ITER TECHNICAL ADVISORY COMMITTEE MEETING

by Prof. M. Fujiwara, TAC Chair

The 17th Meeting of the ITER Technical Advisory Committee (TAC-17) was held on February 19-22, 2001 at the ITER Garching Joint Work Site in Germany. The objective of the meeting was to review the Draft Final Design Report of ITER-FEAT and assess the ability of the self-consistent overall design both to satisfy the technical objectives previously defined and to meet the cost limitations. TAC-17 was also organized to confirm that the design and critical elements, with emphasis on the key recommendations made at previous TAC meetings, are such as to extend the confidence in starting ITER construction. It was also intended to provide the ITER Council, scheduled to meet on 27 and 28 February in Toronto, with a technical assessment and key recommendations of the above mentioned report.

Eleven TAC members and three Home Team Leaders participated in the review. The Joint Central Team staff gave a total of eleven presentations related to the above report. After the introductory remarks made by the Chairman, the Director made a presentation on the highlights in the scientific and supporting programmes, explorations, industry liaison meeting and International Tokamak Physics Activity (ITPA) framework. The Director also informed the TAC-17 participants of the relevant activities performed during the second half of 2000 by the JCT and Home Teams, such as the cost estimate and safety meetings. The Joint Central Team staff then gave a total of 11 presentations, covering the majority of the aspects contained in the report. The presentations were mainly made during the first one and a half days of the meeting. After having detailed discussions on the second and third days in three consecutive plenary sessions, for the review of the Draft Final Design Report of ITER-FEAT, the preparation of a draft report and its review reading was performed on the last day. The following excerpt from the TAC report summarizes the conclusions of the meeting.

Overall assessment by TAC

(1) TAC appreciates the substantial progress made in physics and engineering design activities throughout the process of elaborating the Outline Design Report, Progress Report and Draft Final Design Report, which has led to the establishment of a design basis. TAC hereby gratefully acknowledges the dedicated effort and the intensive design work carried out by the Director, the JCT and the Home Team members.

(2) TAC has high confidence that in the inductive mode of operation ITER-FEAT can meet its objectives of extended burn at a power multiplication of Q = 10 for the reference operating scenario (I_p = 15 MA, Paux = 40 MW). This scenario provides adequate margins to achieve the objectives and is robust against the principal operational boundaries. The approach to ignition ($Q \geq 50$) can be explored at higher plasma currents (~ 17 MA), consistent with the engineering design, with a sufficient margin based on existing physics databases. With the addition of non-inductive current drive, it has the flexibility to establish hybrid scenarios with Q ~ 5 and pulse durations of up to 1500 s, as a route to establishing steady-state operation. The capability to investigate scenarios aimed at demonstrating full steady-state operation with the ratio of fusion power to input power for current drive of at least 5 has been confirmed in some detail.

(3) TAC notes that the engineering design has made good progress since the last TAC meeting and that the results achieved in all R&D areas validate the ITER-FEAT engineering design.

In particular, the vacuum vessel (VV) structural integrity has been validated by the results of VV structural analyses on single and combined load cases for the I_p = 15 MA standard operation. Operation in the range 15-17 MA offers one route to allow studies of performance with higher Q. TAC agrees to the proposed addition of local reinforcement of the vessel to accept the rare occurrence of high load conditions in 17 MA operation with full confidence.

(4) TAC is pleased to note that considerable effort has been made by the JCT and the Home Teams to assess the safety of ITER and acknowledges the conclusion of the informal meeting of the Parties' designated safety representatives that the overall approach of ITER safety, based on the deployment of the defence-in-depth and the ALARA principles, appears to be compatible with the licensing requirements of the Parties.

(5) The investment cost for the construction of ITER-FEAT has been estimated by the JCT to be 49.2% of the cost of the 1998 design of ITER. TAC considers this figure to be credible. Some R&D in order to optimize manufacturing in view of potential cost reductions should be continued.

(6) The focus of the international activities on Physics R&D should continue, together with close co-ordination with technology R&D, including safety studies, in support of ITER and to further enhance the prospects for the development of fusion as an attractive future energy source.

Conclusion

TAC considers that the proposed design is based on a firm physics and engineering basis, satisfying the ITER objectives and cost limitations. The proposed design gives confidence in the ITER-FEAT physics and engineering performance and in the attainment of the envisaged technological goals of the project. ITER-FEAT is now ready for a decision on construction.

Recommendations by TAC

a. TAC recommends that to take ITER forward under the new arrangements there is a need for strong leadership and a focus for co-ordinated physics design and coherent technology activities. TAC believes that this is essential to ensure that ITER-FEAT fully benefits from the international physics and technology programmes, thereby enhancing its performance, flexibility and reliability.

b. A technical review body should be established which comprises the present range of disciplines as represented, for example, in TAC. This would bring together the physics expert groups, the physics committee (under the International Tokamak Physics Activity), and the technology (and materials) R&D programmes of the Parties, together with the possibility of the participation of third parties.

Participants in TAC-17 Meeting

ITER MANAGEMENT ADVISORY COMMITTEE MEETING

by Dr. M. Yoshikawa, MAC Chairman

The ITER Management Advisory Committee (MAC) Meeting was held on 23 February in Garching, Germany.

The main topics were: the consideration of the report by the Director on the ITER EDA Status, the review of the Work Programme, the review of the Joint Fund, the review of a schedule of ITER meetings, and the arrangements for termination and wind-up of the EDA.

ITER EDA Status. MAC noted the Status Report presented by the Director for the period between the ITER Meeting in Moscow (June 2000) and February 2001.

MAC appreciated the efforts of the Director, Joint Central Team, Home Teams and industrial participants to enable the draft Technical Basis for the ITER Final Design Report to be completed on time.