

THE ITER PROJECT CONSTRUCTION AND MANUFACTURING

PROGRESS IN PICTURES 2013 – 2020







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2013 – 2020



A STAR IS BORN

A star will soon be born, a star unlike any other ... a star fashioned by human hands. ITER - the Latin word for "The Way" - will light up in the middle of the decade.

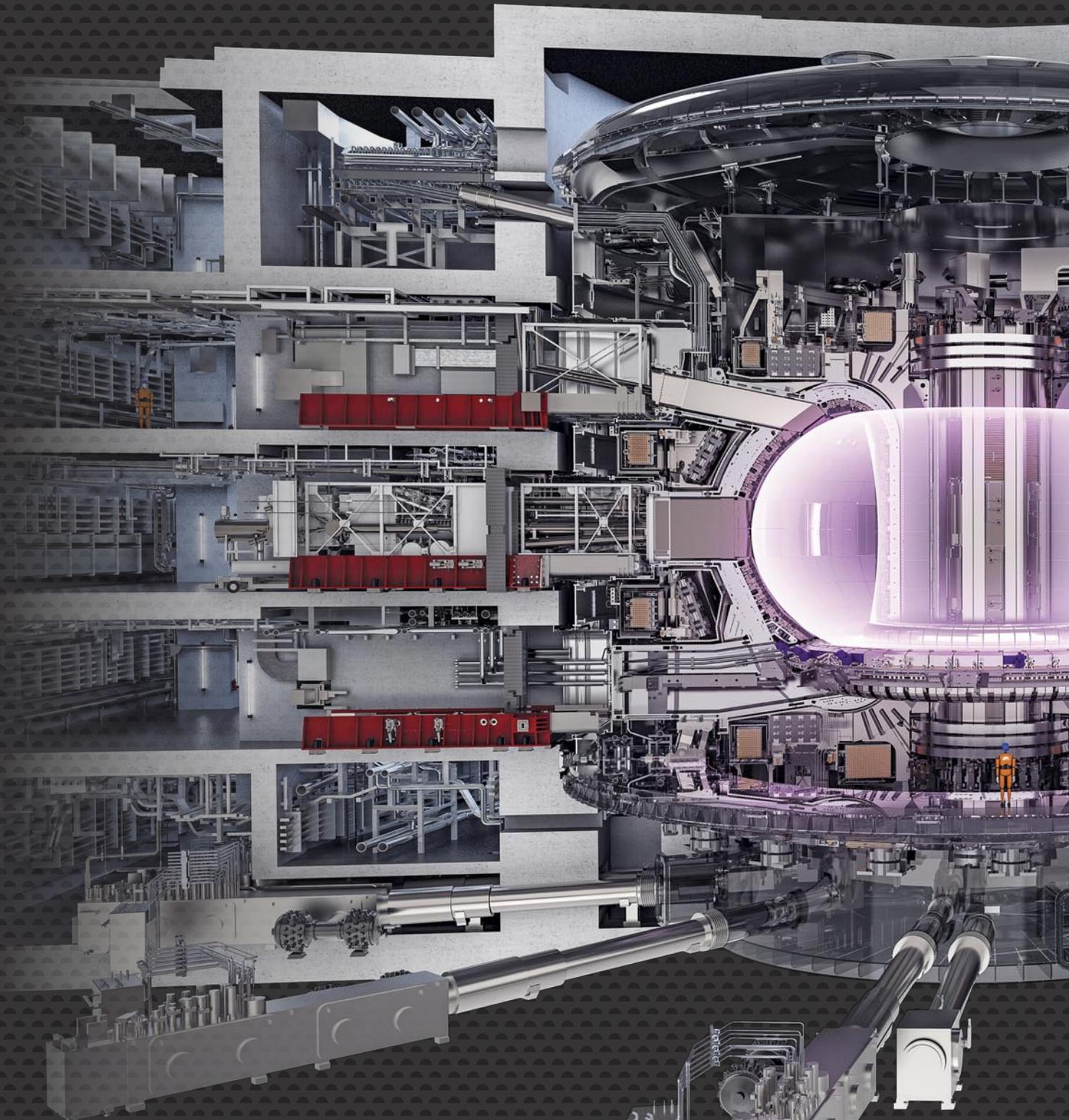
From a scientific and technological point of view, it will be one of humankind's historic achievements. The creation of an artificial star and the tapping of the tremendous amounts of energy produced could forever alter the course of civilization.

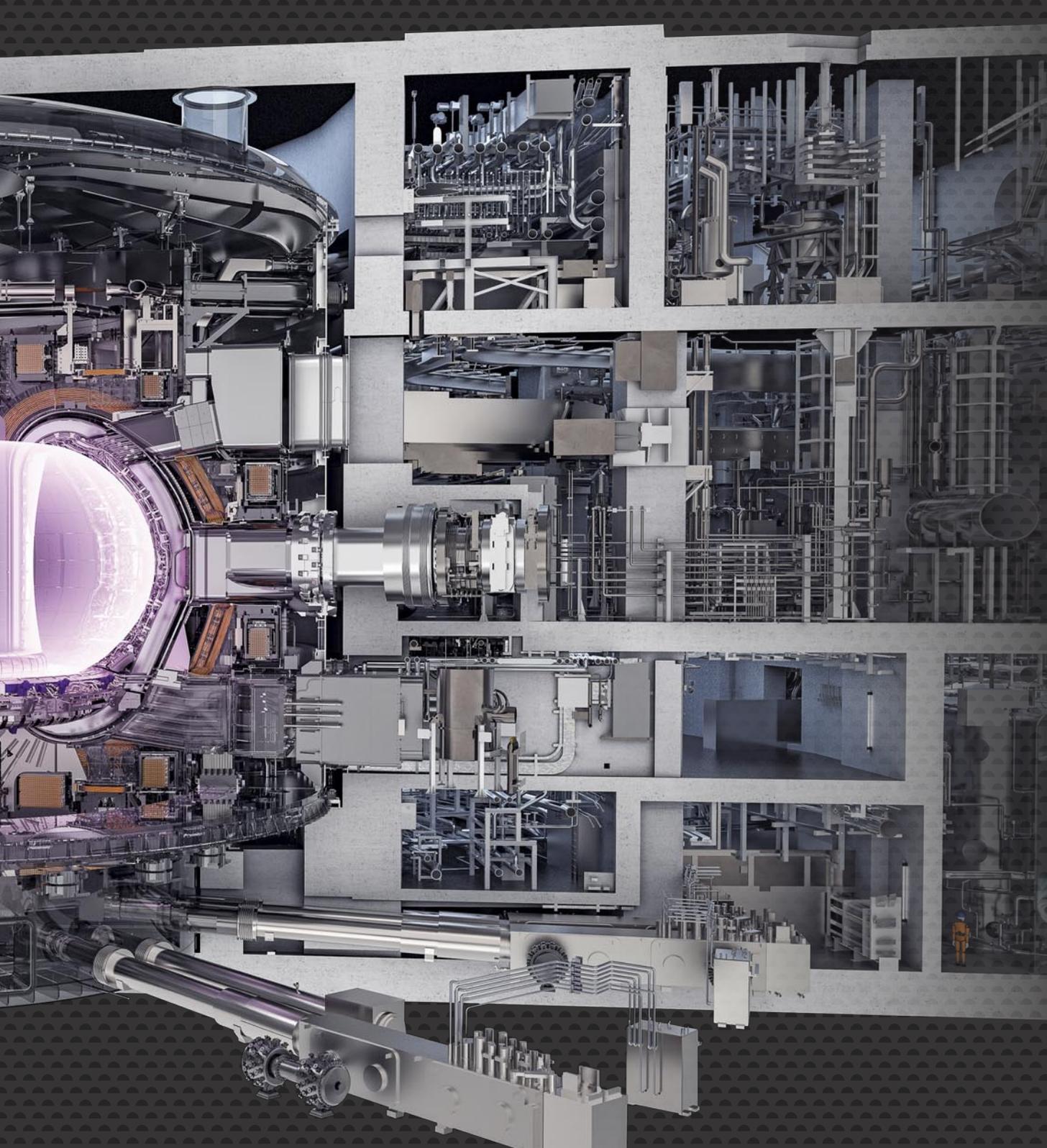
The ITER Project, an unprecedented international collaboration that brings together China, the European Union, India, Japan, Korea, Russia and the United States, is the culmination of decades of research and years of diplomatic negotiation. It has been the aspiration of three generations of physicists; it is now the reality of thousands of scientists, engineers, and labourers involved in ITER in France and throughout the world.

The seven ITER Members, representing half the world's population, share the responsibility for building the ITER machine and facility. Every Member, essentially, is involved in every system, delivering 90 percent of its contribution "in-kind" in the form of completed components, systems or buildings. In this way, Members are simultaneously reinvesting in their own countries, building expertise and stimulating innovation in their companies, national laboratories, and universities. The remaining 10 percent of value is paid to the ITER Organization to fund collaborative design, assembly, and operations.

On the ITER platform, the scientific installation is taking shape and completed components are arriving from ITER Member factories. The first act of ITER machine assembly – the installation of the cryostat base – was achieved in May 2020.

This exceptional edition of the ITER photobook aims to retrace seven years of construction and manufacturing and to take you into the heart of ITER – from the rolling hills of Provence to factories on three continents, where men and women from 35 nations are bent on realizing one of humankind's most enduring dreams: capturing the fire of the stars and making it available to humanity for the millenia to come.





THE ITER TOKAMAK



The ITER machine is a tokamak, the Russian acronym for Toroidal Chamber, Magnetic Coils. Tokamaks were developed in the 1960s at a time when nations were experimenting with all kinds of different systems to reproduce the nuclear reactions at work in the core of the Sun and stars.

A tokamak, imitating a star, is designed to fuse light atoms into heavier ones. A tokamak is a magnificent tribute to Albert Einstein's $E=mc^2$: the tiny loss of mass that results from the fusion process translates into a huge quantity of energy. One gram of fusion fuel (the hydrogen isotopes deuterium and tritium) generates as much energy as eight tonnes of oil.

ITER will be by far the largest and most complex tokamak ever built. Designed from the experience accumulated in hundreds of fusion machines throughout the world, it will demonstrate that fusion energy is scientifically and technologically feasible.

Weight	23,000 t
Height	~ 30 m
Diameter	~ 30 m
Plasma volume	840 m ³
Temperature at plasma core	150,000,000 °C
Fusion power	500 MW

WHO MANUFACTURES WHAT?

CENTRAL SOLENOID



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TOROIDAL FIELD COILS (18)



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CRYOSTAT



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THERMAL SHIELD



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COOLING WATER SYSTEM

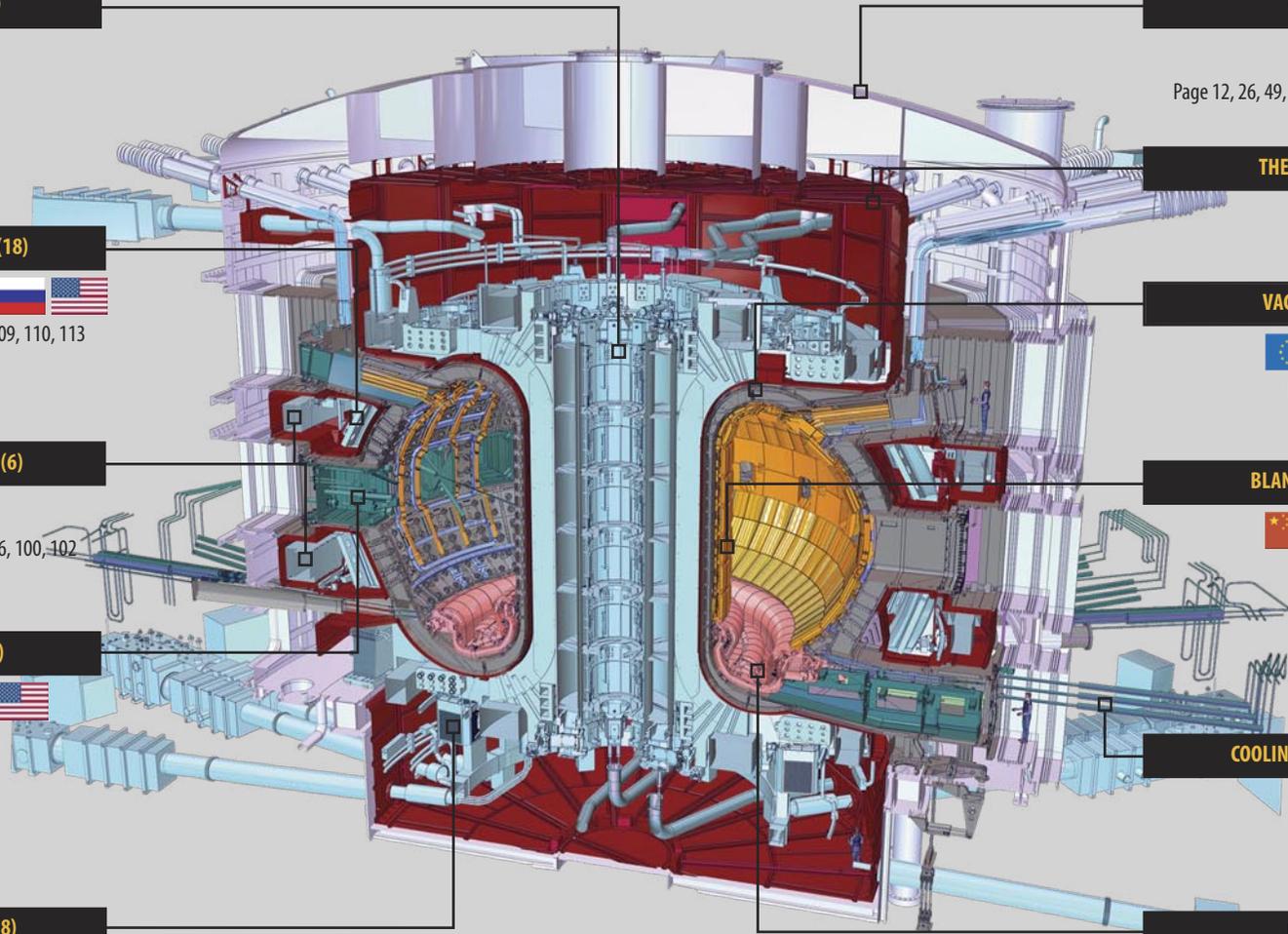


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DIVERTOR



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Not all systems (or contributions) are represented in this illustration.

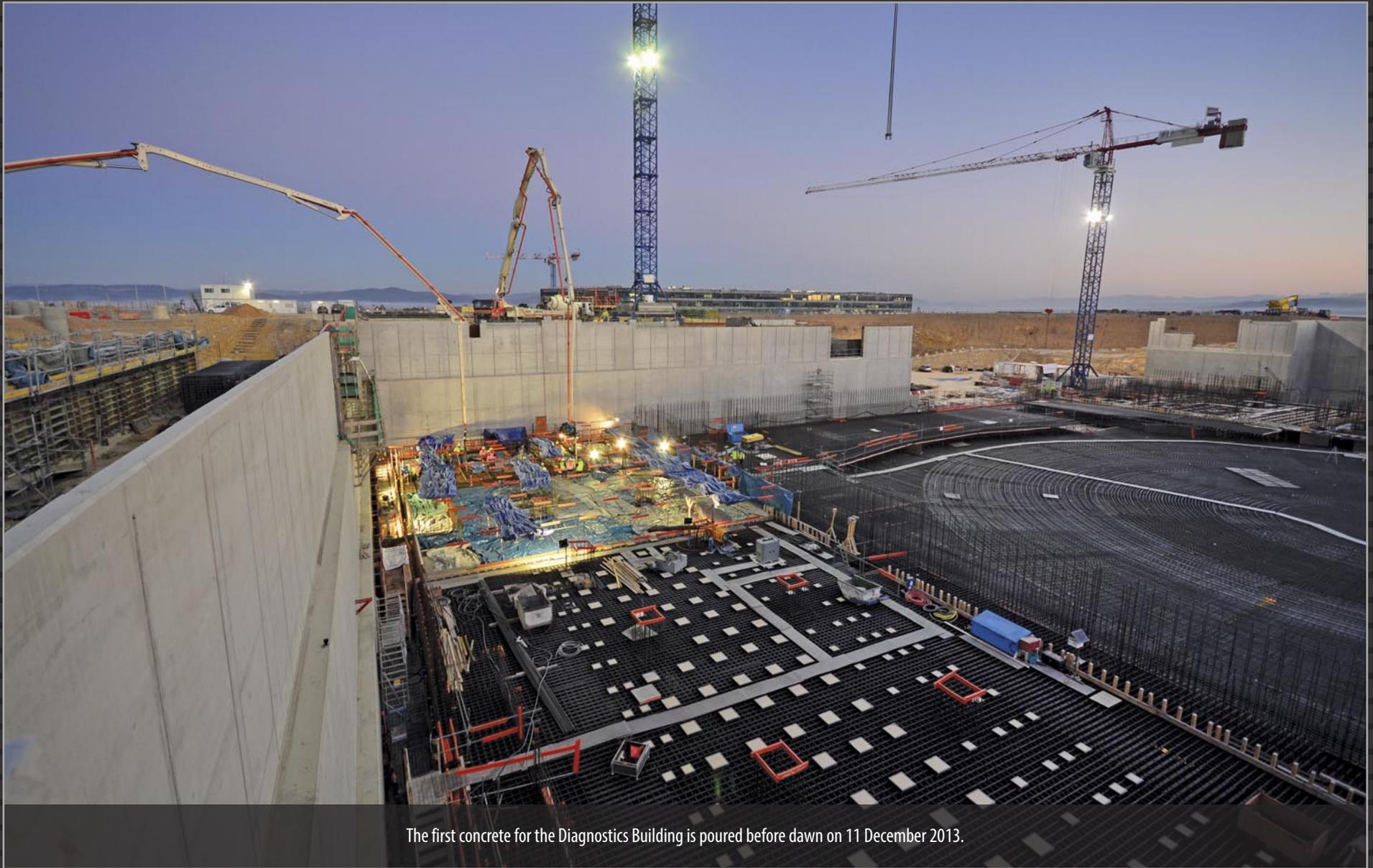
A 42-HECTARE PLATFORM



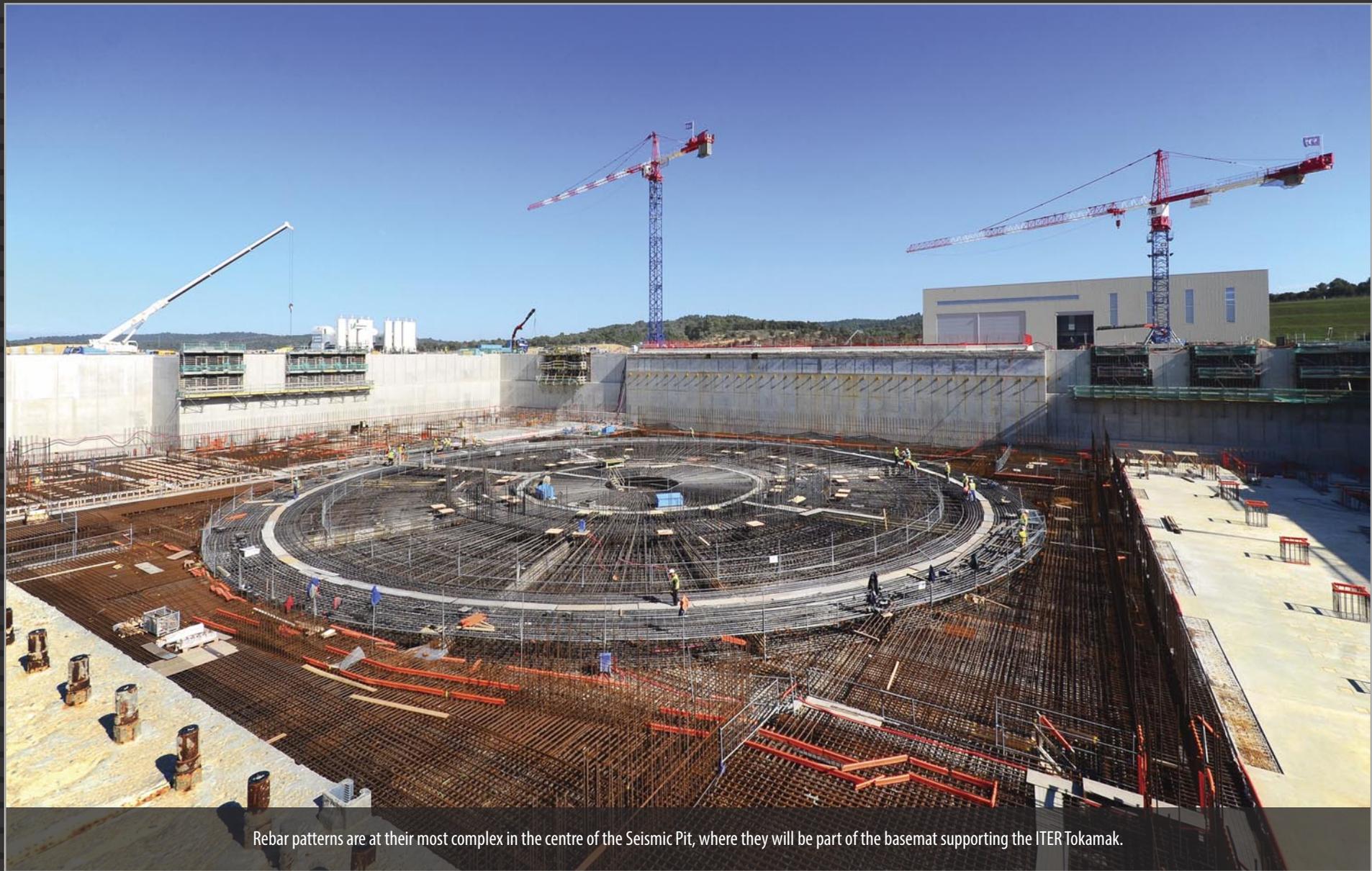
On 28 June 2005, the ITER Members unanimously agree on the site proposed by Europe: a 180-hectare stretch of land located in the Durance River Valley some 75 kilometres north of Marseille. Preparation work on the ITER site begins in January 2007. Over two years a 42-hectare platform is cleared, levelled and readied for building construction to start in the summer of 2010.



No fewer than 16 building projects are set into motion in 2014.

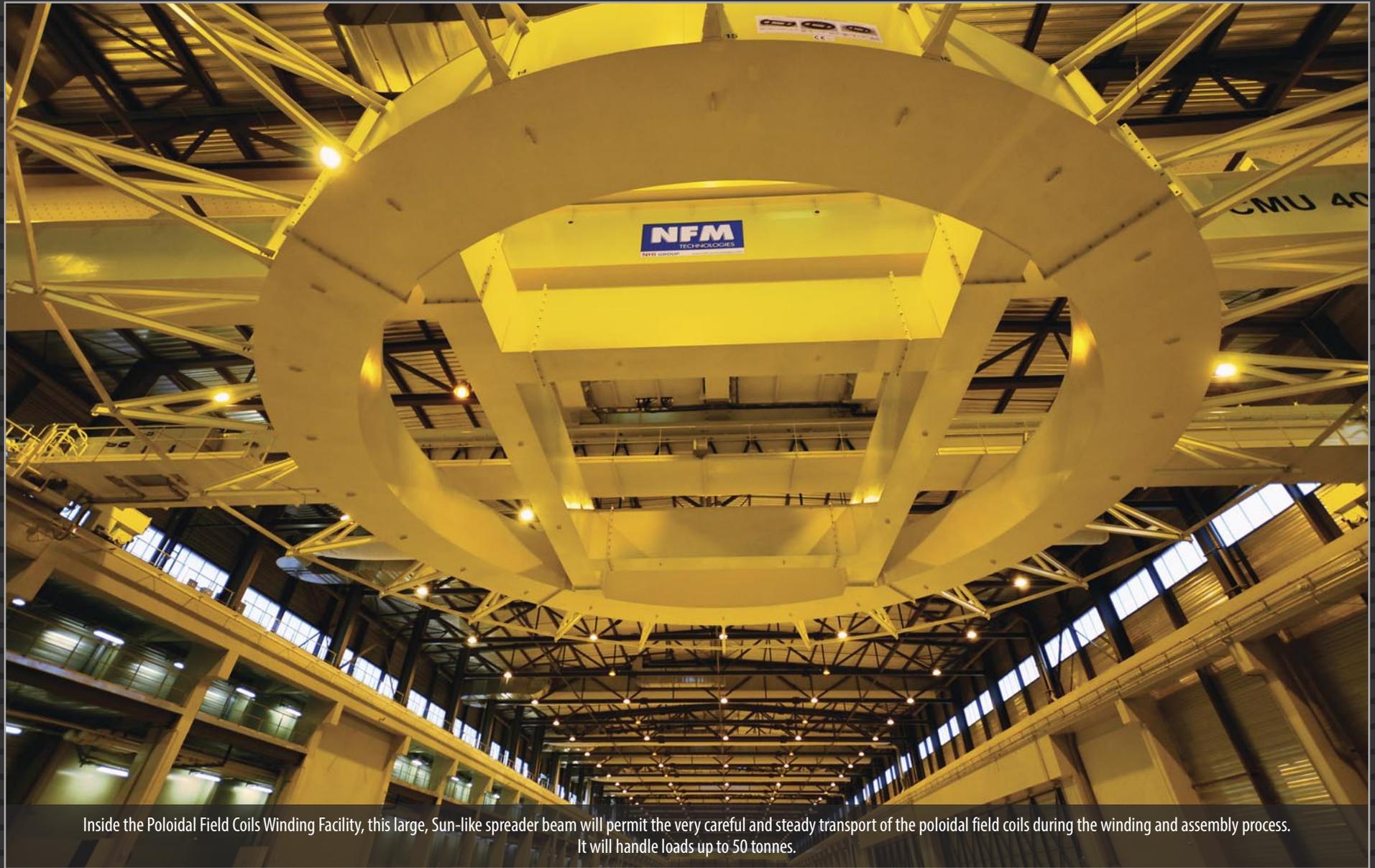


The first concrete for the Diagnostics Building is poured before dawn on 11 December 2013.



