

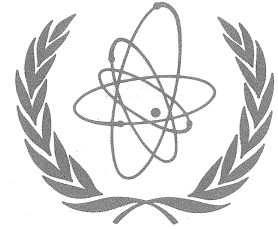
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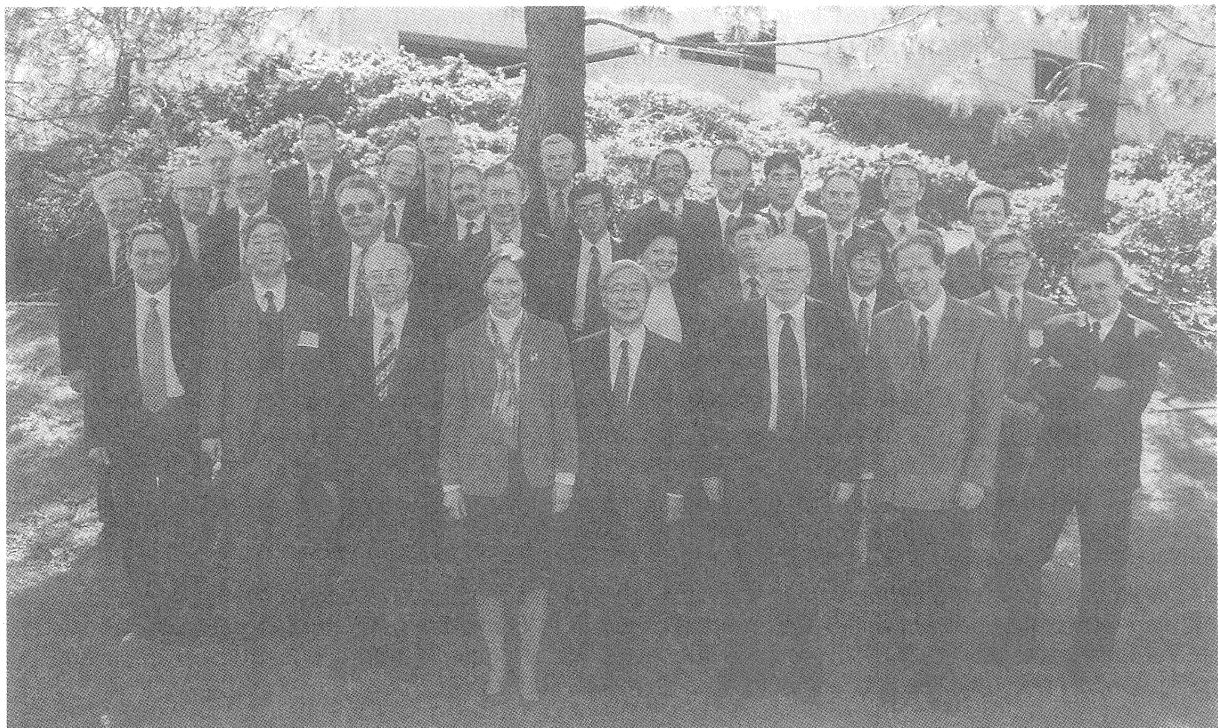
THIRTEENTH MEETING OF THE ITER COUNCIL (IC-13)

by Dr.M. Roberts, ITER US Contact Person

The Thirteenth Meeting of the ITER Council was held in San Diego, at the Joint Work Site, on February 18 and 19, 1998. The principal topics were the acceptance for domestic review of the Final Design Report and preparations for the intended extension of the ITER EDA Agreement for a three-year period.

The meeting opened with a brief summary of the status of the Parties' Explorations aimed at the possible extension of the Agreement. The Explorers, having just completed their Report consisting of two substantive documents, one entitled Draft Understandings Concerning the Extension of the Duration of the ITER EDA Agreement and the other entitled Draft Text of the Agreement extending the EDA Agreement, had agreed to transmit it to the Parties for their consideration.

