

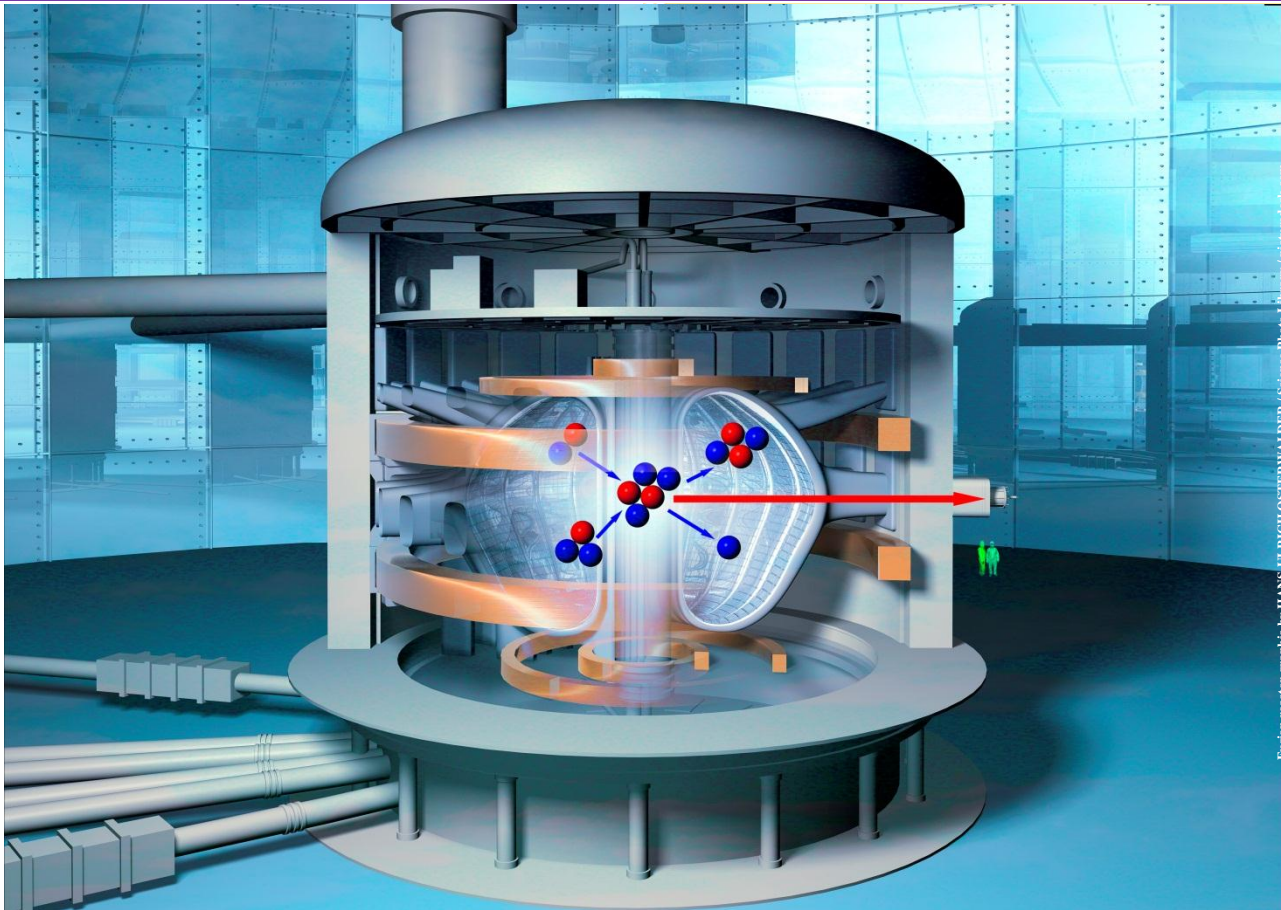


IAEA

International Atomic Energy Agency

PROGRAMME

THIRD IAEA DEMO PROGRAMME WORKSHOP



11-15 May 2015

Shuishang Lecture Hall

University of Science and Technology of China

Hefei, China

Monday 11 May 2015

8.00	Departure from hotel with the conference shuttle bus
8.45-9.00	Welcome and Opening Address J. Li, R. Kamendje, T. Muroga
Special Session	Chair: <u>M. ABDOU</u>
9.00-9.30	Y.X. WAN <i>Present Status of CFETR</i>
9.30-10.00	G. FEDERICI <i>Integrated DEMO Conceptual Design Approach in the EU</i>
10.00-10.15	Coffee Break
Session 1 Morning	In-Vessel Systems Design and Engineering Chair: <u>B. KUTEEV</u>
10.15-10.30	C. WALDON AND T. MUROGA Introduction
10.30-11.00	I. MAZUL <i>PFC Components Development from ITER to DEMO</i>
11.00-11.30	A. E. COSTLEY <i>Diagnostic & control requirements: Their possible impact on device design</i>
11.30-12.00	T. BROWN <i>Design strategies for high availability: Accommodating in-vessel piping services and auxiliary systems</i>
12.00-13.00	Lunch Break
13.00-14.00	Poster Session
Session 1 Afternoon	In-Vessel Systems Design and Engineering Chair: <u>K. KIM</u>
14.00-14.30	G.N. LUO <i>W divertor technical development towards DEMO</i>
14.30-15.00	M. SHANNON AND <u>G. FEDERICI</u> <i>In-vessel system integration towards a coherent European DEMO concept</i>
15.00-15.30	M. MITTWOLLEN AND A. LOVING <i>Remote handling - Impact on DEMO design and availability</i>
15.30-16.00	Coffee Break
16.00-16.30	HIROYASU TANIGAWA <i>Fusion Structural Material Development in View of DEMO Design Requirement</i>
16.30-17.30	C. WALDON AND T. MUROGA <i>Topic 2 Wrap-Up</i>
