

**HEPAP**

June 3, 2010

*LINEAR COLLIDER STEERING GROUP OF THE AMERICAS  
(LCSGA)*

Recommendations

Regarding

a

Linear Collider Strategy for the Americas

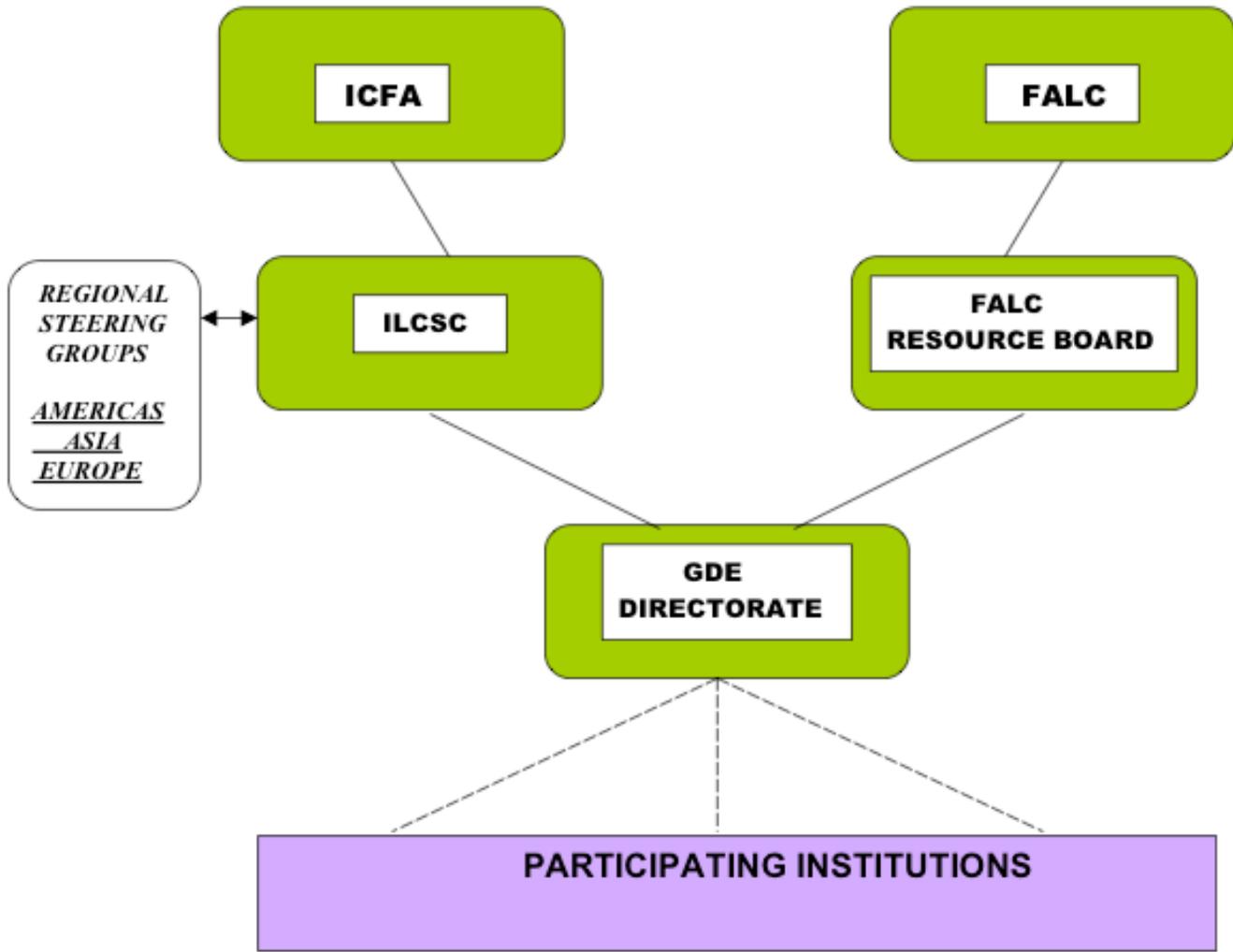
and

Suggestions

Concerning

Organizational Matters

INTERNATIONAL LINEAR COLLIDER-some ORGANIZATIONAL CONNECTIONS



# *LCSGA*

*A self- appointed and self- propagating group of Linear Collider supporters*

## *Strategy Subcommittee:*

P. Drell; P. Grannis; M. Harrison; N. Lockyer; H. Lynch; P. Oddone; S. Ozaki; M. Tigner; H. Weerts

## *LCSGA full committee (current membership):*

J. Bagger; J. Brau; G. Golin; M. Harrison; D. Karlen; R. Keeler; N. Lockyer; H. Lynch; D. MacFarlane; S. Mishra; P. Oddone; M. Oreglia; S. Ozaki (Deputy Chair); N. Phinney; D. Rubin; B. Schumm; M. Tigner (Chair); H. Weerts; A. White

Charge (abbreviated) to the Strategy Sub-Committee  
From the LCSGA proper

“*Suggest* a strategy by which the Americas can best position themselves to participate in a global consortium for constructing, operating and exploiting the ILC at a site not within the US. The strategy should include:

1. R&D program now and for the foreseeable future
2. Organization and Governance

The Sub-committee report will be delivered to the LCSGA as a whole for debate, revision as needed and acceptance (*done*). The report will then be transmitted to the ILCSC (*done*). In addition it will be conveyed informally to DOE/NSF (*done*) and formally by a statement to HEPAP (*being done herewith*)”

## The LCSGA Report (abbreviated)

### **R&D Program** (approved at LCWS09 Albuquerque)

1. Support the GDE's "ILC Research and Development Plan for the Technical Design Phase"  
(<http://www.linearcollider.org/cms/?pid=1000002>) following the the Americas Regional Team and the GDE
2. Support the ILC Research Director's plan to prepare baseline detector designs
3. Advocate for significant participation in the critical physics and technologies involved, thus paving the way for significant involvement in the ILC
4. Support the GDE efforts (see Attachment I) to collaborate with CLIC
5. Be proactive in supporting and participating in generic accelerator and detector R&D in the Americas as a foundation for current and future accelerator based particle science
6. Be proactive in devising a strategy for the decision on ILC construction, informed by LHC data

## ATTACHMENT 1

### Joint GDE-CLIC Committees Formed to Consider Areas of Common Interest

1. Physics and Detectors
