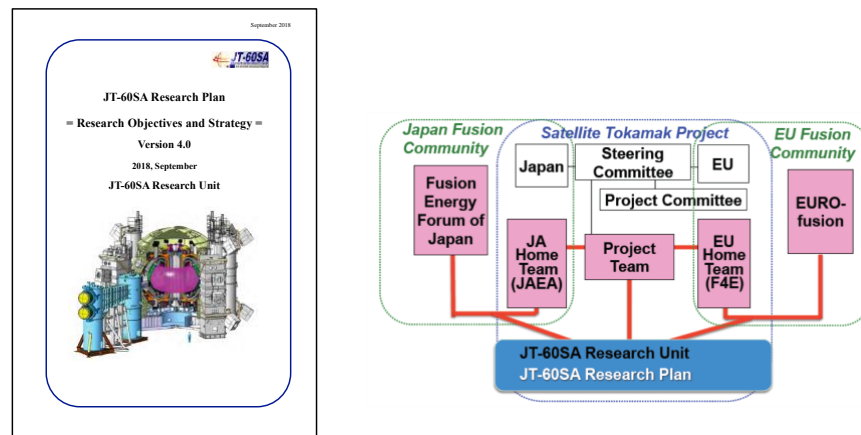


Headline

JT-60SA Research Plan Version 4.0 released



Cover page of the JT-60SA Research Plan v4.0 and organization structure of the JT-60SA Project and the JT-60SA Research Unit

An update of the JT-60SA Research Plan (SARP) has been completed in September 2018. This plan has 416 co-authors: 169 from 18 institutes in Japan, 242 from 32 institutes in 14 countries in the EU, and 5 Project Team (PT) members.

This [version 4.0](#) matches the SARP with the new ITER (International Thermonuclear Experimental Reactor) Research Plan and the Japanese action plan for DEMO (DEMONstration Power Station) construction.

Major objectives (headlines) of the Initial Research Phases I and II of JT-60SA are defined with priority in terms of scenario development and risk mitigation for ITER and DEMO. For the longer term, the strategy of transition from a carbon wall to a tungsten wall is described. The tungsten wall experiment will start in 2030 after achieving JT-60SA's main mission of high-beta full non-inductive steady-state operations and before the start of the ITER full power phase of H/He (PFPO-II) in 2031. This transition to the tungsten wall has become the project baseline of JT-60SA.

News

RWM control coil PS delivered to Naka



RWM control coil PS delivered to Naka on 27 October 2018

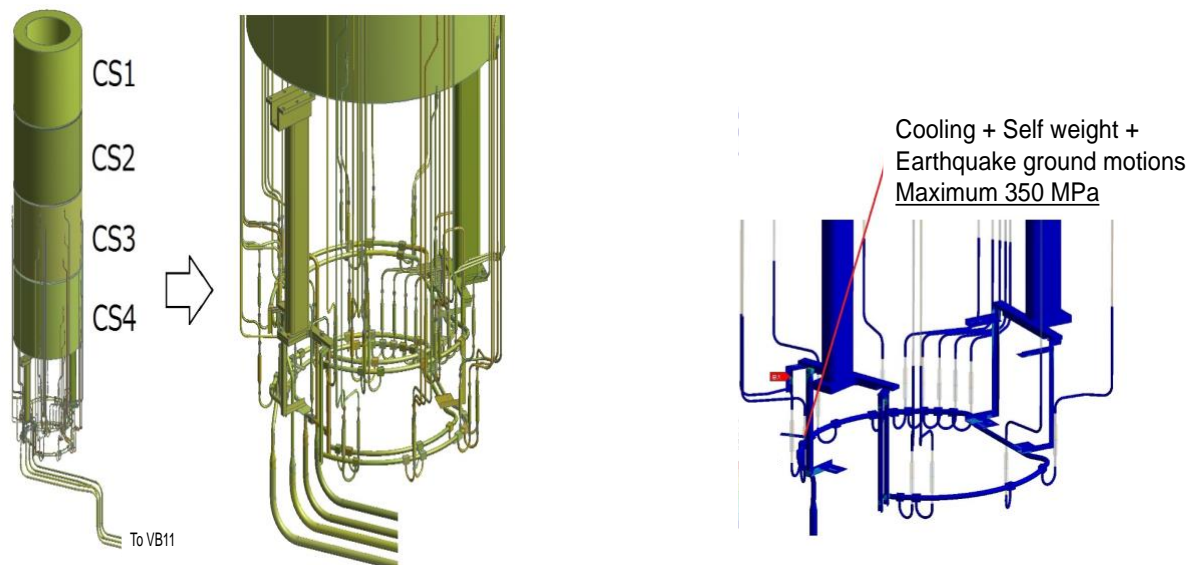
The power supply (PS) system for the active control of resistive wall mode (RWM) instabilities in JT-60SA, procured by Consorzio RFX through a contract with Equipaggiamenti Elettronici Industriali S.p.A. (E.E.I.), has now arrived in Naka. Following the successful factory acceptance test performed in Vicenza, Italy on August 2018, the power supply packed in four cases was loaded into a container and arrived at Yokohama Port on 17 September after the two-month journey.