With this positive start, the Council then heard a comprehensive report by the Director on the Final Design Report, Cost Review and Safety Analysis. (The article on the status of the ITER EDA as reported to the Council will be included in the next Newsletter Issue.) This report, complete with pictures of many of the key pieces of hardware coming from the R&D efforts, was followed by a report presented by the Chair of TAC on TAC's recent review of the FDR and of their favourable conclusions.



Participants in the Meeting

Position of the ITER Council concerning the possible extension of the Engineering Design Activities

Introduction

The overall programmatic objective of ITER is to demonstrate the scientific and technological feasibility of fusion energy for peaceful purposes. The purpose of the ITER Engineering Design Activities is to produce a detailed, complete and fully integrated engineering design of ITER and all technical data necessary for future decisions on the construction of ITER. Such design and technical data shall then be available for each of the Parties to use either as part of an international collaborative program or in its own domestic program.

The EDA has been successful to date in terms of achieving the scientific and technical results envisaged in the Agreement. The ITER design has been developed in compliance with its overall programmatic objective and the detailed technical objectives adopted by the four Parties in 1992 and as such serves as the reference design. While final features of this design depend on specific characteristics of the site at which ITER would be constructed, site requirements and site design assumptions have been established such that the design can be modified to allow ITER to be constructed in the territory of any of the Parties. The Council endorses TAC's favorable review of the reference design.

Shared Views

At this stage of the ITER EDA, the Parties' representatives at the ITER Council share the views that:

1. ITER's overall programmatic objective continues to be valid and central to the fusion energy goals of each Party.
2. The shared results coming from the ITER activities are of direct value to each Party's fusion energy goals.
3. Through participation in the ITER EDA, the ITER Parties have developed efficient modes of international collaboration in which each Party benefits greatly from the sharing of results.
4. There is a shared interest in jointly progressing further toward a possible decision on the construction/operation of ITER in a collaborative framework.
5. The central prerequisites for the decision in 4. above are:
 - 1) to have performed site(s)-specific adaptation of the design;
 - 2) to have provided the information such that the Parties can make their necessary, informed judgments on the regulatory environment for ITER construction, and
 - 3) to have provided, prudently in case the Parties would eventually be unable, for financial reasons, to proceed to the construction of the reference design, option(s) of the design whose cost would be reduced by reducing the detailed technical objectives and possibly decreasing the technical margins.
6. The ITER reference design provides the technical basis from which to address the points in 5. above.
7. Some Parties have expressed an intention to provide site characterizations for the purpose of pursuing site(s)-specific activities. The period required to complete such work is estimated to be three years from July 1998. To enhance the basis for a possible future construction decision, site(s)-specific and other activities should be undertaken in parallel.

8. The site(s)-specific activities are best undertaken on a joint basis in order to ensure that all Parties share fully the information relevant to a future construction decision and to exploit the opportunity presented by ITER for the Parties, should they so decide, to pursue jointly a harmonized approach to the regulatory frame of future fusion power plants.
9. The site(s)-specific activities and other technical and enabling activities are consistent with the purpose and scope of the ITER EDA Agreement, the extension of which would ensure continuity of effort and organizational structure and interactions. They would provide for completion of sites-specific designs as the basis for a possible decision on siting and construction.

Proposal

Pursuant to Protocol 2, Section 5, the ITER Council adopts the following proposal:

The ITER Council recommends to the Parties that a three-year extension of the ITER EDA Agreement is appropriate in order to provide the framework for undertaking jointly site(s)-specific and other activities with the aim of enabling future decision on construction and operation of ITER.

The Council commended the Director and the JCT for accomplishing the FDR and the accompanying technical documentation which are impressive both in technical quality and depth of detail. The Council also commended the Home Teams for their support of this accomplishment. The Council took note of the TAC Report and expressed satisfaction with the view of TAC that the ITER design fulfills the detailed technical objectives and cost target set for it and provides a technical basis sufficient to allow a construction decision to be taken immediately after the presently scheduled end of the EDA. The Council also expressed its appreciation to the TAC Chair and Members for their excellent work done to this point in the EDA period and extended particular thanks to the TAC Chair for his personal contribution to the success of the TAC activities.

