The Infrastructure Team

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Team Activities

High Voltage

Alarms

Autofill

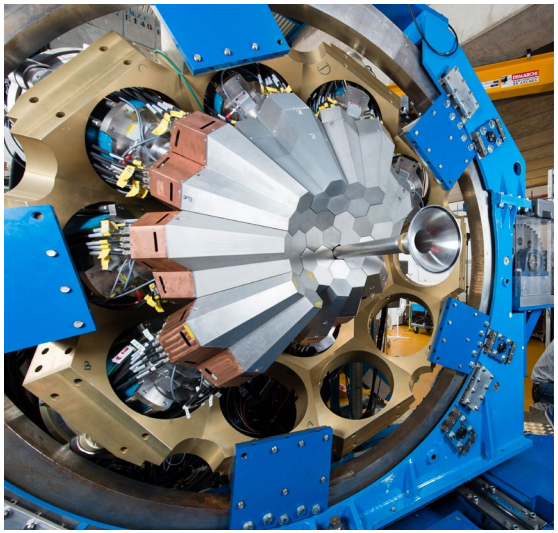
PBC + VCC

PLC

GUI

Detector Support System

Low Voltage



Patch Box: LV filter, BSD, LN2

Cables

Database

Grounding

Highlights

- The experimental campaign closed end of July and the detectors were kept cold during the summer pause
- Minor infrastructure related issues
  - *Problems with 2 LN_2 Autofill channels (PT100 readings). Only 14 channels are working. Cards from the third PBC+VCC available*
  - *Migration to Java OpenJDK for all MUSCADE clients (EPICS will be used for the new system)*
- The unused 6.5 V module has been removed in the LVPS
- Instability of LN_2 level measurement in several detectors: patch box refurbishment is needed
- User friendly Database Interface → **see Cecile's contribution for more details**

- ***Infrastructure sufficient for AGATA 1π (45 capsules)***

- **Preliminary work toward AGATA 4π**

Toward AGATA 4π

- Collected/combined characteristics and specific requirements of candidate AGATA sites after the GANIL campaign: GANIL/SPIRAL, GSI/NUSTAR, HIE-ISOLDE, JYFL and LNL/SPES
- Defined common mechanics and infrastructure solutions, independent from the host laboratory. Checked the compatibility with AGATA characteristics: some issues detected, mainly on mechanics and LN_2 hardware configurations
- Documents with array specifications and requirements for the host laboratory based on LNL, GSI and GANIL experience: *Basic infrastructure for the AGATA array*
  - **Present MoU with 20 ATC**: *June 2016*
  - **Extended to 2π for both LNL configurations**: *July 2019*
- New *AGATA Phase 2 Project Definition* for the full array (*in progress*). No Conceptual Design Report or TDR foreseen
- Updated list of Infrastructure components (present and future): *WIP*

- ***Present infrastructure not ready to accomplish the present MoU specifications***

Toward AGATA 4π

- Design study and paper work (including cost estimation) to adjust the infrastructure projects to the number of detectors specified in next MoU and to new mechanics and electronics specifications
- New production of existing components (replica): LV Patch Boxes, cables, LN_2 parts, …
- Major changes for some subsystems (new development): LN_2 and LVPS but also HV and mechanics
- Autofill and LVPS upgrade projects: approved by AMB (2.2019)
- Meetings:
  - *20180929 VC LVPS upgrade;*
  - *20190214 Saclay LVPS + Autofill upgrades;*
  - *20190313 VC Autofill problems;*
  - *20190618 VC & 20190716 VC LVPS + Autofill upgrades*

