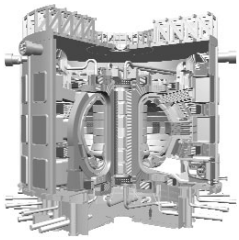

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SECOND MEETING OF THE ITER PREPARATORY COMMITTEE

By M. Drew, EU Contact Person for ITER Transitional Arrangements

The Committee charged to oversee the ITER Transitional Arrangements (ITA), the ITER Preparatory Committee, held its second meeting on 24 September 2003 at the JET Facilities at Culham, UK. Dr. Umberto Finzi of the European Commission was chairman.

This was the first such meeting since the formal accession to the ITER Transitional Arrangements of the three new participants to the ITER Negotiations – China, the Republic of Korea and the USA (see Newsletter issue No. 7, August 2003, Note by the Editor) – who thus were officially represented in the meeting for the first time.

The full list of the currently designated members of the Committee and its Contact Persons (CP) is shown below.

ITER Preparatory Committee Members

Canada
Mr. J. CAMPBELL
Dr. M. STEWART
Dr. K. MOSHONAS-COLE (CP)

China
Mr. JIN Ju
Prof. HUO Yuping
Mr. LUO Delong (CP)

European Union
Dr. U. FINZI
Dr. J.-P. RAGER
Mr. M. DREW (CP)

Japan
Mr. A. KITANI
Mr. S. OHTAKE
Dr. T. TSUNEMATSU (CP)

Republic of Korea
Mr. PARK J.-Y.
Dr. LEE G.-S.
Dr. HAN J.-H. (CP)

Russian Federation
Acad. E.P. VELIKHOV
(position vacant)
Dr. V. VLASENKOV (CP)

USA
Dr. N.A. DAVIES
Dr. M. ROBERTS (CP)

This meeting was also the first since the succession by Dr. Yasuo Shimomura to Dr. Robert Aymar as Interim Project Leader (IPL). Welcoming Dr. Shimomura in his new capacity, the Committee paid tribute to the outstanding contributions of his predecessor to the definition, design and promotion of ITER, and expressed the gratitude of all Participants to Dr. Aymar and its best wishes for future success in his new appointment.

The technical activities of the ITA were the main focus of the Committee's discussions. The Committee took note of the IPL's Status Report on ITA Technical Activities and endorsed the IPL's proposals for the top level structure of the International Team, including the designation of Dr. Pietro Barabaschi as Deputy to the IPL.

The Committee took note of the IPL's proposals on Participants' contributions to the ITA and of the Participants' stated intentions and expectations in this regard. Several Delegations pointed out that access to necessary resources would depend strongly on progress made towards the Agreement. All Participants were invited, in the shared interests of the project, to respond constructively to the specific technical areas where the IPL reported a lack of resources.

Following a presentation from the IT on Project Management Tools, the Committee expressed support, in general, for the proposed strategy designed to provide the current team with the CAD and Data Management elements necessary to prepare for an efficient start of ITER construction, and asked the IT Leader to report on an estimate and time profile of expenditure during the period to mid-2004.

Dr. David Campbell, Chairman of the International Tokamak Physics Activities (ITPA) Co-ordinating Committee, gave a presentation on ITPA Support for the ITER ITA. The Delegations recognized the central role of the IPL in assessing the relevance to ITER of proposals under the ITPA. Some Delegations said that they would like to have a positive assessment by the IPL of proposed meetings of the ITPA and its Topical Groups as a precondition of their support within the ITER framework. The IPL was invited to assess future proposals for ITPA meetings for this purpose.

The Committee supported the proposals to re-establish the ITER Test Blanket Working Group.

The US Delegation outlined its view of the need for a comprehensive review of the project baseline to take place under the Nominee Director General so as to provide a reliable basis for the start of physical construction, and for the related requests for funding. In the US view, the ITER Preparatory Committee should have a role in the coming year in overseeing the preparation for such a review; similarly the Committee should have a role in overseeing the development of the Project Risk Management Process and tools, given the critical importance of cost control.

The Committee agreed that the phasing of planned future financing should be further discussed among the Participants with a view to establishing as far as possible a common basis for the start of ITER construction.

Finally the IPL was asked to estimate the project's needs for cash to support common expenses over the coming two years and to report on this matter to the next meeting, which has been set tentatively to take place in the margins of N-10.

TENTH NEGOTIATORS' STANDING SUB-GROUP (NSSG-10) AND RELATED MEETINGS

by M. Drew, EU Contact Person

The Tenth Meeting of the ITER Negotiators' Standing Sub-Group (NSSG-10) and related meetings were held during the period 18–27 September 2003 at Culham, UK, at the kind invitation of UKAEA-Euratom, who

Topical Working Groups in support of ITER NSSG-10

Intellectual Property Rights (IPR)
ITER Staffing
Procurement Allocation
Decommissioning, Funding Aspects
Project Resource Management Regulations
Drafting Group for the Agreement and Related Instruments

Participants at the Meeting

placed their JET meeting facilities at the disposal of the Sub-Group and its Topical Working Groups. The European Union hosted the meeting, which was also attended by delegations from Canada, China, Japan, the Republic of Korea, the Russian Federation and the USA.

