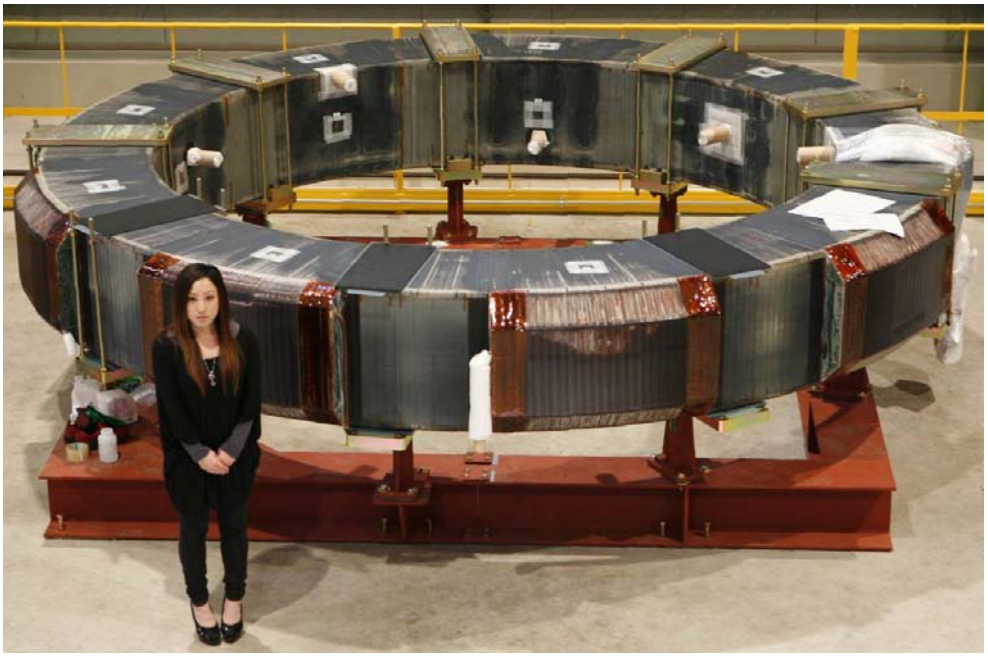
JT-60SA Newsletter
No.29, 31 May 2012

Headline

First equilibrium field coil arrives in Naka, onsite winding prepared

Group photo in front of the equilibrium field coil No.4

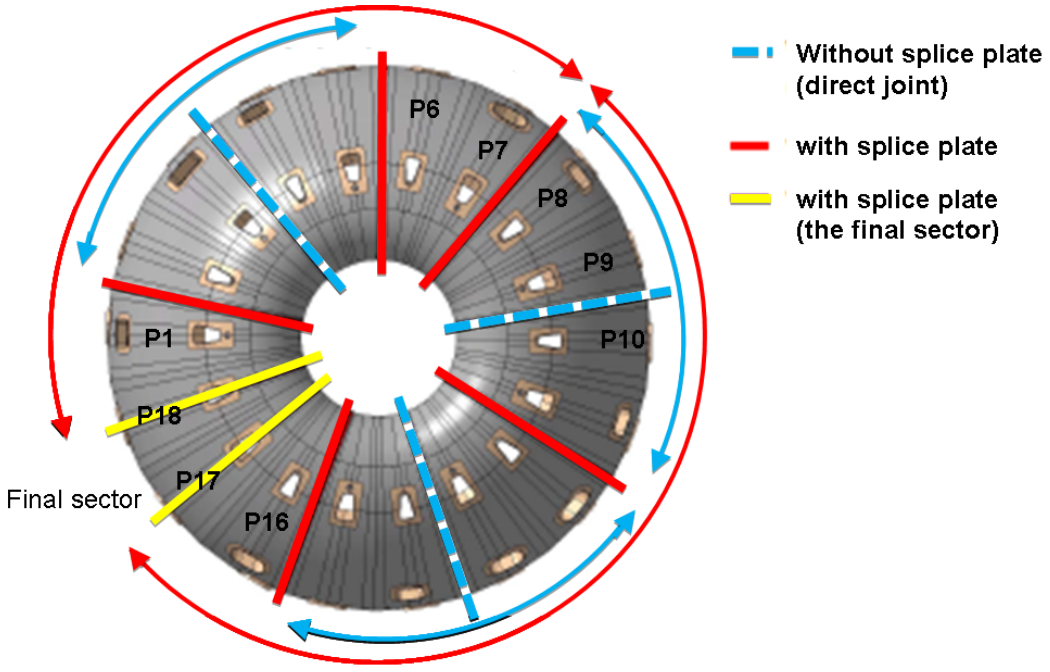
After completion of the insulation resin impregnation and curing, the equilibrium field coil No.4 (EF4) (see the articles of the Newsletter No.13, 15, 16, and 20) arrived at the Naka site at the end of April. Furthermore, the floor of the superconducting coil winding building in Naka was protected against dust in preparation for winding the equilibrium field coils No.5 (EF5) and No.6 (EF6). The winding machine was delivered in May and the winding work will be started in June.



