BE-ICS activities for LIU Project

LIU Project Work Breakdown Structure:

LIU-PSB 18	Alarms	N.A.*
LIU-PSB 19	Access system, doors	N.A*
LIU-PS 18	Alarms	S. Grau
LIU-PS 18	Access system, doors	R. Nunes
LIU-SPS 18	Alarms	N.A.*
LIU-SPS 19	Acess system, doors	T. Ladzinski
LIU-ION 17	Alarms	N.A.
LIU-ION 18	Access system, doors	N.A.

BE-ICS correspondants to be appointed

BE-ICS: types of safety systems

- **Level-3 alarm safety systems (AL3S) and safety alarm transmission:** design, supply, installation, commissioning and acceptance test with HSE, maintenance and operation

- **Access control and Personal Protection System:** design, supply, installation, commissioning, acceptance test and maintenance

Definitions according to IS37 – Level-3 safety alarms and alarm systems:

- **Level-3 alarm**

  Warns of the presence of a potential danger to human life, to property, or to the environment

- **Level-3 alarm system (AL3S)**

  Technical installation designed to detect and to inform principally the SCR of a potentially dangerous abnormality. It consists of a detector (or detection system), a transmitter (or transmission system), and a receiver (or reception system).

BE-ICS: types of safety systems

- Access safety system linked to the safety elements - EIS (radiation hazards from beam, hazards from the machine – electricity, laser, RF/X-rays)
- Beam Imminent Warning (radiation hazard from beam)

- Automatic fire and/or smoke detection system* (risk of fire)
- Audible emergency evacuation system*: sirens and manual call points, break-the-glass type (risk to personnel),
- Emergency call system, e.g. red telephones* (information about various risks)
- Gas detection (flammable or toxic)* (risk of explosion or poisoning)
- Detection of oxygen deficiency* (risk of suffocation)
- Transmission of alarms

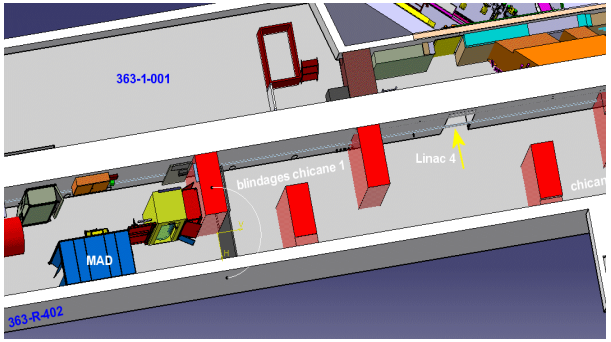
Nota:

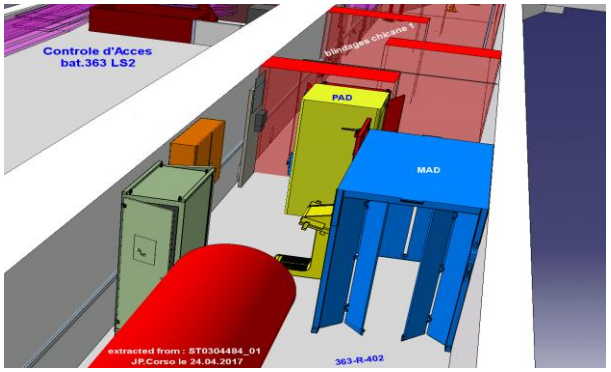
Most systems (*) are AL3S, acceptance test with HSE.

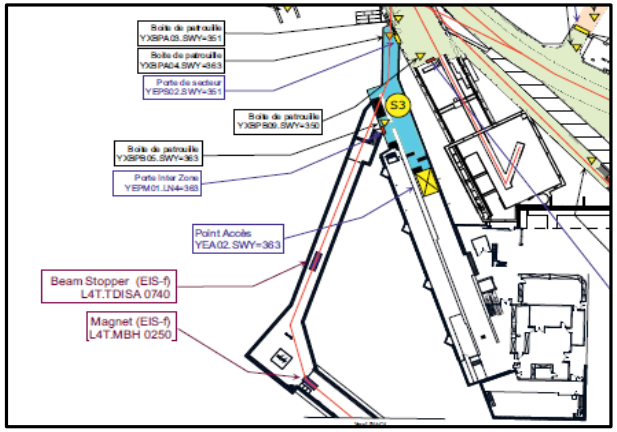
Risk mentioned into brackets according to IS37 – Level-3 safety alarms and alarm systems

