PXD Slow Control
RC & PSC Testbeam Preparations

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Control Architecture

RC & PSC Statemachines

unknown

not ready

loading unloading

aborting

ready

starting stopping

running
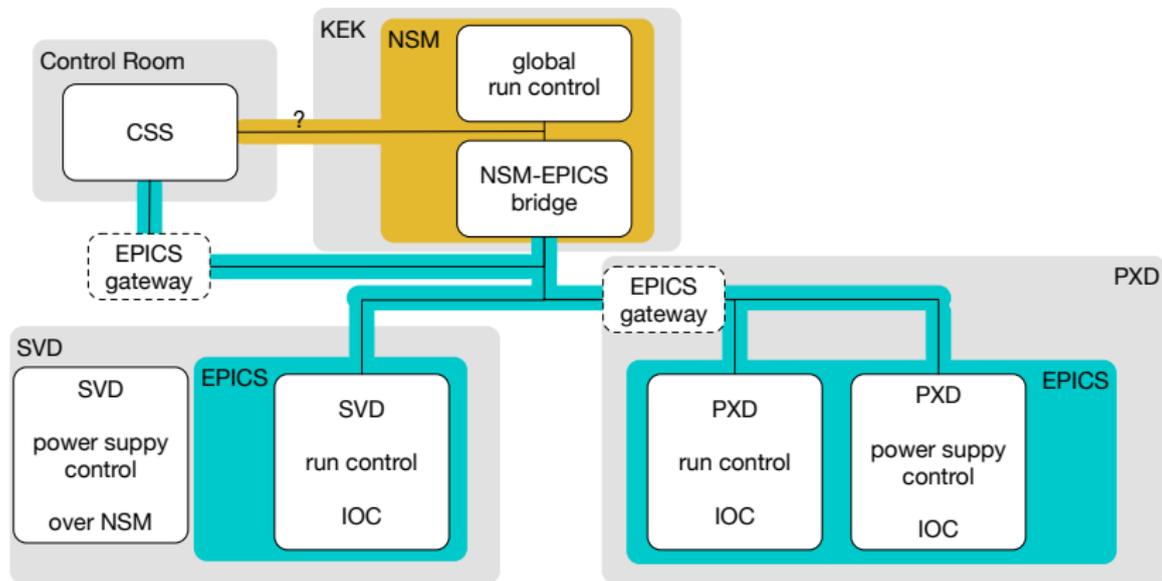
stable state

transitional state
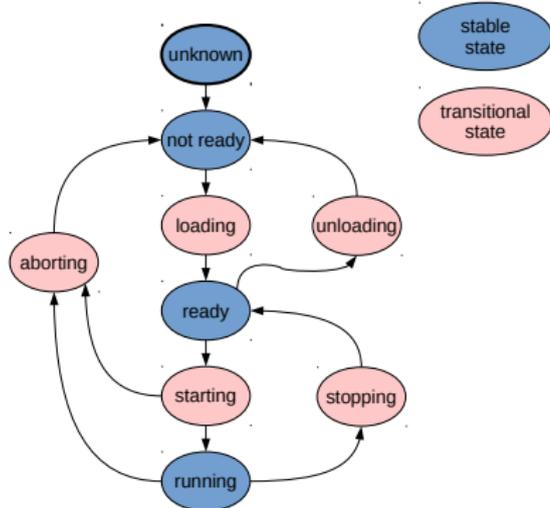
transitional states are not requested by the master.

handshake:
the next stable state is requested
the subdetector acknowledges by reporting the transitional state
when done, the subdetector reports the final state.

the requested state must be reachable from the current state *via only one transitional state* (i.e. request "running" from "not ready" is not allowed).

unknown

off

turning off preparing error

recover

standby

ramping up ramping down

peak

trip

stable state

transitional state
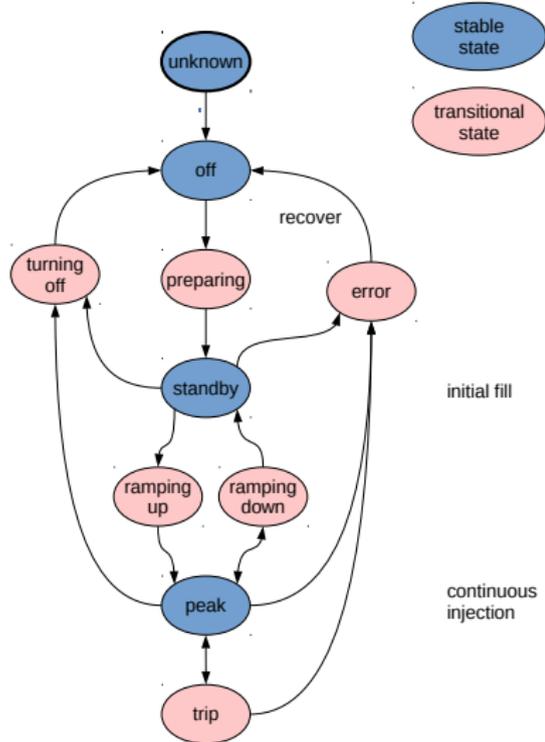
initial fill

continuous injection

Collecting error conditions

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PXD Operation Matrix

	Dummy Mode		
	OFF	**STANDBY**	**PEAK**
NOT READY	Frontend off DAQ off	ASICs+DHH ready DEPFETs not powered DAQ off	Frontend sending data DAQ off
READY	Frontend off DAQ links established	ASICs+DHH ready DEPFETs not powered DAQ links established	Frontend sending data DAQ links established
RUNNING	Frontend off DAQ processing triggers, ROIs. **ONSEN sends dummy data**	ASICs+DHH ready DEPFETs not powered DAQ processing triggers, ROIs. **DHH sends dummy data**	Frontend sending data. DAQ processing triggers, ROIs.