Rebar patterns are at their most complex in the centre of the Seismic Pit, where they will be part of the basemat supporting the ITER Tokamak.

A SUN-LIKE SPREADER BEAM



Inside the Poloidal Field Coils Winding Facility, this large, Sun-like spreader beam will permit the very careful and steady transport of the poloidal field coils during the winding and assembly process. It will handle loads up to 50 tonnes.



The ITER magnet system requires close to 2,800 metric tons of cable-in-conduit superconductors. Before launching actual fabrication, prototypes and "dummies" need to be produced. Here, China delivers a first batch of poloidal field coil dummy conductor for fabrication process testing.



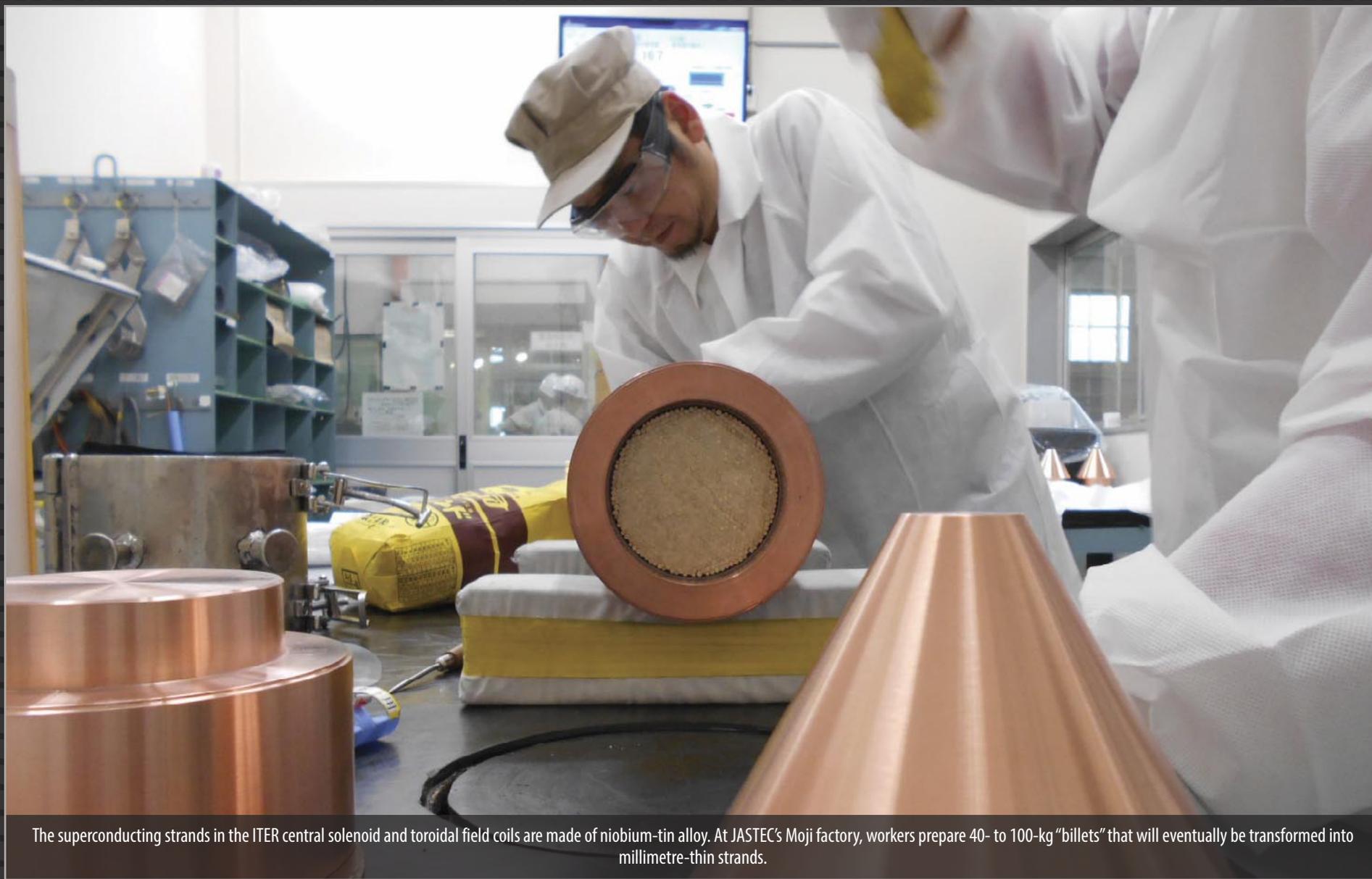
A vacuum vessel prototype, one-third the size of the actual component, undergoes bend testing in Italy. Europe is responsible for five of the nine ITER vacuum vessel sectors.



At the Larsen & Toubro plant in Hazira, fabrication of real-scale prototypes for the cryostat has begun. Pictured is a portion of the cryostat base section, made of 105-millimetre-thick stainless steel.



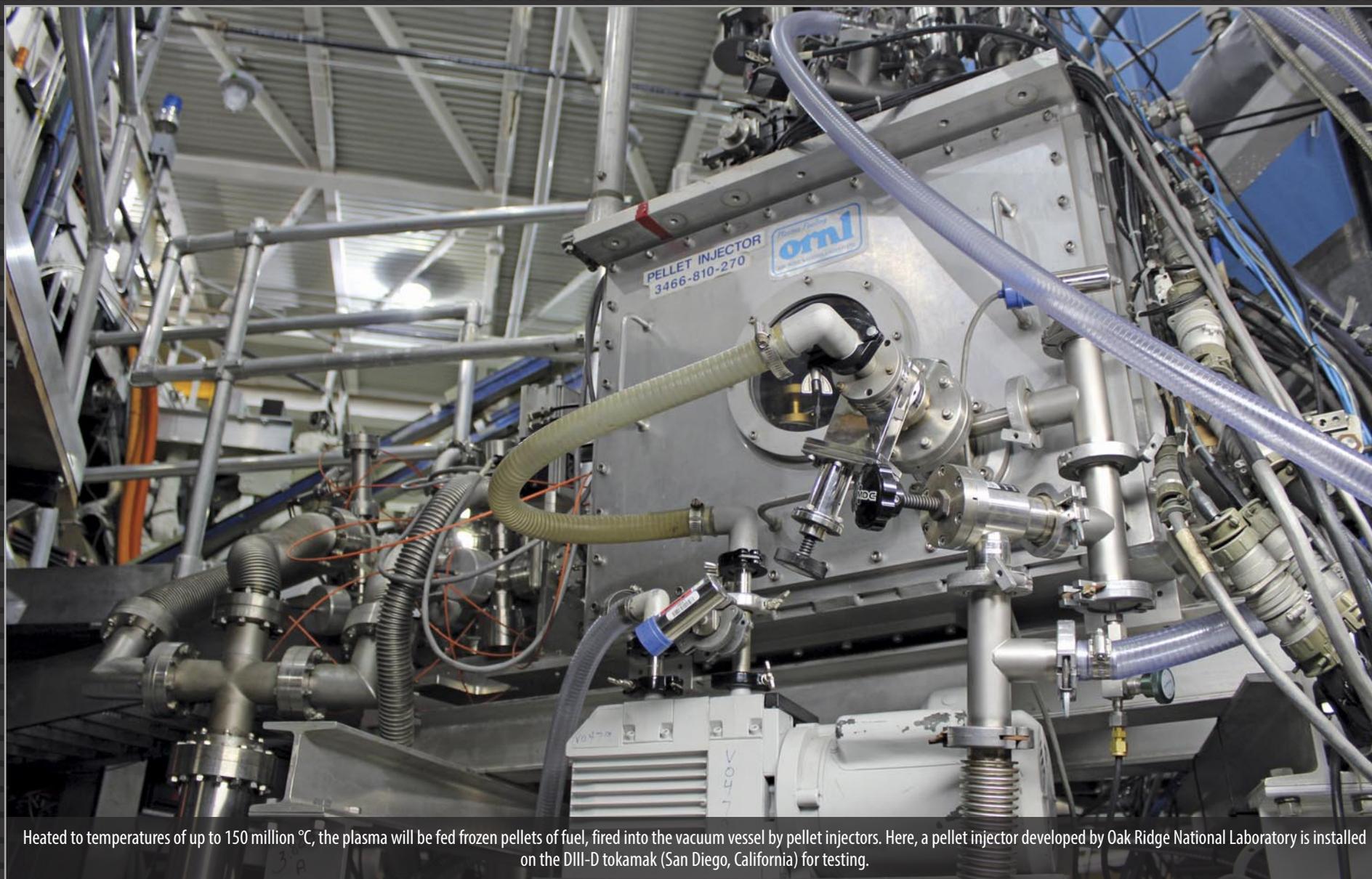
Korea is responsible for procuring four out of the nine vacuum vessel sectors. Manufacturing has started on vacuum vessel sector #6 at Hyundai Heavy Industries in Ulsan.



The superconducting strands in the ITER central solenoid and toroidal field coils are made of niobium-tin alloy. At JASTEC's Moji factory, workers prepare 40- to 100-kg "billets" that will eventually be transformed into millimetre-thin strands.



The Chepetsky Mechanical Plant in Glazov (Udmurtia) is producing superconducting strands for ITER's toroidal field and poloidal field coils.



Heated to temperatures of up to 150 million °C, the plasma will be fed frozen pellets of fuel, fired into the vacuum vessel by pellet injectors. Here, a pellet injector developed by Oak Ridge National Laboratory is installed on the DIII-D tokamak (San Diego, California) for testing.

DELIVERING COMPONENTS TO THE ITER SITE

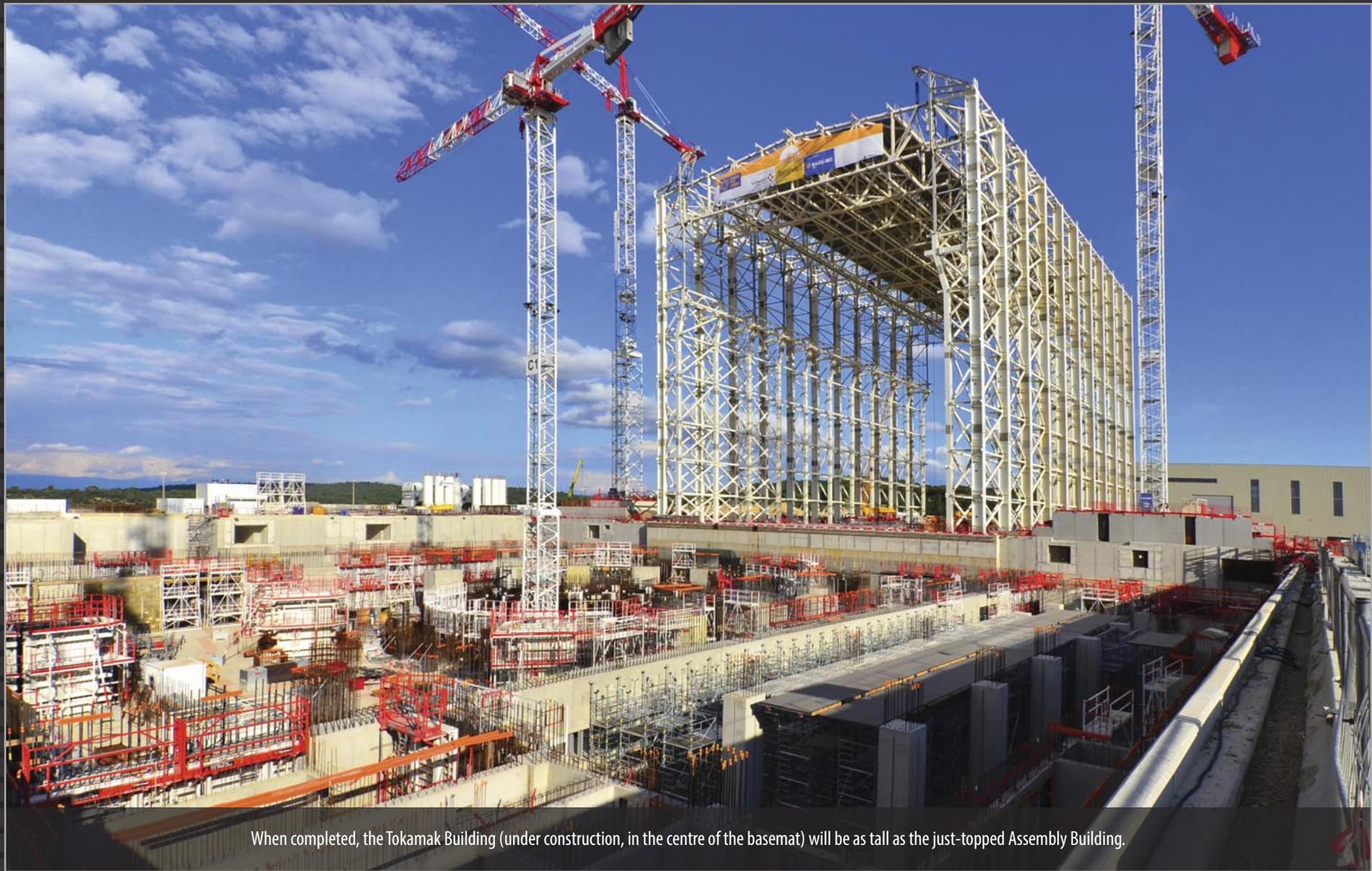


The road itinerary between the Mediterranean coast and the ITER site 104 kilometres away - the ITER Itinerary - is tested with a 600-tonne load before the arrival of the first ITER components.

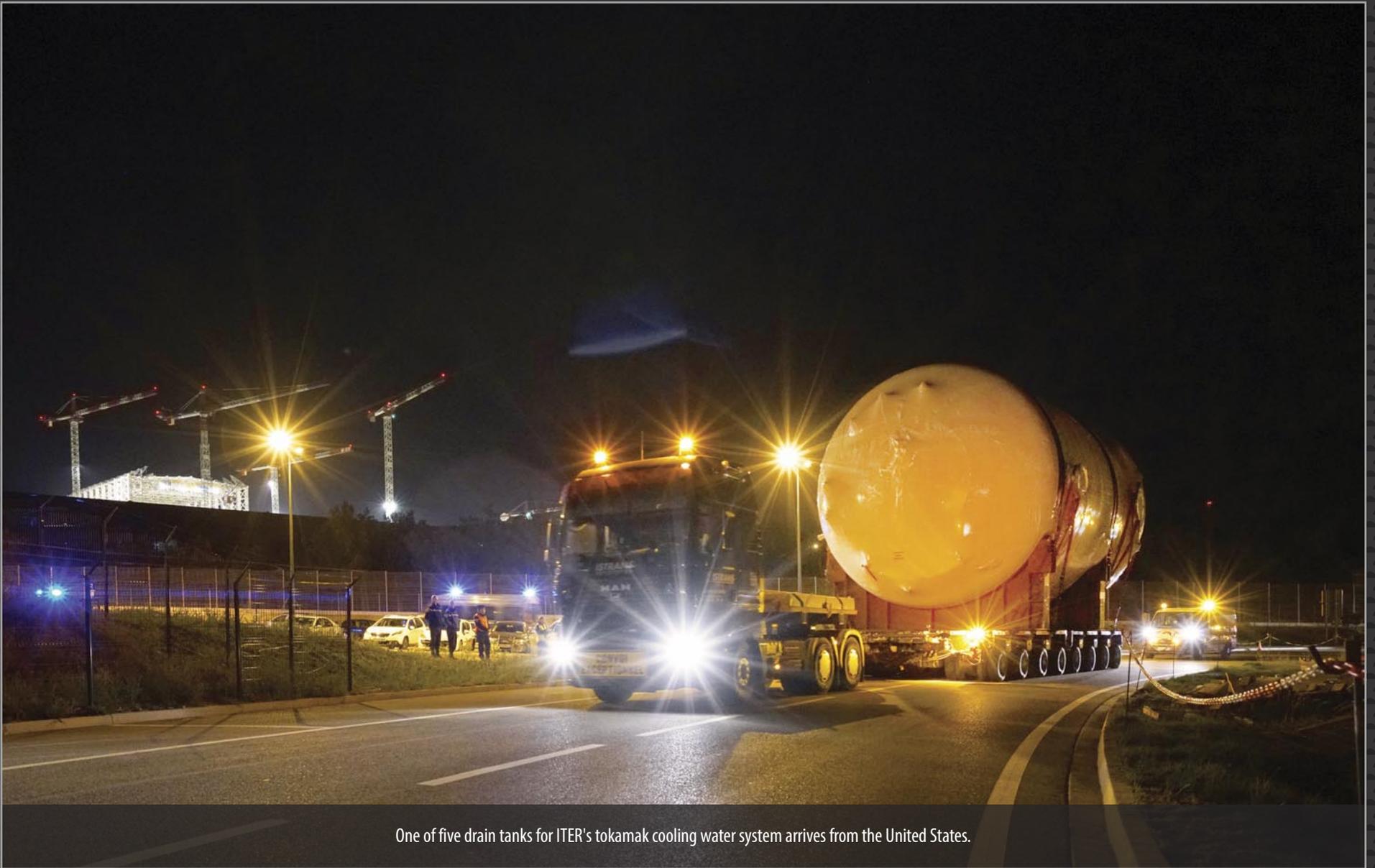


The end of a workday on the ITER site.





When completed, the Tokamak Building (under construction, in the centre of the basemat) will be as tall as the just-topped Assembly Building.



One of five drain tanks for ITER's tokamak cooling water system arrives from the United States.

INTERNATIONAL COLLABORATION AT WORK

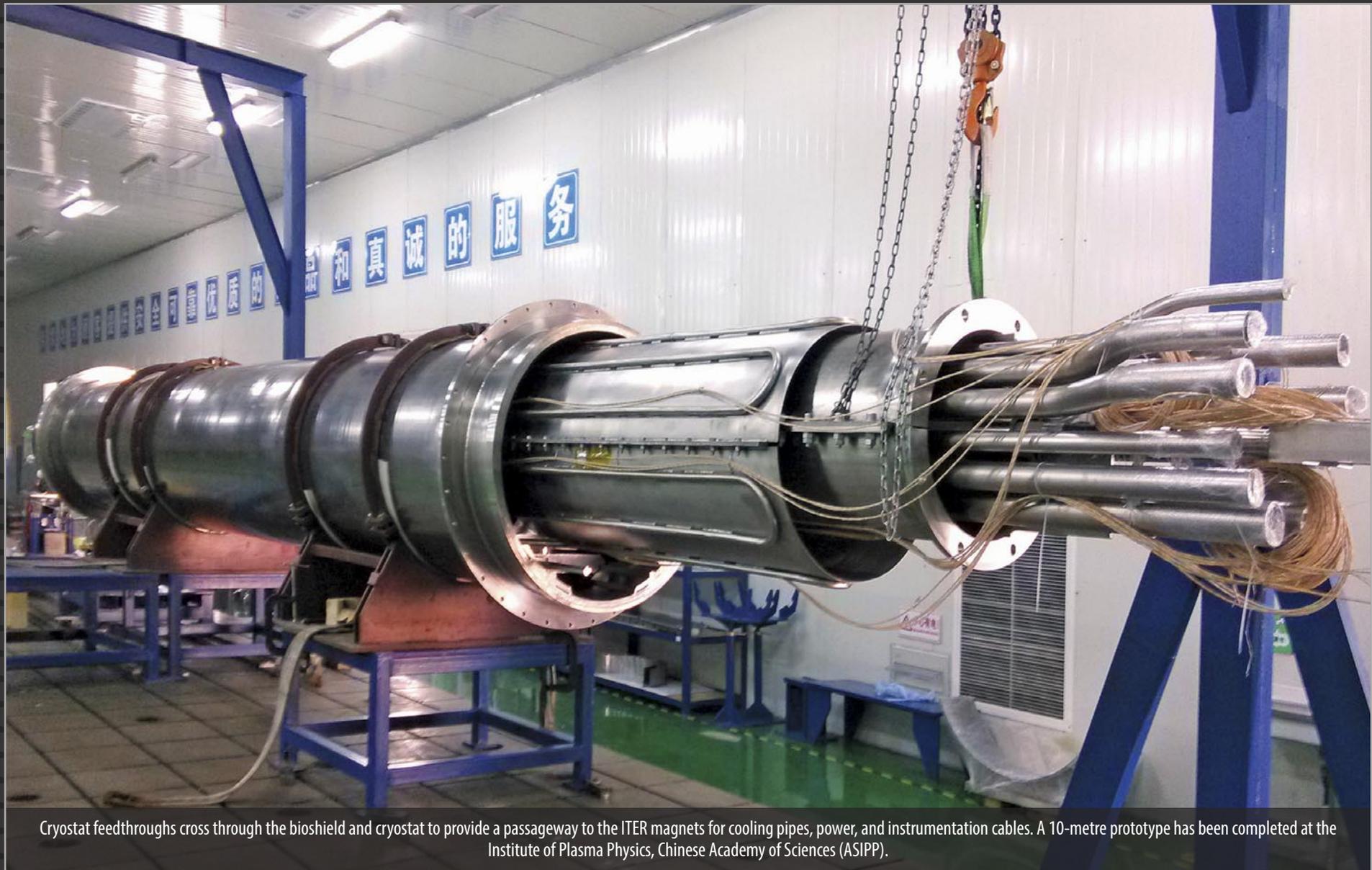


Bernard Bigot (from France, fifth from right) takes the helm of the ITER Project as Director-General in March 2015. He creates the Executive Project Board as a forum for tightened collaboration with the Domestic Agencies.

COME ONE, COME ALL



Held twice a year, ITER Open Door Days are the occasion to visit the construction site, meet ITER specialists, and ask questions about the world's largest collaborative effort in science.

