



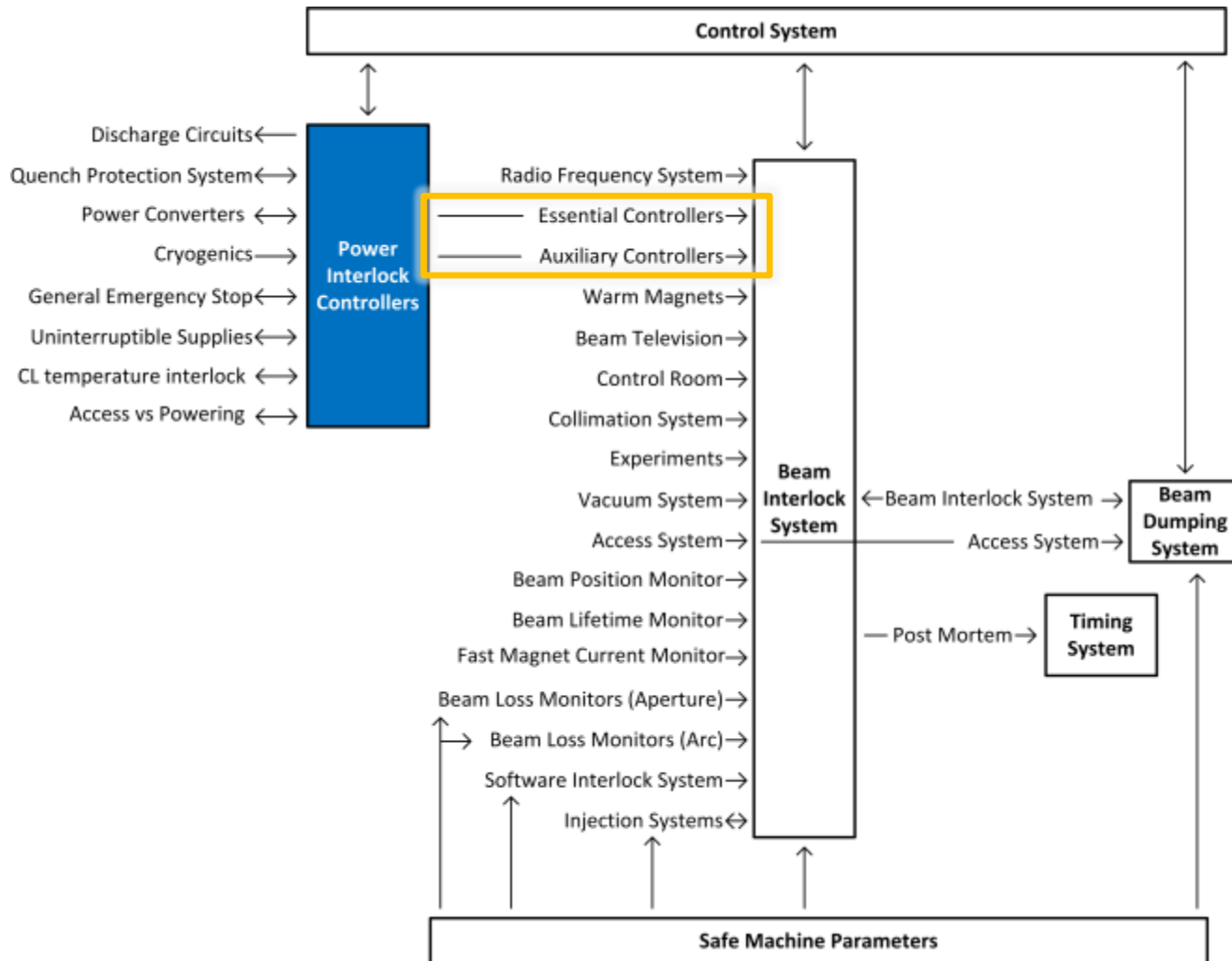
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PIC configuration: Potential modification of skew quadrupoles (RQS)

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MPP meeting – 23.06.2017

Powering and Beam Interlocks



Definition of essential and auxiliary

- **Essential circuits** are connected to unmaskable input of BIS
=> **BEAM DUMP** under any condition (including safe beams)
- **Auxiliary circuits** are connected to maskable input of BIS
=> **BEAM DUMP** if unsafe beams (can be masked on the BIS when running with safe beams)

NOTE: No difference between Essential and Auxiliary definition with unsafe beams!

