The **Physics Integration** Unit will now be based at Naka and will continue to report to the Deputy to the Director. The work in the area of **Safety, Environment and Health** will be undertaken by a Group based in Garching, but with one member matrixed at Naka. The Group will come under the line management of the Deputy Director and Head of Joint Work Site at Garching, but will also report directly to the Director on the development and implementation of project policy in this area.

Functions of the former **Engineering** Division will be taken over by a Group newly established within Nuclear Technology Division in Naka. The Division will also encompass assembly planning work, formerly done in Design Integration Division at San Diego.

The main **Design Integration** functions, including engineering analysis and configuration and layout control, will be the responsibility of a Unit at Garching, with one member matrixed in Naka. The Unit will report to the Director so as to maintain project-wide responsibility.

The functions and responsibilities of the Deputy Directors follow directly from the proposed organizational structure. The Heads of the two Joint Work Sites also have responsibility for interaction with the respective Host Organizations and Host Parties on the general management of the Joint Work Site and the provision of the Host environment and support.

In addition, the Deputy Directors, acting through the General Project Board, will continue to assist the Director in formulating the programme and management policies to be adopted within the JCT and in validating the solutions to the major issues.

ITER TECHNICAL ADVISORY COMMITTEE MEETING AT GARCHING

XA9950313

by Prof. M. Fujiwara, TAC Chair

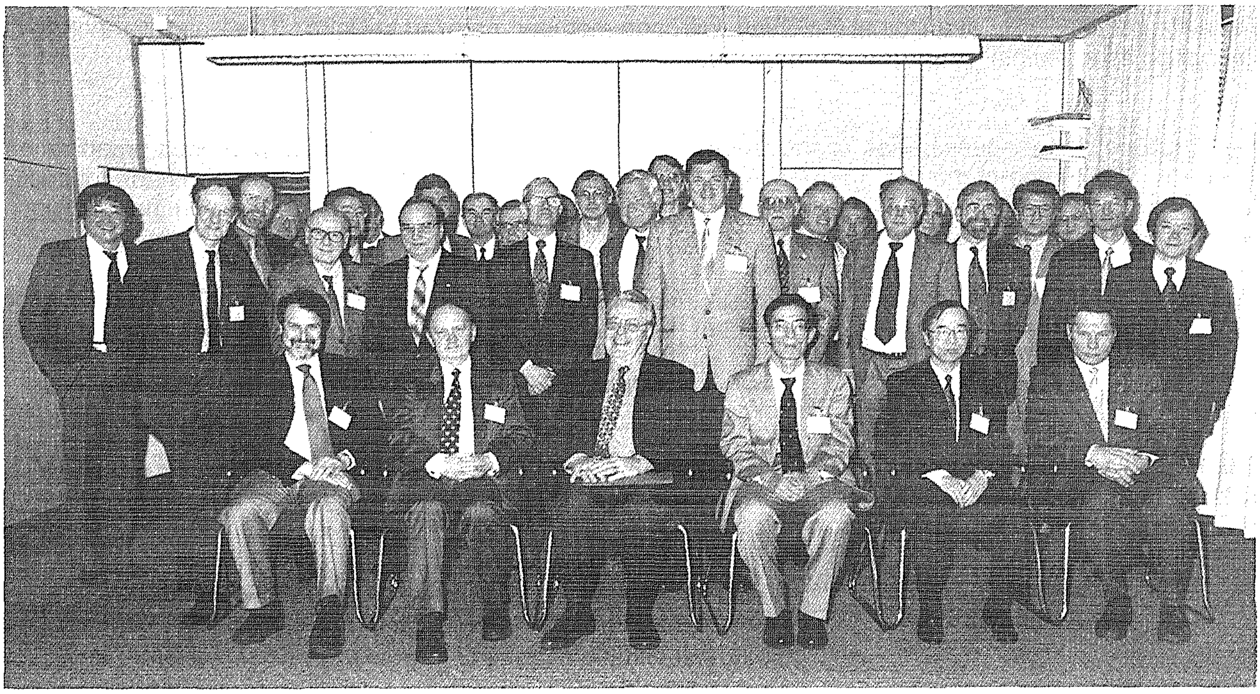
Professor Masami Fujiwara was born in 1941. He received a Ph.D. (1970) in Physics from Nagoya University. After working for 18 years at the Institute of Plasma Physics of that University, he joined the National Institute for Fusion Science (NIFS) as the Director of its Large Helical Device (LHD) Project Department. In April 1999, he was appointed Director-General of NIFS. He has been the designated person for the ITER Physics R&D Committee and a Japanese member of the ITER Special Working Group from 1998 to 1999.

The ITER Technical Advisory Committee (TAC) meeting took place on 24-27 February at the Garching Joint Work Site. According to the discussions at the ITER meeting held in Yokohama in October 1998, the TAC was requested to conduct a thorough review of the document "Stud Options for the Reduced Technical Objectives / Reduced Cost (RTO / RC) ITER," which was issued on 12 February 1998 by the Director. In order to provide a basis for rigorous exploration and qualification of controversial issues and cost accounting, two representative options were selected in the above document for more detailed studies, namely IAM and LAM.

Many of he TAC members have been replaced, and the current list of its members is shown below. In addition, Dr. T. Fukuda was appointed as TAC Secretary.

