ATLAS Forward Proton Detectors
Interlock Test Strategy and Plans

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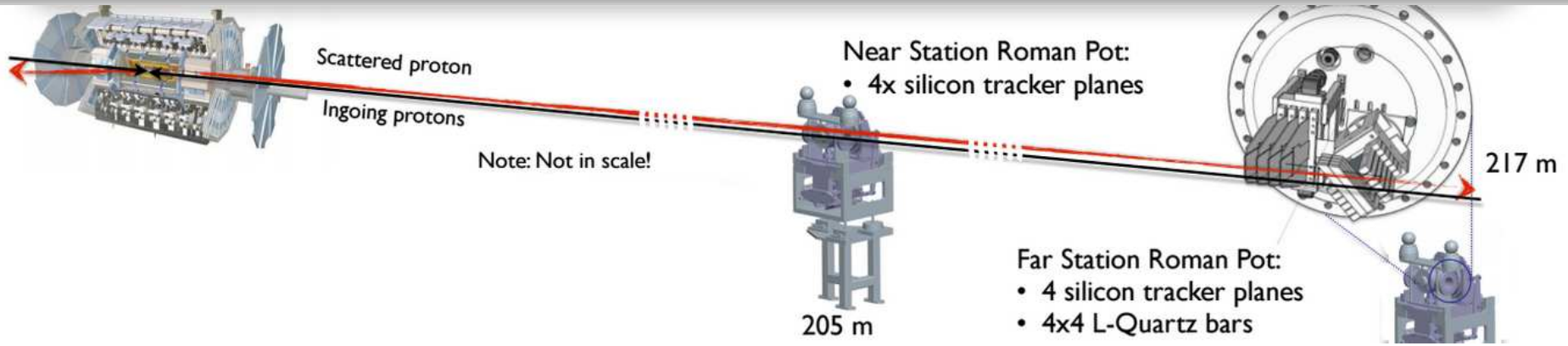
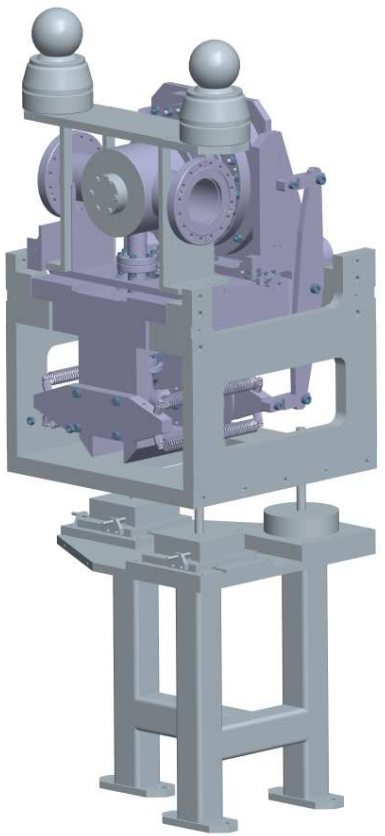
AFP Phase-1: AFP0+2



