



*graph JAEA*

**No. 4**

October 2014

**Well, What's this ?**

**Japan Atomic Energy Agency**



# Hello everyone, this is JT-60SA

We are jointly constructing the JT-60SA machine in collaboration with researchers and engineers in Europe, making mutual efforts for its successful completion by integrating technologies in manufacturing the components in Japan and Europe.

## Current lead

This is the device for introducing electric current into the superconducting coil.



## Toroidal Field Coils

Superconducting coils for confinement of the plasma.



## Cryostat

A large, stainless steel structure surrounding the vacuum vessel and superconducting magnets, providing a super-cool, vacuum environment.



## Vacuum Vessel

A doughnut-shaped vacuum chamber for production of high-purity plasma by maintaining a stringent vacuum.



## Poloidal Field Coils

Superconducting coils for plasma production, positioning and shaping.



## Radio-Frequency Resonance Heating System

Plasma heating device using electromagnetic waves in the electron cyclotron wave range.



## Power Supply

This equipment supplies electricity to the equipment.



## Cryogenic System

This equipment cools the superconducting coil.



## Neutral Beam Injector

Plasma heating device using high energy neutral beams.



## In-vessel Components

For control of high pressure plasma:

- Passive stabilization by the surrounding conducting wall (stabilizing plates).
- Active stabilization using a wide variety of coils which produce offsetting magnetic fields based on detected plasma instabilities.