Proposal for Local Control Options in GUI
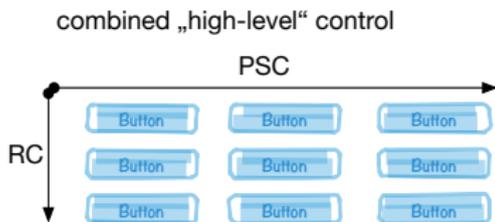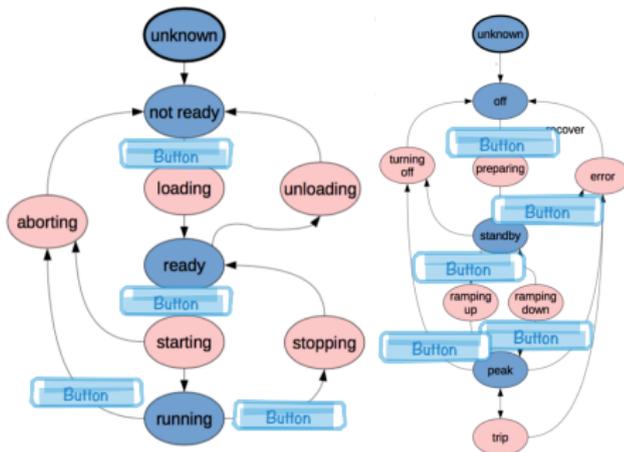
Master Mode: Decoupling Global and Local RC

Belle Run Control → sets → B2:RC:PXD:State:req:S

IF „B2:RC:PXD:Master:cur:S" IS GLOBAL

PXD IOC → sets → B2:RC:PXD:State:set:S

PXD IOC → updates → B2:RC:PXD:State:cur:S

ELSE IF „B2:RC:PXD:Master:cur:S" IS LOCAL

NO ACTION

EXECUTION FLOW

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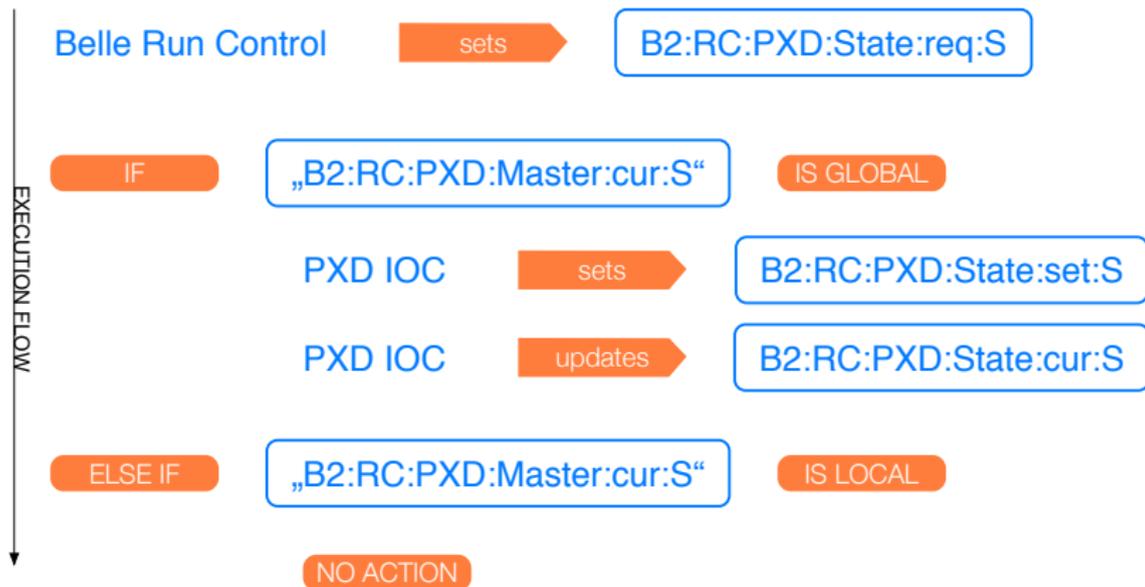
Proposal: Implementation using Code Snippets

```
      state S_starting {
          entry {
              SET_PV(pv_state_current, State_STARTING);
              printf("new state reached: %d\n", pv_state_current);
              error = FALSE;
%%            #include "RC_starting_entry.st"
          }
          when(!error) {
              // do magic stuff at this stage
%%            #include "RC_starting_noerror.st"
          } state S_running
          when(error) {
              // do magic stuff at this stage
%%            #include "RC_starting_error.st"
          } state S_aborting
      }

      state S_running {
          entry {
              SET_PV(pv_state_current, State_RUNNING);
              printf("new state reached: %d\n", pv_state_current);
              error = FALSE;
%%            #include "RC_running_entry.st"
          }
          when(pv_state_requested == State_READY) {
%%            #include "RC_running_ready.st"
          } state S_stopping
          when(pv_state_requested == State_NOT_READY) {
%%            #include "RC_running_notready.st"
          } state S_aborting
      }
```

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