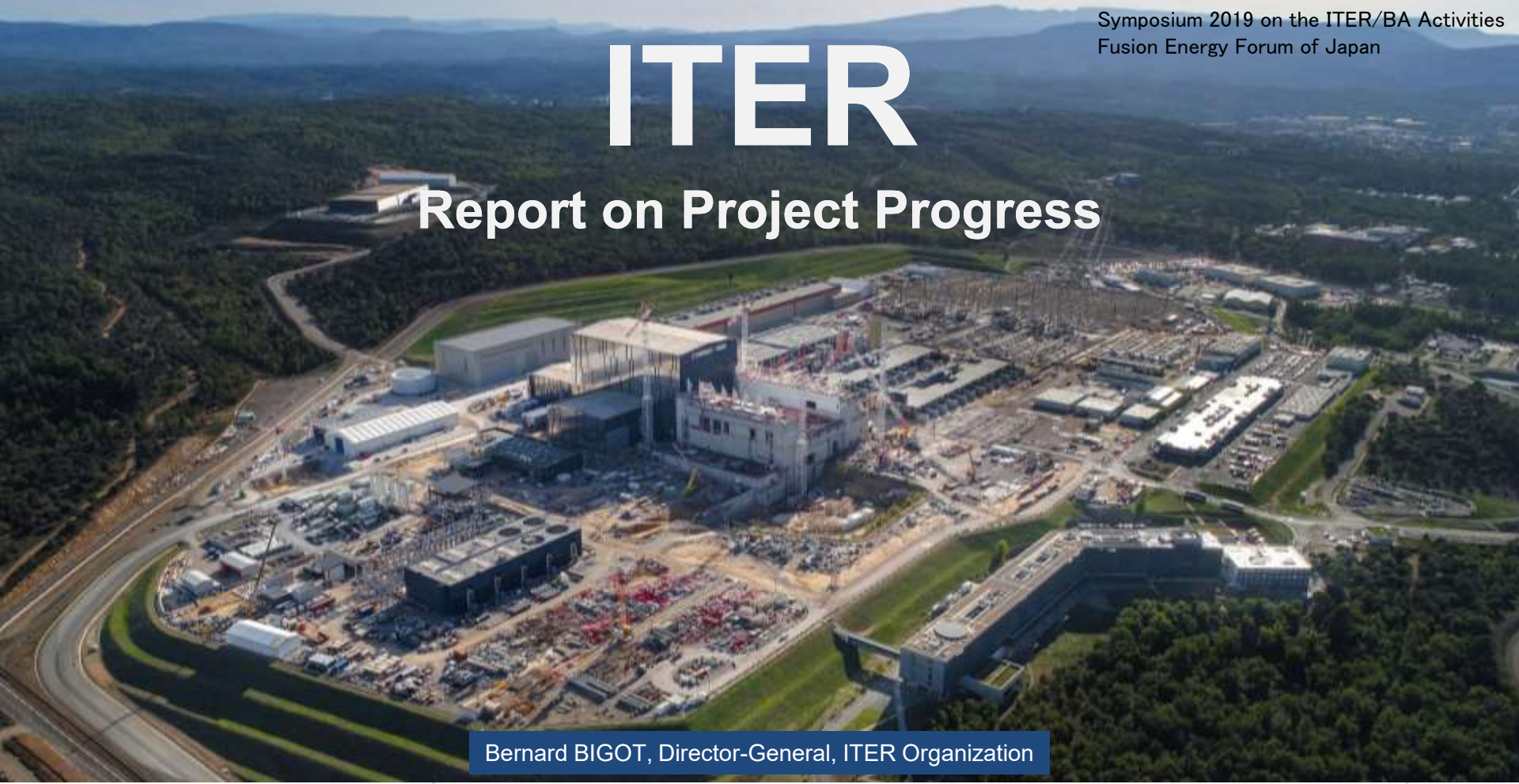
ITER

Report on Project Progress



Bernard BIGOT, Director-General, ITER Organization

On the way to First Plasma over 65% of the work is done

According to the stringent metrics that measure project performance, more than 65 percent of the "total construction work scope through First Plasma" is now complete. The current progression rate is in the order of 0.7 %.

2019-2020, decisive years

Deliveries

- First sector Vacuum Vessel (Korea)
- First elements Thermal Shield (Korea)
- First Toroidal Field Coils (Japan)
- First Central Solenoid module (USA)

Finalized fabrications

- First Toroidal Field Coil (Europe)
- Beginning of first Vacuum Vessel sector pre-assembly (IO)

Installations

- First *cryolines* (India, IO)

Finalized construction (Europe)

- Power conversion buildings
- Tokamak central pit ready for assembly operations
- Rail extension for the double overhead gantry crane, creation of the Crane Hall
- Etc.

