

# Company Presentation

## XLS Midterm Review

3.07.2019

Daniel Ganuza

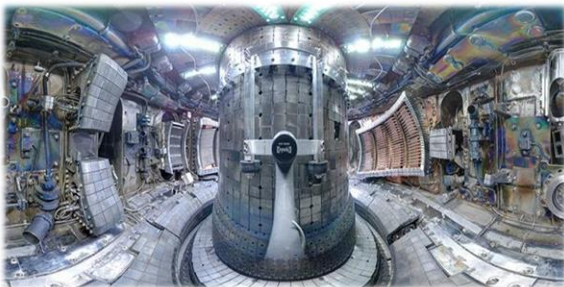
## Company information

- Founded in 1953
- Since 2009 part of Irizar Group (>700 M€ turnover, 3500 employees)
- Headquarters in Lasarte-Oria, Spain
- 160 employees (50% engineers)



## Markets - Electronic power conversion systems

Big Science



Transport



Energy





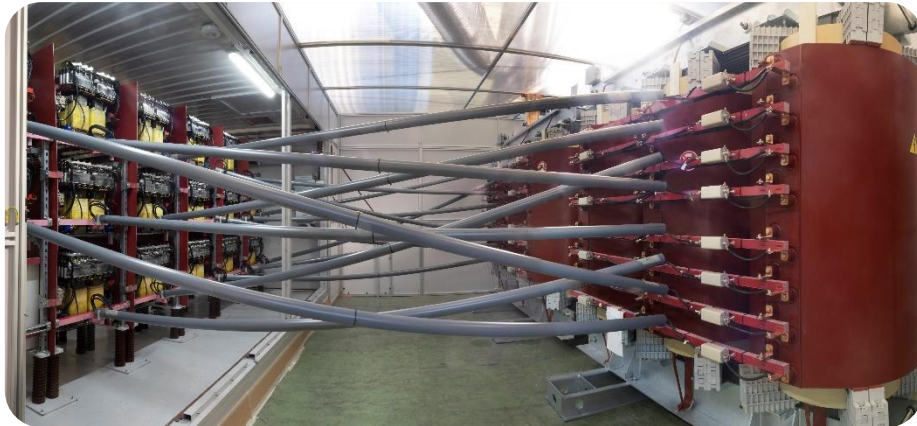
## Facilities

- Total area 4800 m<sup>2</sup> and production area of 2000 m<sup>2</sup>
- Test facility with 30 kV - 22 MVA connection
- High power test facility with 17 MW resistive load



## Big Science (Nuclear Fusion + Particle accelerators)

- High Voltage DC power supplies:
  - for plasma heating devices (Neutral Beam Injectors)
  - for RF tubes (i.e. klystrons, tetrodes, IOT's and gyrotrons)
- Electro magnet DC power supplies:
  - high current magnet coils for nuclear fusion
  - high precision magnets





## Neutral Beam Injector HVPS

Main characteristics:

Voltage : 80-130kV

Current : 70-130A

Power : up to 17MW

Pulse length : 0-10s

Duty cycle : 2-3%

Client : JET, MAST ,TJ-II, Budker, TAE



## Gyrotron HVPS

Main characteristics:

