DTT Project and In-Vessel Coils

Context for the conductor procurement

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Scope of the meeting

- **Inform** about technical and administrative issues and constraints concerning In-Vessel Coils procurement to be launched in Q1/2027

- **Collect** comments and suggestions from the market specialists

Info day programe

ven 20/11

10:00	**Introduction: welcome, scope of the meeting and agenda** *DTT Teams Meeting*	*Gian Mario Polli et al.* 10:00 - 10:10
	In-vessel coil conductor tender: scope of work, planning and logistics *DTT Teams Meeting*	*Gian Mario Polli et al.* 10:10 - 10:30
	In-vessel coil conductor tender: administrative issues (tender procedure, contract type, base price) *Giovanni Pucino et al.*	
11:00	**Q&A** *DTT Teams Meeting*	*Gian Mario Polli et al.* 11:05 - 12:00
12:00		

Q&A details

MEETING CHAT

The chat will be visible to everyone attending

Q&A / D&R

Your questions will be visible only to our team

- We encourage you to submit your questions using these tools during the presentations.
- Your questions will be collected by our team and answered during the Q&A session, which will take place after a short break.

DTT: organisation and mission

DTT S.c. a r.l. is responsible for the construction and future operation of the Divertor Tokamak Test facility in Frascati.

DTT CONSORTIUM

First European public-private partnership

Design, construction and future operation of the experimental facility

FRASCATI, ITALY

Located at the ENEA Research Centre

A major national and international research area for fusion and advanced technologies

COLLABORATIVE PROJECT

Research institutions, universities and industry

Supported by the Italian fusion community and the European fusion programme

Mission: develop scientific and technological solutions for the management of power and particle exhaust in future fusion devices.

