

Headline

Vacuum vessel assembly being prepared

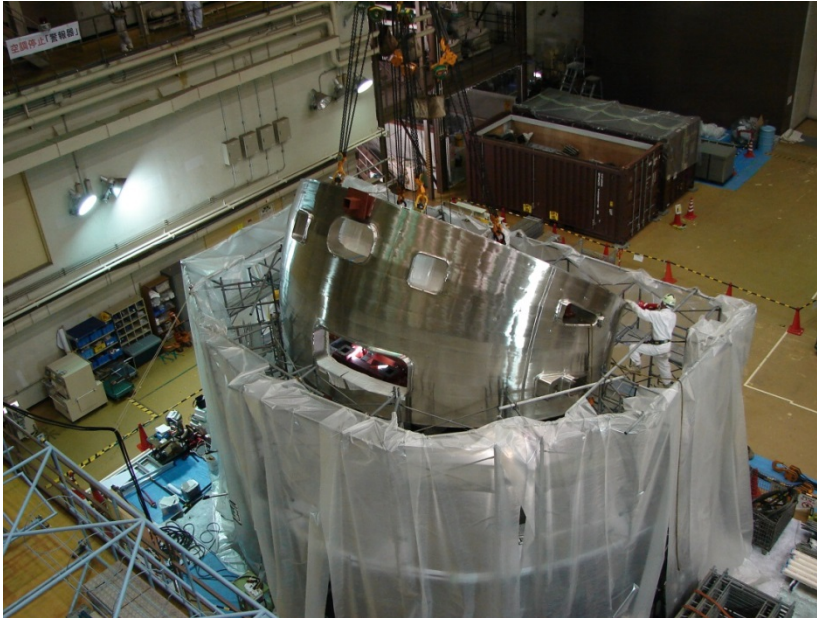


Figure 1: End face correction for D04 and D03

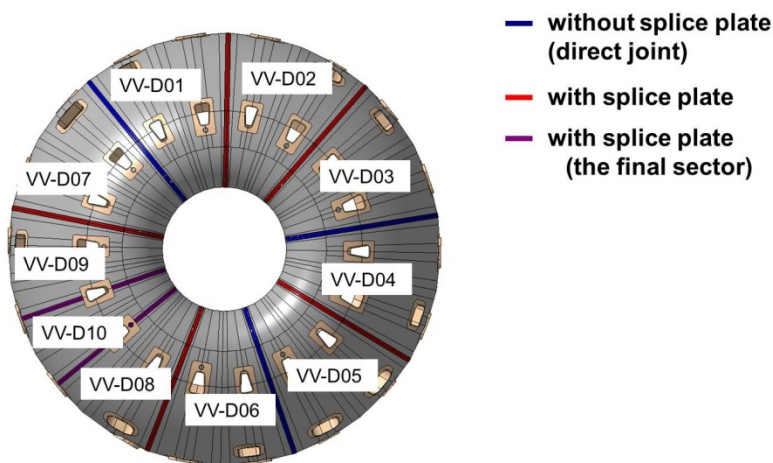


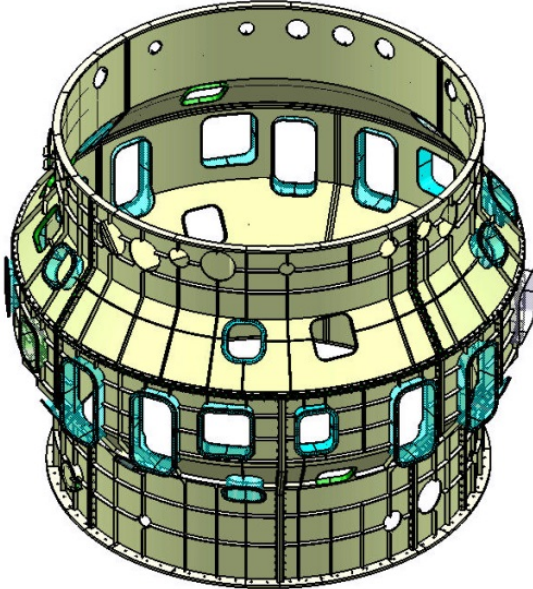
Figure 2: Welding connection of the vacuum vessel

At the beginning of December, the preparation for the vacuum vessel (VV) assembly was started with the end face correction of VV sectors in the JT-60 assembly hall at the Naka site. This end face correction, which needs to be done before the full-scale assembly, for the parts of the VV sectors which are going to be directly joined, is needed in order to be able to keep the 10 VV sectors in total as a torus within the specified tolerances.

