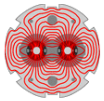


brookhaven - fermilab - berkeley - stanford

LARP Management Issues

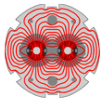
Steve Peggs, BNL/FNAL

Current events: good news!

Early challenges to LARP

Santa Rosa review

Administration



Current events

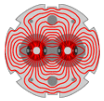
Budget request and allocation

LARP FY06 budget request v2b

Sept 23, 2005			FY2006				
WBS			BNL	FNAL	LBNL	SLAC	Total
US LHC Accelerator Research Program			**2838**	**3207**	**3975**	**780**	**11000**
1	**Accelerator Systems**	**Shiltsev**	**855**	**1150**	**1255**	**700**	**3960**
1.1	**Instrumentation**	**Ratti**	345	250	935	0	1530
1.2	**Commissioning**	**Syphers**	230	620	90	0	940
1.3	**Collimation**	**Markiewicz**	100	50	0	700	850
1.4	**Accelerator Physics**	**Shiltsev**	180	230	230		640
2	**Magnet R&D**	**Gourlay**	**1543**	**1787**	**2320**		**5650**
2.1	**Design Studies**	**Zlobin**	83	190	105		378
2.2	**Model Magnet R&D**	**Sabbi**	0	1334	1063		2397
2.3	**Supporting R&D**	**Ambrosio**	1282	67	504		1853
2.4	**Materials**	**Ghosh**	178	196	648		1022
3	**Program Management**	**Peggs**	**440**	**270**	**400**	**80**	**1190**

Good news:
we have $11M !

	Allocation	First 75%
BNL	2838	2130
FNAL	3207	2980
LBNL	3975	2410
SLAC	780	780
PM cont.	200	0
Total	11000	8300



June DOE review action items

1) Provide R&D plan by July 30 (now Sept 30)

- in preparation are 2 loosely coupled documents by Gourlay & Shiltsev
- foundation for technical review (see “4”)

2) Provide Research Program Management Plan

- “DONE” except for a few comments

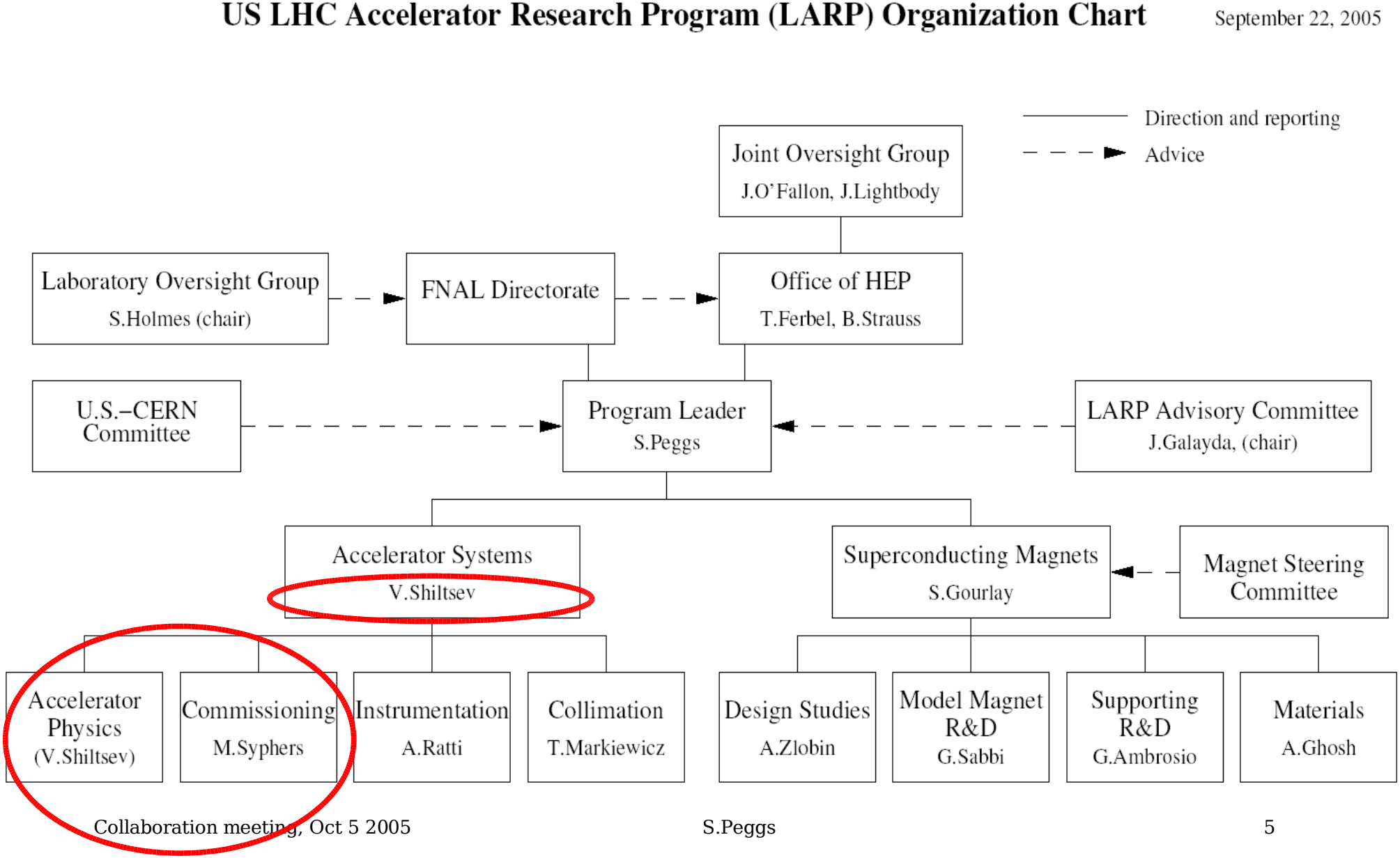
3) Appoint Accelerator Systems L1 manager