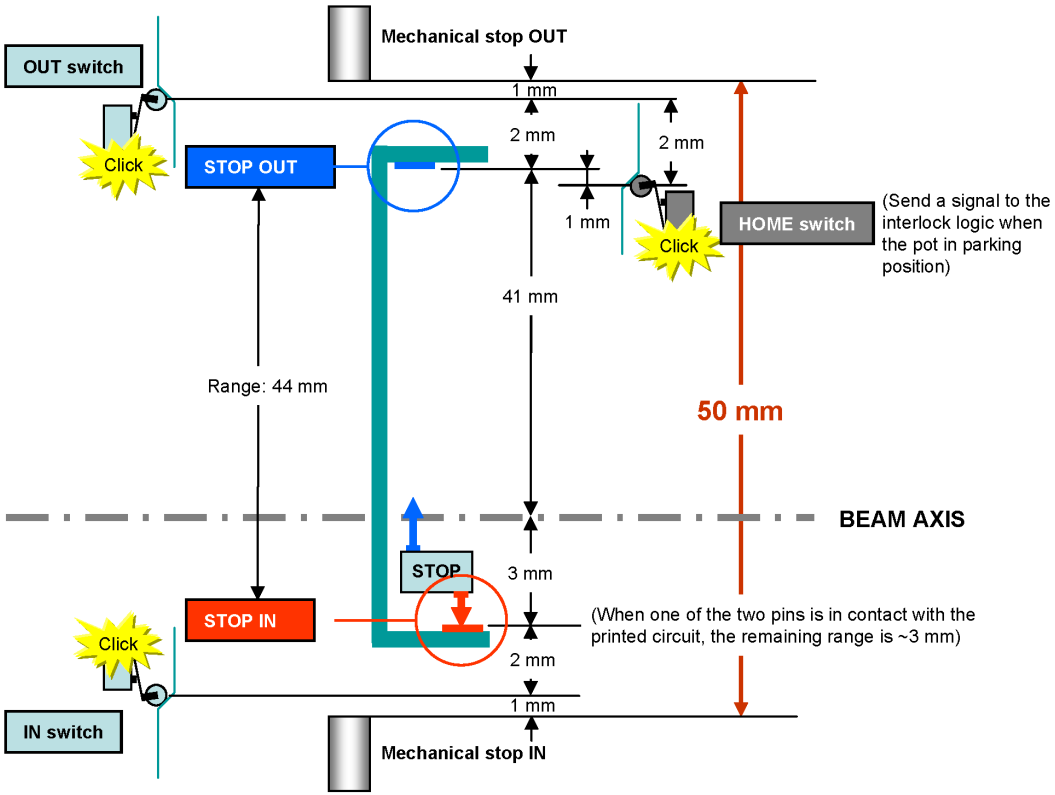
AFP TDR: CERN-LHCC-2015-009, ATLAS-TDR-024

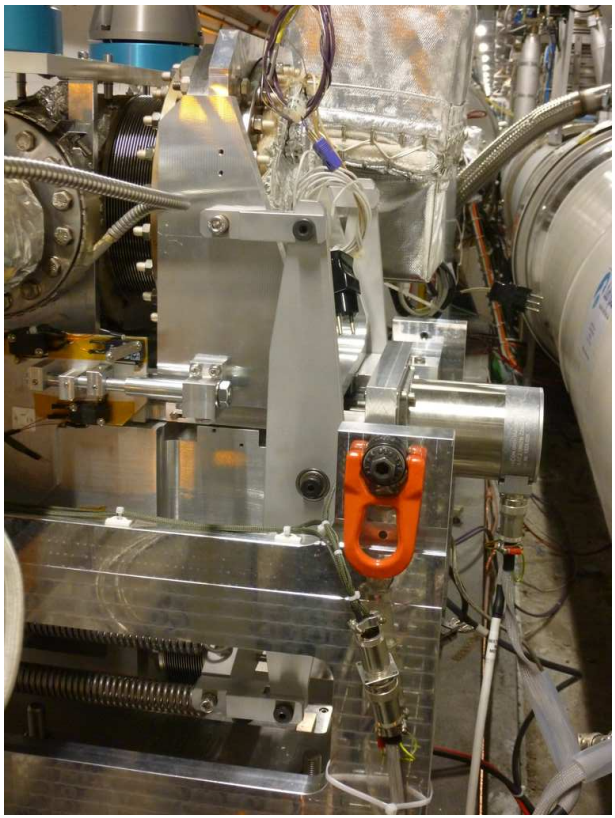
Setup: 2 horizontal Roman Pot stations at 205 and 217 m in A6R1:

- based on the CMS-PPS/TOTEM horizontal stations
- installed 18^{th} Jan.; under vacuum and baked-out since 3 Feb.
- motor motion calibrated, limit switches (HOME, IN, OUT) set, LVDT calibrated on 18 Feb.
- BPM and BLMs installed and cabled
- interlock logic (copy of ATLAS-ALFA logic) installed and ready
  must still be validated to allow operations



