ELENA transfer line commissioning

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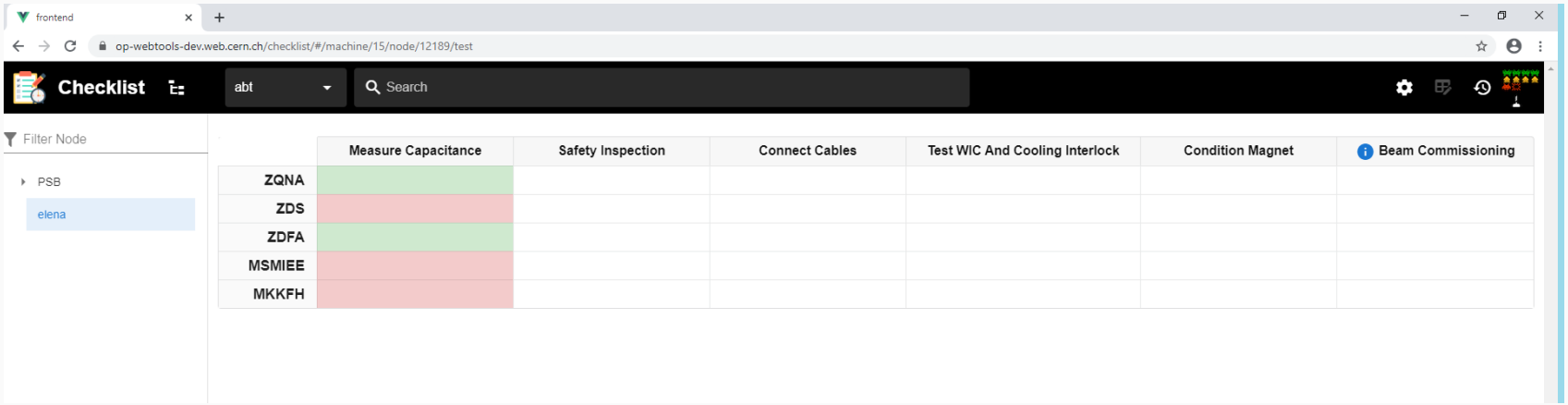
Goals of extraction lines commissioning

- Deliver antiproton beam with reasonable transmission stably within specified spot size to all experiments
- Start with Hminus and do 90% of the tests in high repetition rate
- Automatize tests as much as possible to prepare for efficient antiproton and future commissioning

HW commissioning

- Using OP webtools for tracking
- IST risk analysis as requested by LS2c under preparation - guideline from project on template/timeline/content?



Ongoing preparations for beam

- Re-issue TL layout document with nominal voltages for quads and deflectors in the coming months
- YASP steering: preparing line optics; need mean from profile
- Prepare tools/scripts for efficient commissioning

Beam commissioning

Steps		Period/milestones	LNE00	LNE01
List operational settings		No beam		
Check set/read values in controls SW		No beam		
Check SEM movement, acquistion, logging		No beam		
Check ring orbit and optics before extraction		Prerequisites before beam in line/ring settings at extraction defined		
Extract beam		Single bunch		
	Scan aperture	Single bunch		
	Check FD timing and shot-to-shot repr	Single bunch		
	Influence on individual bunches and circ. beam	Single bunch		
	Check residual voltage impact of ZDSIA	Single bunch		
Thread beam through line		Single bunch		
Scan line acceptance (phase oscillations, blow up)		Single bunch		
	Verify no obstacles in vacuum system	Single bunch/Vacuum remains closed		
Kick response		Single bunch		
	Verify corrector/monitor polarities	Single bunch		
Optics measurements		Single bunch		
	Optics measured in ring	Single bunch		
	Profiles along line	Single bunch		
	Dedicated quad scan if needed, kick response	Single bunch		
	Dispersion measurement	Single bunch		
	Re-define operational line settings	Single bunch		
	Stability check	Single bunch		
	Deliver acceptable beam spot to experiments	Single bunch (pbar)/beam at experiments in spec		
Train splitting				
	Verify train structure in line	Trains pbar		
	Split off bunches at ZDFs	Trains pbar/parallel beam time possible		
Magnetic shielding		Single bunch		
	Test trajectory stability in different conditions	Single bunch		

