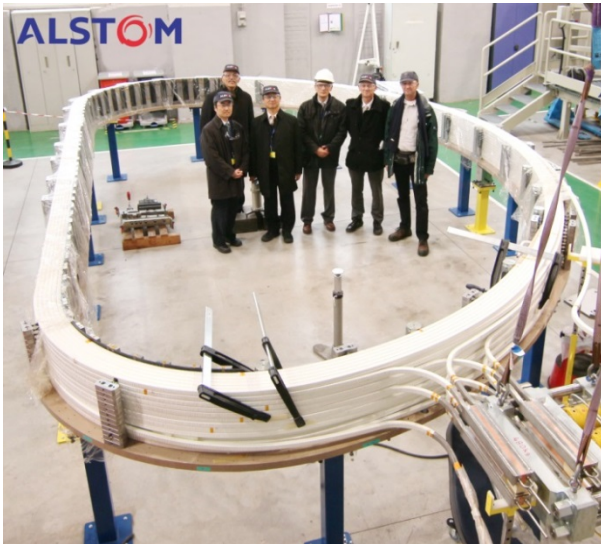


Headline

Impregnation for TF coil No. 10



Coil No. 12 winding in progress



Coil No. 11 at joint workstation



Coil No. 10 extraction from the impregnation mould

Before the recent Technical Coordination Meeting (TCM-21), H. Shirai, the JT-60SA Project Leader (PL) and K. Tsuchiya, of the JA Home Team, visited Alstom, the manufacturer for CEA of 9 toroidal field (TF) coils (from coil No. 10 through coil No. 18). The PL gave an overview of the JT-60SA project status, and Alstom presented their activities and the status of TF coil manufacturing. A visit of the workshop followed so the PL could witness the different workstations. On the winding machine, coil No. 12 up to double pancake (DP) 4 was available, with DP5 being made ready for winding.

On the joints workstation, the welding of the coil No. 11 fourth internal joint was ongoing. On the impregnation and cleaning workstations, the cleaning of coil No. 10 was ongoing under an inflatable tent for dust protection after its recent extraction from the impregnation mould.

Explanation was also given by Alstom on the impressive Paschen tank status, and the welding robot operation monitored by video was demonstrated on a casing mock-up. The PL expressed satisfaction for the first impregnation successfully achieved on coil No. 10 and the general progress of the manufacturing.



Coil No. 10 after first impregnation



Photo of the meeting participants



The PL in front of the welding robot

News

Press Event on CEA's BA contributions



Photo of the industrial delegations at the cold test facility at Saclay



Interviews of the JT-60SA delegation



G. Fioni presenting the CEA contributions to the BA projects to the press representatives



The melting pot: all together exchanging about the projects

With the presence at Saclay of staff of the JT-60SA Integrated Project Team (IPT) for the 21st Technical Coordination Meeting (TCM-21), and with the celebration of the end of construction of the cryogenic test facility (CTF) for the testing of the toroidal field coils of JT-60SA, CEA organised on 14 November at Saclay a press event covering all its contributions to the Broader Approach.

In addition to the IPT members H. Shirai, the Project Leader, Y. Kamada, the JA Project Manager and E. Dipietro, the EU Deputy Project Manager CEA invited also I. Ikeda, the First Secretary, Scientific Counsellor in charge of relations with the ITER Organisation at the Japanese Embassy in Paris, and S. Sakurai, the General Manager of the JAEA office in Paris. CEA also invited its main industrial partners for the Broader Approach. Delegations, led by top-level managers, from Alstom, Air Liquide, Thales, JEMA, SDMS, Alsion and LGM, participated and met the press. Bull also participated in the press kit prepared by CEA, which was given to the journalists prior to the press conference. In total, more than fifty people participated in this event (10 journalists, 12 industry, 5 BA and official representatives, and 20 CEA representatives including CEA communication staff). From the CEA side the main participants were G. Fioni, Director of the Physical Sciences Division at CEA, A. Bécoulet, Head of the Institute for Magnetic Fusion Research (IRFM), Ph. Chomaz, Head of the Institute of Research into the Fundamental Laws of the Universe (IRFU), P. Védrine, Head of the Accelerators, Cryogenics and Magnetism Department (SACM) hosting the CTF, and the three CEA project leaders for the Broader Approach Projects, F. Robin for IFERC/CSC (Computational Simulation Centre), S. Chel for IFMIF/LIPAc (Linear IFMIF Prototype Accelerator), and R. Gondé for STP/JT-60SA.

