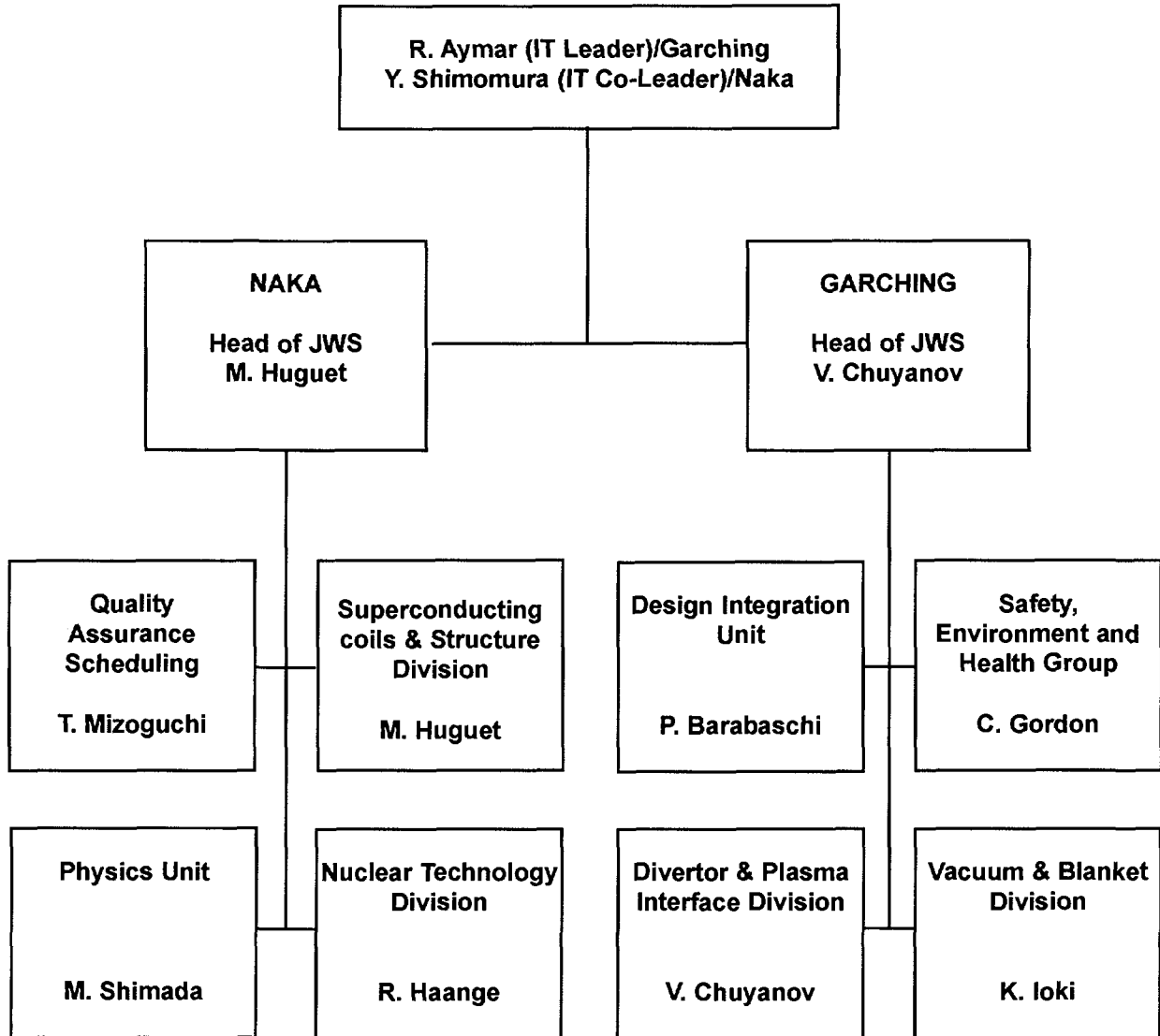




### ITER CTA International Team Structure



### START OF THE INTERNATIONAL TOKAMAK PHYSICS ACTIVITY

by Dr. D. Campbell, Chair, ITPA Co-ordinating Committee

As the ITER EDA drew to a close, it became clear that it was desirable to establish a new mechanism in order to promote the continued development of the physics basis for burning plasma experiments and to preserve the invaluable collaborations between the major international fusion communities which had been established through the ITER Physics Expert Groups. Prompted by Dr. H. Ninomiya of JAERI, representatives of the European Union, Japan, the Russian Federation and the United States began discussions, under the auspices of the respective fusion programme administrations, to establish a new framework for international collaboration on voluntary Physics R&D in support of the design of burning plasma experiments.