In the assembly hall, the end face correction began with measurement of the gap when the end faces of the two VV 40° sectors (D04 and D03, see Figure 1 and 2) were temporarily joined together. Next the VV sectors were separated from each other, and deformed using a hydraulic jack while being heated by a welding torch as needed according to the measurement results. As a result, the gap amount was corrected to be less than the required value of 3 mm. After this correction, the VV dimensions will be confirmed together with the end face correction by rejoining the VV sectors. The further end face corrections will be performed for the other two sets of VV 40° sectors (D05 and D06, D07 and D01) in the near future.

News

Contract awarded for CVBCS



Cryostat vessel body cylindrical section

After the signature of the PA for the cryostat vessel body cylindrical section (CVBCS) on 25 July, 2011, the implementation of the activities by CIEMAT was kept on hold waiting for the authorisation of the corresponding Spanish Ministry to launch the tendering. The call for tender was launched in July 2013 and the contract placed within this year.

The tendering process for the supply of the CVBCS, closed at the end of August, resulted in four offers presented by Spanish companies. All the offers were evaluated after further discussions with the companies in order to clarify technical aspects. The technical assessment of the offers, carried out by CIEMAT technical experts, was finalised in October with one company selected, ASTURFEITO S.A in Asturias. The contract was signed on November 29 and the kick-off meeting, at the company's premises, was held on December 19.

ASTURFEITO S.A. has already worked, as a subcontractor of IDESA S.A, for the manufacture of the cryostat base, in particular all the machining and assembly activities were performed by ASTURFEITO S.A.

The CVBCS has to be manufactured and delivered within 30 months from the start of the contract. The CVBCS is approximately 13.77 m in diameter and 10.95 m in height, with a total weight of 175 t. It is formed by 12 sectors (4 at the upper part and 8 at the lower) assembled by mechanical connection. The component will be manufactured with SS304 plates 34 mm thick externally reinforced with ribs, in which a large number of ports and penetration are made. The tolerances required on the component are in the range of several mm for the position of the ports as well as in radius/height. Flatness required in the contact surfaces is up to 0.5 mm.

News

Detailed design review for cryogenic system



Figure 1: Review panel and the AL-AT team at Sassenage on 3 December

The detailed design review for the cryogenic system, referred to as the “Final Design Review”, in the Newsletter No.47, was held from 2-4 December, at Sassenage France, inside the Air Liquide Advanced Technologies (AL-AT) company premises (Figure 1). This is an important milestone which will enable the company to officially launch the manufacturing activities, expected to be completed within the 12 coming months, and marks the end of the industrial design activities. Three intensive full day meetings were needed to thoroughly review with JAEA, F4E and CEA representatives the extensive documentation developed by AL-AT in their document deliverable package “DD3” over the past 12 months.

The main subject treated on 2 December dealt with full layout and on-site erection of the cryogenic system including a review of the 3D configuration model (Figure 2) and external interfaces with the JAEA site, buildings and F4E gas tanks. The two remaining days were devoted to the detailed review of the cryogenic system process including functional analysis, piping and instrumentation diagrams, operation safety studies, plant control system, cryogenic system manufacturing and associated quality control, manufacturing inspection and test plans, commissioning procedure and site test plan, and quality management. The list of spare parts recommended by AL-AT and its sub-suppliers was also discussed.

The full DD3 package, updated with the minor comments raised by the review panels, will freeze the AL-AT design for the cryogenic system. The detailed on-site commissioning procedure and test plan will be updated during the course of the manufacturing activities and finally validated at the next configuration review foreseen for the end of 2014 in the “As Built Review” associated with the DD4 package. During the course of 2014, CEA will perform a tight quality control of AL-AT manufacturing activities. CEA noted that no major issue was raised during the meetings and that all AL-AT activities are progressing well according to the contract schedule.

