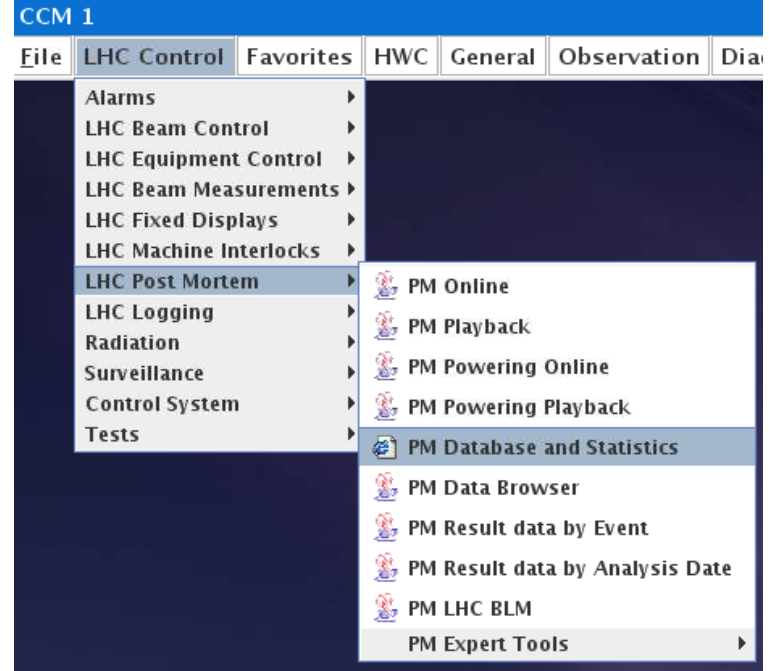


What to do in case of a Circuit Quench, Trip or Earth fault?

Updated version to be used as of 17 March 2016



Open the PM database:

Option 1: CCM Controls LHC Post Mortem PM Database and Statistics

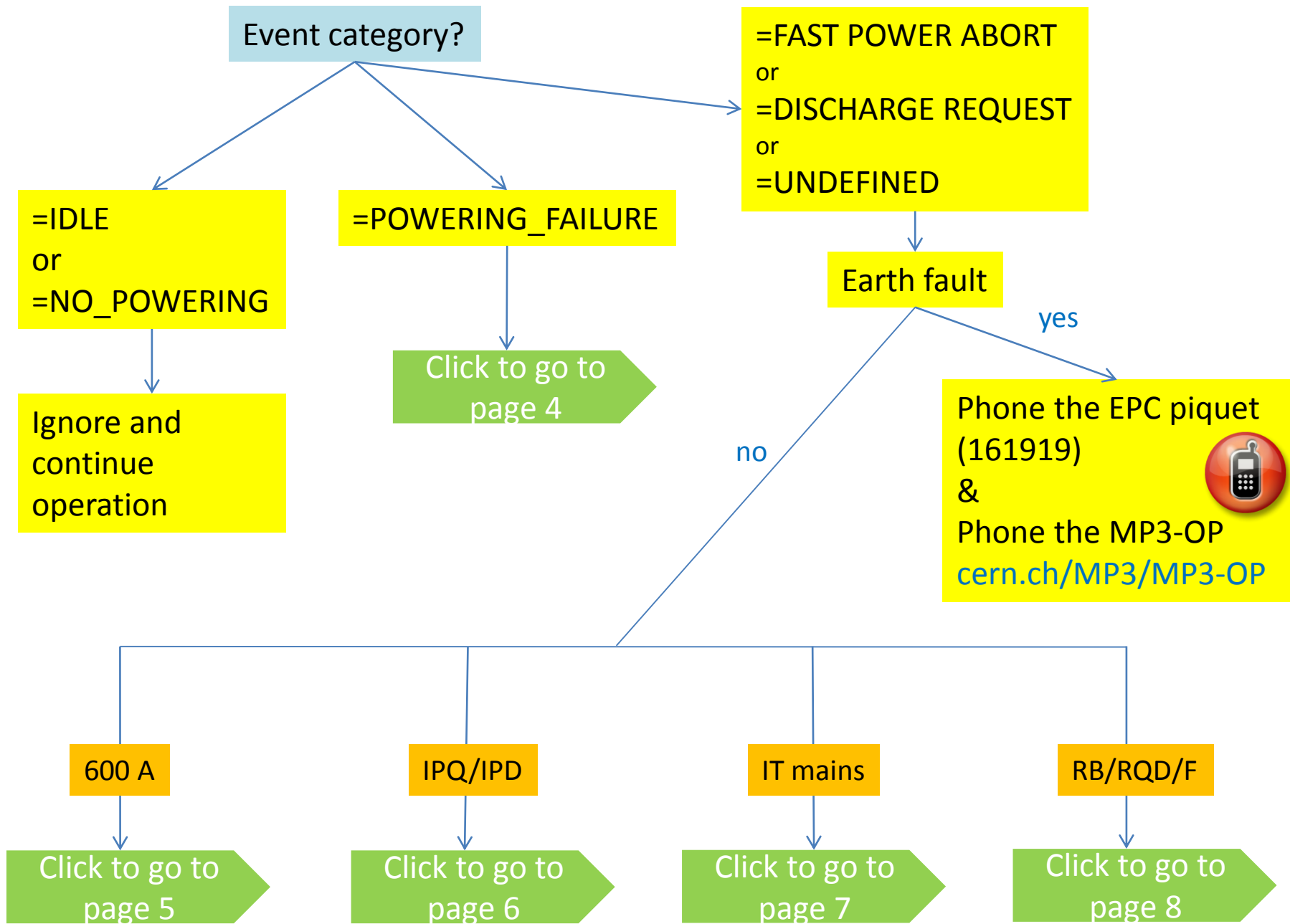
Option 2: https://apex-tn.cern.ch/pls/htmldb_dbabco/f?p=117 or
https://apex.cern.ch/pls/htmldb_dbabco/f?p=117

Login with your NICE account (default setup done for lhcop)

Select “Powering PM events” (upper right).

Select “Event timestamp – Last hour”.

Look for the circuit that was at the origin of the event, i.e. the circuit with **“Event source=YES”** (see here for 3 examples of single circuit trips from [converter](#), [QPS](#) and [subsector abort](#))



Page 4: Event category=POWERING_FAILURE

The cause of the trip is related to the power converter.

DOC circuit? (60A, 80-120A)

yes

no

Circuit needed
for operation?