Following these presentations and discussion, the Council accepted the FDR for consideration by the Parties, with a view to providing informal comments to the Director as soon as possible, leading to approval at IC-14.

In view of the significant progress made, the Council adopted a statement of position (see box above) concerning the present status and possible future development of the ITER EDA, and commended to the Parties a proposal for a three-year extension of the ITER EDA Agreement and for related draft understandings among the Parties. In particular, the Council took note of the Parties' expressions of intent to provide resources during the period of the EDA extension and of the Parties' acceptance of the Director's plan to consult with each Party, at the end of February, about possible changes in JCT membership.

At IC-12, it had been decided to ask the IAEA whether the Agency would be willing to continue its auspices into a possible extension period. At this meeting, the Council noted with appreciation the exchange of letters between the Council Chair and the IAEA Director-General confirming the IAEA's willingness to extend the duration of auspices for the ITER EDA and to continue to offer assistance to the ITER EDA as currently provided.

In anticipation of the Parties' agreement to the extension of the EDA for three years, the Council established a Special Working Group and approved its Charter for two tasks (see box overleaf). The SWG will be co-chaired by Prof. K. Pinkau (EU) and Dr. H. Kishimoto (JA). The Parties agreed to provide full designations of their representatives by the end of February.

The Council also requested the Parties, acting in consultation with the Director, to use best efforts to ensure acceptable information technology capacity, compatible with current standards, at the Joint Work Sites and the RF Design Centre.

SWG Charter

Recognizing that an ITER design which fulfills the overall programmatic objective of the EDA Agreement and the detailed technical objectives adopted by the four Parties in 1992 has successfully been developed and is documented in the Final Design Report,

reaffirming that the overall programmatic objective of ITER is to demonstrate the scientific and technological feasibility of fusion energy for peaceful purposes,

recognizing the crucial importance to the Parties' fusion programs of pursuing the joint activities during an expected 3-year extension of the EDA with a general intent to enable an efficient start of possible, future ITER construction at the end of this period, and in this regard recognizing the importance of pursuing preparatory efforts in all relevant domains, and

recognizing that, in case the Parties would eventually be unable, for financial reasons, to proceed jointly to the construction of the presently foreseen device, it is prudent to plan now to have available, at the time of decisions on construction, option(s) of ITER whose cost would be reduced by reducing the detailed technical objectives and possibly decreasing technical margins while maintaining the overall programmatic objective of ITER,

the ITER Council charges the Special Working Group (SWG) to carry out two tasks:

- 1) the SWG would propose technical guidelines for possible changes to the current detailed technical objectives and overall technical margins, with a view to establishing option(s) of minimum cost still satisfying the overall programmatic objective of the ITER EDA Agreement.
- 2) pursuant to Art. 2(e), the SWG would also provide information on broader concepts as basis for its rationale for proposed guidelines, and articulate likely impacts on the development path toward fusion energy.

The Director will assist the SWG. He, with the JCT and HTs, will be responsible for developing the actual design of the option(s) satisfying the guidelines adopted by the Council under proposal of the SWG.

The SWG is requested to report the result of Task 1 to the Council in time for the Director to examine the technical implications (design, technical margins, cost) of the option(s) and report back to the Council by IC-14 (July 1998). The SWG is requested to report the results of Task 2 to the Council by the end of 1998.

Each of the Parties shall, after consultation with the Council, designate its representatives, up to about five, to the SWG. The SWG will be co-chaired by Prof. K. Pinkau (European Union) and Dr. H. Kishimoto (Japan).

Turning to the future, the Council, upon invitation by the IAEA to meet in Vienna, agreed and planned to meet there, nominally in mid-July, but, if possible, on July 22-23, 1998. Furthermore, in view of the expected SWG Task 1 output [see Box 2] and the evolving procedures of the Parties for the extension of the ITER EDA Agreement, the Council considered that it may be appropriate to schedule a special meeting, possibly with reduced participation, in May.

