

# Babysitting ISOLDE from the CERN Control Centre

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20/12/2010

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## 1. Introduction

ISOLDE is operated by a team of 5 ISOLDE machine supervisors (IMS). The IMS on duty is responsible for the ISOLDE operation for one week at a time, Tuesday 14:00 to Tuesday 14:00. A second person from the IMS team is designated as a “backup”, whose role is to assure the continued supervision in case the regular IMS has been working during the previous night. The babysitting starts when the IMS leaves for the day. The responsibility of the CERN Control Centre (CCC) staff from that moment and until the following morning (weekdays) is the following:

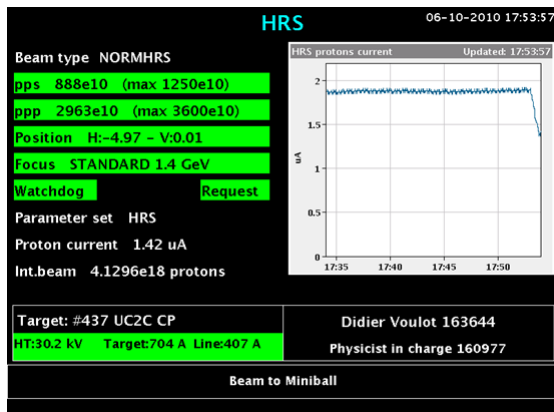
- Monitor the functioning of ISOLDE
- Deal with security and access
- Perform some basic troubleshooting in case of problems.

A ‘Physicist in Charge’ is also designated among the physics team for each shift. The physicist in charge is doing the liaison between the experiment and operation and should be reachable by mobile phone (160977) at any time during the run.

## 2. Monitoring of ISOLDE and troubleshooting

### 2.1 VISTAR

The relevant information for each target is displayed in the corresponding VISTAR page. A red background indicates an interlock on the proton beam.



List of interlocks and possible solutions:

- pps (proton/s): The limit has been exceeded. Reduce the beam intensity.
- ppp (proton/pulse): The limit has been exceeded. Reduce the number of proton per pulse.
- Position of proton beam: The steerer settings have been changed or the power supplies have tripped off. Check steerer settings or reset the power supplies.
  - For GPS: BTY.DHZ211 / BTY. DVT212
  - For HRS: BTY.DHZ323 / BTY. DVT324
- Focus of proton beam: The quadrupole settings have been changed or the power supplies have tripped off. Check quadrupole settings or reset the power supplies.

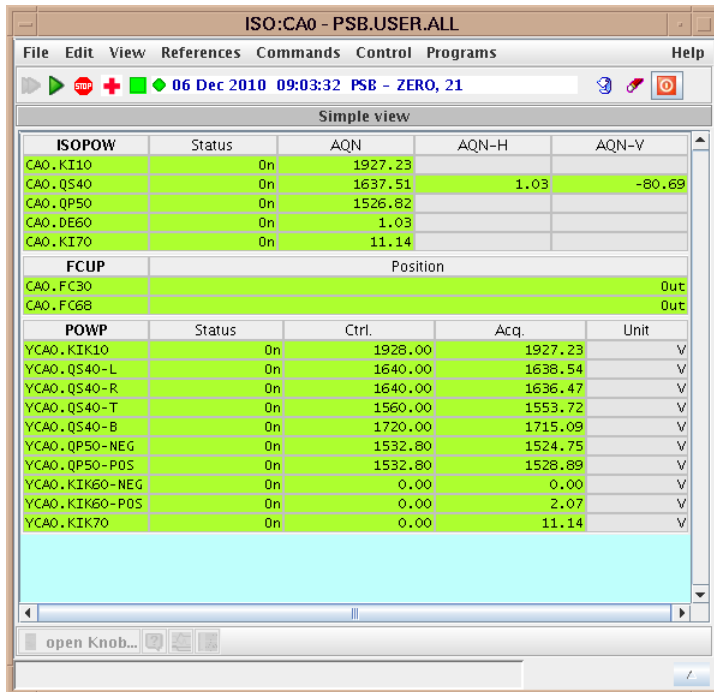
For GPS:            BTY.QDE209 / BTY. QFO210

For HRS:            BTY.QDE321 / BTY. QFO322

- Watchdog: Beam losses in the BTY line. Check proton beam settings.
- Request: on/off status.
- Target high voltage: The high voltage has tripped off. Use the HT control to reset it (see below).
- Target / Line heating: The Target / Line heating is down. Call the IMS.