BE-ICS activities for LIU Project

- **Connection of the Linac4**
  - Interface Linac4-Linac2 → ECR CPS-LJ-EC-0002
    - New EIS-Access and new sector in the Switch-Yard area (Sector 3)
    - (Access system of Linac2 will be moved into the tunnel – request integrated but not in the scope of LIU)
    - New EIS-Beam for the Switch-Yard area: L4T.TDISA.0740 and L4T.MBH0250 instead of the two actual EIS-Beam located in Linac2. LT.STP.10 and LT.BHZ.20 will be disconnected from the access safety system (PASS)
    - EIS-Beam for the Booster area (PSB-Y-ES-0001):
      - During Linac4 commissioning (beam up to LBE with access in the Booster): disconnection of the present EIS-Beam BI.STP FA and SW from the PASS
      - For Linac4 operation: connection of the EIS-Beam L4T.TDISA.0740 and L4T.MBH0250 to the PASS
  - Partial disassembly of Linac2 → ECR CPS-LJ-EC-0003
    - Disconnection of the Linac2 MAD/PAD access control system, named YEA01.LN2-363
    - Access system to be provided during the working period or a guardian as compensatory measure

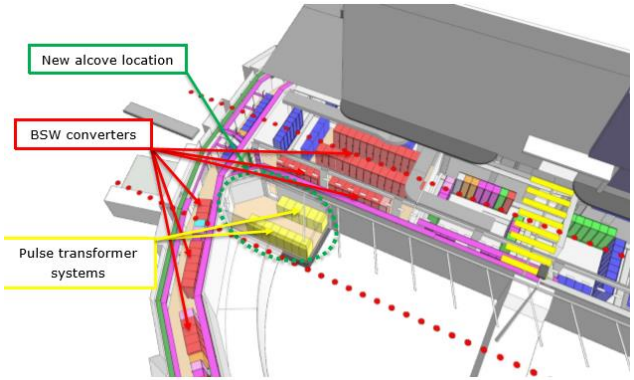


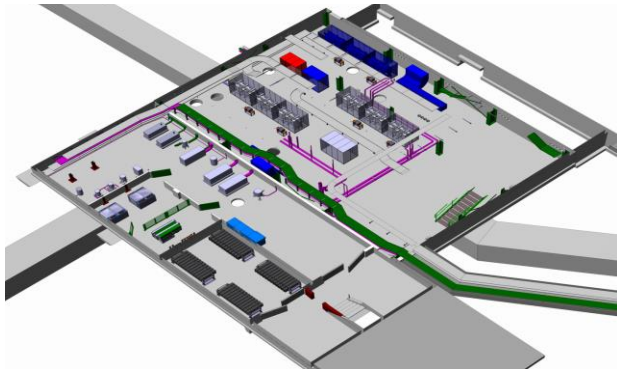




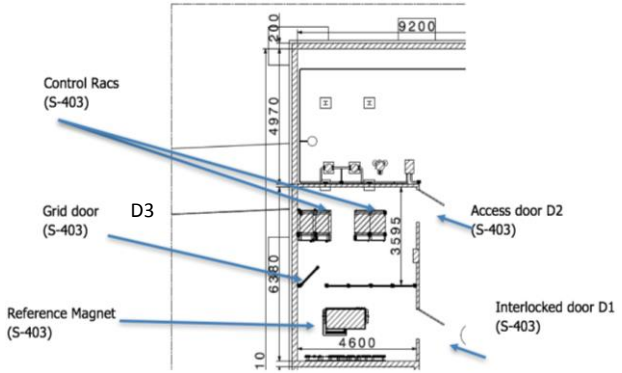
BE-ICS activities for LIU Project

- **PS Booster**
  - Installation of the new power converters in b.361
    → ECR PSB-K-EC-0001
    - Two additional smoke detectors will be installed in the new alcove and will be integrated to the existing fire detection system of BFR2 room in building 361
    - A fire warning horn will be placed above the alcove entrance grated door
    - *No additional smoke detection in BRF2 and BAT due to the new equipment*



