La ricerca e l'industria italiane nel settore nucleare

Sapienza Università di Roma, Facoltà di Ingegneria

12 Aprile 2019

VITROCISET
a LEONARDO company

SUMMARY

- COMPANY OVERVIEW
- BU SPACE & BIG SCIENCE
- KEY PROGRAMS
  - ITER
  - F4E
  - CNISM-INFN
  - ESS
  - INFN

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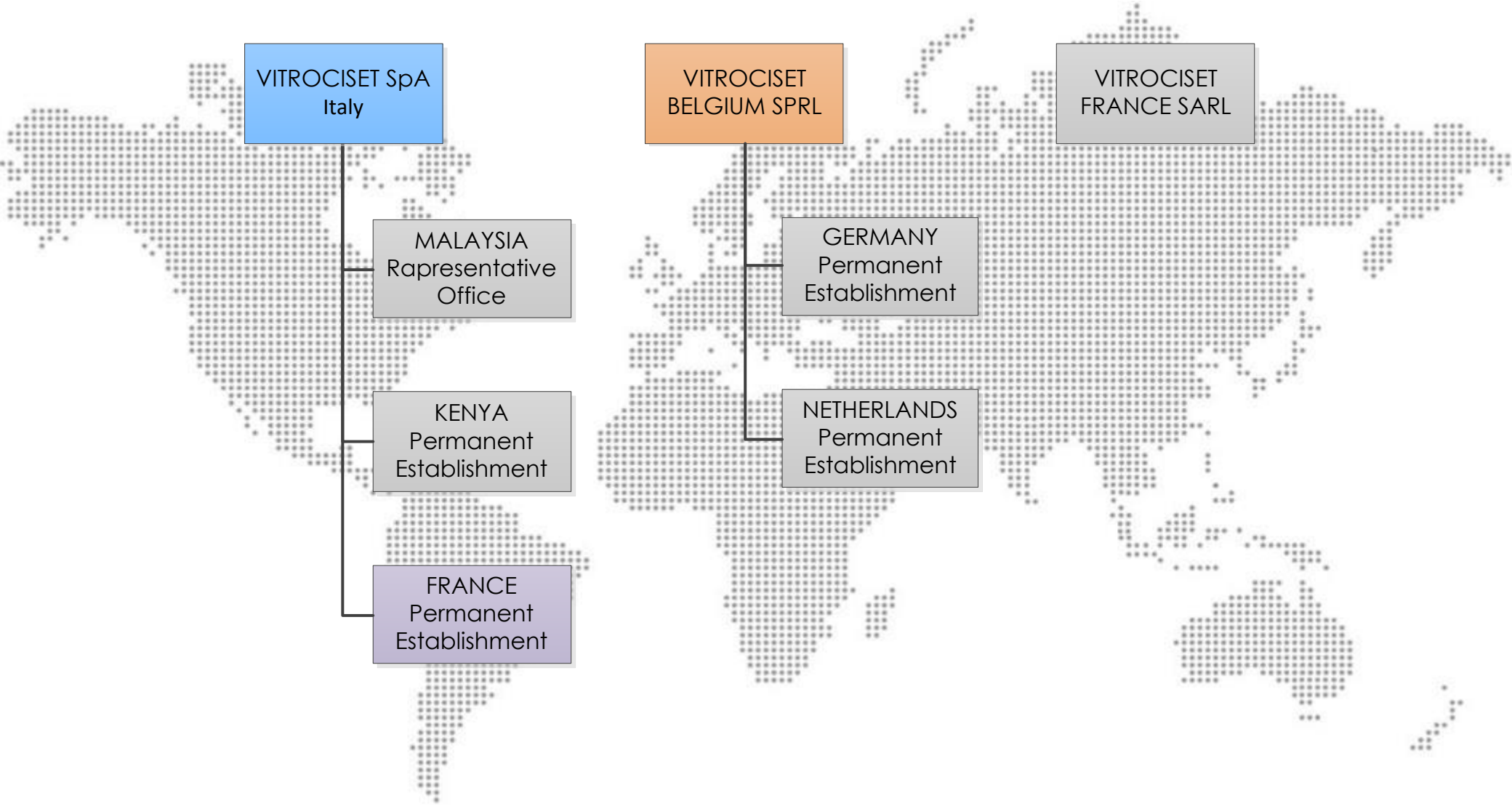
VITROCISET AT-A-GLANCE