DTT Consortium members

















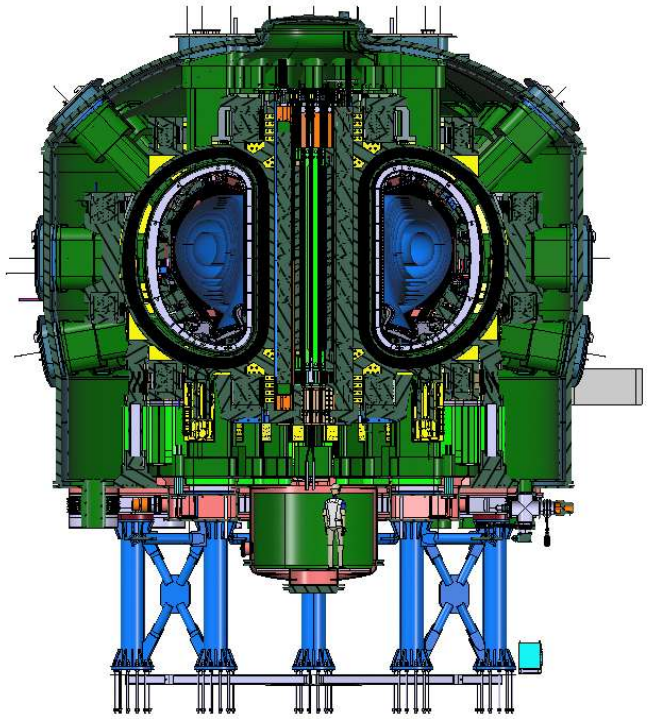






A facility for power exhaust and plasma control

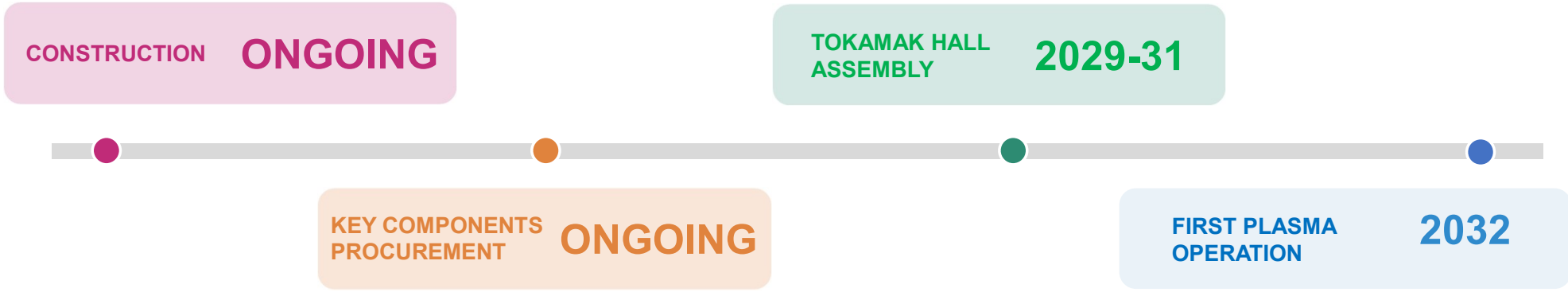
DTT combines high plasma current, high magnetic field and flexible auxiliary heating.



MAJOR RADIUS	2.19 m
PLASMA CURRENT	up to 5.5 MA
TOROIDAL FIELD	up to 5.85 T
AUXILIARY HEATING	up to 45 MW

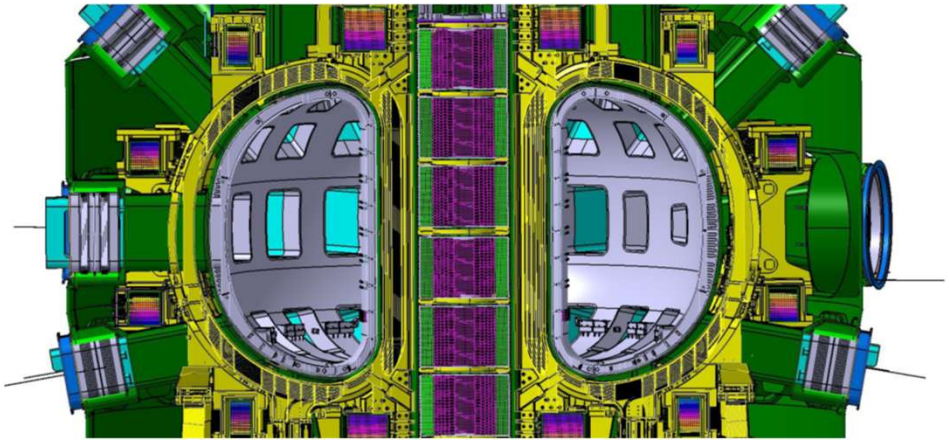
It will be at the forefront of European and global fusion research.

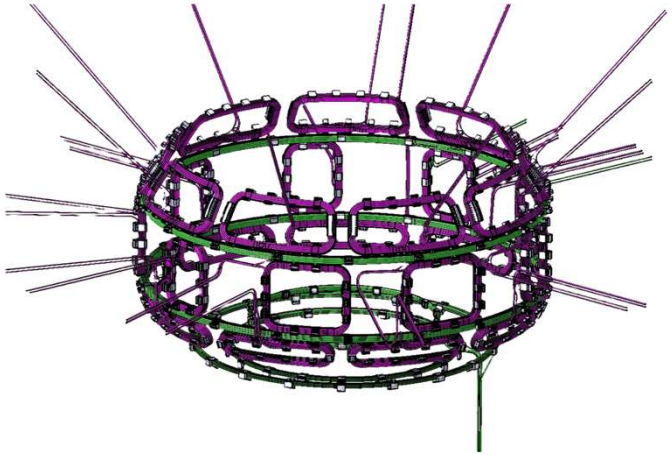
DTT timeline



Why DTT needs in-vessel coils

Placing dedicated coils inside the vacuum vessel improves magnetic coupling and dynamic response close to the plasma.