The result of these discussions is encapsulated in the "Agreed principles for conducting the International Tokamak Physics Activity (ITPA)" appended to this report (see box overleaf). The implementation of this

### **Agreed principles for conducting the International Tokamak Physics Activity**

The International Tokamak Physics Activity (ITPA) aims at cooperation in development of the physics basis for burning tokamak plasmas. The ITPA continues the tokamak physics R&D activities that have been conducted on an international level for many years resulting in achievement of a broad physics basis useful for all fusion programs, for the ITER design, and for general tokamak research worldwide.

With the introduction of the ITER project, these activities were focused on the ITER Physics R&D activities, which have been well organized and successfully conducted to develop the physics basis for the ITER design and to coordinate general tokamak research worldwide. Further development of these voluntary physics activities is important to continue an internationally coordinated approach to tokamak research and to advance the databases for future burning plasma research, including ITER.

The ITPA shall consist in providing:

- validated experimental data according to an agreed format;
- analyzed results of experiments to advance understanding of fusion plasma physics;
- the organization, management, and updating of qualified databases;
- theoretical models and simulation results to explain and reproduce experimental results;
- studies of fusion plasma performance in burning plasma tokamak devices, such as ITER; and
- identification and resolution of key diagnostics issues which might arise both in plasma control and in analysis of a burning plasma experiment, such as ITER.

The International Fusion Research Council (IFRC) supports the ITPA, which is a joint activity of fusion programs in EU, Japan, RF, and US \* (the ITPA participants). The IFRC receives annual progress reports on the ITPA activity. The organizational structure of the ITPA consists of one Coordinating Committee and several Topical Physics Groups.

- The role of the ITPA Coordinating Committee is to oversee the Topical Physics Groups in conducting their tasks as described above. It is composed of three members from each participant. An additional three members can be also appointed from the ITER International Team (IT) through the participants. The Chairman of the Committee is selected from the Committee members by consensus. The Committee can select its secretary (or secretariat). The Committee holds at least one meeting per year.
- The Coordinating Committee shall determine the number and subject of the Topical Physics Groups. Each Group should coordinate tokamak physics research in its specific subject, analyze the database, carry out modeling, and develop materials for its report to the CC. The Coordinating Committee selects the chair and co-chair of the Topical Physics Groups. Each Group consists of 3-5 scientists per Participant, named by each Participants. The Groups may invite the participation of additional scientists, if necessary. Each Group holds an average of two meetings a year. Meeting locations and dates must be approved by the Coordinating Committee. The agendas of Group meetings can include physics issues specific to burning plasma experiments, including ITER. The Group should issue to the Coordinating Committee a succinct summary of each meeting promptly within two weeks after the Group meeting. Group activities should be reported at each meeting of the Coordinating Committee. Groups are encouraged to make their work available to the broader fusion community in a timely manner.

Each participant in the ITPA agrees to perform the following duties:

- Support the purposes, processes, and infrastructure of ITPA as described above.
- Host the meetings of the Coordination Committee and several Physics Groups alternately. No participation fee shall be charged. The host partner shall provide support of the meeting in terms of services such as conference room, computers with internet connection, secretarial support and other meeting arrangements.

The Coordinating Committee will consider the participation of additional participants and take actions based on readiness of that possible participant to satisfy the duties enumerated above.

\* The US activity in ITPA is carried out within the existing US bilateral agreements with Japan, European Union, and Russian Federation.

agreement has been supported by the International Fusion Research Council and the IEA Fusion Power Co-ordinating Committee. Representatives of the four participating fusion communities therefore assembled at the JAERI Fusion Research Establishment in Naka on 3-4 September 2001 in the first meeting of the ITPA Co-ordinating Committee in order to initiate the activity and to establish the necessary structures to pursue the goals of the ITPA.

In scope, the ITPA continues the tokamak physics R&D activities which were conducted successfully during the 1990's, which assembled a comprehensive physics argument for the construction of a burning plasma experiment based on the tokamak and which culminated in the publication of the ITER Physics Basis document in 1999. This extensive review has emerged as an important resource, not only for the ITER activity, but also for the broader magnetic fusion community. The Participants in the ITPA recognize the value of such international collaboration and consider that internationally co-ordinated research is necessary to advance the fundamental understanding and databases for future burning plasma research, including ITER.

The activities of the ITPA are implemented via seven Topical Physics Groups whose members are drawn from the Participants' fusion laboratories and the ITER CTA International Team (IT). It is the responsibility of the Topical Groups' members to maintain contact with the experimental and modelling activities within the Participants' fusion programmes, to disseminate progress in the programmes' fusion research activities within the ITPA and the broader fusion community, and to promote collaboration among the programmes. Topical Groups typically hold two meetings per year and provide reports on their activities to the ITPA Co-ordinating Committee.

