
LIGO Organization & Management

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NSF Review
May 22, 1995



LIGO

Project Management

B. Barish

- Organization and Management
 - » Fall '94 Review → LIGO Responses
 - » Organization/Staffing Status
 - » Project Management Control System (PMCS)
 - » Commissioning/Operations Proposal

G. Sanders

- Overview of the Project
 - » Six Month Review of Accomplishments
 - » Plans for the Future

LIGO Management Approach

Project Management Plan

- Submitted to NSF - December 1994
 - » Incorporated Comments-NSF Review(Sept '94); LIGO Oversight Committee; and from the NSF
- NSF Response - (pending)
- Project Proceeding as in the PMP

NSB Revalidation & Budget Approval

- Construction + R&D Budget - \$292.1M
 - » Construction Completed in 1999
- Commissioning/Operations - \$68.7M
 - » Commissioning Commences in 1997
 - » 3-fold Sensitivity 10^{-20} by July 2000
 - » First Search for Gravitational Waves
 - » Sensitivity 10^{-21} by end of 2001
- Established as our Working Baselines

LIGO

Funding Plan

Fiscal Year	Construction	R&D	Operations	Total
1992	\$15.9M	\$3.2M		\$19.1M
1993	\$20.0M	\$4.0M		\$24.0M
1994	0	\$4.0M		\$4.0M
1995	\$85.0M	\$4.0M		\$89.0M
1996	\$55.0M	\$4.0M		\$59.0M
1997	\$55.0M	\$0.8M	\$0.3M	\$56.1M
1998	\$41.2M		\$7.3M	\$48.5M
1999			\$20.9M	\$20.9M
2000			\$21.1M	\$21.1M
2001			\$19.1M	\$19.1M
Total	\$272.1M	\$20.0M	\$68.7M	\$360.8M

Reviews, Reports, Committees

- **NSF Reviews**
 - » Twice/Year (alternate management and technical)
 - » Special Review of MIT (June '95)
- **NSF Reports**
 - » Monthly, Quarterly, Annual
- **Internal Progress (Weekly)**
 - » Weekly Report from Groups
 - » Project Control Meeting Minutes
 - » Weekly Progress Report (WWW - soon)
- **PPAC (Preliminary)**
 - » Temporary PAC, EPAC
 - » P. Saulson (chair), S. Finn, A. Giazotto, J. Hall, W. Hamilton, C. Prescott, A. Ruediger,
- **Oversight Committee(MIT/Caltech)**
 - » L. Allen(chair), C. Canizares, G. Gibberson, E. Moniz, T. Phillips, T. Tombrello

Response to Fall '94 NSF Review

- 1 “..shared vision.. to construct on cost”
- 2 “..identify areas where base cost can be reduced..”
 - » *Our Approach:*
 - *Trade Studies (e.g. beam enclosure) , Value Engineering*
 - *Cost Containment Options under review now.*
 - *Management Tools (PMCS)*
- 3 “..augment with a few seasoned ‘engineers’..”
 - » *Added strong, experienced senior technical managers (M. Coles, D. Coyne, R. Fischer, E. Jasnow, O. Matherny, S. Meshkov, A. Sibley)*
- 4 - “Demonstrated Results from R &D provide firm foundation scientific goals can be achieved”
 - » ***WE AGREE !!!!***

Response to Fall NSF Review

- 5 “A mature technical design exists for the vacuum system opportunities exist for cost savings..”
 - » *Identifying cost saving items*
 - » *Two competitive design contracts*
- 6 Hire and A & E.. “opportunities exist for cost savings ..”
 - » *H. M. Parsons -- Design & Construction Mgt*
 - » *Conceptual design -- June 30*
 - » *Extensive interaction and Trade Studies !!*
- 7 “..further work needs to be done on commissioning/startup and operations..”
 - » *Proposal submitted -- grounds up costing, from time phased, resource loaded tasks*