The meetings followed the now usual format of a series of meetings of specialist Working Groups each focussing on a specific aspect of the joint implementation of ITER (see box on the previuos page) followed by the plenary meeting of the NSSG. With many of the members of the ITER Preparatory Committee present, the opportunity was also taken to hold the second meeting of the Committee (see previous article).

Over the course of seven days the Working Groups met, at times in parallel sessions, to make progress in their respective topic areas. The work of each group was led by a rapporteur, who subsequently presented the group's findings and recommendations to the NSSG as a whole for consideration and guidance.

The focussed discussion enabled further good progress to be made in developing the many different elements that will be involved in the joint implementation of ITER. In particular the discussions on procurement allocation reached the stage at which it was possible to charge the NSSG Moderator to transmit to the Participants at a high level an agreed proposed allocation among the Parties of responsibilities to procure and contribute in kind the various systems and components for ITER construction. The proposed allocation is well defined up to the current limits of understanding on cost sharing and includes areas of flexibility to allow a full matching to the definitive cost sharing as and when it is finally agreed.

The results of the meeting are to be presented to the next meeting of the Negotiators scheduled for mid-November in China.

FIFTH MEETING OF THE ITPA TOPICAL GROUP ON DIAGNOSTICS

by Drs. A.J.H. Donné, FOM Institute for Plasma Physics Rijnhuizen, and A.E. Costley, ITER International Team

The Fifth Meeting of the International Tokamak Physics Activities (ITPA) Topical Group (TG) on Diagnostics was held at the Ioffe Educational Center in St. Petersburg, Russian Federation from 16 to 18 July 2003. The meeting followed the 30th EPS Conference and was combined with a joint meeting of all ITPA TGs dedicated to plasma control which was held on 14 July, and with a progress meeting on diagnostic developments ongoing in the Russian Federation which are relevant to ITER and more generally to burning plasma experimental (BPX) devices. About 40 participants attended the ITPA Diagnostics and/or progress meetings and all four ITPA partners were well represented. For the first time an observer from China attended the Diagnostics TG meeting.

The key topics reviewed and discussed at the TG meeting were:

- detailed measurement requirements for ITER along with their justifications;
- overall status of diagnostic development for ITER;
- progress in the research on the designated high priority topics;
- progress with some key BPX/ITER relevant diagnostic developments in progress in the ITPA participant laboratories;
- progress and plans for the work of the specialist working groups;
- status and plans for the International Diagnostic Database.

Good progress has been made in the tasks designated as high priority:

1. New concepts were presented for the vertical viewing neutron camera. This device is required to enable an independent measurement to be made of the alpha particle birth profile. Conventionally this measurement is made with a radial and a vertical view neutron camera, but on ITER the coverage of the radial camera has been limited and severe interface difficulties have been experienced in the implementation of a camera viewing from above the machine. The proposal to extend the radial neutron camera utilizes additional compact in-plug collimators and detectors that mainly sample the upper and lower regions of the plasma. Together with the existing radial views, about 90% of the plasma is now covered. The new concepts for the vertical viewing camera are a reduced scale camera viewing from above, and a compact camera viewing from within a divertor port. The preliminary work on these concepts was reviewed.

2. Much progress has been made in the possible impact of the radiation induced electromotive force (RIEMF) on the performance of magnetic coils made from mineral insulated cables. Recent reactor tests in the Japanese Material Test Reactor (JMTR) have indicated that thermoelectric effects, enhanced by radiation (RMTV), are comparable to or even dominate the net RIEMF contribution to the coil voltage. In principle, the contribution of RMTV can be reduced by changing coil construction to improve cooling. A temperature difference over the coil of ~1 – 2 K (as opposed to the present 100 K) may be low enough that the residual RMTV is negligible, at least for some materials. Such a temperature difference may be achievable for ITER by using, for example, a copper matrix. This is in any case necessary to guard against a variety of thermomagnetic effects, which have been calculated to be of similar magnitude. Changing the cable composition and geometry to be more stable against high energy neutron damage and/or to have lower transmutation effects can also reduce the impact of RMTV.

3. An initial investigation has shown that many of the measurement requirements for operating in Advanced Tokamak (AT) mode are already reasonably well covered in the present ITER measurement specifications. The most critical items are the measurement of the different components of ?, the gradients in a number of parameters as well as the possibility to match the flexibility in shape control, especially at the top of the plasma. Work on the measurement requirements and justifications for ITER are in progress.

