JT-60SA Newsletter
No. 46, 31 October 2013

Headline

Spain's secretary of state for research visits JT-60SA

Figure 1: A group shot in the lobby of the JT-60 control building

Figure 2: In front of the cryostat base

Figure 3: At the superconducting coil winding building for JT-60SA

On 2 October, Ms. Carmen Vela, the Secretary of State for Research, Development and Innovation of the Spanish Ministry for Economy and Competitiveness, visited the facilities of JT-60SA and ITER and met with Mr. Tatsuhito Matsuzaki, Vice-Mayor, Naka City, at the JAEA Naka Fusion Institute during her official visit to Japan.

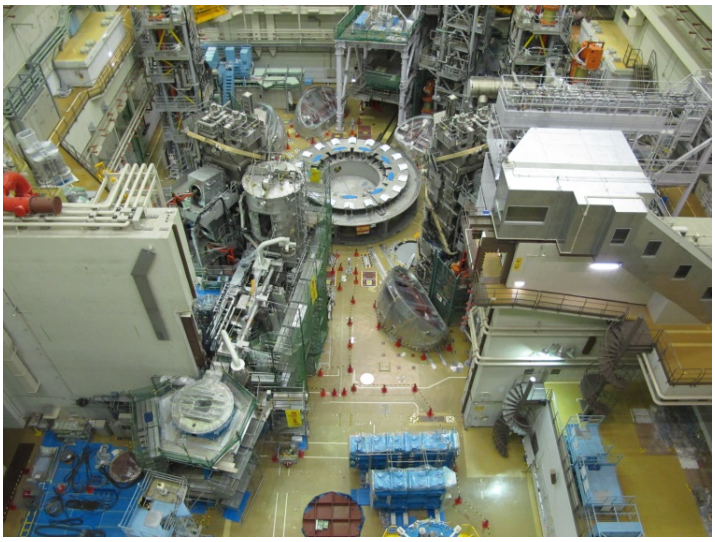
Spain participates in the JT-60SA project jointly implemented between Europe and Japan. The cryostat is designed by the Centre for Energy, Environment and Technology (CIEMAT), funded by the Ministry for Economy and Competitiveness, and its base has been manufactured by the Spanish companies, IDESA/Asturfeito, in Avilés.

"During the visit we had fantastic feelings of great respect for what the Spanish science and technology means. We are pleased since it has meant moving from Spain the cryostat base of 280 tons and seven pieces with no margin for error" she commented,and added "It's a good example of public-private partnership in Spain with an international dimension." She also expressed optimism on the possibility that Spanish industry could participate in the assembly of JT-60SA.

Figure 4: At the remote handling facility for ITER

News

Torus hall busy with completion of cryostat base assembly



Cryostat base in the torus hall in October 2013

The assembly of the cryostat base (CB) components delivered from Spain into the torus hall was started on 28 January 2013. Two months later, the “Celebration of the delivery of the first component from EU and start of assembly of the JT-60 SA tokamak” was held at the Naka site. The CB assembly process including welding and inspection went on as scheduled and all the assembly work was completed on 9 September (see figure).

In parallel with the CB assembly, the modification of the negative-ion-based neutral beam injection (N-NBI) system has also proceeded in the torus hall, in which the ion source tank and the ion dump tank have been temporarily removed to lower the beamline injection position. All the modifications will be completed by the end of this year.

In January 2014, the lower equilibrium field coils of No. 4, No.5 and No. 6 will be carried into the torus hall from the manufacturing facility at the Naka site and temporarily fixed on the CB. In addition, the assembly of the vacuum vessel and vacuum vessel thermal shield will also start from April 2014.

News

VV sector manufacturing progressing smoothly

Figure 1: The eighth 30° outer sector unloading from the truck

The vacuum vessel (VV), consisting of ten sectors: seven 40° sectors, two 30° sectors and one 20° sector, continues to be manufactured. Six out of the seven 40° sectors have already been completed. Overall, the manufacturing of the VV sectors is progressing well, as follows.

