JT-60SA Newsletter
No. 90, 30 June 2017

Headline

TF coil assembly making steady headway

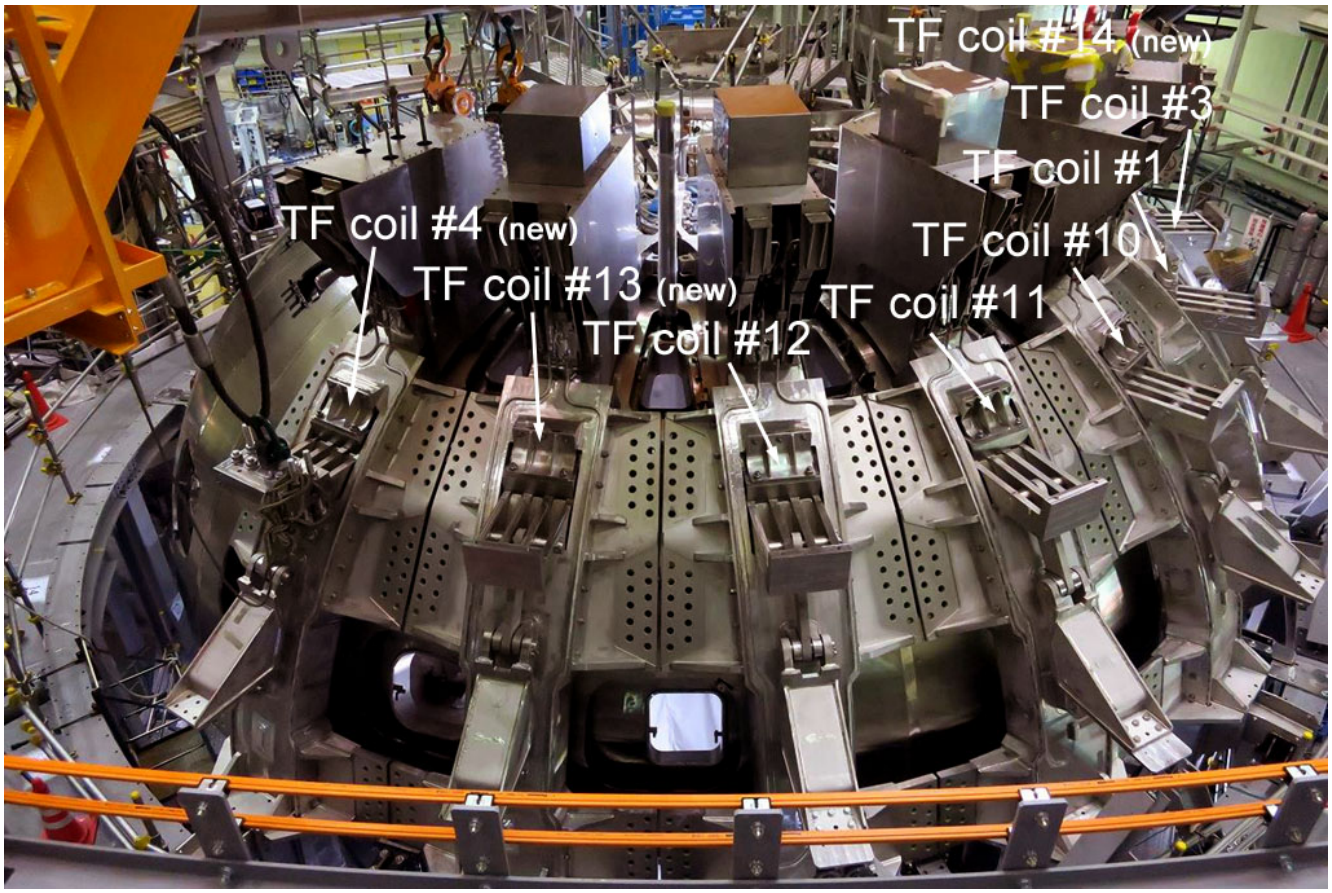


Figure 1: A total of 8 TF coils mounted around the 340° torus

The toroidal field (TF) coil - "Sofia" (coil #4 in the overall TF coil numbering system of JT-60SA) - was mounted in place on 9 June 2017. With the 2 TF coils - "Danièle" (coil #13) and "Emmanuele" (coil #14) - also recently installed on the 340° torus, a total of 3 additional coils have reached their final locations since the last report. In total, 5 French and 3 Italian coils have now been installed (Figure 1).