The meeting was organised in three parts: 1) two presentations, given by Y. Kamada on the general overview of the Broader Approach activities, and by G. Fioni on the CEA contributions to the Broader Approach; 2) a visit of the CTF for which now the installation is finished and of the injector facility which was used as a basis for the design of the LIPAc Injector for IFMIF - this visit was also completed with an overview of the test facilities developed at CEA Saclay (Synergium), and was conducted by Ph. Chomaz, L. Genini and P. Védrine; 3) a joint meeting between journalists, CEA representatives, industrial partners for the Broader Approach, and Broader Approach Representatives.

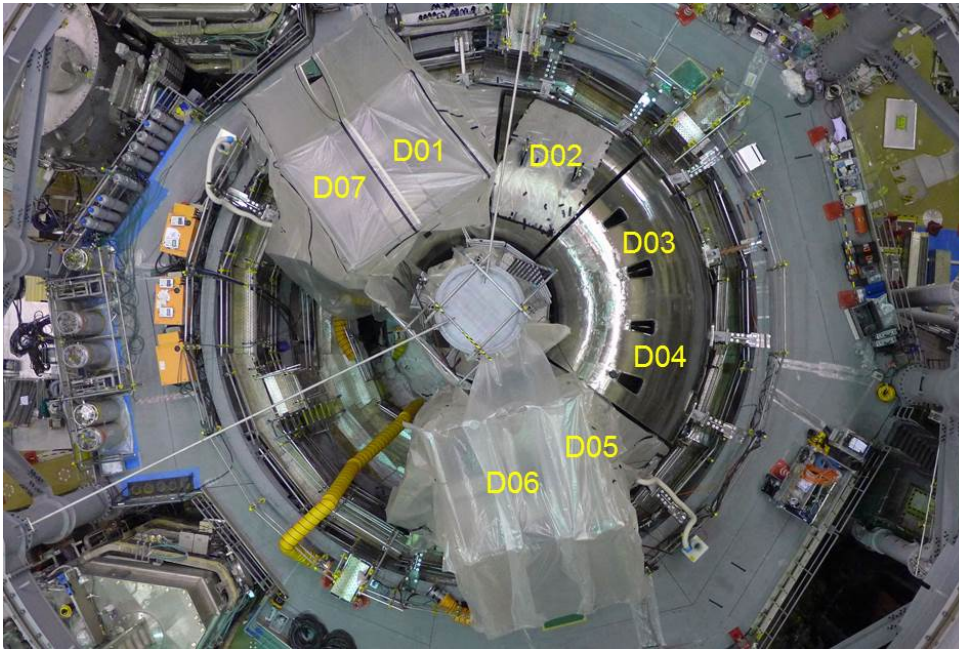
The journalists represented the following publications: Kyodo News, The Mainichi Newspapers, from Japan, and L'Agence Française de Presse (AFP), Le Parisien, La Recherche, VSD, L'Express, Trame, MPE, Industrie & Technologies, from France. The Communication Departments of CEA and of Agence ITER-France (AIF) were also represented and covered the event. Interviews of many participants were recorded. In addition, the ITER Organisation and the on-line review "Europolitics" which were unable to be present on the day, asked for specific interviews on the Broader Approach in the following days.

At the end of the event the press participants expressed great satisfaction with the achievements and said that they would continue following up such exciting projects.

CEA is now waiting for feedback in the French, Japanese and European media.

News

Progress of VV assembly



Seven VV 40° sectors lined up on the cryostat base

The welding between the third and fourth vacuum vessel (VV) 40° sectors (D01 and D07), which started in October, was completed at the end of November including non-destructive testing (radiographic testing, penetrant inspection and ultrasonic testing). The next pair of VV 40° sectors (D05 and D06) was also installed on the cryostat base (CB) and its welding started after the end face correction.