Response to Fall NSF Review

- 8 User program and public outreach
 - » *Aspen Meeting in Jan '95 for LIGO Users + ...*
 - » *Whitepaper on Educational Outreach ..*
- 9 ... Tech transfer..”
 - » *White paper (implementation in future)*
- 10 “..scope reductions... not commensurate with the risks”
 - » ***Maintaining scope !!***
 - » *Project is grappling with questions like how much future expansion to build in or where to just provide flexibility ?*

Staffing and Organization

- **Staffing**
 - » Total Hiring on Schedule
 - » Total Staff Doubled in Past Year
 - » Key Positions are Staffed

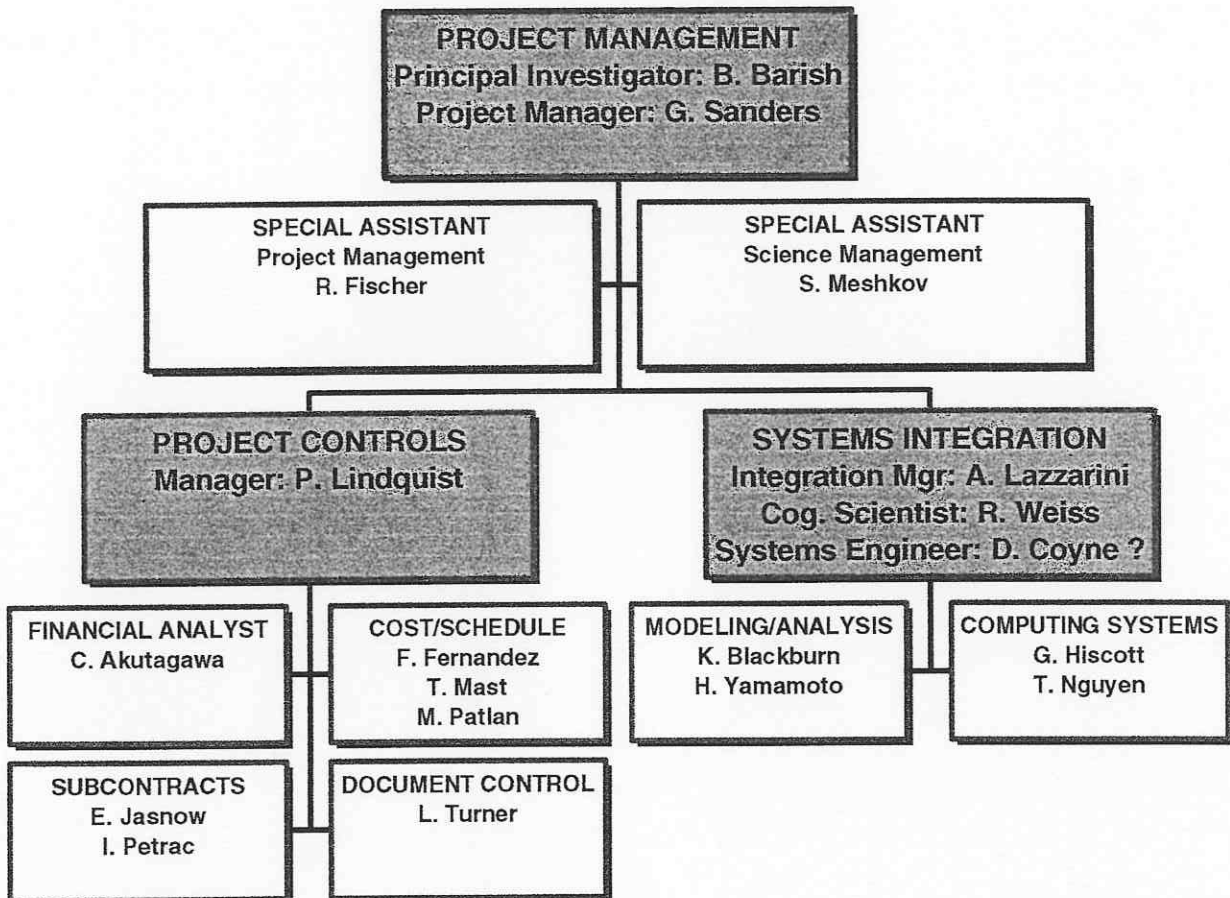
- **New Organizational Structure in Place**
 - » Product Oriented
 - » Parallels the WBS
 - » Tasks, Resources and Schedules as in Baseline

