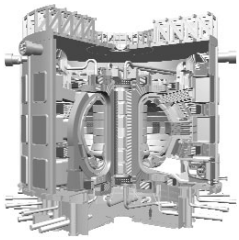

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COMMON MESSAGE FROM THE THIRD PREPARATORY MEETING FOR ITER DECISION MAKING

Vienna, 18 June 2004

Delegations from China, the European Union, Japan, the Republic of Korea, the Russian Federation and the United States of America met at the IAEA Headquarters in Vienna on 18 June 2004 to advance the ITER Negotiations.

The two potential Host Parties, the European Union and Japan, presented their positions, taking account of recent bilateral discussions on a broader approach to realizing fusion energy. The Parties noted that the contents of these offers were essentially symmetrical and showed a readiness of each of the potential Host Parties to contribute significantly to the realization of elements of the Broader Approach other than ITER in addition to their contributions to ITER itself.

All Parties stressed the urgency of reaching a rapid resolution of the siting issue so as to move forward to implementation of ITER in a framework of international collaboration.

ITA TECHNICAL ACTIVITIES STATUS REPORT

by Dr. Y. Shimomura, ITER Interim Project Leader

This note summarizes the progress made in the technical work of the ITER Transitional Arrangements in the period between September 2003 and June 2004.

Design

Detailed design work has continued with very much reduced resources to try as much as possible to prepare for an efficient and smooth transition to the construction phase.

Two formal technical coordination meetings (TCMs) have taken place in this period. The decisions have been shared with the Participant Teams (PTs). The main issues involved port allocation for diagnostics, cryostat helium pumping, gas and pellet injection systems, blanket gaps, and machine assembly procedure.

Update of Baseline Documents

Since the 2001 Final Design Report (FDR), the ITER design has evolved in detail to resolve issues, reduce costs, define details, and improve margins. Developments have been documented in the TCMs as well as reported to the PT Leaders and to the Preparatory Council (PC).

To prepare coherent ITER Design Baseline Documentation for a smooth transfer of responsibilities to the new organization, a large part of the ITER FDR documentation has been updated to a greater or lesser extent following the established design QA procedure. A new configuration-control document, the PID (Project Integration Document), has been made by combining the previous PDD (Plant Design Description) and DRG1 (Design Requirements and Guidelines Level 1).

The work is expected to be gradually completed by the summer.

Risk Management Plan
A risk management plan has now been developed for ITER. This has been added to the ITER baseline documentation structure and will be part of the main project management. For its timely and effective implementation some dedicated and experienced manpower is now needed.

ITER Baseline Web Site
The ITER Baseline web site (http://www.iter.org/bl) has been improved and extended to be available for all PTs. It is frequently updated to show the current status of the ITER design and news about the design baseline, design review meetings, TCMs, design change requests, etc. When the updating of the ITER Design Baseline Documents is complete, it will be made available on this site. A Design Integration Division/Design Office (DI-DO) section has been set up with more limited access for day-to-day interactions on design integration and configuration studies.

Preparation of technical specifications
Work has continued on the preparation of the procurement specifications for long lead items. The progress of some, especially for the vessel and site & buildings, is behind schedule due to lack of resources, particularly from industry, with the delay of a site decision also contributing.

For the site and buildings (particularly the tokamak complex), work is progressing at both the Garching and Naka JWSs with the aim to have available completed models by the end of this year. In parallel, a draft technical description on a room-by-room basis is being prepared with some key areas developed in more detail (e.g. port cells and vault).

Task Agreements
A number of task agreements have been made between the International Team (IT) and the PTs, particularly concerned with R&D on manufacturing processes and/or necessary preparation for writing procurement specifications. The current status is summarized in Table 1. Table 2 shows the allocation of the Task Agreements in various areas. Further new tasks (i.e. CN-7, JA-20, KO-4/6, RF-12 and US-12) have been supported by the PT Leaders at the IT/PT Leaders meeting in June.

Table 1. Status Summary of Task Agreements (1 June 2004)

	CN	EU	JA	KO	RF	US
TA Completed	0	0	2 + 4*	0	0	0
TA On-going	7	29	11	0	27	7
New TA issued to PT	1	4	0	0	1	0
Tasks under proposal	12	36	20	12	19	12

* Final Reports under assessment.

International Team Status
The IT at the beginning of June 2004 consisted of 69 professionals, 60 of whom are assigned long term, and the remainder are visiting researchers working or visiting part-time. 37 are at the Garching JWS and 32 at the Naka JWS.