Voltage : 60-100kV

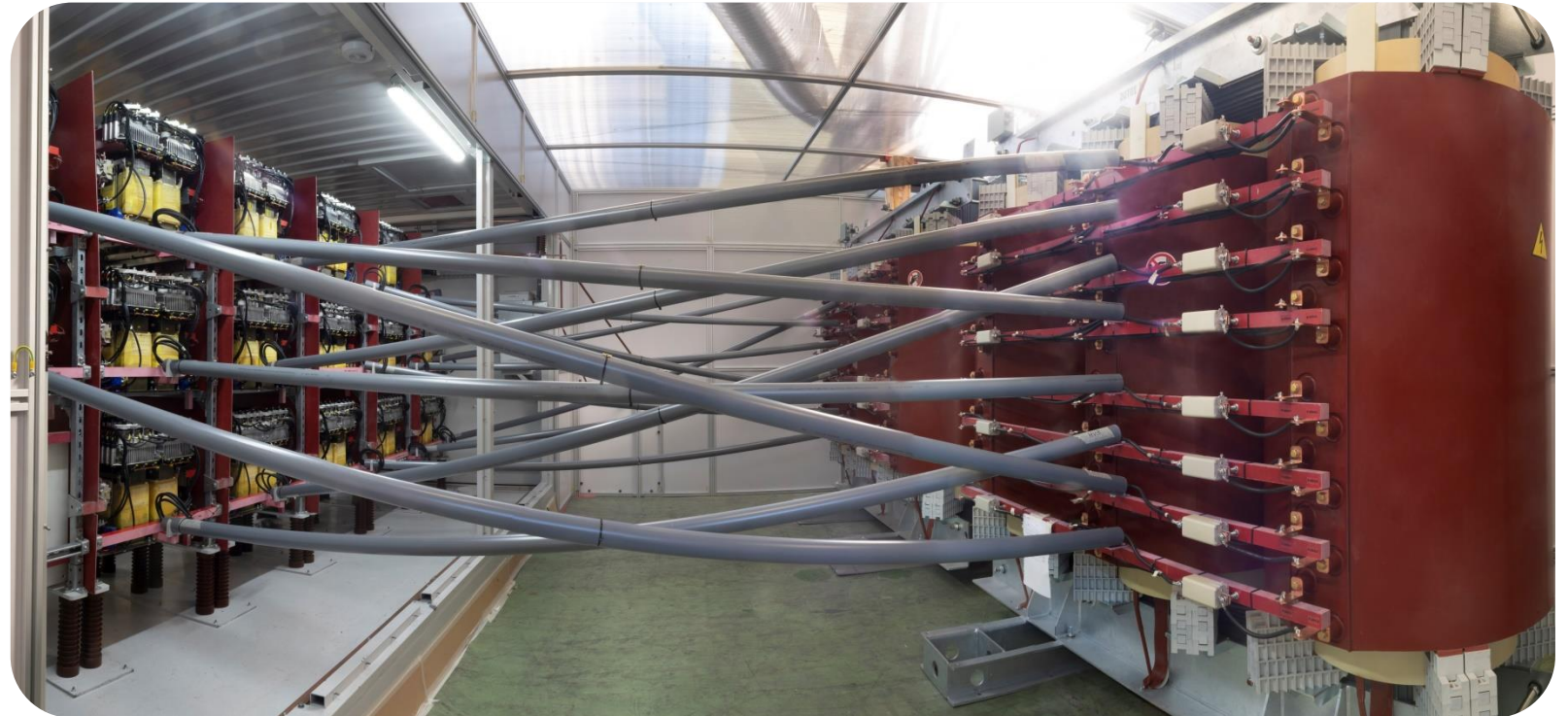
Current : 30-110A

Power : up to 6,6MW

Pulse length : 100s

Duty cycle : 6-10%

Client : TJ-II and JT60-SA



## Tetrode HVPS

Main characteristics:

Voltage : 11-20kV

Power : 400kW

Pulse length : continuous

Client : RAL ISIS & IFMIF





## Solid State Klystron Modulator (medium – long pulse)

Main characteristics:

Voltage : 85-120kV

Current : 60-160A

Peak power : 7-14MW

Pulse length : 3.5ms

Average power : 660 kVA

HVHF transformers in oil or air

Client : ESS Bilbao, ESS Lund and ORNL



## Solid State Klystron Modulator (short pulse)

Main characteristics:

Voltage : 45-150kV

Current : 105A

Peak power : 16,5MW

Repetition rate : 400Hz

Pulse length : 5 $\mu$ s

Pulse to pulse stability : <0,025%

Voltage ripple : <0.8% @ 130kV

Pulse transformer in oil

Solid state switching

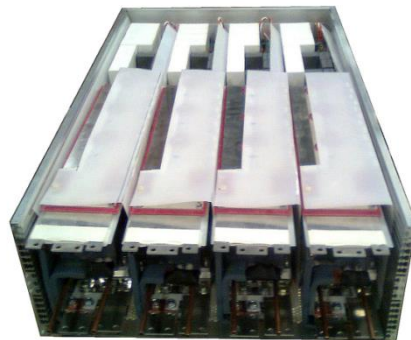
Integrated active bouncer

Client : IFIC Valencia



## Solid State Klystron Modulator (short pulse)

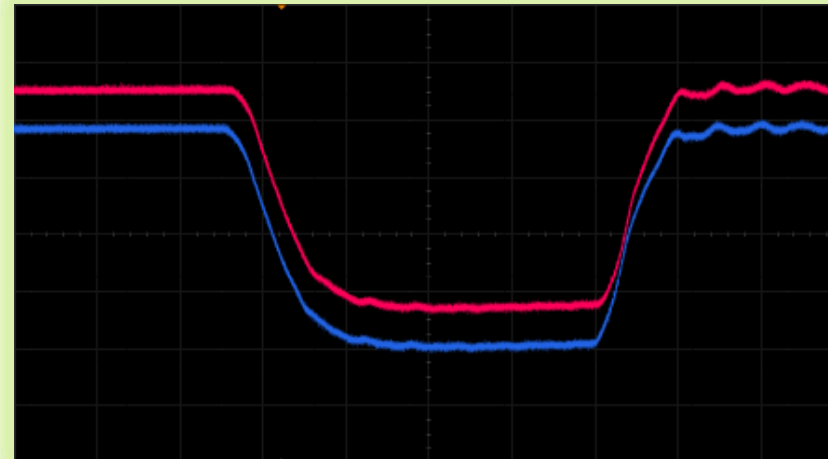
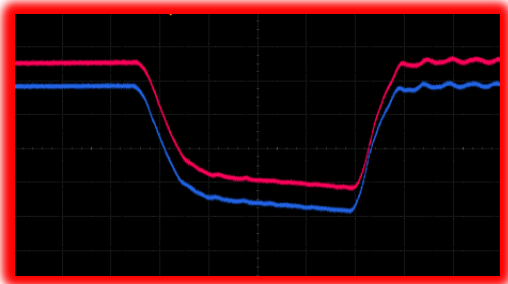
- Modular and scalable solution
- Every individual module includes:
  - Storage capacitors
  - Main switch
  - Bouncer
  - Core reset



