SSRL Top-Off Injection Meeting Notes - 3/29/05

Attendees: Corbett, Safranek, Terebilo, Sebek, Wermelskirchen, Hettel

1. Corbett presented beam parameters and nomographs for various SPEAR top-off modes, assuming 1W injection (see attached). Summarized top-off modes for APS (PAR used to accumulate single injection bunch of ~1 nC every 2 minutes, minimal user interruption time), SLS (several injection pulses every few minutes, few seconds user interruption time), and ALS (multibunch, ~1 nC total, 1 injection pulse per 30 secs, minimal user interruption time).
2. Issue for large charge (~1 nC), single bunch injection: large change in injected bucket amplitude, causes uneven bucket amplitude pattern.

   Ideally would like large total charge in many bunches per injection pulse to maximize interval between injection pulses and to maintain approximately even bucket amplitude.

   Multibunch filling ➔ booster rf should be same as SPEAR rf (costly conversion)
3. Issue for single pulse injection into SPEAR: single-pulse performance of SPEAR kickers.
4. Need to determine what SSRL users will accept for top-off:
   a. What minimum interval between injection pulses?
   b. What maximum interruption time during injection cycle?
   c. Inject at fixed clock intervals, or only when beam current decays to specified value?

   (fixed clock interval ➔ ability to control injected charge to maintain constant current)
5. Safranek summarized injector and BTS performance issues and improvement proposals (see attached).

ACTION ITEMS:

1. Specify integrated charge per day in booster and BTS for various top-off modes; compare with present integrated charge and values assumed by RP (Corbett)
2. Initiate plan to review top-off options with BL/users, determine acceptable modes. (Hettel)
3. Plan SPEAR injection transient and kicker optimization studies using turn-turn BPMs (Terebilo)
4. Plan beam line injection disturbance measurements (Hettel with Rabedeau, Tompkins)
5. Summarize injector and BTS upgrade and study topics by discipline (Safranek)
6. Initiate discussion on BTS upgrade with AP and engineering staff; determine if SPEAR septum window(s) can be kept (Safranek)
7. Determine near-term gun and linac tests and instrumentation needs (Schmerge)
8. Plan resources for carrying out work on injector/BTS instrumentation (Wermelskirchen)
9. Plan booster klystron tests and swap out with S. Park (Sebek)
10. Plan Top-Off project plan (Hettel)