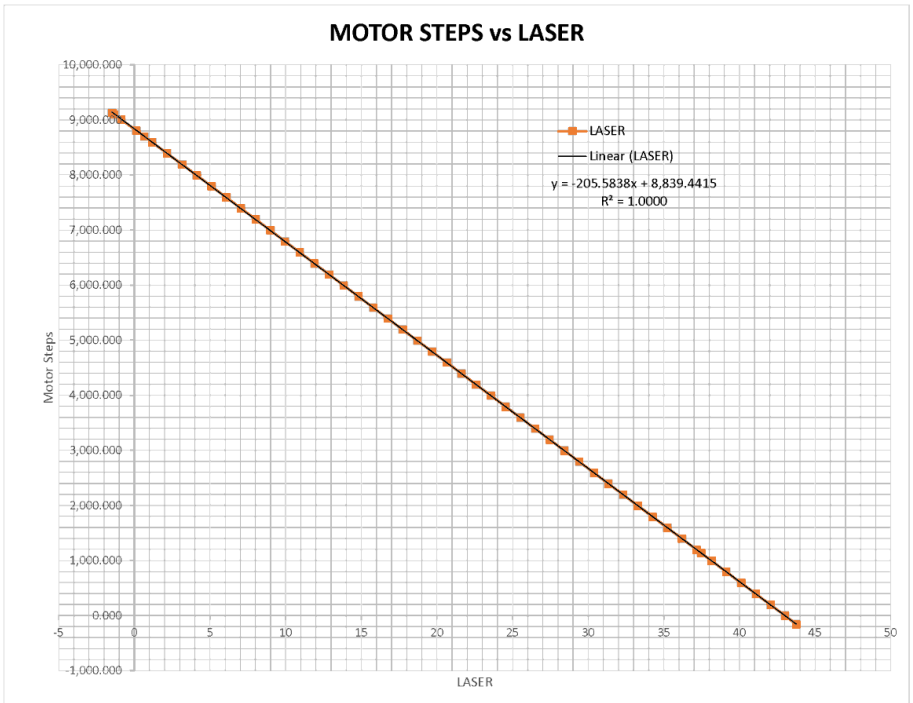
„Specification and Validation of the Motion Control System of the ATLAS Forward Proton Roman Pots", first version attached to the agenda

