



ILC Research Plan: Global Work Package

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Coordinator: International Agreement

GDE/Fermilab

Global design effort



Background Information

- ILC GDE management is having discussions with its governing bodies, ILCSC and FLAC regarding the next phase of ILC, how we propose to manage and how the R&D and EDR work will be carried out.
 - Meeting with FALC (July 07)
- ILC GDE is developing a governance model for our own management through the EDR phase and how it will evolve in to the ILC governance during the construction phase.
 - ILC Governance MOU was discussed with ILCSC (Aug. 07)
- ILC GDE met with the FALC Resource Group and discussed the Project Management Plan and the Work Package development.
 - At this meeting we proposed an idea of Global Work Package Matrix
 - FALC Resource Group has proposed a schedule

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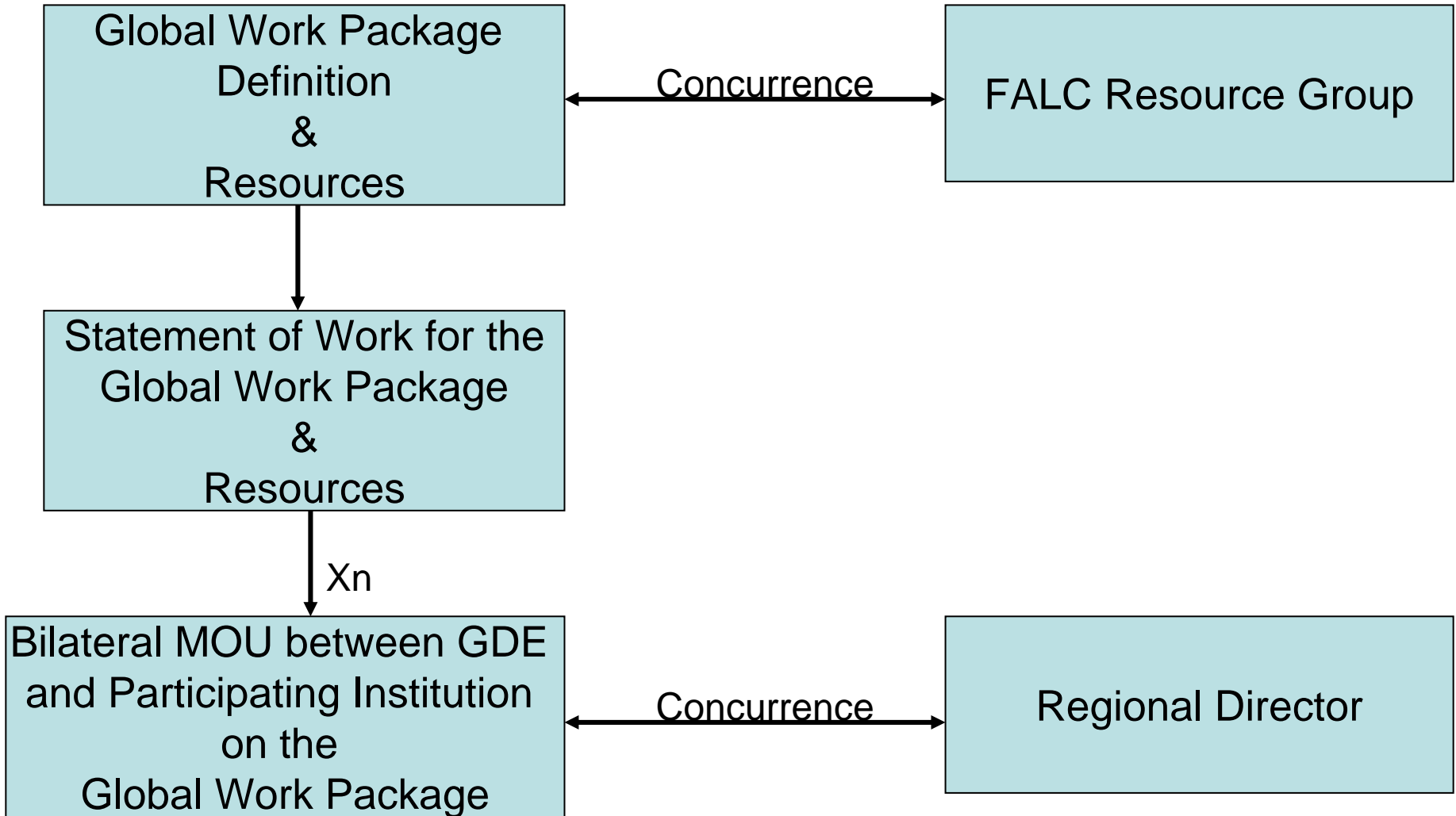
Global Work Package

- GDE plans to develop a set of global work packages for the R&D and Engineering Design work we propose to carry out in CY08-10.
- The global plan and Work Packages are expected to be developed by the PMs and Global GDE L3 managers.
- Global L3 managers are requested to help in developing Global Statement of Work and Institutional MOUs on the Work Package.
 - Global Work Package
 - Either self contained or
 - Large enough resources (> \$1M)
- Coordinator: International Agreement and Project Managers will work together to develop the “Global Work Package Matrix” for discussion with FALC.