Furthermore, the seventh VV 40° sector (D02) was installed on the CB and a total of seven VV 40° sectors (280°) are now lined up on the CB. Welding between the first and second sectors (D03 and D04) was already completed in October.

News

Target performance of dual frequency gyrotron achieved

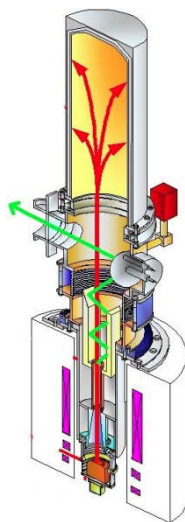


Figure 1: Schematic view of dual frequency gyrotron

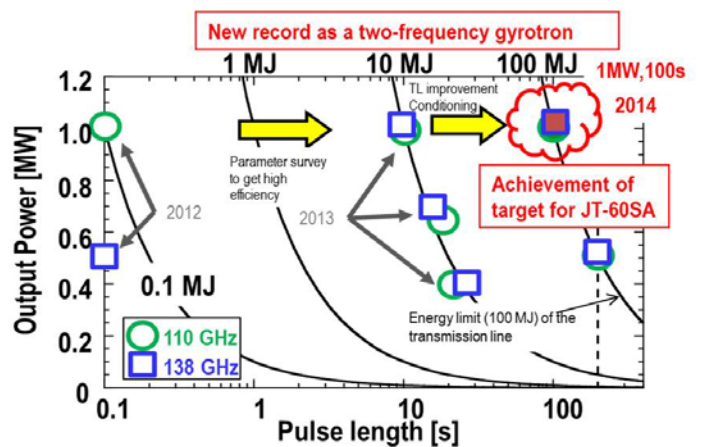


Figure 2: Output power and pulse length

The dual frequency gyrotron (Figure 1) has been under development since 2011 to extend the capability of the ECRF system for JT-60SA. The gyrotron has been newly designed and manufactured, and the commissioning operation to degas inside the gyrotron has been performed while properly adjusting the gyro-motion energy and magnetic field of the beam electrons to obtain higher efficiency microwave generation with a long duration. Very high output performance has been achieved so far.

In recent tests, a rated output power of 1MW was successfully generated at both frequencies (110 GHz and 138 GHz) for 100 seconds, which is the operational requirement for JT-60SA and is the world's highest output performance as a dual frequency gyrotron (Figure 2). In addition, it was also confirmed that the power loss and heat load during mode conversion were as small as designed.

Meetings

24th International Toki Conference



The 24th International Toki Conference (ITC-24) was held at the Ceratopia Toki in Toki city, Gifu prefecture, Japan from 4 to 7 November. The programme consisted of plenary, invited, oral and poster sessions. About 190 participants joined together to present and discuss the latest progress on specific subjects related to plasma and fusion science. The 24th Conference explored new aspects and promoted the cross-fertilisation of diverse fields of science through advances in basic plasma and fusion science.

M. Yoshida from JAEA orally presented an overview of JT-60SA construction, and remarked that JT-60SA is progressing steadily towards the objective to achieve first plasma in March 2019. Also the status of the JT-60SA Research Plan and related studies were reported. Development of operation scenarios, plasma simulation/modelling and feasibility studies on heating/diagnostics have made steady progress under EU and JA collaboration. The audience listened with interest and the presentation was well received.

Meetings

15th BA Steering Committee Meeting



On 4 November, the 15th Broader Approach Steering Committee (BA SC) meeting was held at Karlsruhe Institute of Technology (KIT), in Karlsruhe, Germany with attendance of representatives and experts from Europe and Japan. The 2015 Work Programmes for the three projects (IFMIF/EVEDA, IFERC and Satellite Tokamak Programme (STP)) were discussed and approved. As for the STP Project, the Project Leader (PL), H. Shirai, mentioned that the project had been progressing quite well with the delivery of the quench protection circuit components at the Naka site as scheduled, the start of the welding of vacuum vessel sectors on site, the steady progress of fabrication of the toroidal field (TF) coil winding packs in Italy and France, and the high temperature superconducting current leads (HTS-CLs) in Germany. The SC expressed satisfaction with the progress of the STP Project.

