



# WPSA General Meeting. Introduction

4-6 May 2022

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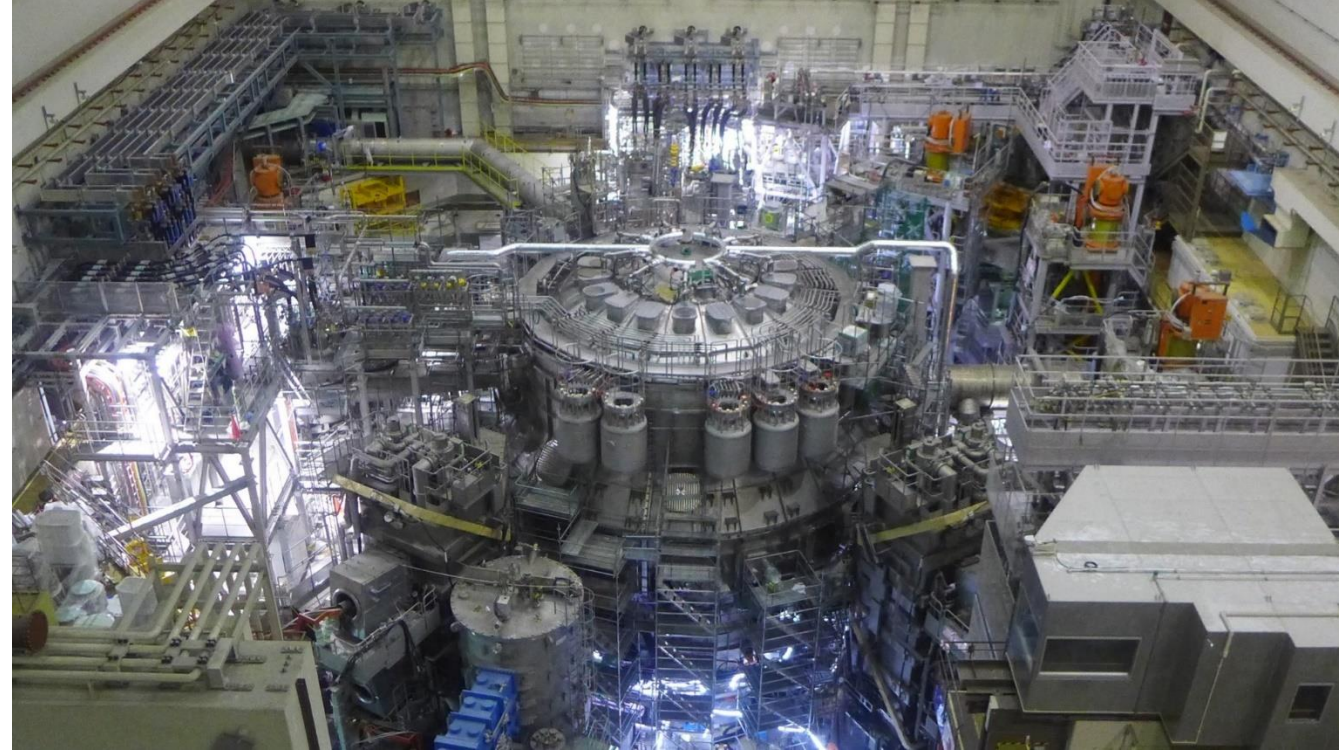


This work has been carried out within the framework of the EUROfusion Consortium, funded by the European Union via the Euratom Research and Training Programme (Grant Agreement No 101052200 — EUROfusion). Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

# Purpose of the meeting



- The 2022 WPSA General Meeting will focus on the discussion of the scientific work being done within the tasks and deliverables.
- Contents:
  - scientific discussion on the status of the tasks,
  - development plan,
  - coordination with QST and experiment team,
  - needs of input data,
  - publications plan.
- Aims:
  - Prepare the support to the Integrated Commissioning,
  - Progress towards the deployment of validated modelling and analysis tools for operation and scientific exploitation,
  - Prepare the selection of future enhancements,
  - Support the scientific output of the Integrated Commissioning.

