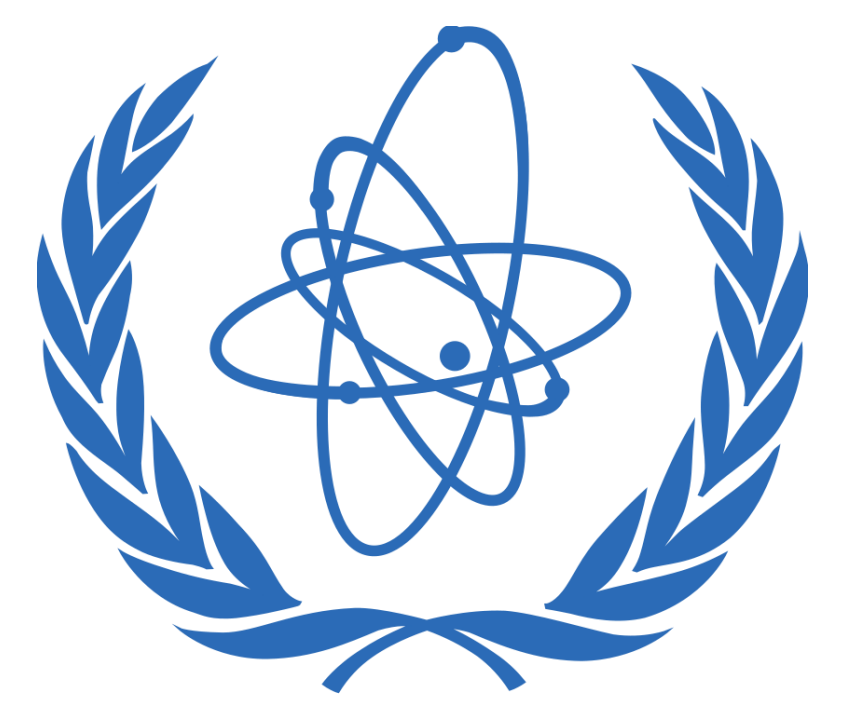




Design and development plan for control and data acquisition system of Thailand Tokamak 1 (TT1)