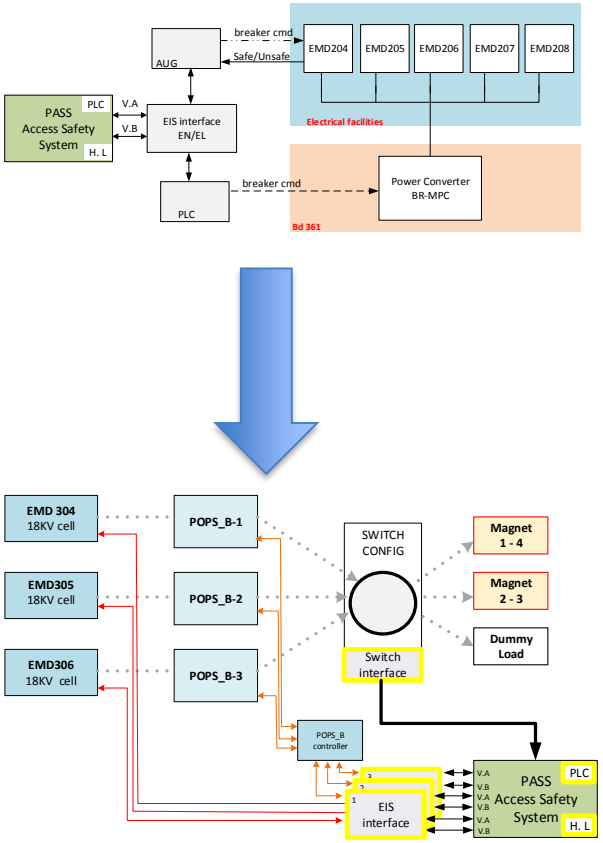


  - New MPS for LIU Booster (POPS-B)
    → ECR PSB-EJ-EC-0008
    - Fire detection and emergency evacuation system in the new building
    - Access control system for the reference magnet area in 245/S-403 under study (access to TE/MSC through D3 door shall be authorized by TE/EPC)
    - *No access control system foreseen for the building. Should it be in the light of the request from EN-ACE for an access control and CSA surveillance of the PSB technical areas building 361 (also a question from the PS-CSAP on 13 July 2017) ?*



BE-ICS activities for LIU Project

- **PS Booster**
  - EIS-Machine related to the Powering Configuration of the PSB bending magnets → ECR PSB-Y-EC-0001
    - Change of the access safety system in order to take into account the new MPS of the PS Booster without jeopardizing personnel protection. The request is to be able to determine in real time, the interlocks of the EIS-machine, called "BR.popsB", according to the powering configuration of the bending magnets.
  - EIS-Beam for the Booster area (PSB-Y-ES-0001)
    - Disconnection of the present EIS-Beam BI.STP FA and SW from the PASS (for Linac4 commissiong)
    - Connection of the EIS-Beam L4T.TDISA.0740 and L4T.MBH0250 to the PASS (for Linac4 operation)



- **PS Booster**
  - There is no dedicated section concerning safety systems in the descriptive part of LIU-PSB Injection, Rings, Extraction
  - No impacts of the LIU project on the existing safety systems installed in the PSB accelerator have been identified until now. This will be confirmed and documented while producing the demonstrative part (hazards inventory, risks induced and control measures to put in place, fire risk assessment).

BE-ICS activities for LIU Project

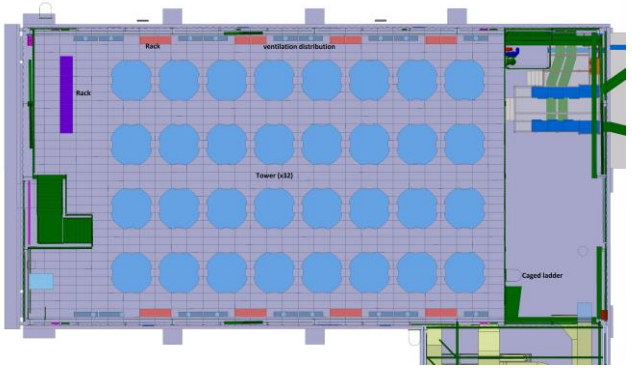
- **PS and TT2**
  - There is no dedicated section concerning safety systems in the descriptive part of LIU-PS Injection, Ring, RF systems, TT2 consolidation and dump
  - No impacts of the LIU project on the existing safety systems installed in the PS accelerator have been identified until now. This will be confirmed and documented while producing the demonstrative part (hazards inventory, risks induced and control measures to put in place, fire risk assessment)

