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Delay on MS92 Description –Novel Acceleration Techniques –WP13

The milestone MS92 is originally expected in M30 (11/2015). This milestone has been postponed to M38 (07/2016) due to problems in production of the normal conducting radio frequency (NRF) feedback cavity to be designed. Therefore, the originally proposed time slot in 05/2015 for installation of the NRF cavity needs to be shifted by about 1 year.

Justification: A limited amount of consecutive time (1-3 weeks/per year) can be used for upgrades and maintenance at FLASH, since the research facility FLASH at DESY is a user facility. The production/installation and commissioning of the NRF cavity is delayed by

- NRF cavity design and simulations
  - The initially intended simulations were extended to additional needs, e.g. multi-beam, multipacting effects etc. in order to avoid problems after final installation which in worst case requires a disassembling of the beamline section

- NRF cavity drawings
  - Decision for in-house cavity drawings to avoid additional time-consuming discussions between company and DESY experts (every step needs to be confirmed by the vacuum group at DESY; this may further delay the time schedule). The installation takes place at SRF accelerator with special requirements on cleanliness and particle-free design and manufacturing.
  - Due to high priority of the European XFEL construction (delayed by ~1 year) very limited resources by DESY experts and technical draftsmen are available

- Beamline section redesign (Partly not on our initial time schedule)
  - An examination of the beamline section housing the NRF cavity point out a redesign caused by space constraints requiring the installation of three new quadrupoles (upgrade of existing quadrupole triplet (three coupled quadrupoles) to 3 single decoupled quadrupoles)
  - Location for new quadrupoles not fully fixed yet and requires start-to-end simulation from beam simulation experts – still ongoing
  - This defines the final length of NRF cavity (location for flanges to mount cavity to beam pipe)

Summary: The installation of a normal conducting feedback cavity at FLASH is associated with the risk of facility down time. To minimize the risk for down time it was proposed to extend the simulations to avoid in case of problems disassembling the beamline section after installation and commissioning of the new feedback cavity. Furthermore, to optimize the

beamline section housing the NRF cavity new quadrupoles will be installed. An installation of components within the beamline strictly requires a particle-free design and installation using clean room conditions. Setting up a local cleanroom already requires 1-2 days. The overall installation time of NRF cavity together with beamline components requires about one week, which restricts the installation to longer shut down period (1-2 weeks down time required).