yes

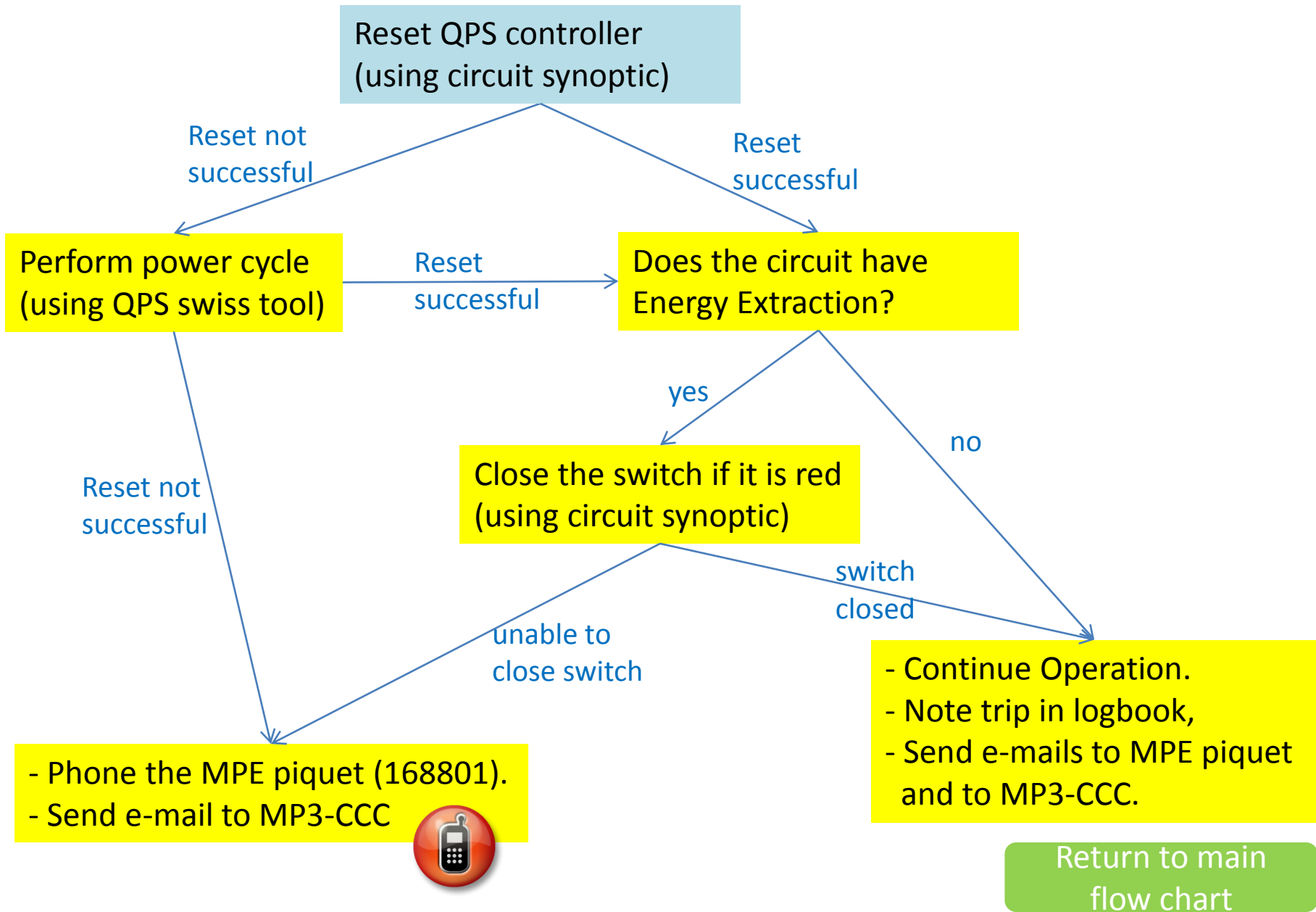
no

Phone the EPC piquet
(161919)
Send e-mail to MP3-CCC if the
trip could have been caused
by a magnet quench.



Superlock the circuit (80-120A), remove from SOC, continue operation, and send an e-mail to EPC.
Send e-mail to MP3-CCC if the trip could have been caused by a magnet quench.


Return to main
flow chart



Quench heater firing?

no

yes



Phone the EPC piquet (161919) or the MPE piquet (168801) depending on your evaluation of the origin of the problem