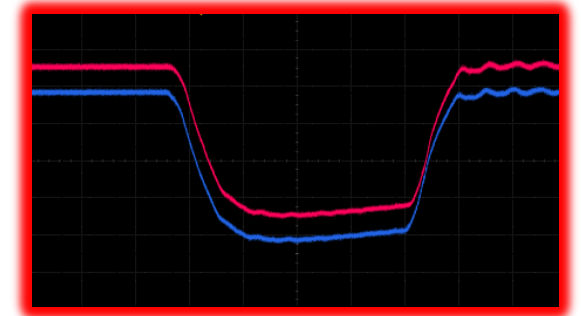


## Solid State Klystron Modulator (short pulse)

-Bouncer allows for easy flatness correction from the control panel

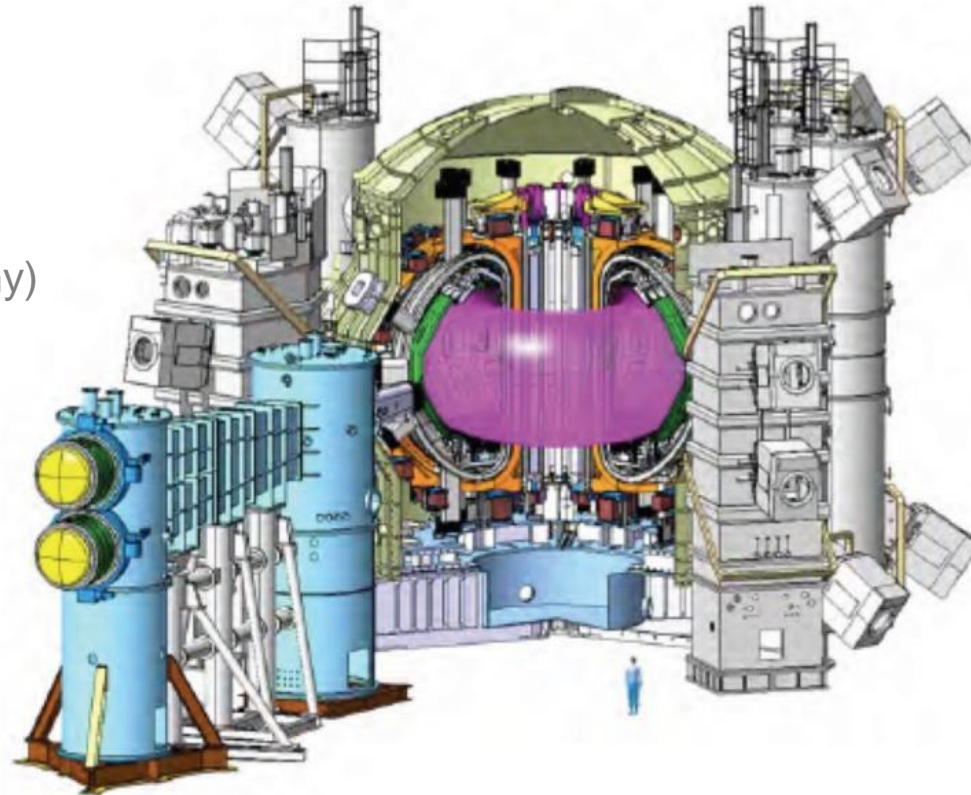


Corrected flatness – IFIC – Valencia



## Nuclear Fusion references

- JT-60SA (Japan)
- JET (UK)
- MAST (UK)
- SST-1 (India)
- TJ-II (Spain)
- SPC (Switzerland)
- W7X (Germany)
- ST-40 (UK)
- C2W (USA)



## Particle Accelerators references

- ESS (Sweden)
- ESS (Spain)
- LHC (Switzerland)
- ISIS (UK)
- IFMIF (Japan)
- IFIMED (Spain)
- DESY-II (Germany)

