	Singapore	Slovenia
Spain	Sweden	Switzerland	Taiwan
Turkey	Ukraine	UK	USA
Yugoslavia			



2

Need for International Cooperation

Avoid duplication

Accelerate progress by sharing
Understanding
Technology
Manpower
Costs

Encourage governments to support research



3

Some IAEA Statistics

Founded 1957

129 Member States

2200 Staff

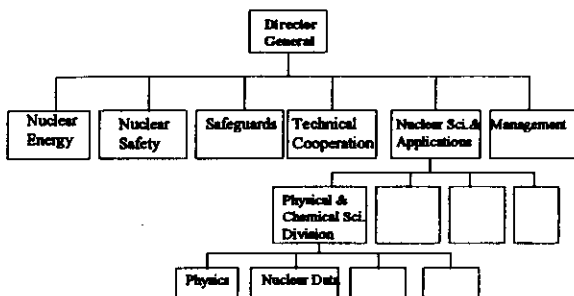
220 M\$ Regular Budget

60 M\$ Additional for Technical Cooperation



4

IAEA Organization



5

IAEA Objective:

To promote fusion energy development

Facilitate international cooperation

Research coordination

Information exchange

Provide public information

Support developing Member States



6

IAEA Fusion Research Activities

Nuclear, atomic, molecular, plasma-material interaction data

Research collaborations

Coordinated Research Projects
Auspices for ITER

Information exchange

Fusion Energy Conferences (500-800 people)
Technical Committee Meetings (30-100)
Advisory Group Meetings (5-15)
Journal *Nuclear Fusion*
Technical Documents

Technology Transfer to developing countries
Public information



7

International Thermonuclear Experimental Reactor

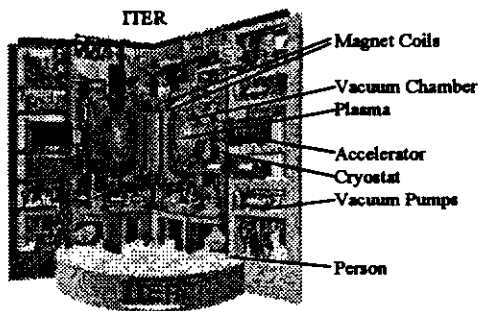


1988-1992 Conceptual Design Activity
1992-2001 Engineering Design Activity

IAEA Provides:

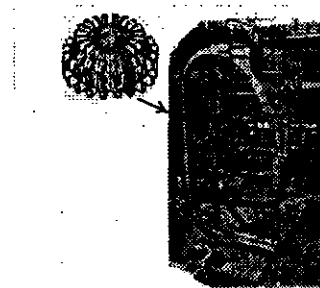
Assistance with meetings
Publication of reports and documents
Monthly newsletter
Administration of the ITER Joint Fund.

8



9

Full-Scale Segment of ITER Vacuum Vessel



Japan Atomic Energy
Research Institute
(Naka, Japan)

10

IAEA Coordinated Research Projects

Number of Institutions	8-16
Duration	3-5 Years
Research Coordination Meetings	every 18 months
Advanced Countries: Agreements	travel support
Developing Countries: Contracts	~ 5 k\$/year + travel
Results:	Technical Document Improved Research Capabilities



11

Coordinated Research Projects

- Plasma Applications
- Compact Toroids
- Divertor Modelling
- Charge Exchange Cross Sections
- Plasma-material Interaction
- Data for Plasma Diagnostics
- Molecular Processes in Edge Plasmas
- Inertial Fusion
- Dense Magnetized Plasmas



12

Evaluation of IAEA Fusion Research Activities

External Panel
November 2000, Vienna
Questionnaire



19

IAEA Meetings in 2000

Fusion Reactor Safety	UK/France	13-16 June
Compact Toroids	Vienna	10-14 July
Int'l. Fusion Research Council	Italy	3 Oct
Fusion Energy Conference	Italy	4-10 Oct
Plasma Diagnostics & Industrial Applications (ICTP Workshop)	Italy	12-13 Oct
Applications to Science & Tech.	China	30 Oct-3 Nov



20

IAEA Meetings Planned for 2001

Power plant design for inertial fusion energy	Vienna	March
Research using small fusion devices	Brazil	25-27 June
H-mode physics and transport barriers	Toki, Japan	September
Control, data acquisition & remote participation	San Diego	July
Steady-state operation of magnetic fusion devices	France	March
Energetic particles in magnetic confinement systems	Gothenburg	October
Spherical tori	Brazil	28-30 Nov.
Divertor concepts	France	10-14 Sep.
High average power drivers	Darmstadt	?
International Fusion Research Council	Vienna	15 June



21