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**ORGANIZATION OF THE ITER PROJECT -
SHARING OF INFORMATIONAL PROCUREMENTS**

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Organization of the ITER Project Sharing of Information and Procurements

MOTIVATION FOR INTERNATIONAL COOPERATION IN FUSION ENERGY DEVELOPMENT

- **Fusion has the potential for a safe, environmentally attractive and practically inexhaustible source of energy, worldwide**
- **Very large and expensive experimental facilities are needed to prove the technical feasibility of magnetic confinement fusion**
- **Four large worldwide programs of about equal size have similar goals and objectives for constructing an experimental reactor as the focal point for the development program**
 - **European Community**
 - **Japan**
 - **U.S.S.R.**
 - **U.S.A.**
- **Cooperation among the four countries to build a single experimental reactor would reduce the cost for each country and provide an international pool of scientific and engineering resources**

**COUNTRIES PARTICIPATING IN
INTERNATIONAL AGREEMENTS
WITH THE U.S.A. IN
FUSION ENERGY DEVELOPMENT**

Countries and Organizations

Australia	1
Canada	2
European Community	9
IEA	9
Soviet Union	2
Peoples Republic of China	1
Israel	2
Spain	1
Japan	7

LARGE COIL TASK

- The goal of the Large Coil Task (LCT) was to demonstrate reliable operation of large superconducting coils, to gain experimental data, and to prove the design principles and fabrication techniques proposed for the magnets in a tokamak experimental power reactor.
- The LCT is an example of effective multinational collaboration in an advanced technology project involving large-scale hardware produced in several countries and operated as a tightly integrated system.
- Participants of LCT were the United States, Japan, Switzerland, EURATOM, including six industrial organizations.
- ORNL designed and constructed the test facility and was responsible for overall integration and coordination of the entire test effort.
- The LCT successfully accomplished its intended purpose (September 1987) and the world-wide participants in fusion research are reaping benefits from the multinational effort.

ITER

The International Thermonuclear Experimental Reactor

Background

- **1985 — Government leaders in summit meetings call for cooperation in fusion energy development**

- **1988 — Four government organizations: the European Community, Japan, Soviet Union, and United States begin Conceptual Design Activity (CDA) under auspices of IAEA**

- **1990 — CDA to be completed in December 1990, will produce a conceptual design including:**
 - **Cost and schedule estimates**
 - **Site requirements**
 - **Validating R&D plan**
 - **Plan for operation**

ITER ORGANIZATION FOR CONCEPTUAL DESIGN ACTIVITY

- **Technical site for design effort at Garching, West Germany**
 - Small staff of 8–10 are in permanent residence
 - Primary technical work is performed at home countries
 - Working sessions of 2–6 months duration with 40 or more individuals on site
 - Design issues are resolved by consensus
 - Supporting R&D at home sites
\$10 M/year, each country

- **ITER Council (IC)**
 - Responsible to IAEA for overall direction of activities