## 2.2 Workingsets

ISOLDE and REX are operated using two different CCM environments (ISOOP and REXOP), however both use standard Workingset tools.



The screenshot shows a software window titled "ISO:CA0 - PSB.USER.ALL" with a menu bar (File, Edit, View, References, Commands, Control, Programs, Help) and a status bar displaying "06 Dec 2010 09:03:32 PSB - ZERO, 21". The main area is labeled "Simple view" and contains several tables of data.

ISOPOW	Status	AQN	AQN-H	AQN-V
CAO.KI10	0n	1927.23		
CAO.QS40	0n	1637.51	1.03	-80.69
CAO.QP50	0n	1526.82		
CAO.DE60	0n	1.03		
CAO.KI70	0n	11.14		

FCUP	Position
CAO.FC30	Out
CAO.FC68	Out

POWP	Status	Ctrl.	Acq.	Unit
YCAO.KIK10	0n	1928.00	1927.23	V
YCAO.QS40-L	0n	1640.00	1638.54	V
YCAO.QS40-R	0n	1640.00	1636.47	V
YCAO.QS40-T	0n	1560.00	1553.72	V
YCAO.QS40-B	0n	1720.00	1715.09	V
YCAO.QP50-NEG	0n	1532.80	1524.75	V
YCAO.QP50-P05	0n	1532.80	1528.89	V
YCAO.KIK60-NEG	0n	0.00	0.00	V
YCAO.KIK60-P05	0n	0.00	2.07	V
YCAO.KIK70	0n	0.00	11.14	V

Example of ISOLDE Workingset. The first part contains beamline elements; the last part contains the power supplies making up these elements. Power supplies can be reset, for example after a vacuum interlock, from the contextual menu (right-hand click).





## 2.3 Target HT

The target high tension is controlled from a dedicated HT application, one for each front end.



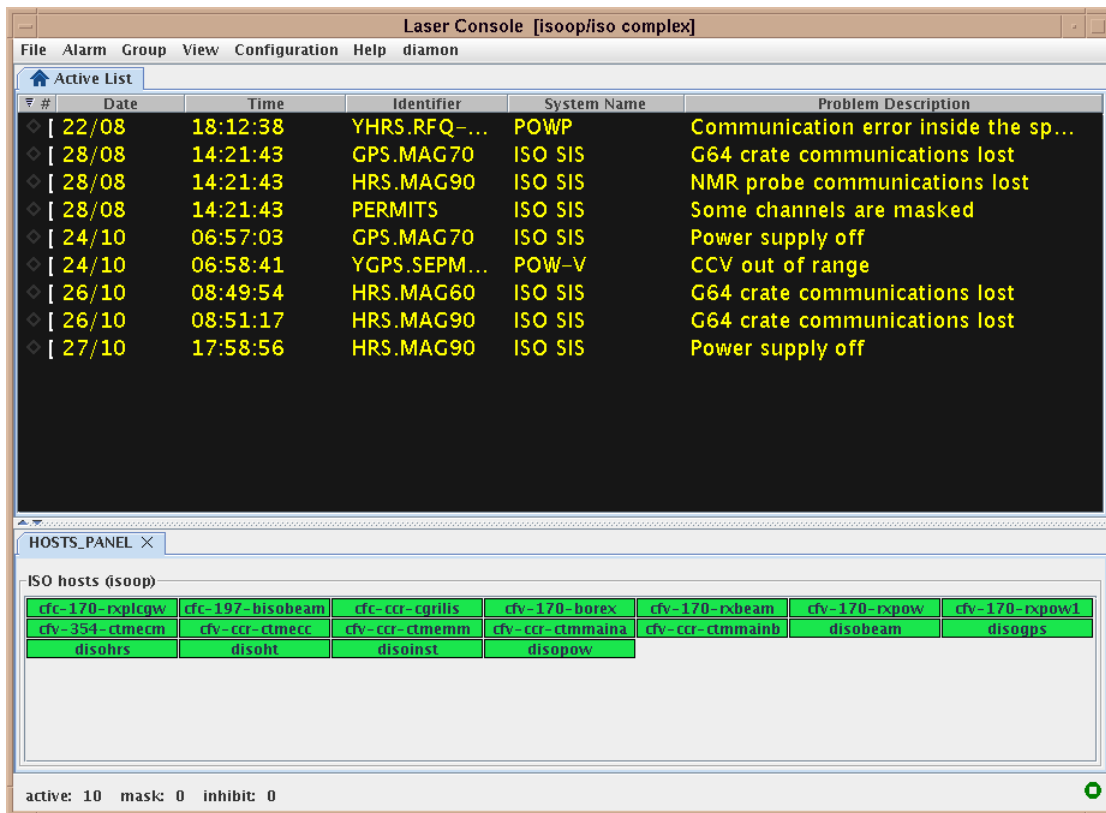
Normal status of ISOLDE vacuum system (in this example beam from GPS to LA2).