The attendees also joined a site tour at KIT during the meeting. KIT is making 6 HTS-CLs for the TF coils and 20 for the poloidal field coils of JT-60SA. A continuous-current test for the first pair of HTS-CLs for the TF coil started on 4 November 2014 and a stable current of 25.7 kA was demonstrated.

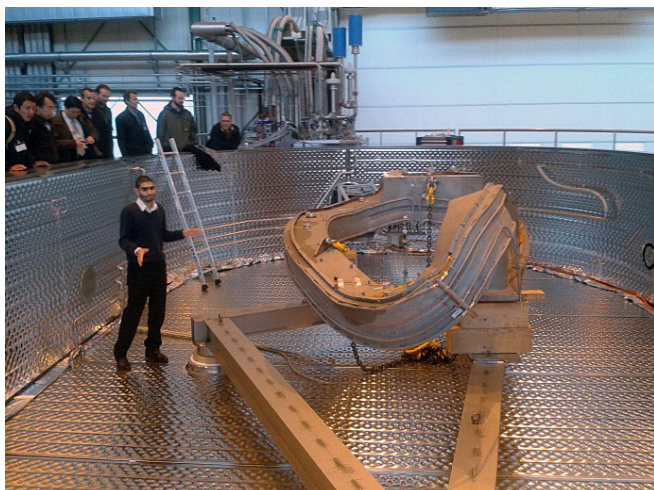
The next BA SC meeting will be held in Naka, Japan on 21 April 2015.

Meetings

TCM-21 held in Saclay



Group photo of participants and CTF team group



Cryostat equipped with superconducting model coil and shunt ready for CTF commissioning as explained in situ by W. A. Maksoud



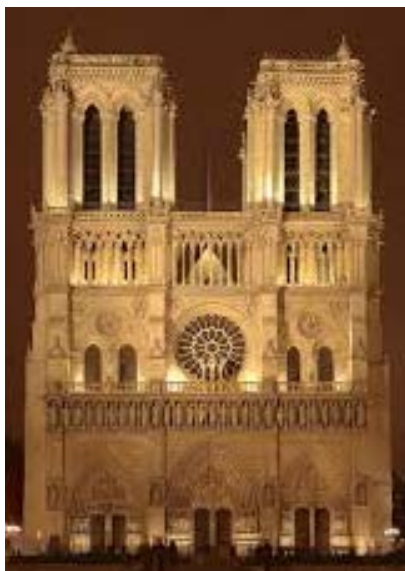
Scale 1 TFC mockup on a CTF test frame



Plenary session

The 21st Technical Coordination Meeting (TCM-21) took place on 12-13 November 2014 at CEA Saclay, France. This gave the participants the opportunity to witness the end of the assembly of the cold test facility (CTF) developed by CEA/IRFU (Institute of Research into the Fundamental Laws of the Universe) in collaboration with the Belgium VC-DI, SCK-CEN, and to visit the pre-assembly hall, where toroidal field coils and the outer intercoil structure will be assembled together prior to shipment to JAEA Naka, Japan. During TCM-21, CEA also announced the start of the shipment to Naka of the main components of the cryogenic system, being manufactured by ALAT in Sassenage, France.

40 members of the Integrated Project Team attended TCM-21, including 10 who had travelled from Japan, as well as a further 20 or so who remotely attended various meeting sessions. The meeting was opened by a welcome talk given by P. Chomaz, head of CEA/IRFU. The group photo was taken around the cryostat of the CTF and included G. Fioni, head of the Physical Sciences Division at CEA. As usual, plenary sessions focused mainly on interfaces between the magnets, magnet shared components, thermal shield, and the progress on component manufacture, developments of the cryostat vessel body and lid, progress made with the cryogenic system manufacture and installation, status of power supply procurements, and development of the assembly procedures. There were also pre- and post-TCM meetings on magnets, pre-assembly, and cryogenic system installation.