- **Transition to Operating Phase**
 - » Plan for Organization and Staffing
 - » Long Range Needs for Commissioning and Operations Consideration in Staffing

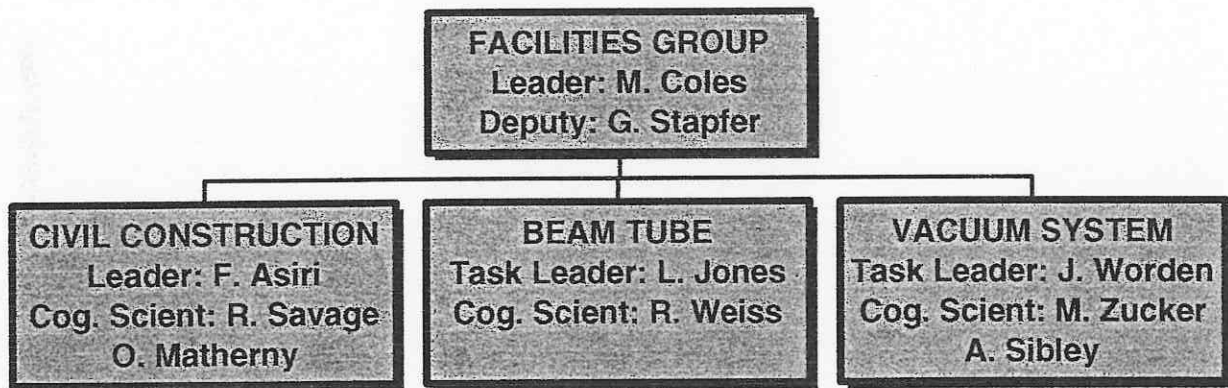
LIGO Staffing (Head)

Task	Caltech	MIT	Total
Proj Mgt	4	0	4
Admin	6	2	8
P Control	8	0	8
Syst Int	6	1	7
Facilities	7	0	7
Detector	17	2	19
R&D	10	7	17
Grad Stud	4	5	9
TOTAL	62	17	79