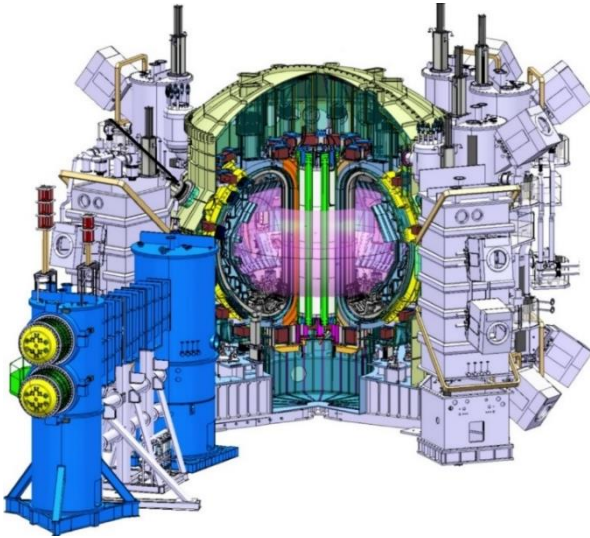




- Sessions:
  - S1.1 Overview (incl. JT-60SA repair status)
  - S1-2: FP8 EU Enhancements
  - S1-3: Initial research phase modelling
  
  - S2-1: JT-60SA Experiment Team
  - S2-2 Commissioning of EU Enhancements
  - S2-3 FP9 Enhancements
  - S2-4 Synthetic Diagnostics
  
  - S3-1 Integrated Commissioning and Remote Experimentation
  - S3-2 Integrated Commissioning Relevant Physics Topics
  - S3-3 Summaries and conclusions (incl. JT-60SA International Fusion School)
- Detailed agenda in: <https://indico.euro-fusion.org/event/1996/>
- Please upload on indico your presentation (Click on Contribution List, presentation title and then presentation materials)



# WPSA: Exploitation of JT-60SA – project objectives



High current, large size, high triangularity shape

=> **High confinement**

Long pulse=>**steady state**

High electron heating, High energy Negative NBI

=>**energetic particles, ITER and DEMO relevant scenario, plasma controllability**

- The main objective is to support the exploitation of JT-60SA through a high level EU participation, fully integrated in the EU fusion programme within the Broader Approach frame
- Maintaining/developing control room experience in a large superconducting machine in view of EU participation in ITER operation
  - play an active role in scientific exploitation and campaigns management
  - participation to the machine integrated commissioning and to plasma operations
  - contributing to a full and efficient access to data and analysis tools, on site and remotely
  - contributing to the machine enhancements plan with the scientific support to specific procurements
- Contribution to specific items of the ITER Research Plan
  - Start-up, Wall conditioning (w and w/o EC)
  - Disruption loads, mitigation, detection, triggering, avoidance...
  - H-mode, L-H transition, ELM control, plasma magnetic control, NBI shine-through
  - Topics in diagnostics R&D (high neutron flux resilience, very high temperature, in-situ calibration...)
- EU Strategic priorities in the JT-60SA research program
  - 1. Development and investigation of high performance scenarios compatible with future W-PFCs.
  - 2. Avoidance and mitigation of disruptions and runaways
  - 3. Fast ion physics
  - 4. Development and validation of high level real-time control strategies