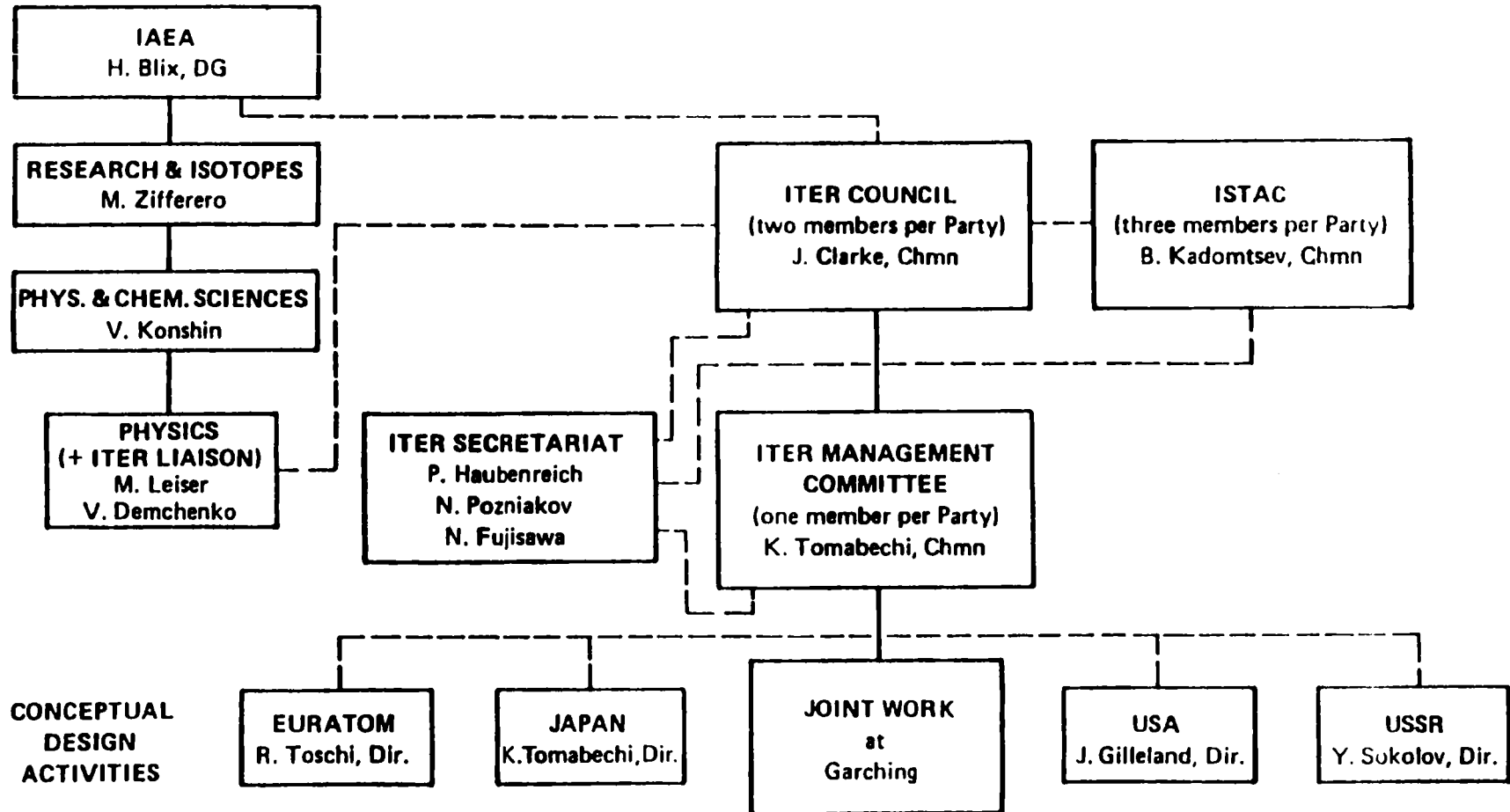
- **ITER Management Committee (IMC)**
 - Responsible for execution of activities
 - Manages work at Garching

- **ITER Scientific and Technical Advisory Committee (ISTAC)**
 - Consists of eminent scientists and engineers
 - Advises the IC

SCHEDULE FOR ITER CONCEPTUAL DESIGN ACTIVITIES

	J	F	M	A	M	J	J	A	S	O	N	D	
1988	CONCEPT DEFINITION PHASE												
Joint Work													
Concept Definition Report Draft Issued											●		
ISTAC Meetings							●				●		
Council Meetings			●			●					●		
1989	DESIGN PHASE												
Joint Work													
Interim Conceptual Design Draft Issued											●		
ISTAC Meetings						●					●		
Council Meetings						●					●		
1990	DESIGN PHASE												
Joint Work													
Final Conceptual Design Draft Issued											○		
ISTAC Meetings			○						○		○		
Council Meetings				○					○		○		