17:30	Adjourn
18.30-20.30	Reception

Tuesday 12 May 2015

8.00	Departure from hotel with the conference shuttle bus
Special Session	<u>Chair: G. FEDERECI</u>
8.30-9.00	R. KASADA et al. <i>Japanese Joint Core Team Report for the Establishment of Technology Bases Required for the Development of a Demonstration Fusion Reactor</i>
9.00-9.30	S. O'HIRA et al. <i>Vision of the Neutron Source for the Post BA Activities</i>
9.30-9.45	Coffee Break
Session 2 Morning	Contribution of Integrated Devices to Closing the Gaps <u>Chair: H. ZOHM</u>
9.45-10.00	H. NEILSON AND E. SURREY Introduction
10.00-10.30	<u>M. GASPAROTTO AND G. FEDERICI</u> <i>ITER Contributions to Closing DEMO Technology Gaps (preliminary analysis)</i>
10.30-11.00	SIMON PINCHES <i>ITER Contributions to Closing DEMO Physics Gaps</i>
11.00-11.30	KEEMAN KIM et al. <i>K-DEMO Mission and R&D Needs</i>
11.30-12.00	<u>A. SAGARA, R. WOLF AND H. NEILSON</u> <i>Technological Readiness Comparison for Helical and Tokamak DEMO</i>
12.00-13.00	Lunch Break
13.00-14.00	Poster Session
Session 2 Afternoon	Contribution of Integrated Devices to Closing the Gaps <u>Chair: A. GAROFALO</u>
14.00-14.30	J. LI <i>Closing Gaps to CFETR Readiness</i>
14.30-15.00	Y. SAKAMOTO <i>Integrated Design Study for DEMO Concept Definition</i>
15.00-15.30	Coffee Break
15.30-16.00	M. DE BAAR <i>Plasma Control of DT Tokamaks - Status and Requirements</i>
16.00-16.30	C. KESSEL <i>Pre-FNSF R&D and FNSF in Preparation for DEMO</i>
16.30-17.00	E. SURREY <i>TRL and Gap for Different Devices</i>
17.00-18.00	H. NEILSON AND E. SURREY <i>Topic 1 Wrap-Up</i>
18:00	Adjourn

