
Beamline Control System Restart's Procedures

Introduction

1. Goal of this document

Enabling the beamline's staff to proceed autonomously to the beamline's control system restart, in order to improve in the greatest way the beamline's control system availability.

2. Abuse's Monitoring

System's restart are archived and monitorated. Abuses (i.e. no-justified restarts or restart without report) will be reported to head office and they'll imply the disabilitation of the password previously assigned. Damages due to abuses or to an incorrect use of the procedures, described later, will be charged to the beamline's budget.

3. Password

Passwords are assigned individually to the beamline's staff during the learning stage and they are non-transferable to others without a suitable instruction by the Measurement Software Operative Unit.

Resetting's different level of the Beamline's Control System functionality

The different kind of restart are described in increasing order of "gravity". If it is indispensable a Beamline's Control System reboot, it had better however try the different procedures, in the described order .

1. Restart of the control's software.

In this case all programs related to the control's system are restarted, but the operating system is still working. This kind of restart is adequate, when you have to reload a new configuration.

2. System's reboot .

In this case, after having shut-down all programs related to the control's system, the operating system is also restarted This kind of restart could be

necessary , when some BCS's programs don't shut-down, even though they received a shut-down command.

3. System's reset.

In this case the CPU is resetted with the rest button This operation shuts-down roughly the BCS's programs, while they're running and sometimes this operation can produce communication's problems (in particular on the serial ports) with the instrumentation. This kind of restart could be necessary , when, due to some malfunctions, there is no way to log-in to the system.

4. Sistem's shut-down.

In this case the whole crate VME is shut-down and this operation produce an hardware reset of the CPU and of all the boards. This operation shuts-down roughly the BCS's programs, while they're running This kind of restart could be necessary , when the other procedures failed.

Operative procedures

1. Proceed only if necessary.

Check if the malfunction is really due to the Beamline Control System: usually it is easier restarting the client PC.

It's important to notice that inhibitions to commands don't disapper with a system's restart, but analysing and solving the causes that generate them (e.g.flowmeter alarms, temperature alarms,...).

2. Proceed in autonomous way only if necessary.

When a problem occurs, in any case try to contact the staff of the Measurement Software operative Unit both in the office and on mobile phone; only if you don't find anybody, proceed autonomously following the procedures described in this document.

3. "Beamdump" risk.

If you have to restart the BCS of a frontend with "Beamdump" risk (1.2, 2.2, 5.2), contact the control room and ask for opening the gap to the "GAP INJECTION" value and for closing the shutter placed immediately before the frontend. Go on with the procedure only when you're sure that valve and shutter are being closed, otherwise you cause a "beamdump" with a notable loss of beam-time for ALL beamlines.

4. Take the rack's keys

The keys of the control's system rack are inserted in the same ring of the frontend's keys; you can pick them up from the "Keysafe" or, if there are some problems, from the guardroom.

5. Switch all VACOs in LOCALE mode

It's important the all VACOs, both those relative to the frontend and those relative to the beamline, are switched to the "LOCALE" mode, turning the corresponding key. Purpose of this operation is to avoid undesiderated valve's movement. The frontend's VACO is usually placed in the same

BCS's rack. The beamlines VACOs have to be located in the different beamlines racks.

Don't forget VACOs of the beamline that share the same frontend!!!!
Some VACOs aren't accesible, because they're closed inside prefabricated room. In this case it's necessary to contact the person in charge of that beamline.

6. Close thel frontend

If they're still open, close Shutter, Stopper and Last Valve, in this order.
On the beamlines with Shopper, close Shopper and last Valve, in this order..

On the bending beamlines, this operation must be done on both branchlines.

7. Close all programs that make request to the control system

In this way you avoid of soliciting the control's system during the restart's procedure and of having unwanted messages on the console.