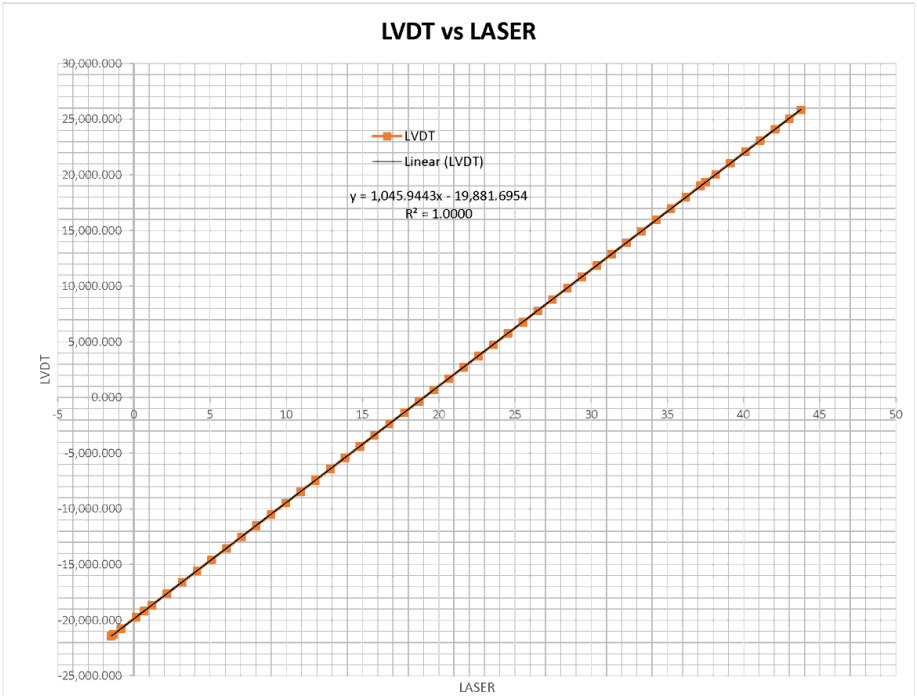


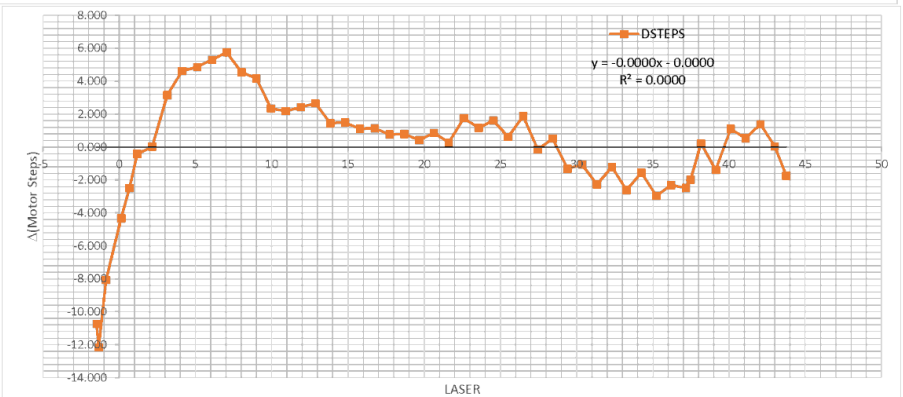


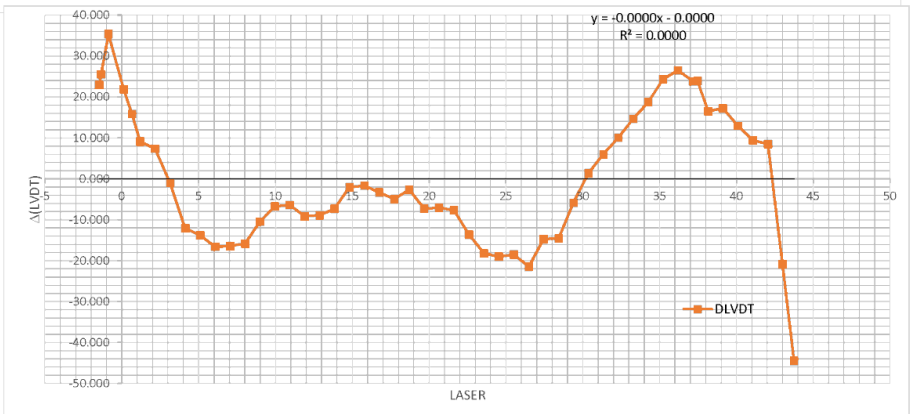
- mechanical stops (to prevent ES damage) installed
- retraction with springs to the HOME position tested
- positions of IN, OUT, and HOME switch and Electrical Stop were set according to the laser measurements (X. Pons, M. Tortrat)

Both stations calibrated (18 Feb.)