BE-ICS activities for LIU Project

- **SPS**
  - Ring & Transfer lines
    - There is no dedicated section concerning safety systems in the descriptive part, but …

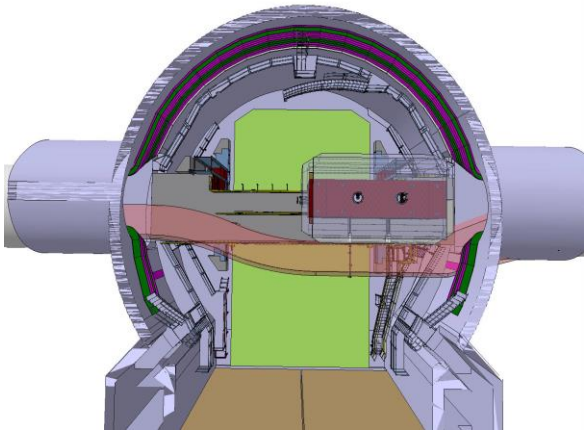
    Plan activity 11415 declared related to the upgrade of the fire safety system in BA3 Faraday cage (in LS2)

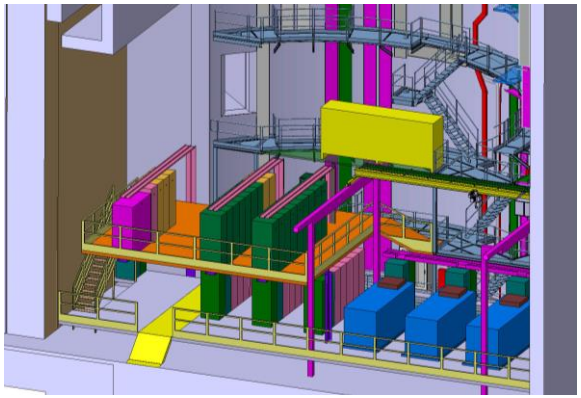
    - No impacts of the LIU project on the existing safety systems installed in the SPS accelerator have been identified until now. This will be confirmed and documented while producing the demonstrative part (hazards inventory, risks induced and control measures to put in place, fire risk assessment)
  - RF system upgrades → SRR SPS-LJ-EC-0001
    - Tunnel LSS3: no impacts of the LIU project on the existing safety systems installed in the SPS accelerator have been identified.
      - The present cavities in LSS3 and the new ones will not produce X-rays. As a consequence, the cavities are not classified as EIS-Machine and are not interlocked with the SPS access safety system
    - New building BAF3:
      - Fire detection and emergency evacuation system in the new building
      - *No access control system foreseen for the building. Should it be in the light of the request from EN-ACE for an access control and CSA surveillance of the PSB technical areas building 361 (also a question from the PS-CSAP on 13 July 2017 for building 245) ?*

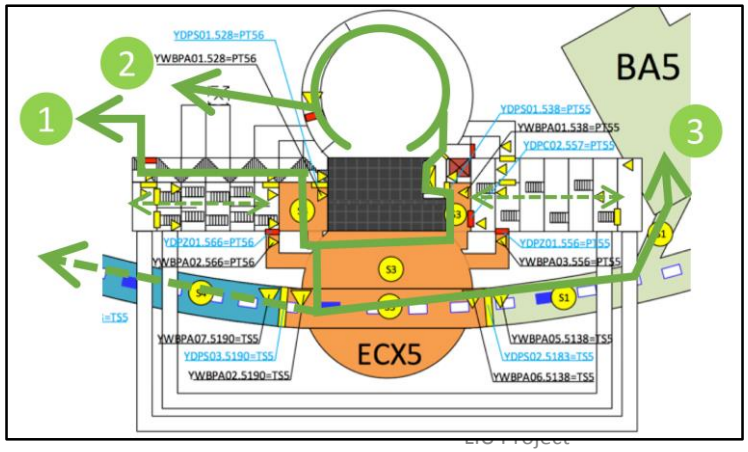


BE-ICS activities for LIU Project

- **SPS**
  - New beam dump in ECX5 → SRR SPS-LJ-EC-0003
    - Tunnel LSS5, ECX5: no impacts of the LIU project on the existing safety systems installed in the SPS accelerator have been identified, excepted:
      - EIS-Beam: two Direct Current Transformers (DCCT) being part of the ion safety system in the North Area (BCTDC.51897 and BCTDC.51895) need to be moved downstream by ~25 m to half period 519 (BCTDC.51951 and BCT.51952)
    - ECA5, kicker area:
      - Fire detection: layer of fire detection units monitoring of the air will be installed near the kicker pulsed generators electronics and controls racks (by row of racks), and near the powering area
      - Reconfiguration of the access sectorization