Worksite progress

Tokamak Complex

Civil works for the main building (Tokamak Bldg) are completed. Work is ongoing for the extension of the crane rails and the creation of the Crane Hall. Inside the Assembly Pit, anchoring systems are being installed on and around the “crown” that will support the combined mass of the machine and its enveloping cryostat (23,000 tonnes).

Tokamak Complex

Manufactured partly in India and partly in France, some 2.7 km of high-technology piping (“cryolines”) must be assembled and welded inside the Tokamak building to distribute cooling fluids to the magnets, thermal shield and cryopumps. Installation works began in September 2019.

Assembly Hall

Manufactured in Korea, two sub-assembly tools (SSAT-1 & 2) will handle loads of up to 1,500 tonnes. Functional tests under load are complete. The floor of the 6,000 m2, 60-metre high Assembly Hall is being coated with epoxy resin to ensure cleanliness during assembly operations. The two halves of the upending tool were delivered last week.

Cryoplant

Close to 5,000 tonnes of equipement are now installed in what will be the largest cryogenic unit in the world, tasked to provide the cooling fluids to the magnetic system, cryopumps and thermal shield. Work is now ~ 50% complete.

Electrical network

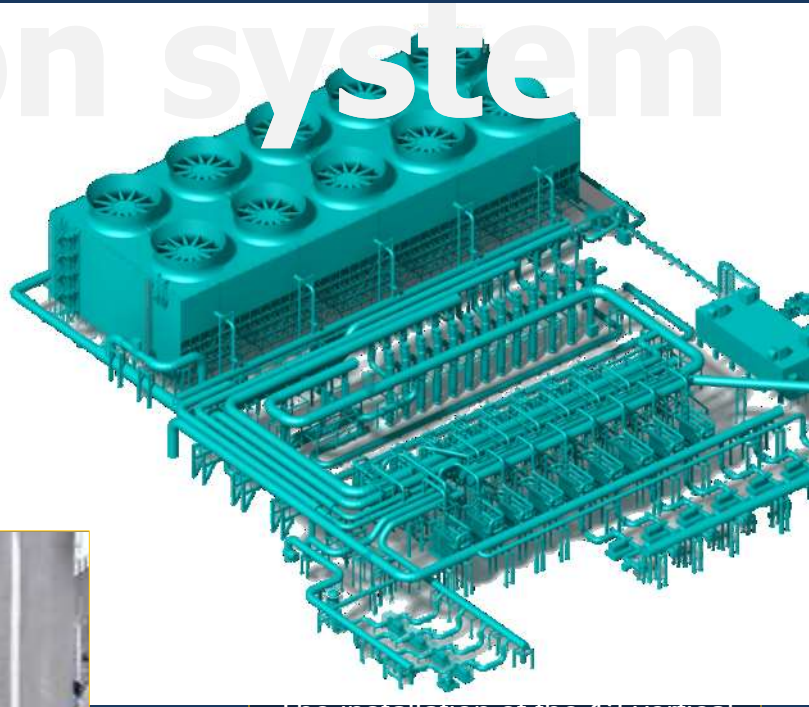
The connection to the French grid (400 kV network) is effective as of 26 January 2019

Electrical conversion

Electrical components from China, India, Korea and Russia are being progressively installed inside of the building as well as in the exterior bays.

Two large Magnet Power Conversion buildings will host the transformers and converters (AC ► DC) feeding power to the ITER magnets.

Heat rejection system



The installation of the 13 vertical turbine pumps is underway now. Each pump is designed to move one tonne of water per second. The heat rejection system is procured by India.

