Making Choices for the SiD LOI
Some Points for Discussion

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How to get to an LOI from here

Date	Milestone
10/1/08	Submit LOI
9/1/08	Begin Final Edit of LOI; complete authorlist
8/1/08	**Complete LOI Draft** Collaboration Review and Comment
6/1/08	**GEANT4 Description Ready** Performance Studies Ready Benchmarking Studies Ready
5/08	**Freeze Detector Design** SubSystems Fully Specified Subsystem Technologies/Alternates Selected Conceptual Engineering Designs Ready
3/08	**Freeze Global Parameters** First Pass Detector Design
2/08	**First Pass Global Parameters**
12/07	**Subgroup Plans Defined** Milestones and Deliverables Manpower Resources Needed

Lots of Choices Coming Up

SiD Global Parameters: R_{ecal}, Z_{ecal}, B, λ_{hcal}

How to optimize?

PFAs evaluate performance vs R, Z, B, λ

Marty's spread sheet evaluates costs vs R, Z, B, λ

We need a simple metric for "performance"

Understand what performance the physics needs. Not done yet!

These are obviously critical parameters:

They establish how well SiD "works"

They set the scale for all SiD Subsystems

They control the cost.

Schedule

Review and Discuss First Pass Values	February, 2008
Freeze Values	March, 2008

See Marty's Talk on Optimization

Lots of Choices Coming Up

Specifying the Subdetector Parameters

The subgroups did this before for the Detector Outline Document. This is our chance to update and improve on those choices.

How to optimize ?
- Stand alone studies, full MC, BOTE???
- Little time to wait for new tools!
- Little time to gather warm bodies!
- Subgroups will share their plans in December 2007

e.g. Hcal:
Absorber?
Transverse segmentation?
No. of Layers?
Gap Thickness?

Criteria for optimization?
- Performance and Cost. What else?

Asking a lot from the Subgroups!

Subgroups Review and Defend Choices
- First Pass Detector Design — March 2008
- Freeze Detector Design — May 2008

Very Soon!

Technology Choices

Resolved: There should be definite technology choices in the SiD LOI

YES

SiD is not defined, performance is not defined, costs are not defined if technologies aren't chosen

An indefinite SiD design weakens the LOI

Can't afford time or $ or manpower to do multiple engineering designs for each tech choice

Can't afford to benchmark a multi-dimensional matrix of possibilities

Learn from the machine: Choose now, allow change control later

SiD has to learn to make choices. Start now.

Process demonstrates maturity of collaboration, a plus for LOI

Selection process focuses our attention on outstanding issues

Technology Choices, cont.

Resolved: There should be definite technology choices in the SiD LOI

NO

- There is insufficient data to choose some subsystem technologies rationally
- If choose technology A, SiD may lose proponents of technology B
- Some technology decisions can be made later, without impacting overall SiD design
- Artibitrary choices weaken the LOI case
- Choosing too soon could compromise SiD performance
- We can evaluate performance and engineer designs for at least a couple of alternatives

Suggested Next Steps

- **Some subgroups should conduct technology reviews** (the Hcal plan provides an example).
  - Demonstrated performance of candidate technologies
  - Robustness, reliability, track record
  - Physics performance expected
  - Conceptual design in SiD. What would it look like,
    - electronics, power, calibration, cooling and all?
  - Cost of integrated system
  - What information is lacking for a sound technology choice?
  - How do we get it?

- **Do this for the following subsystems**
  - Ecal (Si Pixels, CMOS Pixels)
  - Hcal (Scintillator, RPCs, GEMS, Micromegas)
  - Muons (Scintillator Strips, RPCs)
  - Tracking (Long, Short, Type of Pixels)

- **Premature for other subsystems**
  - Vertex
  - Beamcal
  - FCAL?

Suggested Next Steps, cont.

- **Subgroups Summarize the Technology Reviews for all SiD.** This will inform our decision on selecting technologies, and which technologies to choose . Get this done in time to be relevant for the LOI process. That means by March 08 at the latest.

- **The SiD LOI should allow for discussion of alternate technologies** when a rational technical judgment can’t be made.

Lots to Talk About

We'll need a series of SiD Meetings throughout the next year to review new information, hear progress from the subgroups, debate the choices put before us, and stay on track.

Tentative Meeting Schedule

Jan 28-30, 2008	SLAC	PFA Status and Global Parameters
April 2008	RAL/Oxford	Freeze Global Parameters Technology Reviews 1st Pass Detector Specs
June 2008	???	Freeze Detector Design Performance Studies Ready Benchmarking Ready