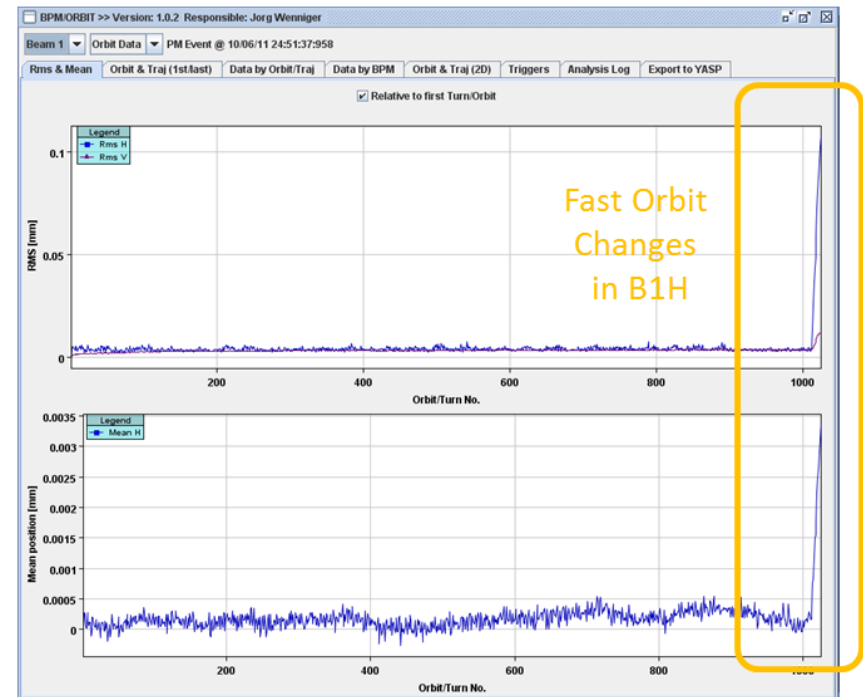
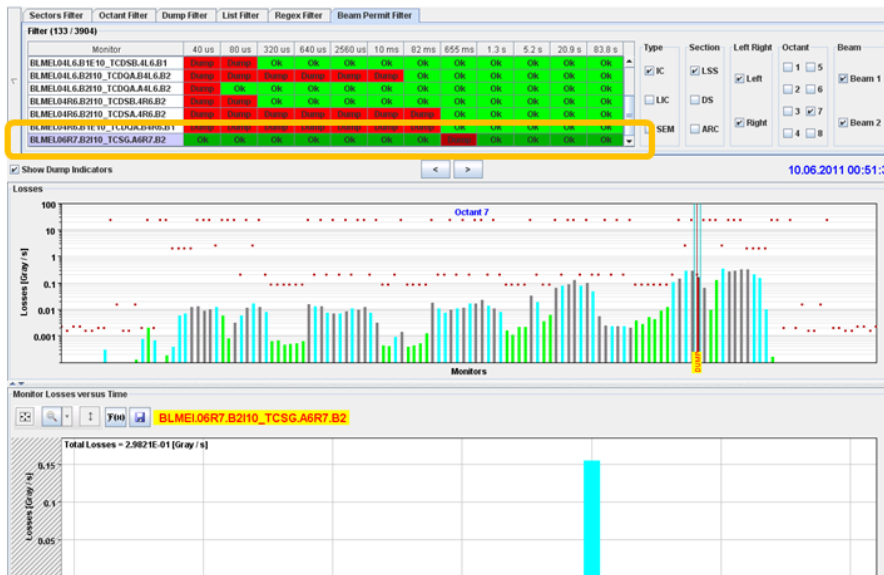
- **None of the above => no impact** on beam

Present PIC configuration

- **UNMASKABLE** (essential for operation):
 - RB, RQD, RQF, RQX, RD1-4, RQ4-RQ10
- **MASKABLE** (not essential for operation):
 - RCS, RQT%, RSD%, RSF%, **RQSX3**, ROD, ROF, RCBXH/V and RCB%
- **NO IMPACT** (do not trigger the BIS)
 - RCD, RCO, **RQS.%**, RSS

Modifications during Run1

- **RQSX3.%**: Included in **Maskable** PIC configuration after trip provoking fast orbit changes and beam losses in SR7 (event on June 2011 – ECR 1203408)



