Fusion for Energy Grant: **F4E-GRT-276-01 (MS-RH)** | April.2011-Oct.2011

Cask trajectories in level B1
of Tokamak Building| Project IST (F4E – ITER)

o Partners:

- **Instituto Superior Técnico (IST),** Portugal – Coordinator
- ASTRIUM ST (France)

o Tasks

- **Task 1** – Trajectories of the CPRHS in TB and HCB
- **Task 2** – Trajectories of the CTS in TB and HCB
- **Task 3** – Trajectories of the Rescue Casks
- **Task 4** – Parking in HCB

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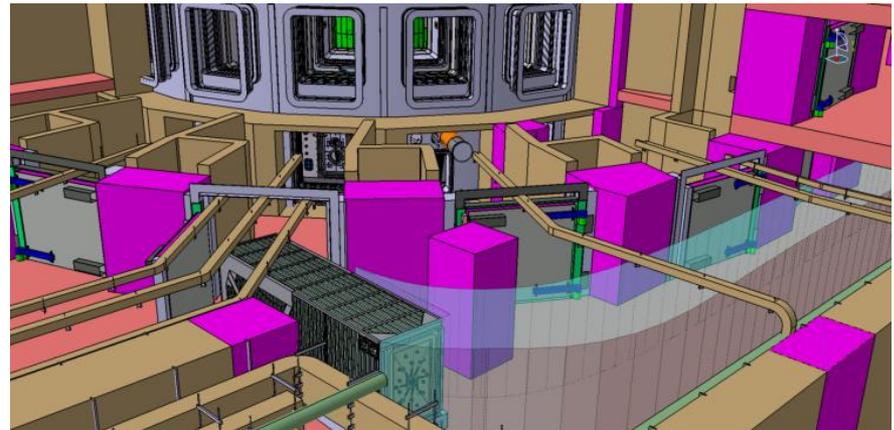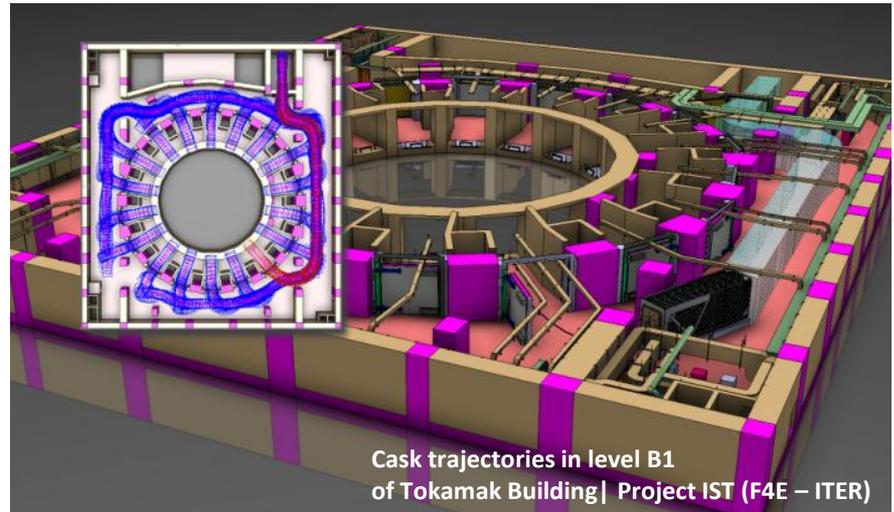
o **Grant Objectives**

- **Trajectories optimization** for nominal operations, for parking and for rescue in TB and HCB for all casks (CPRHS, CTS, Rescue Casks) typologies:

