

PSD Management Meeting

Briefing

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Upcoming meetings

- FSD Management Meetings: 8th / 22nd September; 6th / 20th of October
 - FP10 Working Group: 8th September
 - Bureau: 18th September - remote
 - 56th GA: 8/9th October, Chania, Crete
 - Physics Project Board: 4/5th November, Garching
 - IO & EF D2 meeting January 2027 (likely remote)
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- AL: 25th of Oct – 2nd of Nov
 - 3rd IAEA meeting on long pulse Hefei: 20th-23rd of Oct



JT-60SA mid- and long term EUROfusion scientific priorities

Proposed update for C-phase

1. Development and investigation of high-performance scenarios compatible with future W-PFCs
2. Avoidance and mitigation of disruptions and runaways
3. **Physics of fast ions and their impact on plasma confinement**
4. Development and validation of high-level real-time control strategies

On point 2: Move to emphasis on disruption free operation → propose to only insert this emphasis for W phase as then a satellite of ITER for operations and preparation of Foak → this could motivate once OP2 and OP3 are overcome to develop the control system and research priorities towards this goal in W –

General on W phase priorities: it might be worth to discuss this topic also with ITER as well for best alignment and impact of EUROfusion priorities for JT-60Sa in W towards QST ideas



JT-60SA EUROfusion scientific priorities – W (metal-wall) phase

Proposed priorities for W-phase (ITER satellite, towards EU-DEMO / Foak)

1. High-performance, long-pulse, core-edge-compatible scenarios with W-PFCs, including no-ELM regimes, in view of fusion reactors
2. Disruption-free and safe operation
3. Power and particle exhaust, including wall conditioning, W source and fuel-retention control
4. Energetic-particle physics in reactor-relevant fast-ion regimes



Proposed EUROfusion high-level scientific priorities for BEST

Proposed high-level priorities for BEST (pre-ITER D-T, towards ITER / first-of-a-kind plant / pilot plant)

BEST – Burning Plasma Experimental Superconducting Tokamak (ASIPP, Hefei): D-T-capable device under construction, completion expected 2027, target $Q \geq 1$ before end of 2030 (BEST Research Plan v1.1, Ch. 1)

1. D-T alpha-particle and fast-ion physics at thermonuclear $Q \geq 1^*$, towards burning-plasma conditions at $Q \approx 5^{**}$
2. Reactor-integrated long-pulse D-T scenarios at low torque, including no-ELM regimes
3. Power and particle exhaust and PWI in an integrated full-W, D-T, long-pulse environment
4. Disruption avoidance, mitigation and real-time control in D-T at up to 7 MA

* $Q \geq 1$ likely achievable in conservative scenarios at $I_p = 6\text{--}7$ MA ** high- Q attempted with advanced scenarios, possibly transiently – not guaranteed

EU-retained returns from all four priorities: (i) decisive progress of EU code validation (TSVV – Theory, Simulation, Validation & Verification programme) on alpha-heated D-T data; (ii) EU D-T operational experience maintained between JET (2023) and ITER D-T (2039) – interlaced D / D-T operation, conditioning, integrated-team participation. Once acquired, both remain in Europe even if access is later lost



AWP 26/27 evaluation by EC

- **Establish a unified experimental data platform as a 2027 global objective:** Currently, experimental data remains siloed among individual consortium members who independently manage access and FAIR compliance. The consortium must formally mandate the deployment of a unified, IMAS-based data access platform as a global strategic objective to be achieved by 2027. This will effectively replace fragmented data repositories with a single, standardised gateway for all European fusion experiments.
- While the proposal has been evaluated as submitted, the expert panel has formulated specific recommendations regarding the conceptual design of the Fusion Pilot Plant (FPP):
 - The consortium must reinforce its objectives with robust, quantifiable performance metrics for both engineering (e.g., MTBF, MTTR) and plasma physics (e.g., Beta > 5%, peak heat flux < 10 MW/m²). Furthermore, the programme should actively encourage the application of plasma physics expertise towards solving fusion nuclear technology challenges, particularly targeting highly driven DT plasmas ($Q \leq 1$) to optimise the FPP design.
- While the proposal has been evaluated as submitted, the expert panel has formulated specific recommendation that can be implemented during the Grant Agreement extension phase:
- Maximise the exploitation of key international facilities: The consortium should fully exploit the JT-60SA facility in Japan. Although it is not a Deuterium-Tritium (DT) machine, its operational data and return on experience are invaluable for preparing ITER operations and informing the design of the FPP/VNS. Furthermore, active collaboration with the BEST facility in China is strongly encouraged to capture unique insights into fusion nuclear technology development and DT operations. In connection with these activities, the consortium should actively engage in initiatives to train the ITER scientific exploitation and operation teams, ensuring a strong EU position by the time of Integrated Commissioning and the Start of Research Operation



ITPEA proposal for co-chairs submitted to IO

- **Integrated Operations Scenarios**
 - Joelle Mailloux (UKAEA) is presently co-chair - no objection from our side to become chair; no new co-chair proposed
- **Diagnostics**
 - Sandor Zoltenics (EU) term as chair is ending. We have no objection to Haiqing Liu (China) as new chair. We propose Andrey Litnosvsky from FZ Jülich as new co-chair;
- **Energetic Particle Physics**
 - Andreas Bierwage is presently co-chair (Japan) - no objection from our side to become chair —> we propose Yevgen Kazakov to become new co-chair;
- **MHD, Disruptions & Control**
 - Park Jong-Kyu (USA) is presently co-chair - no objection to become chair; We propose Leonardo Pigatto from RFX as a new co-chair.