- DONE – welcome Vladimir!

4) Hold a detailed technical review in FY06 Q1

- in planning for Nov 2-4 at Santa Rosa
- draft charge now available ...

Recent org. chart changes



Hardware Commissioning

Commissioning Task Force report

Identified 6 to 11.5 appropriate people (names) in U.S. labs

LARP provides only 2.5 FTE-yrs "overlapping" from the IR Commissioning effort (U.S. deliverables)

Many more hardware commissioners are needed

Potential sources of funding/resources:

- CERN: Project Associateships ~5 kCHF/month "real money"
- CERN: Direct Funds potentially left over from constr. proj. ???
- DOE: none so far
- U.S. Labs: Redirection of personnel ?

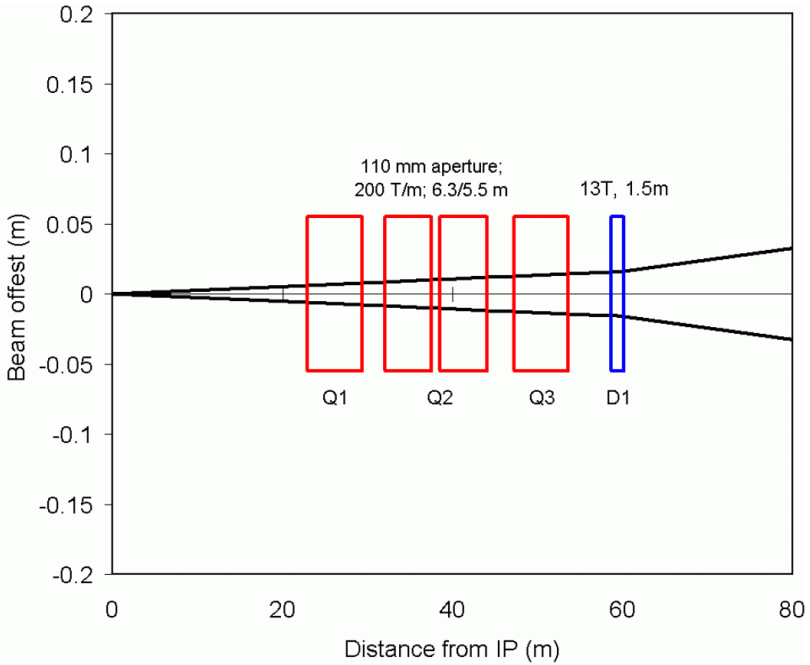
LARP naturally provides incidental expenses (relo, travel, ...)