  - o Common trajectories for both wheels

  - o Different path for each wheel

Same path for both wheels   Different path for each wheel
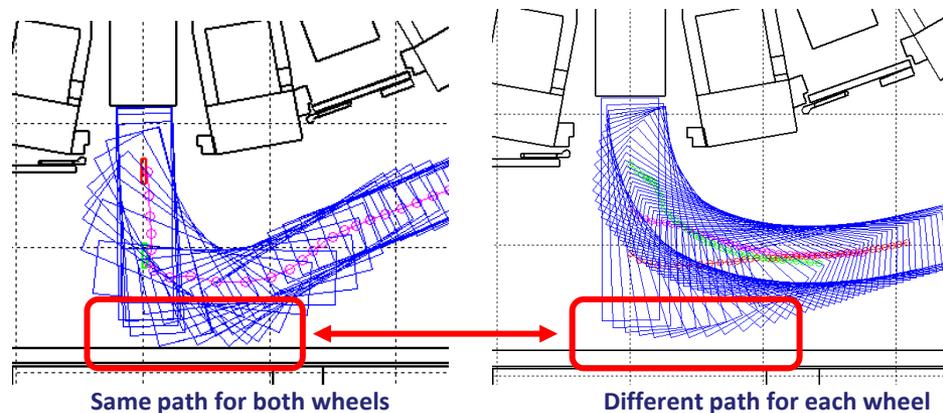
- Maximization of commons parts of different trajectories

o **Grant Objectives (cntd)**

- **3D models** (provided in CATIA) **swep**t by the CPRHS, CTS (when moving alone)and rescue vehicles along each trajectory + volume of safety margin

- Evaluation of minimum distance to nearest obstacles

- Identification of **potential clashes**

- Estimation of the **time of execution**

- Identification of **zones of risk** in the scenario

- **CAD models** with proposal changes

- Validation of 2D trajectories in a 3D VR tool will be provided by ASTRIUM ST.
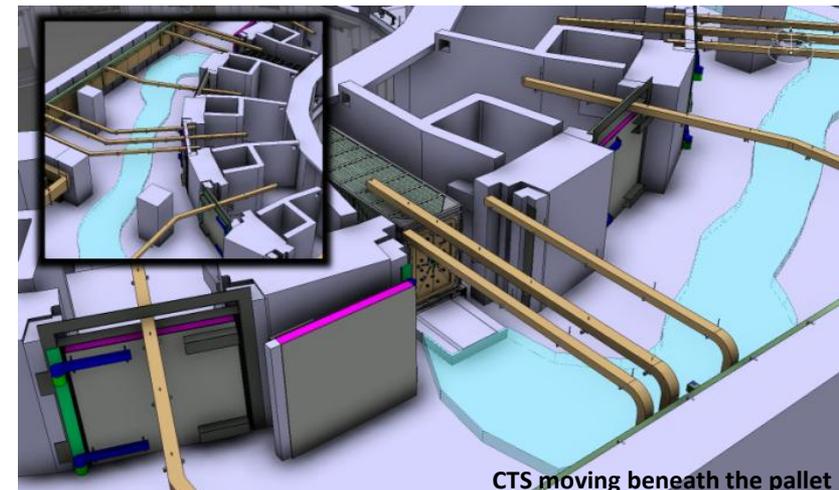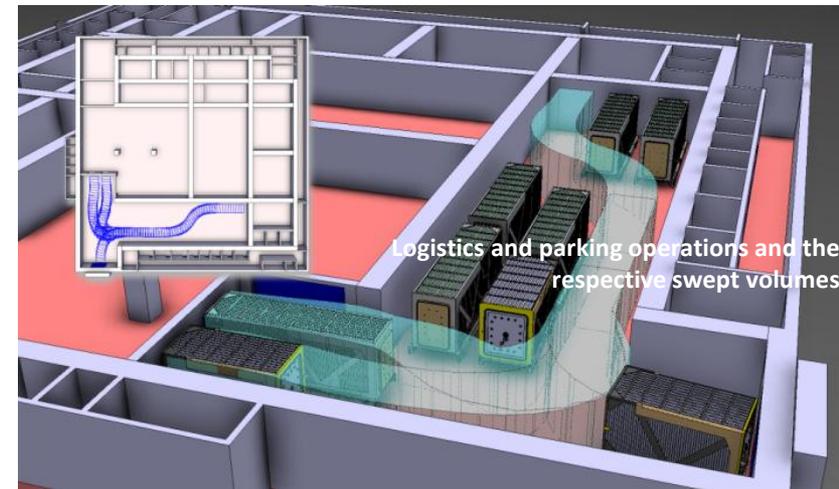
Logistics and parking operations and the respective swept volumes

CTS moving beneath the pallet

o **Publications from IST team**

- Daniel Fonte, Alberto Vale, Isabel Ribeiro, "Path Optimization for Rhombic-Like Vehicles: An Approach Based on Rigid Body Dynamics, accepted for presentation in the 15th IEEE International Conference on Advanced Robotics (ICAR 2011), Tallinn, Estonia, June 20-23, 2011.