VITROCISET AT-A-GLANCE
WORLDWIDE PRESENCE

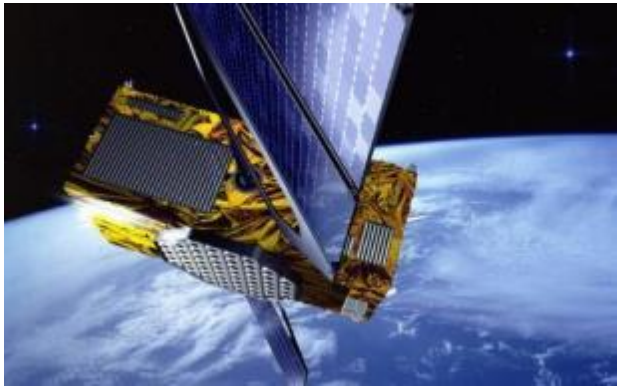


VITROCISET AT-A-GLANCE
BUSINESS SECTORS

DEFENCE & SECURITY

Supporting the armed forces in the complex process of modernization and transformation, through mission and logistic support, training, and systems engineering.

Providing secure fixed and mobile communication networks to connect professional users. Protecting critical assets against physical-cyber attacks.



SPACE & BIG SCIENCE

Developing ground segment and satellite missions systems, providing high value added services and solutions in critical domains such as Space (telecommunications, navigation and localization, earth observation), and Big Science.

TRANSPORT & INFRASTRUCTURES

Providing solutions, systems and services to enable the highest levels of efficiency, reliability, safety and security for infrastructure and transportation market.

➢ JANUARY 2019 VITROCISET IS PART OF LEONARDO COMPANY

LEONARDO

Global high-tech company and one of the key players in **Aerospace, Defence** and **Security**. Headquartered in Rome, the Company has a significant industrial presence in four domestic markets (**Italy,** the **United Kingdom,** the **United States** and **Poland**) as well as strategic partnerships in the most important high potential international markets.

➢ AUGUST 2018 OPENING OF VITROCISET BRANCH

Mar 2019: **16** employees:

- **13 engineer** (Mechanical, Electric, Nuclear, Control & Automation directly **working in ITER project, 100% on site**.
- **11 working for FC 6-181**, several task orders!

Branch Office Vitrociset S.p.A.
LOT 112 ZAC Rourabeau -
13115 SAINT PAUL LEZ DURANCE
tel. +33.04.42.63.75.97

