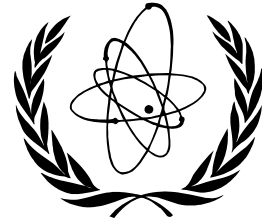


ITER CTA NEWSLETTER



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MEETING OF THE ITER CTA PROJECT BOARD

by Dr. V. Vlasenkov, Secretary, Project Board

The meeting of the ITER Co-ordinated Technical Activities Project Board took place in Tokyo, Japan, on 21 January 2002, coinciding with the second Negotiators meeting (N2). Twelve participants, Project Board Members and experts from Canada, the European Union, Japan, the Russian Federation and the International Team attended the meeting. The Leader of the Canadian Participant Team, Dr. P. Barnard, was represented by Dr. M. Stewart.

The Project Board noted with satisfaction that ITER project activities are funded in the Russian Federation until 2005 and are planned in the European Union until 2006 (subject to final adoption of the sixth framework programme). The continued promotion of the ITER activities in Japan after the end of the CTA depended on making timely progress in the Negotiations.

The Project Board agreed to provide an R&D plan by June 2002, to be linked with the procurement allocation, for the period following the CTA.

The ITER International Team Leader developed a proposal on establishing the Working Groups for drafting technical specifications for the most urgent procurement items. The Participant Team Leaders identified the



Participants in the Meeting

members of these groups, as appropriate for each item. The list of the most urgent procurements items, coinciding with the list of the Working Groups, is as follows:

- Conductors
- Toroidal Field Coils Windings
- Toroidal Field Cases and Structures
- Poloidal Field Coils Windings
- Vacuum Vessel, Blanket Manifolds, Blanket Attachments and Supports
- Vacuum Vessel Port Stubs
- ITER Site Facilities (Tunnels, Fences, and Interfaces with Environment)
- Concrete Buildings
- High-Voltage Alternating Current
- Steady-State Power Supplies
- Large Piping for Cooling Water
- Cryogenic Halls - PF Coils Fabrication

The Project Board took note of the table of preferred procurement items as developed during the NSSG-1 and agreed that, if requested, it will be able to provide further technical assistance to aid the Negotiators in the sharing of procurements amongst the Participants.

The Project Board took note of the statements of the International Team and the Participant Teams' Leaders on the review of the Project Management software packages. This investigation will continue.

In considering the issue of reduction of the decommissioning waste, as originally proposed by the Participant Team of Japan, the Project Board took note of the conclusions, presented by the International Team and the EU Participant Team Leaders. The analysis presented showed that the amount of waste, until about 100 years after shutdown, is mainly driven by the initial content of cobalt in the structural materials. According to both presentations, no substantial gains in the reduction of the decommissioning waste could be achieved at a reasonable cost. The Participant Team of Japan will review these presentations in detail.

The Project Board recognized the need to continue proper co-ordination amongst Participant Teams in the area of development of Breeding Blanket Test Programmes, possibly including demonstration of power generation.

MEETING OF THE ITPA TOPICAL GROUP ON DIAGNOSTICS

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

The First Meeting of the International Tokamak Physics Activities (ITPA) Topical Group (TG) on Diagnostics was held at the Ioffe Physical Technical Institute, St. Petersburg, Russian Federation, on 14-16 November 2001. In total 38 participants attended the meeting and all four ITPA partners (EU, JA, RF and US) were represented. This summary covers mainly the discussions at the TG meeting. The meeting immediately followed a Progress Meeting, held in the same location on 12-13 November 2001, on development efforts being carried out in the Russian Federation on diagnostics for ITER and burning plasma experiments (BPX).

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

- The mandate for the ITPA Diagnostic TG;
- the overall status of diagnostic development for ITER/BPX;
- the progress in the research on the designated high priority topics;
- the progress with some key ITER/BPX diagnostic developments ongoing in the ITPA participant laboratories;
- the progress and plans for the work of the specialist working groups.

The progress with the action items from the last meeting of the ITER Diagnostic Group (meeting number 14) was also reviewed. A proposal for the second meeting of the TG was developed.

The draft mandate for the TG was further developed and it was agreed that it would be finalized soon for submission to the ITPA Co-ordinating Committee.

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

1. New measurements of Radiation Induced Electro-Motive Force (RIEMF) in coils γ -irradiation indicate a manageable effect (in ITER) but the key test in a reactor (neutrons and γ s) remains outstanding. The Japanese participating party plans to carry out the test in 2002. Reactor tests on plain cable suggest that RIEMF is not a concern for large coils (e.g. saddle loops).
2. In general, the measurement of $q(r)$ on a BPX is considered a very difficult but important task that is presently not well covered, and so the development of new techniques that would demand less access and be more rugged in a reactor environment is being encouraged. Progress has been made in the implementation of the systems planned for measuring this parameter on ITER, e.g. the Poloidal Field Polarimeter and the Motional Stark Effect system. This progress was reviewed.
3. The requirements for plasma and target measurements in the ITER divertor region have been further developed in collaboration with the ITPA Scrape-Off Layer and Divertor Physics TG. Changes to the measurement requirements for a number of the parameters have been proposed. The requirements will be reiterated within the Diagnostics TG and then fed back to the Divertor TG.