BE-ICS activities for LIU Project

- **LIU-Ions**
  - There is no dedicated section concerning safety systems in the descriptive part of LIU-Linac3 and LEIR
  - No impacts of the LIU project on the existing safety systems installed in the Linac3 and LEIR accelerator have been identified

BE-ICS activities for CONSolidation linked to LIU Project

- ???
- To request to the consolidation project by BE-ICS : overhauling of the fire detection in the ECA5 cavern?
  - It is recommended by HSE to evaluate the need of overhauling of the existing fire detection system located at the ECA5 ceiling level, to install (or update the existing) evacuation alarm system, to extend the automatic fire detection and evacuation coverage to the volumes that are used to evacuate SPS and ECA5

PLAN

Activities declared by BE-ICS

ID	Title	Group	Responsible	Priority	WBS	Facilities	Group contribution	Status
Id	Title	└ BE-ICS	First name, last name, group o…	Select a priority…	LIU-PROJ	Facility	Select the contributi…	Select a status…
10732	Install - Fire detection & Evacuation - New B245 - POPS Booster	BE-ICS	SILVIA GRAU (BE-ICS-AS)	3. HL-LHC and LIU projects	PBU-PRJ	PS Booster	EN-EL, HSE-SEE	Approved
10697	POPS-B - New project	BE-ICS	JEAN-CHARLES TOURNIER (BE-ICS-AP)	3. HL-LHC and LIU projects	PBU-PRJ	Buildings And Other Facilities		Approved
10048	Modify PS PPS (Personnel Protection System) for LN4 connection	BE-ICS	LOUIS HAMMOUTI (BE-ICS-CSE)	1. Safety	PBU-LN4	LINAC 2, LINAC 4, PS Booster	EN-ACE-COS	Under Approval

PLAN

Linac4 connection

Contribution requests to BE-ICS

ID	Title	Group	Responsible	Priority	WBS	Facilities	Group contribution	Status
	Id	Title	Department-Group	First name, last name, group o…	Select a priority…	PBU-LN4	Facility	BE-ICS	Select a status…
10312	Connection of Linac4 to the PSB	BE-ABP	JEAN-BAPTISTE LALLEMENT (BE-ABP-HSL)	3. HL-LHC and LIU projects	PBU-LN4	LINAC 4	BE-BI, BE-ICS-CSE, EN-ACE-OSS, EN-ACE-SU, EN-CV, EN-EL, EN-HE-HH, EN-MME, EN-STI-TCD, HSE-RP, SMB-SE, TE-EPC, TE-MSC, TE-VSC-BVO	Approved
10048	Modify PS PPS (Personnel Protection System) for LN4 connection	BE-ICS	LOUIS HAMMOUTI (BE-ICS-CSE)	1. Safety	PBU-LN4	LINAC 2, LINAC 4, PS Booster	EN-ACE-COS	Under Approval

Modification of the access system, interlocks

PLAN

LIU-IONS

Contribution requests to BE-ICS

No request

PLAN

LIU-PSB

Contribution requests to BE-ICS

ID	Title	Group	Responsible	Priority	WBS	Facilities	Group contribution	Status
10732	Install - Fire detection & Evacuation - New B245 - POPS Booster	BE-ICS	SILVIA GRAU (BE-ICS-AS)	3. HL-LHC and LIU projects	PBU-PRJ	PS Booster	EN-EL, HSE-SEE	Approved
10697	POPS-B - New project	BE-ICS	JEAN-CHARLES TOURNIER (BE-ICS-AP)	3. HL-LHC and LIU projects	PBU-PRJ	Buildings And Other Facilities		Approved
10311	Supply new converters for Booster Main Magnets (Dipole & Quadrupole) & Trims [POPS-B]	TE-EPC	FULVIO BOATTINI (TE-EPC-HPC)	3. HL-LHC and LIU projects	PBU-PRJ	PS Booster	BE-CO, BE-ICS-AC, BE-ICS-PCS, BE-OP, EN-CV, EN-EL, EN-HE-HH, EN-MME-MM, IT-CS, SMB-SE, TE-MPE-MI	Under Approval

