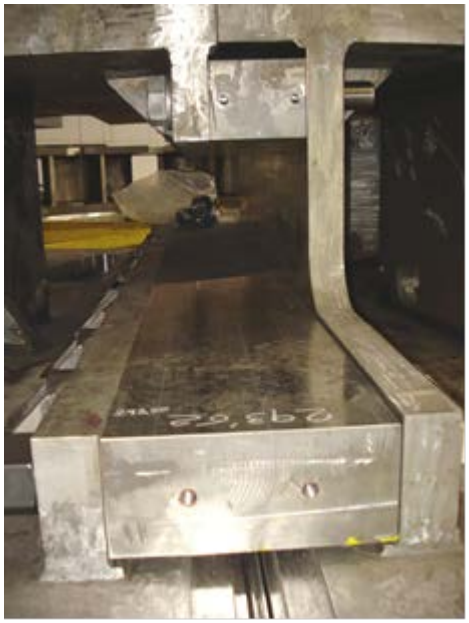
JT-60SA Newsletter
No.35, 30 November 2012

Headline

JT-60SA Cryostat Base: final preassembly for delivery to Naka




The final preassembly of the cryostat base (CB) was carried out at the ASTURFEITO facilities. The seven pieces that make up the CB (i.e. three sectors of the double ring, another three sectors of the lower structure, and the inner cylinder) (see the article of the Newsletter No. 27) were assembled using most of the connecting bolts. All parts matched together with high precision.

After the preassembly of the CB, an accurate dimensional inspection was made in order to check all tolerances. This verification was performed with a 3D coordinate measuring portable machine, a Leica laser tracker LTD 640. To take account of the fact that the technical specifications gave dimensions at 20ºC, the measured dimensions were adjusted by software, considering the material thermal expansion coefficient. The result of this dimensional inspection is satisfactory, with low tolerances under the limits.

Marking of reference points on the components, identification of shear keys, spacers and pins followed the disassembly process. The final cleaning together with the packaging of all the components completed the manufacturing. The CB will arrive at Japan (Hitachi port) in January 2013.

On 7 November, S. Ishida, the JT-60SA Project Leader (PL), together with the representative of CIEMAT, J. Botija, had the opportunity to visit the ASTURFEITO facilities during packaging of the disassembled components of the CB for shipment. The PL was convinced that the successful manufacturing of the CB, the first massive deliverable from Europe to Japan, will ensure the real start of the JT-60SA assembly at the JAEA Naka site from January 2013.

News

First toroidal field coil winding production line prepared

Figure 1: De-spooling and movement/rotating table tools on their carriage before assembly on the winding line rails

On 9 November, S. Ishida, the JT-60SA Project Leader (PL), together with ENEA and F4E representatives, visited ASG premises in Genoa, Italy, where the installation of the tools required to build 9 of the 18 toroidal field coils of JT-60SA is progressing, and was impressed that preparation was proceeding well.

The contract between ENEA and ASG for the procurement of the 9 coils was signed in September 2011. During the first year of activity ASG renewed the building and workshop where the work will be carried out. Moreover, all the tools and materials for the winding, impregnation and final test of the coils were designed and procured.

The PL, during his visit in ASG, had the chance to see the final phase of the winding line installation. The winding line is composed of two parallel rails on which two carriages are placed and electronically controlled. The de-spooling tool is placed on one carriage, and the rotating table with the final shape of the coil is placed on the other. Also it was possible to see the two benches for the double pancake (DP) insulation and winding pack (WP) stacking. The impregnation mould where the WP will be impregnated using vacuum pressure impregnation, and the vacuum chamber to perform the final pressure and electrical tests on the coil before shipment to the cold test facility, could also be inspected.

Figure 2: Impregnation mould within its dedicated closed area

Figure 3: Vacuum chamber for DP and TF coil winding final pressure, leak and electrical tests

The visit was concluded with a review of all the special processes that will be carried out (He inlet insert welding qualification, impregnation mock-up, electrical joint mock-up, shear strength test). According to the ASG schedule, the commissioning of the winding line should start at the beginning of December and then the first DP should be produced at the very beginning of 2013.

News

Contract awarded for the central solenoid switching network units

Attendees at the first progress meeting

The contract for the procurement of the four switching network units (SNUs) for the four modules of the JT-60SA central solenoid was awarded by ENEA to the industrial supplier OCEM Energy Technology on 20 September. OCEM Energy Technology has a wide experience in the field of power electronics applied to nuclear fusion and is already involved in several international projects related to ITER, such as the prototypes of the gyrotron main and body power supplies and the neutral beam injector test facility.