ITER ORGANIZATION



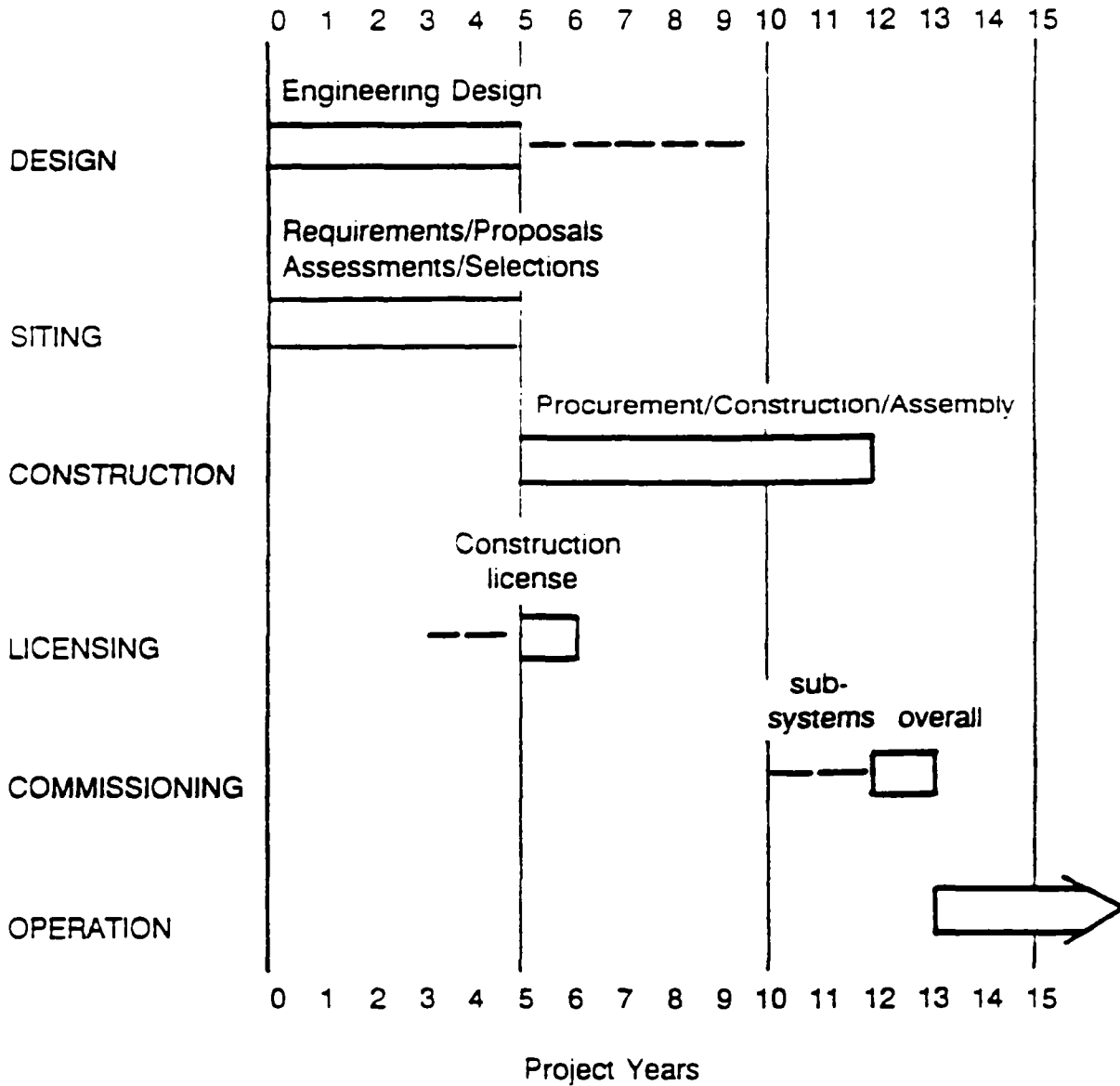
ITER OBJECTIVES

- **ITER is expected to fully confirm the scientific feasibility and to address the technological feasibility of fusion power. Consequently, the machine must be designed for controlled ignition and extended burn of deuterium-tritium plasma. It must also demonstrate and perform integrated testing of components required to utilize fusion power for practical purposes.**