Installation of EIS new system

PLAN

LIU-PS

Contribution requests to BE-ICS

No request

PLAN

LIU-SPS

Contribution requests to BE-ICS

ID	Title	Group	Responsible	Priority	WBS	Facilities	Group contribution	Status
Id	Title	Department-Group	First name, last name, group …	Select a priority…	SPU-PRJ	Facility	BE-ICS	Select a status…
11415	SPS RF Low Level upgrade for LIU	BE-RF	PHILIPPE BAUDRENGHIEN (BE-RF-FB)		SPU-PRJ	SPS	BE-CO, BE-CO-HT, BE-ICS-AS, BE-OP-SPS, BE-RF-CS, BE-RF-FB, BE-RF-PM, EN-CV, EN-EL-EIC, EN-EL-FC, EN-HE-HH, IPT-DI, IT-CS-DO, SMB-SE-CEB	Created
10856	Relocate SPS Dump kicker HV systems in LSS5	TE-ABT	VILIAM SENAJ (TE-ABT-PPE)	3. HL-LHC and LIU projects	SPU-PRJ	SPS	BE-ABP-HSC, BE-ASR, BE-ICS-CSE, BE-OP, EN-ACE-INT, EN-ACE-SU, EN-CV, EN-EL, EN-HE-HH, EN-MME, HSE-RP, HSE-SEE, TE-VSC-BVO	Approved
10838	Replace two extraction kicker magnets (MKE4)	TE-ABT	GAEL BELLOTTO (TE-ABT-KSC)	3. HL-LHC and LIU projects	SPU-PRJ	SPS	BE-ABP-HSC, BE-ASR, BE-ICS-AC, BE-OP, EN-ACE-SU, EN-CV, EN-HE-HH, HSE-RP, HSE-SEE, TE-VSC-BVO	Finished
10835	LIU-SPS RF power upgrade BAF3	BE-RF	ERIC MONTESINOS (BE-RF-PM)	3. HL-LHC and LIU projects	SPU-PRJ	Buildings And Other Facilities, SPS	BE-ASR, BE-ICS-PCS, DG-LS, EN-ACE-ART, EN-ACE-CL, EN-ACE-COS, EN-ACE-INT, EN-ACE-OSS, EN-CV, EN-EL, EN-HE-HH, EN-MME, EN-MME-MM, HSE-SEE, IPT-PI, SMB-SE, TE-EPC	Under Approval
10754	Relocate SPS Beam Dump in LSS5 and LSS1 reconfiguration	TE-ABT	ETIENNE CARLIER (TE-ABT-EC)	3. HL-LHC and LIU projects	SPU-PRJ	SPS	BE-ABP-HSC, BE-ASR, BE-BI, BE-CO, BE-ICS-AC, BE-ICS-CSE, BE-OP, EN-ACE-INT, EN-ACE-SU, EN-CV, EN-EL, EN-HE-HH, EN-MME, EN-STI, HSE-RP, HSE-SEE, IT-CS, SMB-SE, TE-ABT, TE-EPC, TE-MPE-MI, TE-MSC, TE-VSC-BVO	Under Approval

Upgrade of the fire safety system inside Faraday cage (BA3) – LS2

Access system to ECA5 commissioning

Recommissioning EIS functionality

PLC related (not safety systems)

Reconfigure ECA5 sectorization

PLAN

Contribution requests to BE-ICS not yet declared in PLAN:

- LIU-PSB
  - BRF2 alcove :
    - Two additional smoke detectors to be installed in the new alcove and integrated to the existing fire detection system of BFR2 room in building 361
    - A fire warning horn will be placed above the alcove entrance grated door
  - POPS-B:
    - Access control system for the reference magnet area in 245/S-403 under study (access to TE/MSC through D3 door shall be authorized by TE/EPC)
- LIU-SPS
  - ECA5, kicker area:
    - Layer of fire detection units monitoring of the air will be installed near the kicker pulsed generators electronics and controls racks (by row of racks), and near the powering area