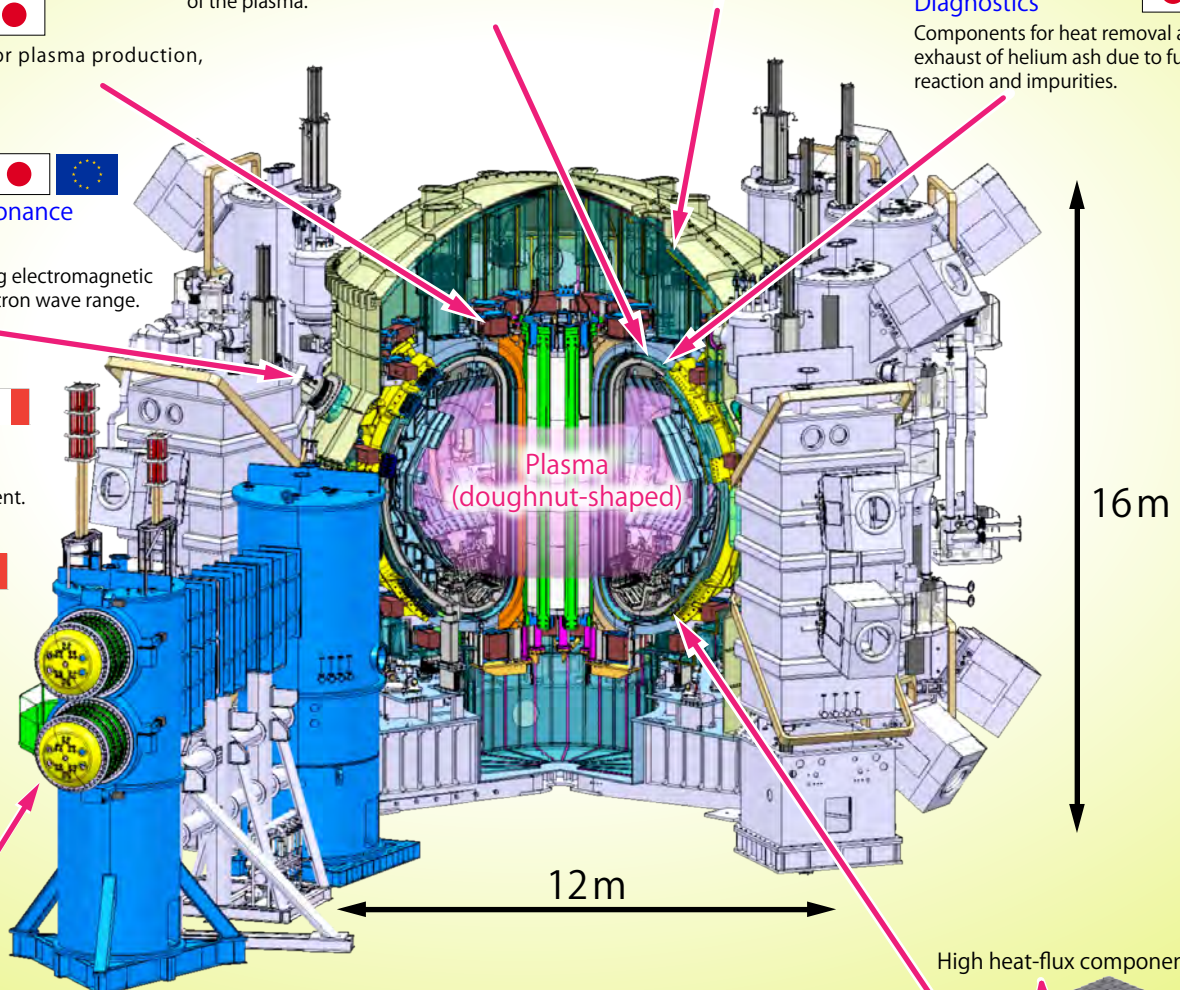
## Divertor

Components for heat removal and exhaust of helium ash due to fusion reaction and impurities.



## Diagnostics

Components for heat removal and exhaust of helium ash due to fusion reaction and impurities.

