X0 Safety Instructions

27.9.2021

Experiment Control Room

Telephone

Figure 1 Telephone and DECT handset. Your number: 3265 (corded) and 3285 (cordless handset)

Dial 9 to connect to the external line. Emergency numbers 112 for ambulance or fire truck, 110 for police. The external line is connected without dialing 9! Inform the gate (3333) where the ambulance / fire truck / police are needed! You are in the Experimental Hall EH.1.029 (cave), C09.1.001 (measurement room), C09.1.002 (sample prep room). Send a person to the green cube to guide in ambulance / fire truck.

Audio Line to Main Control Room

Figure 2 old-style communication line to HKR

Request line to the Main Control (HKR) room by push button. Only Main Control Room can hang up. This is an alternative to calling the HKR at tel. 2222. It is ancient und a bit out of fashion.

Air Conditioning

Figure 3 Air-conditioning on/off and temperature control

set cooling with control unit mounted on wall opposing door. “0” is about 23 deg C

Electric Heater

may get pretty hot! Do not cover when in operation. When leaving set to a safe power.

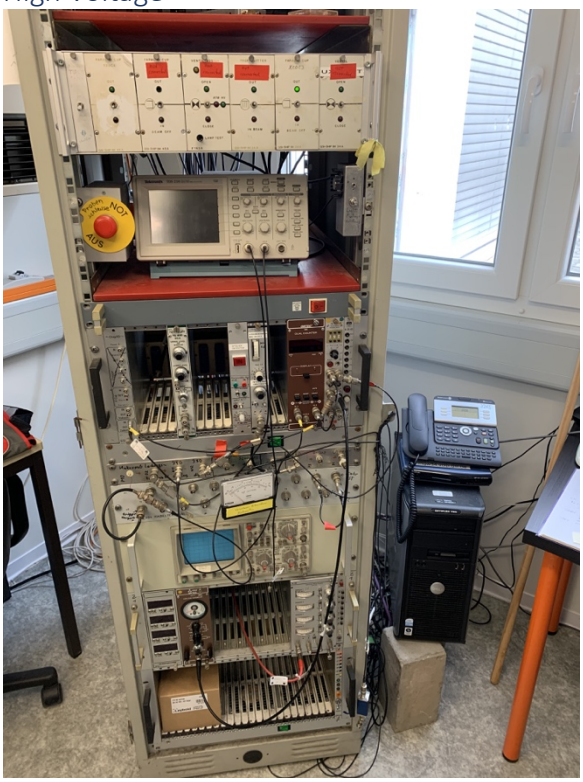
Figure 4 Heater

Circuit Breakers

located left of window to prep room. This is where you can break to power to the entire container. Also, you can check for tripped fuses.

Figure 5 Circuit-breakers

High Voltage



SEETRAM three-foil-detector needs about +100V, detector m about +50V. Switch off voltage before unplugging cables or working on SEETRAM/det m. All power supplies may deliver a few kV if maladjusted!

Figure 6 Sample-inlet control rack

Sample Inlet Emergency Stop

Figure 7 Emergency-stop for sample-inlet system

Motors of the sample inlet system controlled from Experiment Control Room. They will start to move when someone presses RUN on the computer. Be sure not to mangle someones hands when operating the computer remote control! Emergency stop buttons available in software and as hardware button in electronics rack. Camera looking to the magazine position.

Eating and Drinking

Eating or drinking is not allowed as per GSI Safety Department. Feel free to spend your break-time in the kitchen of the operating crew close to the main control room.

Sample Preparation Room

Air Conditioning

Figure 8 Air-conditioning control

Control on wall opposing door.

Potentially Hazardous Materials

Be aware, that potentially hazardous materials might be handled in this room. Do not eat and drink here. When handling such materials, wear lab coat, safety goggles, gloves if appropriate. Be sure that you and bystanders understand necessary safety measures!

Eating and Drinking

Do not eat or drink in the Sample Preparation Room. Spend your breaks in the kitchen of the operating crew close to the main control room.

Membrane Cutter

Figure 9 Membrane cutter

sharp blades hidden in polymer foam. Handle with care! Do not lean on black foamy objects! When unused, put blades into box to keep everyone safe!

Steel Container with “low” Activity Materials

Figure 10 Blue steel container for low-activity samples

Magazines with very low fluence samples can be placed inside. Be aware of possible radioactivity!

Geiger Mueller Counter

Should be around to check activities.

Sink

No “chemicals” go into the sink.

Cave

Emergency Circuit Breaker

Figure 11 General emergency stop

left-hand side when entering the cave. Will cut mains power in experimental hall. End of experiment! In case of electrical accident first push emergency button, then call for professional help and help.