Wednesday 13 May 2015

8.00	Departure from hotel with the conference shuttle bus
Special Session	<u>Chair: H. NEILSON</u>
8.30-9.00	R. STIEGLITZ, R. WOLF AND N TAYLOR <i>Aspects of Fusion Safety Considering Fission Regulations</i>
9.00-9.30	M. ENGLERT <i>Implications of MFE Compliance with Non-Proliferation</i>
9.30-9.45	Coffee Break
Session 3 Morning	ITER-TBM and Blanket Programs toward DEMO <u>Chair: W. BIEL</u>
9.45-10.00	A. IBARRA AND R. KURTZ Introduction
10.00-10.30	L. BOCCACCINI <i>DEMO Blankets Needs from ITER TBM Program</i>
10.30-11.00	Y. POITEVIN AND <u>A. IBARRA</u> <i>What can be measured in and what can be learned from EU ITER-TBM</i>
11.00-11.30	S. CHO <i>Objectives of HCCR-TBM Testing Program in ITER</i>
11.30-12.00	HISASHI TANIGAWA et al. <i>Strategy of WCCB-TBM TBM Testing in ITER</i>
12.00-13.00	Lunch Break
13.00-13.30	Poster Session
Session 3 Afternoon	Contribution of Integrated Devices to Closing the Gaps <u>Chair: E. SURREY</u>
14.00-14.30	YURY STREBKOV AND <u>B. KUTEEV</u> <i>What can be measured in and what can be learned from RU ITER-TBM</i>
14.30-15.00	<u>P. HUMRICKHOUSE</u>, A. YING AND D. RAPISARDA <i>Tritium in DEMO</i>
15.00-15.30	Coffee Break
15.30-16.00	<u>S. SMOLENTSEV</u> AND L. BUEHLER <i>Recent Advances and Prospects for Further Progress in Modeling the Coupled MHD Thermofluids Phenomena of Heat, Mass, and Momentum Transfer</i>
16.00-17.00	A. IBARRA AND R. KURTZ <i>Topic 3 Wrap-Up</i>
17.00-17.15	Closing
17.15	Adjourn
18.30-20.30	Banquet

Thursday 14 May 2015

8.00	Departure from hotel with the conference shuttle bus
Concluding Session	
8.30-12.00	Concluding discussions by PC members and Topics Chairs/Co-Chairs
8.30-12.00	Educational Programme (in Parallel)
8.30-12.00	8:30 Opening 8:40-9:20 CHRISTIAN LINSMEIER (FZJ) <i>First wall materials and components</i> 9:20-10:00 LORENZO BOCCACCINI (KIT) <i>DEMO blanket</i> 10:00-10:40 SATOSHI KONISHI (KYOTO U.) <i>Tritium and safety for fusion plants</i> 10:40-10:50 Break 10:50-11:30 CHARLES KESSEL (PPPL) <i>Tokamak power plant design</i> 11:30-12:10 AKIO SAGARA (NIFS) <i>Helical power plant design</i>
12.00-13.00	Lunch Break
13.00-17.00	Technical tour in ASIPP
17.00	End

Friday 15 May 2015

8.00-17:00	
Optional individual Programmes	

List of Posters - 1

Number	Author & Title
P1	*VINCENT CHAN AND NAN SHI <i>Development of a physics-engineering integrated platform for CFETR design</i>
P2	*ALAN COSTLEY et al. <i>Compact Devices for The Development of Key Fusion Physics And Technologies</i>
P3	*R. BROWN AND C. HARRINGTON <i>Impact of RAMI on European DEMO technology program</i>
P4	*J. AKTAA et al. <i>Development needs of design rules for fusion structural materials</i>
P5	*C. DAY et al. <i>DEMO fuel cycle: Integrated design strategies</i>
P6	*C. LINSMEIER <i>Development strategy for fusion reactor first wall materials</i>
P7	*WOLFGANG BIEL <i>Diagnostic concept development within the European DEMO programme</i>
P8	*PARITOSH CHAUDHURI <i>Design of LLCB TBM towards the Indian DEMO reactor</i>
P9	R. ALBANESE, F. CRISANTI, B. P. DUVAL, G. GIRUZZI, H. REIMERDES, D. VAN HOUTTE, R. ZAGORSKI <i>DTT - An Experiment to Study the Power Exhaust in View of DEMO</i>
P10	H. REIMERDES et al. <i>Towards an Assessment of Alternative Divertor Solutions for DEMO</i>
P11	*Y. T. SONG <i>CFETR design</i>
P12	GE LI <i>Closing the Ignition Gaps by Magnetic Compression at East</i>
P13	CHANGLE LIU et al <i>The Strategies and an Approach of the Shielding Blanket to CFETR Reactor</i>
P14	Y. YANG et al. <i>Basic Requirements of Plasma Diagnostics on CFETR</i>

