

FNAL SCRF Review

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What is this Review?

- FNAL has argued that SCRF technology is an “enabling” accelerator technology (much like superconducting magnets) Its uses go far beyond just the ILC
 - Intense Proton sources (HINS)
 - Muon colliders
 - Medical Accelerators
 - Light Sources, energy recovery linacs

What is this Review ?

- High Energy Physics has developed much of the accelerator technology now used by Nuclear Physics and Basic Energy Sciences
- As the only National Laboratory (after 2009) dedicated to HEP, FNAL needs command of SCRF technology and should be a leader in its development
- OHEP understands and supports this argument, they are willing to open up a line of funding to support SCRF technology at FNAL that is independent of that supporting ILC (Good !)

What is this Review

- They plan to put funds in the 08-09 budgets to support this effort at FNAL
 - thus far FNAL has used “core” funds
 - ILC funding will continue, but is directed at the specific needs of that project (B&R codes!)
- The needed SCRF infrastructure and level of the proposed R&D program is such that DOE want to be sure we have a sensible plan
- In some real sense...we have already won the argument → this review is “ours to blow”

When ?

- The review was originally scheduled as a 2.5 day review Dec 11-13,2006. DOE informed us Tuesday that they cannot be ready with reviewers on this schedule.
- Next dates that work for them and us are in Feb
- DOE also informed us they would like the review to fit into 2 days including closeout
- **The review is scheduled for Feb 13-14, 2007**
- This is the Tuesday – Wednesday following the week containing the Beijing GDE meeting)

When ?

- Any proposed speaker who cannot make those dates should let me know so we can find alternates
- I would like to ask that **speakers submit draft talks to Monica Sasse x 3023 by Jan 2, 2007...**
- Monica will put the talk and agenda on Indico
- ~ week for review and comments on them
- **Practice talks Th-Fr January 4-5, 2007.**
- I will send out a revised schedule and a template for talks in the next few days... Please use it, and please leave time for questions!

Charge

- Superconducting radio frequency (SCRF) technology is an important element for future accelerators with proposed applications in elementary particle, nuclear, and condensed matter physics. The Department of Energy's (DOE) High Energy Physics program has served as the steward of accelerator technology for the United States and has a strong interest in the construction of the International Linear Collider (ILC) based on SCRF technology.

Charge

- SCRF technology is a capital intensive field where significant infrastructure is needed to conduct research and development. The materials used require extensive processing usually under controlled conditions that require clean rooms, high purity washing systems, highly controlled ovens, and advanced surface treatments. Once devices are fabricated they must be tested using cryogenic systems and RF power systems, and sometimes with particle beams. The cost to acquire necessary infrastructure could be significant.

Charge

- Fermilab is developing a research and development plan, including a significant investment in infrastructure to carry out a research program on SCRF technology. The goal of this research program is to benefit a variety of future accelerator facilities and to further advance U.S. competitiveness in SCRF technology compared to other parts of the world.
- We seek your evaluation of the scientific merit of the laboratory's overall SCRF research program as well as the technical merit and cost effectiveness of the laboratory's SCRF infrastructure development plan.
- In particular, we seek answers to the following:

Questions

- 1. What are the key R&D issues faced by the U.S. HEP accelerator community in the area of SCRF?
- 2. What is the scope of facilities required at FNAL to address these key issues including those questions key to the success of the ILC?
- 3. Will the laboratory SCRF infrastructure started in FY06 and planned for FY07 and beyond be adequate to address these key issues, and on what time scale. Are the proposed solutions cost effective?

Questions

- 4. Does the laboratory make effective use of collaboration and existing SCRF assets at other laboratories and universities?
- 5. Does the SCRF plan for FY08 and beyond make use of and develop U.S. industry at an appropriate level?
- 6. Is the FNAL SCRF plan configured and prioritized in a such a way that it can be sensibly scaled back should all of the requested funds not be available?

Themes in our Talks

- We need to address these questions in our talks
- We need to defend the level of the R&D program and infrastructure we propose
- We can use ILC as an argument, but NOT as the sole argument (ie wherever possible point out other potential SCRF uses)
- Expensive! Why is this an R&D program vs a project... with CD0 → CD 4
 - Answer: because there is much yet to learned
 - We still can't specify the needed processes

Themes in our Talks

- Why at FNAL?
 - We need command of the technology to host or participate in ILC
 - Existing skilled workforce (accelerators, RF, cryo, some SCRF)
 - Also need to be able to tell industry what we want them to do
 - Other SCRF facilities are not adequate for needs of ILC and high gradient cavities
- Point out our accomplishments and successes to date (e.g. A0, 3.9 GHz, CCII, CAF, VTS, HTS, clean NML)
- Point out that we do collaborate extensively with other U.S. SCRF institutions, non-U.S. partners, and we work with industry...
- SCRF materials program... AARD ?
- ie defend that what we plan to do makes sense

SCRF document

- SCRF white paper with cost estimates, etc is being prepared
 - Dynamic document... will change
 - Be sure what you say is consistent with that document... esp cost estimates
 - Will also send that out soon
- Please suggest any needed additions

end

- Will mail out this talk
- Your questions ??????