Figure 12 Door lock control with 'panic'-button

Emergency Door Unlock

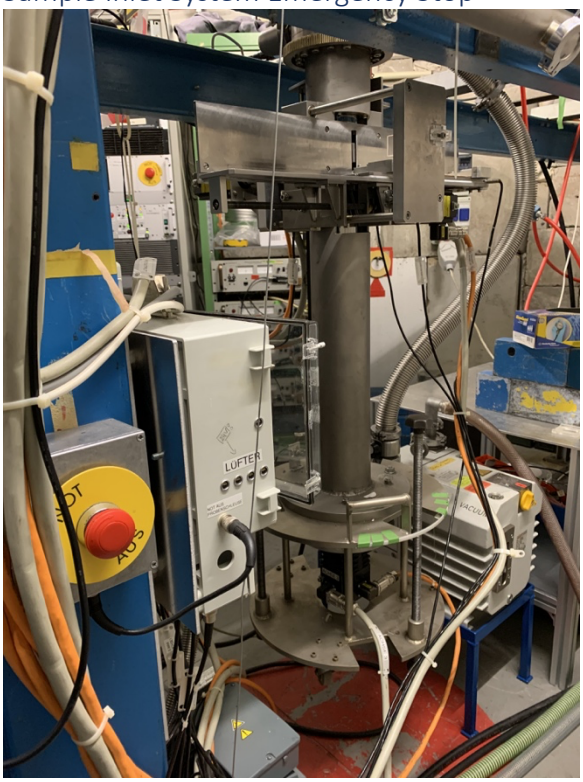
On inside door control panel, there is an emergency push button to unlock the doors. Beam will be cut off. Easy to get beam running again. Not end of experiment. If locked in cave, push immediately! On the outside, the doors can be unlocked with the second key or via the security computer.

Telephone

Figure 13 Telephone with number 1351, vacuum controls and sample-inlet emergency stop on right

behind the beamline at the vacuum and valve control panel, close to sample inlet system. Emergency numbers 112 for ambulance or fire truck, 110 for police. The external line is connected without dialing 9! Inform the gate (3333) where the ambulance / fire truck / police are needed! You are in the Experimental hall, cave X0, EH.1.029. Send someone to green cube to guide in ambulance / fire truck.

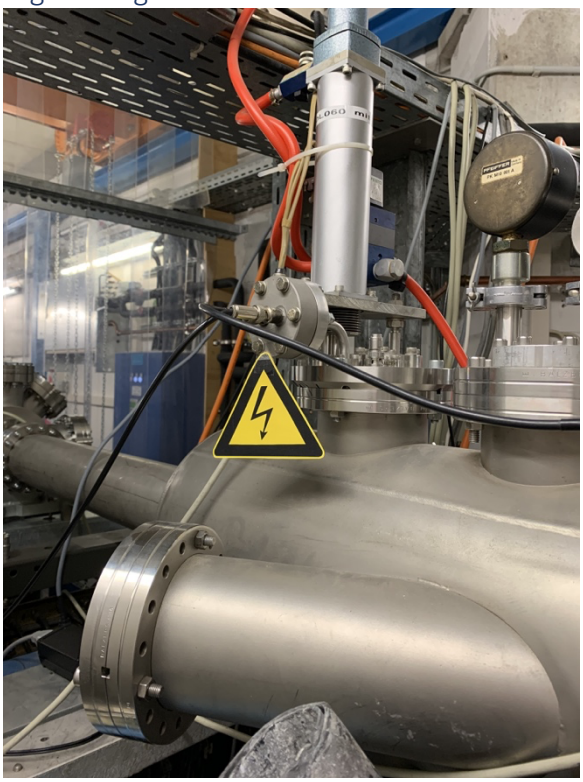
Sample Inlet System Emergency Stop



Motors are controlled from the Experiment Control Room. Do not manipulate when moving. Make sure, coworkers in Experiment Control Room are aware that you intend to manipulate sample inlet system. Emergency Stop button left of sample inlet system.

Figure 14 Sample-inlet system

High Voltage Detectors



SETRAM running with +100V. Power of before working on cables. Detector m working with +50V. Power off before working on cables. High voltage power supplies in Experiment Control Room. Faraday cup runs at -1000V. Faraday cup high voltage supply is in the cave in the NIM mini crate directly left of the curtain. Make sure your coworkers know when you are working on powered-off detectors! Maladjusted power supplies can supply a few kV!