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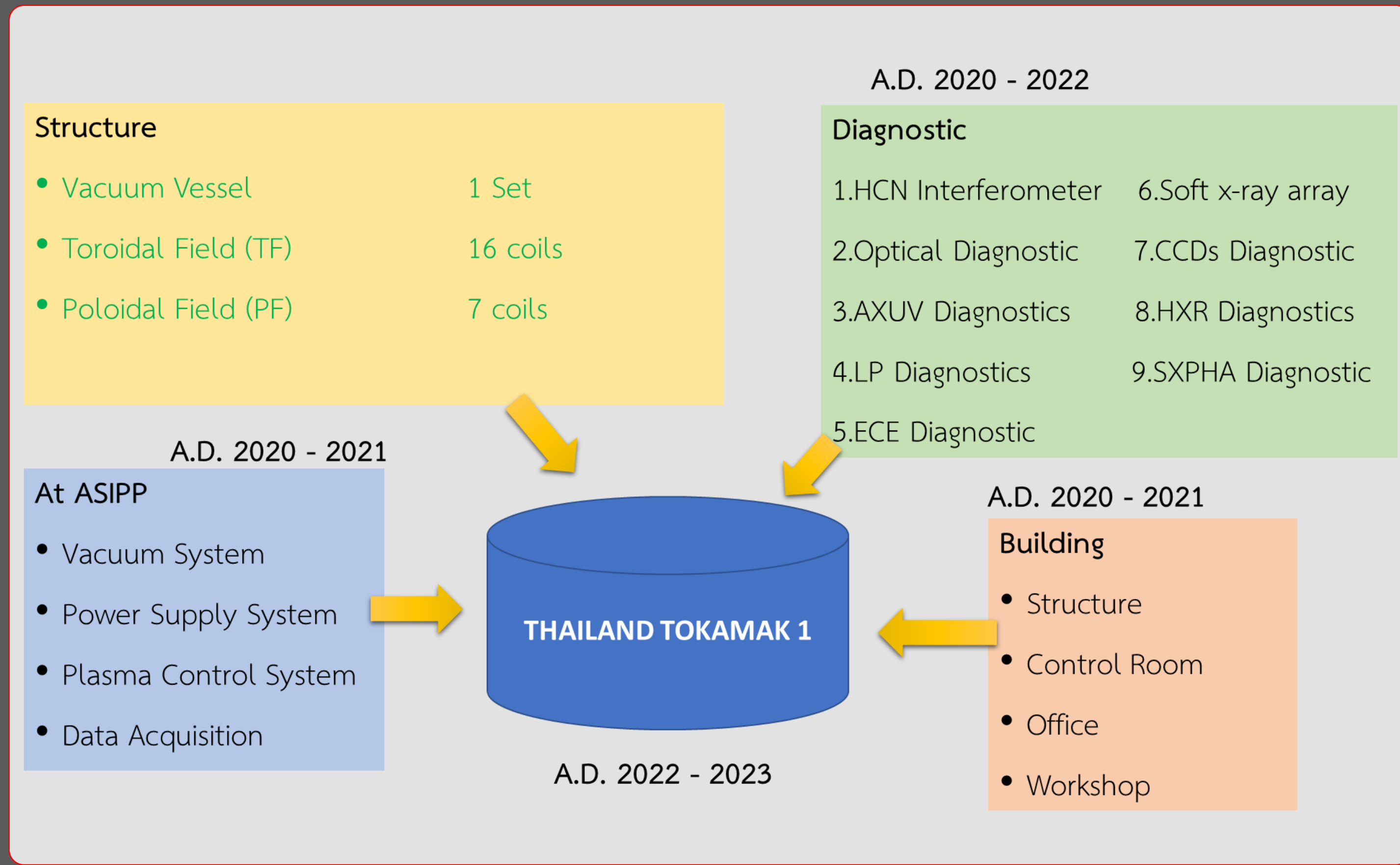
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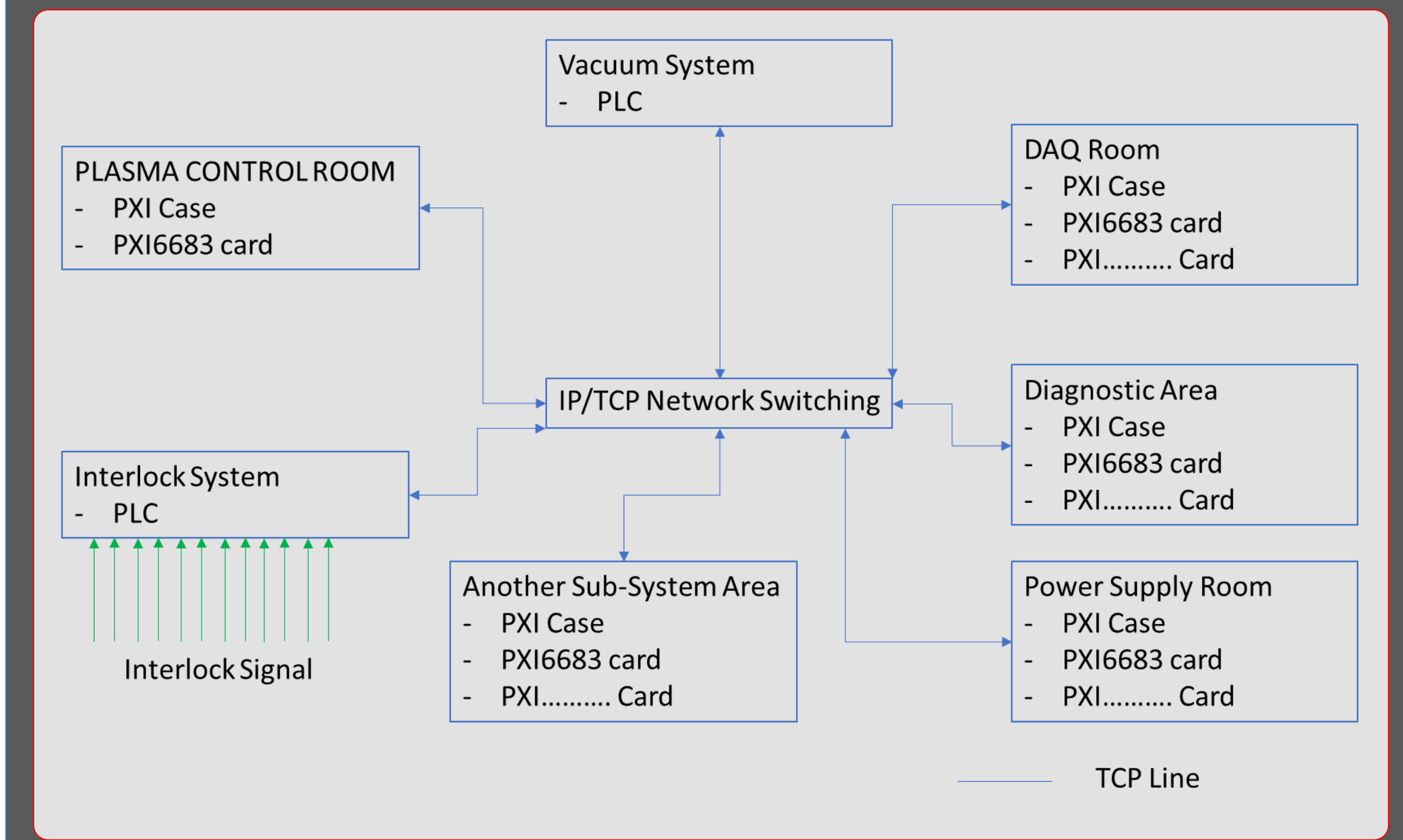
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Introduction: Control and data acquisition systems of Thailand Tokamak 1 (TT1) are designed and developed as tools for researchers and students in Asian country. The control and data acquisition systems is designed base on the PXI platforms and synchronized with a precision time protocol (PTP), defined in the IEEE 1588 standard. The PXI6683 cards are used as a timing module in PXI cases, time resolution up to 100 ns. This protocol is similar to what is planned for ITER. TCP/IP network is used to connect between the central control and PXI cases while fiber optic is used for interlock, triggering and data systems. The data acquisition system is consisted of 192 channels that are installed in 2 PXI case. A bandwidth of this system includes 20 kHz; for poloidal flux loop, Rogowski coil, 2D magnetic probes and voltage loop, 100 kHz; for saddle/locked loops, and 1 MHz; for MHD probes.

