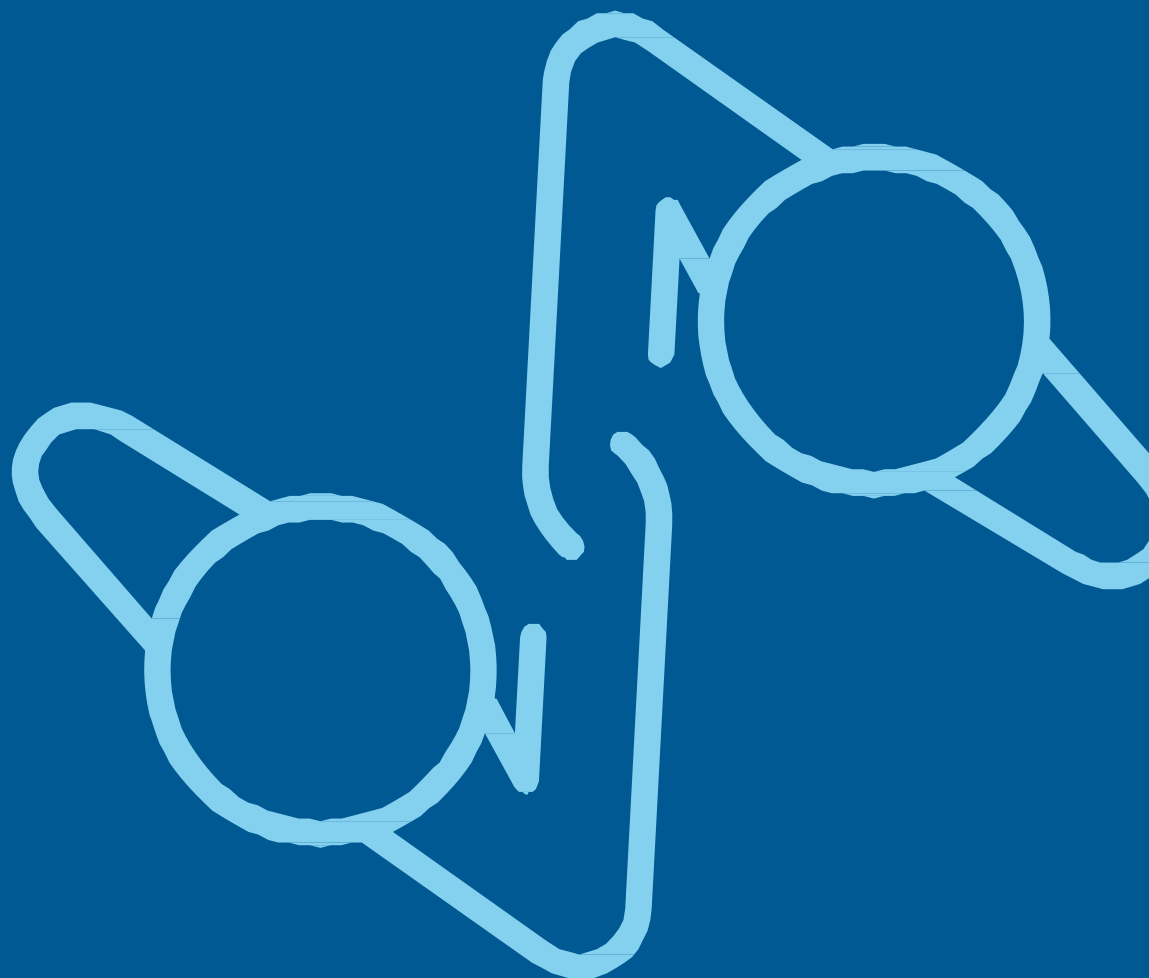


European Science Solutions Company Profile



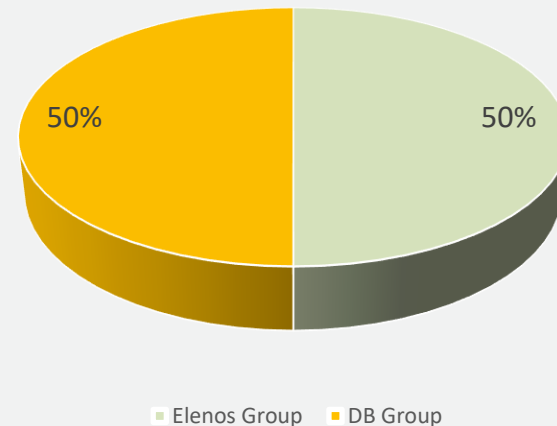
About European Science Solutions

European Science Solutions company is owned, fifty and fifty, by the two most important Italian RF technology providers, **DB Group** and **Elenos Group**.

DB Group is composed by **DB Elettronica Telecomunicazioni SpA**, **DB Asia Pacific PTE LTD**, **DB America LLC** and **Screen Future srl**

Elenos group is composed by **Elenos srl**, **Itelco Broadcast srl**, company funded in consequence of the Electrosys acquisition, **Binary Core srl**, **ProTelevision Technologies**, **Elenos group latam** and **Broadcast Electronics LLC**

European Science Solutions



About European Science Solutions

The main heritage immediately available to European Science Solutions, is the largest expertise capability and knowledge background available worldwide, that has realized the most important RF scientific technology solutions along the last twenty years

- **Capability**, we cover technology knowledge on cavity-tube and solid state RF generators, driver amplifiers, switching power supplies
- **Experience** over twenty years for cooling system, liquid and air cooled
- **Productions facilities**, in four different locations, one in Padova, one in Roma and two in Orvieto. Peculiarity of Orvieto facilities is Electricity Feeding capable to provide up to 400kw continuous power, just to enable the equipment burn in operation at full power.