Figure 15 Faraday cup with -1000V connection

Figure 16 High voltage on SEETRAM, +100V

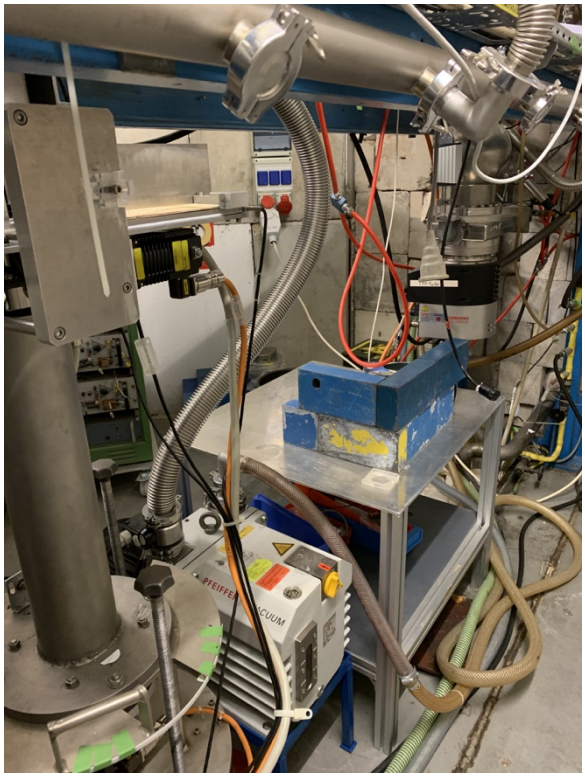


Figure 17 Test-magazine short-term storage

Lead Sample Storage

right of sample inlet system, there is a wall of lead bricks. Put test magazine behind this wall when not in use. Be aware of radioactivity behind the lead-brick wall! Radioactive trash, i.e. dose test films, broken lumiscreens, broken sample holders, exclusively go into the metal trash bin. No other trash goes there! No extra packaging, paper, tape. This waste is very expensive to take care of! There is a heap of lead bricks behind beamline for long-term storage of activated samples.

Figure 18Mini NIM crate with high voltage suppy for Faraday cup

Figure 19 Long-term sample storage for cool-down

Removal of Activated Materials

Activated samples are not to be removed from the controlled area prior to a measurement of the radio-protection division of GSI. Call Accelerator Radiation Protection staff via GSI's beeper system (12-5291-your number) for such a measurement.

Do not work alone in the cave!

The cave is super tight and not frequented by many people. No one will find you for hours if you pass out/get hurt here. Thus, it is strictly forbidden to work in the cave on your own. This means that you have to make sure that someone knows you are working in the cave and will notice and check when you are missing. This has to happen in a reasonable amount of time.

Emergency Exit, Fire Department

Figure 20 Emergency exit, fire alarm button

Evacuation Plan, Fire Extinguishers, First Aid Kit

Figure 21 First-aid kit, fire extinguishers, and floor-plan with evacuation route

SARS-Cov2 Rules

In addition to the general GSI rules take note of the following ruleset specific to work during beamtimes at the X0 installation:

1. 1.5M DISTANCE AT ALL TIMES
2. WEAR FFP2 MASK WITHOUT EXHALATION VALVE WHENEVER NOT ALONE IN A ROOM AT X0
3. WEAR COMMUNITY MASK OR BETTER WHEN ALONE IN A ROOM
4. CLEAN SURFACES AT SHIFT CHANGE, WEAR GLOVES FOR MULTI- USE SURFACES THAT CANNOT BE CLEANED
5. EXCHANGE AIR IN THE ROOMS REGULARLY
6. STAY TF AWAY WHEN YOU FEEL SICK

Now a quick self-test:

Someone hit their head and feels dizzy and nauseated. You decide to call for help. What do you do?

(1) I whatsapp a pal who's in pre-med to ask for homeopathic remedies.

(2) I call the gate at tel. 3333. They are first-aid schooled and may assist in the decision to call appropriate professional help.

(3) I press the General Emergency Stop and Fire buttons to get the attention of as many colleagues and emergency services as possible.

(4) I dial 112 on the GSI phone and alarm the emergency services. Then I notify the gate at tel. 3333 so they can direct the ambulance to 'X0' at EH 1.029 or C09 next to the green cube.

The frigging sample-inlet system broke again and you decide to use your electrical engineering super-powers to fix it. How do you proceed?

(1) You whatsapp the pal from above who also owns a soldering iron.

(2) You call your shift supervisor to organize repairs.

(3) You read the trouble shooting section in the 'X0-files' located in the Control Container and fiddle with the motor control electronics.

(4) You immediately press all red buttons you can find to avert any danger. Then you go home because beamtime is over.

You irradiate samples for a super important Nobel laureate who happens to also be the sister-in law of the current research director of GSI. She is waiting in the chemistry lab to quickly etch her samples before they oxidize. You decide to use the Geiger counter to check for activation. They are slightly active. Who do you ask whether the samples can leave the cave to be etched right away?

(1) Your shift supervisor

(2) The Nobel committee in Stockholm

(3) The Radiation Protection shift at the beeper 12-5291-$yournumber. They will call back at $yournumber and show up immediately and take a measurement and then decide for you.

(4) Noone. You operate the beamline so it's your decision. That's why you get paid so well.

You smell a hint of 'burning plastic'. It appears to come from the cave. How do you react?

(1) You're going with the 'red-button-solution' and press all emergency stop and fire alarm buttons you can find. Better safe than sorry.

(2) You get a fire extinguisher and heroically run into the cave to spray the beamline with CO2. The Corona FFP2 mask will save your lungs from hazardous gases.

(3) You call someone (shift supervisor, Main Control Room). Together you check for smoke from the cave entrance. If there is no smoke you carefully enter and locate the source of the smell. If you cannot enter you call the fire department at tel. 112. You break electrical power supplied to the device/area.

(4) You just wait and see what happens. GSI surly have installed fire detectors in all experiment caves, did't they?