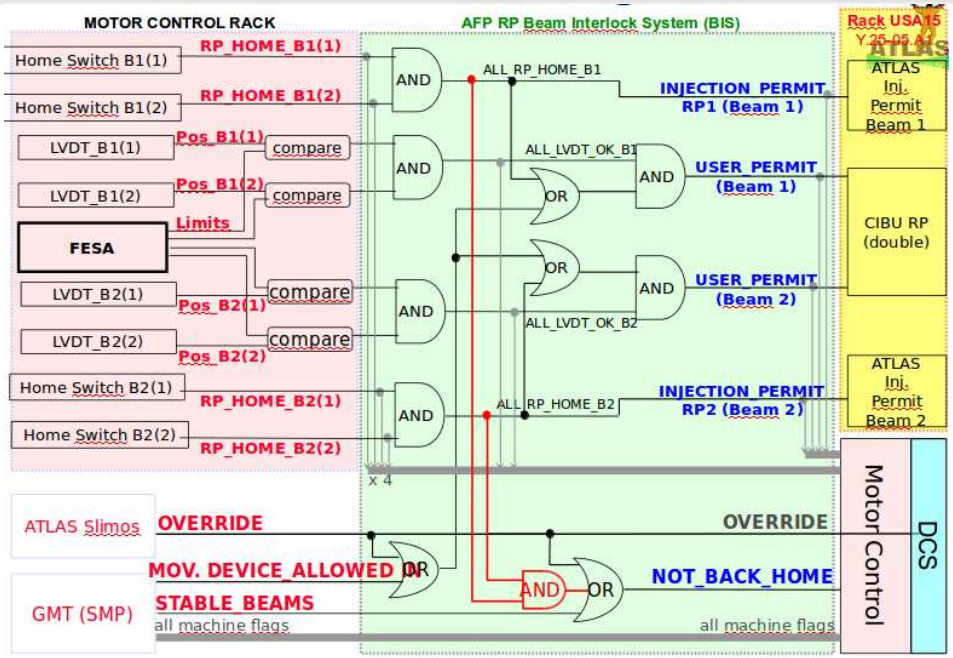






AFP Beam Interlock System

- copy of ALFA BIS
- draft documentation emailed yesterday, also attached to the agenda



- hardware commissioning tests related to the position control of the 2 AFP Roman Pots done (X. Pons, N. Massol, P.-Y. David):
  - correct mapping and signal distribution of the LHC flags between the AFP Interlock and AFP position control system
  - signal integrity of the HOME SWITCH signal from RP station to AFP interlock and the transmission of the COPY HOME switch back to the PXI
  - EXTRACTION RP SWITCH and OVERRIDE signals from the ATLAS control room
  - HOLIDAY MODE KEY
- AFP Beam Interlock System successfully commissioned from the central DCS up to the LHC interface (CIBU)
- **conclusion**: system is ready for the final production software deployment for PXI+FESA+CCC+DCS, to proceed with the final commissioning tests