Potential modification for 2017-TS1

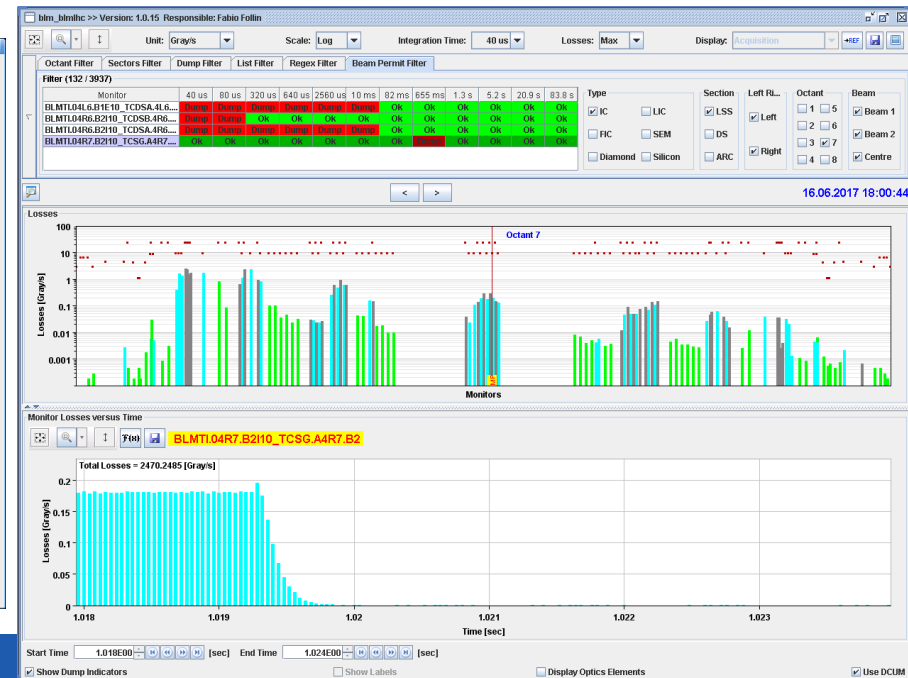
- **RQS.%**: Propose to include in **MASKABLE** configuration to avoid dump on beam losses
- Event on 16.06.2017: Trip of RQS.A81B1 provoked beam losses in R7.
- Several families: RQS.A% (8 circuits), RQS.L/R% (8+8 circuits)
- Currently studying the expected kicks from RQS circuits

History Buffer

Mode: [QPS_45_DR4BC][QPS_45_DT4AG] Time Filter (LOCAL TIME) From: 2017/6/16 00:00:00 to: 2017/6/16 00:00:00

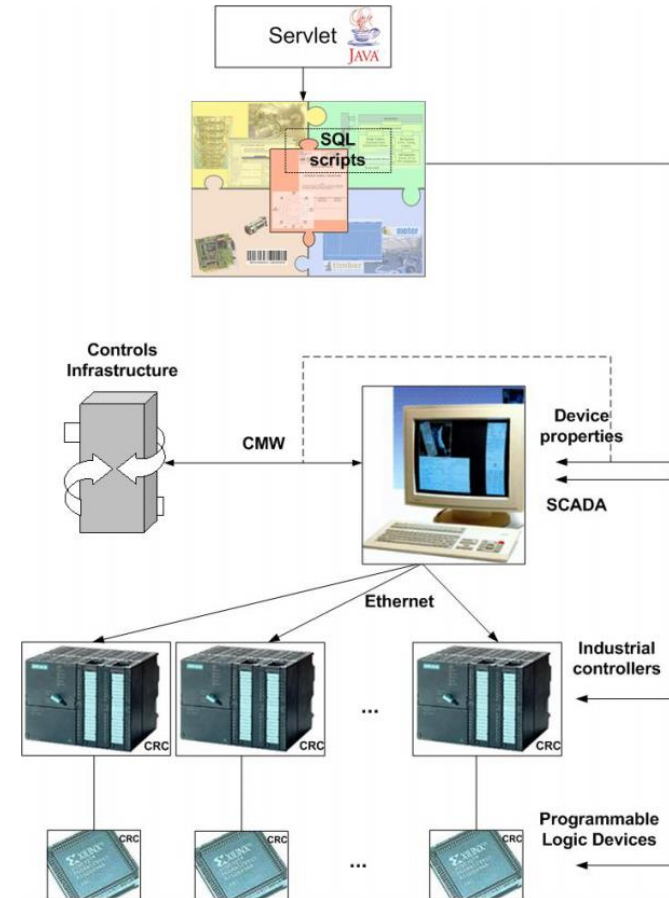
Filter: Source Type Item Message Status Invalid