The inboard and outboard parts of the sixth 40° sector were delivered to the JAEA Naka site and the connection of the sixth 40° sector by welding between the inboard and outboard parts was completed in the building for vacuum vessel sector-assembly at the Naka site by March. The inboard and outboard parts of the seventh 40° sector were delivered to the Naka site in July 2013. The connection of the seventh 40° sector between the inboard and outboard parts is now being welded. The building for vacuum vessel sector-assembly is being used for their storage as well, and the manufacturing of the fourth – seventh 40° sectors will be completed in November 2013 after the acceptance tests.

The 8th and first 30° sector was delivered to the Naka site in October (Figure 1). It is expected that the manufacturing will be completed by the end of November. The rest of the sectors are already being manufactured in the factory. For the ninth and second 30° sector, the toroidal 30° joint of the inboard has been completed, and 20° upper/lower parts of the outboard have been joined (Figure 2). The manufacturing of the final parts for the 20° sector are progressing well, and inboard segments, which are parts divided in the straight and the curved region, were welded. This will be also delivered to the Naka site by March 2014.

Figure 2: Inboard part of the ninth 30° sector at the factory

News

Installation procedure planning for VV thermal shield

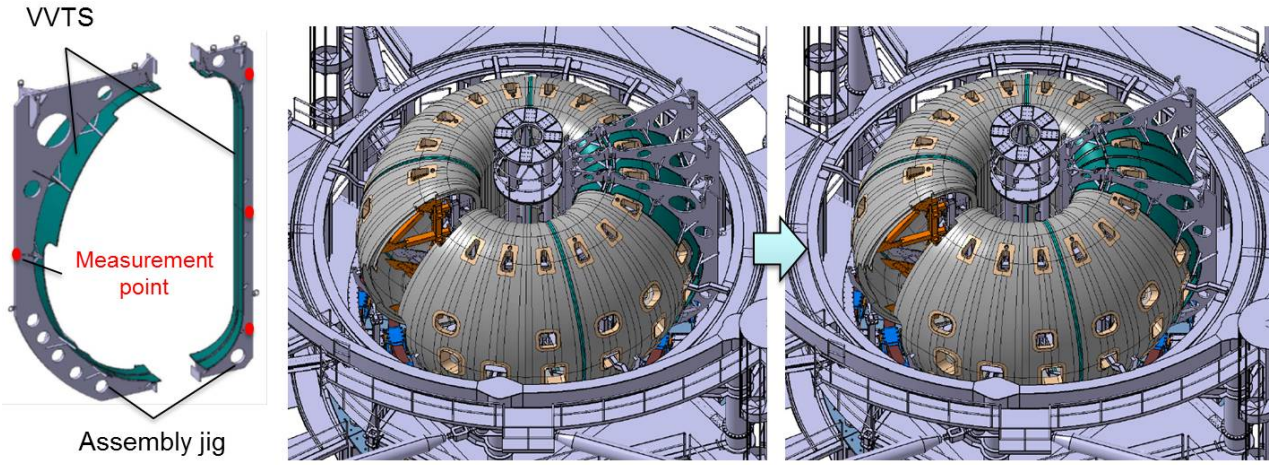


Figure 1: Assembly procedure for VVTS

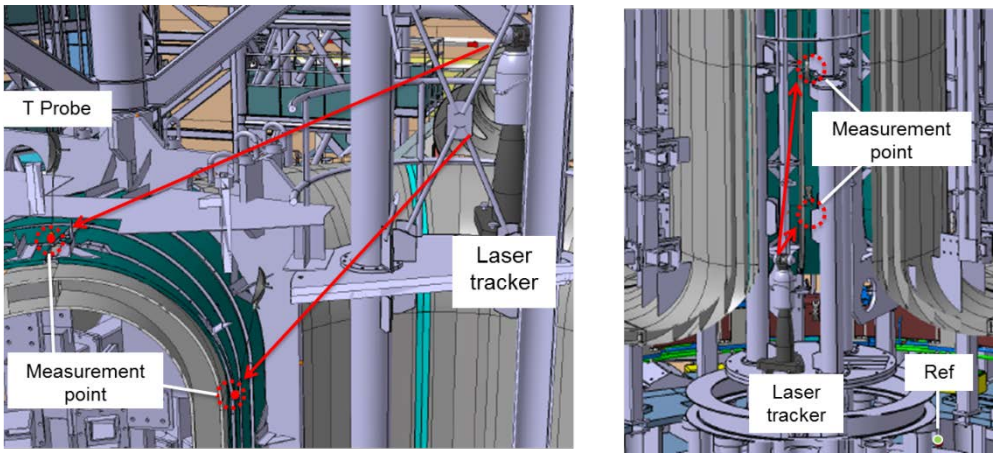


Figure 2: Example of measurement and reference points for VVTS

Since the JT-60SA device will be assembled reusing a part of the existing facility of the JT-60U device, an absolute reference frame for JT-60SA will be set based on the reference point (ref) used for JT-60U and the position of the JT-60SA assembly will be managed using a laser tracker, which is a 3D coordinate measuring machine.

The origin of the absolute reference frame should be set at the centre of the device during operation. However, this origin is imaginary and invisible. Therefore, several refs of the absolute reference frame need to be set on the walls of the assembly hall and the cryostat base (CB), which are easy to use and accessible during and after assembly, so that the origin can be always maintained by the laser tracker. In fact, it is really hard work to observe predefined refs for each component in each assembly process since the over 300 major components are arranged in a doughnut shape to be assembled in the narrow working space. To relieve this difficulty, it is planned that the tracking will be augmented by using the 3D CAD system to establish reference positions for visible measurement points for all target components (Figure 2).