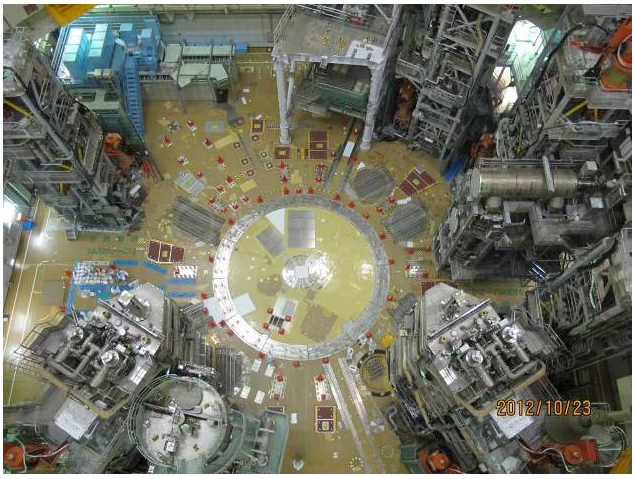
The procurement technical and management activities started immediately after the award of the contract. The first progress meeting was held at the ENEA Research Centre in Frascati, Italy, on 26 October. The meeting was attended (in person or by videoconference) by the representatives of ENEA (A. Pizzuto, A. Cucchiaro, A. Lampasi, G. Maffia, F. Starace, L. Di Pace, C. Cristofani, G. Ginoulhiac, P. Costa, V. Cocilovo, G. Coccoluto), Energy Technology (G. Taddia, F. Burini, S. Tenconi), F4E (L. Novello, A. Coletti, E. Di Pietro), JAEA (M. Matsukawa, K. Shimada, K. Yamauchi, T. Terakado) and the Project Team (T. Ogawa).

Screenshot of the progress meeting videoconference

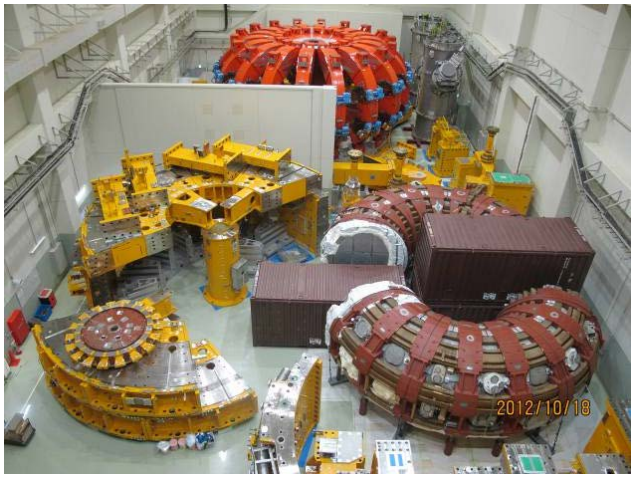
The procurement is based on the technical specifications developed by ENEA with the close collaboration of F4E and JAEA. During the first progress meeting, the system characteristics and the preliminary design solutions were thoroughly analyzed and discussed. The Energy Technology design is based on the hybrid static-electromechanical scheme proposed by ENEA. The specific aspects of the project will be defined during the detailed design phase that will be completed by March 2013. Energy Technology also presented the main management and quality plans, as well as the updated procurement schedule. The delivery of the four SNUs to Japan is expected in 2016.

News

Disassembly of JT-60U successfully completed



Torus hall after completion of disassembly



Disassembled parts stored in the JT-60 storage building

The disassembly work of JT-60U took three years and was completed in October as scheduled. The very last part to be disassembled, the base frame, was cut in half, the base frame halves were lifted out, and delivered to and stored in the JT-60 storage building. The lower frame and supporting column, disassembled and temporarily stored in the assembly hall before the disassembly of the base frame, were also delivered to and stored in the JT-60 storage building. As a result, the storage of all the JT-60U-related disassembly parts (total weight: approximately 5,400 t) has been completed. Finally, the floor surface of the torus hall was repaired and all the disassembly work was completed without any accidents. This means that the torus hall is now ready for the assembly work of JT-60SA, which will start next January (with the assembly of the cryostat base to be delivered from Europe).