Participants in the Meeting

4. Progress has been made with the plasma facing mirrors for optical systems. Key developments include the location of a source of large area, single crystal stainless steel for mirrors. These mirrors are very resistant to erosion caused by sputtering and can be made in sizes up to 12 cm diameter. Good results have also been reported for mirrors made from metallic coatings such as Mo and Rh. However, deposition of divertor and wall material on diagnostic mirrors remains a potential problem and dedicated experiments, especially with mirrors mounted in the divertor region of existing machines, are required in order to build a database and to test models of the process.

It was agreed that the above four topics are to be maintained as high priority in the proposal to the ITPA Co-ordinating Committee. Furthermore, it was proposed that the development of diagnostic techniques for the measurement of confined and escaping alpha particles should be added to the list of high priority issues. Measurements of alpha particles are judged essential in the evaluation of the performance of a BPX plasma but as yet there are no developed techniques that could be implemented on a BPX. However, some promising concepts exist.

Steady progress continues in the investigation of radiation effects in candidate materials for diagnostic construction. For example, the identification of a low loss quartz glass (KS-4V and KU-1) that has a very low radiation induced loss means that refractive optics can be used inside the vacuum vessel in some situations, thus considerably simplifying the optical designs. Fluoride glass, which might have some specific advantages, is presently under experimental investigation. For fibre optics, H₂-hardening leads to a factor of 10 improvement in terms of radiation-induced absorption (RIA). Tests on some specific components are also in progress.

The International Database on the Reliability and Availability of Diagnostic Systems is now accessible via the internet. Since the last meeting of the Expert Group on Diagnostics, a number of new diagnostics have been added. Updating of the currently available information on 93 diagnostics from 11 different machines and the addition of information on new diagnostics will be actively stimulated.

The Parties reported steady progress on many diagnostic systems that are relevant to a BPX, for example reflectometer measurements for the edge position (UCLA and ASDEX UG (IST-IPP)), measurement of plasma density by CO₂ laser polarimeter/interferometer (JT-60), control of long pulses (> 100 s (LHD)), and measurement of rotation velocities by Doppler reflectometry (W7-AS and TUMAN-3N).

The Specialist Working Groups, established by the ITER Expert Group on Diagnostics, reported on progress in their specific fields since the previous meeting. Because of the change from ITER Expert Group to ITPA Topical Group the mandate of the SWGs will be adapted and US members will be included in the groups.

A very productive Progress Meeting on the diagnostic development work in progress in the RF and relevant to the ITER Diagnostic Design and R&D and to BPX was held just before the TG Meeting in St. Petersburg on 12 - 13 November 2001. It was reported at that meeting that good progress had been made in many of the credited R&D and design activities and on BPX relevant topics.

Both meetings ran smoothly and the participants are grateful to the Ioffe Institute for its hospitality and express their gratitude to Dr. Anatoli Kislyakov and his colleagues for their care and attention to all the meeting arrangements.

It is proposed to hold the 2nd Meeting of the ITPA TG on Diagnostics at General Atomics in San Diego from 4 - 8 March 2002, immediately after the ITPA Co-ordinating Committee Meeting. The meeting will include a half-day joint session with the ITPA Scrape Off Layer and Divertor Physics Group on the specific divertor diagnostic issues and a one-and-a-half day session on US work in the field of BPX diagnostics.

Members of ITPA TG on Diagnostics present at the Meeting

Rejean Boivin (GA, USA)
Alan Costley (ITER Int. Team) **
Tony Donn  (FOM, Netherlands, EU) *
David Johnson (PPPL, USA)
Anatolij Kislyakov (Ioffe, RF)
Anatolij Krasilnikov (TRINITI, RF)
Francesco Orsitto (EFDA JET-CSU, EU)

Tony Peebles (UCLA, USA)
Mamiko Sasao (NIFS, JA)
Vyacheslav Strelkov (Kurchatov, RF)
Tatsuo Sugie (ITER Int. Team)
Konstantin Vukolov (Kurchatov, RF)
Victor Zaveriaev (Kurchatov, RF)

* Chairman of the TG
** Co-Chairman of the TG

Guests and other Attendees at the Meeting

Sergey Bender (Efremov, RF)
Victor Bulanin (Ioffe, RF)
Oleg Buzhinski (TRINITI, RF)
David Campbell (EFDA-CSU, Garching, EU)
Igor Chugunov (Ioffe, RF)
Ruggero Giannella (CEA, France, EU)
Manfred von Hellermann (FOM, EU)
Eric Hodgson (CIEMAT, EU)
Boris Kuteev (Ioffe, RF)
Tony Leonard (GA, USA)
Alberto Loarte (EFDA-CSU, Garching, EU)
Boris Lyublin (Efremov, RF)
Artur Malaquias (ITER Int. Team)

Alexander Medvedev (Kurchatov, RF)
Per Nielsen (RFX, Italy, EU)
Alexei Petrov (TRINITI, RF)
Gennady Razdobarin (Ioffe, RF)
Joaquin S nchez (CIEMAT, EU)
Alexander Shevelev (Ioffe, RF)
Leonid Shmaenok (Phystex, Netherlands, EU)
Sergei Tugarinov (TRINITI, RF)
George Vayakis (ITER Int. Team)
Vladimir Voitsenya (KPTI, Ukraine via RF)
Chris Walker (ITER Int. Team)
Ken Young (PPPL, USA)

Items to be considered for inclusion in the ITER CTA Newsletter should be submitted to B. Kuvshinnikov, ITER Office, IAEA, Wagramer Strasse 5, P.O. Box 100, A-1400 Vienna, Austria, or Facsimile: +43 1 2633832, or e-mail: c.basaldella@iaea.org (phone +43 1 260026392).

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