Look in LHC-MPP logbook

"Heater discharge status"=OK

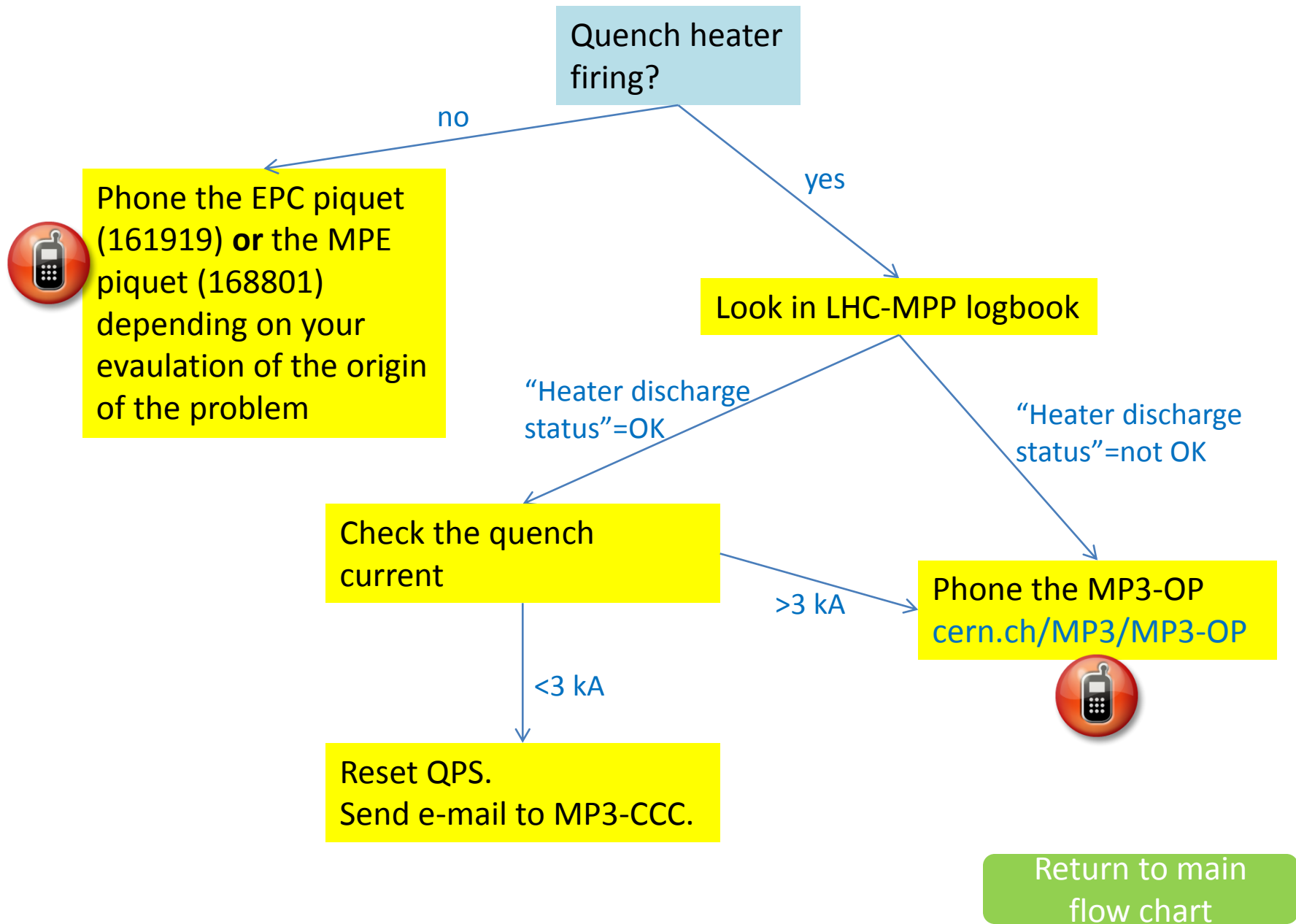