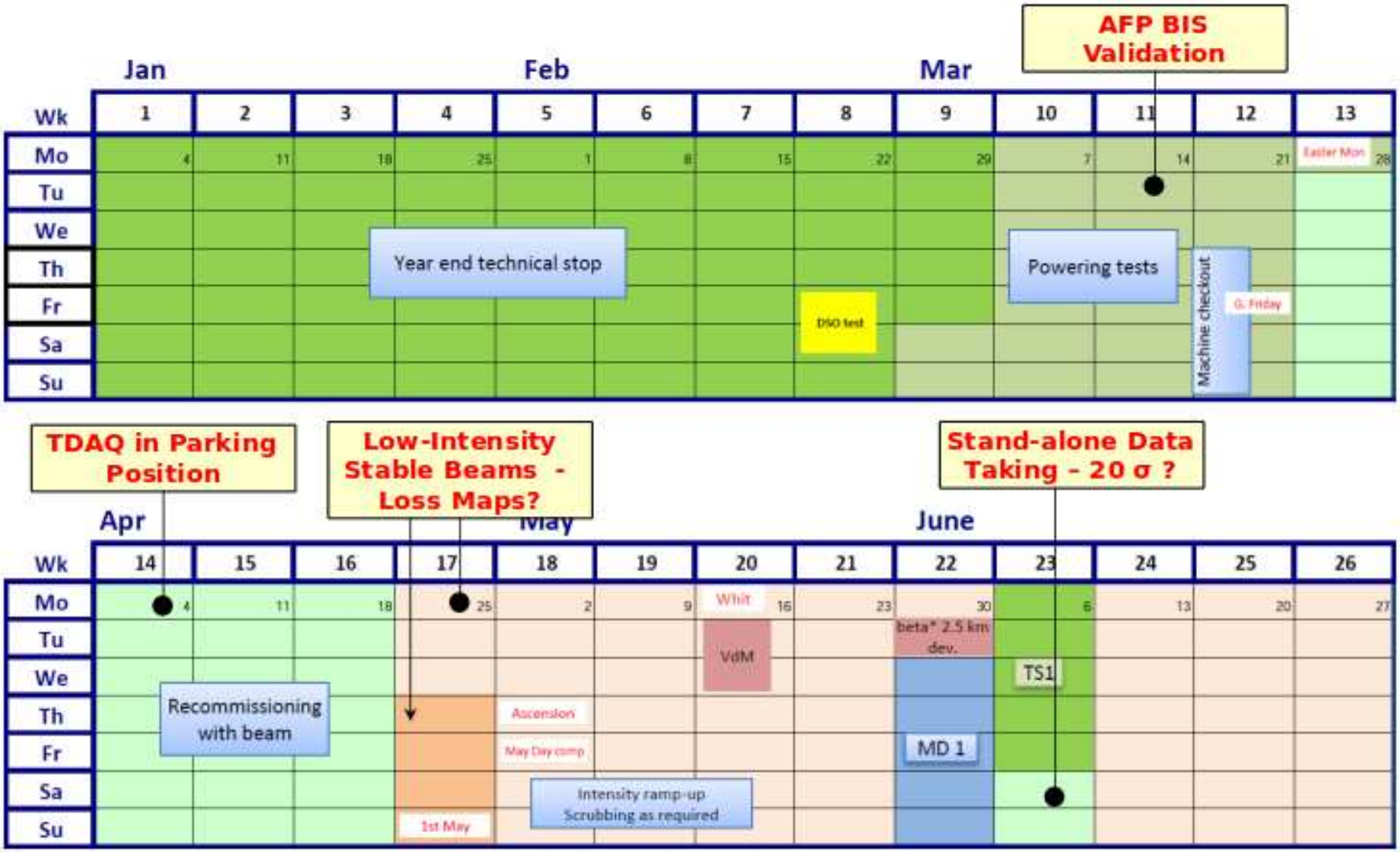
Commissioning:

- commissioning of AFP Beam Interlock System during no-beam (mid-March) – is this fine with you?:
  - motorization control and interlock documentation (draft version available)
  - contact with MPP, participate in relevant meetings
- loss maps with first beam (Mid-End April)
  - do we need to validate with beam in the machine (in addition to loss maps)?
  - is the proposed date (parallel with TOTEM) OK?
- parasitic stand-alone running (in garage) for detector commissioning (NO pot insertion) (End-April)
- is anything else required?

Data taking:

- **after commissioning:**
  - participate parasitically in low-μ runs
  - stand-alone data taking with tentative insertion up to 20 σ
  - **time period: May-June 2016**
- **after LHC and ATLAS approvals:**
  - participate parasitically in a few end-of-store runs (standard optics)
  - stand-alone data taking with tentative insertion up to 20 σ
  - **time period: before September 2016**
- **after ATLAS review and approvals:**
  - participate in a number of standard runs with ATLAS+AFP TDAQ with tentative insertion up to 20 σ
  - **time period: before mid-November 2016**

Dates for AFP BIS Commissioning?



AFP BIS Validation

Following ATLAS-ALFA tests from 2015 (EDMS 1515678), but a bit more simple (2 stations instead of 8):

- INJECTION PERMITs
  - Removal of the INJECTION PERMIT by a Pot leaving HOME
- Response to the LVDT-to-Limits Comparison (ALL LVDT OK)
- Test of USER PERMIT1 and Automatic Pot Extraction as a Function of All Input Flags
- LVDT Bypass Box
  - Failure during the Run
  - The Forbidden Use Case
  - The Holiday Mode
  - CCC Night-call – Failure while Detector is in Standby
- Hardware and Software Buttons
  - Extraction by DCS
  - Disabling by DCS
  - Emergency Extraction by Hardware Button

Thank you!

AFP RP Interlock Diagram 2016