Booster RF Cavity Refurbishment

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Matt Slabaugh
Topics

Refurbishment

• Background/Introduction
  – Cavity refurbishment
  – Tuner refurbishment

• Future
  – New tuners
  – New (old) cavity

• Summary
Background

Labor intensive to re-make and update drawings

Circa. 1969 bid drawing (obsolete)
Cavity refurbishment

- Fragile!
- ALARA

Vacuum

Water

Contact
Cavity refurbishment

Vacuum

• Less frequent, but potentially more time consuming
• Occasional ceramic leak
• Mostly cracked “pie tin” or bad bellows
  – Exploring a prototype flange to replace the old design
  – Possibly integrate into refurbishment of all cavities
Cavity refurbishment

Contact

• “Good enough” isn’t anymore
• RF requires 100% surface continuity

NOTE: Most cavities are Class 2, some Class 3. Co-operative effort with TD Machine shop improves quality, reduces time and distance (dose). ~ 7 days→2 days
Cavity refurbishment
Tuner refurbishment

Each tuner:
- 500+ pieces
- 150ft+ tubing
- 50+ water connections
- 44in long
- 650lbs
Tuner refurbishment
Tuner refurbishment
Tuner refurbishment

Cones-
10 step process
TD supporting work
New aluminum cones in progress
Tuner refurbishment

Tuner re-build time:

- 1 week/tuner to re-build X 3
- 1 week for cones
- ~4 weeks for tuner portion of cavity turn-around
Refurbishment

Putting it all together- how long??

Cavity work: 2-4 weeks
Tuner work: 4 weeks
Tuner installation: 1+ week
RF testing: 1+ week

Potential delays: vacuum and water complications

Typical turn-around:

10-12 weeks / cavity
New Tuners

• Sub-assembly work in early 2014
  – Built at IB2
  – Most parts procured for 20 tuners
  – Inspected/stocked at IB4
  – Technicians in training
• Waiting for high-mu ferrite
New (old) cavity

• Cavity built from leftovers and rejects—Frankenstein!
• Long process—two years+
• Good experience, hasn’t been done since 1970’s
Summary

- 10 cavities done
- 2 cavities re-done
- 30+ tuners re-built
- 20 new tuners, most parts procured
- 1 spare cavity built

Manpower
- 2 AD mechanical techs (contract)
- 2 AD mechanical techs (regular, MI shared)
- More promised....