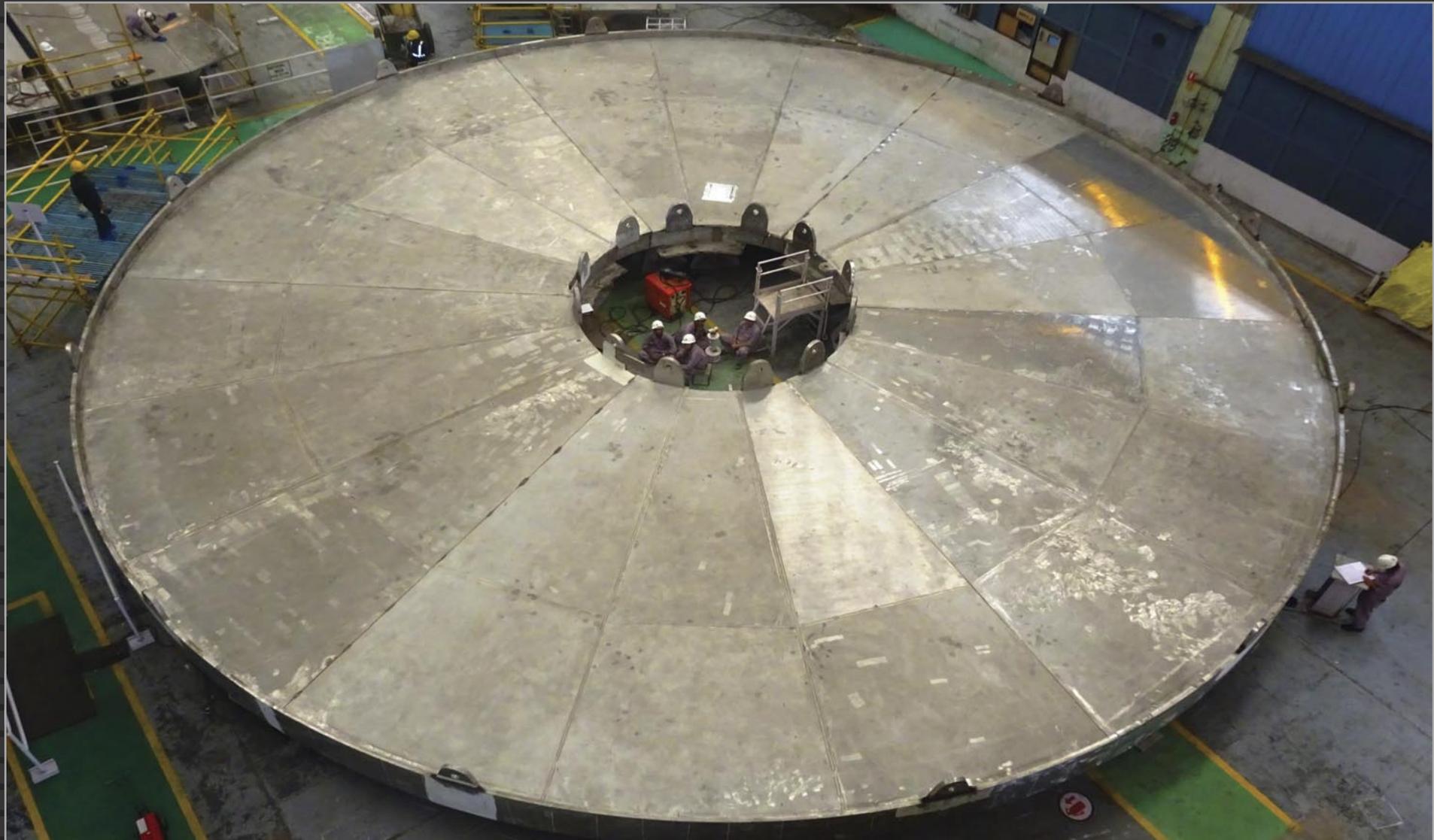


Cryostat feedthroughs cross through the bioshield and cryostat to provide a passageway to the ITER magnets for cooling pipes, power, and instrumentation cables. A 10-metre prototype has been completed at the Institute of Plasma Physics, Chinese Academy of Sciences (ASIPP).

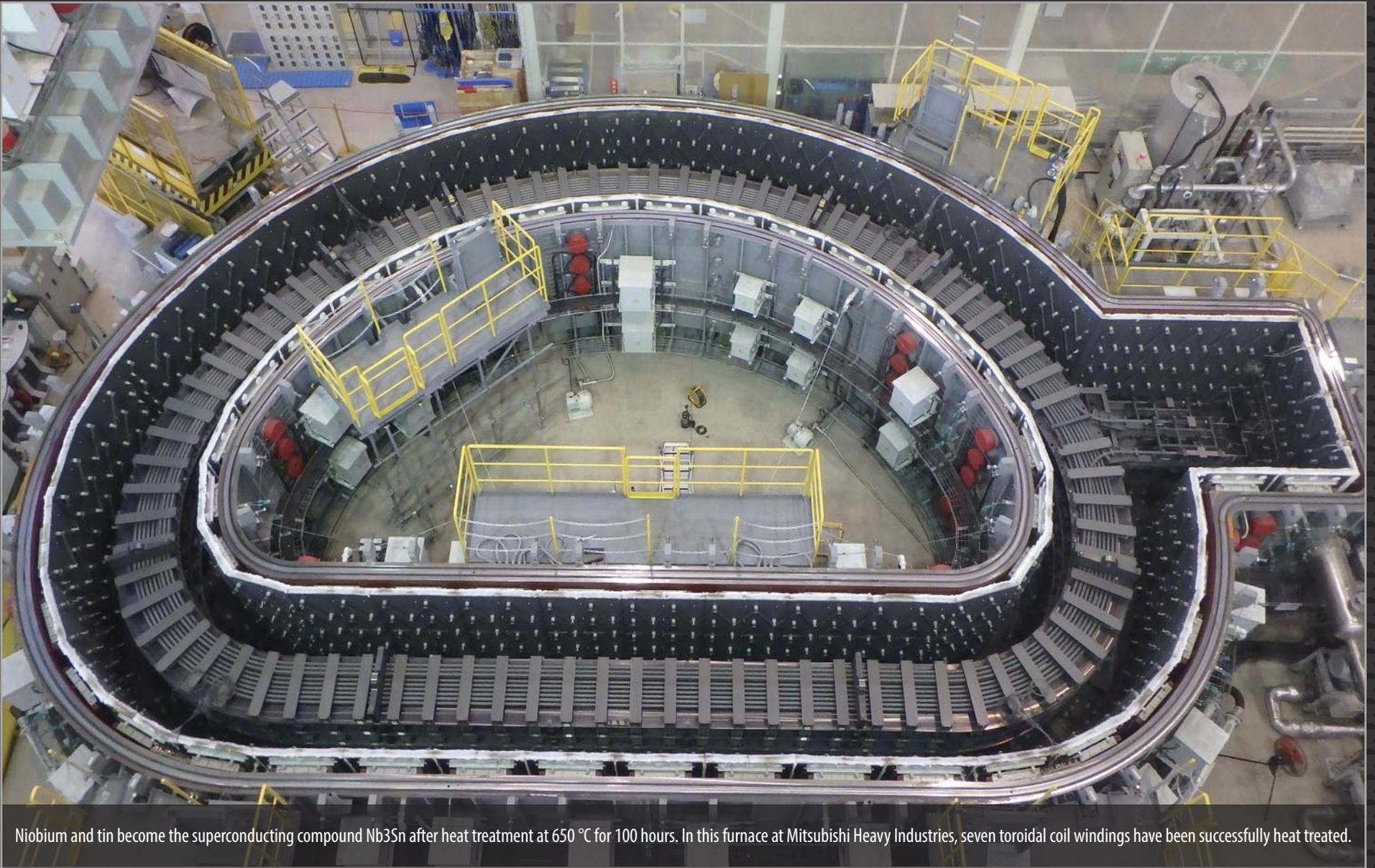


Europe is responsible for procuring the remote handling systems for the ITER divertor, the neutral beam, the cask transfer system, and the in-vessel viewing and metrology system. Pictured: the final demonstration of divertor cassette remote handling at the DTP2 Divertor Test Platform facility in Tampere, Finland.

CRYOSTAT BASE SEGMENTS COMPLETED



At the Larsen & Toubro factory in Hazira, India, Tier 1 of the cryostat base is assembled on the shop floor to verify tolerances before being shipped in six 60° segments to the ITER site. The entire cryostat base (Tier 1 plus Tier 2) will weigh in as the heaviest load of ITER assembly (1,250 tonnes).



Niobium and tin become the superconducting compound Nb₃Sn after heat treatment at 650 °C for 100 hours. In this furnace at Mitsubishi Heavy Industries, seven toroidal coil windings have been successfully heat treated.

GYROTRON PROTOTYPE PASSES TEST



A gyrotron prototype successfully passes factory acceptance tests at Gycom Ltd in Nizhny Novgorod. Russia is responsible for procuring 8 of the 24 energy-generating devices that will inject powerful microwave beams into the ITER vacuum vessel to heat the plasma and drive plasma current.

CENTRAL SOLENOID WINDING BEGINS



At the General Atomics Magnet Technologies Center in Poway, California, central solenoid winding activities have begun.

SPECTACULAR BACKDROP



The ITER Assembly Building is now the most visible feature of the ITER site. This photo captures cranes on the ITER worksite as well as outlying buildings belonging to the CEA Cadarache research centre.



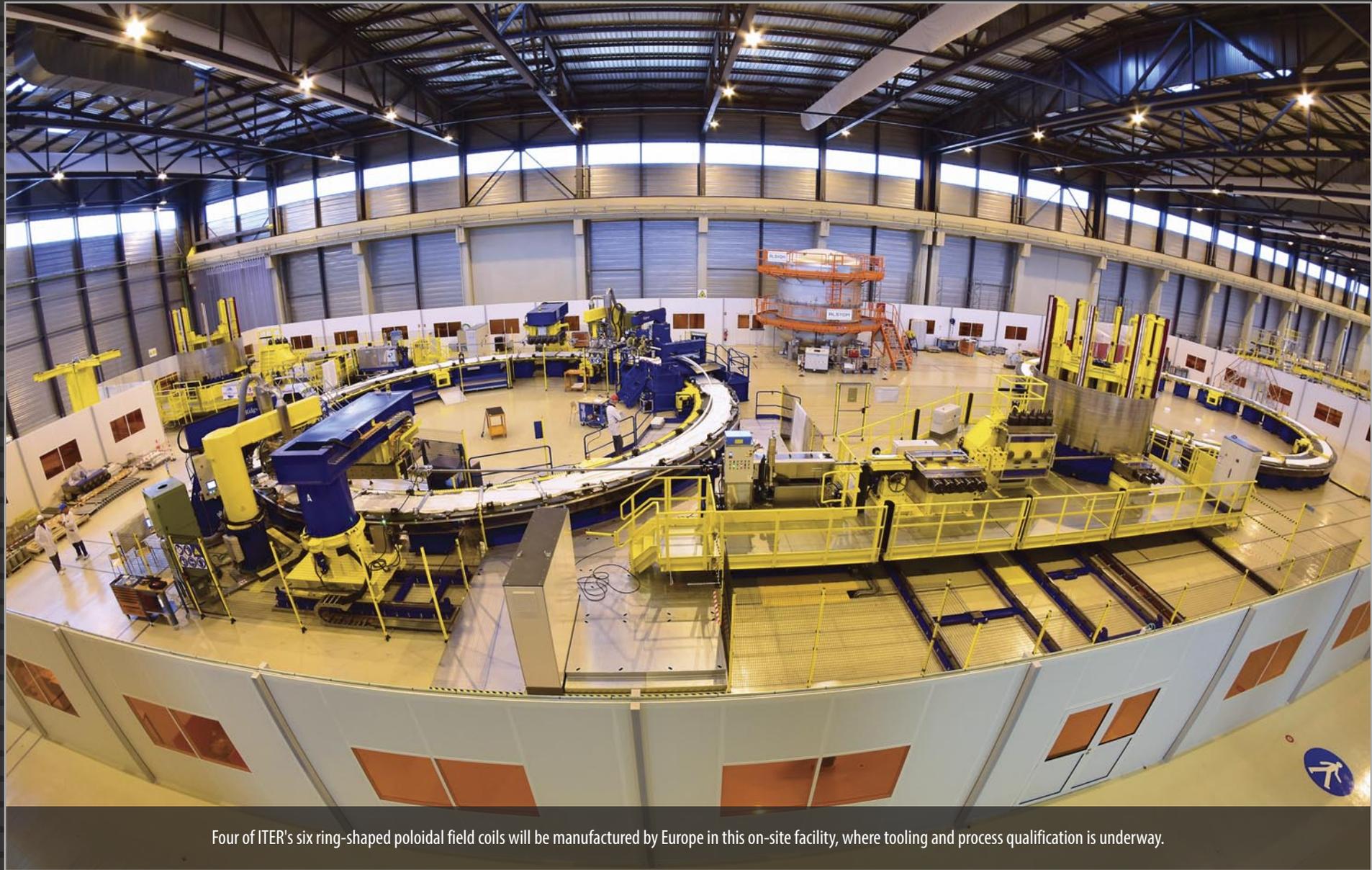
The three-metre-thick ITER bioshield creates an inner circle, with spoke-like reinforcement set in place for the radial walls that will connect it to the cryostat crown. A wider circle is formed by 18 giant columns that will rise 30 metres to provide structural support to the Tokamak Building.



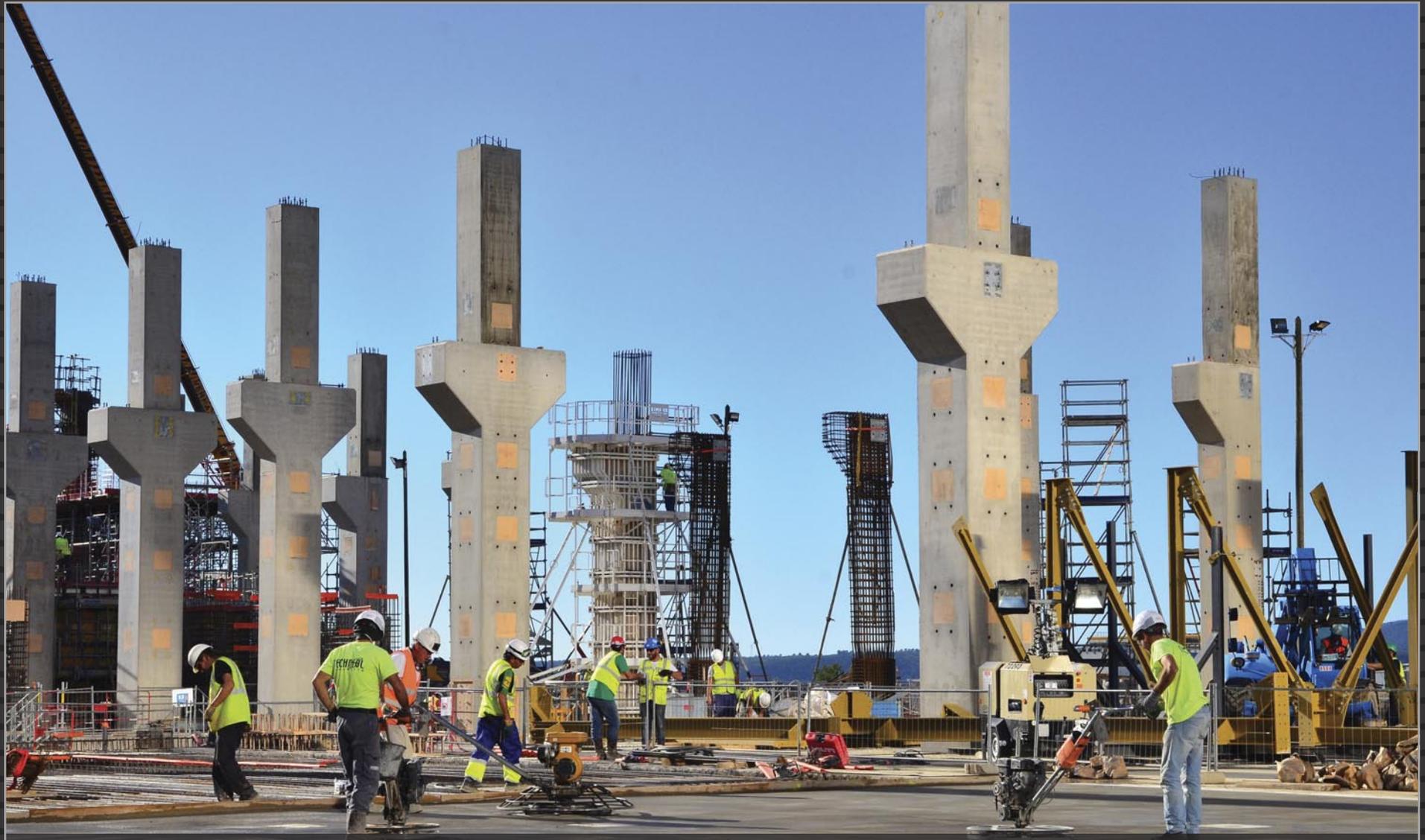
The cavernous spaces in the basement of the Tokamak Building will completely fill up with pipes, cables, feeders and busbars as the Tokamak systems are installed. The equipment will be anchored to the embedded plates that can be seen in the floor, walls and ceiling.



Forty-three metres above the shop floor of the Assembly Hall, two travelling cranes will work in concert to lift loads of up to 1,500 tonnes.



Four of ITER's six ring-shaped poloidal field coils will be manufactured by Europe in this on-site facility, where tooling and process qualification is underway.



Cryogenic technology will be used extensively at ITER to create and maintain low-temperature conditions for the magnet and vacuum pumping systems. The required cooling power will be produced in the cryoplat and distributed through a vast network of pipes, pumps and valves.



Large components like this cryoplat tank procured by Europe are shipped by sea to the Mediterranean port of Fos-sur-Mer before continuing along a specially adapted road itinerary to the ITER site. Approximately 10% of the “highly exceptional loads” scheduled to be delivered along the ITER Itinerary have already reached the site.



Approximately 1,500 workers are involved in the construction of the ITER scientific installation. The last daily shift ends at 10 p.m.



This 300 MVA step-down transformer is one of three that have successfully passed factory acceptance tests in China for ITER's pulsed power electrical network. The first transformer reached ITER this year.



D-shaped toroidal field coils will create the magnetic field that confines the ITER plasma. Europe has successfully completed its first winding pack - the central superconducting core that will be inserted into a structural case.



Double pancakes – the building blocks of the toroidal field winding packs – are produced in series at Mitsubishi Heavy Industries, passing through winding, insulation and finally impregnation stages.

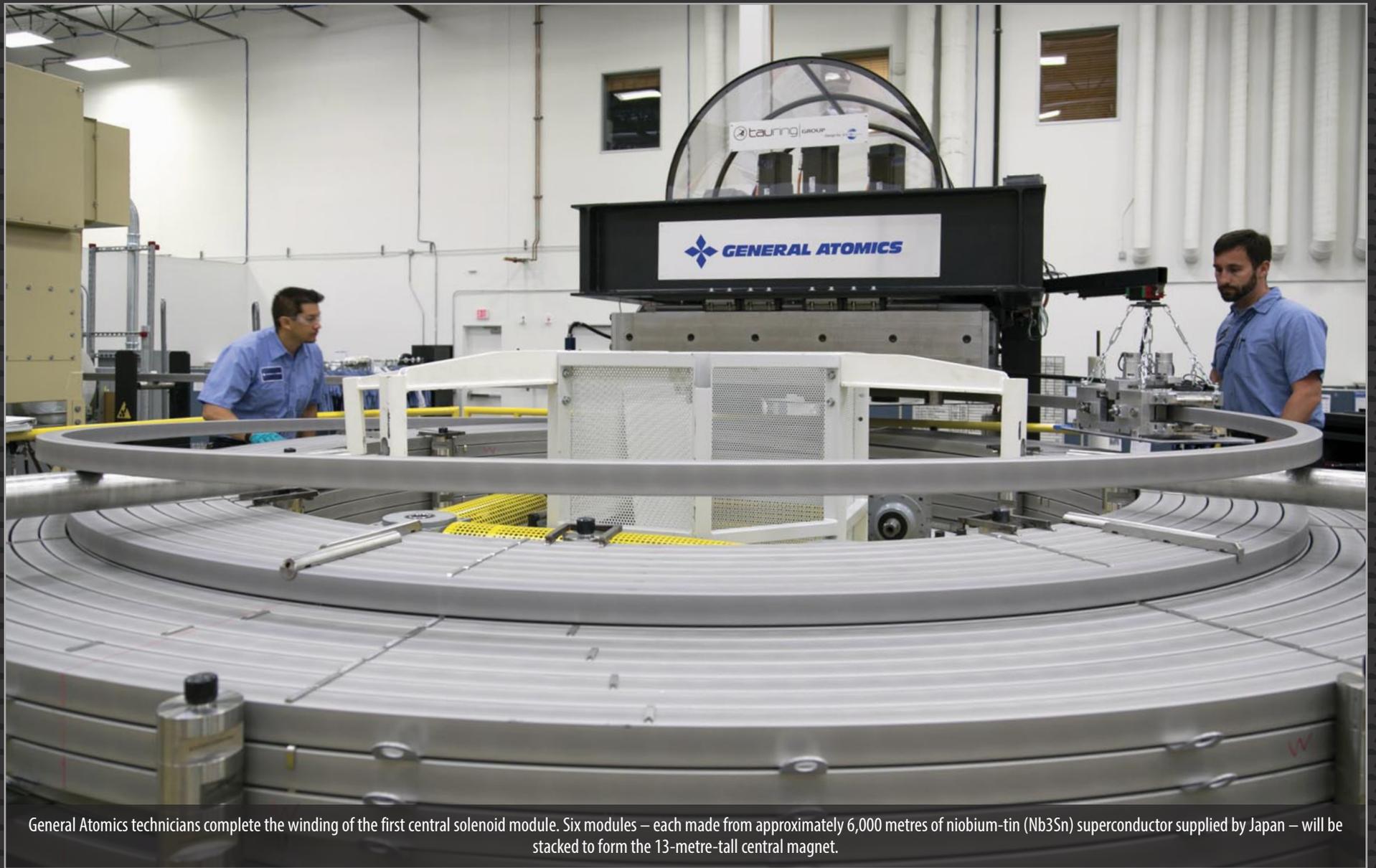


A thin barrier of stainless steel (10-20 mm), actively cooled and covered with a low-emissivity coating of silver, will protect the magnet coils from thermal radiation. At SFA Engineering in Changwon, welding is underway on an outboard sector of the vacuum vessel thermal shield.

FIRST OF EIGHT POLOIDAL FIELD COIL WINDINGS

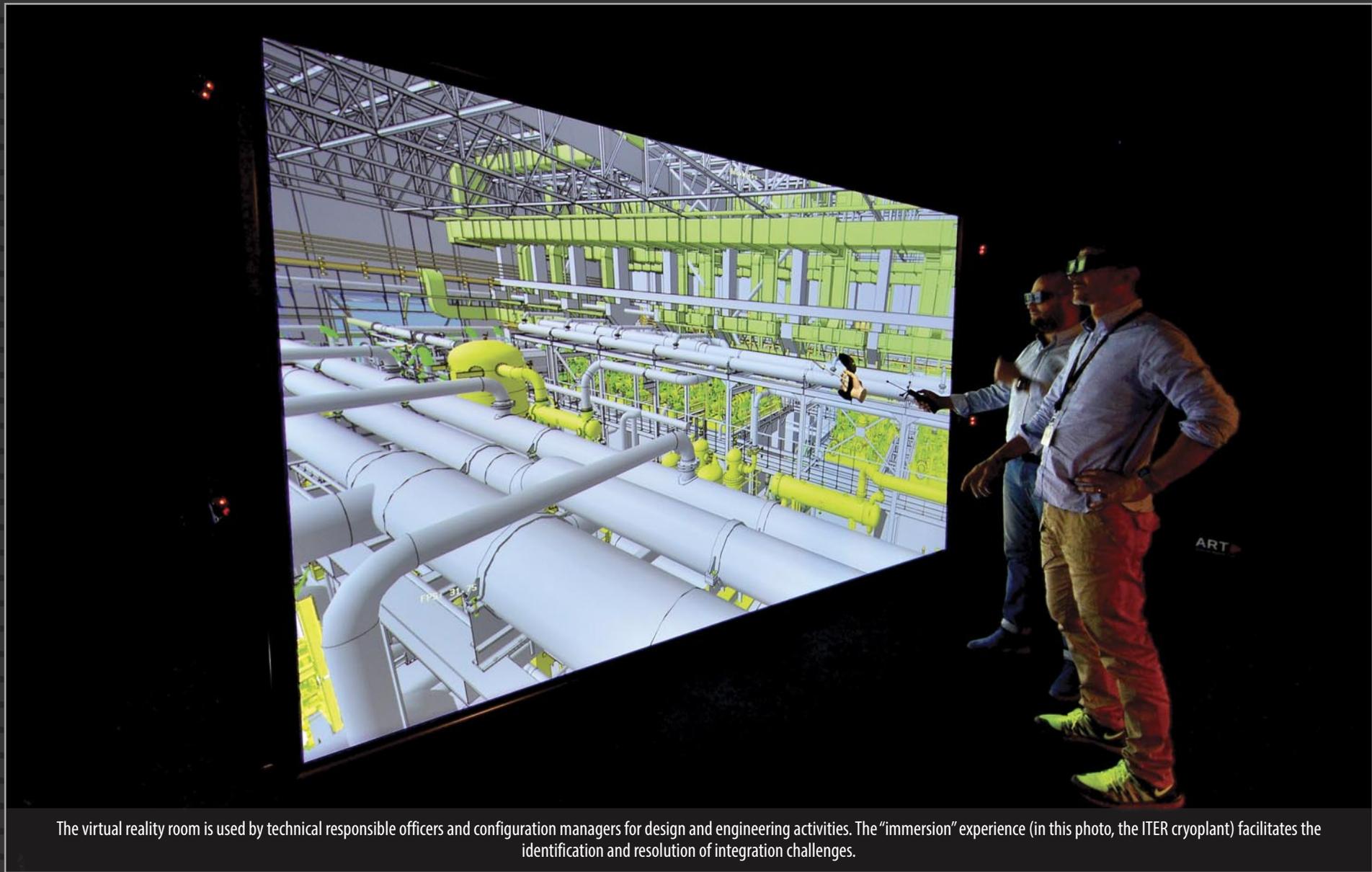


In St. Petersburg, specialists of the Efremov Institute and the Srednensky shipyard have completed the first poloidal field double pancake winding. Eight double pancakes will be stacked to form poloidal field coil #1, the smallest of ITER's ring-shaped magnets.