In parallel with the TF coil assembly, the corresponding TF coil gravity supports have been assembled, and the lower vertical ports located at even-numbered sectors have been connected by welding.

Furthermore, the ninth TF coil - "Giaele" (coil #5) - was delivered to the QST Naka site on 17 May 2017. Acceptance tests are being carried out in the engineering experiment building (Figure 2).

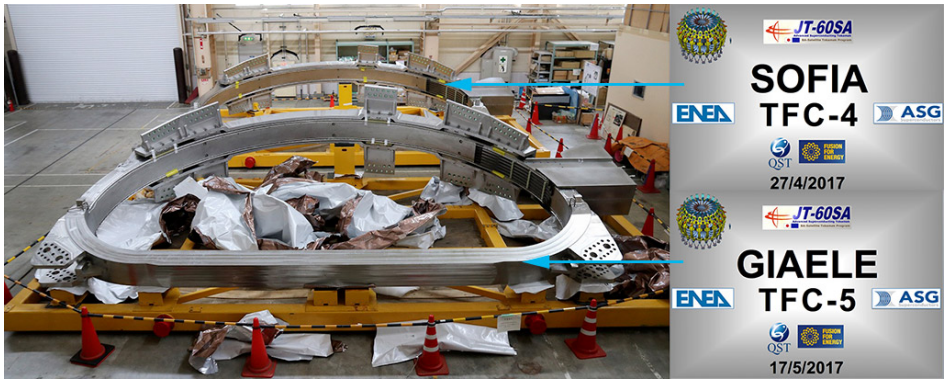


Figure 2: TF coils - "Giaele" - (front) in acceptance tests in the engineering experiment building (the other coil in the back is "Sofia", before being transported into the torus hall)

News

VIP visits QST Naka site

On 27 April 2017, Giorgio Rostagni, Professor Emeritus of Technology and Energy Economics at the University of Padua, visited the QST Naka site to see the progress of JT-60SA construction, which has been supported by European and Japanese collaboration.

Representatives of QST welcomed and guided him on a tour of the JT-60SA device and components, such as the vacuum vessel (VV), VV thermal shields and toroidal field coils being assembled in the torus hall of the JT-60 main building.

Figure left: Y. Kamada, the JA Project Manager (left) welcomed Prof. Rostagni (right) at the entrance

Figure below: Group photo with Prof. Rostagni (second from the right) during the torus hall tour

News

Final acceptance test of CEA SCMPSs begins

JEMA, CEA, F4E and QST team performing the final acceptance test

The concluding activities in the long process to provide CEA's contribution to the superconducting magnet power supplies (SCMPSs) for JT-60SA finally began. On 8 May 2017, the final acceptance test of the first portion of the SCMPSs, starting with the equilibrium field (EF) 4 coil PS tests, officially began at the QST Naka site. The acceptance test covers also the tests of the EF 2, 3 and 5 coil PSs as well as the toroidal field coil PS.

Those PSs were procured by the French Voluntary Contributor, CEA, through a contract with a Spanish supplier, Jema Energy S.A. (JEMA). Since the arrival at the QST Naka site on 27 June 2016, the installation and commissioning of those PSs have been underway continuously. The commissioning and final acceptance tests are expected to be completed by the end of July 2017 unless any major problems arise, reaching the final goal of the long process of the CEA SCMPS procurement, started in April 2013.

