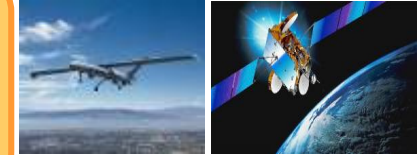




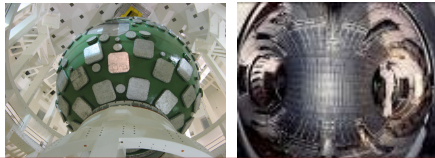
## Microwave and Imaging Sub-systems

## Radio Frequency & Microwave sources

Space, telecoms, TV and radio broadcast, defense, security/NDT, science



Traveling Wave Tubes, grid tubes, X-ray sources, klystrons, gyrotrons  
Space amplifiers, transmitters, atomic clocks, ion thrusters



## Large Instruments

Scientific applications for civil and defense markets

Couplers, energy storage, high power amplifiers  
Design, development and integration of systems

## Radiology

Radiography, fluoroscopy, 3D dental imaging, veterinary, security/NDT



IIR, imaging units, flat digital detectors  
Complete imaging solutions

# RF & Microwave sources – Large Instruments

## Communication

Space - Telecoms  
Uplinks and downlinks  
TV radio broadcast



Traveling Wave Tubes  
Grid tubes  
Space amplifiers  
Ion thrusters  
Atomic clock

## Defense

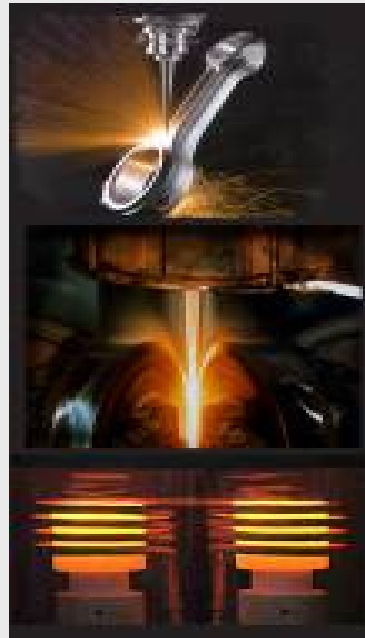
Radars  
Counter-measures  
Missiles  
Datalinks



Traveling Wave tubes  
Transmitters  
Klystrons, CFAs,

## Industry

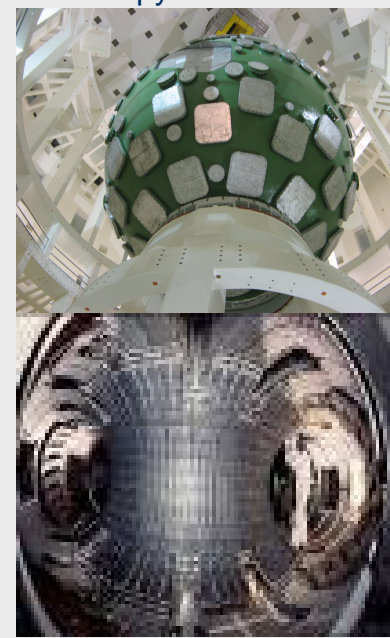
Laser  
Industrial heating  
Sterilisation  
Non Destructive Control



Grid tubes  
X-ray tubes  
X-ray detectors

## Science

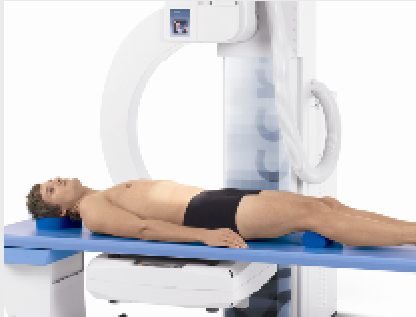
Light sources  
Accelerators  
Thermo-nuclear Fusion  
High power lasers  
Therapy



Power tubes and amplifiers – klystrons, gyrotrons, tetrodes...  
Energy storage, couplers  
Accelerators

## Radiography

General radiography  
RAD room (bone/chest)  
Tables and mobiles



Large-format flat digital detectors  
Portable (WiFi) flat digital detectors  
Digital X-ray imaging sub6systems