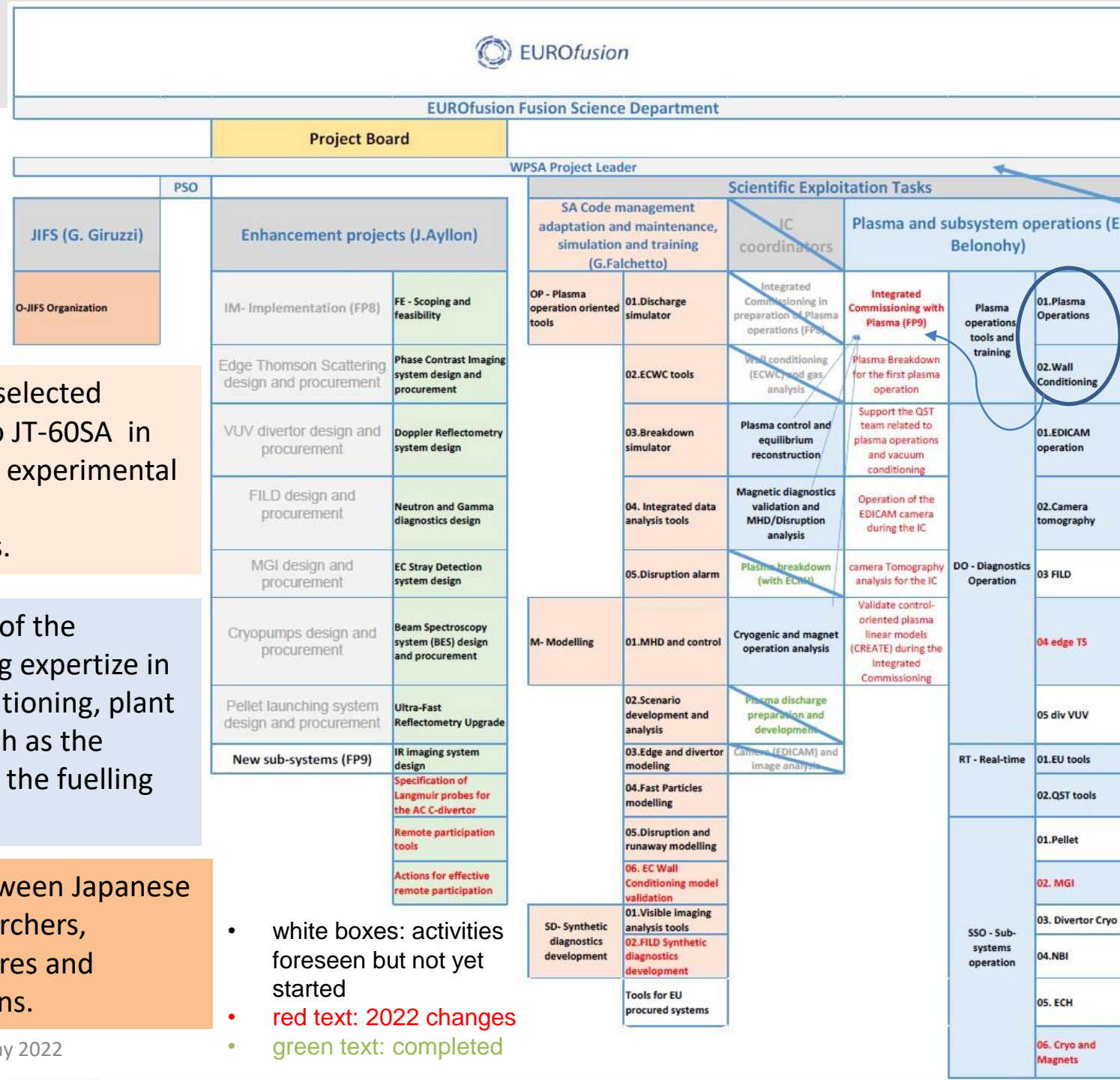
# 1 – WP Organization

SA.EN aims to promote scoping and feasibility studies up to the level of conceptual design for new enhancement projects.

SA.CM aims to provide validated selected simulation tools for application to JT-60SA in support to the preparation of the experimental campaigns, the data analysis and interpretation of the experiments.

SA.OP will support the execution of the experimental campaigns providing expertise in plasma operations, vacuum conditioning, plant commissioning and operation such as the diagnostics, of the heating and of the fuelling systems.

SA.JIFS. aims to develop links between Japanese and EU students and young researchers, completing their training by lectures and practical examples and applications.



**Broader Approach Agreement**  
JT-60SA Project leader and EU and JA Project Managers

**Experiment Team**

Experiment Team Leader from EU Jeronimo Garcia	Topical Groups and Topical Group Leaders	Participant scientists and EU contact persons
Experiment Team Leaders from Japan Maiko Yoshida Hajime Urano	PWI & SOL Tomohide Nakano (QST Naka)	Karl Krieger (MPG)
	Pedestal Nobuyuki Aiba (QST Naka)	Yunfeng Liang (FZJ)
	Energetic Particles Yevgen Kazakov (LPP-ERM/KMS, Belgium)	
	MHD Gianluca Pucella (ENEA, Italy)	
	Transport and Confinement Luca Garzotti (UKAEA, UK)	
	IOS Takuma Wakatsuki (QST Naka)	Xxx Yyy

- white boxes: activities foreseen but not yet started
- red text: 2022 changes
- green text: completed

## 2 – Status of Grant Milestones & Grant Deliverables (2021)



GA Deliverable No.	Title	Due Date	Status	Details on Status (in case of delays or issues)
D02.01	Appointment of Experiment Leader from EU (after call issued end 2020)	30/04/2021	Completed	
D02.02	Report on the first phase of the Integrated Commissioning (before plasma operations). Results and return of experience, mainly for DTT	31/12/2021	Completed	The completion of the integrated commissioning is delayed. Deliverable dependent on external conditions to which the work package is constrained.
D02.03	Report on the initial organisation of the JT-60SA scientific exploitation	31/12/2021	Completed	

GA Milestone No.	Title	Due Date	Status	Details on Status (in case of delays or issues)
SA.M01	Participation in the Integrated Commissioning before plasma operations	30/04/2021	Completed	The completion integrated commissioning is delayed. Deliverable dependent on external conditions to which the work package is constrained.