About European Science Solutions

- **Quality Management System** already implemented in order to keep under control external and internal factors that may have an influence on the conformity of the products produced



About Elenos Group

Elenos was founded in **1977** in Ferrara, Italy

- Focused on providing a wide range of FM transmitters, featuring the most compact products on the market (First in the world to provide a 10KW FM in 4U only)

Itelco Broadcast began in **1962** in Orvieto, Italy

- Specialized in digital modulation and high-power liquid-cooled systems. (Supplier of CERN for High-power amplifier involved on the Large Hadron Collider)

Binary Core born in **2006** in Milano, Italy

- Based on a solid technical experience derived from Modem Lab at the Politecnico di Milano, with a profitable and continuous exchange between business and universities, skills on FPGA and SoC DESIGN devices



About Elenos Group

ProTelevision Technologies, Denmark, with over **50 years of experience**

- Formerly Philips TV & Test Equipment, is a leading designer and manufacturer of advanced future-proof modulation solutions for Digital TV and Radio standards (DVB-T/T2, ISDB-T, DAB+, ATSC 1.0 and ATSC 3.0)

BE was established in Quincy, Illinois in **1959**

- Broadcast Electronics has an illustrious history that has played an influential role in many radio milestones. **BE** offers a wide range of highquality radio broadcast products, including automation software and transmitters for AM, FM and HD Radio.

Elenos group latam was established in Miami

- Elenos group latam is an internationally well-known distributor of broadcasting equipment.



About Elenos Group



About DB Group

DB Elettronica Telecomunicazioni was founded in **1975** in Padova, Italy

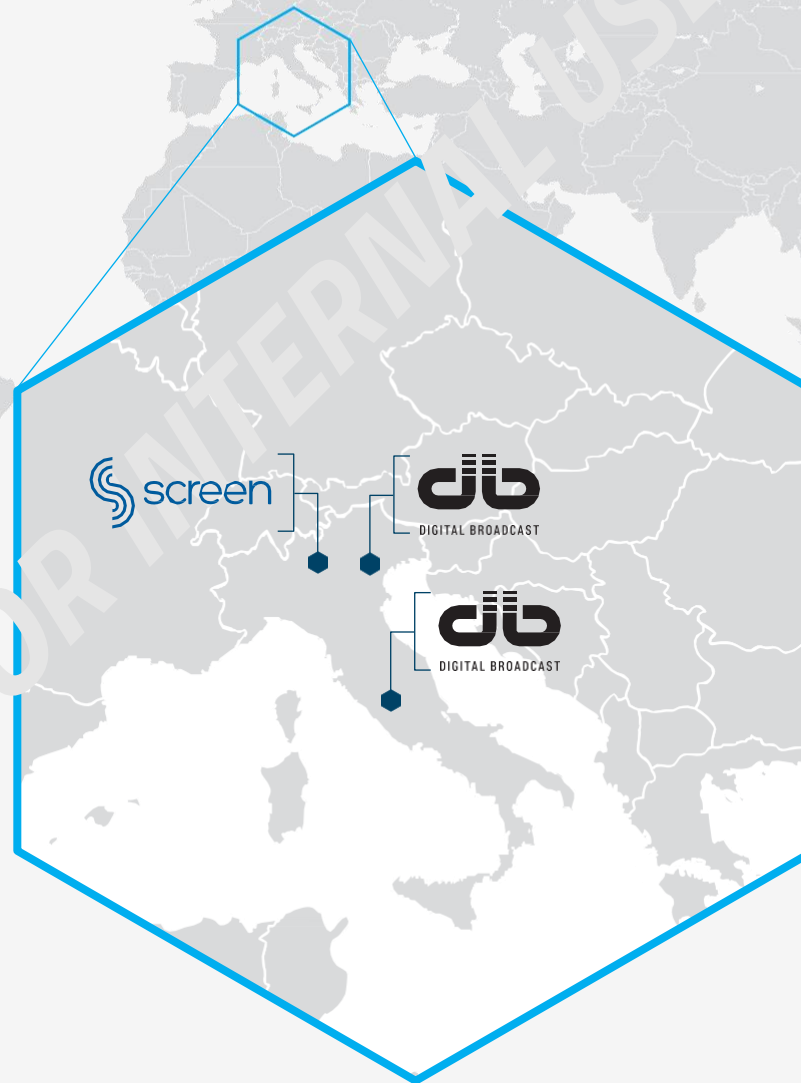
- It's a world leader in communication products, systems, and services for government and private FM and TV customers and in advanced scientific applications. With additional offices in Rome, Miami, Singapore and many worldwide sales and service locations, DB Group assures immediate delivery of products, systems and instant service on every continent.

Screen Future has the headquarter in Brescia and the facilities in Milan, Padova and Rome

- It's a leading company in development, manufacturing and selling of complete multi-standard solutions for digital TV broadcasting.