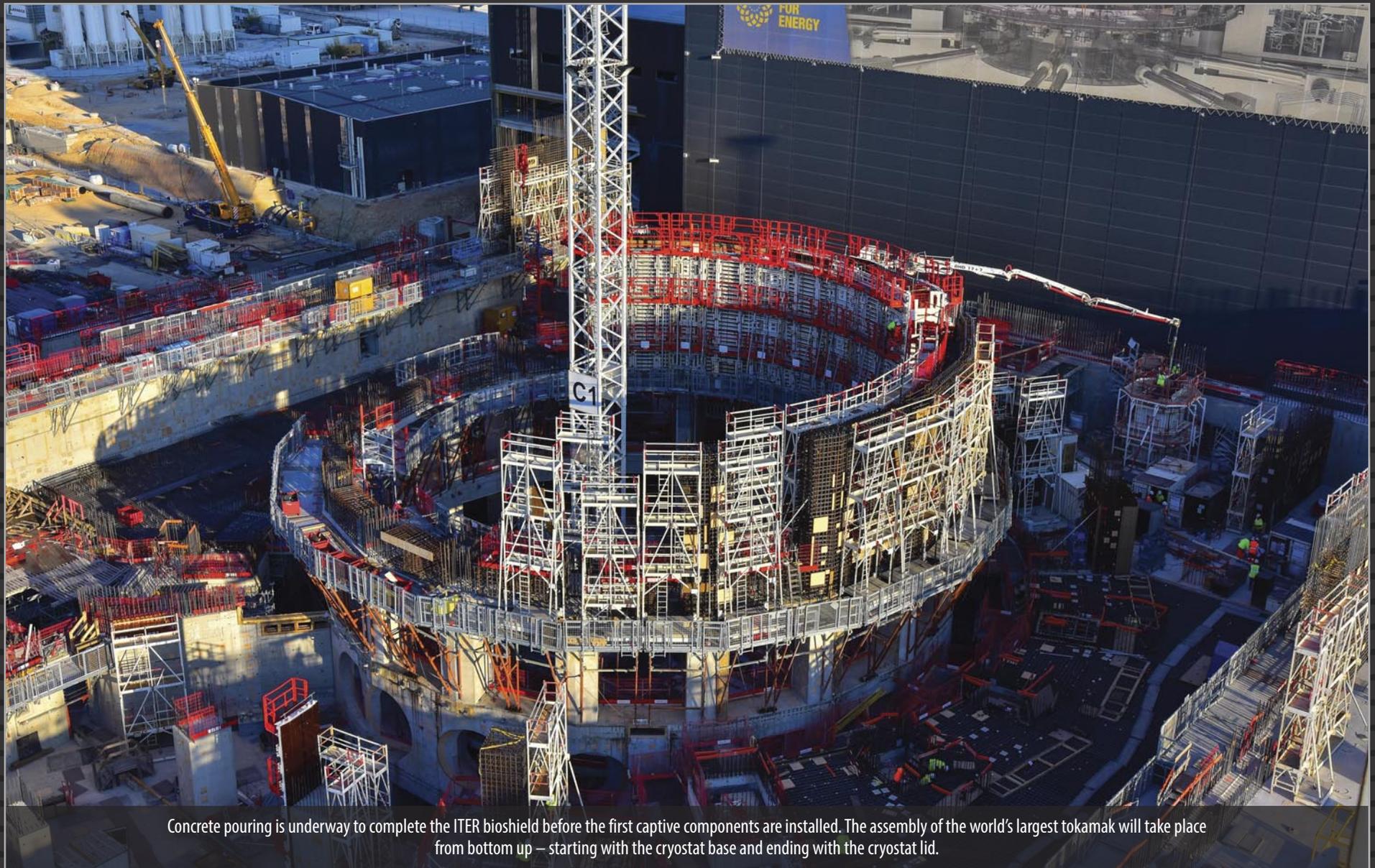


General Atomics technicians complete the winding of the first central solenoid module. Six modules – each made from approximately 6,000 metres of niobium-tin (Nb3Sn) superconductor supplied by Japan – will be stacked to form the 13-metre-tall central magnet.

AN IMMERSIVE EXPERIENCE



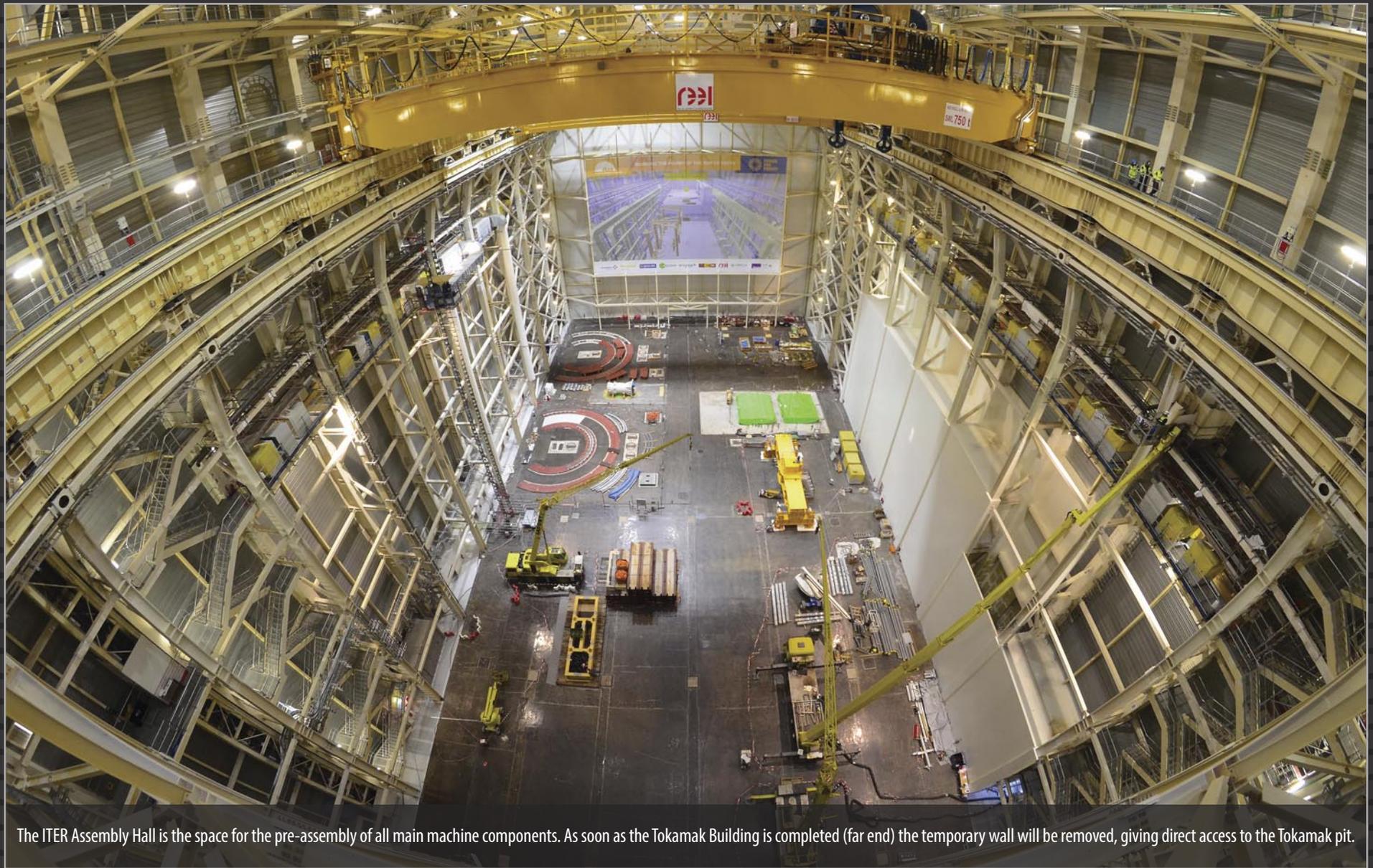
The virtual reality room is used by technical responsible officers and configuration managers for design and engineering activities. The “immersion” experience (in this photo, the ITER cryoplat) facilitates the identification and resolution of integration challenges.



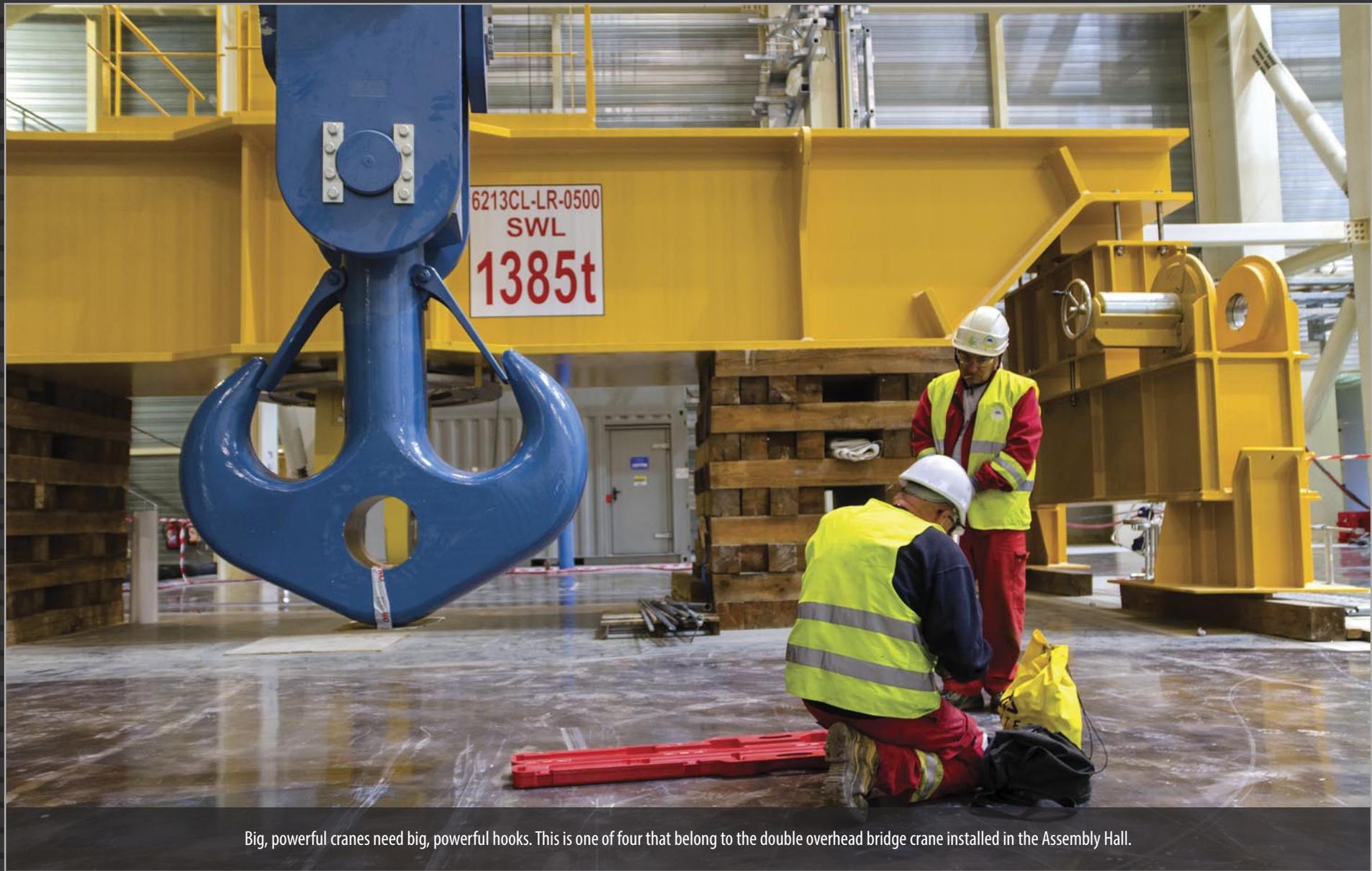
Concrete pouring is underway to complete the ITER bioshield before the first captive components are installed. The assembly of the world's largest tokamak will take place from bottom up – starting with the cryostat base and ending with the cryostat lid.



Fabrication has begun on poloidal field coil #5 in Europe's on-site manufacturing facility, after all tooling and process qualification activities were completed.



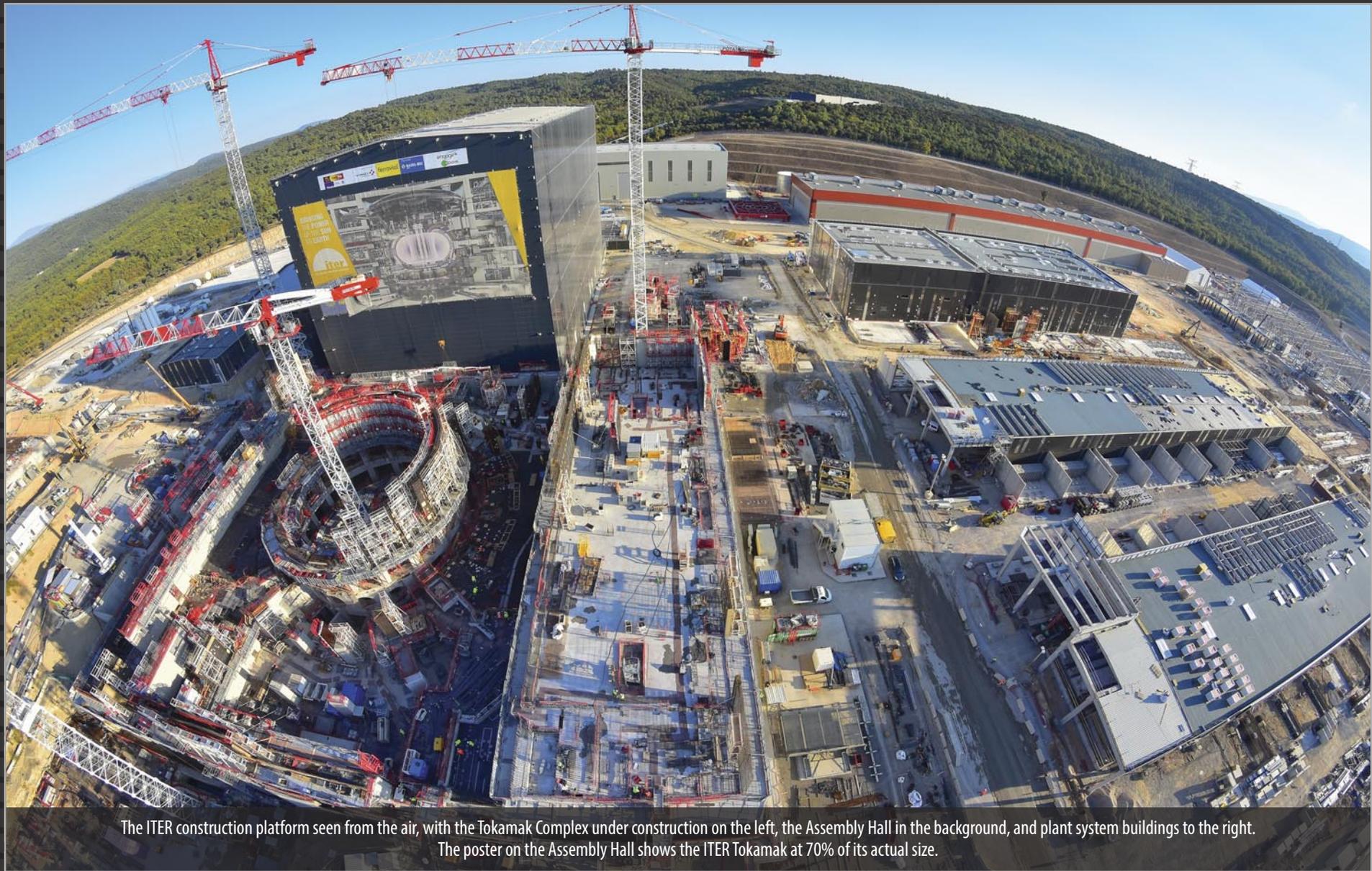
The ITER Assembly Hall is the space for the pre-assembly of all main machine components. As soon as the Tokamak Building is completed (far end) the temporary wall will be removed, giving direct access to the Tokamak pit.



Big, powerful cranes need big, powerful hooks. This is one of four that belong to the double overhead bridge crane installed in the Assembly Hall.



A segment of the ITER cryostat lower cylinder is transported along the ITER Itinerary to the worksite.



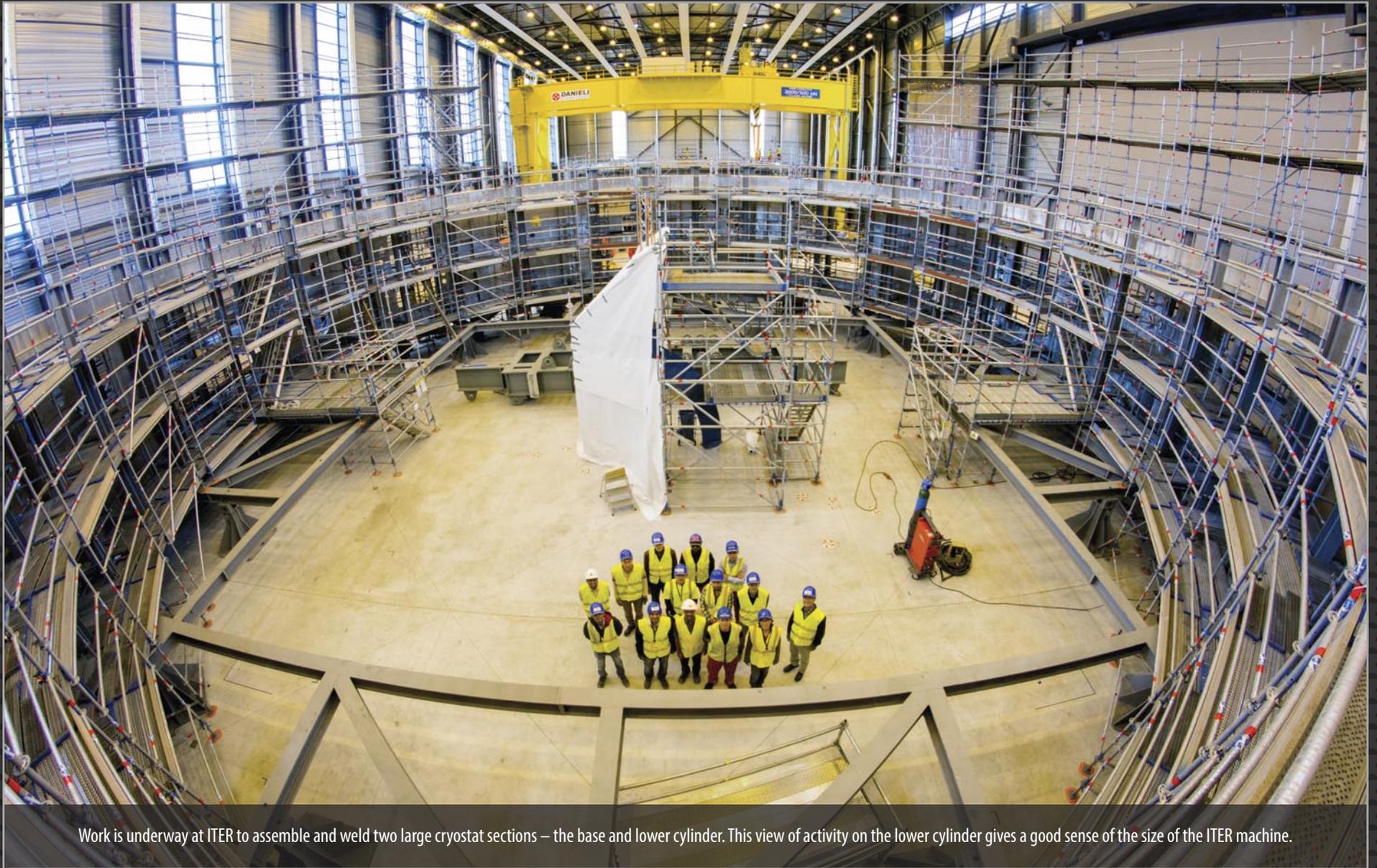
The ITER construction platform seen from the air, with the Tokamak Complex under construction on the left, the Assembly Hall in the background, and plant system buildings to the right. The poster on the Assembly Hall shows the ITER Tokamak at 70% of its actual size.



Despite a simple outward appearance, this elbow-shaped feeder segment is packed with a large number of advanced technology components (high-temperature superconductor current leads, cryogenic valves, superconducting busbars, and high voltage instrumentation hardware). It is the first finalized magnet component to reach ITER.



Six metres above floor level, the mockup of a high voltage deck is tested successfully in a laboratory at HSP GmbH, Germany. The cube is 1/15th the size of the deck that will be integrated into the MITICA testbed, currently under construction at the ITER Neutral Beam Test Facility in Padua, Italy.



Work is underway at ITER to assemble and weld two large cryostat sections – the base and lower cylinder. This view of activity on the lower cylinder gives a good sense of the size of the ITER machine.

CENTRAL SOLENOID CONDUCTOR COMPLETED

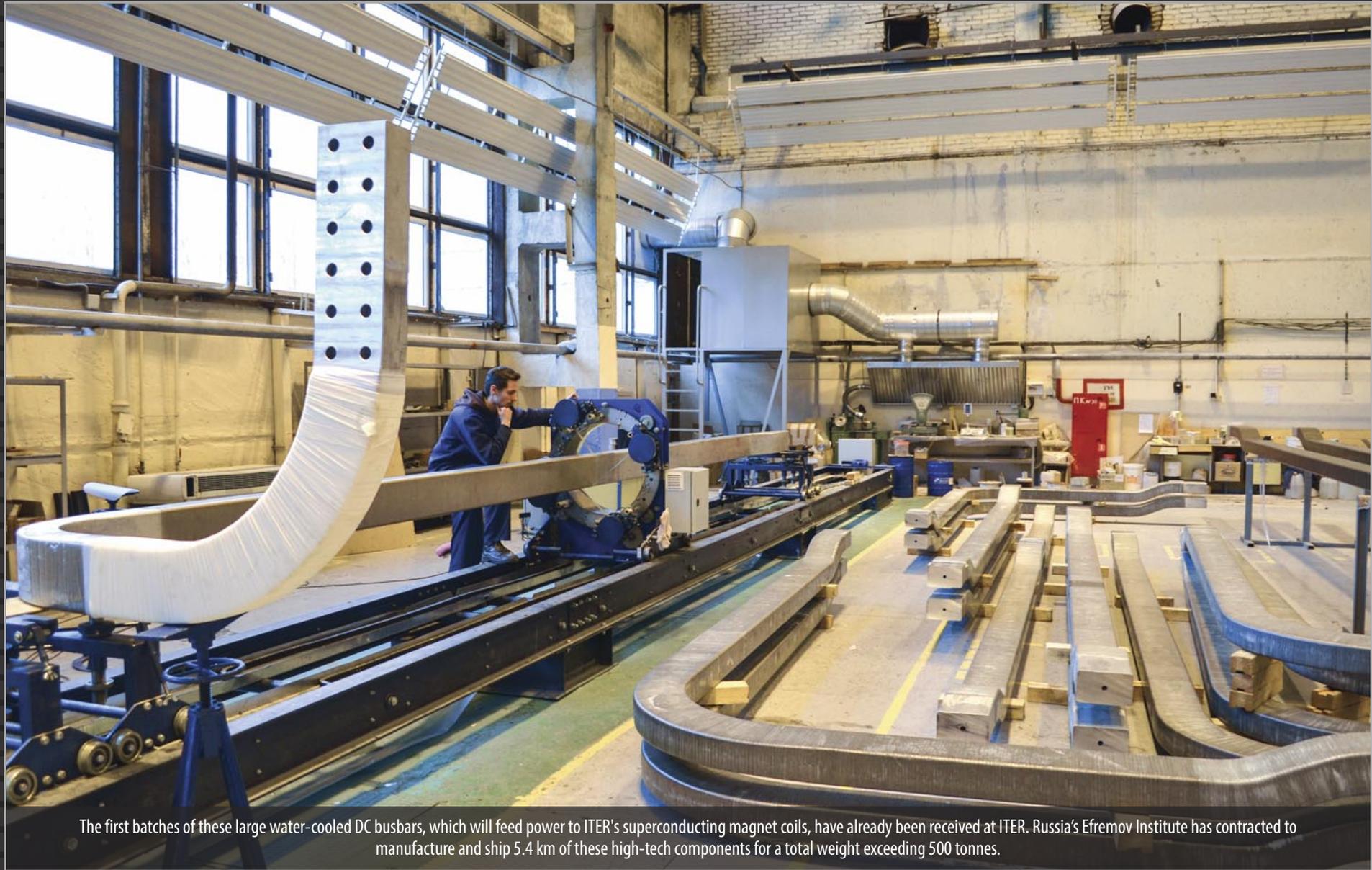


Japanese contractors have successfully completed the fabrication of 43 kilometres (700 tonnes) of niobium-tin cable-in-conduit superconductor for ITER's central solenoid magnet. The last conductor unit length, of 49, is pictured at the Wakamatsu factory of Nippon Steel and Sumikin Engineering Co., Ltd. in Kitakyushu.