Equilibrium field coil No.4 in the factory before final insulation wrap

News

Assembly procedure of vacuum vessel confirmed

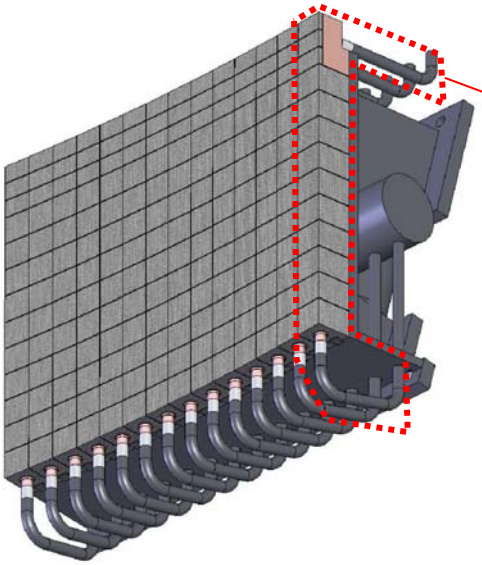


Welding connections of the vacuum vessel

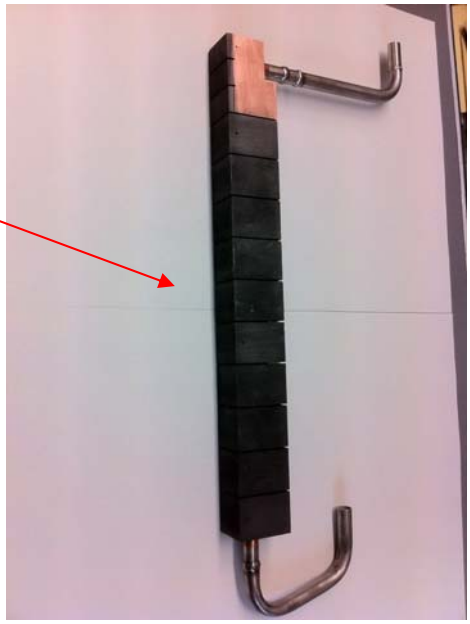
The assembly procedure of the vacuum vessel is one of the most important assembly issues (see the article of the Newsletter No.18 and an animated video). At the 14th Technical Coordination Meeting (TCM-14) in April, this procedure was discussed. It was agreed to manufacture three 80° sectors by directly welding two 40° sectors each, then to insert splice plates to make the connection with the other parts, and lastly to weld them, as shown in the diagram.