PERFORMANCE

- Improved magnetic coupling with the plasma
- Faster and more effective control response

ENGINEERING ENVIRONMENT

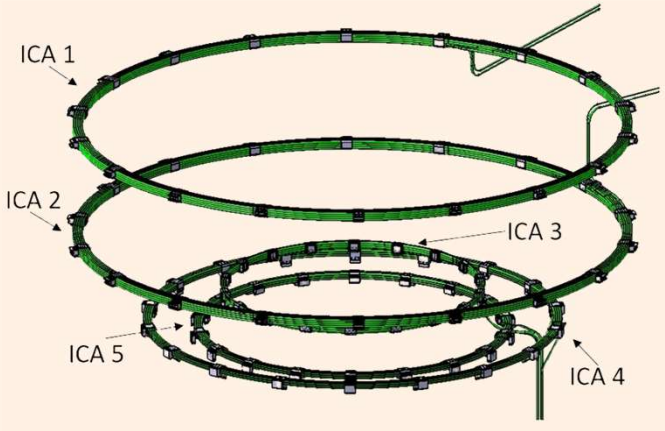
- Operation inside the vacuum vessel
- Limited space and integration with in-vessel systems
- Restricted access after installation

Two in-vessel coil systems

ICA and ICN perform different magnetic-control functions but use the same composite-conductor technology.

ICA

In-vessel axisymmetric coils



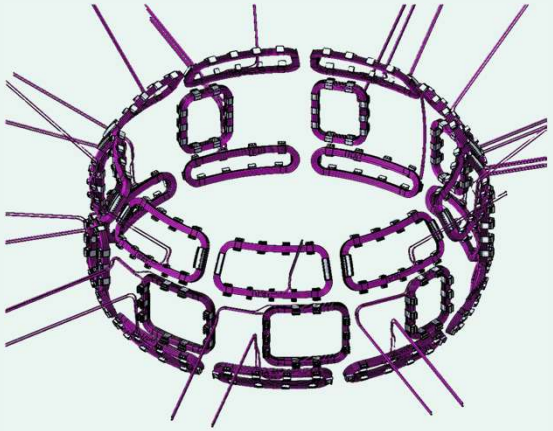
Fast plasma position and shape control

Coils arranged around the machine

High-current, water-cooled conductor

ICN

In-vessel non-axisymmetric coils



Control and correction of 3D magnetic fields

Distributed coils, tailored geometries

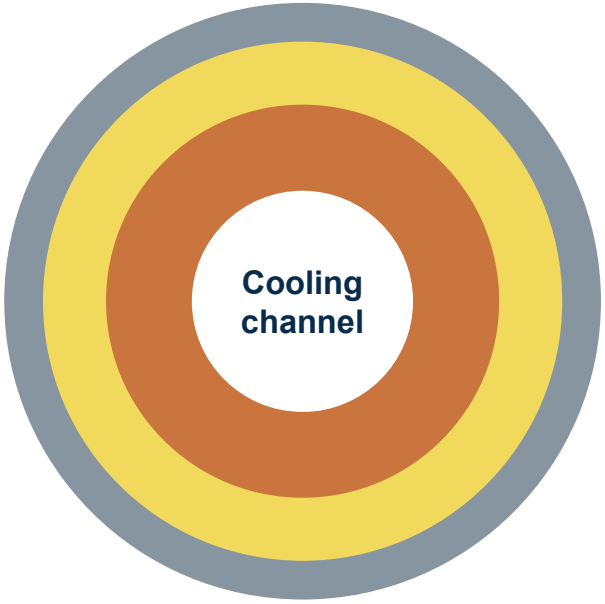
Common conductor and qualification baseline

Different magnetic functions. One common industrial conductor platform.

Thank you for your attention

Why DTT needs this conductor

The conductor integrates electrical, hydraulic, mechanical and vacuum functions in one compact component.



316L jacket

PFA insulation

Cu-OF conductor

ELECTRICAL Carry the coil current and maintain copper-to-jacket insulation

HYDRAULIC Provide an unobstructed internal water-cooling channel

MECHANICAL Survive manufacture, transport and subsequent coil forming

VACUUM Maintain a clean and leak-tight stainless-steel boundary

Approximately 5 km in continuous lengths up to 400 m