Minutes from the September 18, 2003 Meetings of the Linear Collider Subcommittee of the Fermilab Long Range Planning Group

Present: J. Butler, M. Carena, E. Fisk, S. Holmes, Y-K. Kim, H. Montgomery, R. Patterson, S. Tkaczyk

Absent: D. Finley, R. Kephart, A. Kronfeld, S. Nagaitsev

Guests: R. Rubinstein (in spirit), M. Tigner, H. Weerts, V. Yarba

Discussion of Fermilab as an International Laboratory

Roy Rubinstein had prepared some notes on this topic which were presented by Joel in Roy's absence. This particular discussion was based on the assumption that Fermilab becomes an international laboratory (both in financial support and management) as home to the linear collider.

Issues

It is easier to write down issues than solutions. Solutions are likely to be determined in negotiations between governments and it is unlikely physicists will have the final word.

- The U.S. has no experience in having an internationally managed/financed laboratory within its borders. There were some preliminary discussions with ITER, but not much progress before the U.S. withdrew. When the U.S. subsequently rejoined it was with a stated intention not to be the host country.

Roy identified changes in the way Fermilab is managed if it were to function as an international laboratory:

- An internationally constituted oversight council would likely be implemented
  Would replace the URA Board of Overseers
  May have to be constituted as a legal entity within the U.S. to hold funds and enter into contracts.
- At present DOE can deny access to anyone to the Fermilab site.
- Ease with which non-U.S. scientists can enter the U.S. to carry out research at Fermilab has been significantly reduced in recent years.
- There are difficulties for family members entering the U.S. and gaining employment.
- Fermilab as an international laboratory would still be bound by Illinois and U.S. laws and regulations. Example of regulations which could cause difficulties include:
  Davis-Bacon (use of foreign technicians)
  Buy America
- U.S. import/export regulations
- Bottom Line: All this, including many exceptions to U.S. regulations would have to be negotiated between the U.S. and its international partners.

Additional comments by Joel:

- No basis to believe the U.S. can make required adjustments.
- U.S. HEP community is not good at distinguishing between an international experiment collaboration and a laboratory with international management and financing.

Major issues include:

- Secure and dependable (U.S.) budgets
- Dividing benefits among the international participants consistent with contributions.
- Non-interference of government agencies; non-politicization of the site.
- U.S. willingness to adapt to recognized international standards and to waive rules.
- Access to the U.S.
- Exceptions on job permits
- Director may be non-U.S. citizen.
- Have to share: contracts and $$; positions; scientific glory.
- Is the U.S. dependable?
- Can any agreement protect from Congressional and DOE interferenc?

Can we use "learning to be a successful host" as a selling point? (See subsequent discussion: "yes".)

Discussion of the ECFA (Kalmus) Model

Joel: How about other models? How about Fermilab as "host lab" (see Kalmus report)? This means that we contract to do work for the international entity charged to construct and operate the LC.

Steve: This solves about 10% of the issues listed.

Joel: Agree, but the point is the existing infrastructure greatly expedites project startup (as envisaged by Kalmus).

Joel: How can we start demonstrating to the world that we "get it" on a lot of the dependability and entry issues?

International finance committees for experiments
Write down a model for a regional (Americas) council

Discussion of U.S. Efforts to Develop an International Plan

Maury Tigner (chair of the International Linear Collider Steering Committee, and chair of the International Subcommittee of the U.S. Linear Collider Steering Group) joined the meeting.

Maury's subcommittee is drafting a document on international governance, within a U.S. context, for the USLCSG. Hope to have it available in October. The group doing this includes U.S., Canadian, and Mexican representation. The goals are to:

- Make a list of everything an international agreement has to accomplish.
- Draft the American version of the Kalmus model.

This seems to be going in a similar direction to the Kalmus model. The big challenge is the relationship between the host lab and the international entity. It is unclear that the Kalmus model is realistic in terms of the size of the burden it places on the host lab.

- Fermilab should understand this and comment.
- This includes the influence of the linear collider program on the existing program. (Maury was of the opinion that Fermilab would have to continue with the existing research program, at least through the years of initial operation of the LC.)
- How much of the research program at Fermilab would the lab (or the U.S.) be willing to sacrifice?

Kalmus model is stronger on governance than management.