ITER OPERATING PARAMETERS (PHYSICS PHASE)

Major radius, R (m)	5.8
Minor radius, a (m)	2.25
Toroidal field on axis, B (T)	5.0
Current, I_p (MA)	25
Fusion power, P_{fus} (MW)	1000
Neutron wall load (MW/m ²)	1.0

CONCEPTUAL PROJECT SCHEDULE AND COST



Cost Estimate — \$4.9 B (January 1989)

FUTURE PLANS

- **Engineering Design Activity (EDA)**
 - **Working Party on Ways and Means established**

- **Key issues identified for EDA**
 - **Treatment of intellectual property (information and know-how)**
 - **Approach to task-sharing**

- **Evolutionary solutions based on development of further detail and experience appear to be required rather than determining solutions adopted at the outset due to complexity of issues**

- **Issues require innovative approaches for both design and construction**

BASIC PRINCIPLES RELATED TO TASK SHARING

- **Two distinctly different approaches possible — centralized and decentralized**
- **A hybrid approach is most likely**
- **A strong central team is required with primary responsibility for overall design integration and the facility**
- **A desirable procurement system is one that does not require transfer of funds across the parties' boundaries**
- **Standards are required to assure equity among the parties**

QUESTIONS RELATED TO TASK SHARING

- **What is the responsibility of the central team vs the home team**
 - Design
 - R&D
 - Procurement
 - Installation
- **Do home teams assume full or partial responsibility for systems**
- **At what level can private industry be involved**
- **How to divide tasks among home teams**
- **How is equity obtained**
- **When is the best time to divide**
- **Who will decide on all of the above**
- **How to ensure compatibility with domestic needs**
- **How to handle significant changes or new tasks**
- **How to take into account the different areas of concentration among the four parties**
- **How do “other” countries become involved**
- **Relationship of internal divisions to other parties**

HANDLING OF INTELLECTUAL PROPERTY

- **Basic principles**
- **Ownership**
- **Transfer of intellectual property**
- **Protection of proprietary information**

BASIC PRINCIPLES IN HANDLING OF INTELLECTUAL PROPERTY

- **Approach based on recognition of mutual benefit, need for equality, respect for international and domestic arrangements and legislation**
- **Technical success is top priority to ensure broad and prompt exchange of information while ensuring intellectual property rights of parties**
- **Intellectual property includes data, results and methods in the form of drawings, models, calculations, reports, equations, instructions, inventions, etc.**
- **Each party will receive regular reports on the project status**

OWNERSHIP OF INTELLECTUAL PROPERTY

- **Property and copyrights of reports created by central team is owned equally by the four parties**
- **Each party will determine ownership between its national groups based on domestic requirements**
- **Inventions by central team members will be the responsibility of the director**
- **Inventions by home teams will be owned by the party and shared openly with other parties**
- **Inventions by home team members will be the responsibility of home team leaders who will report to the director**
- **In questions of ownership, the director with concurrence of home team leaders will recommend ownership to the Council**

TRANSFER OF INTELLECTUAL PROPERTY

- **Inventions by home team members will be licensed for use at no charge to other parties**
- **Pre-existing property will be licensed for ITER purposes to other parties over a finite time**
- **Protected or sensitive, pre-existing information that a party wants to contribute could be used confidentially under agreed-upon rules**
- **Inventions by the central team will be transferred to “third persons” after approval by all parties**

PROTECTION OF PROPRIETARY INFORMATION

- **Information and know-how will not appear in reports produced by the central team**
- **Information used will be handled by parties in accordance with laws, rules, and administrative practices throughout a time period mutually agreed upon**