"Heater discharge status"=not OK

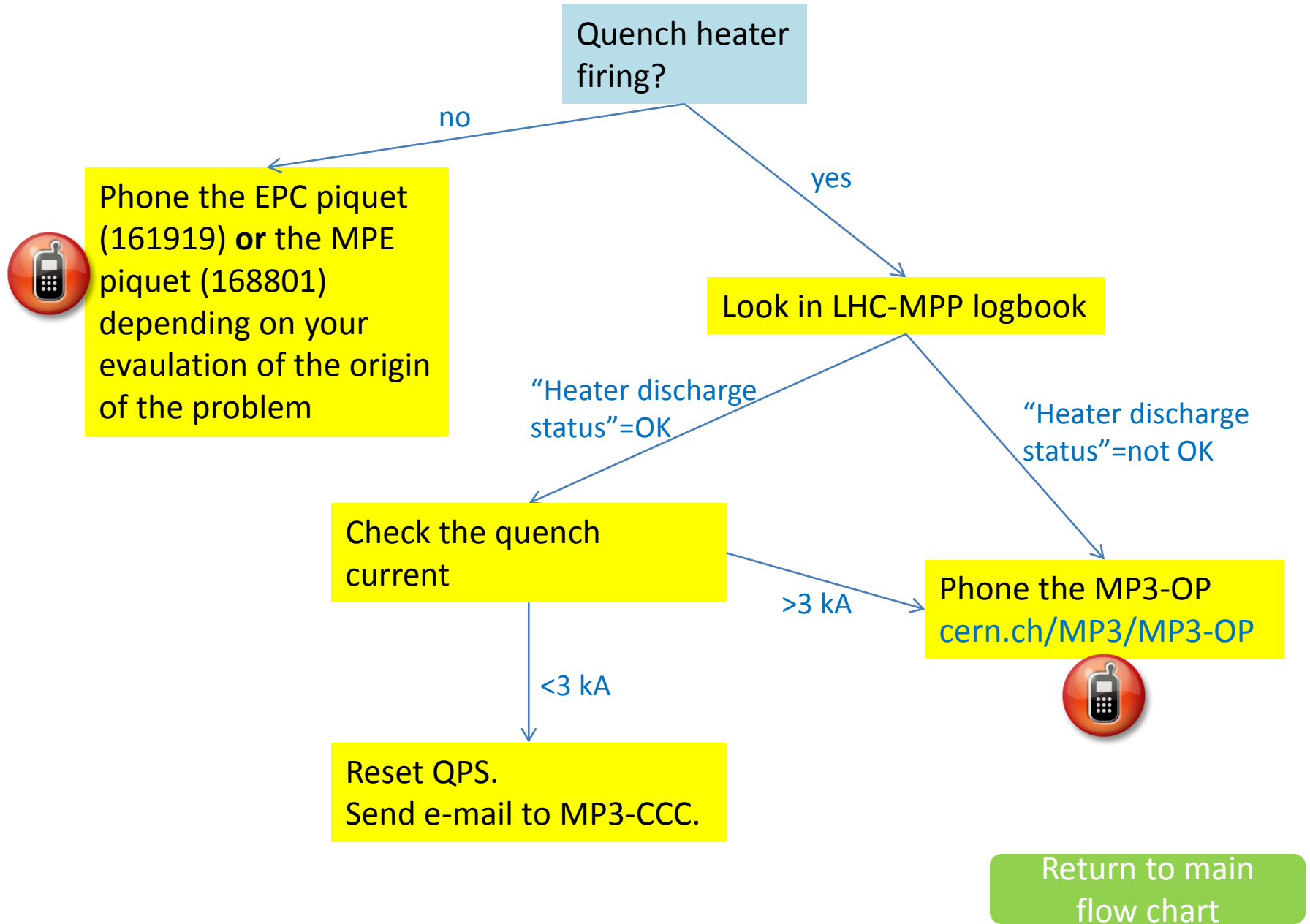
Reset QPS.
Send e-mail to MP3-CCC.