## Radioscopy

Radiography / Fluoroscopy  
Surgical mobiles  
- Cardiovascular  
- Neurology, urology  
- 3D dental imaging (CNCT)



Flat digital detectors  
Conventional imaging units  
CCD cameras  
Digital X-ray imaging sub6systems

## Other applications

Veterinarian Radiology  
-Fixed and mobile equipment  
Security / NDT  
- Industrial radiography  
- Suspicious object control



Flat digital detectors  
X-ray tubes  
Conventional imaging units  
CCD cameras  
Associated software

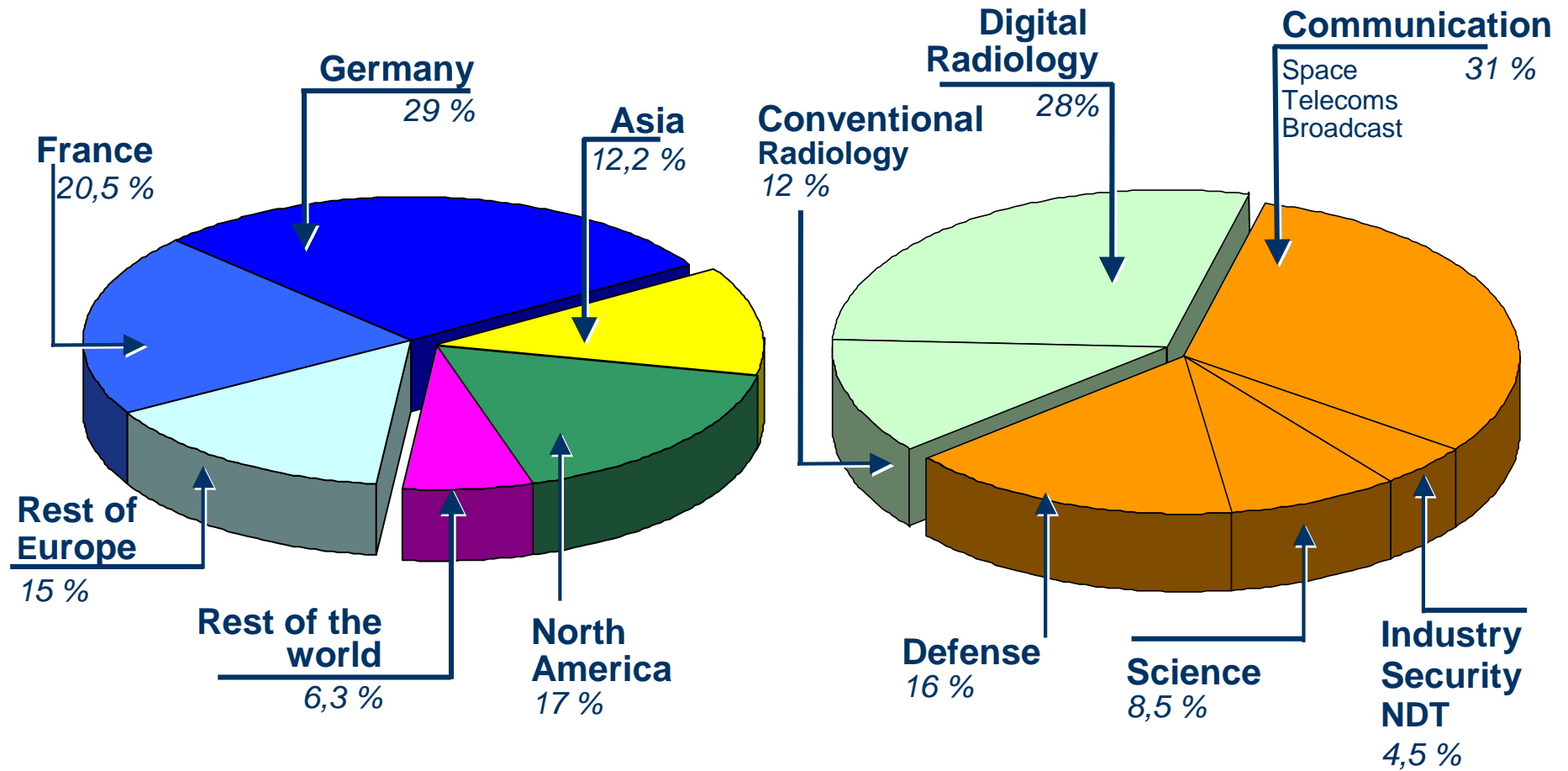




- **Sustainable presence:** over 60 years of experience in the design and manufacture of microwave tubes and image intensifiers
- **High technology:** 10 patents per year (167 valid industrial patents) - mastering key technologies - 2D 3D electron trajectory in vacuum, very high voltage, thin layer deposition, deposition of emitting materials...
- **Know-How:** mastering processes and manufacturing methods of products sometimes unique in the world
- **Expertise:** Design and delivery of prototype systems and related infrastructures for large programs
- **Industrial means:** significant industrial means, manufacturing, control and test equipment tailor-designed

