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Editor's Note

This month's issue is dedicated to the presentation of the ITER EDA Home Teams, to the description of their composition, their tasks, responsibilities, national support and activities.

THE EUROPEAN COMMUNITY ITER HOME TEAM ORGANIZATION

by Prof. R. Toschi, Home Team Leader

The European Community (EC) Fusion Programme embraces all work carried out in the field of thermonuclear fusion by magnetic confinement in the 12 Member States and in two extra-Community countries, Sweden and Switzerland (which are fully associated with this Programme). The long-term objective of the EC Fusion Programme is the joint creation of safe, environmentally sound prototype reactors. This Programme presents itself as a single body in its relation with other Fusion Programmes in the world.

At the Community level, the Commission of the European Communities (CEC) has the overall responsibility for the implementation of the Programme. The Director of the Programme is Charles Maisonnier. The consultative structure consists of the Consultative Committee for the Fusion Programme (CCFP, chaired by Klaus Pinkau) composed of 15 delegations, one from each of the Member States, plus Sweden, Switzerland, and the CEC, and of its subcommittees. The Fusion Technology Steering Committee (FTSC), under the authority of the CCFP, steers the Next Step and the fusion technology activities, including the EC contribution to ITER. The FTSC members are organized in two distinct sections: FTSC-P and FTSC-I. The FTSC-P, chaired by Robert Aymar, handles overall planning, budget and strategy. The FTSC-I, chaired by Roberto Andreani, implements the planning by allocating activities to the various research institutes and industries involved.

The fusion programme is implemented principally by means of contracts of association between the Community and the national organizations active in fusion, by the JET (Joint European Torus) Joint Undertaking, by the Joint Research Centre of the Community, through a multilateral agreement concerning the Next European Torus (the NET Agreement), and in European Industry. There are 13 Associations distributed in 9 Member States and in Sweden and Switzerland, which include the research units shown in Table I.

The NET Agreement, which established the NET Team, has been concluded since 1983 between the Community, its associated partners in the Fusion Programme, and Greece, Luxembourg and Ireland, which have no Associations. With the signature of the ITER EDA Agreement, the scope of the NET Agreement has been accordingly enlarged to cover the implementation of the EC participation in the ITER EDA and the design work on NET has been terminated upon completion of the pre-design phase. The NET Team acts as a focal point for the European contribution to the ITER activity. The EC share of work for the ITER EDA will be carried out in the Associations, in JET, in the JRC and in European industry. Canada, which was involved in the ITER CDA through the EC, is expected to be similarly involved under Art. 19 of the ITER EDA Agreement. The NET Team Leader, Romano Toschi, responsible to the FTSC for the implementation of the NET Agreement, is also the EC ITER Home Team Leader (HTL), and in this respect is also responsible to the ITER Director for the execution of the tasks assigned to the EC.

The activities to be carried out by the EC ITER Home Team have been divided into Fields and Task Areas each led by a Field Co-Ordinator (FC) and a Task Area Leader (TAL) respectively (Table II). In carrying out his duties, the HTL is assisted by the Home Central Team (HCT), which consists of the HTL's Office Staff and the FCs and TALs. The FCs and TALs are responsible to the HTL for the formulation of EC proposals on ITER Tasks, and for monitoring the execution, in Laboratories and Industry, of the Tasks assigned to the EC.

TABLE I.

Belgium:	Ecole Royale Militaire/Koninklijke Militaire School (ERM/KMS) Studiecentrum voor Kernenergie/Centre d'Etude de l'Energie Nucléaire (SCK/CEN) Université Libre de Bruxelles (ULB)
Germany:	Max Planck Institut für Plasmaphysik (IPP) Forschungszentrum Jülich GmbH (KFA) Kernforschungszentrum Karlsruhe GmbH (KfK)
Denmark:	Risø National Laboratory
Spain:	Centro de Investigaciones Energéticas Medioambientales y Tecnológicas (CIEMAT)
France:	Département de Recherches sur la Fusion Controlée, CEA
Italy:	Istituto di Fisica del Plasma del CNR (Milano) Istituto Gas Ionizzati del CNR (Padova) Dipartimento Fusione dell'ENEA
Netherlands:	Energy Research Foundation (ECN) FOM Instituut voor Plasmafysica
Portugal:	Instituto Superior Técnico (IST)
United Kingdom:	AEA Fusion
Sweden:	Royal Institute of Technology
Switzerland:	Centre de Recherches en Physique des Plasmas (CRPP) Paul Scherrer Institute (PSI)

ITER-related activities of priority interest to the EC have been defined and a profile of expertise has been drawn up to identify the Research Institutions which could be involved in each Task Area.