- base salaries already funded within the U.S. HEP program

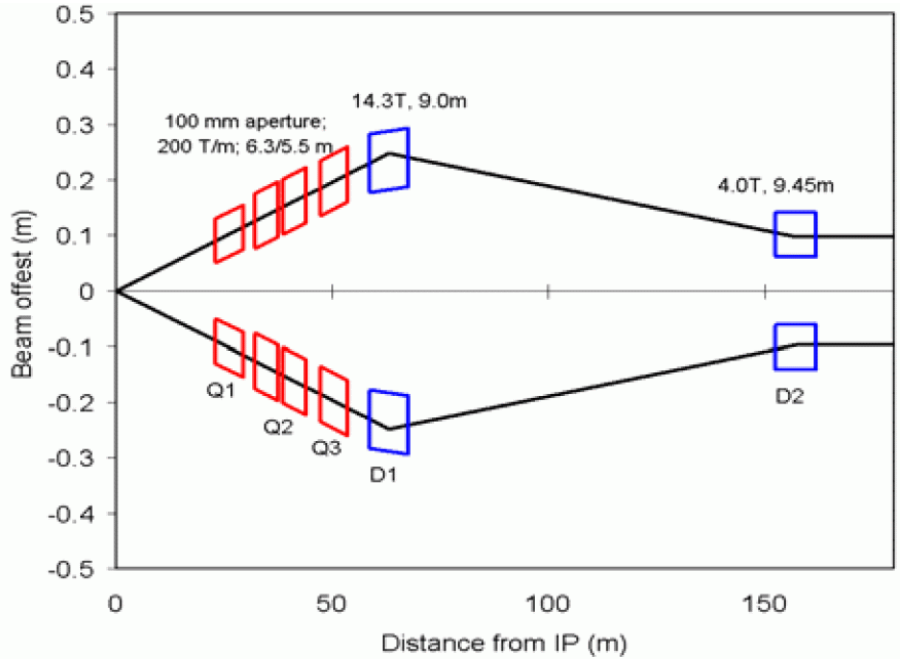
IR upgrade workshop (Mon & Tues)

LARP

Quad first



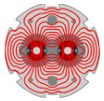
Large angle



All scenarios require highest possible strength quadrupoles with Niobium-Tin (Nb_3Sn) conductor – success not guaranteed!

"Large Angle" scenario with SRF crab cavities – workshop failed to put a stake through its heart. Only do it if LR BB is atrocious

We are entering an exciting Beam-Beam period – wires, electron lenses, predictions



Early challenges to LARP

Luminosity challenge chronology

Accelerator Systems goals are linked to 4 (identified) challenges

Challenge	Luminosity
1) Snap-back	small
2) Stored energy	medium
3) Beam-beam	nominal
4) Debris power	upgrade

Magnet R&D goals:

1) Provide options for LHC Interaction Region upgrades

2) Demonstrate that Nb_3Sn quads are a viable choice by 2009

FOCUS ON THE EARLY GOALS: 2006 (2007)
at this collaboration meeting and at Santa Rosa

Accelerator Systems vital priorities

Early LARP performance will be measured by success in 3 vital Accelerator System tasks:

1) Luminosity monitors
2) Tune feedback
3) Beam Commissioning

These three tasks must be protected against

- budget allocation shortfalls
- Magnet R&D
- other Accelerator Systems tasks
- MISSION CREEP !

Magnet "Program Table"

Sept 27, 2005	Type	Strand process	Length [m]	Gradient [T/m]	Peak Field [T]	Bore [mm]	FY05	FY06	FY07	FY08	FY09
MODEL MAGNETS											
Technology Quad (TQ)	cos(2θ)	MJR	1	> 200		90		2*			
		RRP						1*	2		
Long Quad (LQ)	cos(2θ)	RRP	4	> 200		90				1	1
High Gradient Quad (HQ)	cos(2θ)	RRP?	1	> 250		90				1	1
SUPPORTING R&D											
Practice Coil (PC)	cos(2θ)	RRP	4	N/A		90			2		
Sub-scale Quad (SQ)	block	MJR	0.3	~100		110	1*	1*			
		RRP							1*	1	
Short Racetrack (SR)	block	RRP	0.3		10-12	N/A		1	1*	1	
Long Racetrack (LR)	block	RRP	4		10-12	N/A		1	1		