Autofill

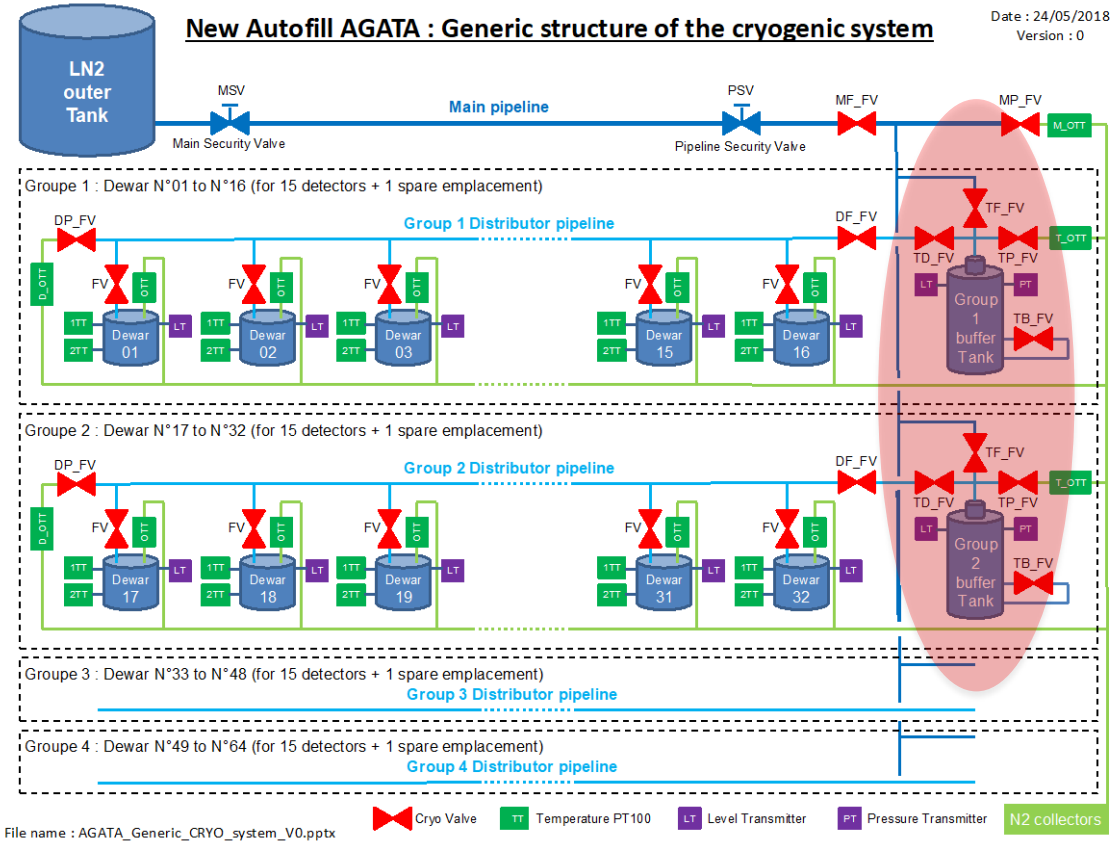
The draft for a new autofill system (1 PT100 reading and 16 detectors) has been prepared by Saclay and presented to the AMB in 2013. The project has recently been updated to include state of the art technical solutions in a configuration that meets the requests of the collaboration (easy to maintain, small footprint, …). Green light received in February 2019. **see Tom's contribution for more details**

Host Laboratories requirements:

- GSI and GANIL use buffer tanks for regular detector filling
- Jyvaskyla has just renewed its Autofill system choosing to fill detectors directly from external tank
- LNL may prefer to fill detectors directly from external tanks without using any buffer tanks. Would that be possible within the planned architecture?

Aim: define a solution for 30 detectors, that could be extended to 60 detectors and find a nearly common cryogenic installation for the different host labs in order to minimize the changes in the PLC

Autofill



Buffer tanks used for regular detector filling or for emergency only ? Possibility to bypass the buffer tank use ?