Meetings

13th Design Review Meeting on water cooling of magnet power supply system

The 13th Design Review Meeting (DRM) on water cooling of the magnet power supply systems was held by videoconference on 12 November with attendance of 17 experts from Germany (Fusion for Energy), Italy (Consorzio RFX and ENEA Frascati), France (CEA Caradache) and Japan (Naka Fusion Institute).

JAEA experts presented the proposed technical specification of the cooling system, which is based on the latest requirements from the power supply components in terms of heat loads, and procurement plan. It was agreed to proceed with drafting its Procurement Arrangement based on the discussion at this meeting and that the precise interfaces between EU components and JAEA piping should be confirmed in the detailed design phase after the PA is signed.

Meetings

11th Meeting of the BA Steering Committee

The Broader Approach (BA) Agreement is now in its sixth year and has become a model for effective scientific collaboration between the EU and Japan, strengthening cooperation in delivering fusion as an energy source for the future. On 6 November, representatives of the EU and Japan met at the offices of FPS Economy, part of the Belgian Federal Government in Brussels, where the steady progress of the three projects of the BA Activities (IFMIF/EVEDA, IFERC and STP (JT-60SA)) was presented, and the 2013 Work Programmes for these projects were approved.

For the STP, it was possible to report that the procurement and manufacturing of components had made steady progress in EU and Japan towards meeting the schedule of first plasma in March 2019. The assembly of the main Tokamak would start in January 2013 following the delivery of the first major component from Europe. Furthermore European and Japanese research communities were now busy planning the scientific exploitation of JT-60SA, while the discussions between the EU and Japan on an understanding for the joint exploitation of JT-60SA were making good progress.

The next BA Steering Committee meeting will be held in Rokkasho (Japan) on 23 April 2013.

Meetings

24th IAEA Fusion Energy Conference

The IAEA Fusion Energy Conference (FEC), which is the largest conference in the fusion community, was held at Hilton San Diego Bayfront Hotel in San Diego, USA from 8 to 13 October. More than 900 participants joined together to present and discuss the latest progress in fusion research.

Following the trend in the FEC in recent years, more and more emphasis is put on the research explicitly directed to ITER. In particular, on tokamak experiments with metal wall materials, in which the ITER-like wall (ILW) experiment in JET is the most significant, and on edge-localized modes (ELM) mitigation experiments. From the ITER Organization, O. Motojima the Director General presented the latest progress in the project and the status of the design and manufacturing of the main components. He also showed pictures of the brand-new ITER headquarters building, outside and inside. Y. Kamada, the JA project manager, gave an oral presentation on the overview of the JT-60SA project. The presentation attracted wide interest and was also referred to in the summary session.

A number of contributions from the JT-60SA EU and JA Home Teams were presented as follows (only presenters are shown):

- Oral presentations (2)

- Y. Kamada, from JAEA Naka, on the progress of the JT-60SA project;
- A. Becoulet, from CEA Cadarache, on the science technology research & development in support to ITER and the Broader Approach

- Poster presentations (7)

- G. Giruzzi, from CEA Cadarache, on model validation and integrated modelling simulations for the JT-60SA tokamak;
- M. Honda, from JAEA Naka, on predictive transport simulations consistent with rotation and radial electric field using TOPICS with OFMC;
- A. Isayama, from JAEA Naka, on progress in the development of the ECRF system for JT-60SA;
- M. Hanada, from JAEA Naka, on progress in the development of long pulse neutral beam injectors for JT-60SA;
- P. Bayetti, from CEA Cadarache, on an overview of CEA contributions to the Broader Approach projects;
- A. Sakasai, from JAEA Naka, on manufacturing and development of the JT-60SA vacuum vessel and divertor;
- S. Ide, from JAEA Naka, on the optimization of JT-60SA plasma operational scenario with capabilities of installed actuators.

Calendar

January 23-24, 2013
16th Technical Coordination Meeting (TCM-16)
Naka, Japan

March 19, 2013
12th Meeting of the STP Project Committee (PC-12)
Naka, Japan

April 23, 2013
12th Meeting of the BA Steering Committee (SC-12)
Rokkasho, Japan

May, 2013
17th Technical Coordination Meeting (TCM-17)
Grenoble, France

Contact Us

The JT-60SA Newsletter is released monthly by the JT-60SA Project Team.
Suggestions and comments are welcome and can be sent to masayasu.sato@jt60sa.org.

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