So far, the EF4 coil PS has been fully commissioned and its final acceptance test has already been performed. Now the tests on the remaining units are being prepared.

As is often the case with special equipment such as these converters, some unexpected conditions were met during the commissioning. But the great teamwork among all parties - JEMA, CEA, F4E, and QST - made it possible to keep the commissioning on schedule nevertheless. And the work will be conducted in the coming weeks with more confidence in completing the final acceptance test on schedule, so as not to delay the following activities of JT-60SA construction.

JEMA, CEA, F4E and QST team intently monitoring the PS performance

News

Error field correction coils completed and delivered

EFCC during the visual Inspection upon its arrival at the QST Naka site

18 error field correction coils (EFCCs) will be installed in the vacuum vessel of the JT-60SA device to correct error fields caused for example by potential unavoidable misalignment of the superconducting coils. The EFCCs have been manufactured by Tesla Engineering Limited in the United Kingdom, under a contract placed by QST in November 2014.

Recently, all of the EFCCs have been completed, and they have been transported to the QST Naka site in 2 shipments. The first 9 EFCCs were delivered on 28 March 2017 by sea after a long voyage from Great Britain to Japan via the Suez Canal, the Indian Ocean, the ports of Singapore, Hong Kong, Kobe and Tokyo. The remaining 9 were delivered on 13 March 2017 after transport by air. Careful visual inspections at the QST Naka site indicated that the delivered EFCCs had no damage during transit and all packaging was in a good state.

News

Progress in large current feeder installation

The installation of the large current feeders for the superconducting coils inside the JT-60 main building was completed before December 2016. The water-cooled copper feeder for the toroidal field coils enters and leaves the torus hall through the west wall penetration, and those for the poloidal filed (PF) coils enters and leaves the torus hall through the north wall penetration.

Now, outside the building, large-scale construction to install the feeder frames, cable racks, and so forth, and to join the aluminium busbars by welding, are being continued in the passage between the JT-60 main building and the rectifier building. The figures show the construction at the north wall penetration and the junction to the rectifier building.

The welding of the PF aluminium feeders and the piping for the lightning conductors were finished in April 2017. The entire construction is planned to be completed in 2018.