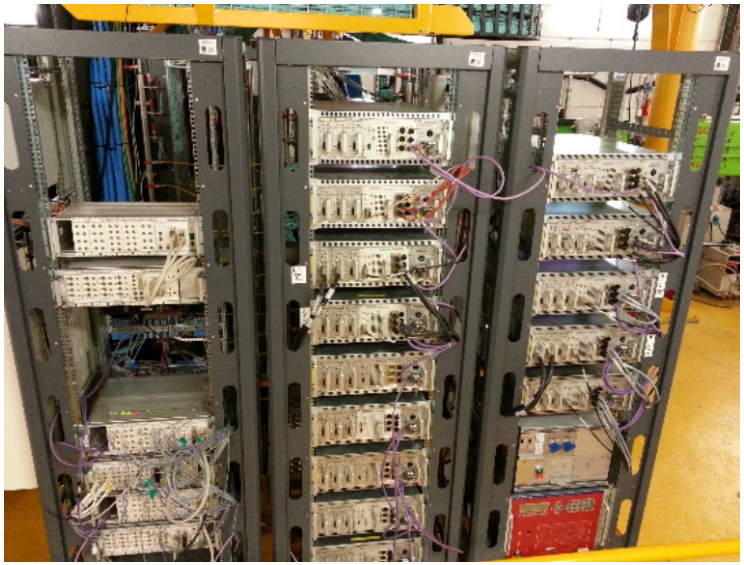
A quick decision is necessary to start the hardware and software development

LVPS

Present

The LVPS system is ready for 15 detectors (+3 units in other laboratories): ± 6 & ± 12 V PS for detectors and 48 V PS for Digitizers

- V0 Digitizers: ~ 300W/capsule; V1 Digitizers: ~70W/capsule
- 48 V PS not regulated
- 6/12 V PS regulated with sense wires
- Profibus communication protocol
- 4U for each ATC



@ LNL: V0, V1 and V2 electronics will coexist !

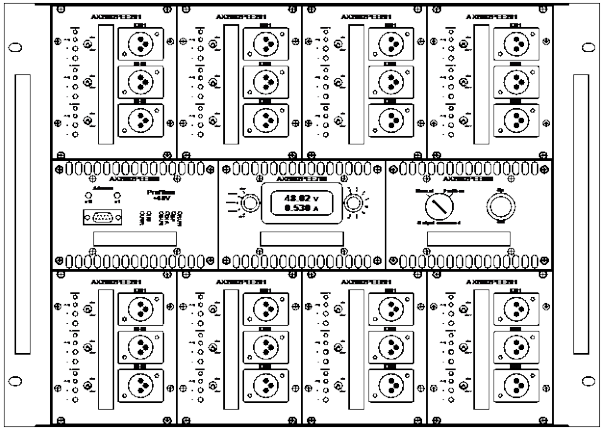
LVPS

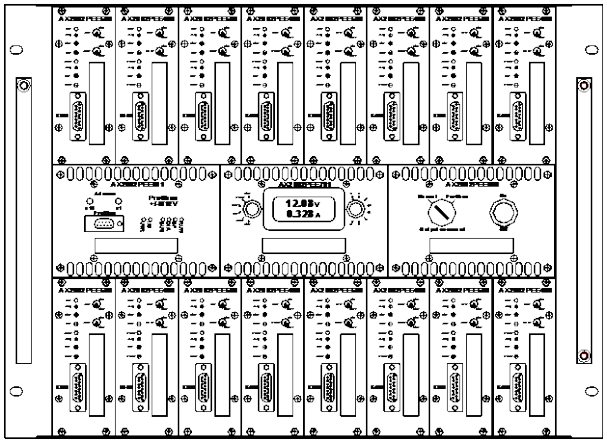
Future

- Backward compatibility ? Limited to V1
- Several configurations have been considered

Preliminary solution (DEV19002: 1.5A on 48V)

- Important space reduction: 2 x 8U for 8 ATC
- Independent 19” crates, depth 600 mm, 60 kg (48V) + 72.5 kg (6/12V)
- Regulated and stabilized 48 V PS
- 6/12V regulated with sense wires
- Profibus communication
- Individual ON/OFF switches