Phone the MP3-OP
cern.ch/MP3/MP3-OP



Return to main flow chart





POWERING FAILURE

Example of single circuit trip for RSF2.A67B2 from 4.4A @ 13:54:13.632 due to an auxiliary power supply of the converter

Powering PM events - Windows Internet Explorer provided by CERN

https://cs-ccr-oas1.cern.ch/pls/html_dbabco/f?p=117:2:2875980773492933::NO

File Edit View Favorites Tools Help

Convert Select

Favorites CERN - AB - OP eLogbook CERN Users' pages derStandard Web Slice Gallery

CERN - AB - OP eLogbook OP Vistars CERN - AB - OP eLogbook Powering PM events

Global PM events Powering PM events Statistics

Go Reports: 1. lhcoop-default Actions

Save Report = "lhcoop-default"

Row text contains 'AUX'

Event Timestamp < 19-FEB-11

Event Timestamp	Circuit Name	Event Type	Event Source	Event Category	Circuit Current	Power Converter Faults	Event Pattern
10-FEB-11 04.58.50.940000 PM	RCO.A12B1	NO_GLOBAL_EVENT	YES	POWERING_FAILURE	.0013696529204025865	TRG JAC BREAKER TRIPPED , TRG JAC PHASE LOSS , TRG VIN DC OVER VOLTAGE , TRG VIN DC UNDER VOLTAGE , TRG PRECHARGE , TRG INVERTER , TRG 4-QUADRANT LINEAR STAGE , TRG VOUT OVER VOLTAGE (1ST LEVEL) , TRG VOUT OVER VOLTAGE (2ND LEVEL) , TRG IOUT OVER CURRENT , TRG CROWBAR , TRG CROWBAR TRIPPED , TRG OVER TEMPERATURE , TRG AUX POWER SUPPLY , TRG AUX DC-DC , TRG WATCHDOG , TRG FAST ABORT UNSAFE , TRG EXTERNAL CURRENT LEADS , TRG EXTERNAL LEARTH OVER CURRENT , TRG EXTERNAL EQUIPMENT STOP , TRG EXTERNAL SPARE , TRG JAC BREAKER	f-P
08-FEB-11 09.10.53.340000 PM	RCO.A12B1	NO_GLOBAL_EVENT	YES	POWERING_FAILURE	.0014940265787223577	TRG 4-QUADRANT LINEAR STAGE , TRG IOUT OVER CURRENT , TRG OVER TEMPERATURE , TRG AUX POWER SUPPLY , TRG AUX DC-DC , TRG JAC BREAKER	Pf
12-NOV-10 12.58.56.340000 PM	RCBYVS4.L1B1	NO_GLOBAL_EVENT	YES	POWERING_FAILURE	.0008425417472608387	TRG 4-QUADRANT LINEAR STAGE , TRG IOUT OVER CURRENT , TRG OVER TEMPERATURE , TRG AUX POWER SUPPLY , TRG AUX DC-DC	f-P
11-NOV-10 02.54.26.540000 PM	RCBYVS4.L1B1	NO_GLOBAL_EVENT	YES	POWERING_FAILURE	.0007277197437360883	TRG 4-QUADRANT LINEAR STAGE , TRG IOUT OVER CURRENT , TRG OVER TEMPERATURE , TRG AUX POWER SUPPLY , TRG AUX DC-DC	f-P
03-NOV-10 01.49.08.740000 PM	RCBXV2.R8	NO_GLOBAL_EVENT	YES	POWERING_FAILURE	5.0211710929870605	TRG AUX POWER SUPPLY / FANS	f-P+a-A
31-OCT-10 01.54.13.632000 PM	RSF2.A67B2	NO_GLOBAL_EVENT	YES	POWERING_FAILURE	4.430459499359131	TRG AUX POWER SUPPLY / FANS	f-P
30-OCT-10 03.16.24.540000 PM	RCBYVS4.L1B1	NO_GLOBAL_EVENT	YES	POWERING_FAILURE	.0008608368479165852	TRG 4-QUADRANT LINEAR STAGE , TRG IOUT OVER CURRENT , TRG OVER TEMPERATURE , TRG AUX POWER SUPPLY , TRG AUX DC-DC	f-P
22-OCT-10 06.15.59.040000 PM	RSF2.A67B2	NO_GLOBAL_EVENT	YES	POWERING_FAILURE	.0003959655587095767	TRG AUX POWER SUPPLY / FANS	f-P
17-SEP-10 11.08.43.840000 AM	RQS.A81B1	NO_GLOBAL_EVENT	YES	POWERING_FAILURE	2.1607930660247803	TRG AUX POWER SUPPLY / FANS	f-P
08-SEP-10 02.27.34.920000 PM	RQX.R8	NO_GLOBAL_EVENT	YES	NO_POWERING	327.1092834472656	TRG AUX POWER SUPPLY	f
08-SEP-10 02.27.34.880000 PM	RQX.R8	SUBSECTOR_ABORT	YES	POWERING_FAILURE	327.1092834472656	TRG AUX POWER SUPPLY	
18-AUG-10 12.10.54.928000 AM	RQTL10.R7B2	NO_GLOBAL_EVENT	YES	POWERING_FAILURE	16.773658846092773	TRG AUX POWER SUPPLY / FANS	