Tools preparation

- LHC - custom
  - TCDQ alignment
- SPS-to-LHC
  - TCDI alignment and validation
  - TDI-S, TCLIA/B validation
  - Septum (ring and TL) alignment
- SPS
  - Batch spacing optimiser (available)
  - MTE steering
- PS - PSB
  - Multi turn grid matching (BIG too)
  - KSW auto

Generic tools

- Dispersion measurements (anyway YASP is there already!)
- Kick response (also with custom elements) (available - ALOHA)
- Aperture measurements
- Optics measurements
  - N screen measurement
  - Beam-size-free quad scan
- Kicker waveform scans
  - BTV
  - BPM
- Automatic optics matching
  - Single screen, if possible
  - 3/4 screens
- Generic scan

Script

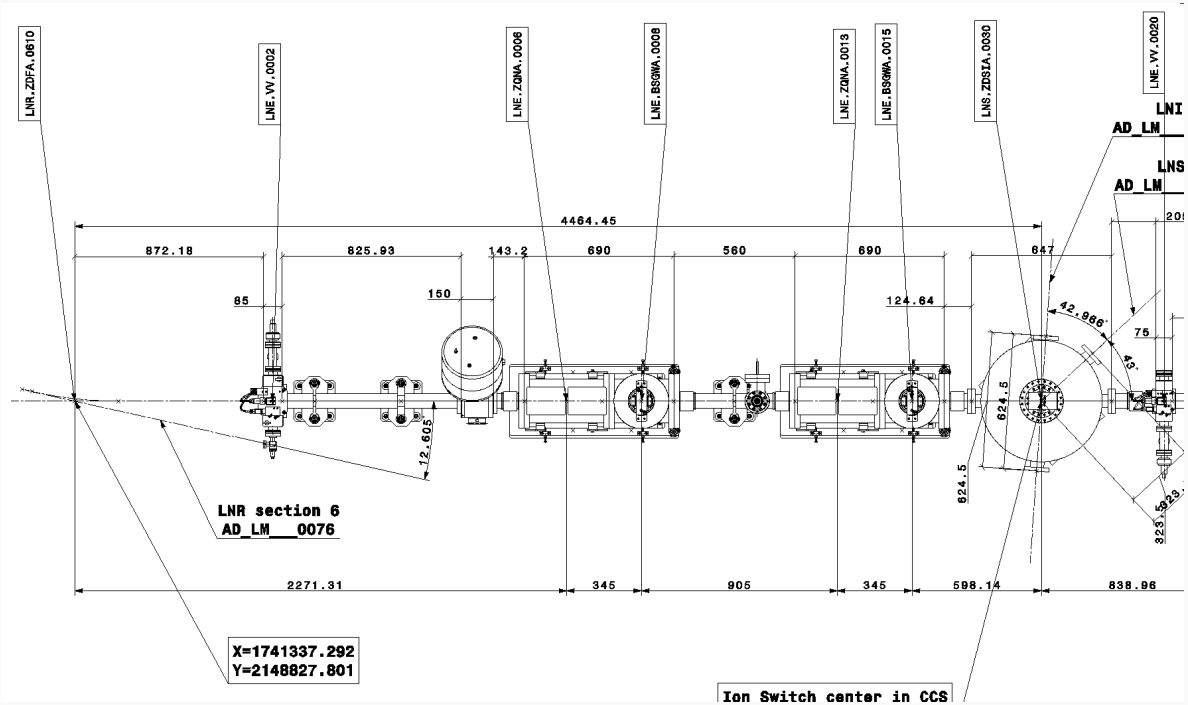
App with GUI

Miscellanea

- Fast deflectors in lines have cables for OASIS
- Ion switch has controlled ramp down of 30kV/s
  - 50 ms remote acquistion from converter side, still expert, but can be made available
  - Envisage test with sonde, need Antoine, Christophe on site, and timing
  - Check timing to ensure we get the 30 kV/s
- Modelling of source quadrupoles, see Matthew's slides
- Optics repository will be moved in the next weeks to *http://acc-models.web.cern.ch/tls/*

Miscellanea

- Logging
  - Definitely SEM raw profile and mean, possibly timing
  - Decouple from ring orbit information



Conclusions

- Consolidated layout and optics model - layout doc to be issued
- Commissioning steps established - time line to follow availability of SEMs and other machines
- Working mostly on commissioning tools now
- We will take care of line commissioning and prepare for smooth handover to OP