- We (Fermilab and U.S.) need to think about authority chain, including the authority of the central team.

Once the U.S. report is complete it will be necessary to convey to DOE and NSF so they can carry forward to the higher ups in government who will negotiate.

Mont: Interested in the comment that the balance of the Fermilab program needs to be maintained even if Fermilab is the LC host lab.

Maury: Fermilab needs to understand the fraction of lab resources that should be devoted to the linear collider effort (construction and initial operations) stage. For example, PPL has limited involvement in ITER to 25% of resources.

Later discussion: This will undoubtably evolve after the linear collider is operating and future directions of the physics research program emerge.

<u>International meetings</u>

There was a meeting this summer in London of U.S. and European agency officials to start discussing possible modes of organizing. A second meeting is scheduled for February in which it is hoped to incorporate Asian representation. The U.S. should have a governance model on the table for this meeting. (See above comment on U.S. report.)

<u>Funding</u>

There are hints from OMB that we could see an (~$20M) increase in LC funding in FY05 if we can make the technology decision ourselves by that time.

The full engineering design for the LC is imagined as costing many × $100M. It is a given within the committees looking into this that an international agreement funding this activity will have to

be in place. It is imagined that this activity would be under the auspices of an international group (referred to in various documents as the Global Design Center, Central Management Group, etc.)

U.S. as a Reliable Partner

Joel and Young-Kee: We need to keep this (lack of confidence in the reliability of the U.S.) in mind in all our dealings with international collaborations (not just LC).

Joel: The LHC experience is a positive in this regard.

Maury: We are reminded by OMB and OSTP that internationalism may by the strongest attraction of LC from the government's point of view (stronger than the physics).

Harry: Does the attraction depend on siting in the U.S?

Maury: To some people yes, to others no.

Evolution of Fermilab in an LC era

Victor: Doesn't believe Fermilab can exist as an international lab. Research program is founded on hadrons and this cannot be entirely abandoned without understanding where leptons may lead. $\Rightarrow$A LC in northern Illinois should be a stand-alone organization and count on Fermilab as a significant contributor.

Joel: A model:

- Fermilab devotes 30% of its resources to linear collider in the construction and early operations phase.
- LC then evolves semi-independent of Fermilab.
- Fermilab gets subsumed by LC when and if physics dictates.

Victor: Yes, can deal with design, construction, and operations separately.

Harry: Yes, need to provide flexibility to keep separate or merge as situation evolves.

Steve (thought as I am writing these notes): Will Fermilab be taken seriously as host lab contender if only willing to redirect 30% of resources into construction and operations?

Consensus: Fermilab and LC should be separate organizations to start. (Consistent with Kalmus model.)

Harry: Still have to recognize/accept that the hadron program will suffer.

Summary

Here is my interpretation of what we thought was important and where some consensus existed.

Major issues to be understood if U.S. host country:

- Reliability of the U.S. as a partner
  Secure and dependable (U.S.) budgets

Congressional and DOE interference
U.S. willingness to adapt recognized international standards and to waive rules.
Non-politicization of the site

- U.S. as a host to international science community
  Access to the U.S. (visas)
  Exceptions on job permits
  ⇒Potential show stopper in current climate

Consensus: Fermilab and LC should be separate organizations to start. (Consistent with Kalmus model.)

- U.S. has no experience base in having an internationally managed/financed laboratory within its borders.
- Fermilab has responsibility to continue a forefront hadron based program during the construction period (at least).

Major issues to be understood if Fermilab is host lab:

- Imperative to form a few on the relationship between the host lab and the international project organization.
- Need to think about authority chain, including the authority of the central team.
- How much of the research program at Fermilab would the lab (or the U.S.) be willing to sacrifice?
- Feeling within the discussion that 30% of Fermilab resources devoted to the project is right scale.
- (Steve: will this fly?)

Need to start demonstrating to the world that we "get it" on these issues. LHC gives a positive indication in some (U.S. reliability) areas.

We are reminded by OMB and OSTP that internationalism may by the strongest attraction of LC from the government's point of view (stronger than the physics).

Next Meeting
September 25, 10:30-Noon, in the Comitium. "Bid to Host"

Agenda:
1. Discussion of essential elements in establishing Fermilab as most attractive host lab for the LC (organized by Ritchie)
2. Discussion of our public presentation (Steve)