The involvement of European industry in the ITER EDA will primarily consist of contributions to the ITER design proper and of the supply of specific equipment and prototypes. In both cases, the contracts will be placed by the CEC, in the framework of the NET Agreement.

ITER Tasks related to the industrial contribution to the ITER design proper will be entrusted to one large systems engineering firm or grouping of firms, to be selected on the basis of one competitive European-wide call for tender. As for the procurement of specific equipment and prototypes, 15 technologies specific to fusion and essential to a Next Step device such as ITER have been defined, within which the CCFP considers that it is more appropriate in the long term to carry out development in industry rather than research in institutes. Within each of these technologies, procurement will result from calls for tender issued to a list of pre-qualified European firms or grouping of firms.

TABLE II.

Field	*Task Area*
Physics	Bulk Plasma Operation Plasma Edge
Plasma Engineering	Fuelling Electron Cyclotron Heating/CD Lower Hybrid Heating/CD Ion Cyclotron Heating/CD Neutral Beam Heating/CD Diagnostics
Plasma Facing Components	Structural Materials Characterization Protection Materials Characterization/Development First Wall and Divertor Mockup and Testing
Vessel/In-Vessel	Vacuum Vessel/Shield Blanket and Neutronics
Magnets	Conductor Coil Systems Facilities and Auxiliaries
Remote Handling	*Standards and Tools* Transporter and Manipulators
Fuel Cycle	Pumping and Exhaust Processing Common Fuel Processes
Safety	Safety Analysis Site and Environment