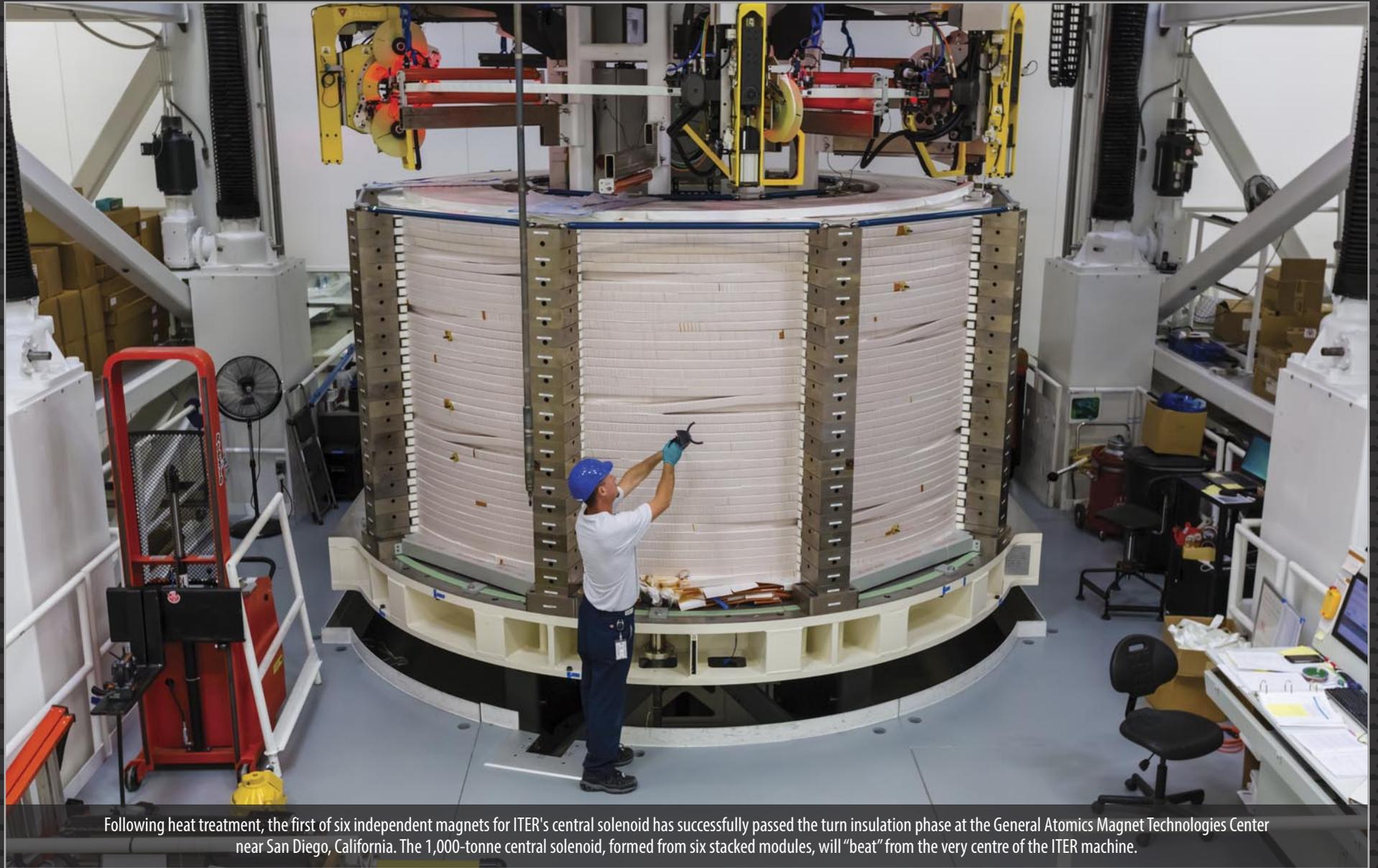
Vacuum vessel manufacturing is time-consuming and labour intensive due to the sheer volume of sub-elements, and their unconventional shapes and sizes. At the end of the process, each sector will measure 6.5 metres in height; 3 x 6 metres in width and depth; and weigh between 400 and 500 tonnes. (Pictured: a sub-element of sector #6.)

A FIVE-KILOMETRE ALUMINIUM SNAKE



The first batches of these large water-cooled DC busbars, which will feed power to ITER's superconducting magnet coils, have already been received at ITER. Russia's Efremov Institute has contracted to manufacture and ship 5.4 km of these high-tech components for a total weight exceeding 500 tonnes.

CREATING THE "BEATING HEART" OF ITER



Following heat treatment, the first of six independent magnets for ITER's central solenoid has successfully passed the turn insulation phase at the General Atomics Magnet Technologies Center near San Diego, California. The 1,000-tonne central solenoid, formed from six stacked modules, will "beat" from the very centre of the ITER machine.

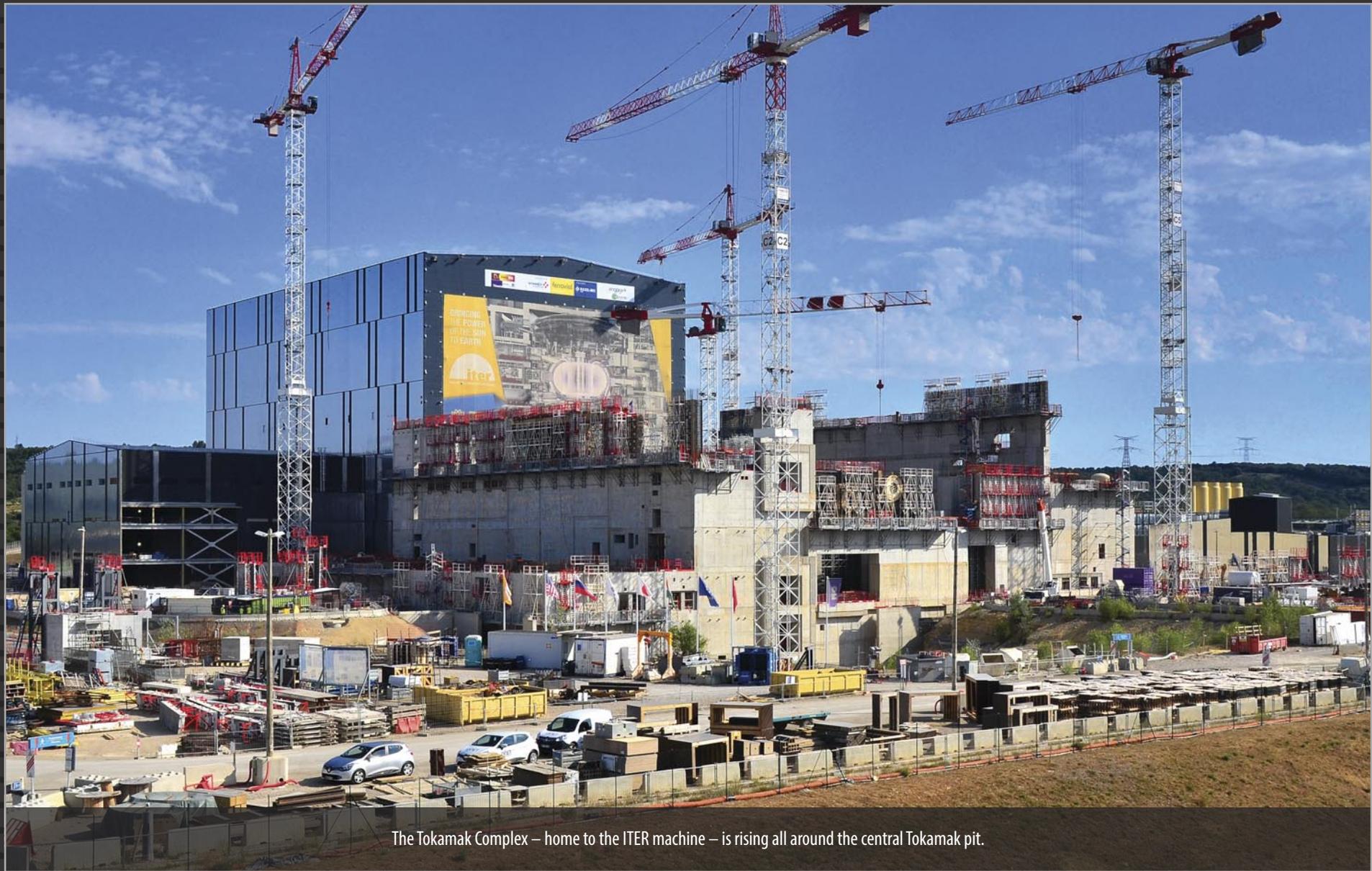
DOING BUSINESS IN THE PALACE OF THE POPES



Business and industry leaders from all over the world meet in Avignon, France, to be informed about upcoming tender opportunities. Close to 450 companies, laboratories and institutions from 25 countries are represented at the 2017 ITER Business Forum, which is held in the Palace of the Popes.



The ITER Organization, established by international agreement in November 2006, formally came into existence eleven months later as ratification procedures were concluded by all Members. In November 2017, 10 years later, a birthday celebration is held at ITER Headquarters.



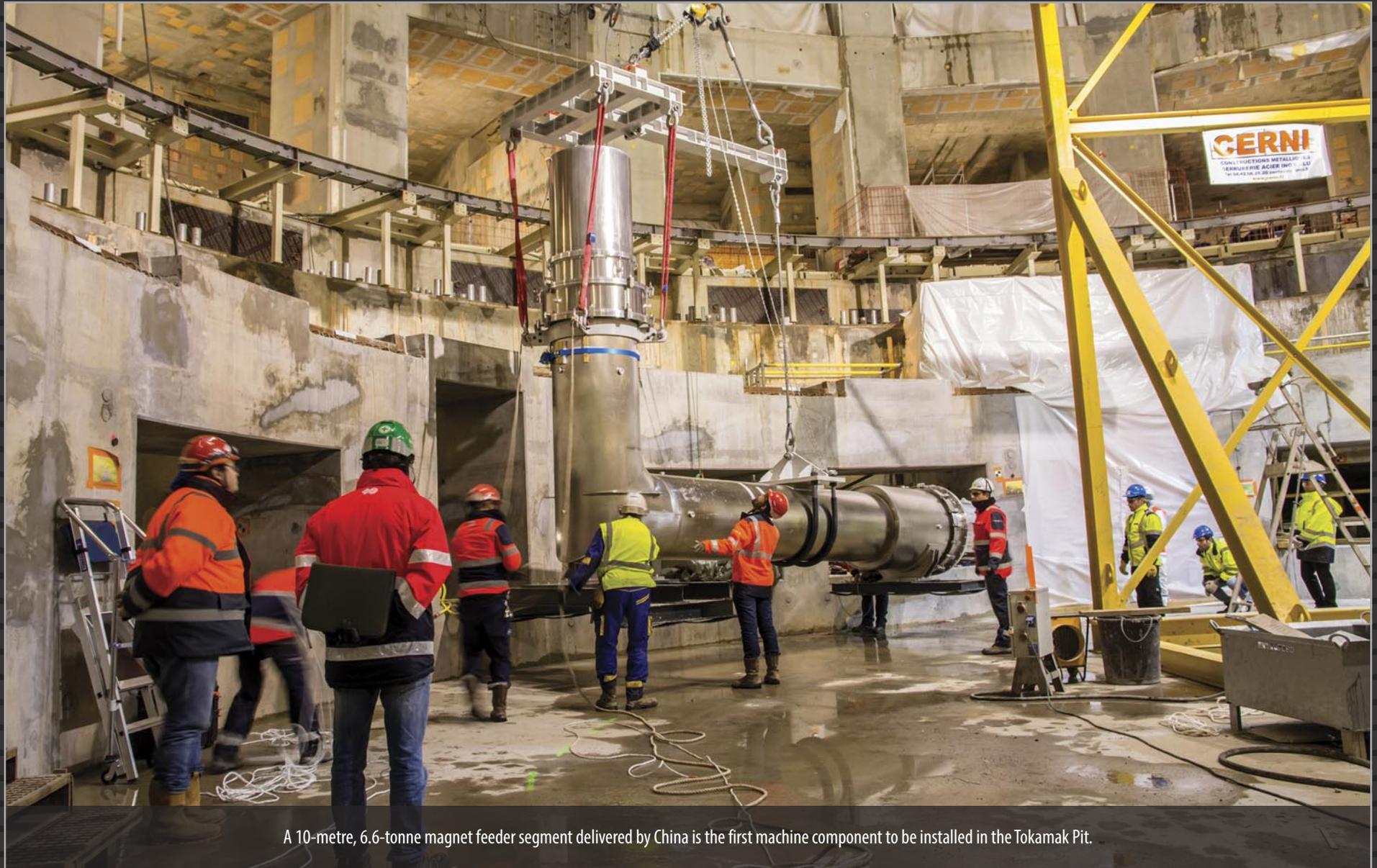
The Tokamak Complex – home to the ITER machine – is rising all around the central Tokamak pit.



The last scaffolding is removed, the lid is raised to the top, and teams now have a 30-metre-deep "well" to prepare for machine assembly.



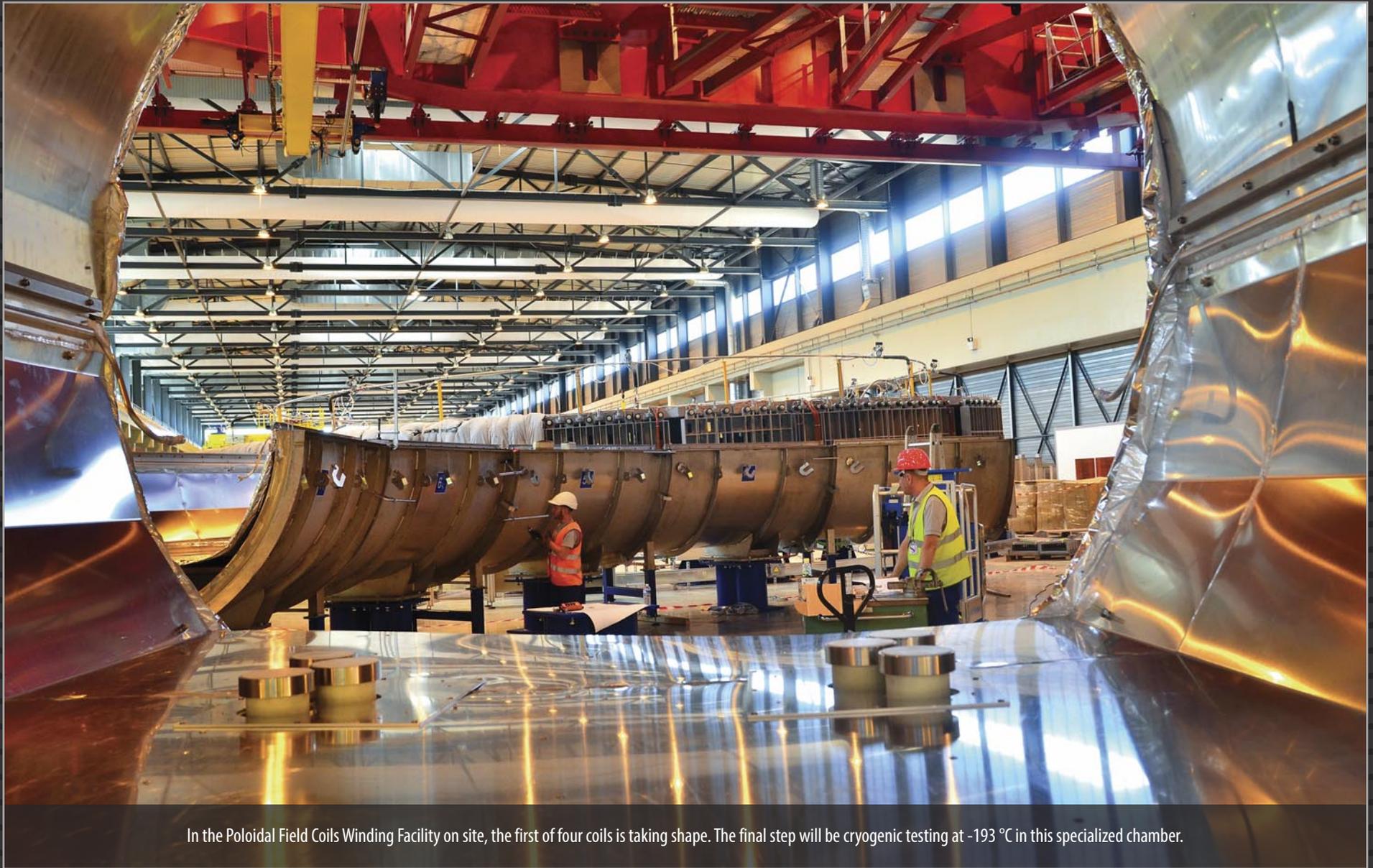
Only one small opening (lower right) remains in the concrete crown for the installation of the first metal component – a magnet feeder.



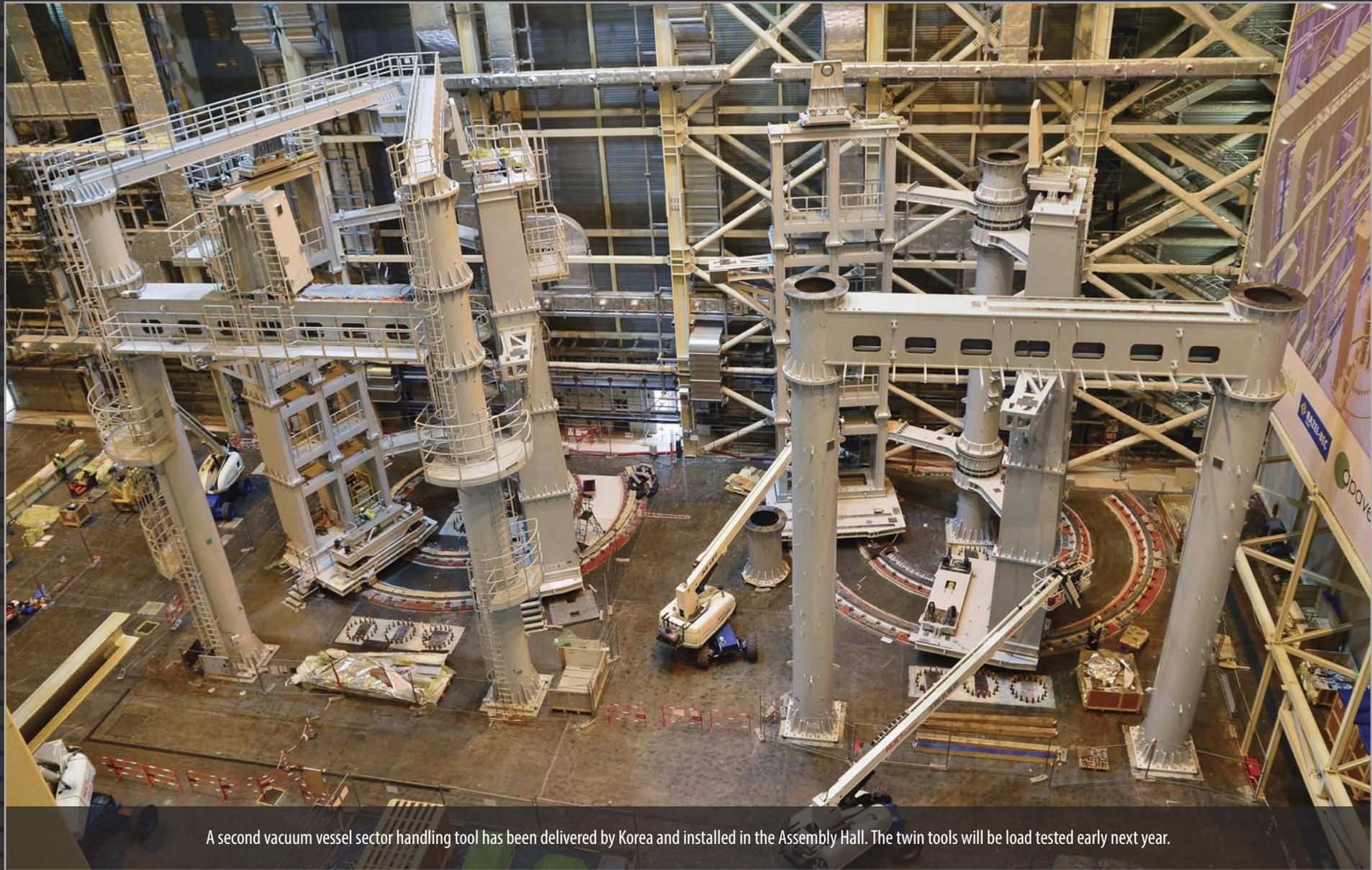
A 10-metre, 6.6-tonne magnet feeder segment delivered by China is the first machine component to be installed in the Tokamak Pit.



Nearly all of the equipment for the ITER cryoplant has been delivered and installation is underway.

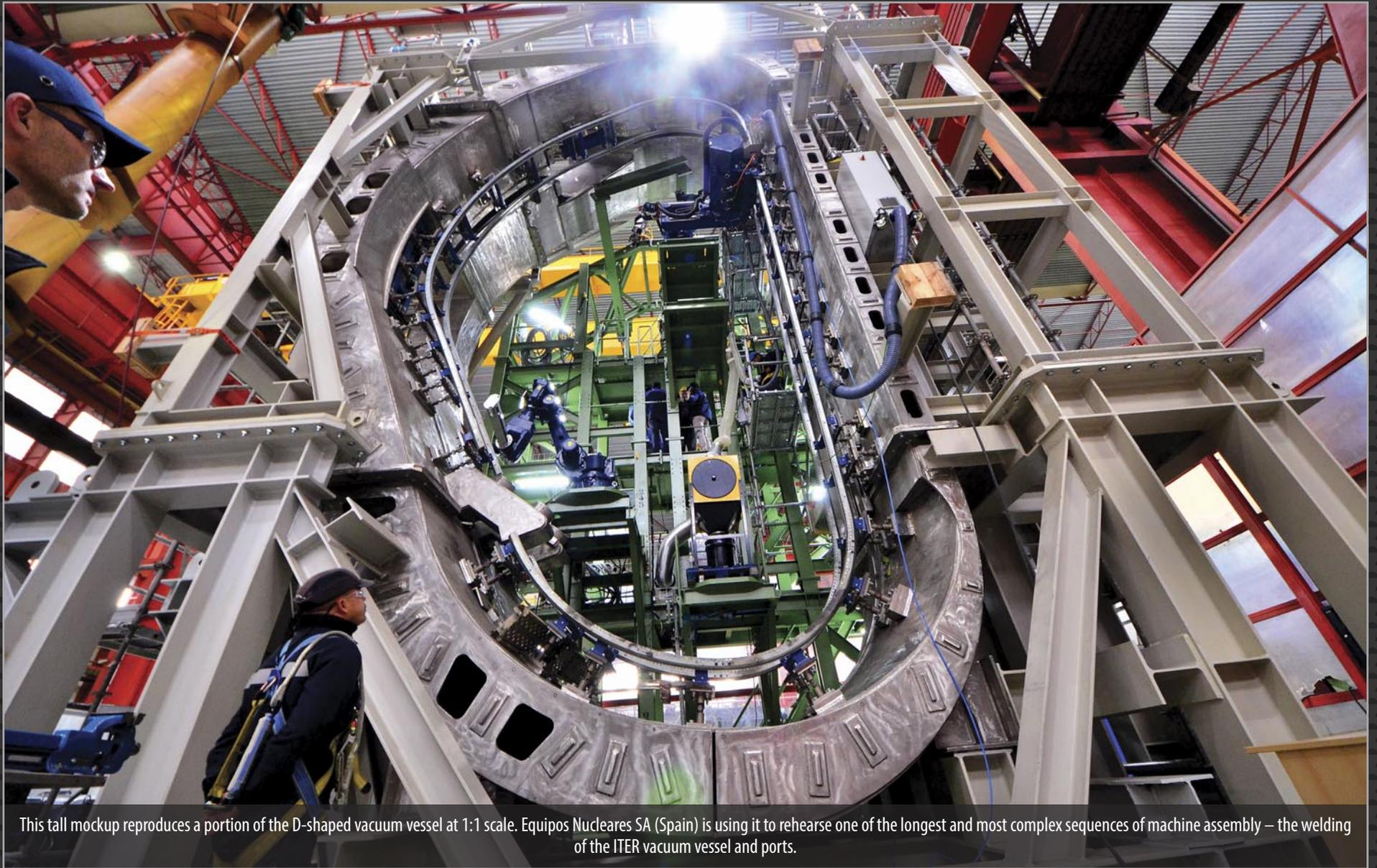


In the Poloidal Field Coils Winding Facility on site, the first of four coils is taking shape. The final step will be cryogenic testing at $-193\text{ }^{\circ}\text{C}$ in this specialized chamber.



