

# Closing Remarks

## Sept 19, 2007

CARE

Advisory Committee

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# General Remarks

- Many WPs completed
- Good progress on remaining work
- Excellent publication and report output in most areas
- Good communications between groups, e.g.
  - EP parameters/modeling, spinning/hydroforming, FEscanning/Dry ice Cleaning
- Good progress on most CARE activities necessitating additional planning to blend with XFEL and ILC work
- Our final report will discuss progress and recommendations in more detail for excellent presentations on many WPs
- And broader impact of CARE progress on world-wide SRF community activities (e.g. low level RF, dry ice cleaning)

# The Committee Recognizes Important Success

- Seamless Cavities
  - Hydro-forming and spinning showing many common elements, learning from each other
  - Several 3-cell Nb cavities have been spun with new machinery installed
  - Three 3-cell cavities have been hydro-formed and a 9-cell completed from same units
- Vacuum Arc Thin Film Deposition
  - RRR,  $T_c$ ...characterization show properties different than thin films deposited by sputtering technique and closer to bulk Nb
  - Progress in eliminating droplets has been achieved
  - Two facilities are ready for coating copper cavities
  - Copper cavities coated, still problems with adhesion
- Electropolishing studies
  - Automated systems installed at two locations
  - Preliminary results emerging from attempts to model EP

# Important Success (2)

- Dry Ice Cleaning (DIC)
  - Installations completed for single cells and nc gun (FLASH)
  - Benefit of DIC successfully demonstrated on single cell cavity
  - DC scanning of samples show fewer emitter with DIC vs HPR
- SQUID scanning system operational and being installed at DESY
- Field emission studies: reduction of emitter density after dry ice cleaning, especially on single crystals/large grain Nb

# Important Success (3)

- Manufacturing non-conformities addressed and initial testing has started with promising results
- Facilities for TiN coating available and multipactor studies being started
- Piezoelectric fine-tuner demonstrated operational; improved blade tuner successfully tested
- Magnetostrictive fine-tuner ready for testing on cavity
- Low level RF controls finished and applied by several accelerator labs
- Beam position monitors accepted to be used in XFEL

# General recommendations

- Time to finish is short, and there are many attractive paths being pursued; but refocusing on the goals of the CARE program is now mandatory: improve gradients, Q-value, reliability; reduce costs; all activities outside this scope should be 2nd priority
  - performance testing is needed (e.g. 3 cell spun cavity, thin film cavities)
  - Committee recommends focus in selected areas over other activities in the same area: thin film coating, dry ice cleaning, multi (3) cell spinning
- Committee recognizes that there is strong competition for preparation and testing resources; stronger coordination needed

# Specific recommendations

- Seamless cavities
  - Test successfully spun 3-cell cavities after treatment (over fabrication of one 9-cell unit)
  - Test first 9-cell hydro-formed cavity (over fabrication of a second 9-cell)
- Vacuum arc film deposition
  - Apply best copper cleaning methods known from past sputtering activities
  - Test one copper coated cavity (from each facility) first without HPR, then gradually increase pressure for HPR, (rather than coat many cavities at once.)
- Electropolishing
  - Apply automated EP systems installed at DESY and Saclay to several single cell cavities to determine impact on reproducibility (rather than investigate recipe variations)
- Dry ice cleaning of 9-cell cavity