2. Positron Generation
3. Damping Rings
4. Beam Dynamics
5. Beam Delivery System & Machine Detector Interface
6. Civil Engineering & Conventional Facilities
7. Cost & Schedule

The ILCSC and CSC have approved the formation of a CLIC/ILC General Issues working group by the two parties with the following mandate:

- Promoting the Linear Collider
- Identifying synergies to enable the design concepts of ILC and CLIC to be prepared efficiently
- Discussing detailed plans for the ILC and CLIC efforts, in order to identify common issues regarding siting, technical issues and project planning
- Discussing issues that will be part of each project implementation plan
- Identifying points of comparison between the two approaches

The conclusions of the working group will be reported to the ILCSC and CLIC Collaboration Board with a goal to produce a joint document.

## **Organization and Governance**

To be congruent with other groups studying these matters [GDE, EU], in the discussion below we divide the considerations as follows:

1. Legal status of project
2. Management structure
3. Representation and voting structure in governing body
4. Duration of agreement
5. Attribution of in-kind contributions (value pricing)
6. Operating cost
7. Budgetary control
8. Access policy

## *Preface for HEPAP*

*While not pretending to be expert in these matters most of us have been involved in large international collaborations with various rules of organization and governance. Further, we have consulted widely with colleagues in astronomy, fusion and materials science. From them we have learned some of the conditions that foster an efficient and effective process and some that are inimical to such effectiveness.*

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In what follows, the material preceded by the bold title summarizes observations about current practices in ongoing international scientific projects. The sentences preceded by “LCSGA” contain our suggestions regarding each item.

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(1) **Legal Status:** Four approaches to establishing a legal status for an international collaboration have been used or suggested in the recent past: a) treaty organization; b) limited liability corporation; c) extension of an existing international organization; d) reliance on the legal standing of an associated organization.