8. Shut-down of the control's software

Log-in to the control's system terminal as user stopXXX (where XXX is own's frontend number 012,022,032,...:so stop012, stop022,...) and type the password, that the Measurement Software operative Unit previously gave you. This user will shut-down the control's system applications. This operation should imply a large amount of messages on the console, messages that are relative to the applications that are shutting down. The last message should be similar to:

```
GESTNOD0 received a SIGCHLD signal to release a family
GESTNOD0.bye: joining threads
GESTNOD0.bye: detach
GESTNOD0: free pdiag_din
GESTNOD0: clear shared memories...
GESTNOD0: clear semaphores...
GESTNOD0: bye-bye
```

If the procedure failes, proceed to the [system's reboot](#)

9. Restart of the control's system programs

Log-in to the control's system terminal as user startXXX (where XXX is own's frontend number 012,022,032,...:so start012, start022,...) and type the password, that the Measurement Software operative Unit previously gave you. This user will start the control's system programs. This operation should imply a large amount of messages on the console, messages that are relative to the applications that are starting. The restart's procedure finished positively, if it appears the following messages:

```
##### B C S  START-UP  OK #####
```

```
start-up countdown ...
```

```
----- F I R E   B C S   ----- 5 -----
----- F I R E   B C S   ----- 4 -----
----- F I R E   B C S   ----- 3 -----
```

```
----- F I R E   B C S ----- 2 -----  
----- F I R E   B C S ----- 1 -----  
----- F I R E   B C S ----- 0 -----
```

FIRE! ...

#####GESTNOD0: All protocols running...

In this case the procedure finished successful. If the procedure failes, proceed to the [system's reboot](#)

10. Switch VACO's in REMOTE mode

Switch all VACOs, both those relative to the frontend and those relative to the beamline (even those of your twin-beamline), to the "REMOTE" mode, turning the corresponding key.

11. Working's Test

Test the system reading some variables (e.g. the status of some valves,...) and sending some commands (open/close valve). If the test fails, consider the opportunity of proceeding with the [system's reboot](#).

12. Close the racks and put away the rack's keys

It's a heavy responsibility, of those took the key, closing the rack and not leaving it unattended. We want remind you that manual operations from the instrument panels can cause heavy damages.

Rack's keys have to be put in the "Keysafe" or returned to the guardroom.

13. Compile a report

This report has to be submitted with the Web application "[TAR - Technical Assistance Request](#)" using the Virtual User Office login, specifying as "Activity" the "Beamline Control System". Furthermore in the field "Description", specify the beamline's name, the reasons that lead to the restart, the operation's sequence and any other useful information .

100. System's Reboot

Log-in to the control's system terminal as user rebootXXX (where XXX is own's frontend number 012,022,032,...:so reboot012, reboot022,...) and type the password, that the Measurement Software operative Unit previously gave you. This user will stop the control's system programs and then will restart the system. This operation, that can takes many minutes, should imply a large amount of messages on the console, messages that finish with the appearance of the login's prompt.

user name:

If the procedure finished successful, proceed to the [restart of control's system programs](#) and following the next recommended steps up to compiling the report.

Otherwise proceed to the [system's reset](#)

200. System's Reset

Locate on the CPU's board of the control's system the reset button and push it. This operation causes the CPU's reset; after this step the CPU proceeds with the autoboot's process via network. This operation, that can takes many minutes, should imply a large amount of messages on the console, messages that finish with the appearance of the login's prompt:

user name:

If the procedure finished successfull, proceed to the [restart of control's system programs](#) and following the next recommended steps up to compiling the report.

Otherwise proceed to the [system's switching off](#)

300. System's switching off and on

Locate the VME's crate of the control's system and switch it off, using the button placed on bottom part of the power supply, on the right side.

Furthermore switch all VACOs off ; notice that this operation'll close all the valves eventually still open. Wait for a couple of minutes and then switch all VACOs on and finally the VME's crate. At the restarting moment the CPU proceeds with the autoboot's process via network. This operation, that can takes many minutes, should imply a large amount of messages on the console, messages that finish with the appearance of the login's prompt:

user name:

If the procedure finished successfull, proceed to the [restart of control's system programs](#) and following the next recommended steps up to compiling the report.

Otherwise the problem needs to be solved by specialized staff.

Authors: [Fulvio Billè](#), [Roberto Pugliese](#)