JAPANESE HOME TEAM ORGANIZATION AND STATUS

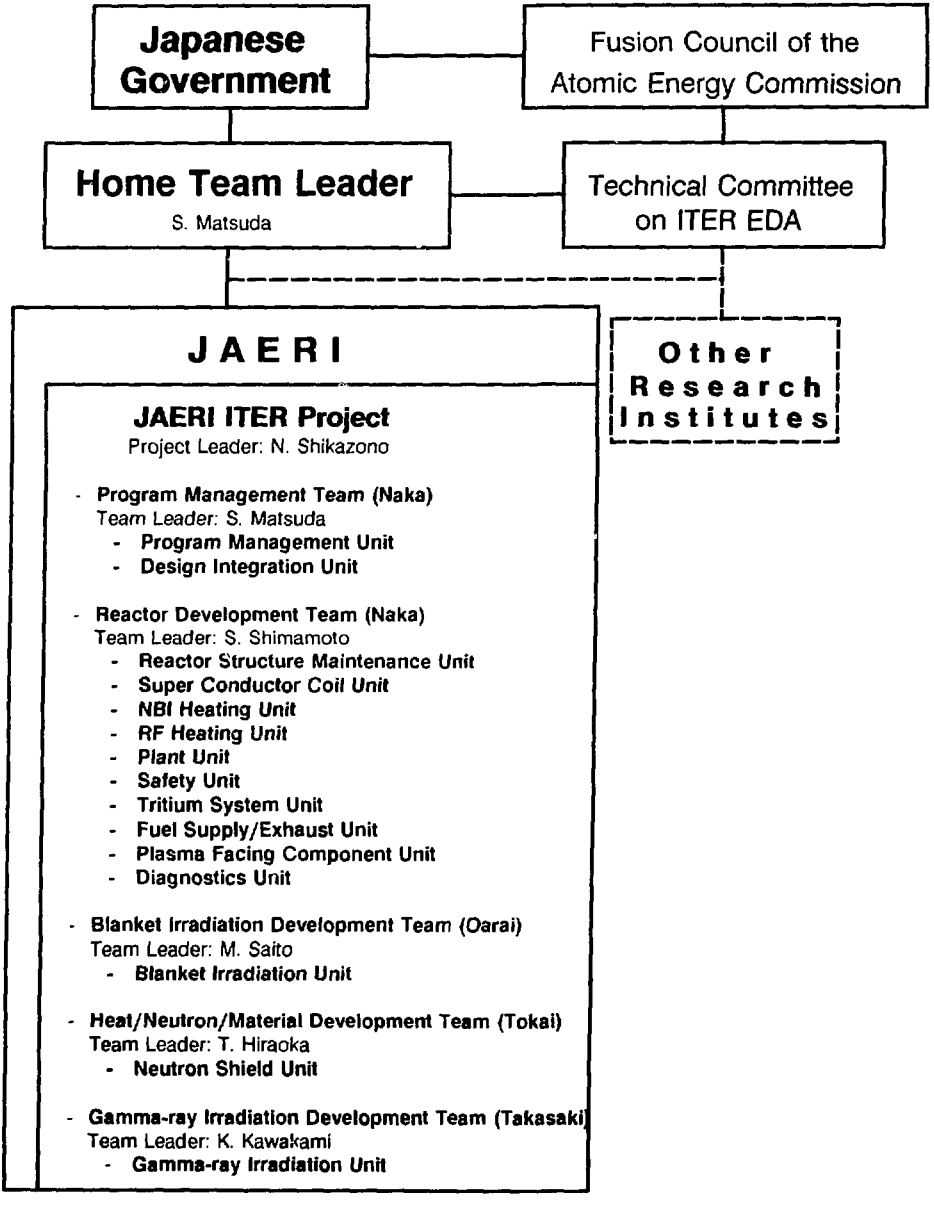
by Dr. S. Matsuda, Home Team Leader

In June 1992, the Atomic Energy Commission of Japan specified the Third Phase Basic Programme of Fusion Research and Development. It determines the national policy for the experimental reactor phase of fusion research and development.

As a government committee, the promotion and the planning of the entire fusion programme will continually be carried out by the Fusion Council of the Atomic Energy Commission. The Fusion Council has recently established the ITER Technical Committee which will advise the Fusion Council on technical matters of the ITER Programme. Thus, the government is ready to fully support ITER in this unprecedented international collaboration.

On signing of ITER EDA Agreement, the Japanese Government designated the Japan Atomic Energy Research Institute (JAERI) as the implementing organization. JAERI established a new task force, the JAERI ITER Project, as the core of the Japanese Home Team (see figure overleaf), led by the Director General of the Naka Research Establishment for the efficient execution of ITER tasks. It consists of five teams, each of which is divided into several units. The JAERI ITER Project includes the Programme Management Team which deals with overall technical management and co-ordination as well as design integration and Reactor Development which covers most of the R&D for the major components necessary for ITER. These two teams are organized at the Naka