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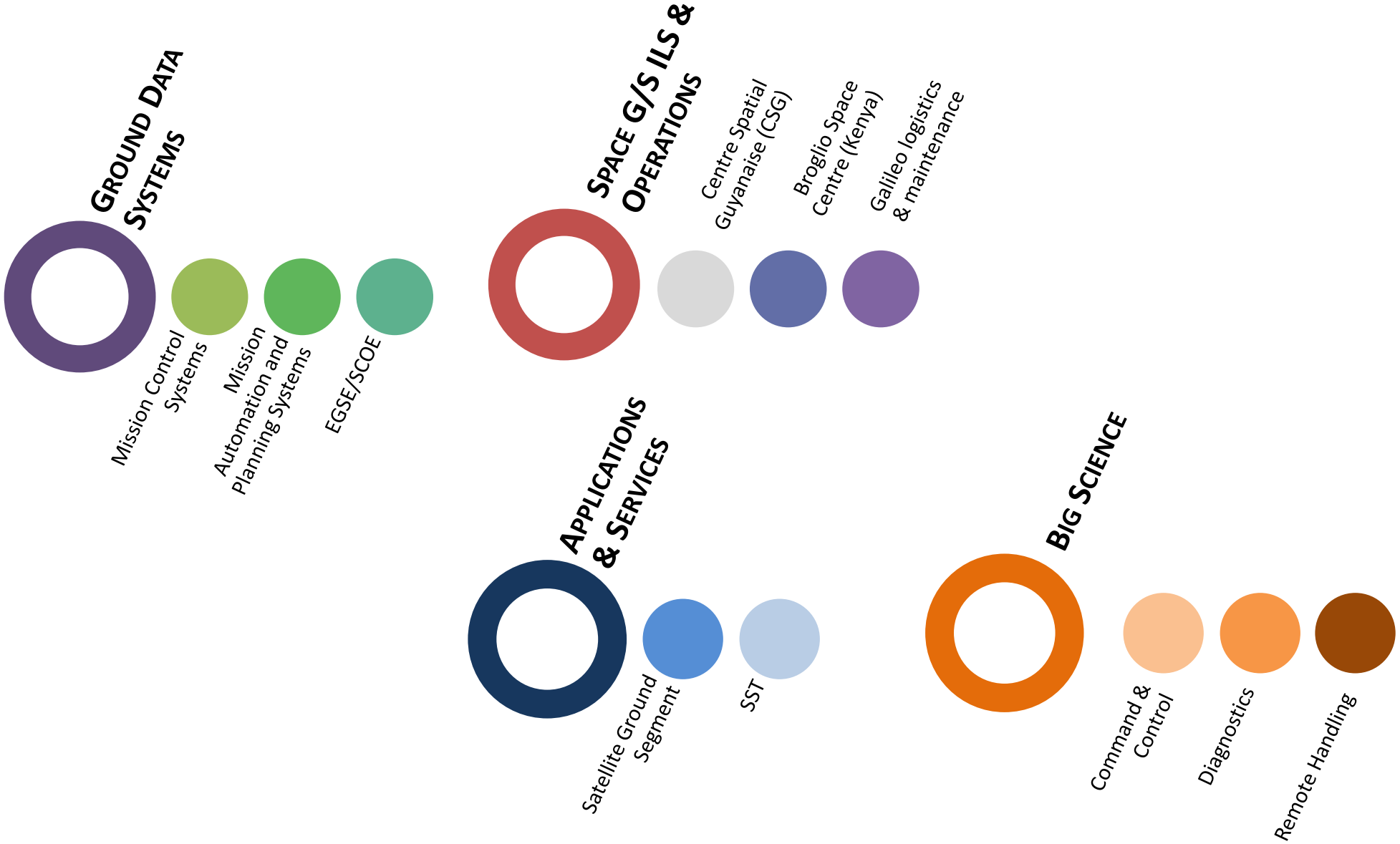
BUSINESS UNIT
SPACE & BIG SCIENCE

SPACE & BIG SCIENCE
ACTIVITIES AND PROGRAMS



BIG SCIENCE
ACTIVITIES

- **ITER Organization**: Engineering Support for Engineering Support for Plant Control Systems and Nuclear Safety and Diagnostic System. Design and Development of Remote Handling Supervisory Control System.
- **F4E**: Engineering Support for System, Instrumentation and Control Engineering Support
- **CNISM – University of Calabria**: design, implementation and commissioning of STAR Control System
- **ESS Organization**: 3 framework contracts
  - Provision of EPICS Infrastructure and Integration, HW and SW Services for the Control System
  - Provision of Software Development Services for ESS Integrated Control Systems
  - Technical Consultants and Services
- **ENEA**: R&D activities on TOP-Implart Monitoring and Control System (Proton Therapy LINAC)
- **INFN**: design, implementation and commissioning of SIS-100 quadrupoles magnet test-bench

CNISM	STAR CONTROL SYSTEM
ITER ORGANIZATION	CODAC, Heating and Diagnostics
European Spallation Source	Engineering support
ENEA	Signed Agreements
Fusion for Energy	Engineering support
INFN	SIS-100 Magnets test bench

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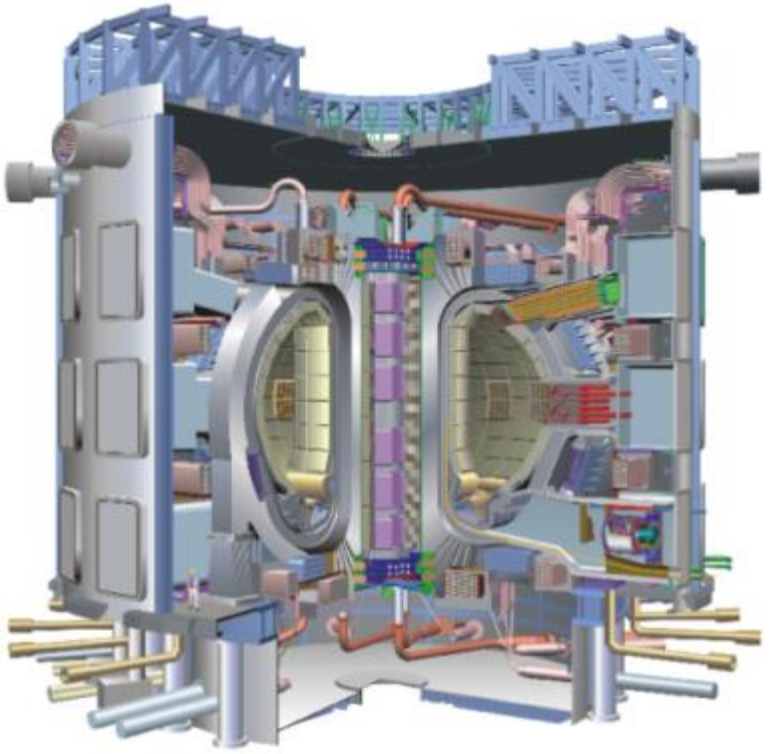
BIG SCIENCE ACTIVITIES