Under these circumstances, development of a comprehensive work programme cannot be achieved. However, the ITA has been maintained as effective as possible in collaboration with the PTs, in particular by the use of Task Agreements. Nevertheless, there are still several areas with a serious lack of resources. The following positions must be filled urgently:

1 1 senior staff (DH) member in charge of the Nuclear Technology Division;
2 2 staff members in the field of “Codes and Standards”, including Quality Assurance, Design Criteria, Electrical Standards and Conformity Assessment;
3 3 staff members in the field of civil and layout engineering, including process piping, cabling, HVAC, etc.;
4 1 senior staff member to coordinate the integration of the heating systems;
5 1 staff member in charge of Scheduling-Project Management;
6 1 staff member in charge of CODAC;

7 1 staff member in charge of Risk Management;
8 1 staff member in charge of the tritium plant and its layout;
9 1 staff member in charge of the Cryostat detailed design;
10 1 staff member in charge of Divertor mechanical design.

Table 2. Allocation of Task Agreements by Area for each Participant at 1 June 2004

	CN	EU	JA	KO	RF	US
11 Magnets	4	3	4	0	7	4
15 VV	1	1	3	0	5	0
16 Blankets	1	1	1	0	2	0
17 Divertor	0	3	0	0	3	0
19 Plasma	0	0	2	0	2	0
22 Assembly	0	0	1	0	1	0
23 Remote Handlings	0	2	1	0	0	0
24 Cryostat	0	0	0	0	0	0
26 Water Cooling	0	1	0	0	0	0
27 Thermal Shield	0	0	0	0	1	0
32 Tritium Plant	0	2	3	0	0	0
34 Cryoplant	0	2	0	0	1	0
51 – 53 H & CD	0	1	0	0	0	0
55 Diagnostics	0	1	0	0	0	0
62 Buildings	0	3	2	0	0	0
73 Nuclear Analysis	1	0	0	0	1	0
74 Materials	0	3	0	0	2	1
81 Safety	0	5	0	0	2	2
93 Operation	0	1	0	0	0	0

Party-wise the contributions to the IT manpower are still very unbalanced amongst the Participants. The contributions by the new Participants, the CN, KO and US, are still very limited even though they joined the project more than a year ago.

The allocation of the Task Agreements amongst the Participants is unbalanced as well. However, CN and US have entered into Task Agreements with the IT and have been performing the tasks actively.

CAD and Document Management

In the CAD implementation, following the negotiation of an attractive price offer for software, a pilot phase has been undertaken to begin the transition from the use of CATIA V4 to V5 supported by Enovia VPM (as virtual product data manager). This has involved the training of 10 designers, managers and information technology staff, and the development of a software configuration suitable for ITER during construction. The positive results of this phase will allow (from the end of June) the CAD software and hardware upgrading at ITER (Garching and Naka), aiming at a full design office production using CATIA V5 before the end of 2004.

Regarding document management, pilot projects have been tested using several market-leading commercial products. It was recognized that the technology in this field is in very rapid change and that much (costly) customization was required from each of these commercial packages. Given the delay in the site selection, it has been decided to develop a pilot project with a different type of package (under development and testing)

based on ZOPE tools. Such a package offers the advantage of larger distribution (open source) and good compatibility with our needs, in particular in the area of content management. Results of the tests are encouraging, although the first general release for wide project use is still a few months away.

Codes and Standards (C&S)
The IT and the PTs met on May 17th and 18th, and agreed (a) the roles and responsibilities of the IT and PT in the establishment and management of C&S applicable to ITER, (b) the requirements and impact of the choice of C&S on the licensing and procurement processes, (c) future development needs in C&S, including their possible review and validation.

On the issue of responsibility it was agreed that the IT should act as a "proxy" for the future organization and hence ensure that the Project should maintain (and further develop) a C&S "Package" including QA, technical requirements and conformity assessment. It was also generally agreed that the role of the PTs rests with confirming the C&S package by (a) feeding back to the IT potential problems with local suppliers and, when also potential Host (EU, JA), (b) helping to identify potential obstacles that may occur with the regulatory body during licensing in the application of the ITER Project plans.

It was also generally agreed that the related manpower within the IT needs to be strongly reinforced to appropriately lead those needed development activities. These will be organized along two lines: overall C&S activity coordination (QA, CA and external panels), and technical coordination (design criteria, in-service inspection, etc.)