Valves can take four states:

-  valve open, authorization to close
-  valve closed, authorization to open
-  valve open, closing forbidden
-  valve closed, opening forbidden

It is necessary to log on (top right corner) to operate the system. Logging as 'isoop' gives sufficient rights to maneuver valves and acknowledge alarms.

## 2.5 LASER alarm



The screenshot shows the 'Laser Console [isoop/iso complex]' interface. The 'Active List' tab is selected, displaying a table of active alarms. Below the table is the 'HOSTS\_PANEL' showing a grid of ISO hosts.

#	Date	Time	Identifier	System Name	Problem Description
22/08	18:12:38	YHRS.RFQ-...	POWP		Communication error inside the sp...
28/08	14:21:43	GPS.MAG70	ISO SIS		G64 crate communications lost
28/08	14:21:43	HRS.MAG90	ISO SIS		NMR probe communications lost
28/08	14:21:43	PERMITS	ISO SIS		Some channels are masked
24/10	06:57:03	GPS.MAG70	ISO SIS		Power supply off
24/10	06:58:41	YGPS.SEPM...	POW-V		CCV out of range
26/10	08:49:54	HRS.MAG60	ISO SIS		G64 crate communications lost
26/10	08:51:17	HRS.MAG90	ISO SIS		G64 crate communications lost
27/10	17:58:56	HRS.MAG90	ISO SIS		Power supply off

ISO hosts (isoop)						
cfc-170-rxplcgw	cfc-197-bisobeam	cfc-ccr-cgrilis	cfv-170-borex	cfv-170-rxbeam	cfv-170-rxpow	cfv-170-rxpow1
cfv-354-ctmecm	cfv-ccr-ctmecc	cfv-ccr-ctmemm	cfv-ccr-ctmmaina	cfv-ccr-ctmmainb	disobeam	disoqps
disohrs	disoht	disoinst	disopow			

active: 10 mask: 0 inhibit: 0

- cfc-170-rxplcgw REX power supplies
- cfc-197-bisobeam ISOLDE beam instrumentation
- cfc-ccr-cgrilis RILIS
- cfv-170-borex REX beam instrumentation
- cfv-170-rxbeam REX beam instrumentation

- cfv-170-rxpow REX-EBIS
- cfv-170-rxpow1 REX power supplies extension
- cfv-354-ctmecn ...
- cfv-CCR-ctmecc ...
- cfv-CCR-ctmemm ...
- cfv-CCR-ctmmaina ...
- cfv-CCR-ctmmainb ...
- disobeam ISOLDE beam instrumentation
- disogps GPS target and separator (**should not be rebooted while target is on!**)
- disohrs HRS target and separator (**should not be rebooted while target is on!**)
- disoht ISOLDE target HT
- disoinst ...
- disopow ISOLDE power supplies