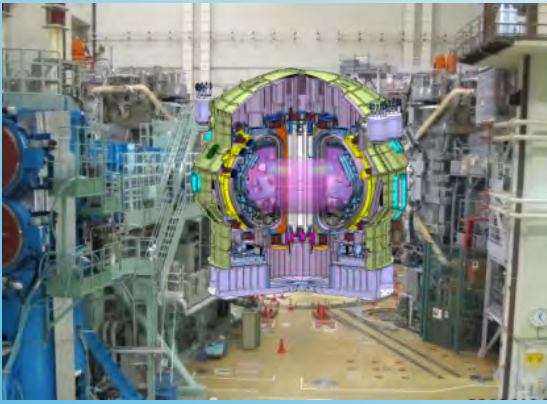


16m

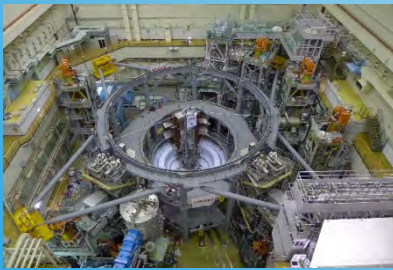
12m

High heat-flux components

Particle exhaust



March 2019  
JT-60SA  
First plasma



May 2014  
Assembly of the  
vacuum vessel  
started



January 2014  
Temporary installation of  
equilibrium field coils

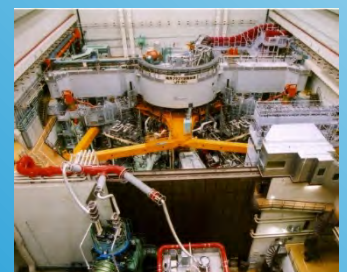


January 2013  
Assembly of  
JT-60SA started

October 2012  
Disassembly of  
JT-60 completed



October 2009  
Disassembly of  
JT-60 started



Evolution of manufacturing JT-60SA



# JT-60SA cutting-edge



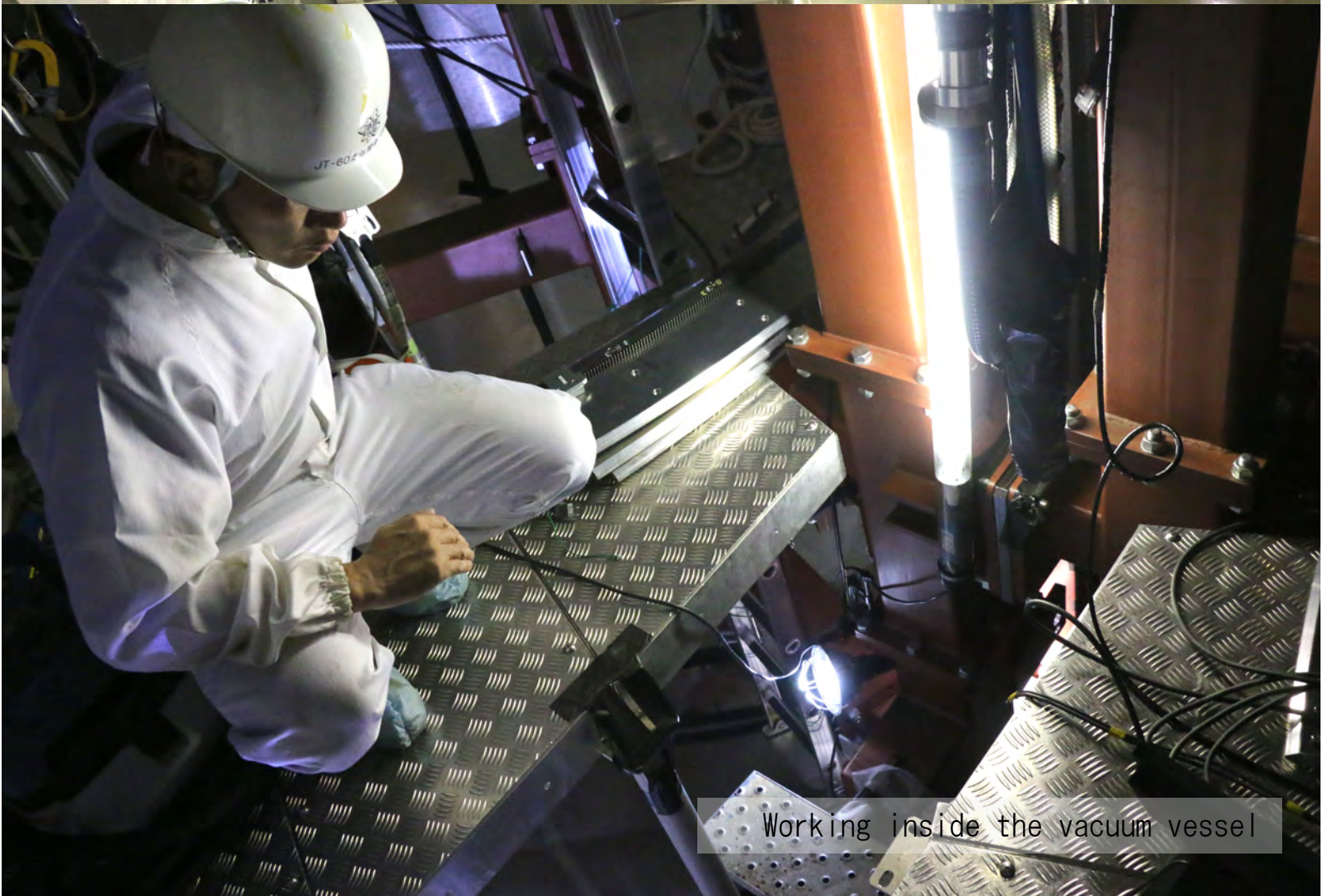
Checking the tip end of the pancake coil