A second vacuum vessel sector handling tool has been delivered by Korea and installed in the Assembly Hall. The twin tools will be load tested early next year.

REHEARSING A GRAND PRODUCTION



This tall mockup reproduces a portion of the D-shaped vacuum vessel at 1:1 scale. Equipos Nucleares SA (Spain) is using it to rehearse one of the longest and most complex sequences of machine assembly – the welding of the ITER vacuum vessel and ports.

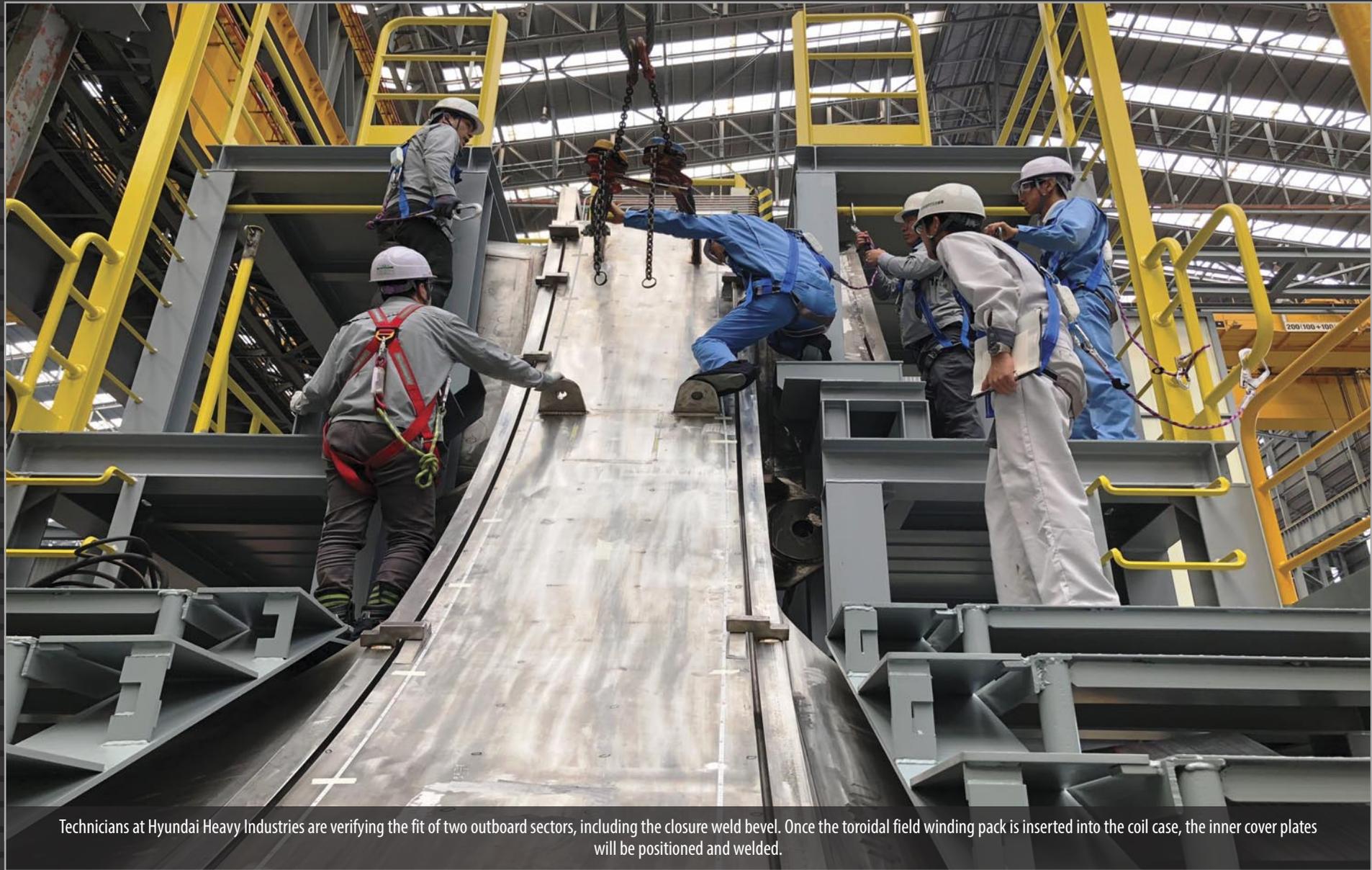
HELIUM TEST PASSED



Hot helium leak tests on this 2.8-tonne blanket shield block prototype have successfully confirmed its suitability for ITER's ultra-high vacuum environment.



This plasma-facing component of the ITER divertor – a full-scale prototype of the inner vertical target manufactured by Ansaldo Nucleare and ENEA – is about to be tested at the ITER Divertor Test Facility at the Efremov Institute in Russia.



Technicians at Hyundai Heavy Industries are verifying the fit of two outboard sectors, including the closure weld bevel. Once the toroidal field winding pack is inserted into the coil case, the inner cover plates will be positioned and welded.

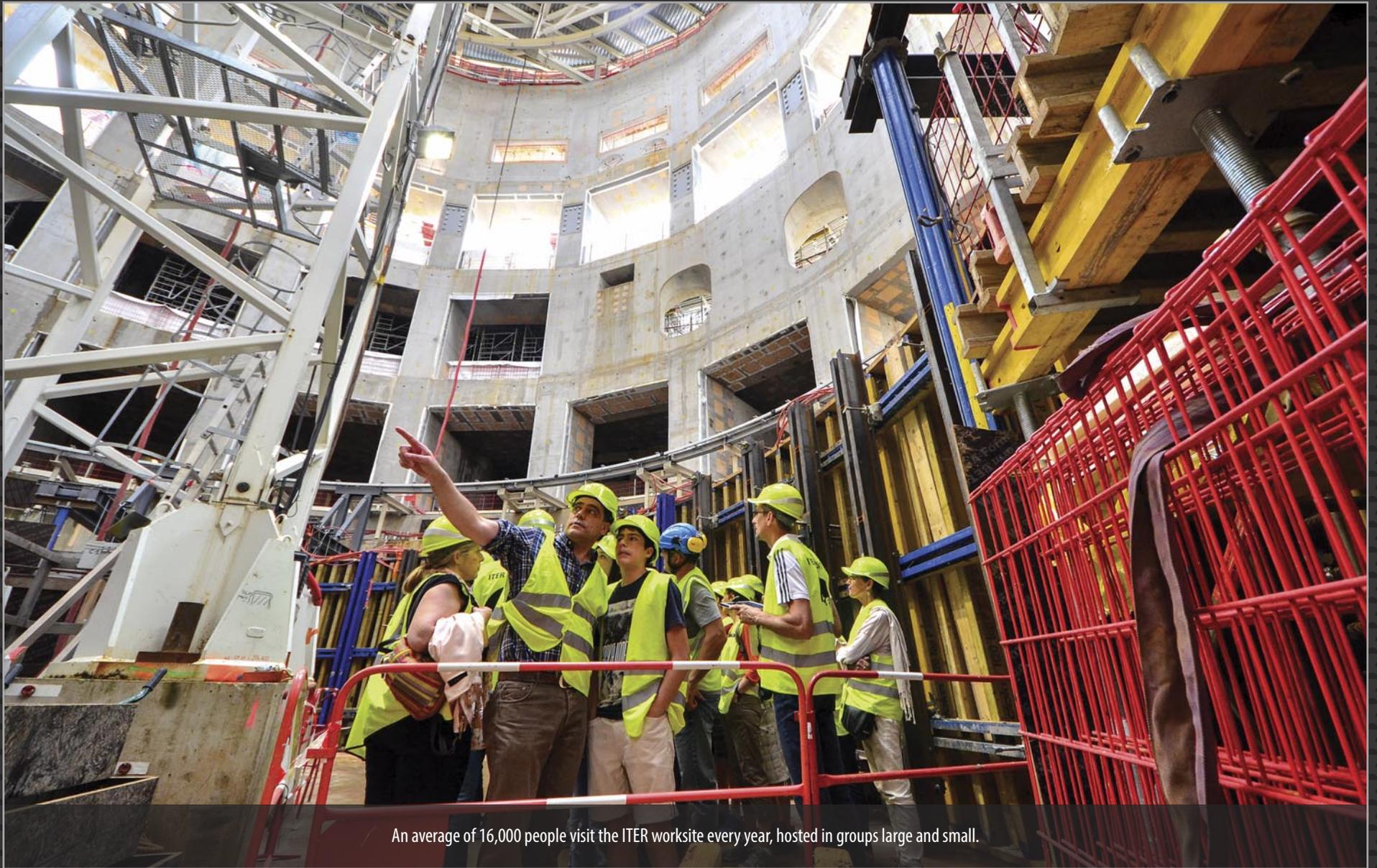


Hyundai Heavy Industries is manufacturing four of ITER's nine vacuum vessel sectors. The first to come off the production line in 2019 will be sector #6. (Pictured, technicians are inserting in-wall shielding blocks into one of four sector #6 segments.)

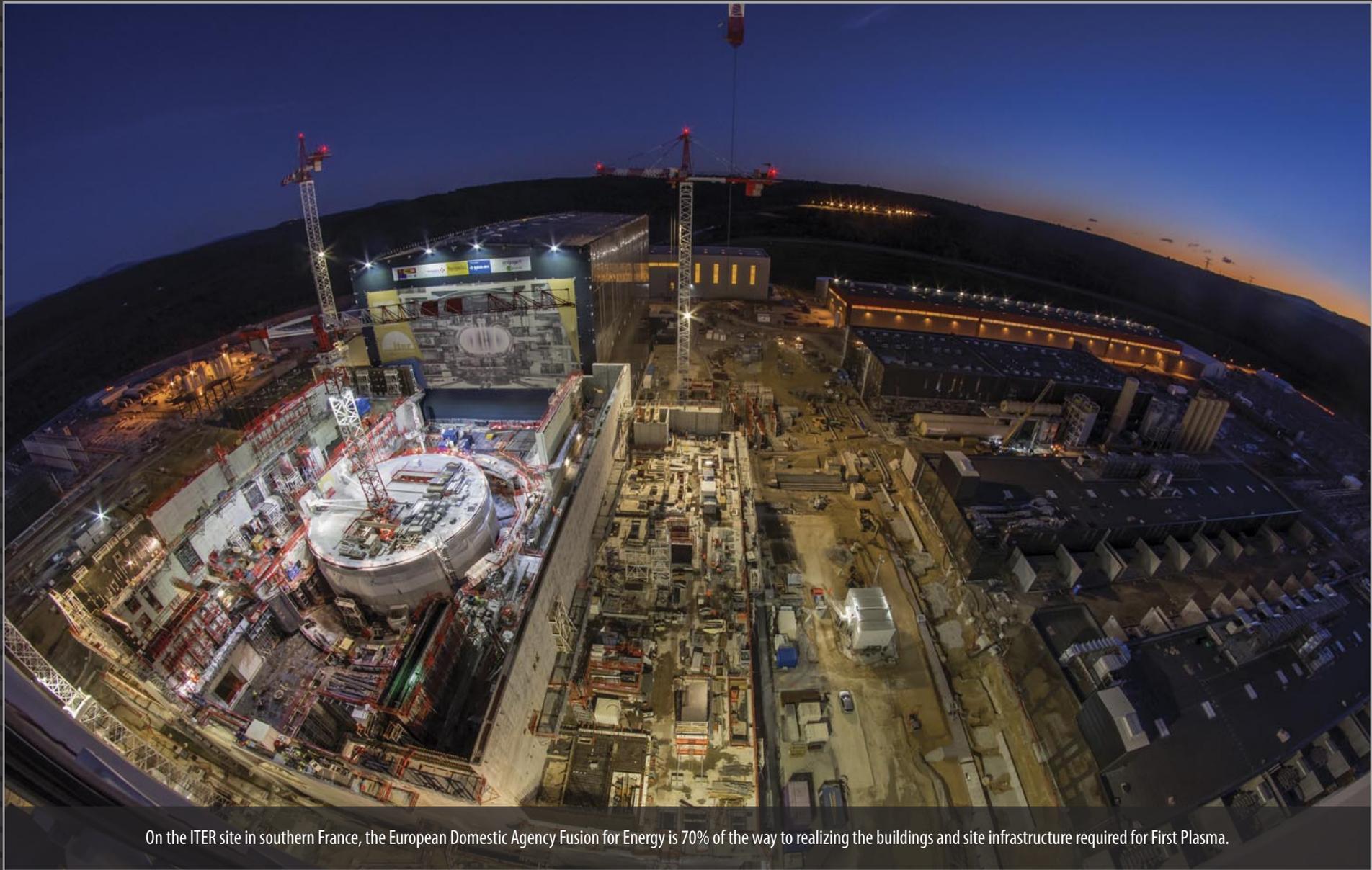
COMPLETELY WOUND



All eight double pancake windings have been completed for poloidal field coil #1; now they must undergo vacuum pressure impregnation (pictured).



An average of 16,000 people visit the ITER worksite every year, hosted in groups large and small.



On the ITER site in southern France, the European Domestic Agency Fusion for Energy is 70% of the way to realizing the buildings and site infrastructure required for First Plasma.



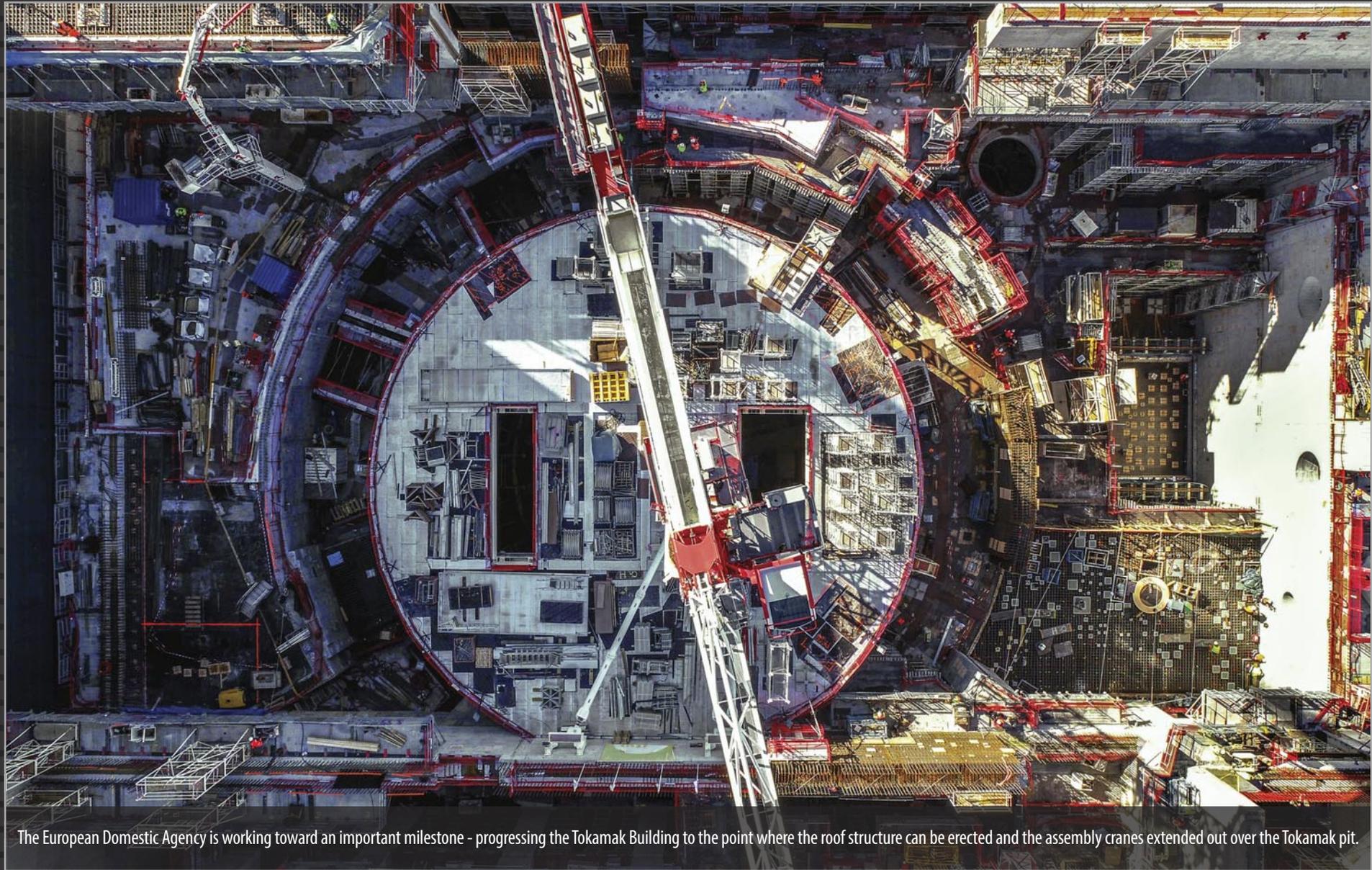


Two vacuum vessel sector handling tools now stand side by side in the Assembly Hall, looking exactly as the sketch in the background illustrates. All commissioning activities – including tests with loads – have been completed.

A FRAME FOR "UPENDING"



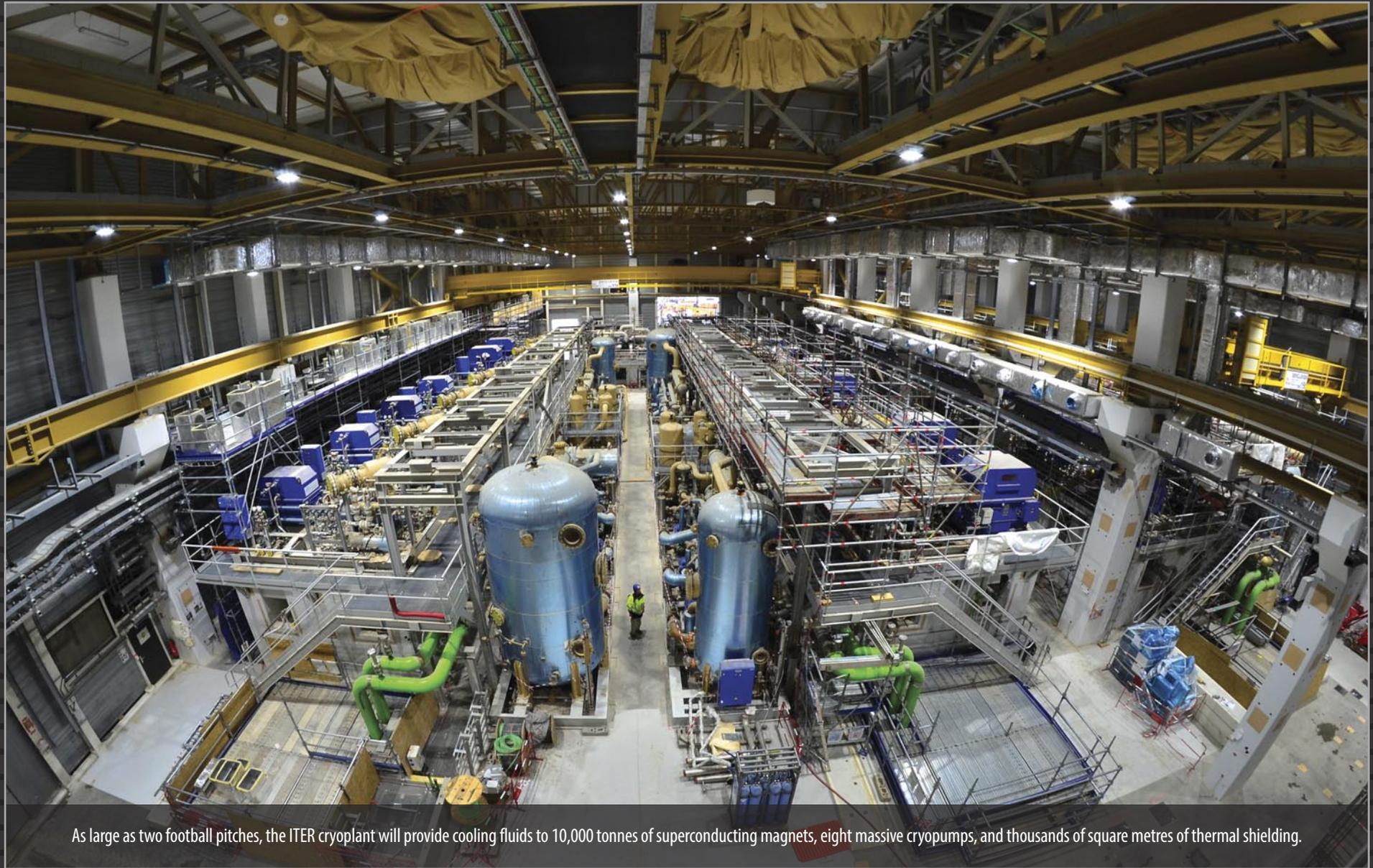
A second built-to-purpose assembly tool (right) has arrived from Korea. This "upending frame" will be used to raise some of the largest machine components from their horizontal delivery positions to vertical for subsequent handling.



The European Domestic Agency is working toward an important milestone - progressing the Tokamak Building to the point where the roof structure can be erected and the assembly cranes extended out over the Tokamak pit.



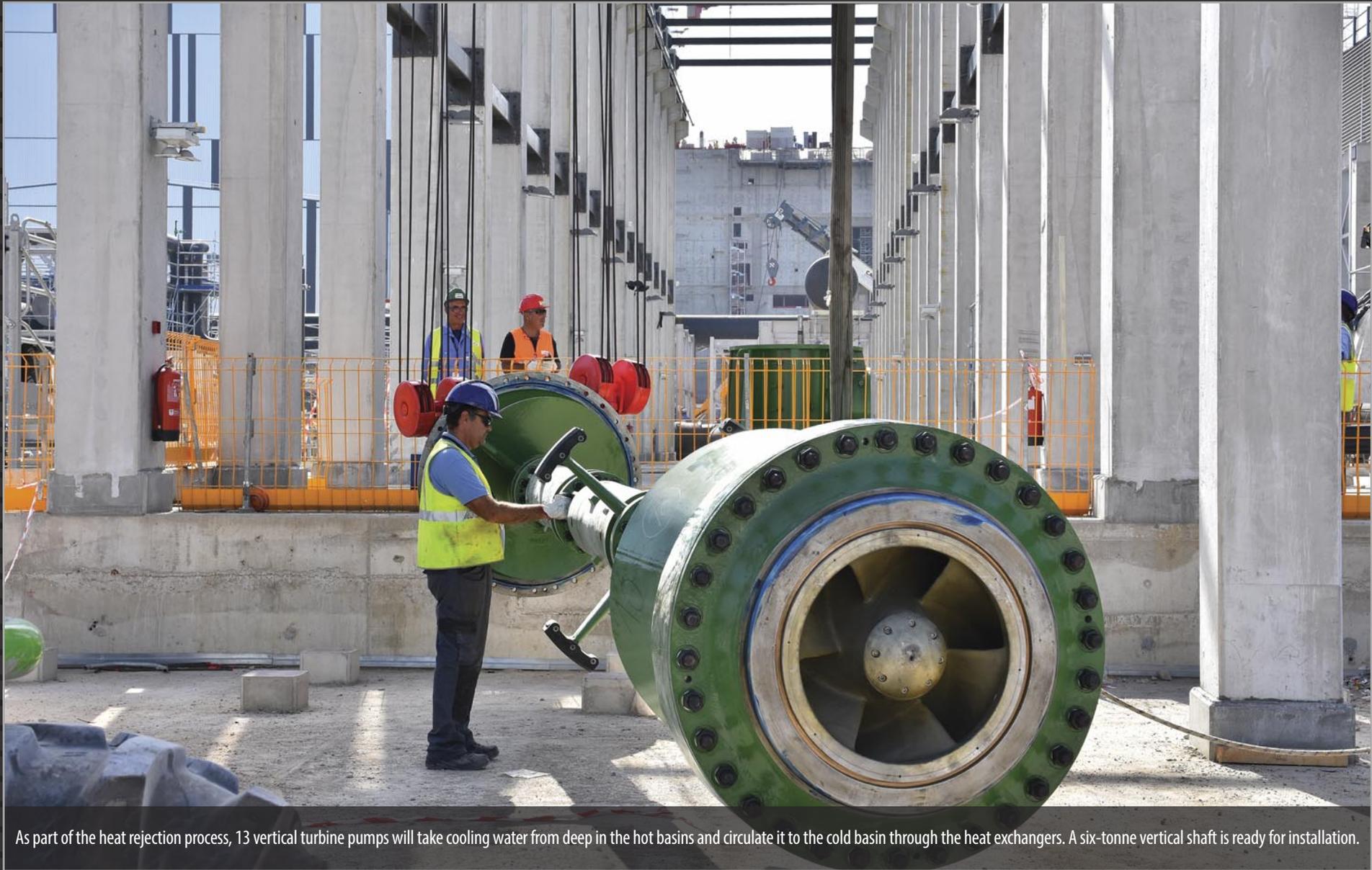
Heat generated by the machine is collected by the Tokamak's cooling water system and transferred through the component cooling water loops to the heat rejection system. The largest piping is 2 metres in diameter.