ITER CODAC Core System development

In 2012 Vitrociset has signed a contract with ITER Organization for ***Engineering Support for Plant Control Systems and Nuclear Safety***, providing the following professional skills:

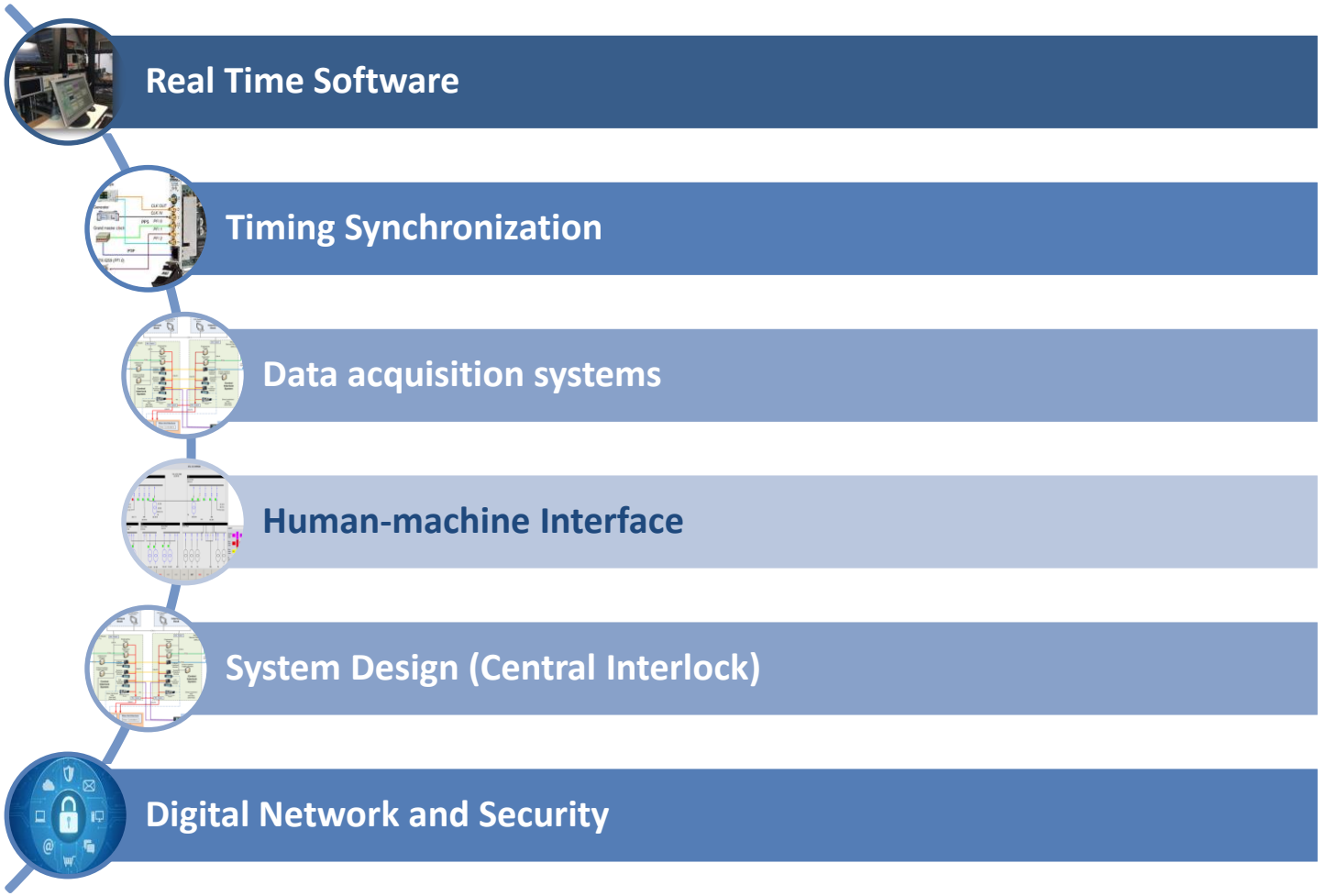
- Interlock system Engineer
- Digital Network Engineers
- Software Engineers/Developers