Local Time	Source	Type	Item	Description	Message	Status	Invalid
2017.06.16 18:00:03.270	External Systems	CMW	RCBXV3.P8	Power Permit from QPS to start powering of circuit	ST_QPS_OK_BOOL	BAD	<input type="checkbox"/>
2017.06.16 18:00:13.520	External Systems	CMW	RCBXV3.P8	Power Permit from QPS to start powering of circuit	ST_QPS_OK_BOOL	OK	<input type="checkbox"/>
2017.06.16 18:00:43.074	Input	B1	RQS.A81B1	Skew quad (Q23P8 Q27R8 Q27L1 Q23L1) Beam 1	ST_ABORT_PIC	BAD	<input type="checkbox"/>
2017.06.16 18:00:43.075	Output	B1	RQS.A81B1	Skew quad (Q23P8 Q27R8 Q27L1 Q23L1) Beam 1	CMD_ABORT_PIC	BAD	<input type="checkbox"/>
2017.06.16 18:00:43.076	Output	B1	RQS.A81B1	Skew quad (Q23P8 Q27R8 Q27L1 Q23L1) Beam 1	CMD_PWB_Permi_PIC	BAD	<input type="checkbox"/>
2017.06.16 18:00:43.076	Input	B1	RQS.A81B1	Skew quad (Q23P8 Q27R8 Q27L1 Q23L1) Beam 1	ST_FAILURE_PIC	BAD	<input type="checkbox"/>
2017.06.16 18:00:44.088	Monitoring INPUT	PLC	CPTZ76.AR7	HW Signal, Beam presence flag read from CIBU Interf	ST_BNFO_BJB2	BAD	<input type="checkbox"/>
2017.06.16 18:00:44.088	Monitoring INPUT	PLC	CPIUA67.AR6	HW Signal, Beam presence flag read from CIBU Interf	ST_BNFO_BJB2	BAD	<input type="checkbox"/>
2017.06.16 18:00:44.088	Monitoring INPUT	PLC	CPIUA87.AR8	HW Signal, Beam presence flag read from CIBU Interf	ST_BNFO_BJB2	BAD	<input type="checkbox"/>
2017.06.16 18:00:44.089	Monitoring INPUT	PLC	CPIUA27.AR2	HW Signal, Beam presence flag read from CIBU Interf	ST_BNFO_BJB2	BAD	<input type="checkbox"/>
2017.06.16 18:00:44.089	Monitoring INPUT	PLC	CPIUA47.AR4	HW Signal, Beam presence flag read from CIBU Interf	ST_BNFO_BJB2	BAD	<input type="checkbox"/>
2017.06.16 18:00:44.089	Monitoring INPUT	PLC	CPIUA63.AL6	HW Signal, Beam presence flag read from CIBU Interf	ST_BNFO_BJB2	BAD	<input type="checkbox"/>
2017.06.16 18:00:44.089	Monitoring INPUT	PLC	CPIUA83.AL8	HW Signal, Beam presence flag read from CIBU Interf	ST_BNFO_BJB2	BAD	<input type="checkbox"/>
2017.06.16 18:00:44.089	Monitoring INPUT	PLC	CPIU33.AL3	HW Signal, Beam presence flag read from CIBU Interf	ST_BNFO_BJB2	BAD	<input type="checkbox"/>
2017.06.16 18:00:44.089	Monitoring INPUT	PLC	CPIU33.AR3	HW Signal, Beam presence flag read from CIBU Interf	ST_BNFO_BJB2	BAD	<input type="checkbox"/>
2017.06.16 18:00:44.089	Monitoring INPUT	PLC	CPIUL557.AR5	HW Signal, Beam presence flag read from CIBU Interf	ST_BNFO_BJB2	BAD	<input type="checkbox"/>
2017.06.16 18:00:44.089	Monitoring INPUT	PLC	CPIUSC55.AL5	HW Signal, Beam presence flag read from CIBU Interf	ST_BNFO_BJB2	BAD	<input type="checkbox"/>
2017.06.16 18:00:44.090	Monitoring INPUT	PLC	CPTZ76.AL7	HW Signal, Beam presence flag read from CIBU Interf	ST_BNFO_BJB2	BAD	<input type="checkbox"/>



How to deploy new configuration...

- Apply changes to **reference DB**
- Generate **configuration data** (script)
- **Download new configuration** to PLC
- Time estimated for changes: 4 hours
- Time estimated for validation: 2 hours
 - Run a few powering tests
 - Run PIC-BIC interface sequences



Thanks for your attention