ORGANIZATION OF JAPANESE HOME TEAM

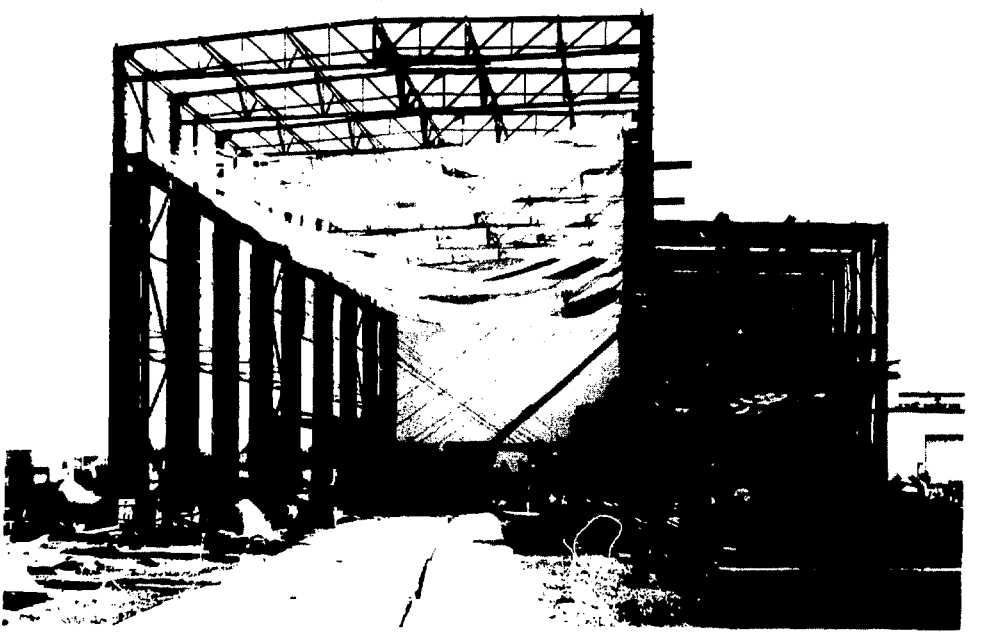


Research Establishment. In addition, there are three other establishments in JAERI involved in the EDA: materials, heat and 14 MeV neutron studies at the Tokai Research Establishment, blanket studies and development using fission reactor irradiation at Oarai Research Establishment, or γ-ray irradiation at Takasaki Research Establishment. Some other units are to be organized in the near future in pace with the evolution of ITER activities. The involvement of other research institutes is open as a future possibility. The number of persons nominated as Home Team members is about 100 at present and will be increased, depending on the tasks assigned to the Japanese Home Team.

The participation of industries in the EDA is very important for the success of ITER. Firstly, innovative concept proposals based on the technical expertise in other fields can be expected. Secondly, experience in production, fabrication or assembly is valuable in the integral review of the design. Thirdly, development and integration of production technologies are essential in realizing the future construction.

JAERI has so far always encouraged the participation of industries in the development of fusion research, because this was mutually beneficial and is also expected to be quite effective in the ITER EDA. Participations of industries to the EDA of the following three types are envisaged: First, under design contract with the Home Team, industries may undertake part of the design work. Second, through the procurement contract of the ITER Technology R&D, industries can participate in the fabrication of components. Third, personnel in industries may temporarily be hired as JAERI employees through the contract of employment etc. in order to participate in the Home Team or in Joint Central Team activities.

Although not much work has been allocated to the Home Team as yet, the second ITER Council Meeting has approved the construction/upgrading of two model coil test facilities as urgent tasks. JAERI is now constructing a new building for the model coil test facility (see photograph below). Over 80 tasks have been proposed for ITER in nine technology R&D categories. This work is ready to start once tasks agreements have been developed.



New building under construction for ITER EDA model coil testing

RUSSIAN FEDERATION HOME TEAM ORGANIZATION

by Dr. O.G. Filatov, Home Team Leader

The general responsibility for the ITER activity in the Russian Federation (RF) is assigned by the RF Government to the Ministry for Atomic Energy of the RF. The Head of the Fusion Programme in the Ministry, Dr. N.S. Cheverev, is member of the ITER Council. The scientific leader of the RF Fusion Programme, the President of the Russian Research Centre "Kurchatov Institute", Acad. E.P. Velikhov, is the ITER Council Chairman.

For the direct organization, budget distribution and supervision for the ITER activity the National RF ITER Directorate is organized by the Ministry under the leadership of the Home Team Leader (HTL). The Russian HTL is working at the Efremov Scientific Research Institute of Electrophysical Apparatus (SRIEA), St. Petersburg, as a Director of the Scientific Technical Centre "SINTEZ", where the Headquarters of the project is located. The branch is located at the Kurchatov Institute. The members of the National Directorate are the key persons from the main institutes directly involved in the project. They are responsible for the organization and supervision of the specific parts of the activity in the RF:

Dr. Yu.G. Prokofiev, SRIEA	Electrophysical technology (vacuum vessel and system, divertor technology materials)
Dr. Yu. S. Strebkov, Institute of Power Engineering	Nuclear Technology (blanket and first wall, shielding)
Dr. V.N. Tebus, Institute of Inorganic Materials	Tritium Technology
Dr. Yu.A. Sokolov, Kurchatov Institute	Physics
Prof. N.N. Semashko, Kurchatov Institute	Plasma Technology (NBI, ECRH development)
Dr. V.A. Belyakov, SRIEA	R&D Co-ordinator
Dr. L.G. Golubchikov, Ministry of Atomic Energy	Resources and Finances

The Magnet Technology R&D is directly supervised by the HTL.