# JT-60SA cutting-edge



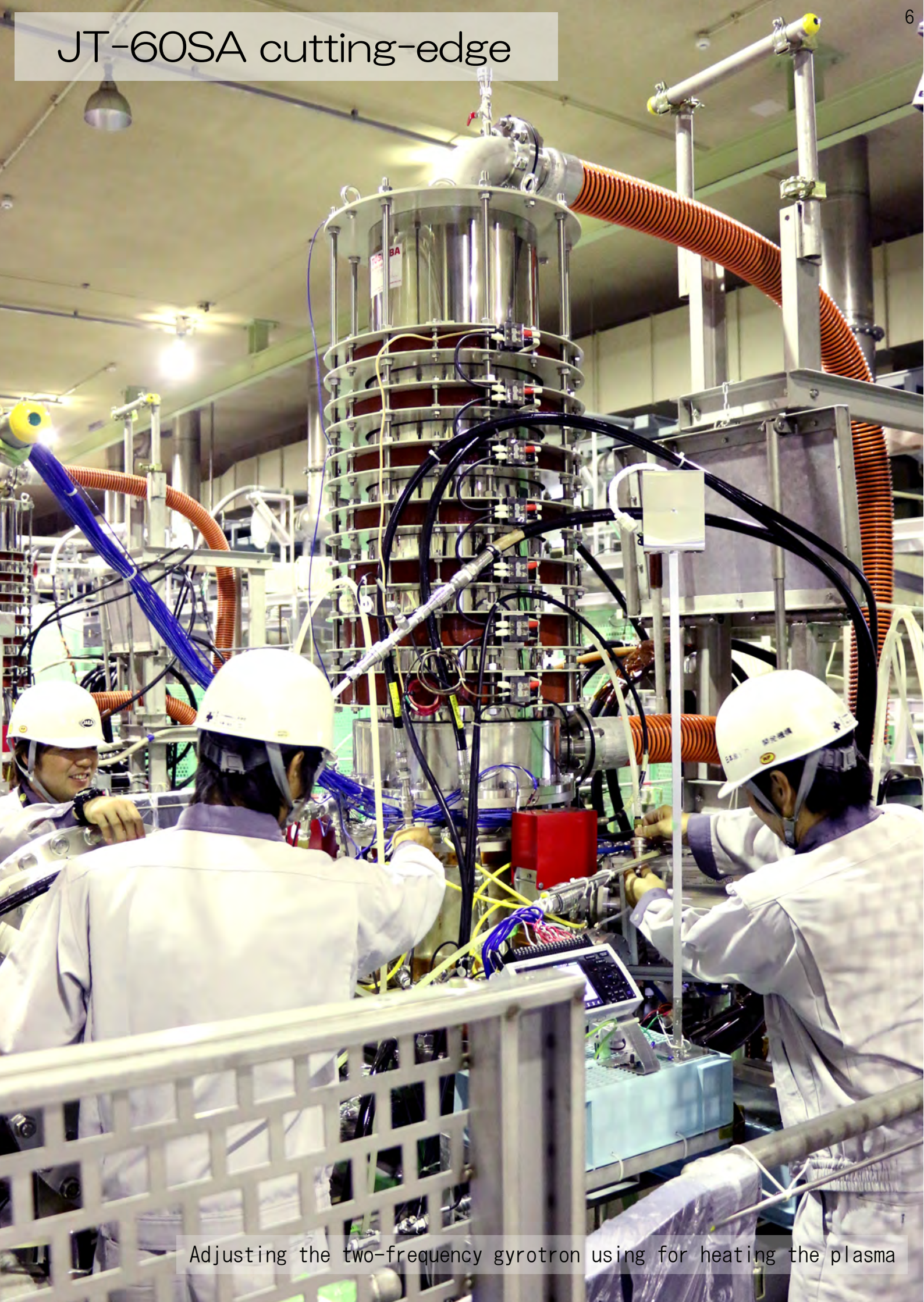
Suspending the vacuum vessel (40 degree-sector)