About DB Group



About Elenos and DB

The size of the Elenos Group

Aggregate Turnover **25.000** (euro/000)



123 employees
or stable co-worker

The size of the DB Group

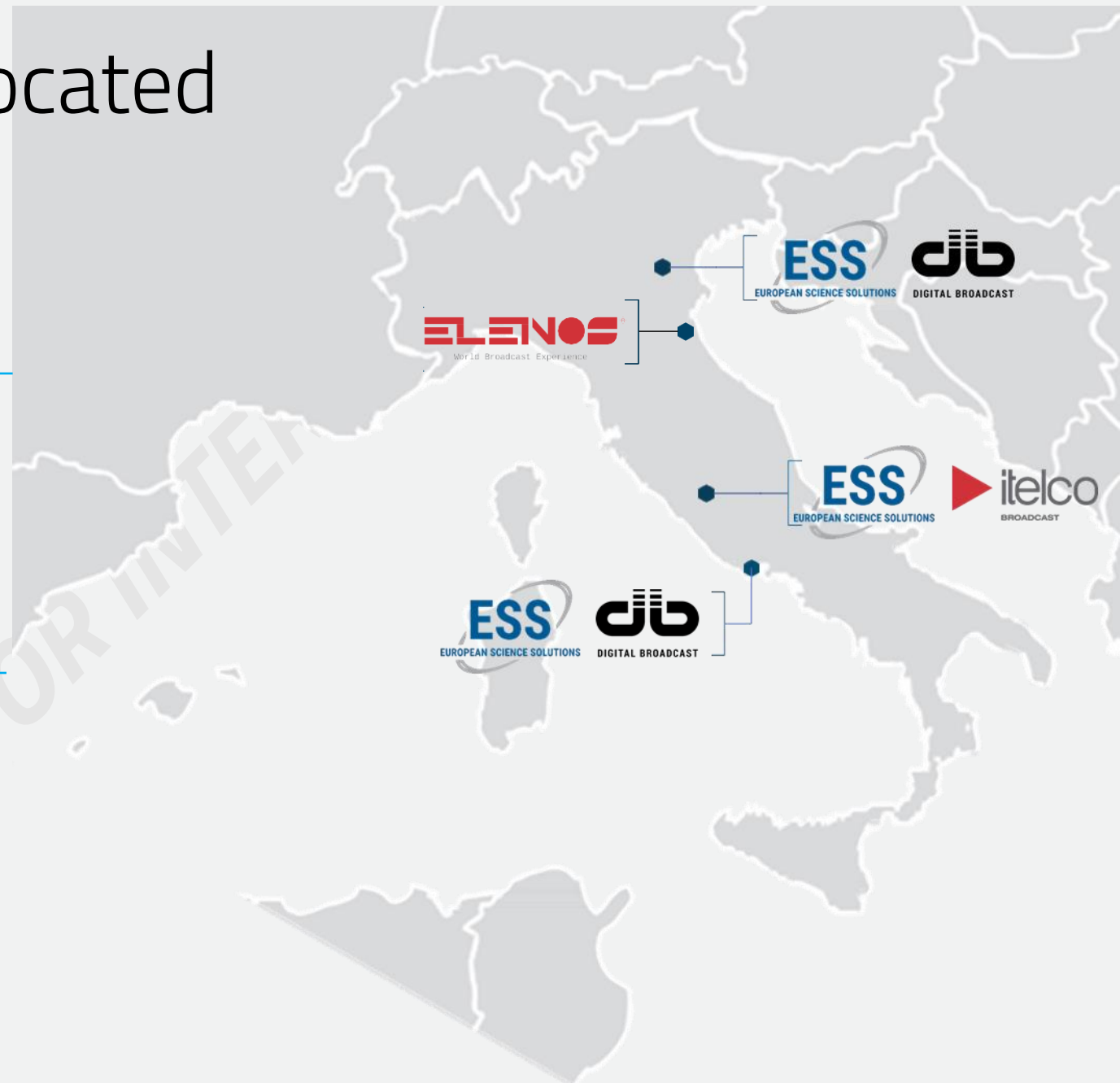
Aggregate Turnover **10.500** (euro/000)