## 2.6 REX linac RF

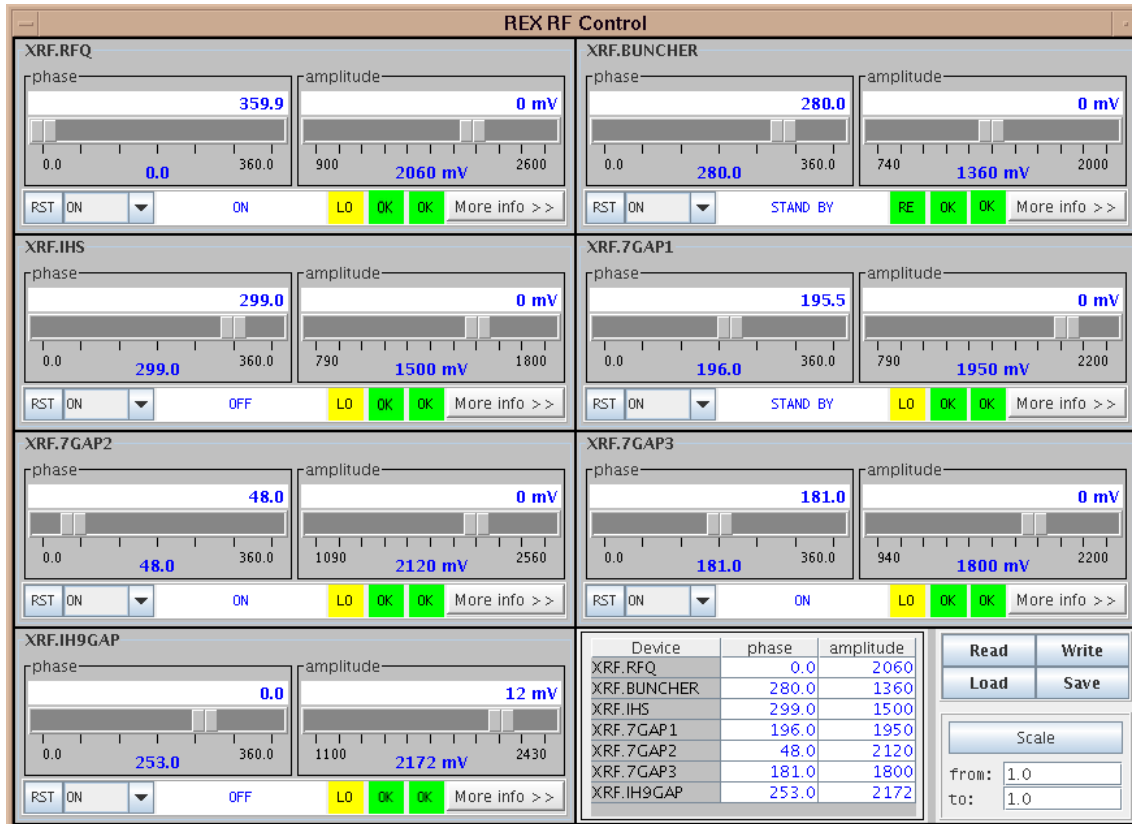
The RF amplifiers for the REX linac accelerating cavities are operated in local mode, except for the rebuncher. For this reason they cannot be reset remotely, however the Workginset can be used to get the status of the amplifiers.

The screenshot shows a software window titled "REX:RF - ASYNC.PERIODIC.600" with a menu bar (File, Edit, View, References, Commands, Control, Programs) and a status bar (16 Dec 2010 17:05:32 ASYNC - 600). Below the menu is a "Simple view" table with the following data:

REX linac RF	State	Status	Setting#phase	Acquisition#phase	Setting#amplitude	Acquisition#amplitude
XRF.RFQ	ON	Local control	0.0	359.9	2060	0
XRF.BUNCHER	ON	Remote control	280.0	280.0	1360	0
XRF.IHS	ON	Local control	299.0	299.0	1500	0
XRF.7GAP1	ON	Local control	196.0	195.5	1950	0
XRF.7GAP2	ON	Local control	48.0	48.0	2120	0
XRF.7GAP3	ON	Local control	181.0	181.0	1800	0
XRF.IH9GAP	ON	Local control	253.0	0.0	2172	12

Detailed status information can be found using the specialist tools from the REX tools webpage:

<http://wwwpsco.cern.ch/private/mw/RDA/local-java/rex-downloads.html> -> [REX RF Control](#)



Click 'More info' to view the interlocks, warnings and faults registry.

### 3. If there is no beam reaching the experiment

In case the beam does not reach the experiment, check:

1. Interlocks in the VISTAR.
2. Status of section valves along the beam path.
3. RFQCB pressure (for HRS runs): HRS40 should be between  $3e-6$  and  $4e-6$  mb when the He buffer gas is on. A pressure in the E-7 range indicates that the leak valve is closed or that the He bottle is empty.
4. Status of HV power supplies for beam optics in the Workingsets. A vacuum burst might have triggered the vacuum interlock of the HV supplies.
5. Status of REX power supplies and RF (for REX runs).

If none of the above apply or if the problem cannot be resolved remotely, the IMS should be called.

### 4. Contacts and references

Further information can be found on the ISOLDE web page and the ISOLDE help page:

<http://isolde.web.cern.ch/ISOLDE/>  
<http://isolde-help.web.cern.ch/isolde-help/>

<https://edms.cern.ch/document/1110036/1>



Information about the ISOLDE operation team can be found on the IMS page:  
<https://espace.cern.ch/be-dep/OP/ISOLDE/default.aspx/>