The first meeting of the ITPA Co-ordinating Committee (CC) was convened to formalize the implementation of the activity. The members of the CC nominated by the Participants and the ITER IT are listed in the table below. The delegates were welcomed by Dr. H. Ninomiya, who hosted the meeting on behalf of JAERI, and who opened the meeting as Acting Chair. The members of the CC expressed their warm appreciation of Dr. Ninomiya's tireless efforts in support of the establishment of the ITPA.

#### Members of the ITPA Co-ordinating Committee

EU	JA	RF	US	ITER IT
D. Campbell ‡ F. Romanelli H. Zohm	H. Ninomiya ‡ S. Takamura* M. Wakatani ‡	N. Ivanov* ‡ S. Konovalov* S. Mirnov*	E. Oktay ‡ N. Sauthoff R. Stambaugh	R. Aymar* M. Shimada Y. Shimomura

‡ Participants' Contact Persons  
\* Did not attend first CC meeting

The CC agreed the structure of the Topical Physics Groups and, on the basis of nominations made by the Participants, selected Dr. D. Campbell (EU) as Chair and Dr. M. Shimada as Co-chair for the CC. On the same basis, it selected Chairs and Co-Chairs for the Topical Groups (see the table on the next page). Dr. M. Shimada, CC Co-Chair, was appointed as Secretary for the Co-ordinating Committee. The Secretariat will be responsible for managing the calendar of Topical Group Meetings and the approval of Topical Group Minutes. The CC also agreed that it is important to allow a range of experts from the Participants' fusion programmes to take leading roles in the ITPA as Chairs/Co-Chairs of the Topical Groups. The CC will therefore review these positions annually with the intention of rotating the Chairs/Co-Chairs appointments amongst the Participants' experts, with a typical timescale of several years.

The CC drafted the Charge to the Topical Groups (box on page 6), defining the general scope of the TG activities and their responsibilities within the ITPA. In particular, the need to focus the ITPA activity on burning plasma physics issues was confirmed. The CC recommended that, in framing their scope and tasks, the

### ITPA Topical Physics Groups and Chairs/Co-Chairs

	Chair	Co-Chair
<b>Diagnostic</b>	<b>Tony Donne (EU)</b>	<b>Alan Costley (IT)</b>
<b>Pedestal &amp; Edge Physics</b>	<b>Yutaka Kamada (JA)</b>	<b>Tom Osborne (US)</b>
<b>Divertor &amp; Scrape-Off Layer Physics</b>	<b>Nobuyuki Asakura (JA)</b>	<b>Bruce Lipschultz (US)</b>
<b>MHD, Disruptions and Control</b>	<b>Otto Gruber (EU)</b>	<b>Yuri Gribov (IT)</b>
<b>Confinement Database and Modelling</b>	<b>Wayne Houlberg (US)</b>	<b>Alexei Polevoi (IT)</b>
<b>Transport &amp; Internal Transport Barrier Physics</b>	<b>Edward Doyle (US)</b>	<b>Vladimir Mukhovatov (IT)</b>
<b>Energetic Particles, Heating &amp; Current Drive, &amp; Steady-State Operation</b>	<b>Claude Gormezano (EU)</b>	<b>Kenro Miyamoto (JA)</b>

TGs refer to the "Agreed principles for conducting the International Tokamak Physics Activity (ITPA)" for guidance in identifying the range of activities to be addressed: the TGs are expected to identify specific tasks in their fields of competence which can be implemented within the Participants' fusion programmes and which will promote the development of an improved physics basis for the design of burning plasma experiments. The CC requested that the TGs prioritize their activities into High Priority, Medium Term and Long Term. In particular, each Group should define a small number (=3) of High Priority Physics R&D Issues. These would provide a focus for the Topical Groups' activities in a timeframe of 1-2 years and should be determined on the basis of their likely importance both in increasing understanding of fusion plasmas and in providing increased confidence in achieving significant fusion gain in proposed long-pulse burning plasma facilities, as well as on the probability of achieving significant progress within this timeframe.

Dr. Shimomura, Co-Leader of the ITER IT, presented an overview of ITER status and plans. He emphasized that Physics R&D under the ITPA is considered an important element contributing to the continuing ITER studies during the CTA. The delegates briefly discussed current developments in relation to ITER and the design of other burning plasma devices.

Finally, the necessity of developing a general Physics Basis for burning plasma experiments from the existing ITER Physics Basis and Physics Guideline documents was agreed. It is intended to discuss this issue in detail, with the participation of Topical Group Chairs and Co-Chairs, at the next Co-ordinating Committee Meeting, to be held in San Diego on 1-2 March 2002.

An ITPA website has been established, where further information on developments in relation to the activity can be obtained: <http://www.aug.ipp.mpg.de/itpa/>.