* In addition to building new coils there will be several revised configuration tests using existing coils
MJR: Modified Jelly Roll
RRP: Rod Restack Process (84/91)

SQ01 completed in FY04, retested in FY05

TQs for high gradient with new material: RRP

Long Racetracks to test scale-up

Long and strong prototypes

Magnet R&D vital priorities

3 major program components are critical to early success:

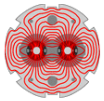
1) Establish a conductor "work horse" with advanced but stable performance

2) Develop short Technology Quadrupoles to explore magnetic, mechanical and fabrication issues

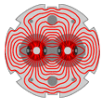
3) Use simple Long Racetrack coils to investigate length scale-up

while planning:

4) Segue into Long Quad and High Gradient Quad series



Santa Rosa review (Nov 2-4)



Charge

"... assess the arrangements .. with CERN to integrate U.S. efforts for the commissioning of U.S. supplied components, the commissioning of the beam and associated instrumentation"

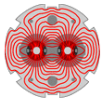
- CTF report
- Focus on Beam Commissioning risks and uncertainties

"... examine ... the research plans you are submitting for the development of superconducting magnets, and ... accelerator-physics components and instrumentation in LARP."

- Use this collab meeting as final step in preparing the "LARP R&D Plan" document by Oct 15
- MUST include timelines/milestones

"... provide distinct evaluations of: (i) goals for next year, (ii) and the long-term plans"

- LARP is best served by focusing on (i) to perform risk analysis for the next year (or two)



Agenda

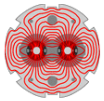
Santa Rosa agenda is being prepared right now!

Centered on long but focused "keynote" expositions:

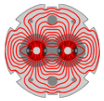
- Luminosity Monitors
- Tune Feedback
- Beam Commissioning
- Materials
- Technical Quad series
- Long Racetrack coils
- segue to Long Quad and High Gradient Quad series

Under debate is the need for:

- "Task Detail" presentations
- Accelerator Systems longer range (eg Collimators)



Administration



Miscellaneous

Research Program Management Plan

add prescriptions:

- EDMS (CERN Engineering Design Management System)
  for engineering deliverables (eg Lumi Monitors)
- annual Letters of Agreement between LARP & U.S. Labs
- Change Control Board (= Executive Committee ??)

LARPAC

LARP Advisory Committee (Galayda et al)

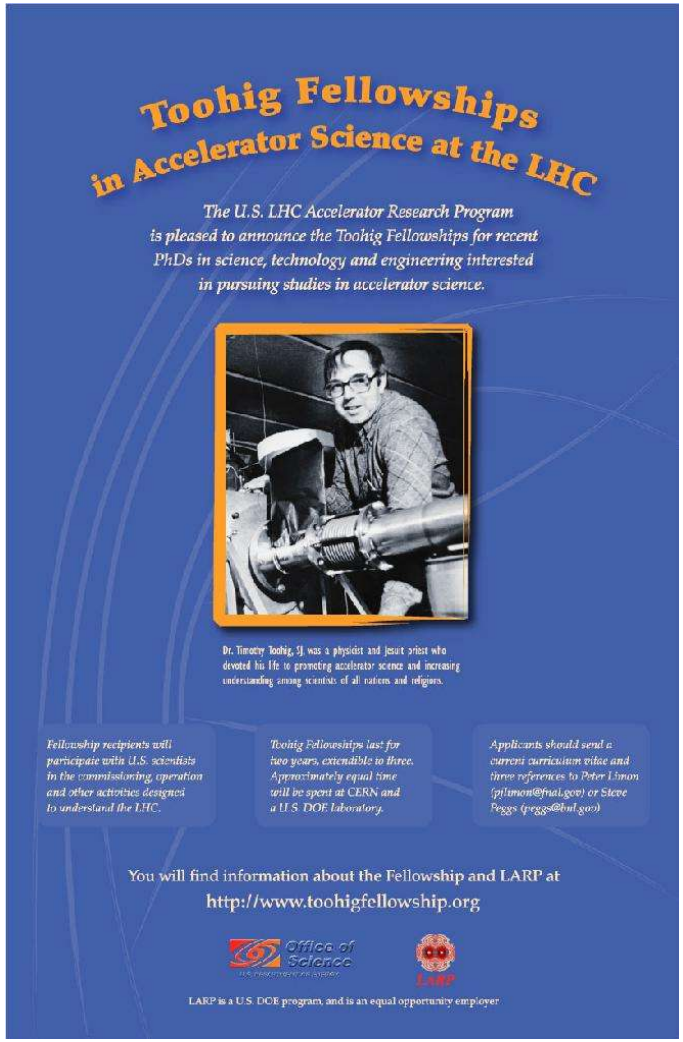
- last met June 04
- schedule next meeting for Jan/Feb 06