4. New data were presented on the effects of erosion and deposition on first mirrors. The list of suitable materials for first mirror fabrication is becoming longer. Experimental investigations of the behaviour of first mirrors in several fusion devices have started and more are being prepared. The analysis of the composition of contaminating carbon-based deposit on stainless steel mirror samples exposed during a recent experimental campaign inside the T-10 vacuum vessel has been completed. Some interesting and

relevant tests have recently been carried out on NSTX, where a quartz balance has been exposed to the plasma and the net layer deposited per shot determined. In most cases material was deposited typically at the rate of 0.2 nm per second of exposure to the plasma but in disruptive shots it was observed that deposited material was removed at the enhanced rate of 22 nm/s.

5. In the field of alpha particle diagnostics, extensive calculations were presented on the feasibility of the various wavelength options for collective ion Thomson scattering (CTS) in ITER. CTS would measure the confined fast ions and specifically the alpha particles.

The parties reported steady progress for many diagnostic techniques that are relevant to a BPX. A productive progress meeting on ITER/BPX relevant diagnostic developments in the RF was held with many contributions reporting good progress, for example advances in the design of the divertor Thomson scattering system, development of vacuum photodiodes for soft X-ray tomography, and development of the waveguide and antennas for the microwave reflectometer. The Specialist Working Groups (SWG) reported good progress in their specific fields since the previous meeting. The SWG on Radiation Effects was urged to further develop the Radiation Effects Database. The charter for a new SWG on Beam-Aided Spectroscopy and NPA was accepted.

Since the 4th meeting of the Topical Group on Diagnostics, in total 34 new diagnostics have been added to the International Diagnostic Database (IDD). In particular, the many new diagnostics added by the TORE SUPRA team should be highlighted. The database, which is now password protected, contains information on 239 diagnostics. Addition of information on new diagnostics and information updates for diagnostics that are already in the database continue to be actively stimulated.

An outline proposal for the diagnostics sections in the Tokamak Physics Basis was discussed and the preliminary authorship for the various sections proposed.

It is proposed to hold the 6th meeting of the ITPA TG on Diagnostics at JAERI, Naka, in the week 16–21 February, 2004, with a second stage in San Diego immediately after the High Temperature Plasma Diagnostics Conference (19–22 April). Dedicated sessions on ITER/BPX relevant diagnostic work in progress in Japan and the USA will be included. A special session on active spectroscopy for ITER/BPX devices will be included in the meeting held in San Diego.

Participants at the Meeting

Both meetings ran very smoothly and the participants are grateful to the Ioffe Institute for its hospitality. They express their explicit gratitude to Drs. Boris Kuteev and Sergei Lebedev and the Ioffe staff for their care and attention to all the meeting arrangements.

Members of THE Topical Group on Diagnostics

Rejéan Boivin (GA, USA)
Alan Costley (ITER IT, Naka, JA)
Tony Donné (FOM, Netherlands, EU)
Hans Hartfuss (IPP-MPG, Greifswald, EU)
David Johnson (PPPL, USA)
Yasunori Kawano (JAERI, JA)
Anatolij Kislyakov (Ioffe, RF)
Anatolij Krasilnikov (TRINITI, RF)
Yoshinori Kusama (JAERI, JA)
George McKee (GA, USA)
Richard Pitts (EPFL, Switzerland, EU)
Mamiko Sasao (NIFS, JA)
Fernando Serra (IST, Portugal, EU)
Vyacheslav Strelkov (Kurchatov, RF)
Tatsuo Sugie (ITER IT, Naka, JA)
Konstantin Vukolov (Kurchatov, RF)
Victor Zaveriaev (Kurchatov, RF)

Guests and Attendees at the Topical Group Meeting

Tom Casper (GA, USA)
I. Chugunov (Ioffe, RF)
Ivan Duran (IPP-CSA, Czech Rep., EU)
Basilio Esposito (ENEA, Italy, EU)
Ruggero Giannella (CEA, France, EU)
Alexey Gorshkov (Kurchatov, RF)
Nick Hawkes (UKAEA, UK, EU)
Manfred von Hellermann (FOM, Netherlands, EU)
Christian Ingesson (EFDA-CSU, EU)
Kiyoshi Itami (ITER IT, Naka, JA)
Takahi Kondoh (ITER IT, Naka, JA)
Artur Malaquias (IST-Lisbon, Portugal, EU)
Yudong Pan (Southwestern Inst., PRC, Observer)
Alexey Petrov (TRINITI, RF)
Michael Petrov (Ioffe, RF)
Genadiy Razdobarin (Ioffe, RF)
Joaquin Sanchez (CIEMAT, Spain, EU)
Dan Sporea (Inst. Atomic Phys., Romania, EU)
Sergey Tugarinov (TRINITI, RF)
Vladimir Vershkov (Kurchatov, RF)
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