LCSGA: Which approach will prove most effective will depend upon conditions not known now such as the host country and its legal structures and the predilections of the negotiating parties. Most desirable will be an instrument that: i) maximizes the incentive of the parties to complete the project on an agreed upon schedule; ii) provides ready access for the international staff, their families, and for the users; iii) provides tax free access to equipment and materials needed for construction and operation of the facility.

(2) **Management Structure:** All project organizations have Councils at the top, giving representation to the governments and to the scientific communities of the contributing countries.

LCSGA: A project whose primary objectives are scientific is best served by a strong Council with a balance of representation from the funding agencies and the scientific community. For efficient conduct of business, it is highly desirable that these representatives should have decision making authority, both governmental and technical. Ideally, the members of the line organization would be selected primarily for their scientific and technical expertise so that they have the capability and stature to conduct the scientific project effectively.

(3) **Representation and Voting:** The project Councils are intended to represent the interests of the contributing countries or groups of countries. Some existing Councils for large international ventures are not effective at making the needed financial or scientific/technical decisions. This can be because of the large numbers of members, and even advisors to the members.

LCSGA: The governing Council will need to meet often enough to keep pace with project-related events. For efficiency, the Council should be kept as small as possible consistent with its mission. We think it desirable that one member of each delegation be a particle physicist, that the number of advisors be kept small, and that ministerial level delegates participate periodically.

(4) **Duration of Agreement:** Each of the current, large international projects has a definite duration and each has a provision for extension. Provisions for withdrawal are universally included.

LCSGA: It seems reasonable that the founding agreement be for a fixed term based on the anticipated length of the construction and a period of operation long enough for a thorough assessment of the scientific capability of the facility. It also seems important to provide for potential extension of the agreement in increments of some years and for penalties to withdrawal before completion of the facility.

**(5) Attribution of in-kind contributions:** All of the projects assume a large basis of in-kind contributions and thus there needs to be a framework to evaluate each country's contribution. A typical practice is to establish value in some arbitrary unit, pegged to a certain year. Practical implementation includes arrangements for a Common Fund and for contingency management.

LCSGA: The details of this all important feature of any agreement will be particular to the project. Experience shows the importance of establishing, from the very beginning, procedures for dealing with the many different circumstances that can arise during implementation of a complex, expensive and lengthy international project, e.g. design changes, uneven inflation for some in-kind contribution elements, contingency caps in some countries and not others, non-performance of contractors, and so forth.

(6) **Operating Cost:** This is new territory for Elementary Particle Physics as previously the operating expense has largely been borne by the host. A new paradigm may be needed.

LCSGA: The model where the host contributes the operating cost has served well up to the present and may in the future. However, the definition of “host” for a truly international project will depend on the prevailing circumstances at the time. If the “host” is not simply one country or one region, there will need to be a formula for cost sharing based upon the various types of benefits that the participating countries or country groups may reap through their participation. Such a formula must also consider the scientific needs of the enterprise as a whole and is best as an ab initio agreement.

(7) **Budgetary Control:** In most of the projects a budget cap is part of the overarching agreement. Cost growth experienced by the individual contributors has to be borne by them up to their own contingency limit. After that, some authority must decide whether or not to use project common funds or contingency to grant relief. As these funds near exhaustion, descoping is usually required.

LCSGA: Some current large international scientific projects are under stress because of inadequate Common Funds or Contingency. It is important that the initial agreement provide both a significant Common Fund to provide for items not obtained by in-kind contributions and an overall Contingency fund.

(8) **Access Policy:** The high energy physics culture has historically strongly supported open access to facilities based only on merit based peer review of proposals. This may change with the new circumstances where energy frontier accelerators may no longer be available in all three regions. The current principle appears in an ICFA Statement ([http://www.fnal.gov/directorate/icfa/icfa\\_guidelines.html](http://www.fnal.gov/directorate/icfa/icfa_guidelines.html))

LCSGA: We await the ICFA discussion and resolution of this matter.

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### Next Steps

- Presentation to FALC by ILCSC
- Study how best to carryout our recommendations regarding the R&D plan – then act
- Follow, AVIDLY, LHC progress and results