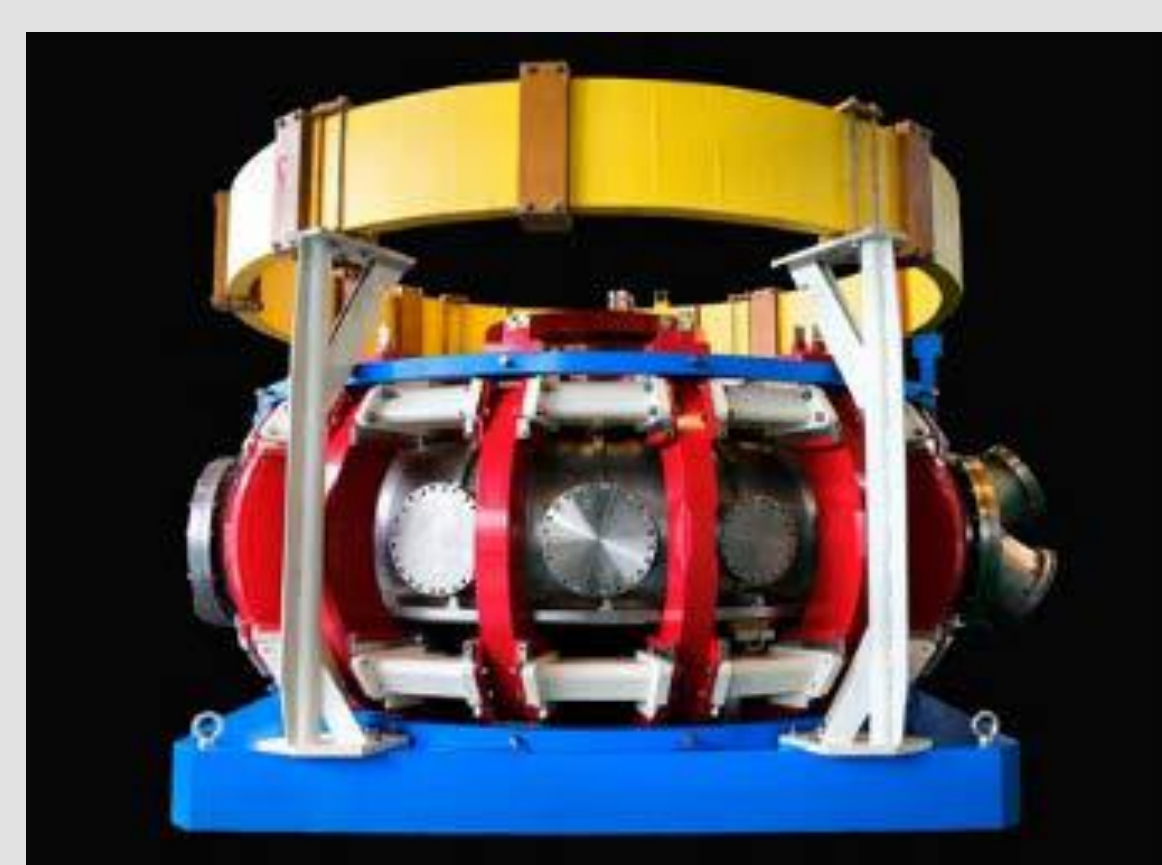
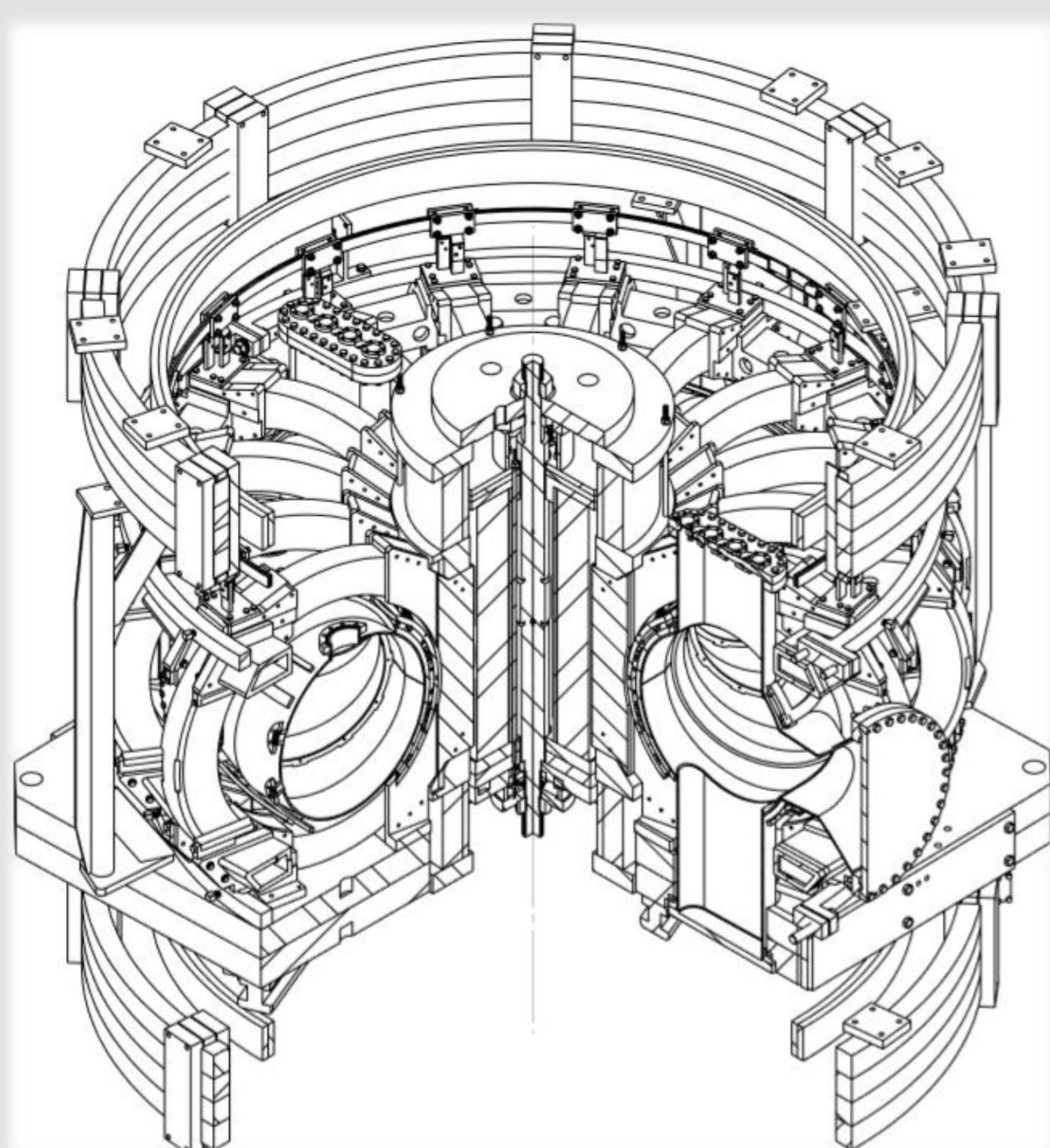
Four Year Plan:



Time Base (IEEE1588):



HT-6M:



Main Radius, R (m) 0.65 m
Minor Radius, a (m) 0.2 m
Plasma current, IP(kA) 150 kA

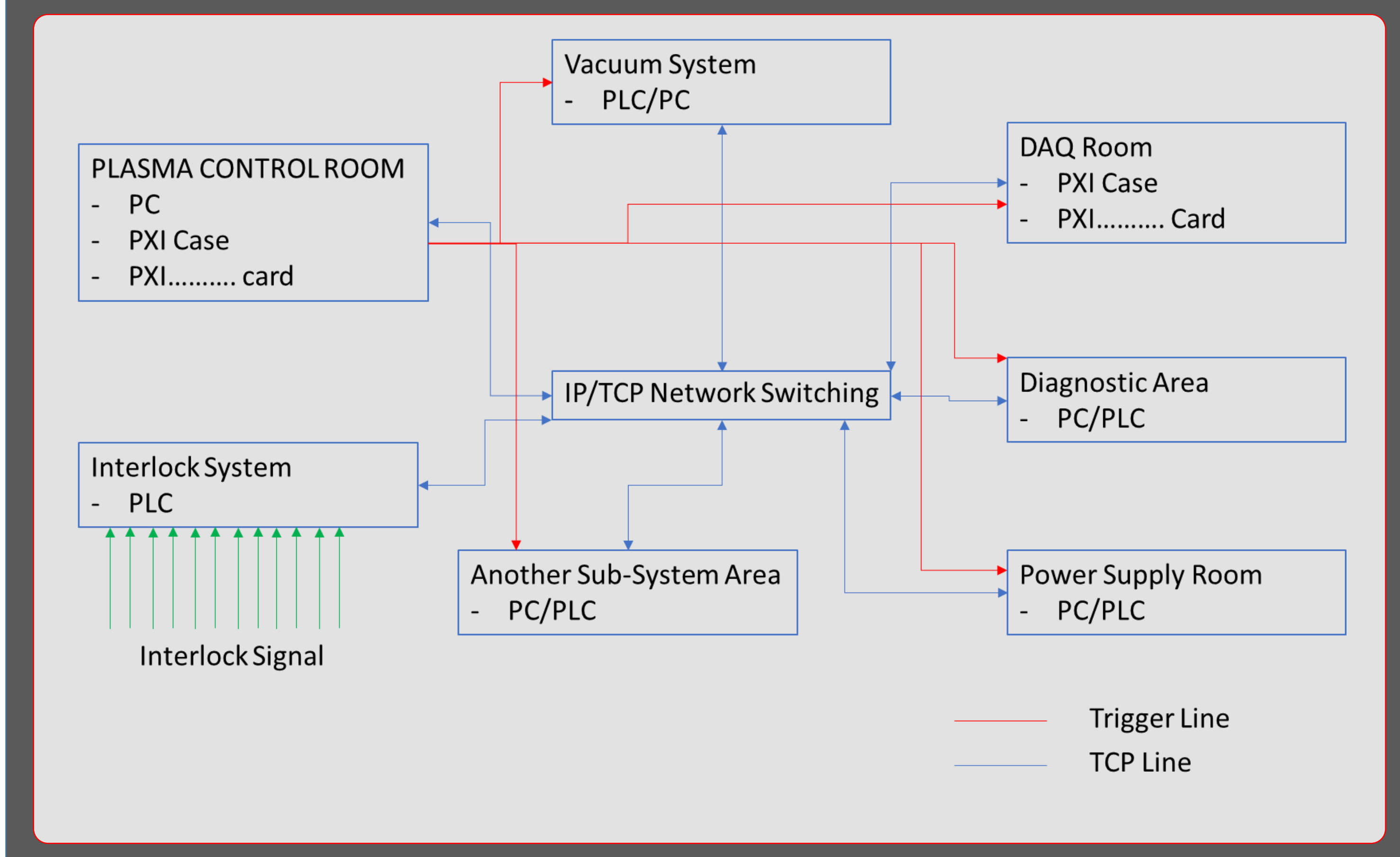
Toroidal Field (TF) 16 coils

- Toroidal field(BT) 1.52 Tesla
- Max. Ripple (δ) 6.53 %
- Turn current (ITF) 7.64 kA
- Flat top time(τ) 100 ms