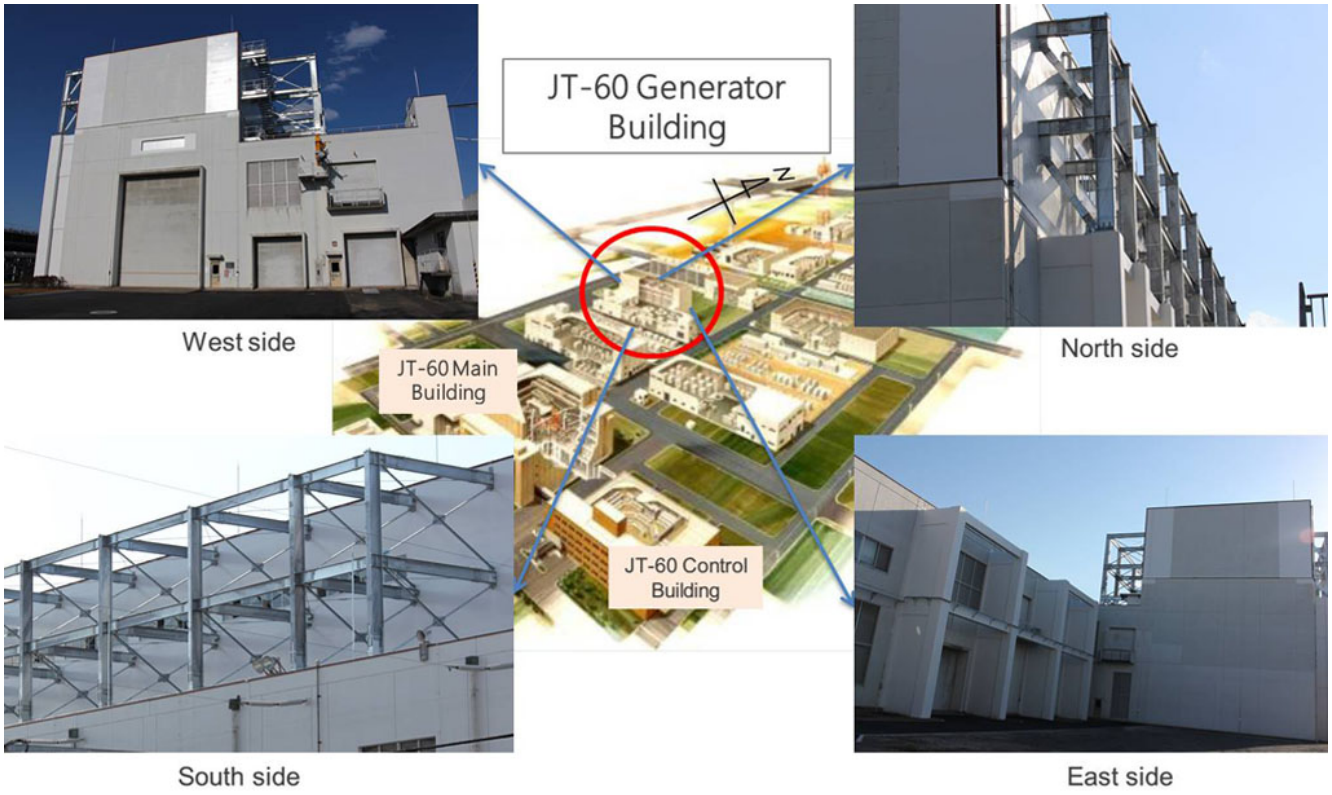
News

JT-60 generator building reinforced

Seismic reinforcement of the JT-60 generator building was completed at the end of March 2017. This is to make sure that the motor generator (MG), one of the core JT-60SA components, will be well protected so that its operation can be quickly restarted even in the case of severe seismic events like the Tohoku Earthquake off the Pacific coast of Japan in 2011.

The work began in June 2016 in parallel with the maintenance and integrity examination of the MG itself already installed in the building. Various work, such as demolition, soil improvement, piling, and wall reinforcement, were carried out making full use of two 120 t heavy cranes. The lightning conductor was repaired as well.

As a result, the building has become much more substantial than before, as can be seen in the figures.