Return

FAST ABORT

Example of single circuit trip of RCS.A78B2 from 113A @ 03:40:41.360 due to a Fast Abort / QPS trigger

Powering PM events - Windows Internet Explorer provided by CERN

https://cs-ccr-oas1.cern.ch/pls/htmldb_dbabco/?p=117:2:2875980773492933::NO

Post Mortem Database - Data Browser

User: LHCOP Help

Logout

Global PM events Powering PM events Statistics

Go Reports 1. lhcop-default Actions

Saved Report = "lhcop-default"

Event Timestamp	Circuit Name	Event Type	Event Source	Event Category	Circuit Current	Power Converter Faults	Event Pattern
06-MAR-11 06.16.34.024000 PM	RQT13.R7B2	NO_GLOBAL_EVENT	YES	FAST_POWER_ABORT	20.23330307006836	TRG EXTERNAL FAST ABORT	a-AP+f
05-MAR-11 05.28.00.859504 AM	RQT12.R2B1	NO_GLOBAL_EVENT	YES	FAST_POWER_ABORT	-6.358053684234619	TRG EXTERNAL FAST ABORT	a-AP
05-MAR-11 05.28.00.859504 AM	RQT12.R2B2	NO_GLOBAL_EVENT	YES	FAST_POWER_ABORT	.04655797407031059	TRG EXTERNAL FAST ABORT	a-AP
05-MAR-11 05.28.00.859504 AM	RQTL11.R2B2	NO_GLOBAL_EVENT	YES	FAST_POWER_ABORT	904693288898468	TRG EXTERNAL FAST ABORT	a-AP
05-MAR-11 05.28.00.859504 AM	RQTL11.R2B1	NO_GLOBAL_EVENT	YES	FAST_POWER_ABORT	3.881897211074829	TRG EXTERNAL FAST ABORT	a-AP
05-MAR-11 03.43.02.403000 AM	RCS.A78B1	NO_GLOBAL_EVENT	YES	IDLE	-	NOT_OK	IDLE
05-MAR-11 03.40.41.360000 AM	RCS.A56B1	NO_GLOBAL_EVENT	YES	FAST_POWER_ABORT	-113.00616465078125	TRG EXTERNAL FAST ABORT	a-APf
05-MAR-11 03.40.41.360000 AM	RCS.A78B2	NO_GLOBAL_EVENT	YES	FAST_POWER_ABORT	-117.73692321777344	TRG EXTERNAL FAST ABORT	a-AP-f
05-MAR-11 03.40.41.360000 AM	RQTL10.R7B1	NO_GLOBAL_EVENT	YES	FAST_POWER_ABORT	-140.99073791503906	TRG EXTERNAL FAST ABORT	a-APf
05-MAR-11 03.40.41.360000 AM	RQTL10.R7B2	NO_GLOBAL_EVENT	YES	FAST_POWER_ABORT	-146.88180541992188	TRG EXTERNAL FAST ABORT	a-AP-f