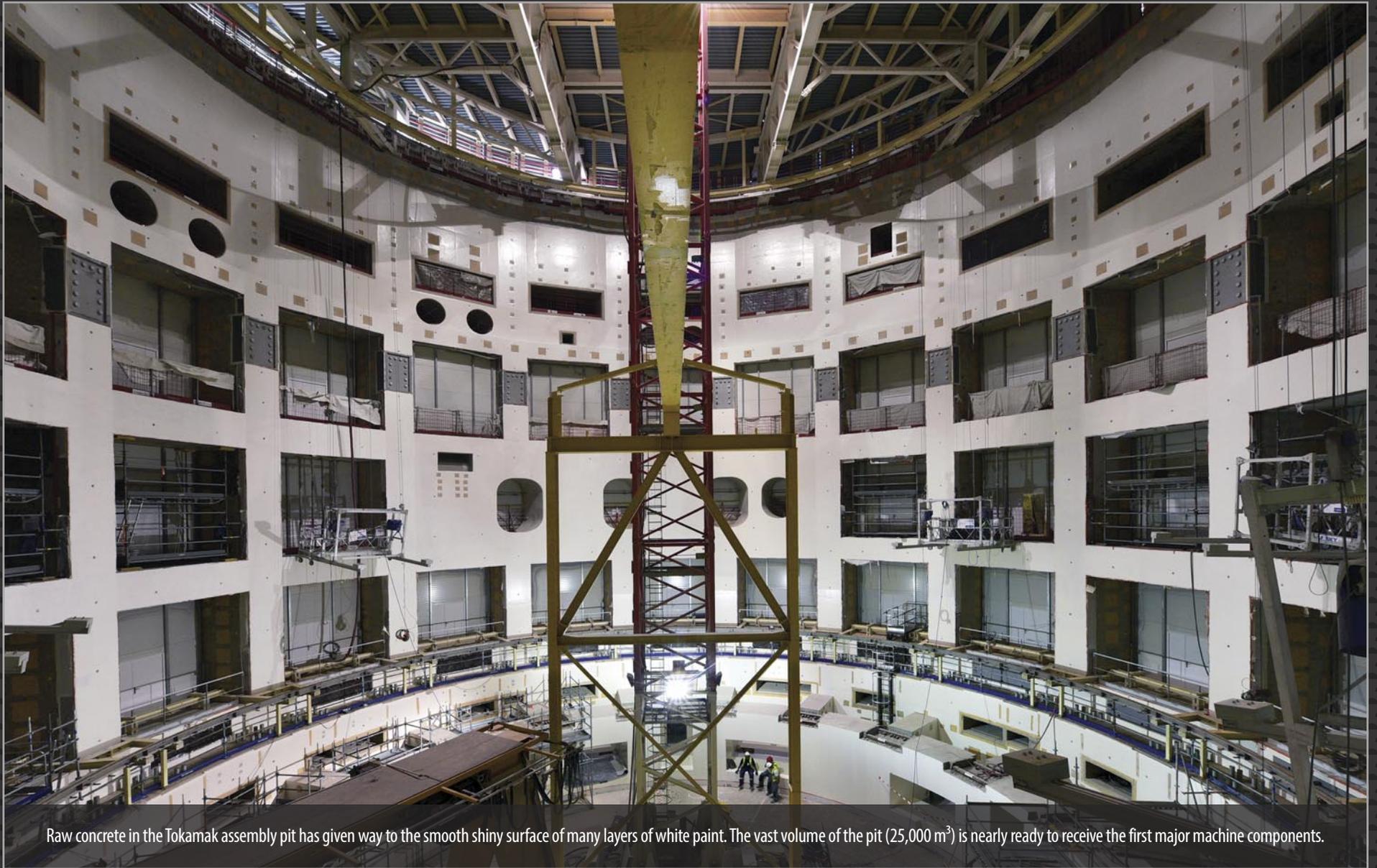
As large as two football pitches, the ITER cryoplant will provide cooling fluids to 10,000 tonnes of superconducting magnets, eight massive cryopumps, and thousands of square metres of thermal shielding.



Over nine days in December, five pre-assembled modules for the roof of the crane hall are lifted into place. The first operation takes place very early in the morning.



As part of the heat rejection process, 13 vertical turbine pumps will take cooling water from deep in the hot basins and circulate it to the cold basin through the heat exchangers. A six-tonne vertical shaft is ready for installation.



Raw concrete in the Tokamak assembly pit has given way to the smooth shiny surface of many layers of white paint. The vast volume of the pit (25,000 m³) is nearly ready to receive the first major machine components.



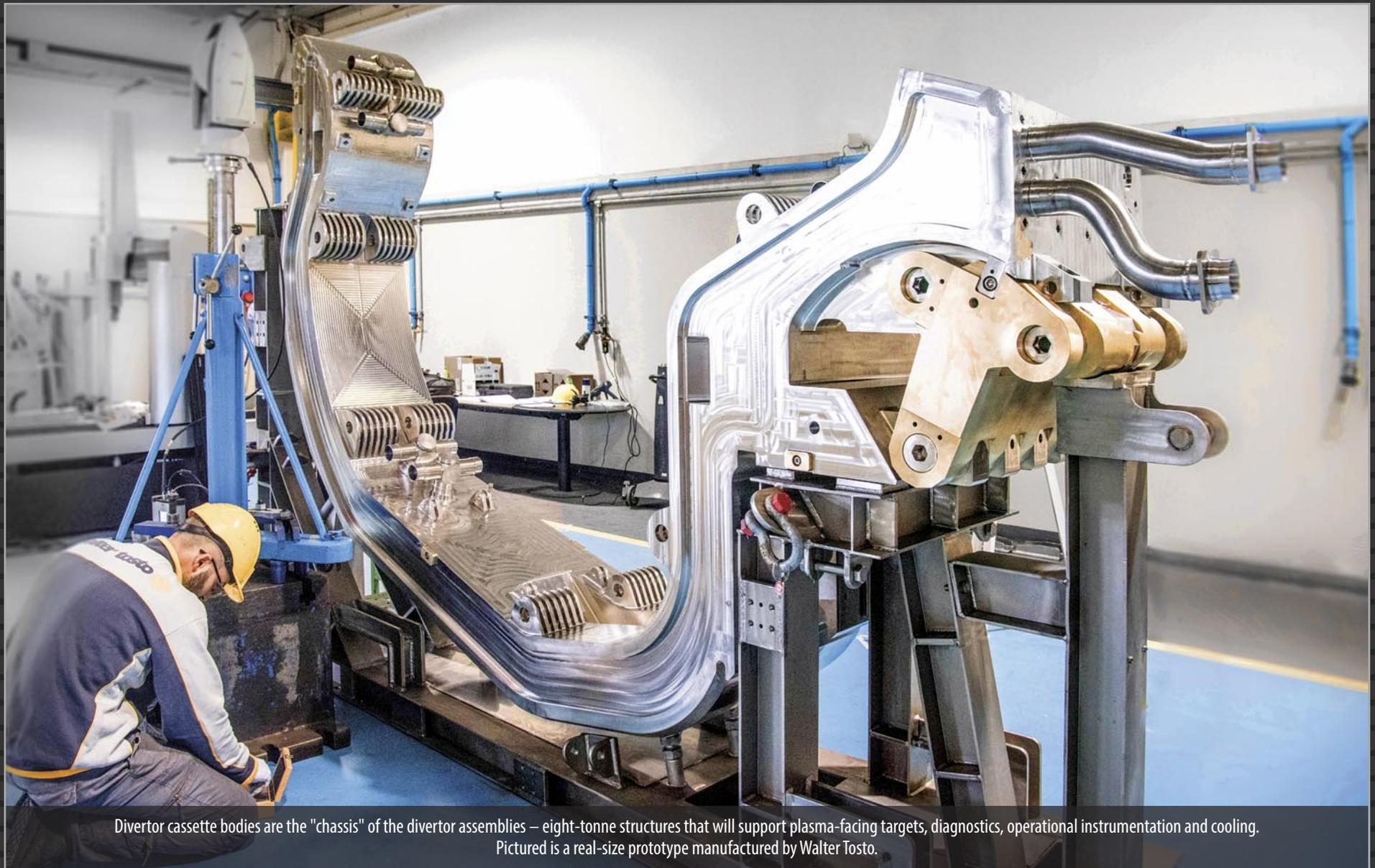
Between the concrete crown on the floor of the Tokamak pit and the base of the machine, 18 cryostat "bearings" will play an essential role in accommodating the wobbling, expansion and occasional displacement of the 23,000-tonne machine.



In one of the yet unpainted galleries of the Tokamak Complex, teams meet to discuss the day's work program. The vast galleries that surround the central machine well will be completely filled with plant system equipment in the next few years.



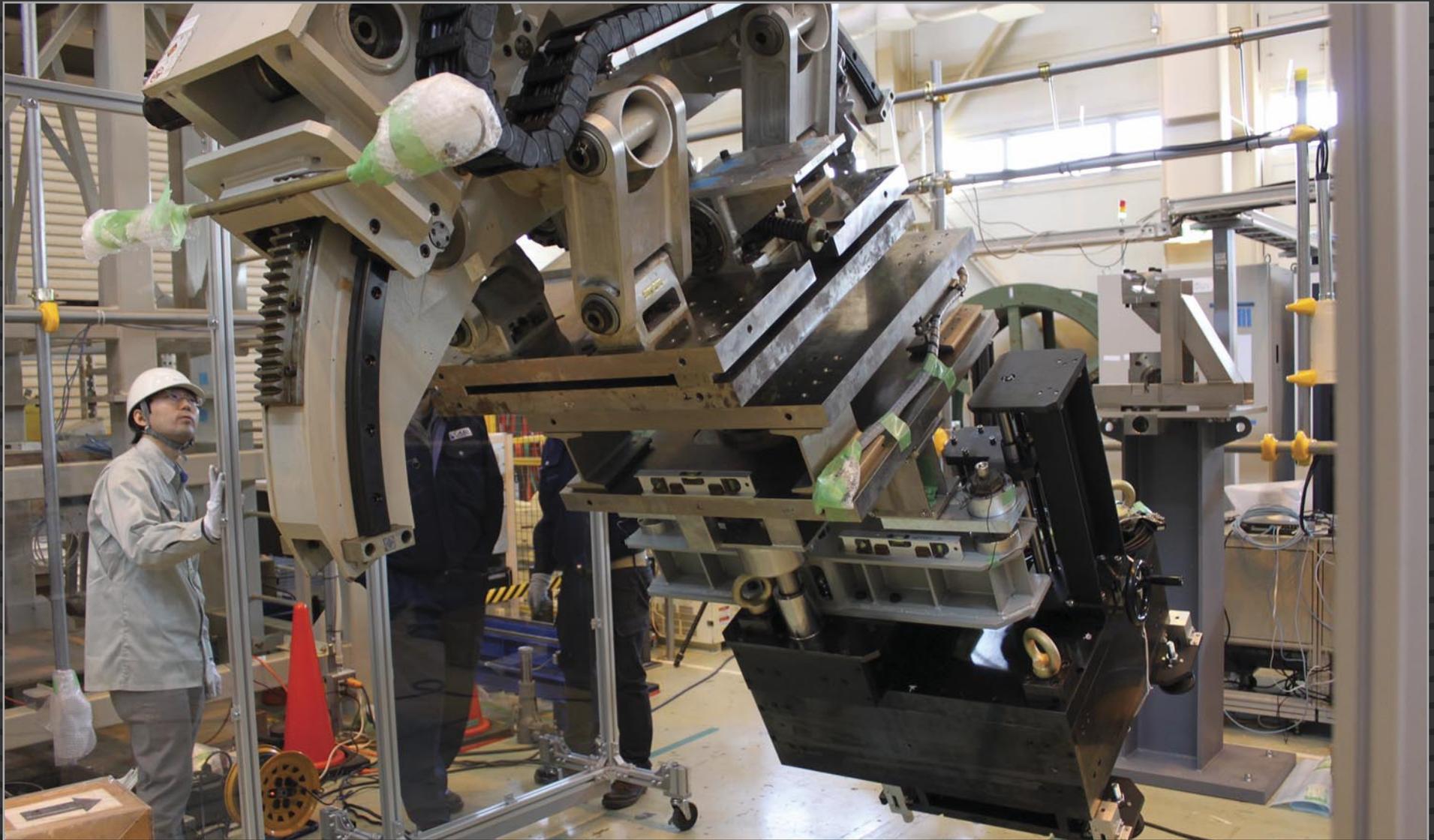
China is delivering over 100 magnet feeder components, many with unusual shapes such as this in-cryostat feeder on its way to Shanghai port. The bulk of arrivals are expected in the next two years.



Divertor cassette bodies are the "chassis" of the divertor assemblies – eight-tonne structures that will support plasma-facing targets, diagnostics, operational instrumentation and cooling. Pictured is a real-size prototype manufactured by Walter Tosto.



Work has ended on the cryostat base and lower cylinder. One of the sections – the lower cylinder – is cocooned against weather and moved out of the Cryostat Workshop to make room for the assembly of the upper cylinder.



Although not as powerful as the Infinity Gauntlet of comic book fame, the bolting tool (pictured) that will be used to install ITER's in-vessel blanket modules robotically is impressive. It will provide 10 kilonewton metres (kNm) of torque to tighten the massive bolts of the blanket first wall panels remotely.

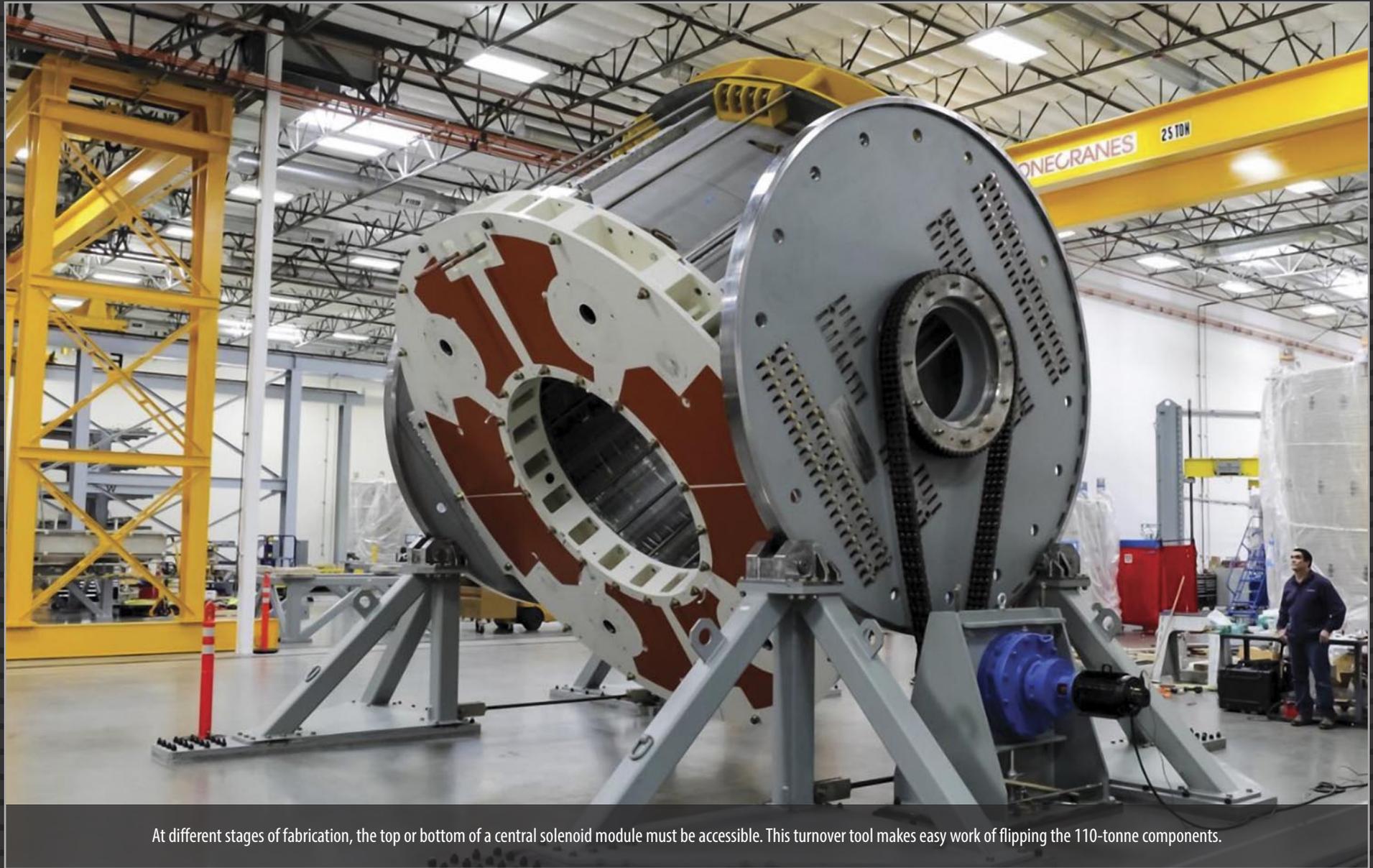


Korea has shipped the thermal shield panels required for vacuum vessel sector #6. Silver plating on every surface makes the components glimmer and shine.



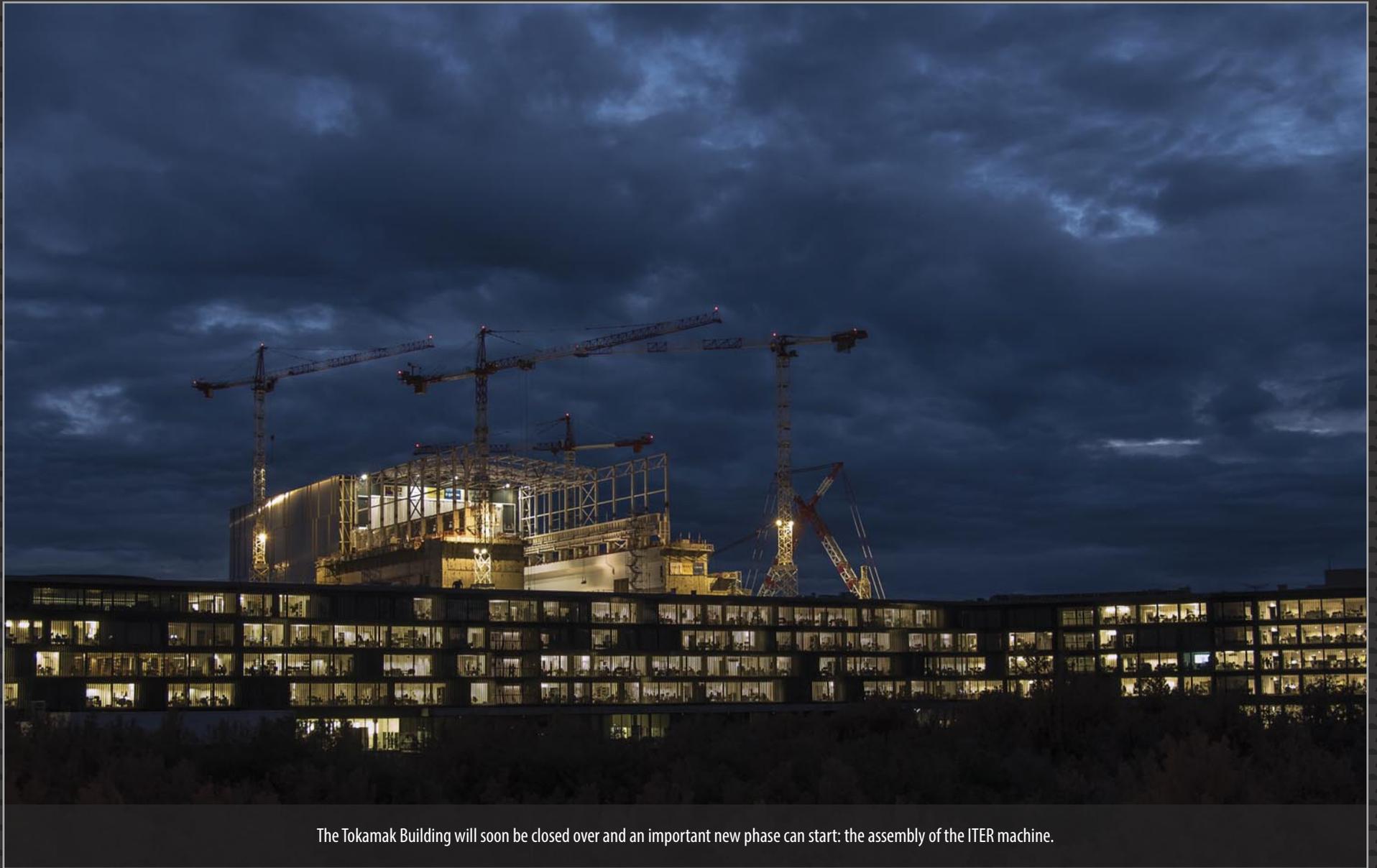
Specialists of the Sredne-Nevisky Shipyard and the Efremov Institute have completed vacuum pressure impregnation on the eight double pancakes that will be stacked to form poloidal field coil #1 - ITER's smallest poloidal field coil (nine metres in diameter).

TURNOVER STATION



At different stages of fabrication, the top or bottom of a central solenoid module must be accessible. This turnover tool makes easy work of flipping the 110-tonne components.

AS THE YEAR ENDS



The Tokamak Building will soon be closed over and an important new phase can start: the assembly of the ITER machine.

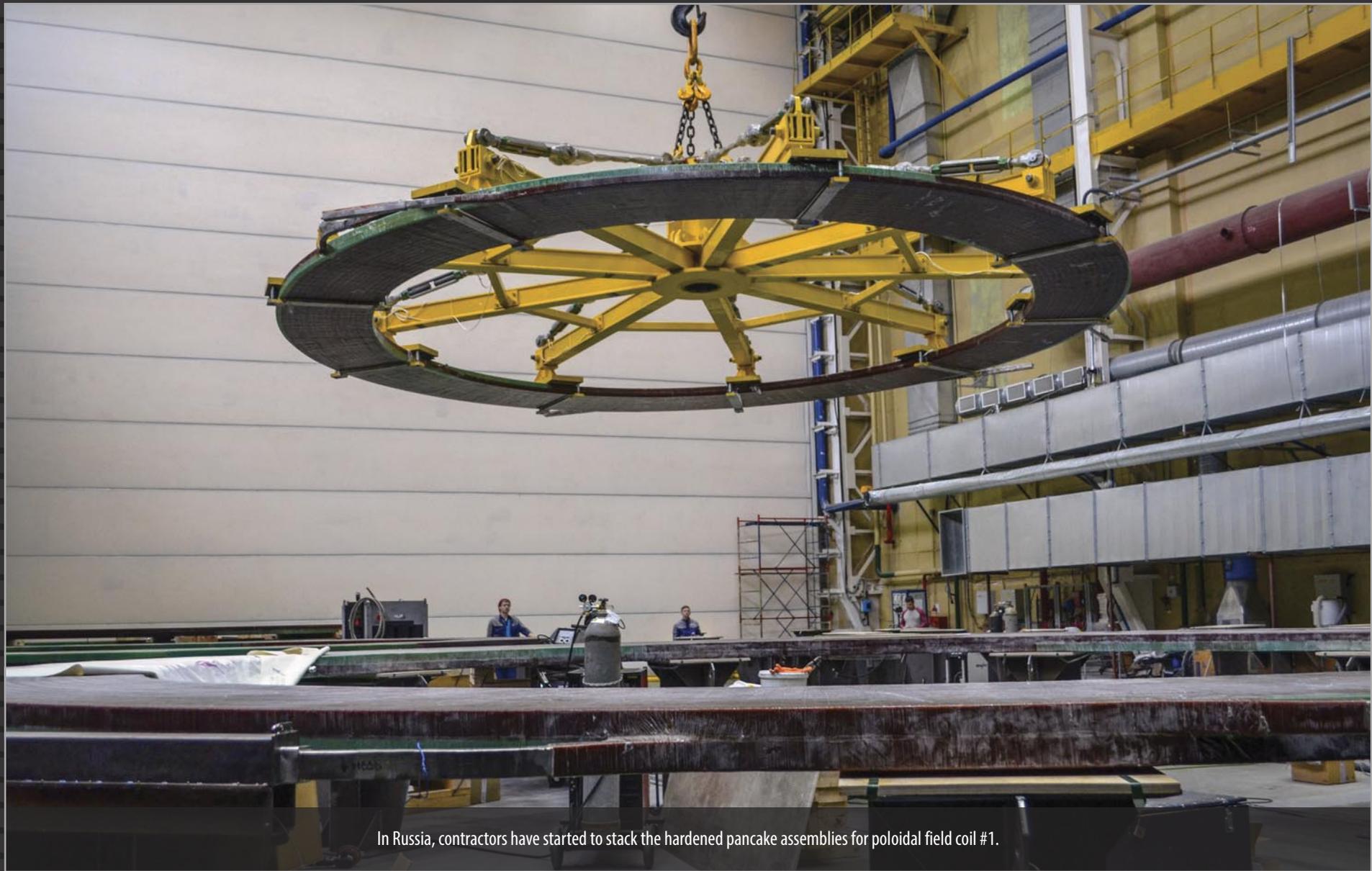
CLOSE TO THE 1,000 MARK



Over 900 people now work directly for the ITER Organization in St-Paul-lez-Durance, France.



