SECOND IAEA DEMO PROGRAMME WORKSHOP

17-20 December 2013
IAEA Headquarters, Vienna, Austria
**Welcome and opening address**
M. Venkatesh, R. Kamendje, H. Zohm

**Special Session**
Chair: H. Zohm

**08:45-09:15**
**SPECIAL 1:** X. Gao  
*Update on CFETR*

**09:15-09:45**
**SPECIAL 2:** D. Meade  
*Framework for a US Road Map to Magnetic Fusion Energy*

**09:45-10:15**
Coffee Break

**Session 1 Morning**
Fusion Design Codes; Chair: D. Ward

<table>
<thead>
<tr>
<th>Time</th>
<th>Speaker/Title</th>
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</table>
| 10:15-10:30 | D. Ward  
*Introduction* |
| 10:30-11:00 | S1-1: R. Kemp  
*How to produce a DEMO baseline design* |
| 11:00-11:30 | S1-2: L. Bocaccini  
*Technology assumptions* |
| 11:30-12:00 | S1-3: C. KesSEL  
*Sensitivity of design to physics and technology assumptions* |
| 12:00-13:00 | Lunch Break |
| 13:00-14:00 | Posters |

**Session 1 Afternoon**
Fusion Design Codes; Chair: D. Ward

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<tr>
<th>Time</th>
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| 14:00-14:30 | S1-4: G. Giruzzi  
*DEMO physics assumptions* |
| 14:30-15:00 | S1-5: D. Ward  
*Tokamak DEMO benchmark* |
| 15:00-15:30 | S1-6: C. KesSEL / R. Kemp  
*Different approaches to benchmark*  
*C. KesSEL - Data base; R. Kemp - Optimization* |
| 15:30-16:00 | Coffee Break |
| 16:00-16:30 | S1-7: T. Goto  
*System design of helical fusion reactors* |
| 16:30-17:00 | S1-8: V. Chan  
*GA systems code and benchmarking with CFETR* |
| 17:00-18:00 | Session 1 Wrap-up: D. Ward  
*Adjourn* |
| 19:30     | Workshop dinner |

**TUESDAY 17 DECEMBER**

08:30-08:45  
Welcome and opening address  
M. Venkatesh, R. Kamendje, H. Zohm

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*Adjourn*  
19:30  
Workshop dinner
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<td><strong>Special Session</strong></td>
<td><strong>Chair: H. NEILSON</strong></td>
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| 08:30-09:00  | **SPECIAL 3: F. ROMANELLI**  
              EU Roadmap update |                |
| 09:00-09:30  | **SPECIAL 4: E. AZIZOV**  
              Update of RF Roadmap |                |
| **Session 2 Morning** | **Plasma Power Exhaust & Impurity Control;** | **Chair: N. ASAKURA** |
| 09:30-09:45  | N. ASAKURA  
              Introduction |                |
| 09:45-10:15  | S2-1: D. HILL  
              US Roadmap for divertor and PMI research |                |
| 10:15-10:45  | Coffee Break |                |
| 10:45-11:15  | S2-2: H. ZOHM  
              EU Assessment of Exhaust Problem |                |
| 11:15-11:45  | S2-3: M. SAKAMOTO  
              Divertor simulation and PWI study using linear devices towards DEMO |                |
| 11:45-12:45  | Lunch Break |                |
| 12:45-13:45  | Posters |                |
| **Session 2 Afternoon** | **Plasma Power Exhaust & Impurity Control;** | **Chair: N. ASAKURA** |
| 13:45-14:15  | S2-4: A. KALLENBACH  
              Reactor radiative cooling scenarios with high core- and divertor radiation levels |                |
| 14:15-14:45  | S2-5: D. HILL  
              Modelling of Radiative Divertor Solutions for DEMO |                |
| 14:45-15:15  | S2-6: K. HOSHINO  
              Impact of exhaust power and edge density profile on DEMO divertor power handling |                |
| 15:15-15:45  | Coffee Break |                |
| 15:45-16:15  | S2-7: W. MORRIS  
              Compatibility of advanced divertor solutions with high core performance (Snowflake and Super-X) |                |
| 16:15-16:45  | S2-8: V. SERGEEV  
              Concept of power and particle exhaust in DEMO using lithium technology |                |
<p>| 16:45-17:45  | Session 2 Wrap-up: N. ASAKURA |                |
| 17:45        | Adjourn |                |
| <strong>THURSDAY 19 DECEMBER</strong> | <strong>Session 2</strong> | <strong>Wrap-up: N. ASAKURA</strong> |</p>
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<td>09:30-09:45</td>
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<td>R. HAWRYLUK</td>
<td>Introduction</td>
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<td>09:45-10:15</td>
<td>S3-1: Y. KAMADA</td>
<td>S3-1: Y. KAMADA</td>
<td>Review of DEMO tokamak operational scenarios with relation to experimental results and emphasis on control</td>
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<td>10:15-10:45</td>
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<td>Coffee Break</td>
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<td>10:45-11:15</td>
<td>S3-2: Y. KAMADA</td>
<td>S3-2: Y. KAMADA</td>
<td>Development of Operational Scenarios in JT-60SA towards Steady-state DEMO</td>
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<td>11:15-11:45</td>
<td>S3-3: P. THOMAS</td>
<td>S3-3: P. THOMAS</td>
<td>H&amp;CD systems and their impact on scenario/economics</td>
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<td>11:45-12:45</td>
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<td>Lunch Break</td>
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<td>13:00-13:30</td>
<td>S3-4: F. POLI</td>
<td>S3-4: F. POLI</td>
<td>Status of modelling ITER steady-state and lessons learnt for the step to DEMO</td>
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<td>13:30-14:00</td>
<td>S3-5: A. GAROFALO</td>
<td>S3-5: A. GAROFALO</td>
<td>Impact of H&amp;CD technology on scenario choice</td>
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<td>14:00-14:30</td>
<td>S3-6: F. ORSITTO</td>
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<td>Diagnostics R&amp;D for DEMO, taking into account results from Varenna Workshop</td>
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<td>14:30-15:00</td>
<td>S3-7: W. BIEL</td>
<td>S3-7: W. BIEL</td>
<td>Diagnostics and impact on controllability</td>
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<td>Coffee Break</td>
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<tr>
<td>15:30-16:00</td>
<td>S3-8: P. LANG</td>
<td>S3-8: P. LANG</td>
<td>Fuelling and disruption mitigation</td>
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<td>16:00-16:30</td>
<td>S3-9: R. WOLF</td>
<td>S3-9: R. WOLF</td>
<td>Which issues will come up in addition for stellarators?</td>
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<td>16:30-17:30</td>
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<td>Session 3 Wrap-up: R. HAWRYLUK</td>
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<td>Closing</td>
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**FRIDAY 20 DECEMBER**