# 2009 turnover breakdown

2009 turnover : 430 M€

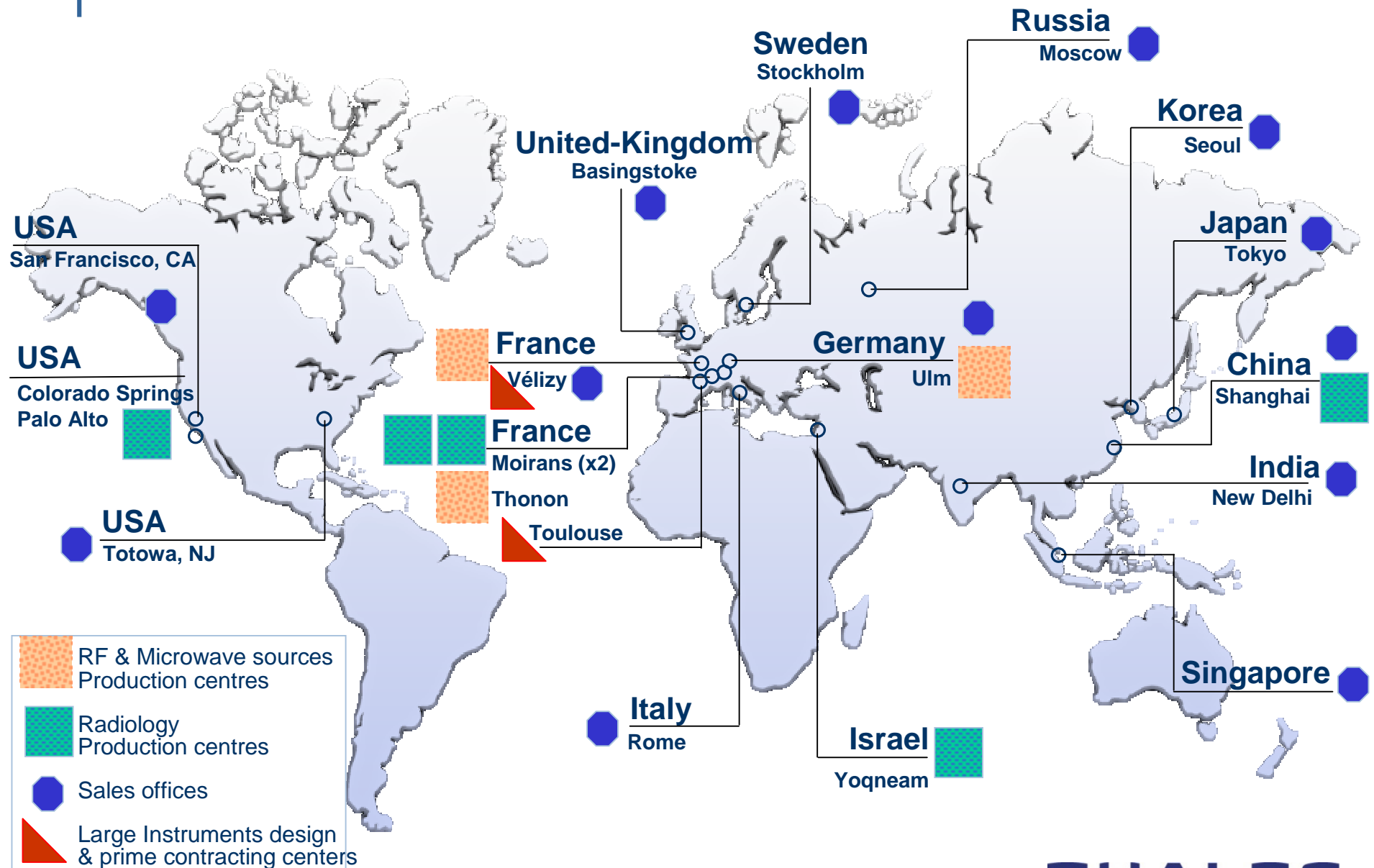




- 2009 turnover: **430 M€**
- **10%** of turnover dedicated to R&D
- **2 600** employees
- **40%** of managers, engineers and highly qualified technicians
- **8** industrial sites (Production, R&D)
- **100 000 m<sup>2</sup>** industrial surface, including **9 000 m<sup>2</sup>** clean rooms
- **1 500** clients
- **13** sales offices in the world
- **167** valid industrial patents
- **2 000** product references

**World # 1 for microwave & imaging sub-systems  
for professional applications**

# International implantation





# MIS Large Instruments - 3 main domains



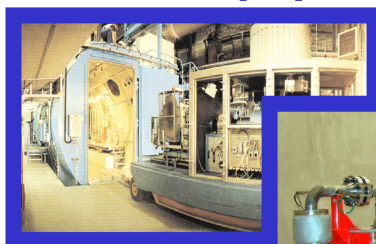
## Very Large Research Infrastructures

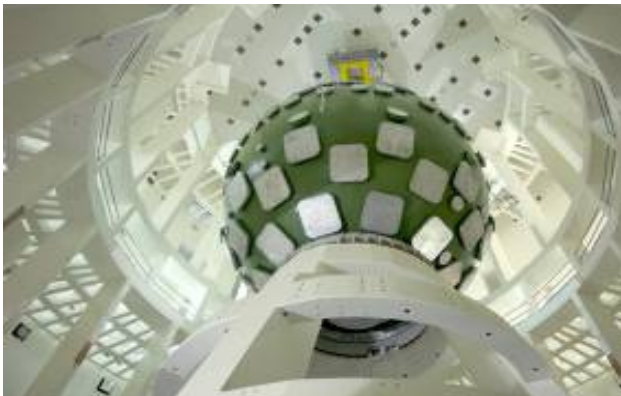


## Specific logistic equipments



## Multi technology Test equipments





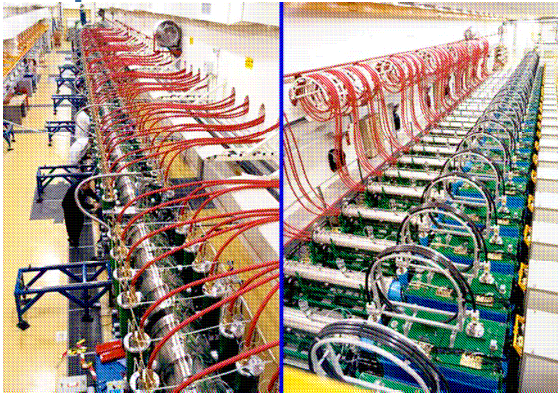
- **50 people**
- **80% of engineers**
- **2 design and system engineering centers**

**The Large Instruments Unit covers 3 domains :**

- ⇒ **Very Large research Infrastructures**
- ⇒ **Multi Technology Test Means**
- ⇒ **Specific Logistic Means**

- Several decades of experience in RF and  $\mu$ wave sources and in complex system engineering
- **Wide variety of mastered technologies :** mechanical and opto-mechanical engineering, thermal and mechanical stability, cooling systems, cryogenic techniques, high voltages, high currents, vacuum, RF and  $\mu$ waves, command and control systems, site integration
- A complete offer, from expertise to turn key systems

# A modular offer, from system to component



- **Turnkey systems**
- **Sub-systems**
  - Sensitive equipment supporting structures
  - Sensitive equipment transport
  - Fluid distribution networks
  - Vacuum equipments
  - High precision mechanical equipment under vacuum
  - High voltage and high current generators
  - RF and  $\mu$ wave transmitters.
- **RF Components**
  - Couplers
  - Vacuum Electron Tubes