

ITER CORE MACHINE ASSEMBLY PROGRESS

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ABSTRACT

- **ITER project overview:** ITER is a global collaboration of seven partners aiming to demonstrate nuclear fusion as a large-scale, carbon-free energy source using a tokamak magnetic confinement device
- **Technical and organizational challenges:** Assembling the ITER tokamak requires precise placement of heavy components within tight tolerances, using specialized tools and coordinated efforts among international partners, contractors, and management.
- **Project progress and construction management:** The report covers the current status of ITER core machine installation, emphasizing detailed planning, worker qualification, daily coordination, and lessons learned that helped recover the schedule after repair delays.

BACKGROUND

- In 2023, the ITER project was rebaselined, with the target to start scientific research operations in 2035.
- To sustain this program, and beyond the science underlying the tokamak technology, a robust schedule and construction management organization is necessary to ensure the viability of the project.
- The paper details the progress to date, the schedule organization to plan on long-term basis and short-term activities broken down to daily operational level.
- Furthermore, it describes the enhanced collaboration between the ITER Organization, Momentum (construction management as agent) and the contractor (CNPE-Consortium).

CHALLENGES & RELATED OPPORTUNITIES

TIGHT GAPS

In the Tokamak assembly, there is very limited clearance between massive components. For example, the Central Solenoid coil is about 12m high and must be placed with an 18mm radial gap. To address this, assembly tools and technologies are developed upfront, while workers and processes are pre-qualified in advance.

AMBITIOUS SCHEDULE

Sequences are reviewed continuously, addressing long-, mid-, and short-term spans. Long-term sequencing allows seizing opportunities involving long-lead actions. Mid-term reviews ensure alignment of activities with available resources (space, tools). Finally, the short-term coordination plan, shared with all stakeholders, defines operational activities at the finest level.

COLLABORATION

Target dates are agreed upfront on a long-term basis, with daily coordination among contractors, fostering a “one team – one goal” spirit. Problems are openly discussed, and solutions found together. The partnership relies on trust, reciprocal support, and pride in achieving challenging results.



Teams in Assembly hall

OUTCOME

PROJECT DELIVERY

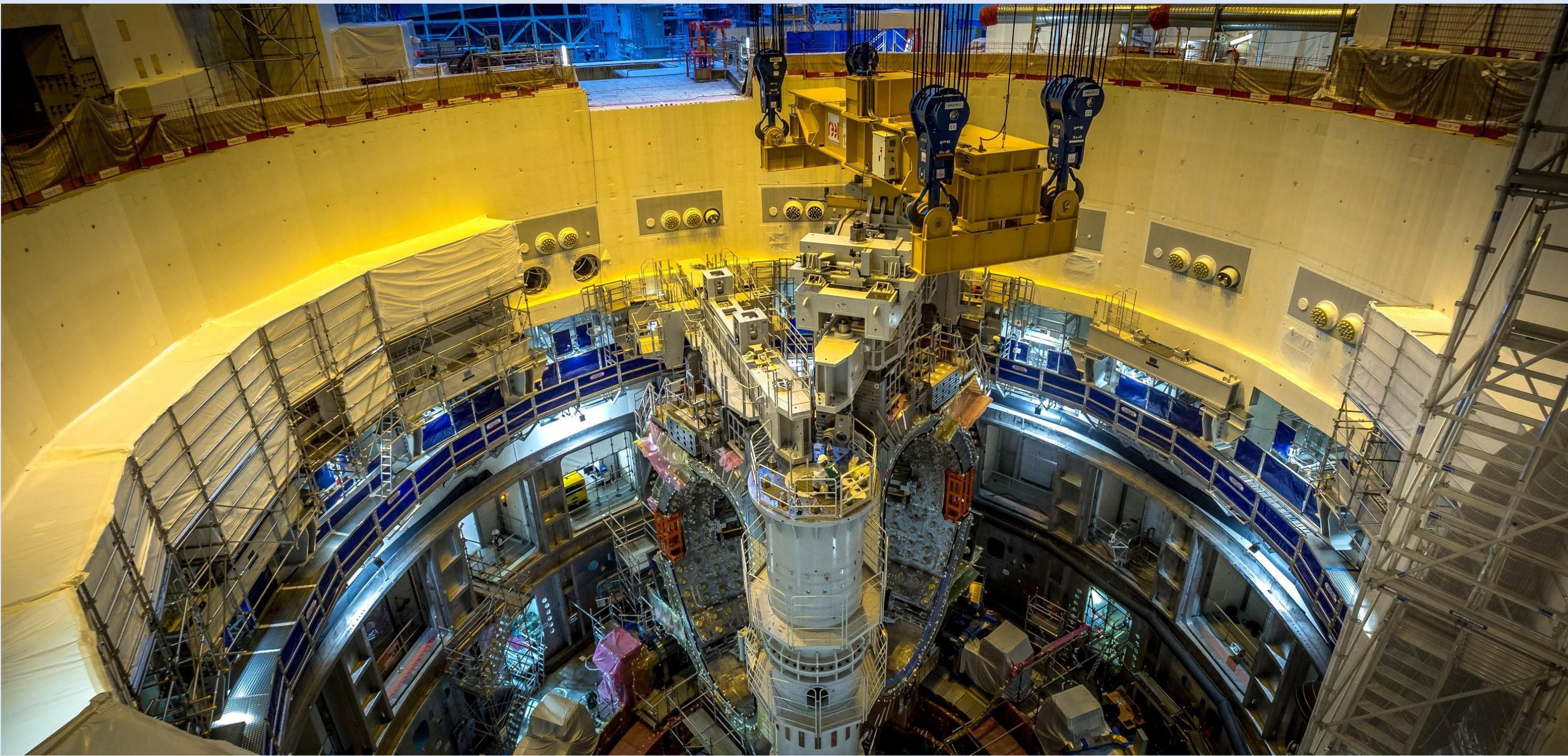
In the past three years, the ITER project has been progressing at a fast pace, aligned with its baseline target schedule. This momentum has been maintained through effective planning, real-time monitoring, and adaptive strategies. Site operations are managed in an agile and efficient manner, with teams showing strong coordination and responsiveness to challenges.

PARTNERSHIP

The technical and operational challenges have forged a strong, solution-driven, and lasting partnership among the teams. This close collaboration has fostered mutual respect and shared responsibility, with continuous improvement encouraged at all levels. The teams take genuine pride in their collective achievements and remain committed to the project success.



ITER assembly hall



Two sector modules placed in ITER Pit

CONCLUSION

- Beyond science, a robust construction management organization is needed to ensure the viability of experimental science projects.
- The ITER Project, in partnership with its stakeholders, has put in place the necessary processes to enable efficient site management and progress in accordance with its targets.

ACKNOWLEDGEMENTS

- To all stakeholders involved in the ITER Tokamak machine assembly.