Common Expenses
In December 2003 the IT had provided the Parties with an estimate of expenses for 2004/5. The document remains valid other than that all dates have slipped by several months, with the exceptions where purchases, commitments or preparations have been made already from the indicated 2004 planned expenditure.

At Garching, equipment, software and training to a value of €314k has been purchased with support by the EU, mainly to cover the first phases of upgrading the CAD system, as well as the upgrading of the project firewall at Garching.

At Naka, the upgrade of CATIA from V4 to V5 and introduction of Enovia VPM have been requested to be implemented by July 2004, including necessary new hardware. In addition, the first phase of renewal of personal computers and of the teleconference equipment to enhance communication is also underway. Support for these items is expected from JA; the amounts are approximately ¥24.5M (~€190k).

If a further delay of the site decision occurs then, in addition to the present and the above support to Garching and Naka, the commitment of ~ €500k per 6 months will be necessary. If the decision is taken in the summer, the necessary expenditure for this year is estimated to be about 20% of the first one-year-budget, i.e. €2520k in addition to the above budget.

Future Network Connectivity Needs – GLORIAD
A document was distributed to the Parties in April in which the IT highlighted the needs for high speed communications between ITER field centers and the opportunity that the GLORIAD network could provide to that end. Given the relatively urgent need for high speed connectivity, the future ITER Parties were requested to indicate their readiness to join GLORIAD, either directly or by financing the ITER project to do so. Each Party should also undertake a technical and cost evaluation of the possibility to connect the potential location of their Field Center to the GLORIAD backbone touchdown points, assuming a bandwidth of ~70 Mbps at the end of 2004, ~300 Mbps at the end of 2005 and ~800 Mbps at the end of 2006. For the case of the Host Party these bandwidths would need to be multiplied by 3.

Travel support of members of the International Team
During the last two years support for travel for the RF members of the IT has been generally adequate in volume, and no travel problems to international events have been encountered as long as these could be planned a long time in advance. However, in cases when long term planning was not possible, such as internal IT meetings or meetings with PTs and industries, the procedure to obtain financial support from the RF took so long that, normally, participation of RF IT members had to be cancelled, at times with a significant loss for the Project. The situation may be improved by giving the IT leader the responsibility to directly take

decisions on the RF members' missions in the frame of the funds allocated for an integrated period of time (say, per 6 months). For JA IT members, the support for travel has been very tight and needs to be increased in order to permit efficient interactions with PTs and industries, and within the IT.

Testing Blanket Working Group (TBWG)
The TBWG was re-established in October 2003 with new members representing all six Parties and under new leadership. With six Parties and only three ports available a new approach is now needed to accommodate the interests of all the Parties, based on better integration and cooperation between Parties.

Up to now there have been two meetings of the TBWG, and the third meeting is planned for July 2004. During these two meetings the TBWG has reviewed conditions of the TBM testing on ITER and the Parties' plans for development and testing. Five working sub-groups have been created to analyse different technical options and to find areas of common interest and cooperation. The sub-groups submitted their reports to the second meeting of the TBWG in March 2004.

This work has allowed selection of the relevant options, preliminary allocation of ports, and led to the appointment of "port-masters" who, together with the IT, will define requirements on TBM systems, piping, coherence of testing in the port, and hot cell use, and report to the next TBWG meeting. The TBWG plans to finish its job with an integrated testing plan in the Spring of 2005.

Physics Status
The priorities for physics research in 2003–2004 as set forth by the ITPA Coordinating Committee, held in October 2003, will strengthen the physics basis of ITER, including new modes of operation that could be used to approach steady-state operation. Significant progress has been made in the preparation of the Tokamak Physics Basis for Burning Plasmas, an update to the ITER Technical Basis. Most of the sections have been drafted and reviewed.

Calculations of the fusion power and fusion gain dependence have been carried out by the IT for the case of reduced helium content. It was shown that reduction of the central He density to 3.5–4% could provide fusion powers ~ 500 MW with Q = 20 for the reference 15 MA case at a density of 85% of the Greenwald density.

"Improved hybrid" operation scenarios for ITER have also been analysed in the light of recent experiments, which show a 20% improvement over the confinement scaling used to define ITER at safety factors of 4–5. This operation regime could enable investigation of high Q at long pulse with benign ELMs. $Q > 20$ and a burn time longer than 1000 s are expected.

Steady state, weak shear, operation scenarios with NB (33 MW) + EC (20 MW) and $Q > 5$ have been analysed. This operation scheme could provide a potential scenario for steady state operation before the lower hybrid system is installed.