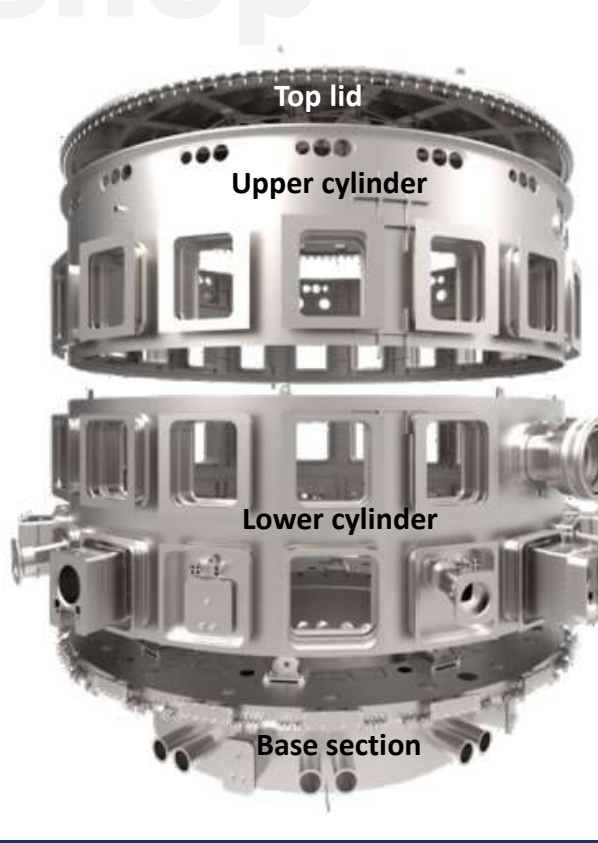
Cryostat workshop


Lower cylinder moved to storage

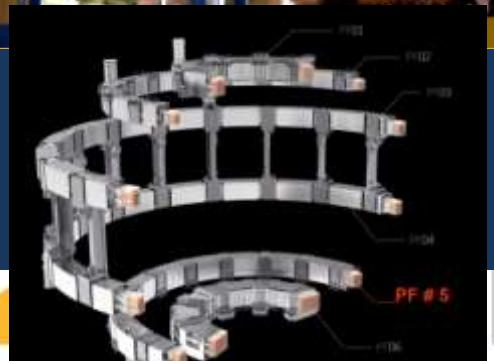

Base section finalized


Upper cylinder being assembled

Manufactured in India, the 30 m x 30 m cryostat (the insulating vacuum vessel that encloses the machine) is being assembled and welded on site by German company MAN Energy Solutions. The lower cylinder is in storage; the base section is finalized; assembly work has begun on the upper cylinder.



PF Coil winding facility



Too large to be transported by road, four of ITER's six ring-shaped magnets (the poloidal field coils, 17 to 24 m, in diametre) will be assembled on site by Europe in this 12,000 m² facility. Resin impregnation ongoing for PF Coil # 5 (17 m. diametre, ~ 350 tonnes) and work has started on PF Coil # 2 (17 m. diametre, 204 tonnes)

Manufacturing progress

Japan is producing nine superconducting winding packs for the toroidal field coils, in addition to 18 (plus one spare) toroidal field coil structures. (Completed winding pack pictured overhead)

Fabrication of Japan's share of superconducting cables (43 km, 745 t.) was finalized last year.

Cold tests are finalized at Mitsubishi Electric Corporation for the first winding pack of TF coil # 12

The first TF coil manufactured in Japan is expected to be delivered to the ITER site in early 2020

Manufacturing progress

400-tonne ring-shaped coil (PF Coil # 6), manufactured under contract from Europe was finalized a few weeks ago.

India procures part of the “cryolines” that transport the extremely low-temperature fluids that cool the superconducting magnets.

Five vacuum vessel ectors (out of 9) are being manufactured by Europe. Completion rate: ~ 50 to ~ 65 %

Manufacturing progress

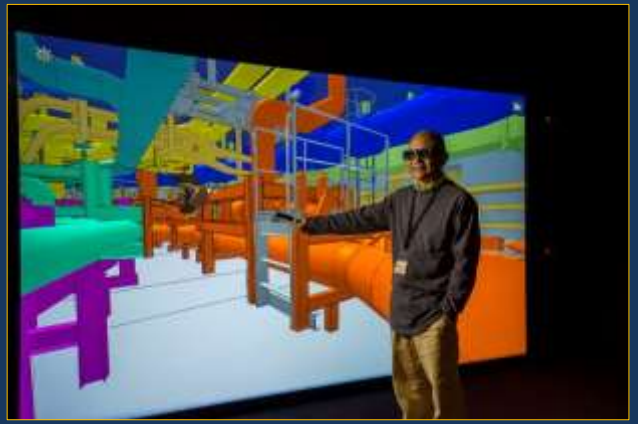
Five out of the 7 central solenoid modules procured by US are in the latest stages of fabrication at General Atomics In San Diego (Ca.).

Russia is progressing on fabrication of the 18 upper ports of the vacuum vessel.

4 out of 9 sectors for the vacuum vessel are being manufactured by Hyunday Heavy Industries. The first one is now completed.

Promoting ITER jobs in Japan





ITER Organization and the Japanese Domestic Agency have launched a promotional campaign to advertise job openings at ITER.

ITER is moving forward!