60 employees
or stable co-worker

Where ESS is located

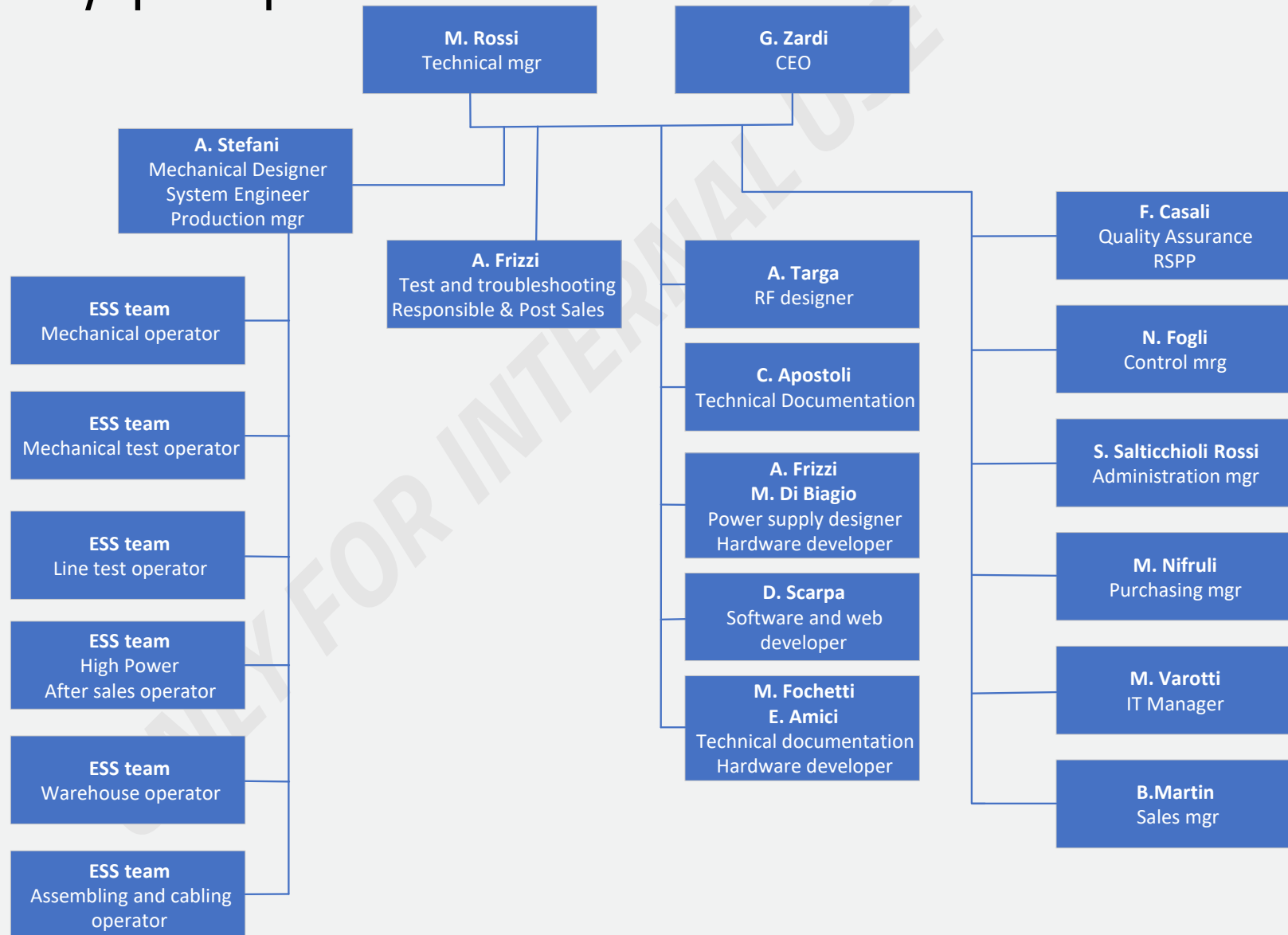
- **Padova** is the DB head quarter, DB production facility and ESS reserved competence area
- **Orvieto** is the Elenos Group head quarter, Itelco production facility, including ESS reserved competence area, ESS head quarter and production facility
- **Roma** is the DB laboratory, DB production facility and ESS reserved competence area



Business flow



ESS key people



ESS activities and process flow

Production flow

managed by the **ERP System** (SAM) already active which will allow to:

- Create the **product documentation** (Bill Of Material)
- **Manufacturing** activities **plan**, delivery schedules and purchasing activities (MRP)
- **Identify** and **trace** the products at each stage of their production cycle. All activities related to the management of the product/service are identified and are traceable by means of coding
- Manage the **Non-Compliance** through the necessary corrective actions (Not conformity database, KPI analysis)
- **Stock management** to ensure the materials in the warehouse are appropriately identified and stored
- **Manage administration** activities as invoices, payments and shipping

ESS activities and process flow

Material Procurement and Purchase Dpt

- Both Elenos group and DB purchase depts will be used for the preliminary management of the suppliers
- The ESS organization will manage:
 - The new suppliers qualification to ensure they are able to offer goods and services that meet the technical, economic and qualitative requirements
 - The monitoring of processes, products and services provided from the suppliers, ensuring the quality of supplies.

Communication

- A complete report system (bill of material, Gantt diagrams, schematic, etc) to make easier the exchange of information and to keep people updated about the progress

ESS activities and process flow

Measurement test instruments and power connections

Based on the Elenos group and DB facilities, ESS already has all the equipment to perform measurements and calibrations

- probes
- multimeters
- peak power meters
- spectrum analyzers
- oscilloscopes
- network analyzers
- power analyzers
- RF generators
- sync generators
- pressure meters
- thermo camera
- fuse testers
- dummy loads
- deionized water cooling systems
- RF attenuators
- RF mixers
- power supplies loads
- Climatic chamber

Measurement test instruments



Measurement test instruments



ESS activities and process flow

Production area and recovery production plant

- Dedicated areas have been assigned in all production sites (Padova, Orvieto and Roma)
- To ensure a high production flexibility and the delivery on time, **all produced parts by DB will be produced even by Elenos group and viceversa**

The main working areas available in each plant are:

- **Low Power Area**

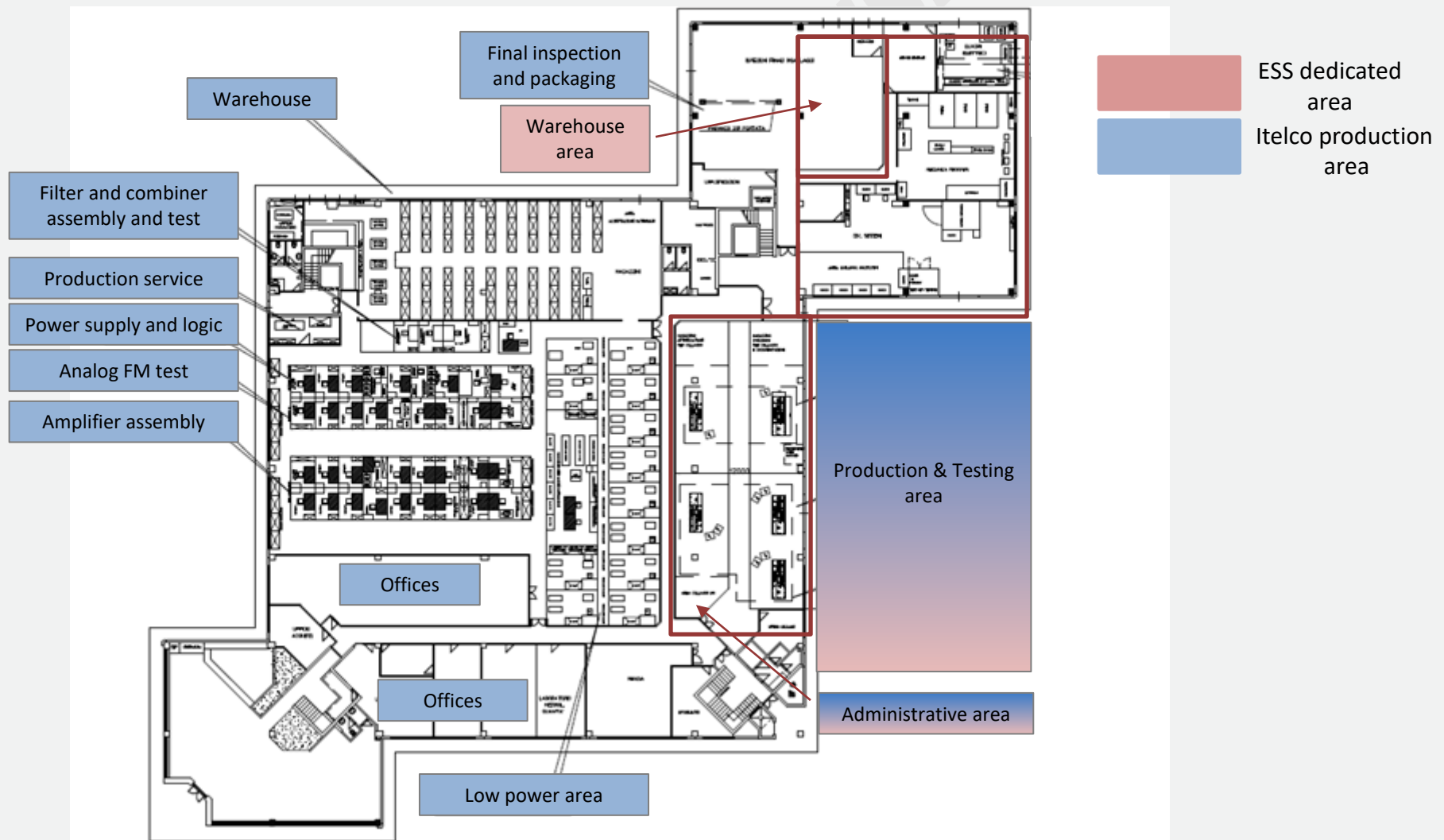
equipped with 8 working-areas used for the modules assembling, control, measurements, final testing.

Each single working-areas is equipped with a single-phase line with 2.6 kW max capacity and a common line of 6 kW three-phase.

- **High Power Area**

divided into 5 multi-purpose areas where to assemble and test the whole system. Equipped with independent liquid cooling 4/way exchanger, provided with 400kW a.c. line power.

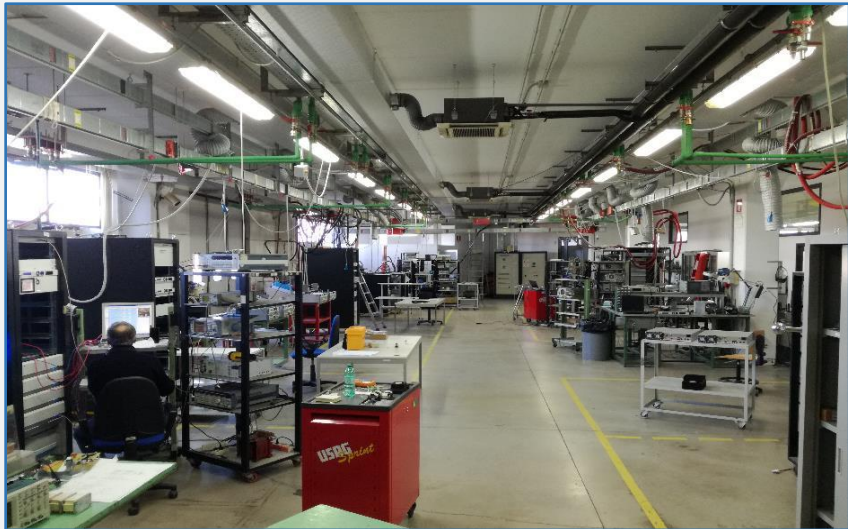
Production Area Layout (Orvieto site)



Production Area Layout (Orvieto site)



Production Area Layout (Orvieto site)



Production Area Layout (Orvieto site)

