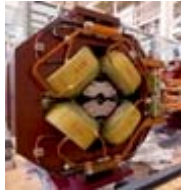


ATF2
Magnets

Lessons learned from designing, fabricating & installing ATF2 magnets and their power supplies that should be remembered for same tasks for the ILC's BDS

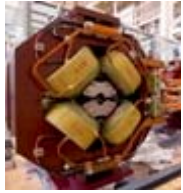
Cherrill Spencer, SLAC. Member of ATF2 Magnet Team

Briant Lam, SLAC. ATF2 Power Supply Engineer



ATF2 Lessons learned and comments on ATF2 **Magnets** magnet engineering, fabrication & installation

- Integration of magnets with rest of beamline apparatus needs attention of fulltime integration engineer from early-on in project
- Beamline installation drawings showing all beamline devices and their supports and their precise locations must be made before installation starts
- BDS will have magnets with tight harmonic & stability tolerances, avoid using old magnet designs or actual old magnets as they will rarely match the ILC requirements, quality will be compromised & money won't be saved in the end
- Different countries have different standards and rules regarding magnet fabrication & integration. ILC-wide magnet group must develop, promulgate and enforce design + fabrication standards; integration rules (e.g. can a beampipe touch a magnet's poletips?)
- If choose to have magnet vendors "build to spec" rather than "build to print" then must carefully review vendor drawings before they start fabrication & have on-going visits by ILC magnet engineer to their factory (later is best practice even if building to ILC-provided drawings)
- Have regular engineering meetings just on magnet issues via *webex*



ATF2 Lessons learned and comments on ATF2 power **Magnets** supply engineering, fabrication & installation

- Understand the AC power grid of the lab where magnet PSs to be installed.
 - Neutral line on 3 phase power at KEK not available [used in a ground current detection circuit], SLAC sent bulk PS needing neutral
- Do not daisy chain extension cords; do not put too many devices on one circuit
 - Japan uses 100V AC at 50Hz, USA uses 120V AC at 60 Hz. Most 120V devices can deal with 100V, but daisy chaining etc causes ATF2 line voltage to drop to 80 V- then equipment misbehaves or fails.
- Keep Memoranda of Understanding up-to-date, have clear agreements on property transferrals
 - *Donating* the 44 brand new redundant PSs was impossible because not enough time to get all approvals and do paperwork
- Allow remote data acquisition so distant engineers can monitor the performance of the power supplies they designed and built and troubleshoot operating problems more effectively
 - A remotely accessible electronic logbook would help distant magnet & PS engineers monitor repeating problems and track reliability