News

Mono-block targets delivered to Naka

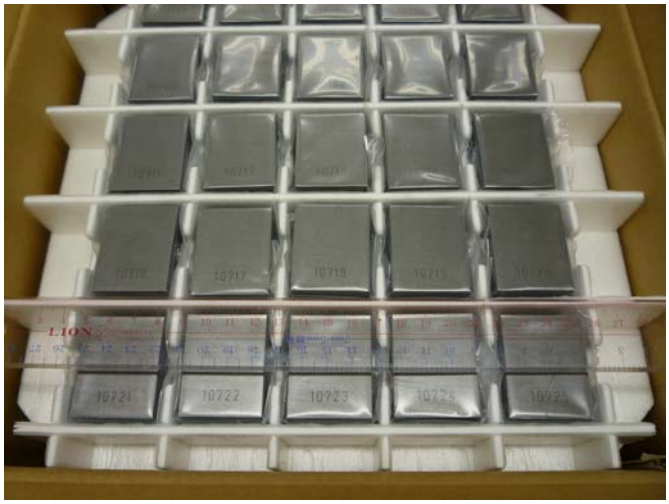


Mono-block target plate



A piece of mono-block target

Bolted CFC tiles



CFC material for mono-block targets

15 mono-block type CFC divertor targets, two divertor cassettes, bolted CFC tiles and CFC material for mono-block targets (1,905 bolted CFC tiles and 5,000 pieces of CFC material for mono-block targets), which are part of the in-vessel components, have been delivered to the Naka site. A mono-block type CFC divertor target plate, which can remove a heat load of 15 MW/m^2, will be installed as a part of the outer divertor target at the start of the Initial Research Phase. Inner and outer targets with bolted CFC armour tiles will replace the mono-block type target plate during the Initial Research Phase.

Meetings

17th Joint workshop on electron cyclotron emission and electron cyclotron resonance heating

Figure 1: Willibrordhaeghe conference centre in Deurne

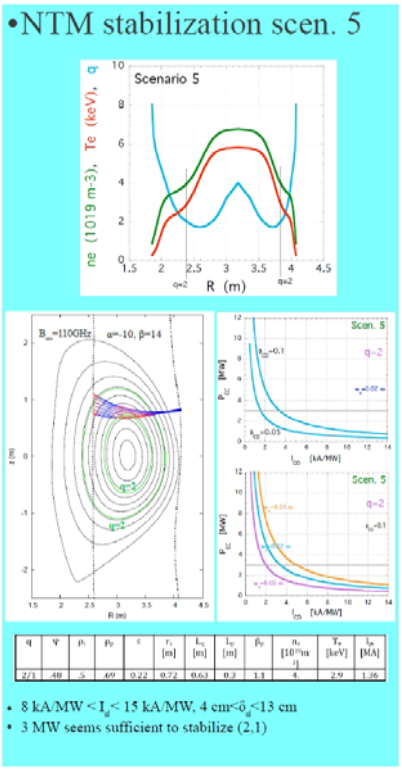


Figure 2: Detail of the poster

The 17th Joint Workshop on Electron Cyclotron Emission (ECE) and Electron Cyclotron Resonance Heating (ECRH) was held in The Netherlands between 7 and 10 May 2012. About 80 scientists coming from fusion laboratories all over the world gathered in the Willibrordhaeghe conference centre, a former seminary in the outskirts of the village of Deurne in the beautiful surroundings of the Brabantse Peel not far from Nuenen the birthplace of one of The Netherlands' most famous painters Vincent Van Gogh (figure 1).

Most of the topics related to EC and ECRH/ECCD (Current Drive) were discussed within the excellent scientific program, including gyrotron source development, EC diagnostics development and recent results, and advanced applications such as real time control of neoclassical tearing modes (NTM) in present and future machines.

Dr. Carlo Sozzi of Istituto di Fisica del Plasma (Italy) and EU responsible person for the EU and JA group working on the specification of the Heating & Current Drive systems in SARP 3.0, presented a poster discussing the capabilities of NTM control using the ECRF system of JT-60SA during the Initial Research Phase when only part of full power of the system will be available. Results are encouraging especially for the advanced scenario 5 (figure 2). Several scientists visited the poster showing interest in the progress in the implementation of JT-60SA and its scientific program.

Figure 3: Marta Pan, Sculpture flottante ‘Otterlo’, 1960-1961

Participants to the workshop took the opportunity for an exciting cultural excursion to the Kröller-Müller Museum where several paintings by Vincent Van Gogh are on display. The museum is also famous for its peculiar Sculpture Garden (figure 3).

Meetings

24th ICEC24-ICMC

Fukuoka International Congress Centre in Fukuoka, Japan

From 14 to 18 May, 2012 the 24th International Cryogenic Engineering Conference - International Cryogenic Materials Conference (ICEC24-ICMC), was held in Fukuoka International Congress Centre, Japan. This conference was hosted by the Cryogenic and Superconducting Society of Japan (CSSJ) and organized by Kyushu University.

Almost 600 participants from 29 countries took part in the conference, a unique opportunity to meet people working in the fields of cryogenics for fusion, large scale refrigeration and liquefaction, accelerators, magnet technology, high-temperature superconductors, cryocoolers, power applications, etc.