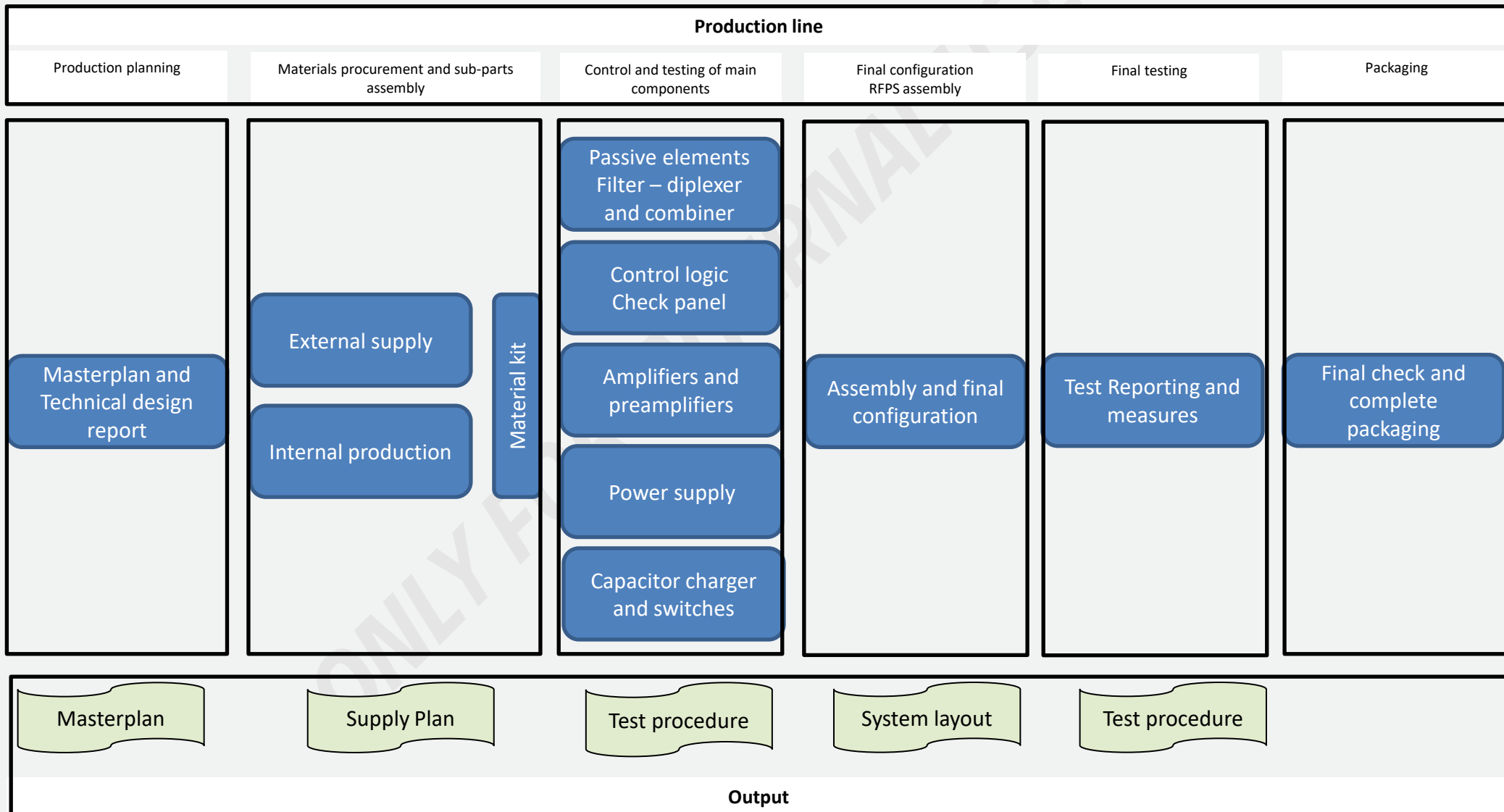


Production steps

The main steps of the production are:

- The planning based on the customer road/map (**Masterplan**)
- The material procurement from external suppliers (**Supply Plan**)
- The control and testing activities on the sub/parts of the final product (**Test procedure**)
- The assembly and final configuration
- The final testing stage and the relevant final reports with measurements (**Test procedure**)
- The packaging and delivery

Production steps



Other services: Training

- Being highly specialized in technology systems, ESS suggests and proposes to carry out training to the staff involved in the installation.
- The course could enable the station personnel to achieve a necessary level of competence in installation, maintenance, operation, troubleshooting and repair of units and the relative sub-parts.
- Training course could include instructions on how to operate with test equipment, replacements and regulations/settings.
- Training could be in English language.

References

	2000	2006	2007	2010			
Customer	INFN	GANIL	ELETTRA	CERN ORGANIZATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE	INFN	GSF HELMHOLTZZENTRUM FUR SCHWERIONENFORSCHUNG	EBG MEDAUSTRON GMBH
Country	ITALY	FRANCE	ITALY	SUISSE	ITALY	GERMANY	AUSTRIA
System	RF AMPLIFIER 100W 150W 300W 600W 1KW 250KW CW 500KW PULSED 175MHz SOLID STATE AMPLIFIER 5x125KW CW 352MHz	RFAMPLIFIER 10KW 20KW 70KW 88.05MHz	RF AMPLIFIER 2x80KW CW 500 MHz 2-WAY SWITCHLESS COMBINER	RF AMPLIFIER 60KW PULSE 352 MHz SOLID STATE AMPLIFIER 100x800W CW 10kHz - 200MHz	RF AMPLIFIER BI 12,5 KW CW 73.6 MHz	RF AMPLIFIER 10KW 107MHz 5KW 216.816 MHz	RF AMPLIFIER 1KW CW 10kHz - 50MHz

