# LINAC4 Reliability Run

ESS – CERN meeting 12/01/2017

Jan Uythoven

Thanks to all people involved

# LINAC4 Reliability Run

See also half day workshop on 30/11/2016: https://indico.cern.ch/event/588169/

## Goal

- □ Prove that LINAC4 availability requirement of 95 % can be reached
- Identifying weakest systems and start improvements
- □ First step to routine operation with organisational structure
- Comparison with LINAC4 availability modelling
- Actors
  - Operations
    - Need to run under realistic conditions from the final control room (CCC) with operators instead of RF experts
    - Training of operators and testing of control system tools
    - Will provide initial input of fault statistics
  - Experts
    - Setting-up, supervision, repairs
  - □ Availability experts
    - Organisation, defining goals, modus operandi
    - Detailed fault bookkeeping and checking against availability model

#### LINAC4 RR, Jan Uythoven

# How and When. Open Questions

## Beam 24/7 on LINAC4 main dump

- $\hfill\square$  No standby service outside normal working hours  $\rightarrow$  adapt statistics
- □ Weekends ? Specialists ?

## 2017 & 2018

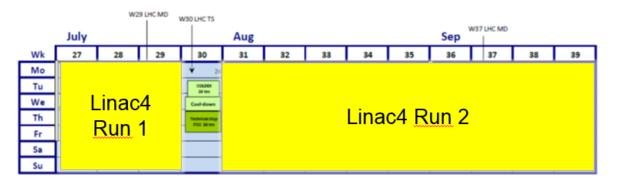
- Expect need several weeks before RR to determine beam parameters.
  Run different cycles for different users interleaved
- Interleaved with periods for repair and modifications
- □ Expect will extend the RR to 2018 (several months)

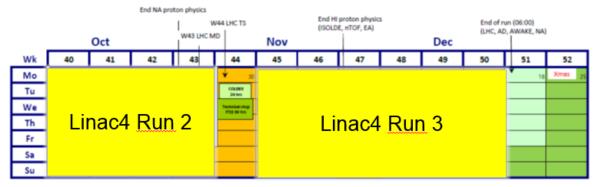
2017											2018												
1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
Shut down			ector Debuncher st installation			Reliability Run					Shut	down	Spare for    own  Reliability    Run				rs	Beam Shut recommissioning down					
	EYETS										S	hutdov	vn										LS2

### LINAC4 RR, Jan Uythoven

# Synchronise with Technical Stops of the accelerator complex

	im to PSB		priyana physics															
	Apr			Beam to SPS			May	Start L					June					
Wk	14	Τ	15	16	17		18	19		20	21	22	23	24	25	26		
Mo	*	з	¥ 10	Easter Mon 17	•	¥ 24	May Day 1	↓ ↓	<b>_</b>	15	22	29						
Tu		ſ	Recomm	issioning			NA setup				UA9 [24 h]							
We			with	beam			Non Secup	Injector MD 30 hrs 8 to 38	J	Injector MD 10 hrs 8 to 18	injector MD 10 hrs 8 to 18	Technical stop 1751.24 hrs (1941)						
Th			ISOLDE, nT	OF, EA, AD							Ascension	[96]	Li	าac4	Run	1		
Fr																		
Sa																		
Su			G. Friday															





#### ESS meeting @ CERN 12/01/2017

#### LINAC4 RR, Jan Uythoven

# **Discussion Points**

- Standby intervention nights and weekends
- Fault tracking via logbook and Accelerator Fault Tracking Tools
- Training of operators
- Development of Controls Tools for Operators.
- Standard beam parameters for operation
  - □ Different for different periods
  - □ Different cycles for different future clients simultaneously
- Regular measurements of these parameters: how often, how and what to do with it
- How much time do the RF experts need to do the regulations and debugging before we have stable operation ?
  - □ Debugging ≠ Reliability Running