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ILC Work Package Agreement



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Example: Work Package Definition and Resource MOU

Definition:

Work Package: Improving the Performance Yield of the SRF Cavity, for CY08 and CY09 has two fold goals.

- The preparation process and low-power vertical test yield for 35 MV/m at $Q_0 = 10^{10}$ should be greater than 90% for a sufficiently large number (greater than 100) of preparation and test cycles. A complete description of the preparation and testing processes will be developed so that it can be reproduced in any qualified facilities.
- After successful completion of the goal 1, ILC collaboration R&D would focus on the achievement of 35 MV/m at $Q_0 = 10^{10}$ in a sufficiently large sample (greater than 30 per batch) of nine-cell cavities in a low-power vertical dewar test in a production-like operation e.g. all cavities in a batch getting the same treatment. The yield for the number of successful cavities of the final production batch should be larger than 80% in the first test. After re-processing the 20% of cavities that under-perform, the yield should go up to 95%.

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Example: Work Package Definition and Resource MOU

Resources:

- This R&D would require a total of about 220 ILC 9-cell cavities to be fabricated, processed and tested.
 - The estimated cost for the fabrication, processing and testing of these 9-cell cavities are 16.5M and 7.7M Euro respectively, with a total of 24.2M Euro.
 - This cost estimate does not include the infrastructure development cost that would be needed in Japan and USA.
 - The cavity processing and testing infrastructure at DESY is already in place for the XFEL Project and is under development at KEK and collaborating US laboratories lead by Fermilab for future advanced accelerator development.
 - The work under this work package would be done by participation of DESY, Fermilab leading the collaborating US institutions and KEK by the end of 2009.
- It would also require about 40 1-cell cavities for the development of processing techniques in the 1st phase. The estimated cost of this study is 0.4M and 0.3M Euro with a total of about 0.7M Euro.

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Global Work Package: Statement of Work

- Statement of work for the Global Work Package will describe in detail the work that will be (**not should be**) carried out under this work package and resources needed.
 - This would require you to have a reasonable idea of the available global resources.
 - It is understood that in most cases we will get a projection on resources from institutions, which may not be a commitment.
 - It should outline the work that are planed to finish by the end of CY09 (US for example).
 - This SOW will be used to develop Institutional MOU.
- There will be a separate discussion on the work that we cannot get done due to resource limitations, its priority etc.



Example: Institutional MOU on WP

Work Package: Improving the Performance Yield of the ILC Cavity, for FY08 and FY09.

- WBS 3.9.1 Cavity Fabrication

- Fermilab has already either in hand or on order a total of 32 cavities using the FY06 and 07 funds. Fermilab will fabricate 24 (FY08) and 48 (FY09) 9-Cell TESLA Shape ILC cavities to support the ILC R&D goal of achieving a reproducible gradient of 35 MV/m with high yield. Fermilab will also fabricated 12 (FY07), 18 (FY08) and 18 (FY09) 1-cell cavities to support the R&D program in cavity processing. Additional 9 cell ILC cavities could also be fabricated as part of the US industrial development.

Year	FTE	M&S	Total
CY08	n1	n2	=n1*o1+n2*o2
CY09	m1	m2	=m2*o1+m2*o2

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Example: Institutional MOU on WP

- **WBS 3.9.3 Cavity Processing and Vertical Testing**

- Cavities fabricated by US and international vendor are surface processed (Electro-polished, High Pressure Rinsed, low and high temperature bake etc.) followed by a vertical dewar low RF power test. These cavities will be processed using upgraded infrastructures at Jlab, Cornell and new infrastructures at ANL and Fermilab. The assumed processing and testing capacity are 12, 40 and 40 respectively for Cornell, Jlab and ANL/FNAL. Cavity fabricated in one year is tested the following year. At present we will not enough cavities in the pipeline to saturate the capacity that would exist by the end of FY07. We also plan to process 6 cavities each in FY08 and FY09 from KEK and DESY as a part of this work package.

Year	FTE	M&S	Total
CY08	n1	n2	=n1*o1+n2*o2
CY09	m1	m2	=m2*o1+m2*o2

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Goal

- Global L3 Managers are requested to help develop these documents.
 - Statement of Work
 - Institutional MOU
- We are expected to share this top level Global Work Packages matrix with the FLAC Resource Group in late Nov. 07.
- Our goal is to have the Statement of work defined for major WP defined by the Fermilab meeting of the GDE.
- Our goal is to have a few institutional MOUs in place by end of the CY07.
- Coordinator: International Agreement working with PMs will develop a ILC Research Plan: Global WP Matrix of ILC work by mid Nov 07.

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