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<tr>
<td>08:30-12:00</td>
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<td>Concluding PC discussion, including Session Organizers</td>
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<td>12:00</td>
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<td>Closing</td>
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<td>P2</td>
<td><strong>M. MUROGA</strong> <em>Structural Materials R&amp;D Necessary for Transition to DEMO Phase</em></td>
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<td>P3</td>
<td><strong>M. ABDOU</strong> <em>Blanket/First Wall Challenges and Required R&amp;D on the pathway to DEMO</em></td>
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<td>P4</td>
<td><strong>R. ALBANESE</strong> <em>Magnetic control of DEMO plasmas</em></td>
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<td>P5</td>
<td><strong>F. FRANZA</strong> <em>Technology modules for fusion reactors systems codes: radial build-up and power distribution</em></td>
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<td>P6</td>
<td><strong>F. ALBAJAR</strong> <em>Calculation of EC losses at high temperature with the RAYTEC code</em></td>
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<td>P7</td>
<td><strong>C. REUX</strong> <em>SYCOMORE: a modular system code for DEMO reactor design</em></td>
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<td>P8</td>
<td><strong>F. WARMER</strong> <em>Stellarator Specific Developments for the Systems Code PROCESS</em></td>
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<td>P9</td>
<td><strong>H. BUFFERAND</strong> <em>Multi-scale modelling for DEMO divertor design: from first principle simulations to integrated system code</em></td>
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<td>P10</td>
<td><strong>I. IVANOVA-STANIK</strong> <em>COREDIV modelling of the DEMO tokamak scenarios</em></td>
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<td>P11</td>
<td><strong>F. CRISANTI</strong> <em>Power exhaust as an integrated radiation magnetic topology control problem</em></td>
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<td>P12</td>
<td><strong>M. JAWORSKI (presented by H. NEILSON)</strong> <em>Status of Liquid Metal Plasma-Facing Component Development</em></td>
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| P13    | N. ASAKURA  
*Characteristics, application and issues of advanced divertors for DEMO tokamak reactor* |
| P14    | F. FELICI  
*Real-time tokamak simulations for plasma state reconstruction with minimal diagnostics* |
| P15    | R. SAKAMOTO  
*Operational requirements to allow self-burning plasma on a helical DEMO reactor* |
| P16    | S. TOKUNOGA  
*Simulation study on fusion output control in DEMO* |
| P17    | A. YU. DNOSTROVSKIJ  
*Developing FNS-ST design codes* |
| P18    | Q. ZENG  
*Development of super Monte-Carlo calculation program and its applications to fusion system* |
| P19    | J. YU  
*Development of DEMO toward fusion application in China* |
| P20    | Y. WU  
*Conceptual design of fusion fission hybrid reactor for spent fuel burning (FDS-SFB)* |
| P21    | V. LUKASH  
*Study of plasma scenarios in Fusion Neutron Sources based on spherical tokamak* |
| P22    | M. PETROV  
*The possibilities of neutral particle analysis and Gamma spectroscopy in control of isotope fuel ratio on DEMO* |
| P23    | S. KONISHI  
*Implication of the Fukushima event and its possible impact on tritium release from fusion facilities* |