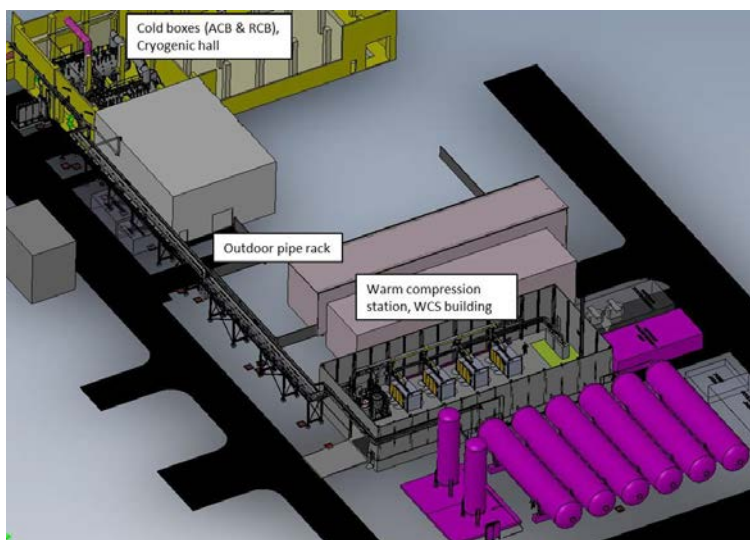


Figure 2: Cryogenic system overall view

News

Conductor manufacturing for upper EF coils progressing well



Helium leak test underway for conductors for EF2

The manufacture of the superconducting conductors for three out of the six equilibrium field coils (EF1, EF2 and EF3), which will be installed in the upper section of JT-60SA, and three out of four central solenoid (CS) modules, has been progressing smoothly in the superconducting conductor jacketing building at the Naka site (Newsletter [No. 45](#)).

12 conductors for the EF2 (the total length of one single conductor is 387 m) are now being manufactured. The first and second conductors have been completed. In addition, a compaction test has also been performed for the third and fourth conductors: they were bent in two by a bending machine and wrapped around a spool with a diameter of 3 m. Withstand voltage tests and helium leak tests were performed for these conductors and it was confirmed that the test results met the design specifications.

In the future, pancakes will be manufactured using conductors for the EF1 and the EF2 and these pancakes will be layered to complete the circular superconducting coils with a diameter of 12 m (EF1) and a diameter of 9 m (EF2) respectively in the superconducting coil winding building.