In a related action outside of the ITER Council meeting, the Parties' representatives on ITER matters {J. Routti (EU), T. Imamura (JA), Yu. Sokolov (RF) and J. Decker (US)} initialled a statement commending the Draft Understandings Concerning the Extension of the Duration of the ITER EDA Agreement and the Draft Text of the Agreement extending the ITER EDA Agreement to their respective authorities with a view to appropriate and timely actions being taken to conclude a possible extension to the ITER EDA Agreement along the lines proposed.

THIRTEENTH MEETING OF THE ITER TECHNICAL ADVISORY COMMITTEE

by Dr. P. Rutherford, TAC Chair

The Thirteenth Meeting of the ITER Technical Advisory Committee (TAC-13) took place on 12-16 January, at the ITER San Diego Joint Work Site and was called to address the following charge from the ITER Council:

"The TAC is requested to conduct a thorough review of the technical basis for the Final Design Report, including safety and costing methodologies. The TAC is requested to report on this charge at the next ITER Council."

The TAC review was based on the draft "Technical Basis for the ITER Final Design Report (FDR), Cost Review and Safety Analysis", which was issued by the Director on 20 December 1997. In addition to the technical documentation for the FDR, a complete set of Design Description Documents (DDDs) was made available at the meeting. A draft of the second version of the Non-Site-Specific Safety Report (NSSR-2) was also made available.

12 TAC members, 18 invited TAC experts and all 4 Home Team Leaders participated in the review. A total of 43 presentations were given by Joint Central Team (JCT) and Home Team staff.

The TAC-13 Report, which was presented to the ITER Council at its meeting on 18-19 February 1998, was endorsed by all TAC members present.

The full TAC-13 Report presents a detailed technical assessment of the status of the design and its supporting R&D for all tokamak and auxiliary systems, including physics; an assessment is also given of the safety analysis and costing methodology. The following excerpt from the TAC Report summarizes the overall TAC conclusions.

Overall TAC Assessment

The purpose of the ITER Engineering Design Activities (EDA) has been to produce a detailed, complete, and fully integrated engineering design of ITER and all technical data necessary for future decisions on the construction of ITER.

In the TAC's view, the work that has been carried out during the EDA and is now nearing completion fulfills this purpose.

The detailed technical objectives of ITER are:

- to demonstrate controlled ignition and extended burn with a pulse duration of at least 1,000 seconds;
- to aim at steady-state plasma operation using non-inductive current drive;
- to demonstrate technologies essential for a reactor in an integrated system, for example superconducting coils and remote maintenance;
- to test plasma power and particle exhaust;
- to test concepts for a tritium breeding blanket;
- to demonstrate the safety and environmental potential of fusion.

In the TAC's view, the present ITER parameters and overall design are adequate to fulfill all these technical objectives.

The ITER design has evolved from the Outline Design, through the Interim and Detailed Designs, to the present Final Design, with successive improvements at each stage. As a result of the improvements, the TAC concludes that the present design provides a robust mechanical structure for the magnets and other components, efficient remote maintenance procedures, adequate plasma power and particle exhaust, and flexibility to accommodate a range of optimized plasma configurations.