- JT-60SA Experiment Team (at present: 3 Experiment Team Leaders and 6 Topical group Leaders) now in activity
- First Experiment Team meeting (Kick-Off) with remote participation held on 25-27 April.
- Productive meeting with live discussion and updates on the preparation of the tools for the experimental campaign
- Among the topics discussed
  - Experiment Team - Policy and Rules (also for publications)
  - Environment of Participation to Experiment and Data Analysis
  - TGLs presentations
  - Status and features of the Plasma Control System
  - Summaries of EU and JA modelling activities and plans
  - Research items and collaborative works
- More in the dedicated session on Thursday morning
  
- Close interaction expected with the ET to evolve the WPSA programme
  - Modelling needs
  - Enhancements programme
  - Participation to the plasma operation



- **Selected Engineering Grantees related with JT-60SA**

<b>EEG21-15</b>	Thomson Scattering	Federico D'Isa	ENEA
<b>EEG21-20</b>	Development of software tools for ECH exploitation (JT-60SA and ITER)	Jelle Slief	DIFFER

- Both contracts started

- **Selected Research Grantee (JT-60SA analysis/application part of the work programme)**

<b>Riccardo Rossi</b>	ENEA	Tor Vergata University of Rome	Development and implementation of a physics-based multi-machine plasma instability detection and classification system for disruption avoidance, prevention, and mitigation
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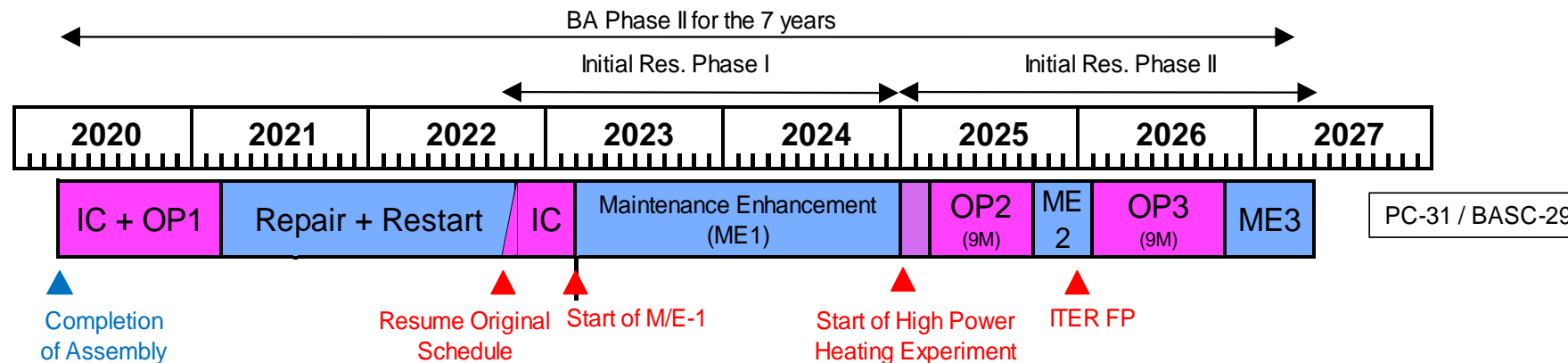
- **contract expected to start soon**



# Objectives for 2022



- Advance with the Remote Access (SA.M.02 Grant Milestone in 2022)
- Complete the procurements of FP8 projects and prepare installation in 2023-2024
- Progress towards the deployment of validated modelling and analysis tools for operation and scientific exploitation
- Contribute to the Integrated Commissioning II (SA.D.02 Grant Deliverable 2022 )
- Support the IC analysis
- Prepare the Enhancement program after 2025, in interaction with the ET and F4E (SA.D.04 Grant Deliverable 2022)



# Announcement: in person WPSA Planning Meeting in September



- **5 - 9 September 2022 - Budapest**
- **Main Building of the Hungarian Academy of Sciences (Széchenyi István sq. 9)**
- Local Organizer: Plasma Physics Department, Centre for Energy Research
- Website and Registration form available soon
- Please give a feedback on the interest for in person participation