Once all the paperwork for customs clearance was concluded, a delegation formed by the members of the National Institutes for Quantum and Radiological Science and Technology (QST) and Fusion for Energy (F4E) performed the port of entry inspection on 26 September. The cases were immediately loaded on the truck to be delivered to the Naka site, where the celebratory picture was taken the day after.

The cases were unloaded and moved into the vacuum circuit breaker (VCB) room of the rectifier building in preparation for the later installation.

News

Support structure of CS module connection pipes proved



Support structure of coolant pipes of CS (CS3 & 4)

The mechanical strength of the support structure of the coolant pipes leading to the central solenoid (CS) was analysed. In the analysis, under the conditions of room temperature and low temperature (4K), the mechanical strength under earthquake conditions (0.6 g horizontal and 0.4 g vertical forces) was calculated.

The earthquake occurring at low temperature turns out to be the most severe condition. The maximum stress in the support of the coolant pipes at that time was shown to be 350 MPa, which satisfies the permissible value (420 MPa). The average stress of an insulation coupler was 1.4 MPa, which is much lower than the design rupture stress (4.8 MPa).

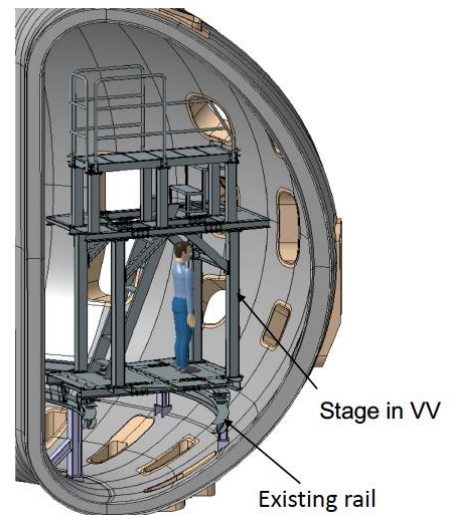
Based on the above, it was confirmed that the support structure of the lower coolant pipes of the CS is not problematic in terms of mechanical strength.

The analysis of the mechanical strength of the insulation coupler will now be carried out in more detail.

Installation of stages in VV finished



Stage in vacuum vessel

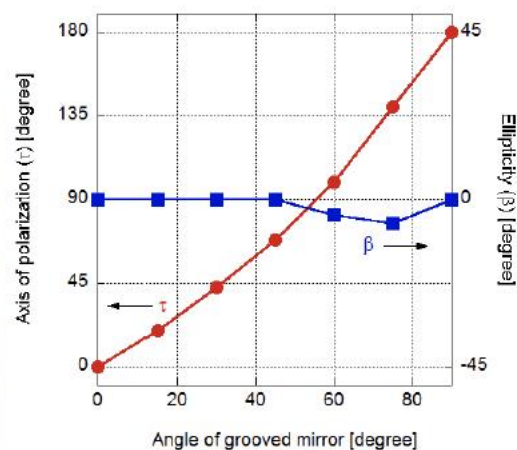
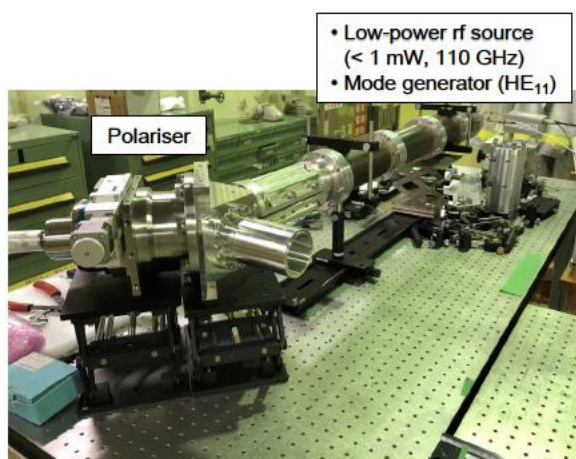


Structural drawing of stage in vacuum vessel

The stage in the vacuum vessel (VV) is a working platform used for the assembly of the in-vessel components such as electromagnetic detectors and the inboard first wall.

This stage can move in the circumferential direction on wheels on the existing rails installed in the VV. The work can be done on the lower, middle and upper parts in accordance with the height of the working position. Two of these stages have been installed, starting on 10 September and ending on 25 September 2018.