List of Posters - 2

Number	Author & Title
P15	*K. FENG et al. <i>Progress on Design and R&D of CN HCCB TBM toward DEMO</i>
P16	X. LIU et al. <i>Surface Damages of Tungsten Materials under ELM-Like Loads and the PWI Program towards DEMO</i>
P17	QIAN LI et al. <i>The Contributions of HL-2M to Fusion Reactor</i>
P18	ZAIXIN LI <i>Activation of Component and Shutdown Maintenance Issues of DEMO</i>
P19	YICAN WU et al. <i>Overview of Nuclear Fusion Safety and License of DEMO and its Implications on the Design and Operation</i>
P20	ZHIQIANG ZHU et al. <i>The Design and Experiment of PbLi Loops for Fusion Blanket Technology</i>
P21	JIE YU et al. <i>Design and R&D Progress of Breeder Blanket towards DEMO in China</i>
P22	QUNYING HUANG et al. <i>Overall Development of CLAM Steel for Fusion Application in China</i>
P23	GANG SONG et al. <i>Development of High Intensity D-T fusion NEutron Generator (HINEG)</i>
P24	JIEQIONG JIANG et al. <i>Design Progress of Gas Dynamic Trap Based Fusion Neutron Source in China</i>
P25	JING SONG et al. <i>Development and Experimental Validation of Super Monte Carlo Simulation Program for Fusion Applications</i>
P26	JIE WU et al. <i>Preliminary Reliability and Probabilistic Safety Assessment Approach for Fusion Reactor</i>
P27	TAO HE et al. <i>Development of Virtual Reality-Based Simulation System for Nuclear and Radiation Safety and Its Application</i>
P28	G.H. NEILSON <i>Application of TRLs to compare the readiness of stellarators and tokamaks for DEMO</i>

TOPICS

1. CONTRIBUTION OF INTEGRATED DEVICES TO CLOSING THE GAPS

The set of DEMO machines¹ now being considered world-wide span an interesting range in technical readiness, risks, mission goals, and envisioned schedules. A comparison of these machines in terms of their contributions to closing fusion power plant readiness gaps beyond ITER, as well as their main design choices and associated pre- and co-requisite R&D programmes, can usefully inform DEMO programme planning by all parties. It may also highlight opportunities for collaboration or coordination of efforts internationally. The oral presentations on this topic will focus on the programmatic roles of ITER and the various DEMO machines in fusion development, i.e. what these machines and their accompanying programs will contribute to closing gaps in the scientific and technical basis for fusion power plants. Poster presentations describing design characteristics and other information about these DEMO machines will be both encouraged and welcomed.

Topic Chair: **H. Neilson**, Co-chair : **E. Surrey**

2. IN-VESSEL SYSTEMS AND ENGINEERING

This session will focus on the influence of critical in-vessel systems (including their support structures and services), i.e., the blankets, first wall, divertor, heating and current drive components and their enduring attributes on the overall plant configuration. Topics of interest in this session include but are not limited to: model based systems engineering, standards and licensing considerations in materials development; reliability, availability, maintainability, and inspectability (RAMI) considerations in design and technological exploitation; impact of safety on design; and compatibility with available electricity-generation technologies. System integration will be discussed as the overarching theme highlighting the relational aspects and importance on competing requirements. Poster presentations reporting integrated design effort and R&D plan of in-vessel systems and components will be encouraged and welcomed.

Topic Chair: **C. Waldon**, Co-chair: **T. Muroga**

3. ITER-TBM AND BLANKET PROGRAMS TOWARD DEMO

Under the ITER Test Blanket Module (TBM) program, the international community will construct a set of fusion breeding blankets and install and test them on a DT-burning fusion machine for the first time. This session will consider the loads and operating conditions for a DEMO blanket and first wall and the role that ITER TBM as well as the various national programs and test facilities should play in order to provide a better understanding and for the development of solutions. Opportunities for increased international collaboration in resolving these issues, beyond the ITER TBM program, will be discussed. Poster presentations describing design characteristics and other information about the different DEMO blankets, TBMs and other related topics will be both encouraged and welcomed.

Topic Chair: **A. Ibarra**, Co-chair: **R. Kurtz**

4. SPECIAL TOPICS

- Updates on national roadmap plans, i.e. focusing on significant progress or changes since the last workshop.
- Proliferation issues in connection with magnetic fusion power plants.
- Fusion safety: case studies.

¹ The term “DEMO” as used here refers to a class of fusion facilities generally characterized by steady-state or long-pulse DT burning plasmas, reactor-relevant neutron wall loads, tritium breeding, and in some (but not all cases), electricity generation.