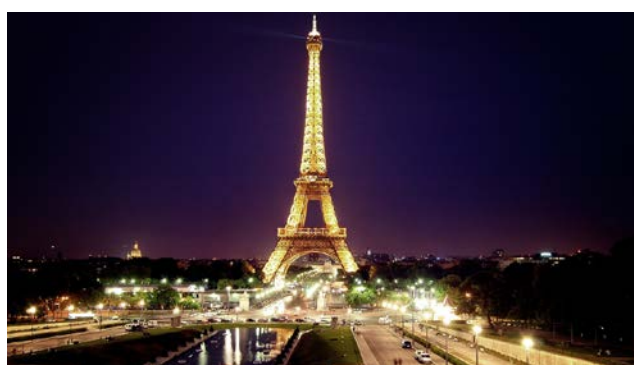
Notre Dame dressed in light



Le Pont Neuf with our time shuttle



Le pont des Arts



The Eiffel Tower by night

On the intermediate evening, the TCM attendees enjoyed a typical French dinner served on a cruise boat on the River Seine, in Paris - a good opportunity to continue fruitful exchanges in a very pleasant and relaxing way.

This gave them the chance to experiment with Einstein's theory of relativity. At the speed of the "Bateaux-Mouches" along the River Seine, just after sunset, there is a magic opportunity, in just two hours of compressed time, to experience a thousand years of architecture, history, poetry and romanticism, as well as to pass under most of the thirty seven bridges crossing the Seine in Paris. Each of these bridges opens on new architectural dreams, as Jun-ichiro Tanizaki, a Japanese novelist, could have written, in which the white stones of the monuments reflect the electric light, justifying the nickname given to Paris - the "City of lights" - which is never so pertinent as it is around Christmas.

The tour starts way back in time in the early eleventh century, near Notre Dame, wreathed in white light, outlining the silhouette of Quasimodo, as if in a fairy tale. It crosses the "Pont Neuf", the New Bridge, actually the oldest stone bridge of Paris built during the seventeenth century, and passes under the timeless "Pont des Arts" a romantic pedestrian gateway where hundreds of thousands of couples have attached a love padlock engraved with their names as a vow of eternal love, before sliding alongside the Louvre Palace, the historical, administrative and political heart of the Kingdom of France throughout this period, where now the great glass pyramid reveals the foundations of the first royal castle built in Paris around the year 1190.

Approaching the place "de la Concorde", one sees the obelisk of Rameses, erected both exactly where the last crowned King of France was "guillotined" and at the end the famous "Champs Elysées". At this point the French National Assembly lies on the left, and the Madeleine Church on the right, like two symmetrical monuments. Passing under the Alexandre III bridge, one is already entering into the incredible nineteenth century, where "ephemeral" achievements, designed for World Expo 1889, mark the first century after the French Revolution. Ephemeral, because these monuments, such as the Eiffel Tower and the "Grand Palais", in particular, should have been dismantled immediately after the end of the Expo. However, the magic geometric perfection of the Eiffel Tower, today reinforced by its wonderful illumination, seems to have definitively frozen the tides of time, in the same way as Mt. Fuji has done with the ocean waves in a woodblock print of Hokusai, a Japanese artist in Edo period, exhibited just this fall in the "Grand Palais"!

Finally, one is in the far west of Paris, the business centre of "La Défense", where its skyscrapers and the "Grande Arche" can be seen, opening Paris to the twenty-first century. Then it is already time to be back on firm ground. In France, there is a wonderful song called "Syracuse", saying: ".... I would so much like to see Mt. Fuji ... to remember it in Paris ...", for sure, one will never forget Paris!

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Calendar

March 17, 2015
16th Meeting of the STP Project Committee (PC-16)
Naka, Japan

April 21, 2015
16th Meeting of the BA Steering Committee (SC-16)
Naka, Japan

April 22 – 23, 2015
22nd Technical Coordination Meeting (TCM-22)
Naka, Japan

May 17 – 21, 2015
23rd International Conference on Nuclear Engineering (ICONE-23)
Chiba, Japan

May 31 – June 4, 2015
26th Symposium on Fusion Engineering (SOFE-26)
Austin, USA

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 newsletter@jt60sa.org.

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