The National Directorate also discusses and suggests the delegations for the ITER Technical Meetings, approves the main reports, etc.

A part of budget for the Physics and Plasma Technology is going from the Ministry to the participating organizations via Kurchatov Institute, and the largest part for all the other programmes is going via SRIEA. The institutes, universities and industry are involved via key institutes by means of special contracts approved by the Directorate. The total number of involved organizations is about 100. The highest level persons from the National Fusion Programme and Fusion-Related Areas supervise the ITER activity through their participation in respective Committees. For example, the ITER TAC members from the RF are:

Acad. B.B. Kadomtsev	Director of the Fusion Centre at the Kurchatov Institute
Acad. V.A. Glukhikh	Director of SRIEA
Prof. E.O. Adamov	Director of the Institute of Power Engineering
Prof. M.I. Solonin	Director of the Institute of Inorganic Metals.

Our internal working programme consists of 15 tasks related to ITER needs: Magnet Technology, Divertor and Plasm Facing Components, Blanket and First Wall, NBI and ECRH systems, Vacuum Vessel, Tritium System, Pumping and Fuelling System, Diagnostics, Safety, Liquid Metal Systems, Remote Handling System, Control System, Power Supply System, Plasma Physics, Layout and Buildings.

The ITER activity in the RF is strongly supported by the scientific and engineering community. We are sure that the ITER co-operation will be successful and hope that the contribution from the RF Home Team will be highly appreciated.

ORGANIZATIONAL STRUCTURE AND NATIONAL ACTIVITIES OF THE UNITED STATES IN SUPPORT OF THE ITER ENGINEERING DESIGN ACTIVITIES

by Dr. C.C. Baker, U.S. Home Team Leader

Efforts in the United States (U.S.) on ITER are nationwide. Within the U.S., the government agency responsible for the ITER Engineering Design Activities (EDA) is the Department of Energy (DOE). All ITER funds are provided by the U.S. Government through DOE. Within the DOE, the Office of Fusion Energy (OFE) is organizationally responsible to carry out the ITER activities under the direction of Thomas R. James, Director, ITER and Technology Division.

The U.S. Home Team operates under the direction of the OFE and is comprised of many institutions involved in the work, see Table below, which include national laboratories, universities, and industries.

INSTITUTIONS PARTICIPATING IN U.S. WORK ON ITER

National Laboratories
- Argonne National Laboratory
- Idaho National Engineering Laboratory
- Lawrence Berkely Laboratory
- Lawrence Livermore National Laboratory
- Los Alamos National Laboratory
- Oak Ridge National Laboratory
- Pacific Northwest Laboratory
- Princeton Plasma Physics Laboratory
- Sandia National Laboratories, Albuquerque
- Sandia National Laboratories, Livermore

Universities
- Cornell University
- Georgia Institute of Technology
- Massachusetts Institute of Technology
- New York University
- Rensselaer Polytechnic Institute
- University of California at Los Angeles
- University of Illinois
- University of New Mexico
- University of Texas, Austin
- University of Wisconsin