Location and outside views of the JT-60 generator building after reinforcement

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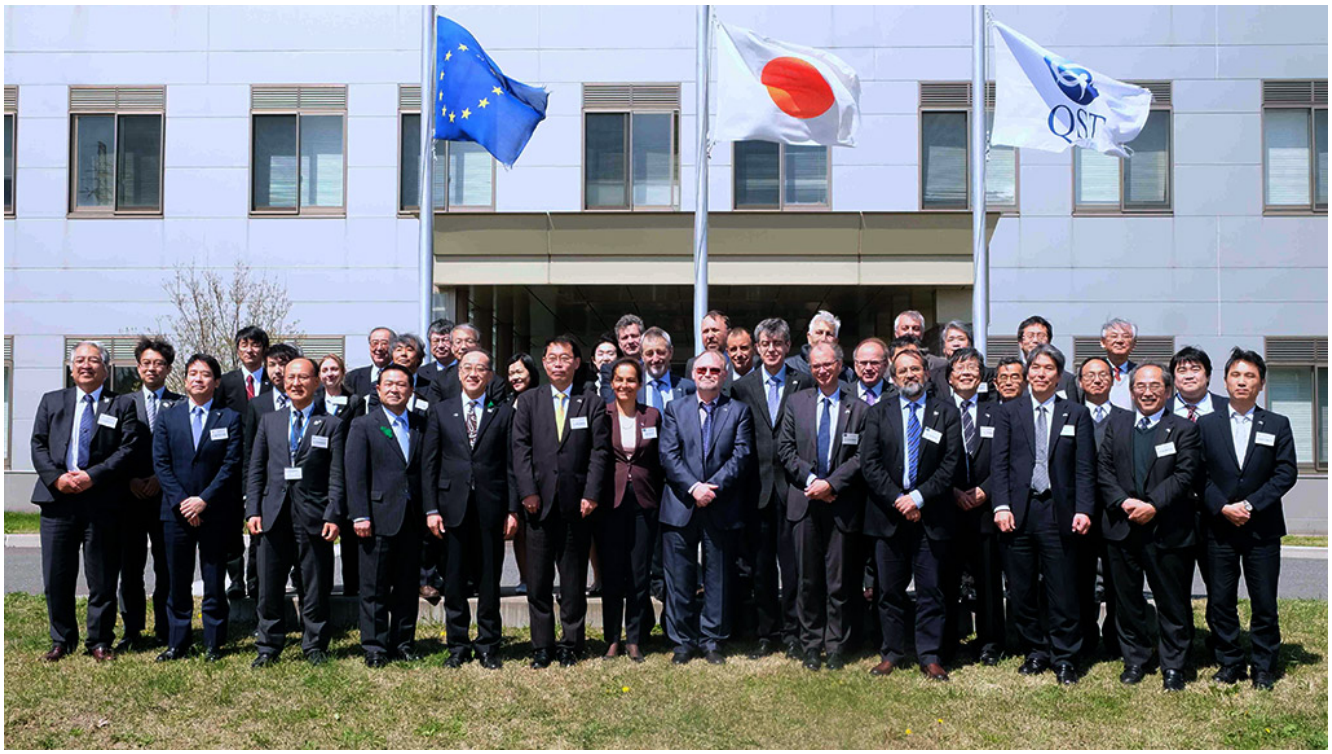
Meeting

20th BA Steering Committee meeting



Group photo of the BASC-20 participants

On 27 April 2017, the 20th Broader Approach Steering Committee meeting (BASC-20) was held at QST Rokkasho Fusion Institute, Japan with attendance of representatives and experts from Europe and Japan. The Annual Report 2016 and the

Project Plan for the 3 projects (IFMIF/EVEDA, IFERC and Satellite Tokamak Programme (STP)), which had been submitted to the BASC beforehand, were discussed and approved.

Concerning the STP Project, the Project Leader, H. Shirai, mentioned that the project had been progressing well in procurement, assembly, installation and commissioning of the JT-60SA components and systems, in particular, the procurement of the toroidal field (TF) coils, equilibrium field coils, central solenoid modules, high temperature superconductor current leads, power supply systems, cryostat vessel body, vacuum vessel, and thermal shield. In addition, he reported that the whole process of fabrication, tests, pre-assembly and delivery of the TF coils was on track. He also explained that the tokamak assembly would be finished in March 2020 and the first plasma was foreseen to be achieved in September 2020.

A demonstration of the ITER remote experimentation centre (REC) was held during the BASC meeting, connecting the REC room in Rokkasho and the JT-60SA control room in Naka on the internet. A 60-second-discharge of JT-60SA was successfully simulated.

The next BASC meeting will be held in Mol, Belgium on 13 December 2017.

Discussion during the BASC-20 meeting

REC demonstration connecting Rokkasho and Naka

Calendar

5 – 6 July 2017
28th Technical Coordination Meeting (TCM-28)
Naka, Japan

25 – 29 September 2017
13th International Symposium on Fusion Nuclear Technology (ISFNT-13)
Kyoto, Japan

27 – 29 September 2017
16th International Workshop on Plasma Edge Theory in Fusion Devices (PET-16)
Marseille, France

17 October 2017
21st Meeting of the STP Project Committee (PC-21)
Naka, Japan

5 – 8 December 2017
Joint meeting of the 26th International Toki Conference and The 11th Asia Plasma and Fusion Association Conference (ITC-26 & APFA-11)
Toki, 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/.