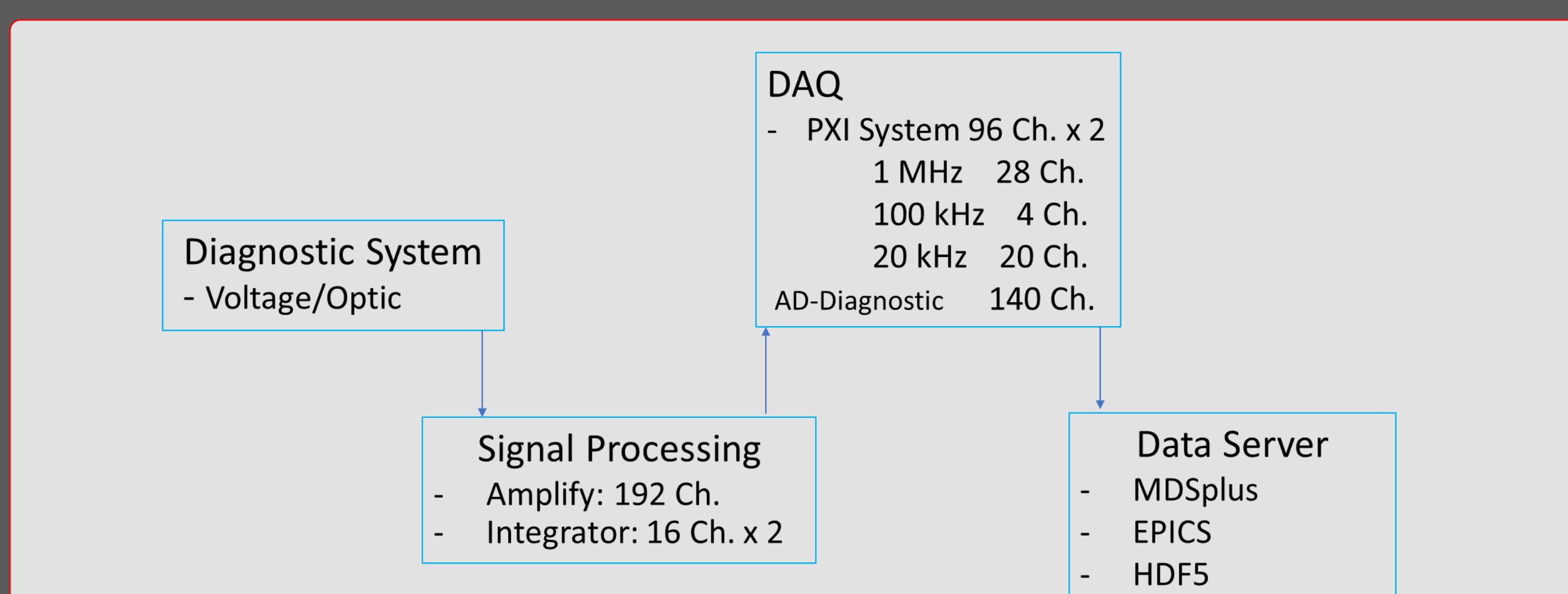
Poloidal Field (PF) 7 coils

- Central Solenoid coils (CS) 1 pieces
- Ohmic Heating coils (HF) 4 coils
- Vertical Field (VF) 2 coils

Trigger Base:



Data System:



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Data Acquisition (DAQ):

Non-Integrated Signal (32 Ch.)

- MHD probes for measuring the MHD mode (BW > 1000 kHz).
 - N-mode, 16 probes in toroidal direction
 - M-mode, 12 probes in poloidal direction

b. Voltage loop, (BW > 20 kHz)

- 4 probes in toroidal

Integrated Signal (24 Ch.)

a. Poloidal flux loops, (BW > 20 kHz).

- 4 probs in toroidal

b. Rogowski coil for plasma current, (BW > 20 kHz).

- 2 probes inner
- 2 outside vacuum vessel

c. Saddle/locked loops,

- 4 probes in one toroidal direction (BW > 100 kHz).

d. 2D Magnetic probes,

- 12 probes in one poloidal (BW > 20 kHz).