References

	2011		2012	2014	2015	2016	2017
Customer	CERN ORGANIZATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE	GOETHE UNIVERSITAT FRANKFURT AM MAIN	GSI HELMHOLTZZENTRUM FUR SCHWERIONENFORSCHUNG	IMPERIAL COLLEGE	UPPSALA UNIVERSITY	INTER UNIVERSITY ACCELERATOR CENTRE	CERN ORGANIZATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE
Country	SUISSE	GERMANY	GERMANY	LONDON	SWEDEN	INDIA	SUISSE
System	RF AMPLIFIER 9x60KW CW 800 MHz	RF AMPLIFIER 40KW 325MHz	RF AMPLIFIER 5x12KW 107MHz	RF AMPLIFIER 3x8KW PULSED 324MHz	RF TUBE AMPLIFIER 2x400KW PULSED 352MHz	RF AMPLIFIER 2x20KW 97MHz	RF AMPLIFIER 6x300W CW 400 MHz 2x60KW CW 400MHz

References

		2019-2021
Customer		INFN
Country		ITALY
System		RF AMPLIFIER 26x400KW 352 MHz

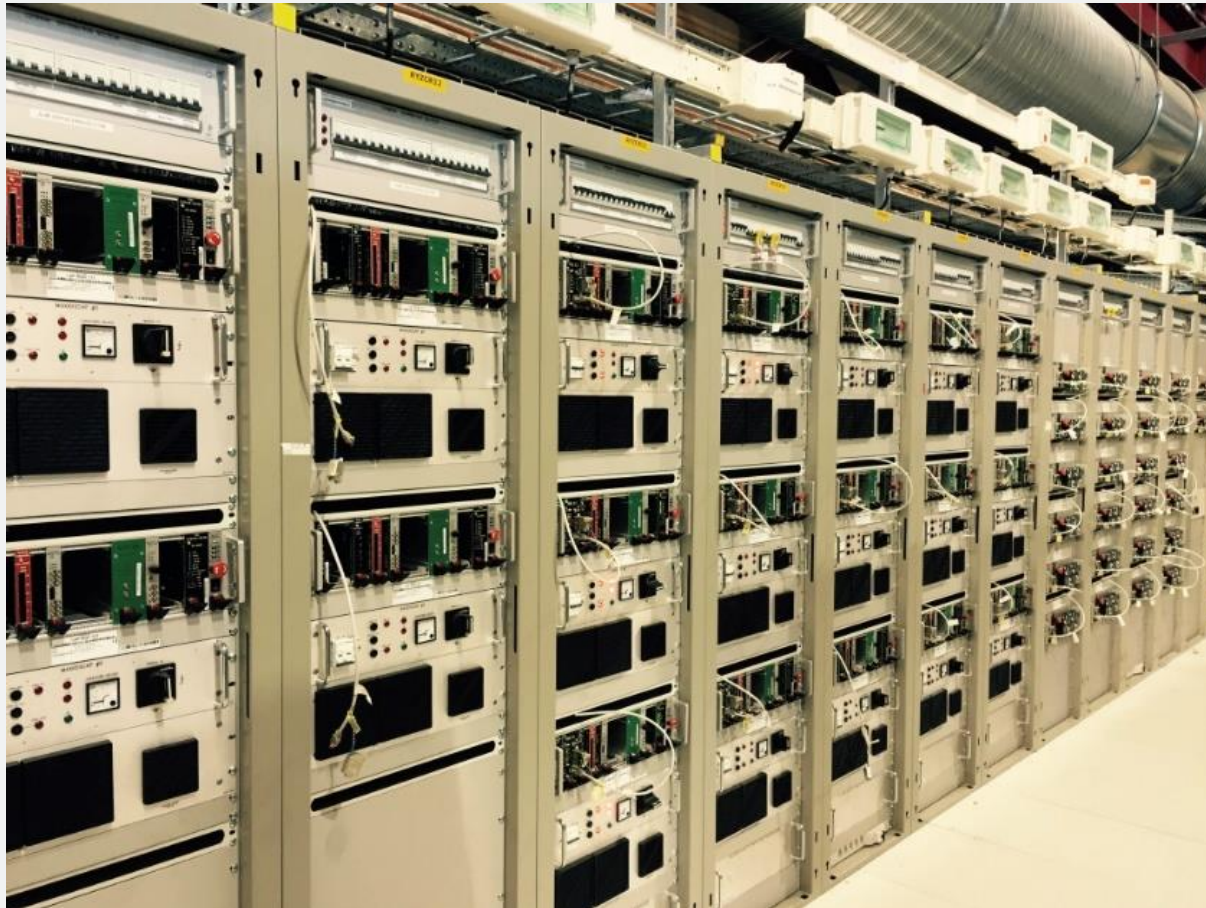
Our creations



Our creations



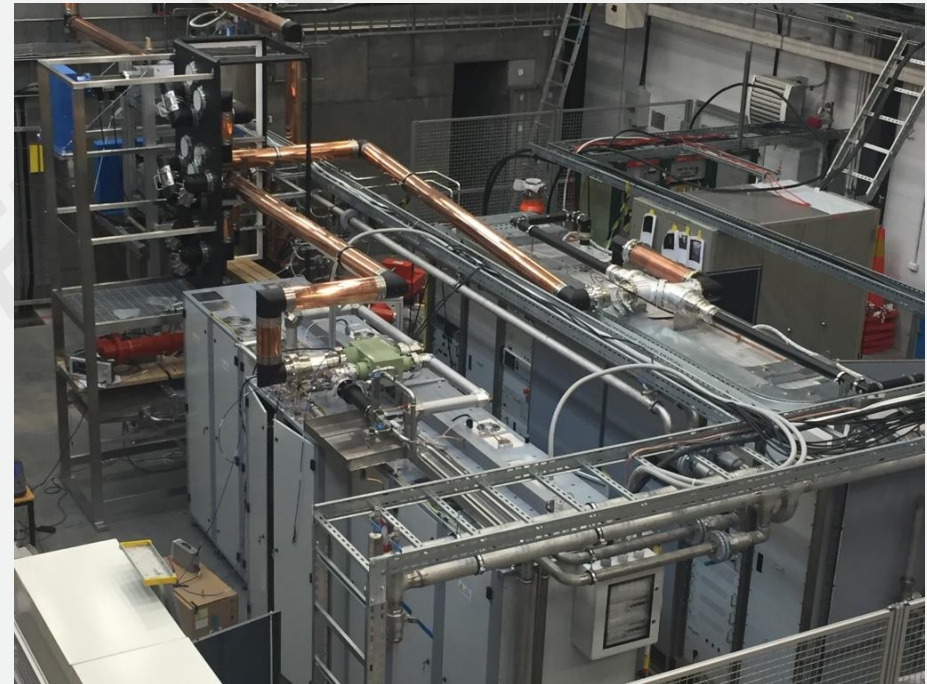
Our creations



Our creations



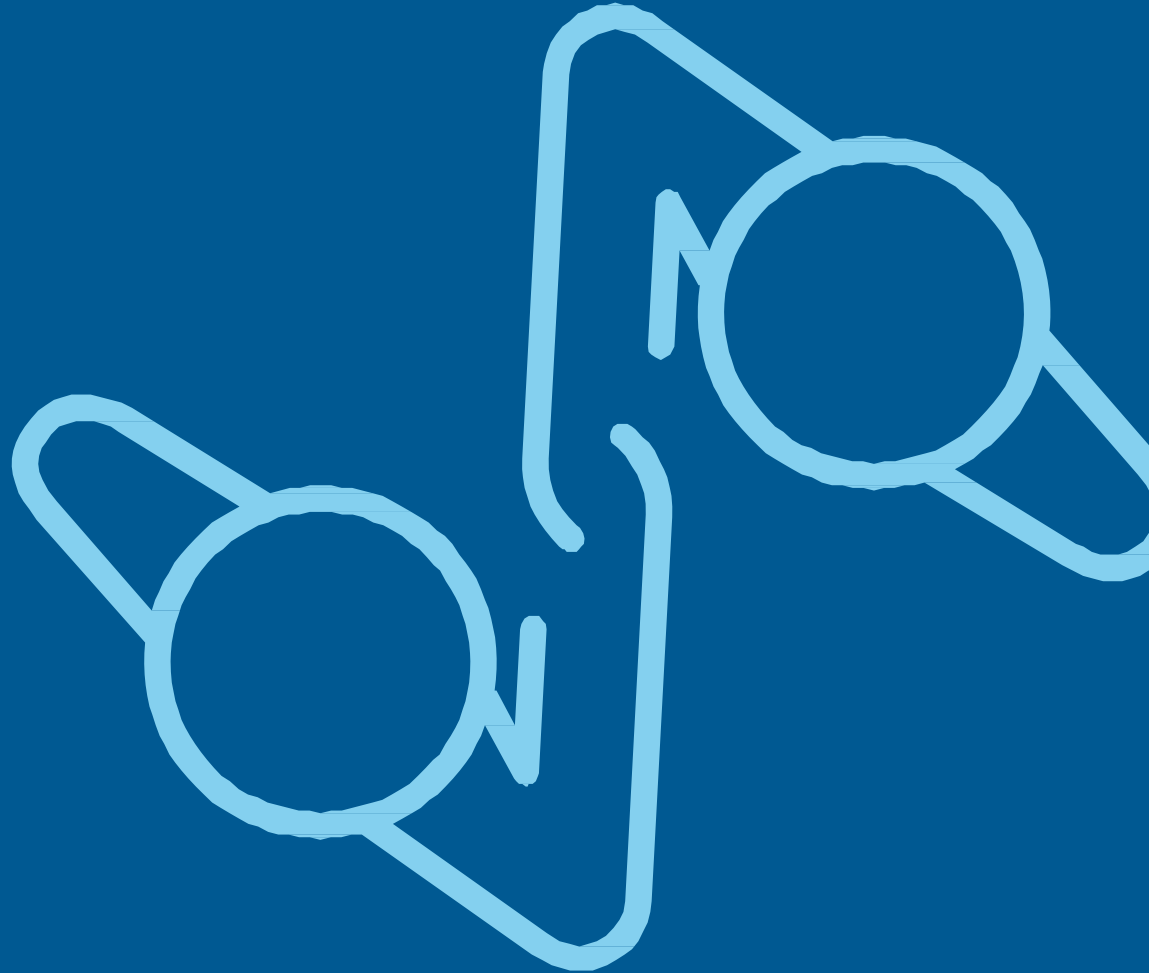
Our creations



Thank You

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ESS
Headquarters:

05018 Via Dell'Innovazione 4 - Orvieto TR - Italy Telephone +39 0763 96
03 30

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