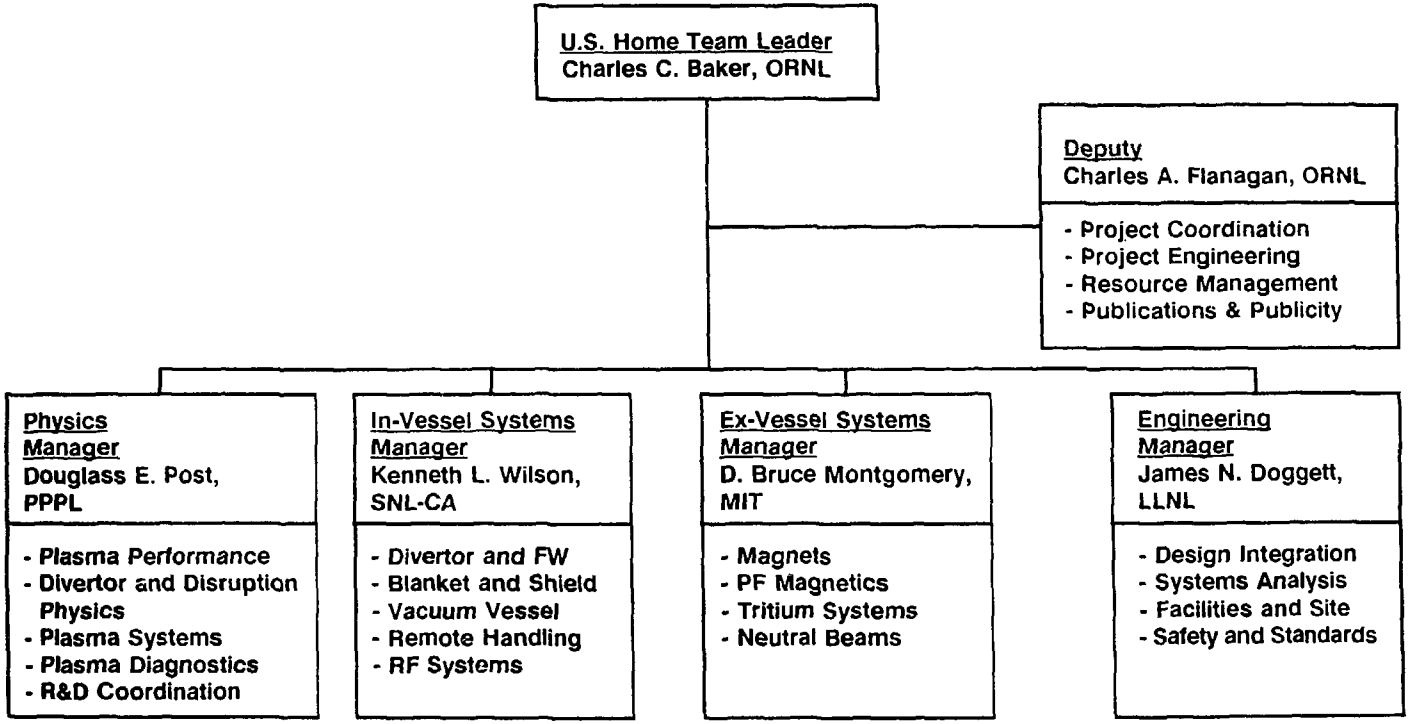
Industries
- CIMCORP Precision Systems, Inc.
- Ebasco Services, Inc.
- General Atomics
- General Dynamics
- Grumman Aerospace Company
- McDonnell Douglas Aerospace
- Pitt Des Moines, Inc.
- Rockwell International
- Westinghouse Electric Corporation

The U.S. Home Team Management organization is shown in the figure overleaf. The technical managers and task area leaders (identified in the figure overleaf by task area positions underneath each technical manager) support the U.S. Home Team Leader and operate nationwide from their home institution.

The U.S. Home Team Leader is Charles C. Baker, Oak Ridge National Laboratory (ORNL), who is responsible to OFE for planning and co-ordinating all ITER technical activities within the U.S. and who is responsible to work with the ITER Director and the Joint Central Team (JCT) on all ITER tasks assigned to the U.S. The Deputy Home Team Leader is Charles A. Flanagan, ORNL, who co-ordinates the U.S. ITER Project Office and the resource management.

The technical activities are co-ordinated by four technical managers supported by task area leaders in each technical area. These individuals integrate and co-ordinate all ITER tasks assigned to the U.S. Home Team. The Physics Manager is Douglass E. Post, Princeton Plasma Physics Laboratory, who is responsible for the physics functional task areas shown. The In-Vessel Systems Manager is Kenneth L. Wilson, Sandia National Laboratories California. This technical area includes those systems and components nominally located inside the vacuum vessel, along with closely allied systems and components. The Ex-Vessel Systems Manager is D. Bruce Montgomery, Massachusetts Institute of Technology. This area includes technical systems and components nominally located external to the vacuum vessel. The Engineering Manager is James N. Doggett, Lawrence Livermore National Laboratory, who is responsible for overall design integration and systems analysis, as well as safety and standards. He also co-ordinates all U.S. efforts associated with nomination, selection, and secondment of U.S. personnel to the JCT. The cognizant task area leader positions