Recently, an installation process plan and a position measurement method for the vacuum vessel thermal shield (VVTS) have been established. The VVTS will be delivered and set on the cryostat base with the assembly jig since its stiffness is relatively low. To set the VVTS in the correct position, the measurement point should be established by setting a laser tracker on the assembly jig and after correctly and temporarily fixing and connecting the three adjoining sectors using the established measurement point, the assembly jig of the sector in the middle should be removed (Figure 1). This procedure is able to set the VVTS in the correct position. However, there is a possibility that the VVTS will be bent by removing the assembly jig. Therefore, it is planned to assemble the VVTS using a contact type probe, which is able to directly measure the measurement point (marking off line) on the VVTS, together with a laser tracker while confirming the position of the VVTS. The VVTS assembly will actually be performed in 2015.

News

EF5 and EF6 coils manufacturing right on track

EF5 (on the left) and EF6 coils (on the right) in the superconducting coil manufacturing building at the Naka site

There are 6 equilibrium field (EF) coils (EF1 to EF6), which are a part of the superconducting coils and take the role of controlling the plasma shape. These 6 EF coils are manufactured by stacking coil pancakes.

The EF5 and EF6 coils are now being manufactured in parallel. All pancake coils for both EF coils have already been stacked and the joint parts, which connect each pancake, have been completed in October (see figure). After this, the insulation resin impregnation and curing will be made for the coil stack. Lastly, the support structures and refrigerant pipes will be installed on the coils. All the EF5 and the EF6 coil manufacturing works will be completed by the end of December.

Meetings

13th STP Project Committee Meeting

On 9 October, the 13th Meeting of the Satellite Tokamak Programme (STP) Project Committee (PC-13) was held by videoconference between EU and Japan. 27 participants in total joined the meeting, 6 members from the Project Committee, the Project Leader (PL), 4 Experts from the Project Team, and 16 experts from the EU and JA Home Teams.