Return

SUBSECTOR ABORT

Example of subsector abort at injection, triggered by trip of RB.A67 @ 07:25:44.917 due to a discharge request from power converter (likely water failure)

Powering PM events - Windows Internet Explorer provided by CERN

https://cs-ccr-oas1.cern.ch/pls/htmldb_dbabco/f?p=117:2:2875980773492933::NO

Global PM events Powering PM events Statistics

Reports: 1. lhcoop-default

Event Timestamp < 19-FEB-11

Event Timestamp	Circuit Name	Event Type	Event Source	Event Category	Circuit Current	Power Converter Faults	Event Pattern
18-FEB-11 07.33.38.804000 AM	RQF.A67	NO_GLOBAL_EVENT	YES	IDLE	.	NOT_OK	IDLE
18-FEB-11 07.33.38.204000 AM	RB.A67	NO_GLOBAL_EVENT	YES	IDLE	.	NOT_OK	IDLE
18-FEB-11 07.28.06.604000 AM	RDD.A67B2	NO_GLOBAL_EVENT	YES	IDLE	.	NOT_OK	IDLE
18-FEB-11 07.25.45.517000 AM	RB.A67	SUBSECTOR_ABORT	YES	DISCHARGE_REQUEST	.	NOT_OK	fP+d-A-a
18-FEB-11 07.25.44.917000 AM	RB.A67	SUBSECTOR_ABORT	YES	DISCHARGE_REQUEST	757.1666870117188	UNIDENTIFIED_FAULT	fP+d-A-a
18-FEB-11 07.25.44.917000 AM	RCD.A67B1	SUBSECTOR_ABORT	NO	FAST_POWER_ABORT	.	NOT_OK	AP+a+f
18-FEB-11 07.25.44.917000 AM	RQTL10.L7B2	SUBSECTOR_ABORT	NO	FAST_POWER_ABORT	-.00482902629300952	TRG EXTERNAL FAST ABORT	AP-a
18-FEB-11 07.25.44.917000 AM	RQTL10.L7B1	SUBSECTOR_ABORT	NO	FAST_POWER_ABORT	-.005442372523248196	TRG EXTERNAL FAST ABORT	AP-a
18-FEB-11 07.25.44.917000 AM	RQTF.A67B2	SUBSECTOR_ABORT	NO	FAST_POWER_ABORT	-.0003959268797188997	TRG EXTERNAL FAST ABORT	AP+a+f
18-FEB-11 07.25.44.917000 AM	RQTF.A67B1	SUBSECTOR_ABORT	NO	FAST_POWER_ABORT	.0013150520389899611	TRG EXTERNAL FAST ABORT	AP+a+f
18-FEB-11 07.25.44.917000 AM	RQTD.A67B2	SUBSECTOR_ABORT	NO	FAST_POWER_ABORT	.0005106425378471613	TRG EXTERNAL FAST ABORT	AP+a+f
18-FEB-11 07.25.44.917000 AM	RQTD.A67B1	SUBSECTOR_ABORT	NO	FAST_POWER_ABORT	.0014218682190403342	TRG EXTERNAL FAST ABORT	AP+a+f
18-FEB-11 07.25.44.917000 AM	RQT13.R6B2	SUBSECTOR_ABORT	NO	FAST_POWER_ABORT	-.003338645212352276	TRG EXTERNAL FAST ABORT	AP-a
18-FEB-11 07.25.44.917000 AM	RQT13.R6B1	SUBSECTOR_ABORT	NO	FAST_POWER_ABORT	-.002934254240244627	TRG EXTERNAL FAST ABORT	AP-a
18-FEB-11 07.25.44.917000 AM	ROF.A67B2	SUBSECTOR_ABORT	NO	FAST_POWER_ABORT	.04750480502843857	TRG EXTERNAL FAST ABORT	AP+a+f

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Return