Actual ECRF polarisation rotator performance confirmed



A characteristic evaluation test of the actual polarisation rotator to be used in JT-60SA was carried out at low power. As a result, it was confirmed that the polarisation angle of millimetre waves propagating inside the waveguide transmission lines can rotate from 0 to 180 degrees by changing the rotation angle of the diffraction grating.

Changes of the ellipticity with the rotation angle of the diffracting grating were also measured. The maximum change of the ellipticity was about 10 degrees, in accordance with the design.

From now on, the performance of the polariser will be confirmed together with an actual polarisation converter

News

Experts visit QST Naka site



Mr. Richard Cobben (second from left) and Mr. Tullio Bonicelli (second from right)

On 5 October 2017, Mr. Richard Cobben (Head of ITER Delivery Department at Fusion for Energy) and Mr. Tullio Bonicelli (Project Team Manager at Fusion for Energy) visited the QST Naka site to discuss fusion research and development.

Representatives of QST welcomed them and took them on a tour of the JT-60SA device being assembled in the torus hall.

SOFT 2018



Y. Kamada making his invited talk

The 30th Symposium on Fusion Technology (SOFT 2018) was held in Messina, Italy from 16 to 21 September 2018. The symposium focused on the latest development of running and planned fusion experiments. The programmes consisted of plenary sessions, oral and poster presentations. A total of 1,023 participants attended the conference.

Y. Kamada, the Project Leader, presented an invited talk entitled “Status of the JT-60SA Project” giving an overview of the fabrication, assembly, research plan, and future exploitation of the JT-60SA device. He remarked that the JT-60SA project is progressing steadily. His talk was well attended.

The 18 contributions from the JT-60SA EU and Japanese Home Teams were presented as follows (only presenters and titles are shown):

- Invited presentations (1)
 1. Y. Kamada, Status of the JT-60SA Project.
- Oral presentations (3)
 1. S. Davis, JT-60SA TF magnet assembly;
 2. G. M. Polli, JT-60SA Toroidal Field coils procured by ENEA: a final review;
 3. W. Abdel Maksoud, Completion of the JT-60 SA Toroidal Field coils tests in the Cold Test Facility.
- Poster presentations (14)
 1. P. Lang, Final design of the JT-60SA pellet launching system for simultaneous density and ELM control;
 2. Y. Shibama, Design and manufacturing of thermal shield for JT-60SA;
 3. T. Kobayashi, Development of two-directional beam steering ECH/CD launcher for JT-60SA;
 4. M. Takechi, Disruption simulation for design of JT-60SA components;
 5. P. Rossi, Welding technologies applied on casings for JT-60SA toroidal field magnet;
 6. D. Tsuru, Design of inboard first wall for the initial operation phase of JT-60SA;
 7. T. Hayashi, Remote handling tools for hydraulic connection of divertor cassette in JT-60SA;
 8. L.D. Corona Rivera, Plasma shape control assessment for JT-60SA using the CREATE tools;
 9. E. Gaio, Towards the completion of the Power Supply system for Resistive Wall Modes control in JT-60SA;
 10. M. Pretelli, Final tests of four switching network units procured by the European Union for JT-60SA;
 11. E. Gaio, Final Design of SiC-based Power Supply system for Resistive-Wall-Mode control in JT-60SA;
 12. S. Hatakeyama, Development of Supervisory Control System for Magnet Power Supplies in JT-60SA;
 13. K. Natsume, Design of the JT-60SA cryogenic pipe system;
 14. K. Fukui, Monitoring and Control of the Magnet System of JT-60SA.

The next SOFT will be held in Dubrovnik, Croatia from 20 to 25 September 2020.



S. Davis making his oral presentation



G. M. Polli making his oral presentation



K. Natsume with his poster presentation



P. Rossi with his poster presentation



Symposium sign



Beach, sky, and Mt. Etna

Calendar

12–17, November 2018

2nd Asia-Pacific Conference on Plasma Physics (AAPPS-DPP 2018)
Kanazawa, Japan

19–22 November 2018

The 27th International Toki Conference on Plasma and Fusion Research
& The 13th Asia Pacific Plasma Theory Conference (ITC & APPTC 2018)
Toki, Gifu, Japan

21–22 November 2018

31st Technical Coordination Meeting (TCM-31)
Naka, Japan

5 December 2018

23rd Meeting of the BA Steering Committee (SC-23)
Grenoble, France

13 March 2019

24th Meeting of the STP Project Committee (PC-24)
Naka, Japan

Contact Us

The JT-60 Newsletter is released monthly by the JT-60SA Project Team.

Suggestions and comments are welcome and can be sent to newsletter@jt60sa.org.

For more information, please visit the website: <http://www.jt60sa.org/>.