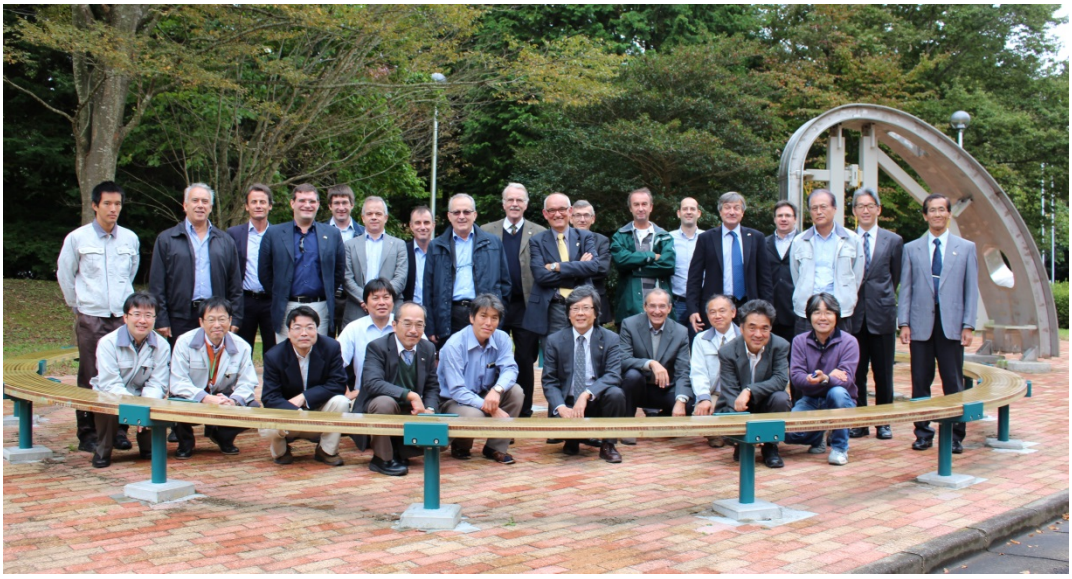
The PL overviewed the project status and presented the “Work Programme 2014” and “Updated of Project Team”, to be submitted to the Broader Approach Steering Committee to be held in December, and the latest status of procurement and assembly were also reported in detail by the Project Managers of the EU and JA Home Teams. The PC members expressed satisfaction for the progress in both EU and JA procurements and assembly activities.

The next STP-PC meeting (PC-14) will be held on 18 March 2014.

Meetings

18th Technical Coordination Meeting

The 18th Technical Coordination Meeting (TCM-18) was held at the JAEA Naka site on 23 and 24 October, and about 65 experts in total, including 17 visitors from Europe, got together from France, Germany, Italy and Spain via videoconference. In parallel, satellite meetings on the TF coils, cryogenic system, high temperature superconducting current leads, power supply, cryostat and assembly were organized during this week in order to discuss about interface issues and on-site work in detail.



On the first day, after introduction by the Project Leader (PL), the JA and EU Project Managers reported the status and issues of procurement and assembly activities. Then the progress and issues on the TFC, cryogenic system and high temperature superconducting current leads (HTS-CL) were discussed in detail.

On the second day, hot discussions continued on assembly work on site and pre-assembly of TF coils, in-vessel components, PF coils, cryostat, vacuum vessel, thermal shield and power supplies, the TF coil cold test facility and so on. The status of the JT-60SA research plan and configuration control models were also presented. Finally, the action lists and the PID (Plant Integrated Document) were updated for finalisation, and the next TCM-19 was confirmed to be held at Garching on 26-27 February 2014.

Calendar

November 5-8, 2013
9th Asia Plasma and Fusion Association Conference (APFA-9)
Gyeongju City, Korea

December 3-6, 2013
30th Annual Meeting of the Japan Society of Plasma Science and Nuclear Fusion Research (JSPF)
Tokyo, Japan

December 17, 2013
13th Meeting of the BA Steering Committee (SC-13)
Saclay, France

February 26-27, 2014
19th Technical Coordination Meeting (TCM-19)
Garching, Germany

March 18, 2014
14th Meeting of the STP Project Committee (PC-14)
Naka, Japan

Contact Us

The JT-60SA Newsletter is released monthly by the JT-60SA Project Team.
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For more information please visit the website: http://www.jt60sa.org/