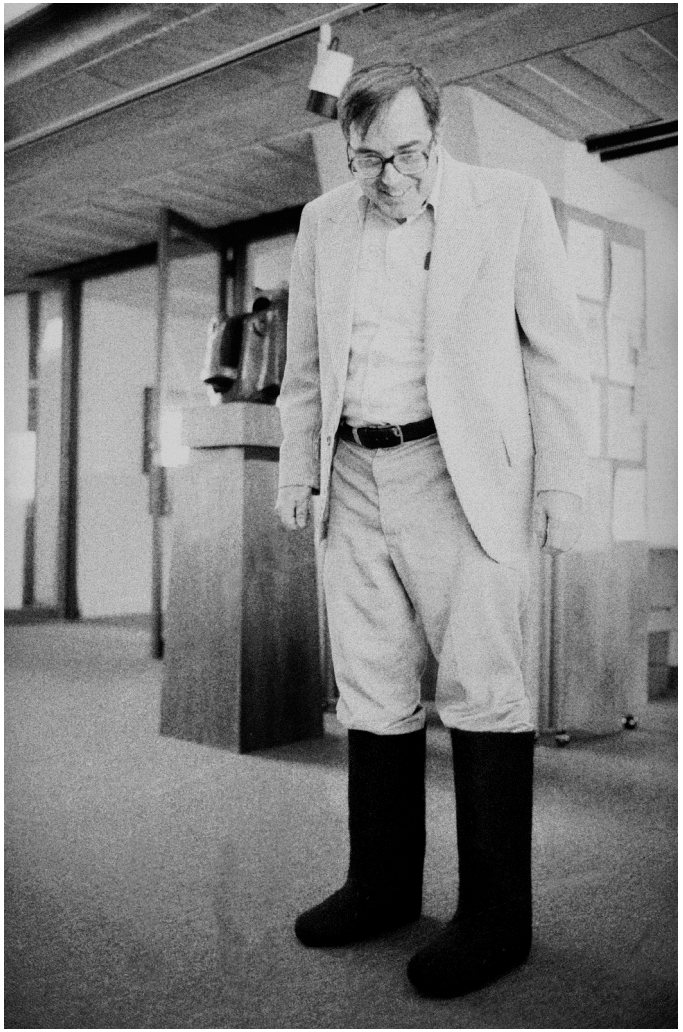
WWW home pages

Need re-design

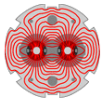
- new tools
- maintaining flexible input & co-ordination

First Toohig Fellowship





Rama Calaga (Stony Brook)



Summary - 1

ACCELERATOR SYSTEMS

1) Lumi monitors, Tune feedback & beam commissioning are highest early priorities

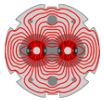
2) Searching for ways to enhance U.S. role in hardware commissioning

3) Beware mission creep (in general). Flip side: many potential worthwhile tasks fall off the list

MAGNET R&D

4) Demonstrating a long, strong Nb_3Sn quadrupole by 2009 has risk, both fundamental and programmatic

5) Early challenges: workhorse conductor, “technical quads”, long coils



Summary - 2

SANTA ROSA

1) "LARP R&D Plan" document is a vital deliverable. Use this meeting to finish preparations

2) Timelines and milestones in R&D Plan!

3) Use the review to our advantage: risk management in 2006 (& 2007)

COUNT OUR BLESSINGS

1) Not many corners of U.S. HEP are as blessed as us. Let's continue in the successful manner to which we are becoming accustomed!