Diagnostics
Diagnostic work has continued in all the main technical areas: specific system design, integration and interface design, and guidance and support of design and R&D work ongoing in the PTs. As far as possible, attention is focused on implementation feasibility issues where these remain, and on areas where there is a mismatch between target measurement requirements and anticipated measurement performance.

A major undertaking since September 2003 has been the activity of the Diagnostic Working Group (see previous ITER ITA Newsletter). A technically feasible and costed set of port-based procurement packages has been developed along with a unique solution for procurement (one party per package and all packages allocated) that conforms to the targets for diagnostic sharing set by the ITER Negotiators. This is presently awaiting their approval.

Task Agreements for large Physics R&D
The coordination of work in the frame of the ITPA has led to many significant and ITER-relevant results. At the same time discussions have already taken place on ways to improve the link between ITER and the ITPA. Along these lines the execution of voluntary tasks for ITER does need a stronger formal definition and acknowledgement.

To that end, it is proposed that the "Task Agreement" system should be extended also to the key, particularly substantial cost, physics R&D activities directly contributing to ITER. In such a fashion it will be possible for the IT to better define the specifications of the R&D, including the deliverables. Similarly the Parties will be able to have a stronger accountability for research done in the name of ITER within their domestic programs.

THIRD MEETING OF THE ITER PREPARATORY COMMITTEE

by M. Drew, Secretary

The ITER Preparatory Committee (PC), the body that oversees the ITER Transitional Arrangements, held its third meeting on 22nd June 2004 at IPP Garching. The meeting was preceded one day before by a meeting of the Leaders of the International Team (IT) and of the six Participant Teams (PTs).

The IT Leader reported on the status of technical activities and on the IT/PT Leaders' meeting the day before.

- Participant Teams including those from the new participants in ITER expressed interest in undertaking new R&D task agreements. The EU PT said that, pending a more balanced distribution of resources it was not in a position formally to accept further Task Agreements although it would continue to consult with the IT in formulation and pursuit of ITER-related R&D and design work.
- The Participants undertook to assist the IT within their budget constraints, in filling, either by full assignment to the IT or by sending visiting researchers, .the urgent vacancies in the IT.
- The PC endorsed the actions being undertaken by the IT to update its CAD system and install a document management system, and agreed that contact persons be designated in the IT and PTs to ensure the important co-ordination of these developments throughout the Participants.
- The PC endorsed the agreement reached between IT/PT Leaders on Codes and Standards. This sets up an activity, under IT responsibility with invited PT experts, to consolidate a "Vacuum Vessel Code" which may be presented for endorsement to the ASME or directly used for licensing and shelves plans for a JAPT– ASME meeting on Codes and Standards in August this year.
- With regard to physics tasks for ITER, the PC agreed that there should be more formal definition and acknowledgement of large Physics Tasks for ITER and that the initiative should rest with the IT to propose specific design-oriented Physics Tasks.

Both current Joint Work Site hosts confirmed that, depending on the progress of the Negotiations and especially depending on the site decision and its consequences, they would be able to continue their current general level of support until the end of 2005 (EU) and March 2005 (JA). The PC noted that both hosts were supporting expenditure needed for the CAD upgrade at the sites. The possibility of establishing a joint fund as in the EDA for future common expenditures was raised; some difficulties were foreseen as to what could be done in the absence of a legal framework.

The IT explained that it foresaw a need during the construction and operation phase for reliable wide-band telecommunications linking the ITER Organisation, including Field Centres, and the Domestic Agencies, of the order 2 GbB/s at the ITER site and 1 Gb/s at other centres. The proposed development of the GLORIAD ring promised to offer a suitable backbone for such a network, assuming that the ITER Organization and the future Parties would secure appropriate local connections from their respective centres to the GLORIAD ring. The PC instructed the IT, in consultation with the PTs through designated contact points, to evaluate this approach in comparison with alternatives such as an ITER-dedicated network to be procured from the open market or from other sources.

The PC noted that the RF was expecting to make a presentation on fusion at Expo 2005 in Nagoya and agreed that this should be co-ordinated with any other Parties' planned inputs to the Expo on fusion-related matters.

The next meeting of the IPC would normally take place around the end of 2004, depending on the progress of Negotiations. If there were any significant developments to be addressed, it could be possible to organize a meeting for the margins of the IAEA Fusion Energy Conference in early November 2004.

Items to be considered for inclusion in the ITER ITA Newsletter should be submitted to C. Basaldella, 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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