News

Modification of N-NBI system power supply for long pulse



Figure 1: Power panel for inverter in the upgraded inverter building

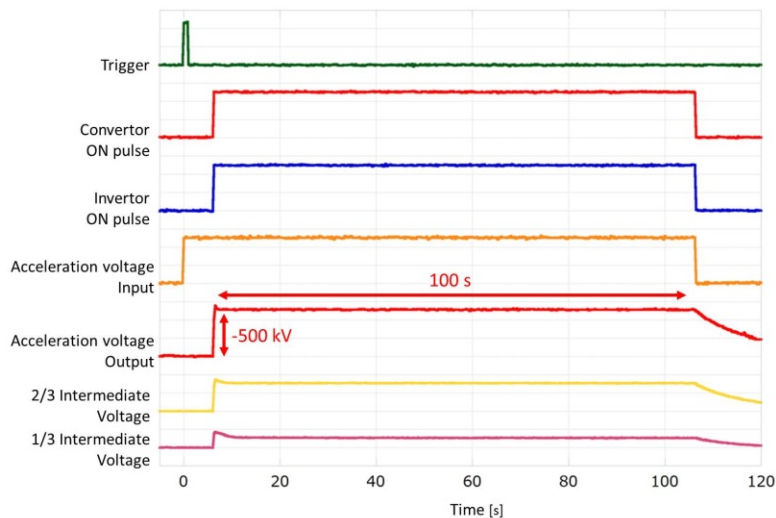


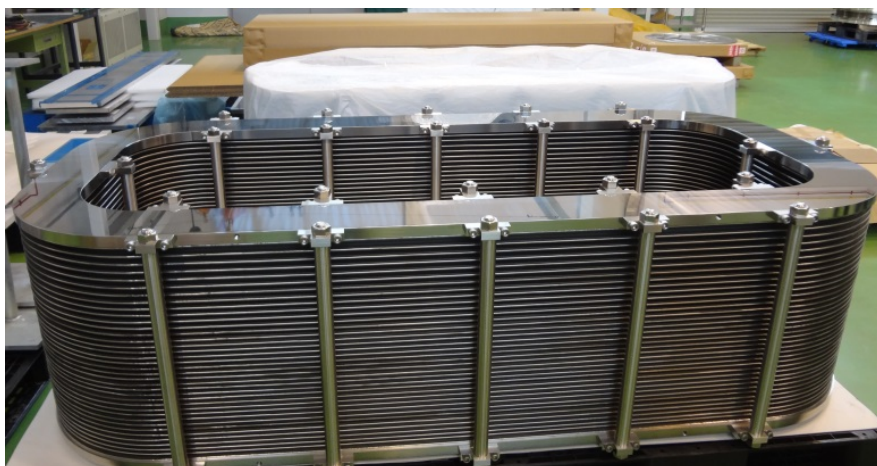
Figure 2: Output results of accelerator power supply for N-NBI

In addition to lowering the beamline injection position of the negative-ion-based neutral beam injection (N-NBI) system, part of the construction work (Newsletter [No. 47](#)), further modification is required for the N-NBI to have a long pulse to sustain a high performance plasma for 100 seconds.

An inverter circuit for the 500 kV accelerator power supply was recently installed for the N-NBI in the upgraded inverter building for this long pulse (Figure 1). Protection and sequence tests were performed for the accelerator power supply and its specifications were confirmed without any problems. After that, a no-load output adjustment test was performed. As a result, it was confirmed that a high voltage at 500 kV output can be maintained stably for 100 seconds (Figure 2). An actual loading test with the beam power will be needed in the future before the actual operation.

Visits

PL's visit to VV port bellows manufacturer



Completed VV port bellows

The contract for the supply of the vacuum vessel (VV) port bellows implemented by JAEA since 2009 will be completed by March 2014. Under this contract, 45 bellows including two prototypes have been already delivered to the JAEA Naka site. The rest (12 bellows) will be delivered in March 2014. The largest bellows, which will be used for a horizontal port in JT-60SA, has a height of 2.2 m and a width of 1.0 m and a length of 0.6 m.

For the bellows assembly, first the joint between the bellows and the VV ports will be made, second between the ports and the VV, and finally between the bellows and the cryostat vessel body cylindrical section (CVBCS) after the assembly of the CVBCS.

S. Ishida, the JT-60SA Project Leader (PL), visited the manufacturer's factory with an expert from JAEA, K. Masaki, in Matsuyama located in western Japan on 29 November 2013. He confirmed that the fabrication work of the bellows was progressing well on schedule, expressing appreciation for their quality work throughout the manufacturing processes.



The Project Leader and K. Masaki (JAEA) visiting the manufacturer's factory

Local

Christmas market in Munich



During the four weeks before 24 December the traditional Munich Christmas market attracts citizens and tourists. The origins of the Christmas Market date back to the so-called “Nikolaus Markets” of the 14th century where it used to be a commodity market. Today the market is centred on Marienplatz and extends into the neighbouring streets of the pedestrian district illuminated by a 27 m high Christmas tree in front of the Town Hall.

More than one hundred booths offer crafts, Christmas decoration, knitwear, candles, food and beverages. While taking a break and strolling across the market you can experience the Christmas spirit with all senses, including the scent of cinnamon, honey and cloves, gingerbread, roasted almonds, fried bratwurst, and of steaming mugs of mulled wine. This spirit is supported by traditional Christmas folk music from the balcony of the Town Hall or brass music from bands playing on the nearby tower of St. Peter.

A special area of the market is devoted to the Christmas manger market. Christmas mangers have a long tradition in Munich. As early as 1597, the Jesuits set up a manger in St Michael's church. At the manger market you find everything to create your own authentic Christmas manger: Exclusive wood carvings or unbreakable plastic figurines of the holy family and the shepherds, timbered cottages, the lantern for the manger, ox and donkey, beaming cherubs and gifts of the three Magi.

Calendar

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

April 10, 2014

14th Meeting of the BA Steering Committee (SC-14)

Rokkasho, Japan

May 26-30, 2014

21th International Conference on Plasma Surface Interactions (PSI-21)

Kanazawa, Japan

June, 2014

20th Technical Coordination Meeting (TCM-20)

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/>