2 permanent staff @ ITER Premises,

some activities executed @ Vitrociset lab in Rome

ITER CODAC Core System development



In consortium with

CONSORZIO RFX
Ricerca Formazione Innovazione

Istituto
di Fisica del Plasma
"Piero Caldirola"
Consiglio Nazionale delle Ricerche

LTCalcoli.it

In September 2016, **Vitrociset** has signed 6 years framework contract for ***Diagnostic System Engineering Services*.**

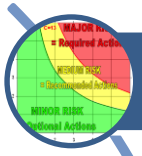
30 task orders :

- 11 Completed
- 15 Running
- 2 in evaluation phase
- 2 in offer phase

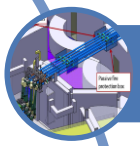
Currently@ ITER premises:

- ***11*** *Engineers as permanent staff of the new Branch Office in St. Paul Les Durance*

ITER Diagnostics



General Diagnostics Engineering with ability to cover issues from sensor to data analysis

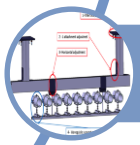


Expertise in concept, design, realization, interface definition and documentation of Plasma diagnostic systems

Ex vessel electrical services design and procurement

Magnetics systems design

Diagnostics Windows systems specification and development for nuclear environment



Spectroscopy systems design, development and integration

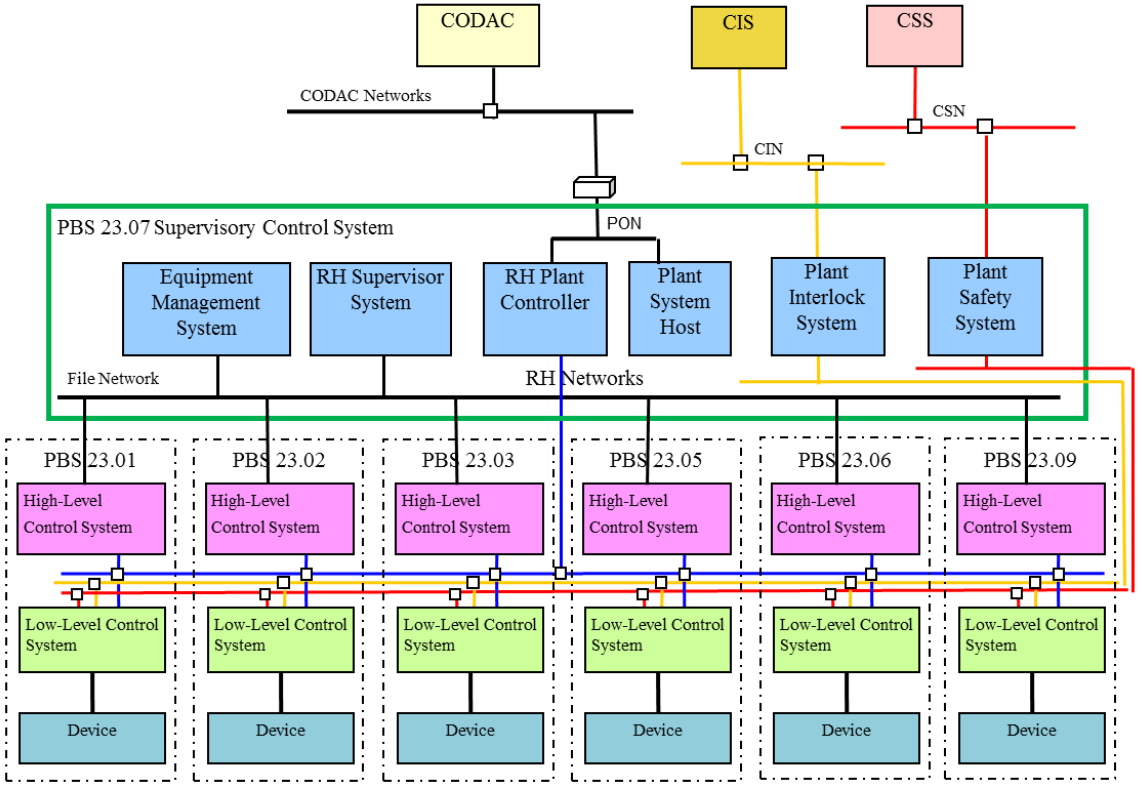
Development and integration, diagnostics engineering interfaces resolution in complex environments