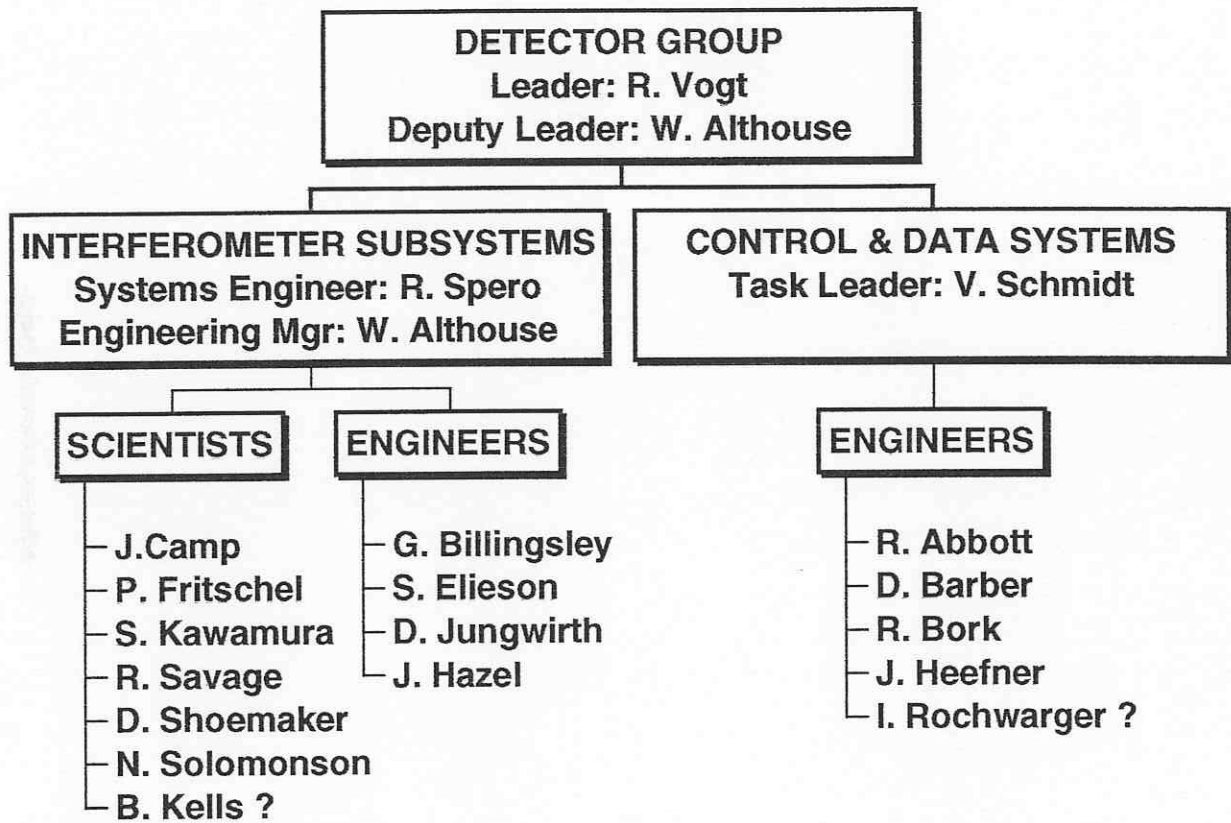
Project Office



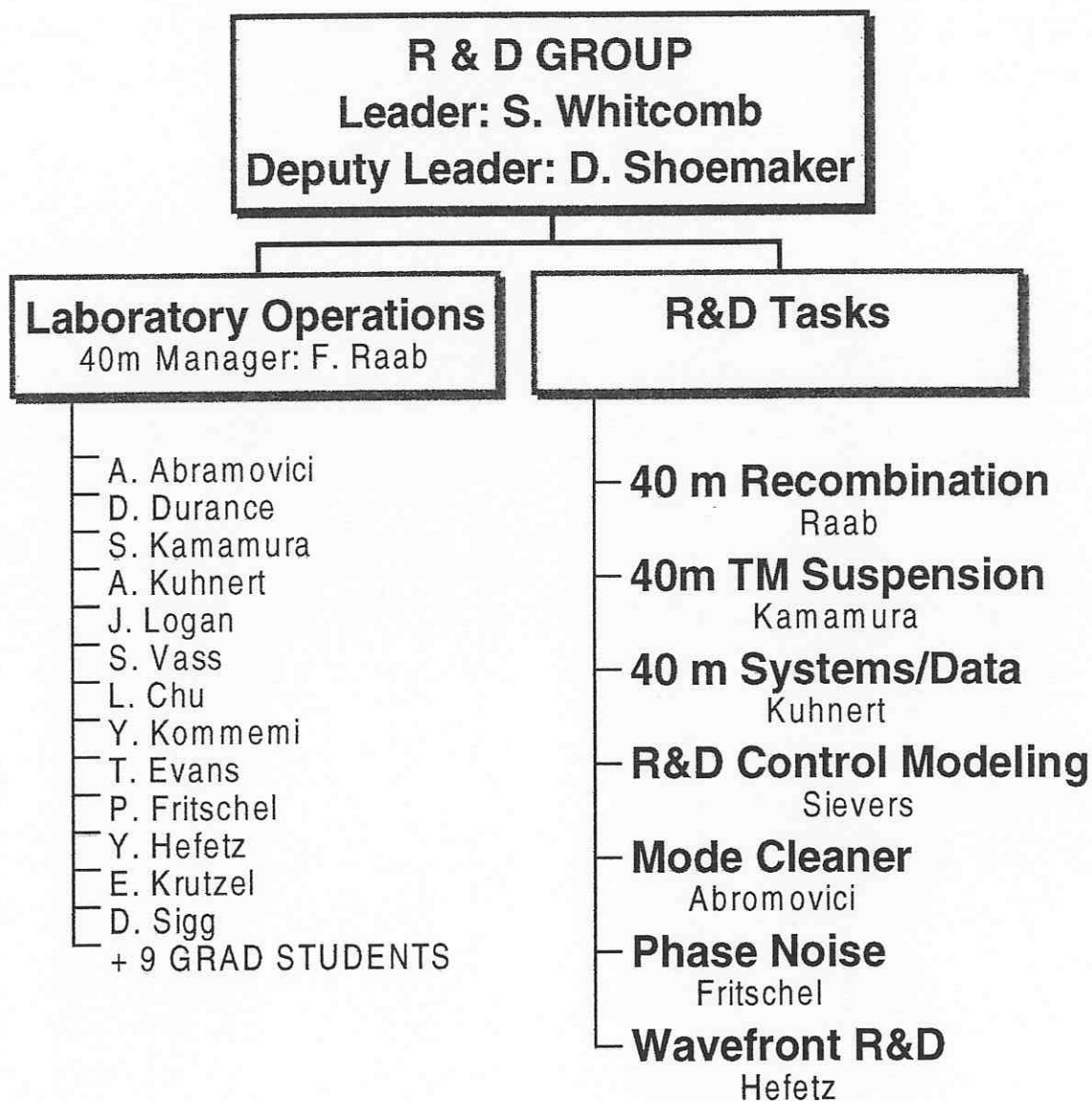
Facilities and Vacuum Systems



Detector Group



R & D Group



Management of LIGO Project

Regular Project Meetings

- Group Meetings - Weekly (Detectors, R&D, etc.)
- Management -Weekly (Project Control)
- Science and Integration - Quarterly

On-Demand Meetings

- “All Hands” - Informational for Staff
- Technical and other Reviews
- Planning (eg. procurement strategy)
- Change Control Board

Management of LIGO Project

Technical Design and Management

Project Controls

- Project Management Control System (PMCS)
 - » measure performance, report, and manage
- Configuration Management
 - » changes in technical, cost and schedule baseline
 - » manage contingency
- Document Control
 - » official 'paper trail' for contracting, etc..
 - » technical reports, publications, etc..

LIGO PMCS System

- What was Promised?
 - » June 94 NSF Review -
 - » Sept 94 NSF Review -
 - » Project Management Plan -

- PMCS
 - » Cost Book is the Basis of Baseline
 - » Software (Cobra & Open Plan)
 - » Integrated Cost-Schedule Baseline
 - » Reports of Performance Compared to Established Baseline and Actual Costs
 - » **Milestone of April 28 !!**