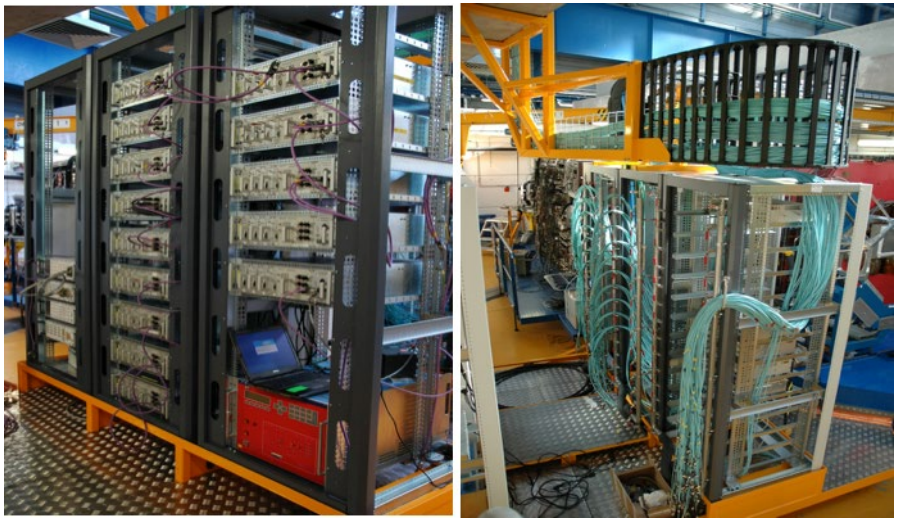


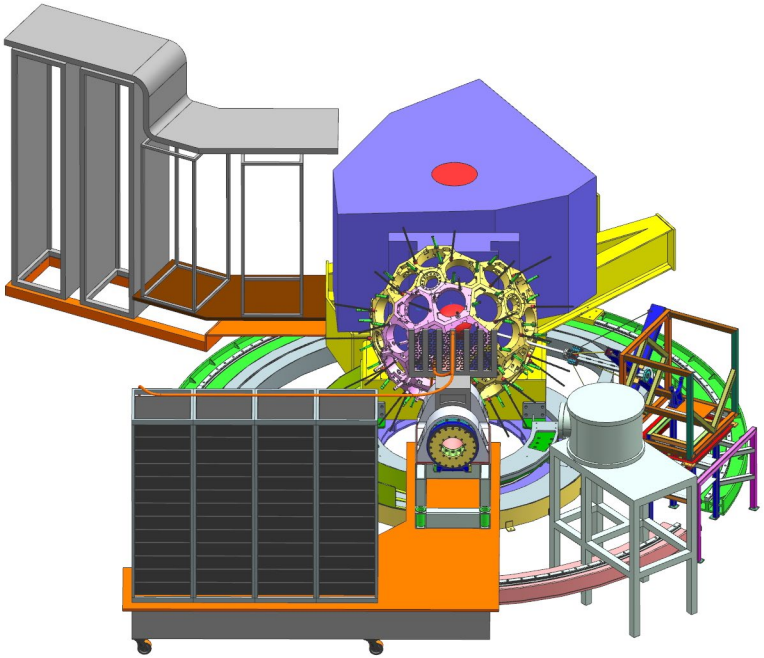
V2 electronics power requirements not confirmed:
necessary to start the project

Space requirements

DSS space requirements for 20 to 30 ATC

- 4 (*2.4 + 1.5 for LVPS*) to 5 (*2.9 + 2 for LVPS*) racks for digitizer boxes, considering a variable mix of V0, V1 and V2 electronics,
- 2 racks hosting detector LV and HV power supplies, the DSS control system and the Ge cooling system for 30 dewars





AGATA @ LNL

LN_2 detector filling system

- About 1200 liters/day
- New development platform (from MUSCADE to EPICS)
- Buffer tanks ? Ongoing discussion on new LNL hardware configuration: decision before September 15 (control system development)
- Remote control
- New external tank (2 bar, >= 10000 liters)
- Security issues: buffer tanks, N_2 exhaust
- New detector bayonets and metallic vacuum insulated LN_2 hoses

Hardware configuration @ LNL: meeting with AirLiquide experts 20190913

AGATA @ LNL

Detectors

- New production of LV patch boxes

Cabling

- Two configurations: with PRISMA and at 0°
- Detailed cable layout to allow array translation and rotations
- Length: MDR <= 10m, Digitizer PS <= 8m, Optical fibers <= 60m
- Platforms position

Cooling

- Experimental Hall: water cooling for digitizers

DAQ

- 7 Racks, power consumption > 50 kW
- New LNL Data Center