U.S. HOME TEAM MANAGEMENT AND TASK AREA LEADER POSITIONS



are as indicated in the figure on the previous page. The task area leaders assist the cognizant technical manager in planning, co-ordinating, and reporting on task assignments. Most of the task area leader positions are fractional to full-time (10% to 100%) positions and are technical working positions rather than management positions. Each task area leader maintains cognizance over the work in his area of responsibility, independent of the institution where the work is done.

Two advisory committees provide counsel to the U.S. Home Team Leader. The ITER Steering Committee - U.S. (ISCUS) comprises representatives from the major research laboratories and universities in the U.S. The Chair of ISCUS is Weston M. Stacey, Georgia Institute of Technology. This committee meets approximately bi-monthly and provides technical and programmatic advice to the U.S. Home Team Leader. A second advisory committee is the U.S. ITER Industry Council (IIC) which comprises approximately 12-15 senior management posts from energy-related industries. The Council provides the U.S. Home Team Leader advice on policy issues relating to industrial participation in the ITER project. The Chair of the IIC is Harold K. Forsen, Bechtel Corporation. This committee meets approximately three times a year.

A wide range of ITER-related design (physics and engineering) and research and development (R&D) tasks are actively underway in the U.S. The areas include the physics, engineering, and technology required to proceed with ITER.

Major contributions to the physics database and understanding necessary for the efficient, confident design of ITER are coming from experiments at five major research facilities (TFTR, DIII-D, Alcator C-Mod, PBX-M, and TEXT-U), and a substantial number of smaller laboratories and universities. Substantial support comes from the U.S. fusion institutions in the areas of theory and in those plasma technology areas which have a significant physics involvement. The U.S. program is focussed on resolving key physics issues of magnetic fusion: confinement, MHD equilibrium, stability including disruptions, alpha-particle physics, power handling and particle control, and plasma heating and current drive.

Major technology programmes are underway in a number of diverse areas, including superconducting magnets; plasma facing components such as the divertor and plasma exhaust, and first wall; blanket and shield; fuelling; tritium systems; remote handling systems and components, vacuum vessel and associated systems and components; heating and current drive systems and components; diagnostics; and safety and environment. ITER engineering design and analyses are performed on essentially all of the indicated technology areas. The design effort also includes the associated design integration. A strong systems analyses activity provides important design insights on ITER-related issues.

In accordance with DOE guidelines to increase industrial participation in the Magnetic Fusion Energy Programme, considerable progress was made during the past year to enhance participation by industry in the ITER EDA. The U.S. Home Team established competitively awarded industrial contracts in five technology development areas with industry teams with expertise in the respective area. These contracts will result in a collaborative DOE laboratory/industry partnership in conducting the necessary technology development in these areas on tasks assigned by the JCT during the EDA. The five technology areas, the cognizant DOE laboratory, and the industry team members are shown in the table overleaf.