Working inside the vacuum vessel



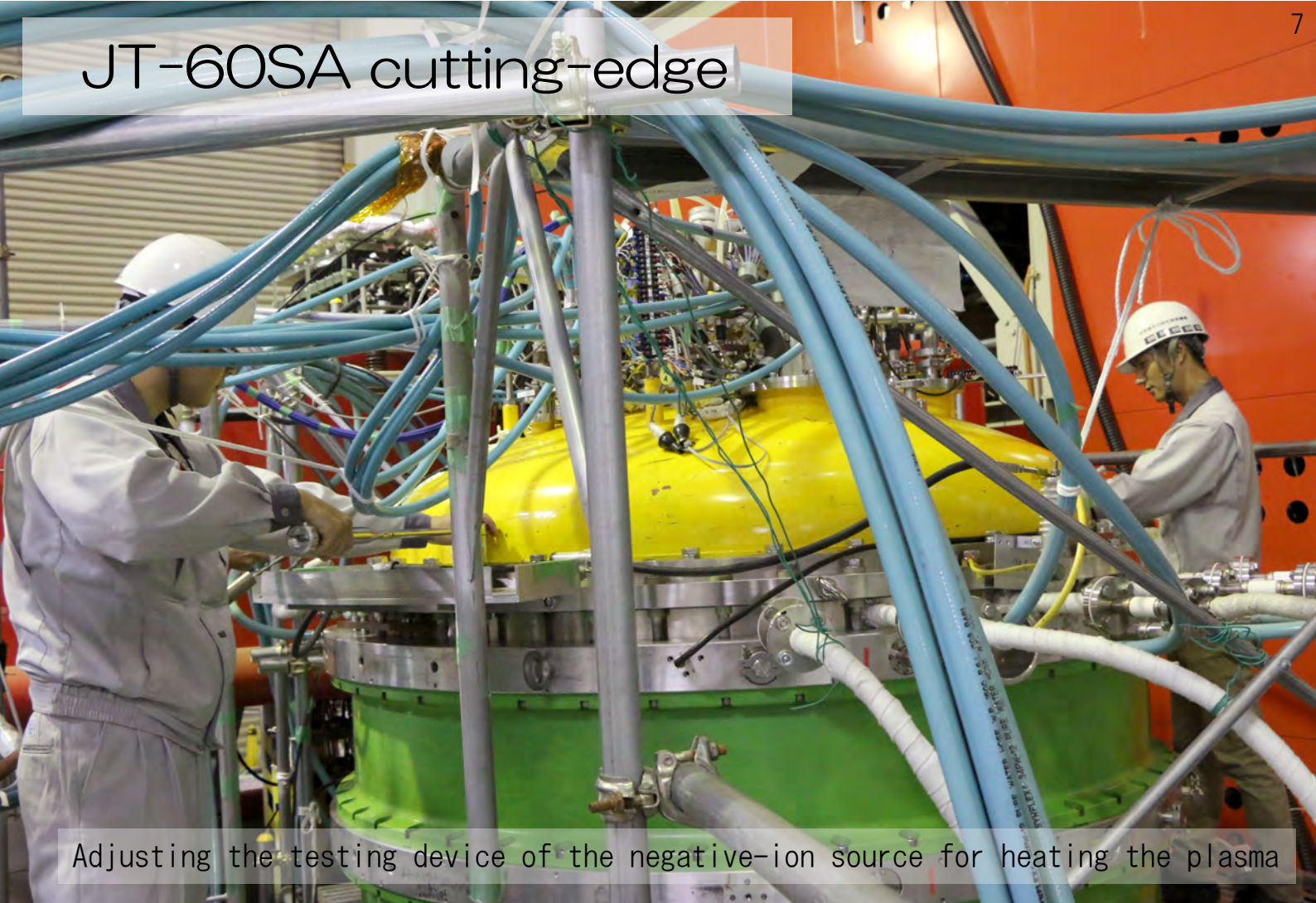
# JT-60SA cutting-edge



Adjusting the two-frequency gyrotron using for heating the plasma



# JT-60SA cutting-edge



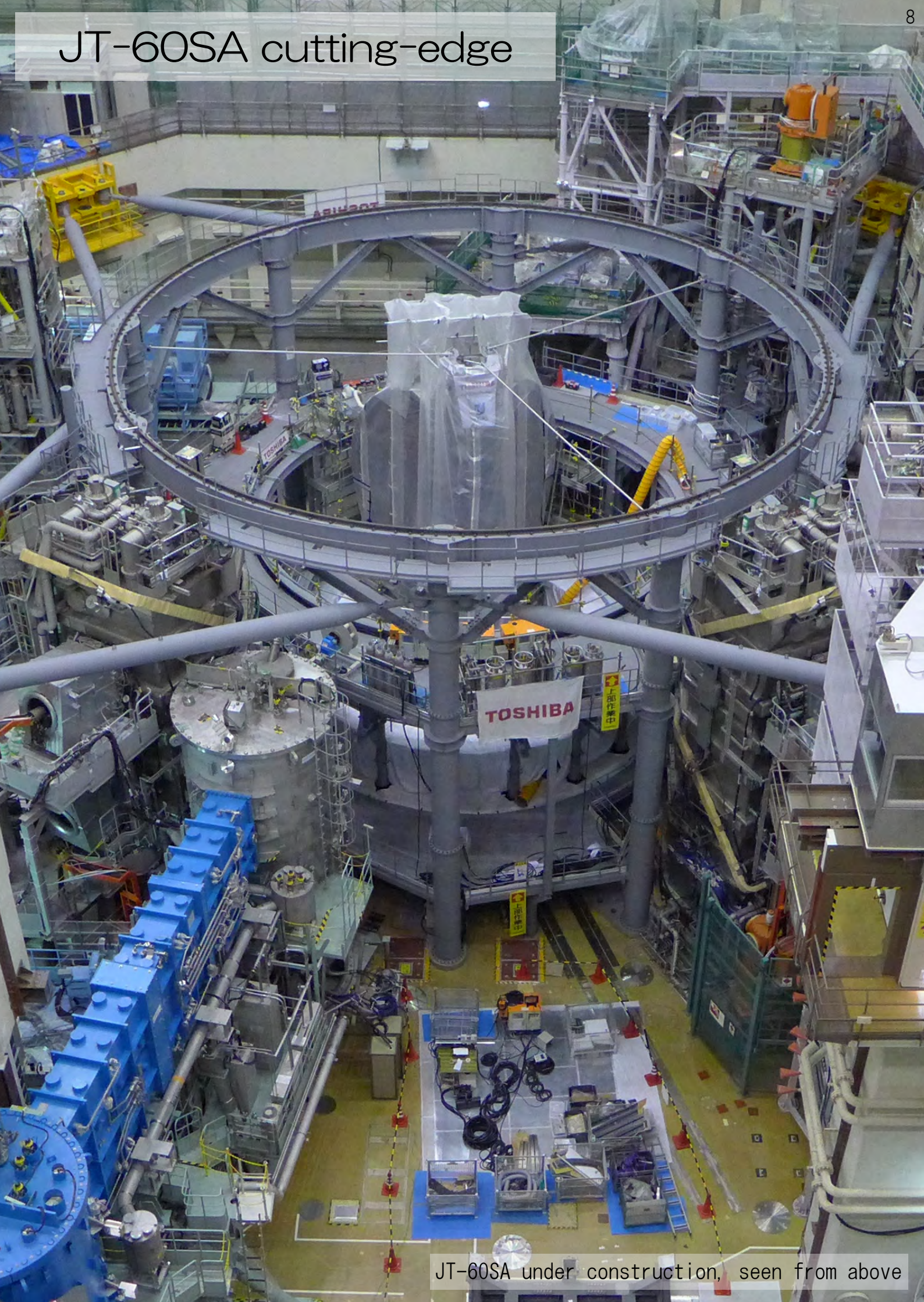
Adjusting the testing device of the negative-ion source for heating the plasma



Operating the negative-ion source testing device



# JT-60SA cutting-edge



JT-60SA under construction, seen from above