Chair	Prof. M. Fujiwara	National Institute of Fusion Science
EU	Dr. R. Andreani	EURATOM ENEA Association
EU	Dr. J. Jacquinot	JET Joint Undertaking
EU	Dr. D. C. Robinson	EURATOM UKEA Association
EU	Prof. F. Troyon	EURATOM Swiss Confederation Association
JA	Prof. S. I. Itoh	Kyushu University
JA	Prof. S. Tanaka	Tokyo University

JA	Dr. K. Soda	Japan Atomic Energy Research Institute
RF	Dr. V. G. Kuchinski	Efremov Institute
RF	Prof. V. P. Smirnov	Nuclear Fusion Institute
RF	Prof. V. A. Shishkin	R & D Institute of Power Engineering
RF	Dr. A. K. Shikov	Bochvar Institute on Inorganic Materials
US	Prof. G. Navratil	Columbia University
US	Dr. P. H. Rutherford	Princeton Plasma Physics Laboratory
US	Dr. J. Sheffield	Oak Ridge National Laboratory
US	Dr. R. D. Stambaugh	General Atomics



Participants in the Meeting

Thirty-nine attendants, including the thirteen TAC members, eleven invited TAC experts and two Home Tea Leaders, participated in the review. The meeting consisted of eleven presentations from the JCT members, covering all aspects of the Reduced Technical Objectives/Reduced Cost Options ITER design, including safety considerations and the cost estimate. The Director also made a review on the background for TAC, relating to the present status of specific studies on reduced cost options for ITER.

The TAC report, submitted to the ITER Meeting held on 10-11 March in Cadarache, was endorsed by all TAC members present. The full TAC report presents a detailed technical assessment of the engineering design and its supporting R&D as well as the related physics issues. The following excerpt from the TAC report summarizes the overall conclusions.

Overall assessment and advice from TAC

TAC concluded that the options described in the document "Study of Options for the RTO/RC ITER" , i.e., Intermediate Aspect Ratio Machine, High Toroidal Field (IAM) and Low Aspect Ratio Machine, Low Toroidal Field (LAM) satisfy the technical guidelines given in SWG task 1 report and approved in the ITER Council in June 1998.

In the view of TAC, the preliminary cost estimate for options described in the report is of the order of 50% of that for FDR. Reduction in size leads to operation nearer the limits in physics and to some extent in engineering. Further work is necessary to confirm the level of physics performance now required and to confirm that technical margins can be maintained at acceptable levels. In this respect, it is important to identify the modifications of plasma parameters in conjunction with engineering margins and manufacturing capabilities and their associated risks which could lead to the possibility of further cost reduction. TAC recommended that the acceptable level of risk should be defined by the Director, JCT and Home Tea s before a single minimum cost design is chosen.

TAC took notes on the following issues as major findings, related to the design options presented to the meeting.

(1) The common features of LAM and IAM are:
- a reasonable operational margin of Q = 10
- a reasonable operational plasma density smaller than the Greenwald density
- higher elongation and triangularity to improve the density limit, and the beta limit
- confinement and superior capability of steady-state operation

(2) The specific features of LAM and IAM are as follows:
- LAM has better access, lower electromagnetic forces, better flexibility of plasma configuration such as the possible operation of double null divertor, and
- larger power threshold margin for L-H transition
- IAM has better capability for steady-state operation, higher Greenwald density and higher average neutron flux.

(3) Variants of IAM and of LAM are also studied, which have a similar characteristics as those of IAM and LAM. In addition, a sensitivity analysis, spanning the range of parameters for IAM and LAM, was performed.

(4) The magnet and structural concept of the presented options are considered to be sound. An additional analysis and possible R&D on NbTi "cable in conduit" conductor behaviour is needed to make the final design selection.

(5) In accordance with the less demanding performance objectives recommended by the SWG in its first task, the relative role of the heating and current drive systems has increased when compared to alpha particle heating, both for extended burn and aiming at demonstrating steady-state operation. The progress on R&D for all the systems confirms their suitability for application to the RTO/RC ITER to fulfil the above objectives. The systems are capable of being used for heating and with increased emphasis on current drive to meet the requirements of steady-state operation and for the mode stabilisation.

(6) The same diagnostic technique and designs are applic able and transferable from the FDR to RTO/RC ITER.

(7) The appropriate engineering design solutions for the vacuum vessel, blanket, and divertor components, including the additional R&D together with the flexibility to study advanced tokamak modes, have been identified as recommended in the SWG Tas #1 report. In many cases existing design solutions have been used together with their associated R&D, resulting in significant cost reductions.

(8) An assessment of the vacuum vessel design indicates that it is feasible but some local refinements are needed to enhance the structural integrity. The impressive R&D work during the EDA is appropriate for the new design but further R&D on welding is required if no backplate is to be included. There are advantages and disadvantages associated with the backplate removal. TAC thereby proposes that the impact of removing the backplate should be re-evaluated.

(9) Previous comprehensive safety assessments have demonstrated the safety and environmental attractiveness of ITER. Initial evaluations of the RTO/RC ITER confirm this position and with some improvements compared to the FDR.

TAC concludes that the options presented at this meeting can represent a sound basis for the selection of design parameters.

The TAC recommends the ITER Council to take appropriate action s, aimed at making possible the convergence towards a single option, so that effective work can lead to an Outline Design. TAC also emphasized that improvements in the present organization are necessary in order to resume the joint wor between the JCT and Home Teams and to effectively respond to the charge given by the ITER Council.

Items to be considered for inclusion in the ITER 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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