ITER Remote Handling Supervisory Control System

In August 2018 Vitrociset has signed a contract with ITER Organization for **Design and Development of Remote Handling Supervisory Control System**.

This contract involves the following professional figures:

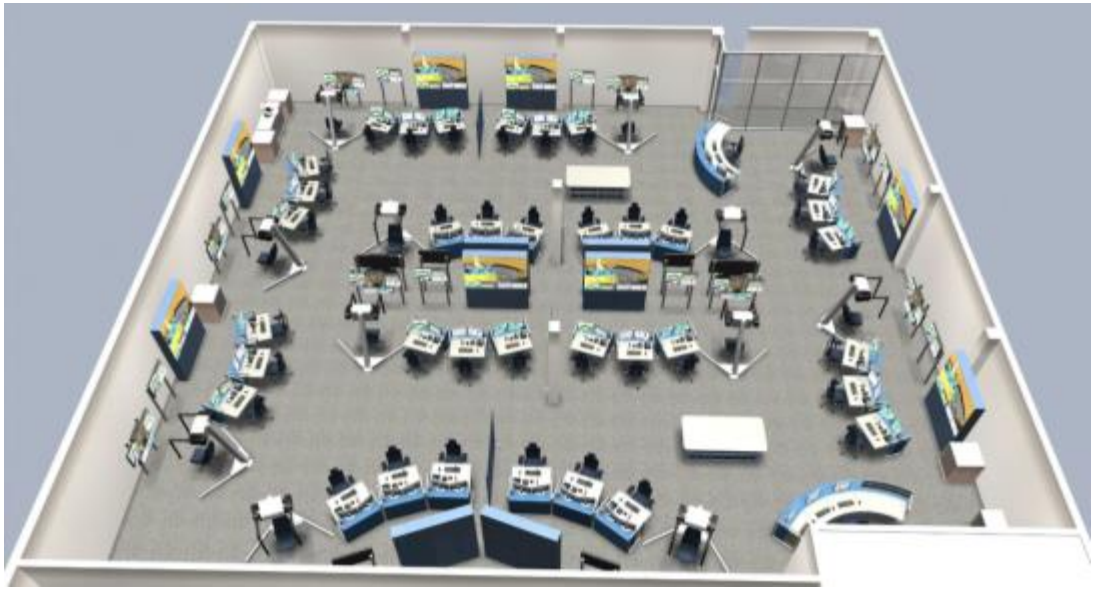
- System Engineers
- Software Engineers
- Software Developers
- Network Experts



ITER Remote Handling Supervisory Control System

RH Supervisory Control System is used to:

- Schedule, execute and analize the RH maintenance campaign
- Receive and dispatch alarm, messages and commands from/to ITER Main Control Room



The RH control system architecture needs to support two operational viewpoints:

- Central monitoring and coordination of ITER plant process from the Main Control Room.
- RH operators control of remote maintenance tasks from the RH control room

In cooperation with:

- Consortium CREATE (Italy)
- IPFN-IST (Portugal)

Vitrociset has signed in January 2016 a framework contract (duration 2 + 2 years) for:

PROVISION OF SYSTEM, INSTRUMENTATION AND CONTROL ENGINEERING SUPPORT

Six task orders have been assigned, involving 5 permanent staff @ F4E premises in Barcelona (Vitrociset S.p.A., Vitrociset Belgium and CREATE)

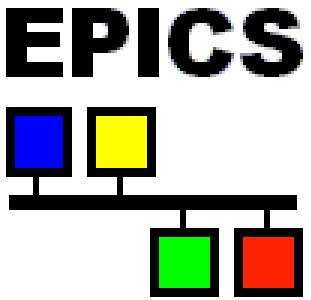
STAR Control System

Southern Europe Thomson Back-Scattering Source for Applied Research (STAR) Source is a **compact hard X-ray source** designed by INFN for advanced applied materials-science research. Emitted from a 10 µm source, the X-rays are tunable in the 10 – 200 keV range, monochromatic and collimated.