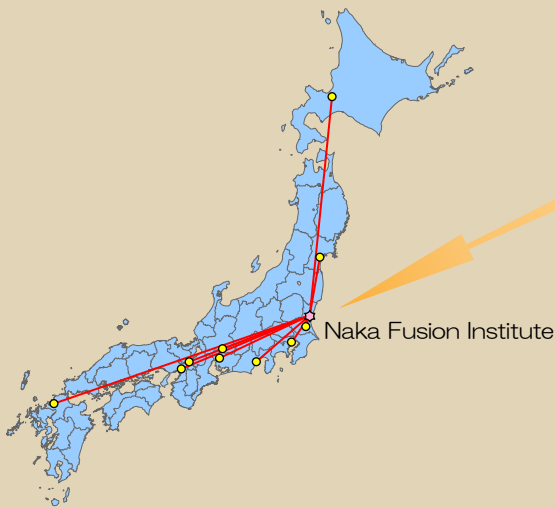


# JT-60SA and the future of nuclear fusion

## International collaboration among various countries and regions

The JT-60SA project is a joint scheme, combining the "Satellite Tokamak Program" and the national program.

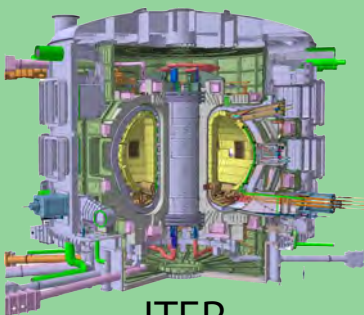
We are consolidating the views of the fusion community in Japan, and making them contribute to the discussions between Japan and Europe.