For the JT-60SA project, two contributions were presented: one poster for the “Design of JT-60SA thermal shield and cryodistribution” by K. Kamiya from JAEA and one oral presentation on “Experimental investigations for pulsed loads smoothing on cryogenics circuits of superconducting magnets in JT-60SA tokamak” by C. Hoa from CEA Grenoble.

In addition to the scientifically fruitful exchanges, there were also many ways to enjoy the Japanese culture, and especially at the banquet reception at a beautiful place in Fukuoka city, in the Hakata area. The organizers offered a wonderful evening, with traditional music and an exquisite dinner.

Meetings

4th Preparatory Working Group meeting on the ITER Remote Experimentation Centre

On 18 May, the 4th meeting of the Preparatory Working Group on the ITER Remote Experimentation Centre (PWG-4) was held by videoconference with 12 participants: 8 PWG members (4 from both EU and JA), 2 experts from JA, and 2 from the IFERC project team including the Project Leader as the chair. The PWG agreed to hold a face-to-face meeting (PWG-5) in EU in June and discussed its agenda where the main items would be the functional and technical requirements, the procurement sharing, and the off-site requirements for ITER remote experimentation.

Local

Naka Fusion Institute

Aerial photo of the Naka Fusion Institute

The Fusion Research and Development Directorate and the Naka Fusion Institute of the Japan Atomic Energy Agency (JAEA) are charged with advancing fusion research and development aiming at realization of fusion energy. They execute research and development activities both as a Domestic Agency of the ITER project and as an Implementing Agency of the

Broader Approach (BA) activities. The procurement activity of the ITER project, and the upgrade of JT-60 to the fully superconducting tokamak, JT-60SA, a BA activity, fusion plasma research, and R&D on various fundamental technologies are carried out in the Naka Fusion Institute. The International Fusion Energy Research Centre project, and the Engineering Validation and Engineering Design Activities of the International Fusion Material Irradiation Facility, are executed mainly in the Aomori Research and Development Centre, which is located in Rokkasho.

The Naka Fusion Institute is located in Naka city next to Mito, the capital of Ibaraki Prefecture. It has good access to Narita airport, which can be reached by car in two hours, and Tokyo, which is around one hour away by train. Ibaraki Prefecture, situated within the Tokyo metropolitan area, possesses a number of centres of scientific and industrial research and development. Moreover, the climate is mild, and nearby medical care, housing, sports and leisure, arts and cultural facilities provide attractive and safe living conditions (see “Local” articles of the Newsletters No.1, 2, 3, 6, 9, and 13).

At the Naka Fusion Institute, originally established with the Japan Atomic Energy Research Institute (JAERI) in 1985, JT-60 and various fusion testing and research facilities are provided in an area of approximately 1.3 million square metres (see aerial photo). JT-60 operated from 1985 to 2008 as one of the largest tokamaks in the world. During its operation, JT-60 produced a number of prominent results with new findings and world records leading to the advancement in fusion energy development. In particular, JT-60 made a significant contribution to the design of ITER through its development of steady-state operation with high fusion performance.

Public relation activities including “outreach” are very important to the Naka Fusion Institute, actively communicating with many people, including the local community, to encourage understanding and support for fusion energy. The institute also makes a large effort to educate young people who will be responsible for the next generation, conducting activities aimed at promoting understanding of fusion energy and scientific technology (see photos).

The Fusion Booth of the Naka Fusion Institute at the “Youngsters’ Science Festival in Hitachi” in November 2011; explaining superconductivity on the left and JT-60SA on the right

Calendar

July 2-6, 2012
39th European Physical Society Conference on Plasma Physics & 16th International Congress on Plasma Physics (EPS/ICPP)
Stockholm, Sweden

July 30-August 3, 2012
20th International Conference Nuclear Engineering/ASME 2012 Power Conference
Anaheim, USA

September 19-20, 2012
15th Technical Coordination Meeting (TCM-15)
Padua, Italy

September 24-28, 2012
27th Symposium on Fusion Technology (SOFT 2012)
Liege, Belgium

October 7-12, 2012
Applied Superconductivity Conference (ASC 2012)
Portland, USA

October 8-13, 2012
24th IAEA Fusion Energy Conference (IAEA FEC 2012)
San Diego, USA

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/