ADUC 7th February 2023

AD facility
Developments - Consolidation

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2022 Highlights

- PUMA exp area + barracks in 393
- BASE-STEP exp area
- ELENA-side crane + ramp refurbishment
2022-2023 YETS activities

- **AD machine:**
  - 2 magnets extracted for refurbishment (BHW48 and QFN16): due back W7
  - e-cooler maintenance, replacement of water cooling pipes
  - BCCCA repair
  - C10 cavities cryo pumping replacement by NEG pumps
  - Improvement of AEgIS shielding
  - Installation of slits + collimator in target area to reduce radiation at injection (in approval)
2022-2023 YETS activities

-ELENA ion source:
  -Maintenance + replacement of vacuum pumps

-Infrastructure
  -ASACUSA barrack replacement (in progress)
  -Electrical switchboards maintenance (complete)
  -Decabling campaign (in progress)
YETS + run services disruptions

YETS is a maintenance period, disruptions to services are unavoidable!
- Cooling water stopped every Xmas break + 1 week end of winter for maintenance (20-24 Feb this year)

- Cryogen fluids distribution stopped during Xmas break + 1 week end of winter or early spring: date still to be confirmed by TE-CRG

- Power distribution stopped for annual mandatory AUG and secured networks tests. This year also refurbishment of ERD5 and ERD6 switchboards caused additional disruptions. Announced early

- Access on the shielding perturbed by magnet extraction / installation

Coming up:
- Major refurbishment of experiments side 50t crane (18th Dec 2023 – 23rd Feb 2024) – lHe delivery for BASE will be arranged

- ALPHA barrack replacement (during next YETS, exact dates TBC)
LHe situation:
- Cryoplant can only deliver 20 dewars a week
- Management gave strict rules in terms of quantities and conditions of deliveries to AD experiments

GHe situation:
- Last year global situation drastically limited the amount of available GHe available CERN-wide
- This year availability will approximately be half of «normal» year
- New supply source could be accommodated using gHe recovered from Cryo group
- Billing system could be put in place in case of excessive consumption
AD-CONS project status

-Magnets refurbishment:
  -status: Will continue till LS3 included
  -Planning: 1-2 magnets extracted for refurbishment every YETS
  -Financing: secured

-RF systems:
  -Status: C10 cryo pumps vacuum system replaced by NEG pumps
  -Next: LLRF + HLRF systems to be upgraded
  -Financing is secured

-AD e-cooler:
  -Status: project was completely re-organized in 2022, magnetic and vacuum systems designs are complete. Gun and collector designs being improved
  -Next: enter call for tender phase for main / long lead items, installation planned LS3
  -Financing is secured, but cost increases have to be considered
- **Stochastic cooling:**
  - Status: New kickers have to be engineered and produced – no design available yet
  - Financing: New estimate is needed, not secured yet

- **Cooling and ventilation:**
  - Status: Planned for LS3, not much activity yet.
  - Next: Studies expected to start in 2024, and works to take place during LS3
  - Financing: Ventilation secured, cooling remains to be secured

- **Power convertors:**
  - Status: ongoing. Injection line optimization proposed (new simpler magnets and power supplies), tender expected to proceed soon
  - Next: bulk of spending/installation work in 2023-2024 and after LS3 (mains)
  - Financing: only partially secured yet
-AD cranes refurbishment:
  -Status: experiment side planned for YETS 2023-2034
  -Financing: secured

-Magnetic Horn:
  -Status: complete
  -Next: power cables and transmission line were mentioned as additional work for 2028-2030
  -Financing: to be secured in due time

-Cryo fixed distribution system:
  -Status: design showed that LHe consumption would be increased to unacceptable level. Project is stalled, looking for alternatives
  -Next: study “light” version, in parallel to a “full Monty” one, with new liquefactor to be installed on AD site
  -Financing: secured for “light” version. Liquefactor solution to be studied and costed
Study of a fixed LHe distribution system

With such a distribution scheme, 45% of the transferred liquid would be evaporated into gas --> not affordable for the LHe central liquefier
-CERN management requested the organization of a WS to review the detailed status and prospects for AD/ELENA systems, including main AD-CONS project WP’s.

- Priorities should be established in the light of the anticipated physics program of AD experiments beyond LS3, and the corresponding anticipated needs of AD/ELENA machines operation.

- Date proposed for 16th March, with following agenda:
  - Introduction: M. Lamont (as ATS director)
  - Physics program prospects beyond LS3: ADUC chairman, reporting for all existing AD experiments collaborations
  - Operation views on consolidation and upgrade needs, a new test line for CERN and experiments
  - Follow-up on JAPW, beam line optics from target to ejection, potential gains
  - Operation/YETS planning till LS3, Infrastructure, decabling campaign, lHe and gHe distribution limitations
  - AD/ELENA systems status, improvement needs, consolidation WPs status (including finance situation and timeline)
  - Overview of AD-CONS finances, details of approved and non-approved WPs

Thank you