The **STAR Control System** (SCS) has been designed to meet the need of monitoring, controlling and computing data from all STAR accelerator facility: safety, plant operations subsystems, diagnostics.

The core of the **EPICS** (Experimental Physics and Industrial Control System) has been chosen as the basis for the control system architecture.

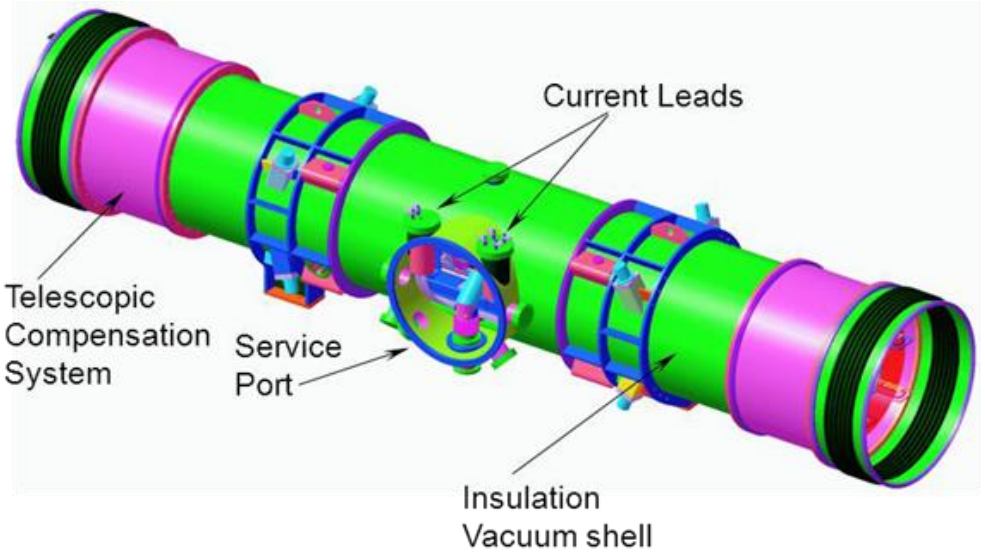
The control system is **modular**, incrementally upgradeable, **scalable**, and extendable in order to accommodate the build-up of the accelerator and beamlines from early testing, through installation and commissioning and during the life of the facility, without impacting the performance



EUROPEAN SPALLATION SOURCE

- From April 2017, Vitrociset is providing support for the design and integration of the Control System for the ESS accelerator. The Control System consists of both control equipment (e.g. Power Supply, PLCs, fieldbus sensors) using different standard industrial protocols (e.g. Profinet, MODBUS, EtherCAT) and beam diagnostic equipment (i.e Faraday Cup, Beam Current Monitor, Emittance Meter Unit, Doppler Shift Measurement and Non-invasive Profile Monitor).
- Support service consists in provisioning of
  - ✓ engineering support for the design, development and integration of the Control System based on the EPICS framework.
  - ✓ planning, monitoring and coordination with the different ESS In-Kind partners involved.
  - ✓ technical documentation and participate to project reviews.
  - ✓ Conduct FAT and SAT

SIS-100 Quadrupole Modules Test Bench



- The M&CS shall control and supervise the site acceptance tests (SATs) of the **quadrupole modules (QM)**. Tests are concerning electrical, hydraulics and thermal measurements in both room temperature and cryogenic conditions.

SIS100, the main accelerator of the research facility FAIR (@GSI Darmstadt), is a heavy ion synchrotron with 1084 m in circumference at 12.5 m underground. Magnets are essential components of circular accelerator facilities, directing and holding the particles on their circuit. the SIS 100 ring accelerator is equipped with **superconducting magnets.**

The quadrupole units, weighing tons, consist of a superconducting quadrupole magnet that is combined in a variety of arrangements with superconducting sextupole and steering magnets. These units are being manufactured and factory tested in Dubna (Russia).

Thanks for your attention

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