Domestic community



EU-Japan Technical Coordination



ITER



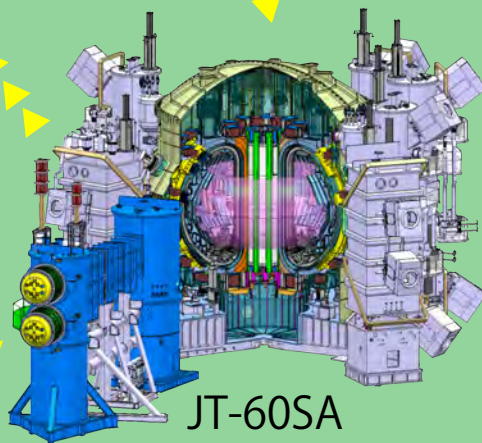
DEMO reactor

### Contribution to the DEMO reactor

Based on the results of the predecessor JT-60, JT-60SA will give full support to ITER and contribute to the realization of a continuously operational and economically attractive demonstration reactor with the development of human resources such as researchers and engineers who will take the lead in the next generation.



JT-60

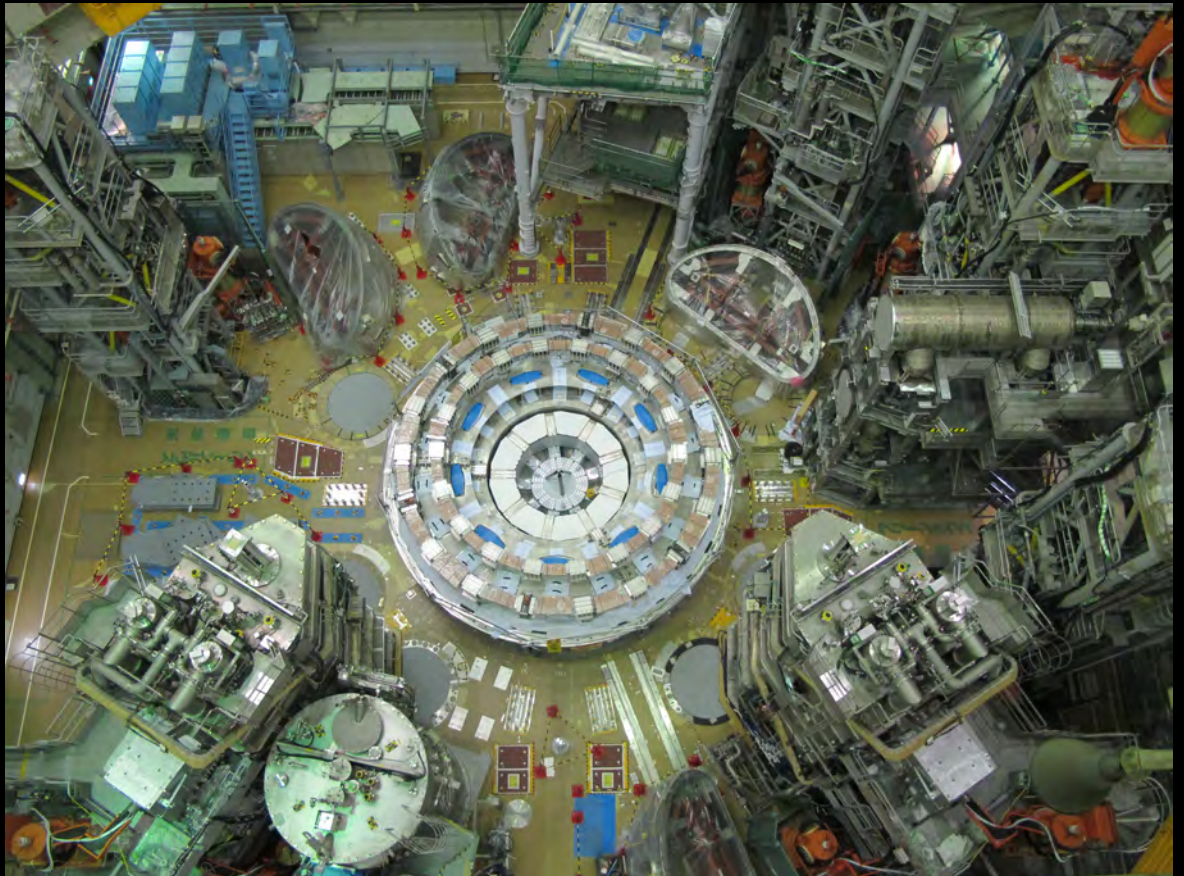


JT-60SA



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The photo on the front cover page is a zoomed-in photo of the one shown above, which shows a superconducting equilibrium field coils temporarily installed on the cryostat base.

***graph* JAEA**

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