- Next Goal: Establish PMCS as an Effective Management Tool in LIGO

Commissioning/Operations

- Proposal Submitted to NSF
 - » Yearly Funding same as Presented to NSB
- Commissioning Plan
 - » Time Phased Manpower/Resources
- Management for Hanford:
 - » F. Raab (Head)
 - » O. Matherny (Facilities Manager)
 - » J. Worden (Vacuum Engineer)
- Management for Livingston
 - » M. Coles (Head)
 - » G. Stapfer (Facilities Manager)
 - » A. Sibley (Vacuum Engineer)
- Caltech/MIT
 - » Support operations, data analysis, detector development
 - » Staffing reduced to accommodate staffing sites

The LIGO Community

- **LIGO Users**
 - » Aspen Workshop (Jan 95)
 - » Formed charter, organization
 - » Joint with VIRGO?
- **Collaborations**
 - » VIRGO : Visit in March (Barish, Sanders)
 - cooperate on technology, data analysis;
MOU in process
 - » GEO 600: Planning meeting in April (Kuhnert)
 - » New MOUs in Progress:
 - K. Thorne (Caltech), Bender (JILA), Cutler (Penn State), Australian groups, etc
- **LIGO Visitor Program**
 - » MIT: K. Sliwa (Tufts) on sabbatical next year
 - » Caltech: P. Saulson (July), B. Allen (Winter 96)
- **General**
 - » WWW, published papers, technical documents
 - » educational, technology transfer white papers