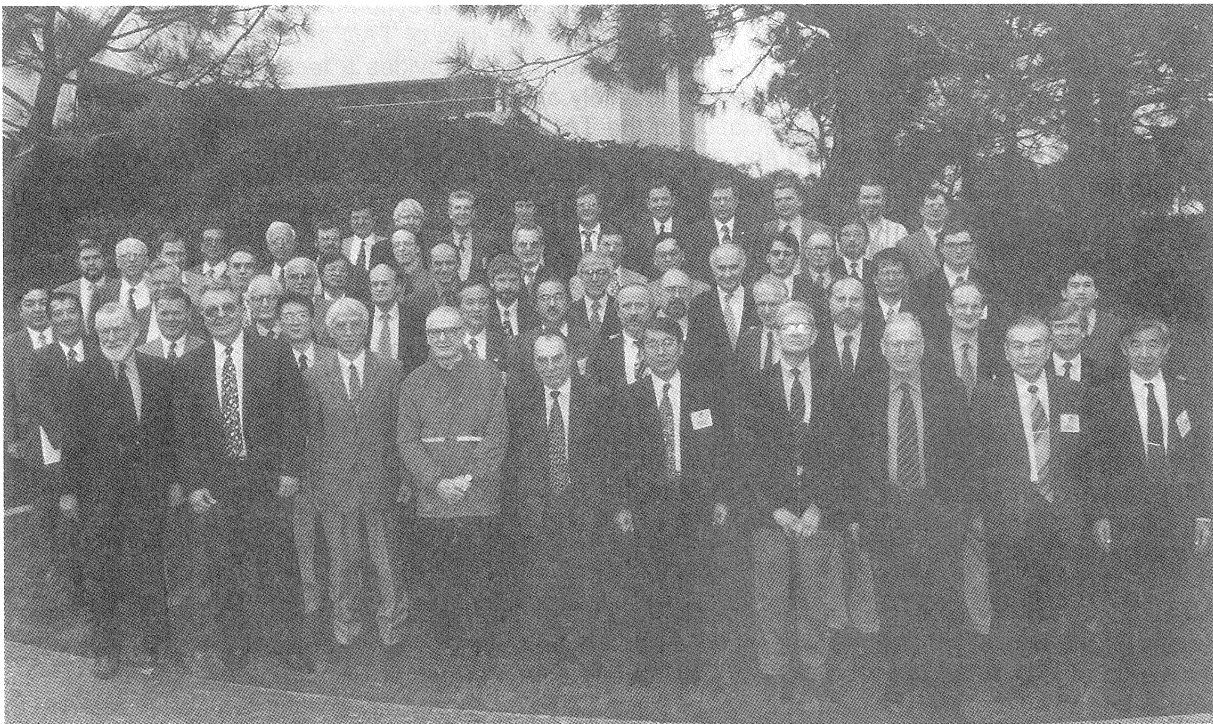
The EDA has included an R&D program aimed at confirming the design and establishing manufacturing methods for all major components. In the TAC's view, the R&D results are now sufficient to qualify the major design choices, but final confirmation requires completion of the full committed EDA R&D program.

The ITER EDA has served as a stimulant to the world tokamak program, focusing experimental and theoretical efforts on key issues of reactor tokamak physics. Confidence in the performance of the ITER plasma has been increased, both by major advances in physics characterization and understanding and by appropriate modifications of the design, where necessary. In the TAC's view, the physics operating range at full performance in ITER is acceptable, although modest; the operating range will continue to broaden, assuming sustained flow of relevant information from a strong world tokamak program.

In the TAC's view, the demonstration of the safety and environmental potential of ITER has been effectively achieved; this is a result of importance for any future fusion reactor.

An additional objective of the EDA has been to maintain the cost within an agreed range of the CDA cost estimate. The estimated construction cost of ITER has now been established through detailed and comprehensive costing of procurement-like packages by industries of all four Parties. The costs of operation and decommissioning have also been estimated. In the TAC's view, the estimated construction cost is valid, and it remains within the range agreed at the start of the EDA.

The TAC commends the Director, the JCT and the four Home Teams for producing design documents and accompanying technical data that are impressive both in technical quality and depth of detail. In the TAC's view, the ITER FDR documentation is superior to what has existed at a comparable stage of previous projects. In the TAC's view, the ITER design and the accompanying technical data would be sufficient to allow a construction decision to be taken immediately after the presently scheduled end of the EDA.



Participants in the Meeting

Items to be considered for inclusion in the ITER Newsletter should be submitted to B. Kuvshinnikov, ITER Office, IAEA, Wagramerstrasse 5, P.O. Box 100, A-1400 Vienna, Austria, or Facsimile: +43 1 237762, or e-mail: c.basaldella@iaea.org (phone +43 1 206026392).

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