ITER Council members discover the new display in the Headquarters Building that retraces ITER and fusion history.



In Russia, contractors have started to stack the hardened pancake assemblies for poloidal field coil #1.

FIRST D-SHAPED COIL FINALIZED



Japan's National Institutes for Quantum and Radiological Science and Technology (the procuring agency, QST) joins with Mitsubishi Heavy Industries, Ltd. and representatives of the ITER Organization to celebrate the completion of ITER's first toroidal field coil in January.



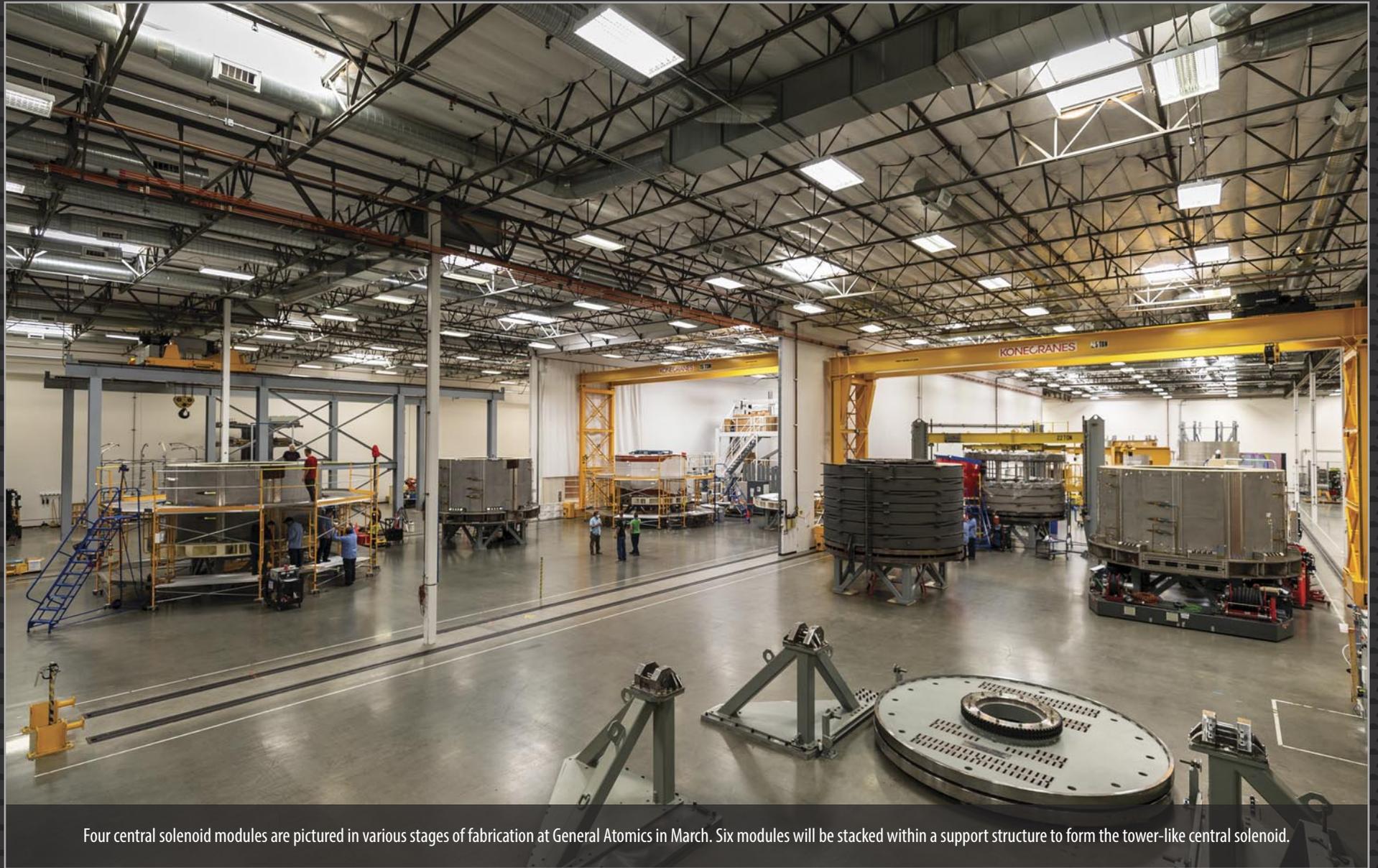
Ten years of planning and fabrication come to an end as Korean Domestic Agency contractor Hyundai Heavy Industries completes the first vacuum vessel sector in April.



The first of 10 toroidal field coils to be procured by the European Domestic Agency, Fusion for Energy, is ready for shipment. This is the first deliverable of a decade-long program involving more than 700 people and 40 companies.



Two poloidal field coils, plus a cryogenic chamber for cold testing, are visible in this photo taken in July. European contractors will begin cold testing a third coil – (#6, hidden under the gantry crane on the right) in August.



Four central solenoid modules are pictured in various stages of fabrication at General Atomics in March. Six modules will be stacked within a support structure to form the tower-like central solenoid.

400-TONNE MAGNET REACHES SITE



Procured by Europe and manufactured in China, ring-shaped poloidal field coil #6 will be the first to be integrated into the ITER machine. The massive component arrived on site in June after a 10,000-kilometre voyage from its manufacturing site in Hefei, China.

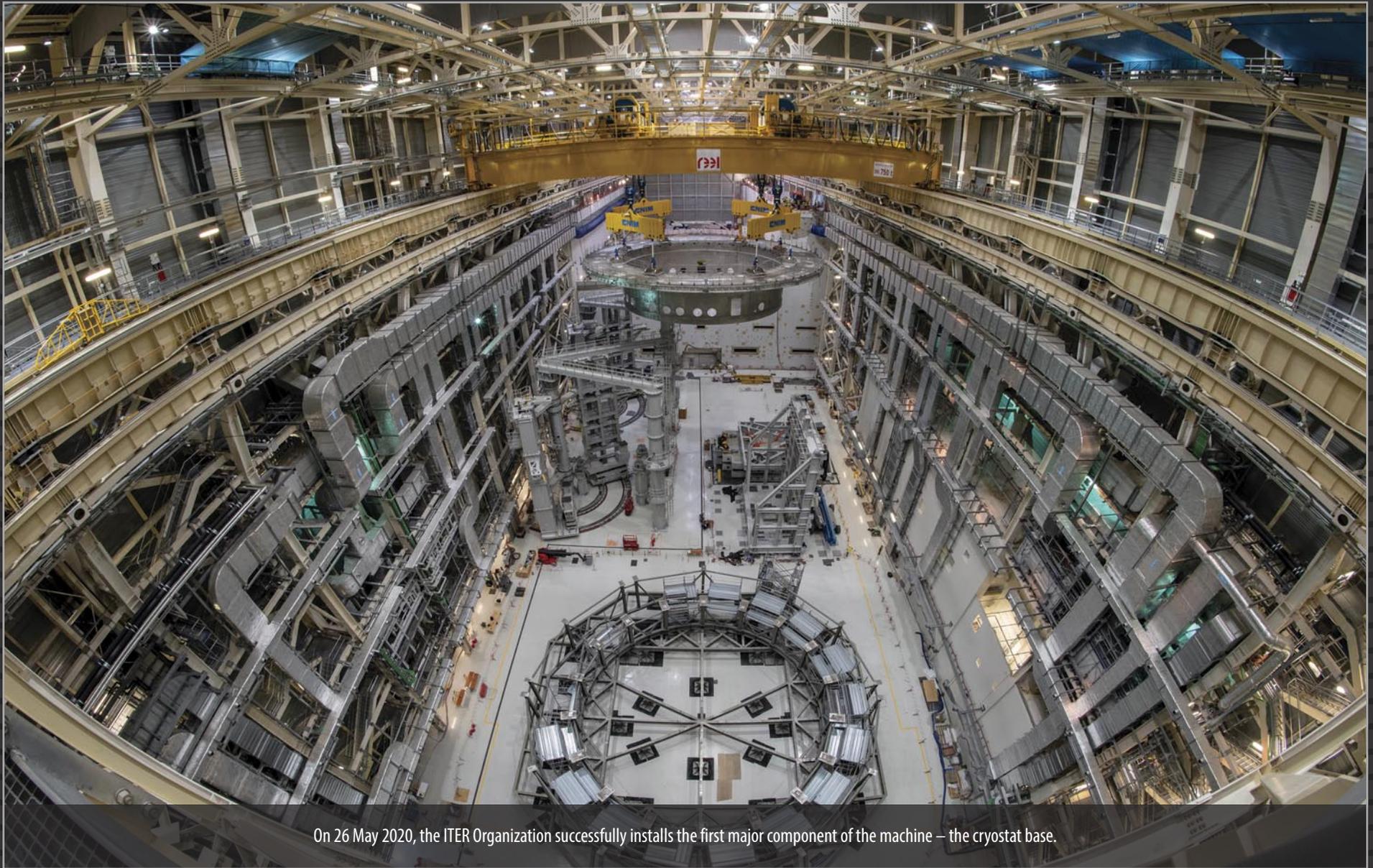


Thermal shield panels will be mounted on vacuum vessel sectors before they are lowered into the assembly pit. All sectors have now been completed and shipped.



The European Domestic Agency successfully achieves three milestones by end March, effectively opening the way to ITER machine assembly: the completion of the crane hall structure, the removal of the temporary wall separating the Assembly Hall from the Tokamak Building, and the demonstration of the overhead crane load path. In this image, overhead cranes are carrying mock loads of just over 1,000 tonnes.

CRYOSTAT BASE INSERTION



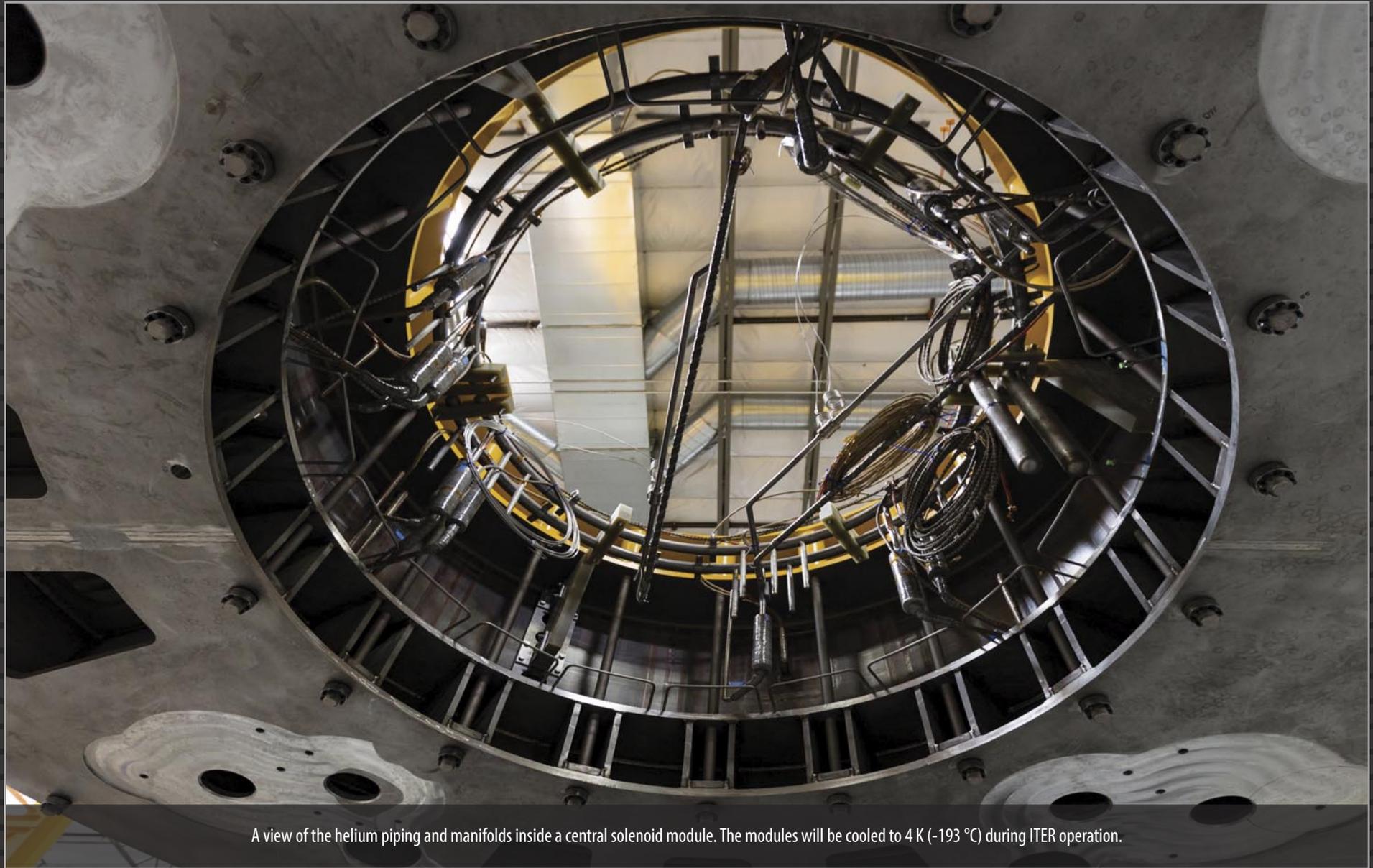
On 26 May 2020, the ITER Organization successfully installs the first major component of the machine – the cryostat base.



The 1,250-tonne base is slowly lowered by the cables of the overhead crane, with tolerances decreasing from 50 cm to 5 cm as it reaches the bottom.



Metrology experts, cryostat engineers, crane operators and supervisors all had a role to play in the precision operation. Months of planning and testing were rewarded as the operation went off without a hitch.



FIRST D-SHAPED COIL ARRIVES



The European Domestic Agency delivers the first D-shaped toroidal field coil of the ITER program (TF9) on 17 April 2020. Eighteen others are expected (including one spare) from Europe and Japan.

SECOND TOROIDAL FIELD COIL DELIVERED



One week after the arrival of the first European toroidal field coil, Japan delivers TF12 on 25 April. Each toroidal field coil weighs 360 tonnes, but the load along the ITER Itinerary is closer to 600 tonnes (including the transport frame and vehicle).



The buildings and infrastructure for First Plasma are 75% complete (May 2020). Two large ITER components – the lower and upper cylinders of the cryostat – can be seen in exterior storage at the top of the image.

IC-26 UNDER COVID CONSTRAINTS



For the first time in ITER Council history, the Twenty-Sixth Meeting in June 2020 takes place entirely by video conference. Project execution to First Plasma is now about 70% complete.

THIRD TOROIDAL FIELD COIL DELIVERED



Toroidal field coil #13 is received from Japan on 3 July 2020. Coils TF12 and TF13 will be paired with the first vacuum vessel sector from Korea to form the first sector sub-assembly of the machine. Specialized tooling in the Assembly Hall is all ready for the operation.

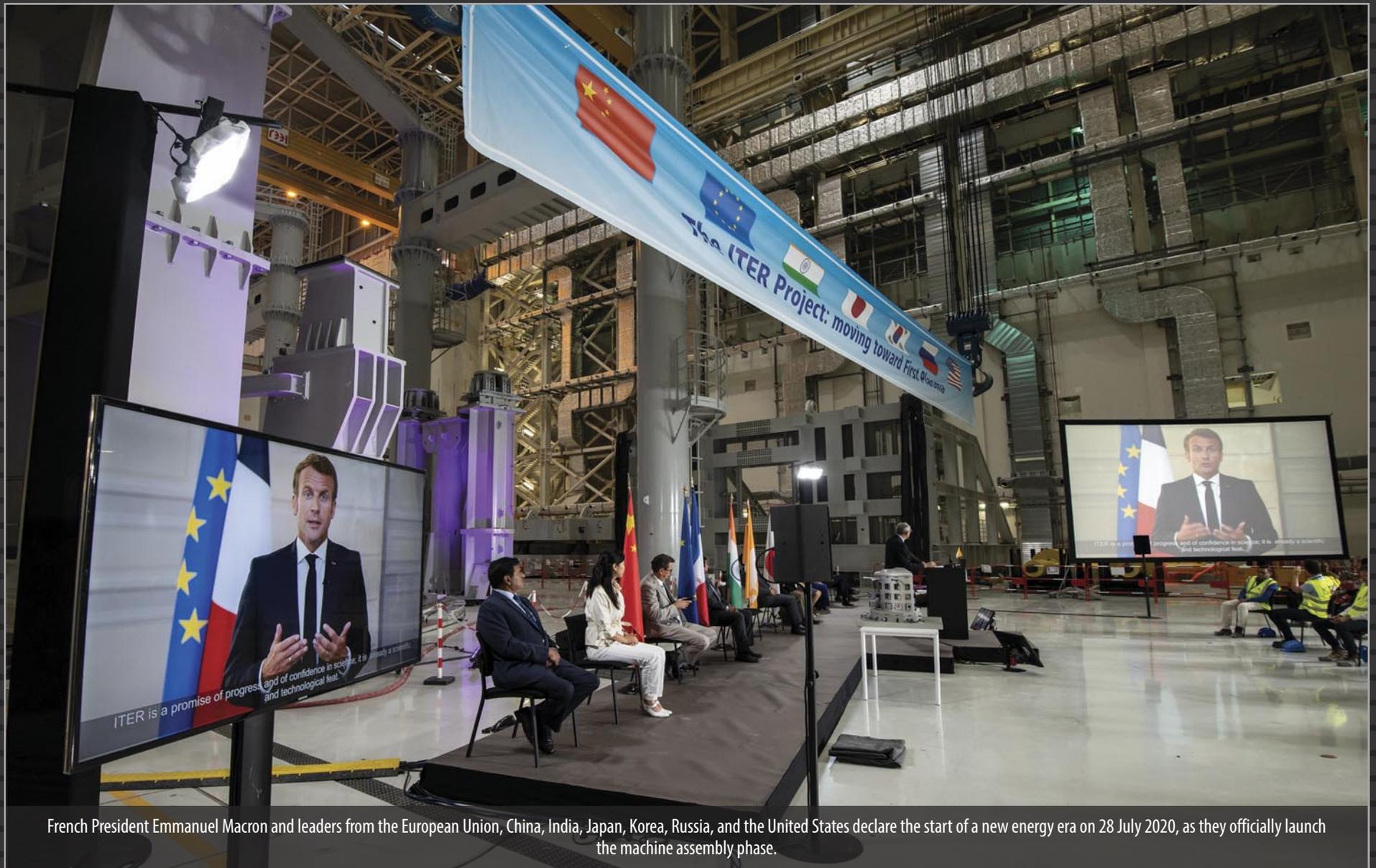


With a flag-off ceremony on 30 June 2020 for the top lid, the Indian Domestic Agency and Larsen & Toubro Heavy Engineering mark the end of an eight-year industrial adventure – the manufacturing of the ITER cryostat.



The first sector of the ITER vacuum vessel is unloaded in France on 22 July 2020 after a one-month sea voyage.

ASSEMBLY PHASE KICKS OFF



French President Emmanuel Macron and leaders from the European Union, China, India, Japan, Korea, Russia, and the United States declare the start of a new energy era on 28 July 2020, as they officially launch the machine assembly phase.



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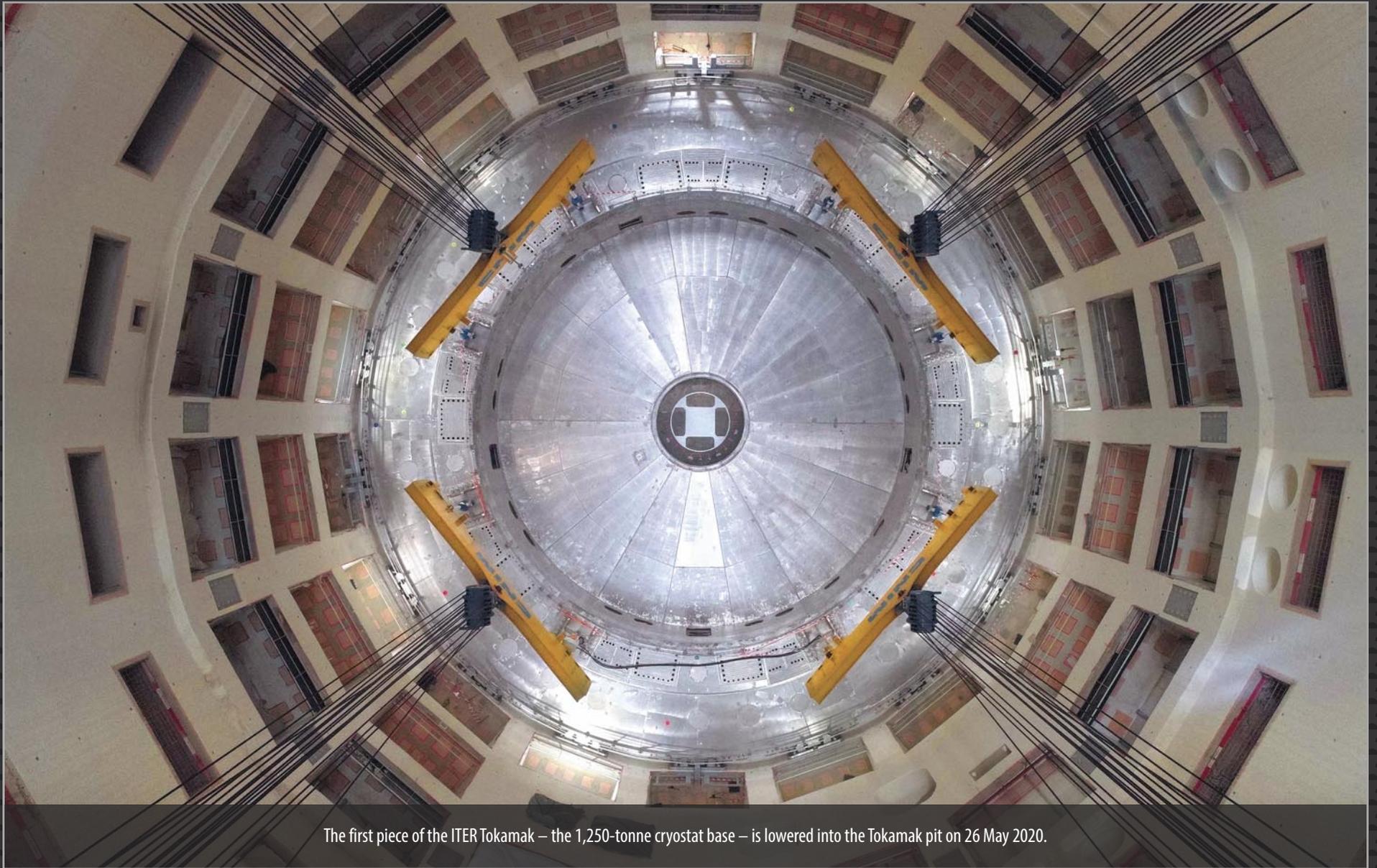
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The first piece of the ITER Tokamak – the 1,250-tonne cryostat base – is lowered into the Tokamak pit on 26 May 2020.

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