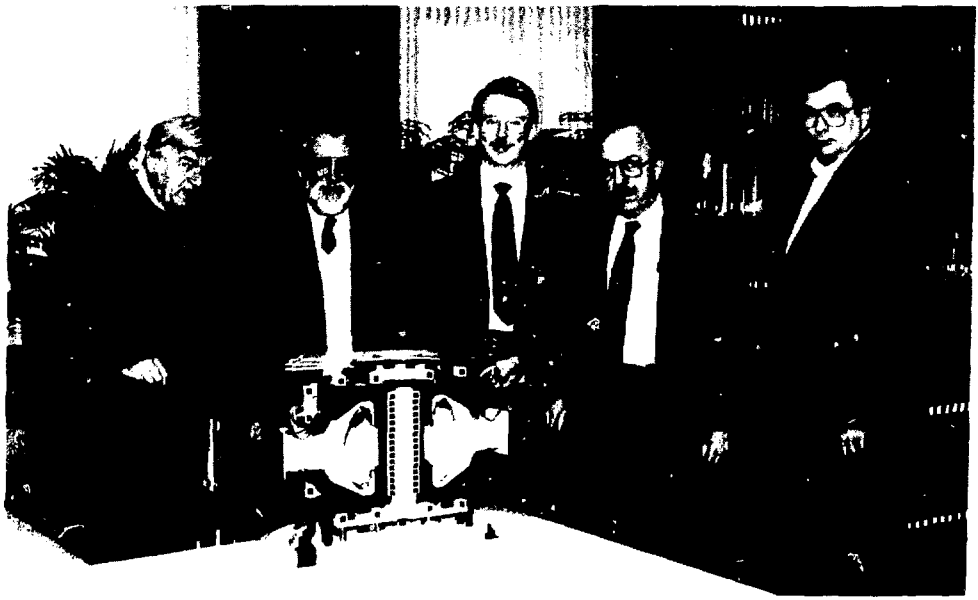
Similar teams will be organized in other technical areas, as needed. In addition, efforts are underway to establish a contract for broad-based design support from industry. The contracting institution for this effort is the Lawrence Livermore National Laboratory.

All of the ITER work is performed throughout the U.S. at the cognizant institutions. National U.S. Home Team meetings are held approximately three to four times a year to review and discuss present activities and to plan future work. Representatives of the involved U.S. institutions attend these meetings, which enhance programme co-ordination and information exchange. Frequent smaller meetings are held among the cognizant technical personnel as necessary to accomplish assigned work tasks.

Technology Area	Contracting Institution	Industry Members
Magnets	Massachusetts Institute of Technology	General Dynamics, Westinghouse Electric Corporation
Plasma Facing Components	Sandia National Laboratory-Albuquerque and University of California at Los Angeles	McDonnell Douglas Aerospace, Ebasco Services, Inc., General Atomics, Rockwell International, Westinghouse Electric Corporation, University of Illinois
Blanket/Shield	Argonne National Laboratory	McDonnell Douglas Aerospace, Westinghouse Electric Corporation, University of Wisconsin, University of Illinois
Containment Structures	Oak Ridge National Laboratory	Pitt Des Moines, Inc., Grumman Aerospace Company
Remote Handling	Oak Ridge National Laboratory	Rockwell International, General Atomics, CIMCORP Precision Systems, Inc.

Extensive use is made of electronic communication including electronic mail on INTERNET (e.g. EUDORA) and facsimile transmission. A nation-wide electronic ITER-File-Sharing system is used which provides ITER participants instantaneous access to project information stored on the system, and which provides users the capability to easily exchange and transfer computer files.

ITER is a top priority programme within the U.S. Magnetic Fusion Energy Programme. The ITER efforts within the U.S. since the conclusion of the Conceptual design Activities at the end of 1990 have been to continue a strong national programme and to prepare fully to provide efficient and effective support to the Director and the JCT as the EDA programme is implemented.



Members of the U.S. Home Team

From left to right: James N. Doggett, LLNL, Engineering Manager; Charles A. Flanagan, ORNL, Deputy Home Team Leader; Douglass E. Post, PPPL, Physics Manager, Alexander J. Glass, LLNL, former U.S. Home Team Leader and present Member of MAC, and Charles C. Baker, U.S. Home Team Leader. Not shown are D. Bruce Montgomery, MIT, Ex-Vessel Systems Manager and Kenneth L. Wilson, SNL-CA, In-Vessel Systems Manager.

COMING EVENTS

- SWG-2 meets in Tokyo, Japan, 16-18 February
- Technical Meeting on Divertor Experiments, Garching, Germany, 25-27 February
- TAC meets in Garching, Germany, 15-17 March
- SWG-2 meets in San Diego, U.S., 18-19 March
- MAC meets in Garching, Germany, 24-26 March
- Technical Meeting on Vacuum Vessel and Blanket, Garching, Germany, 29 March-7 April
- The ITER Council meets in Tokyo, Japan, 21-22 April
- Technical Meeting on Plasma Control, Naka, Japan, 26-28 April
- Technical Meeting on Remote Maintenance, Standards and Quality Assurance, San Diego, U.S., 24-28 May