Fermilab

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Fermilab Resource Management

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DOE Institutional Review

10-Feb-2015

Outline

- Establishing and communicating Priorities, Goals
- New Fermilab management structure
- Project Resource Control
- Resource Providers - Divisions and sections
- Division Resource Planning
- Wrap up

Priorities, Goals

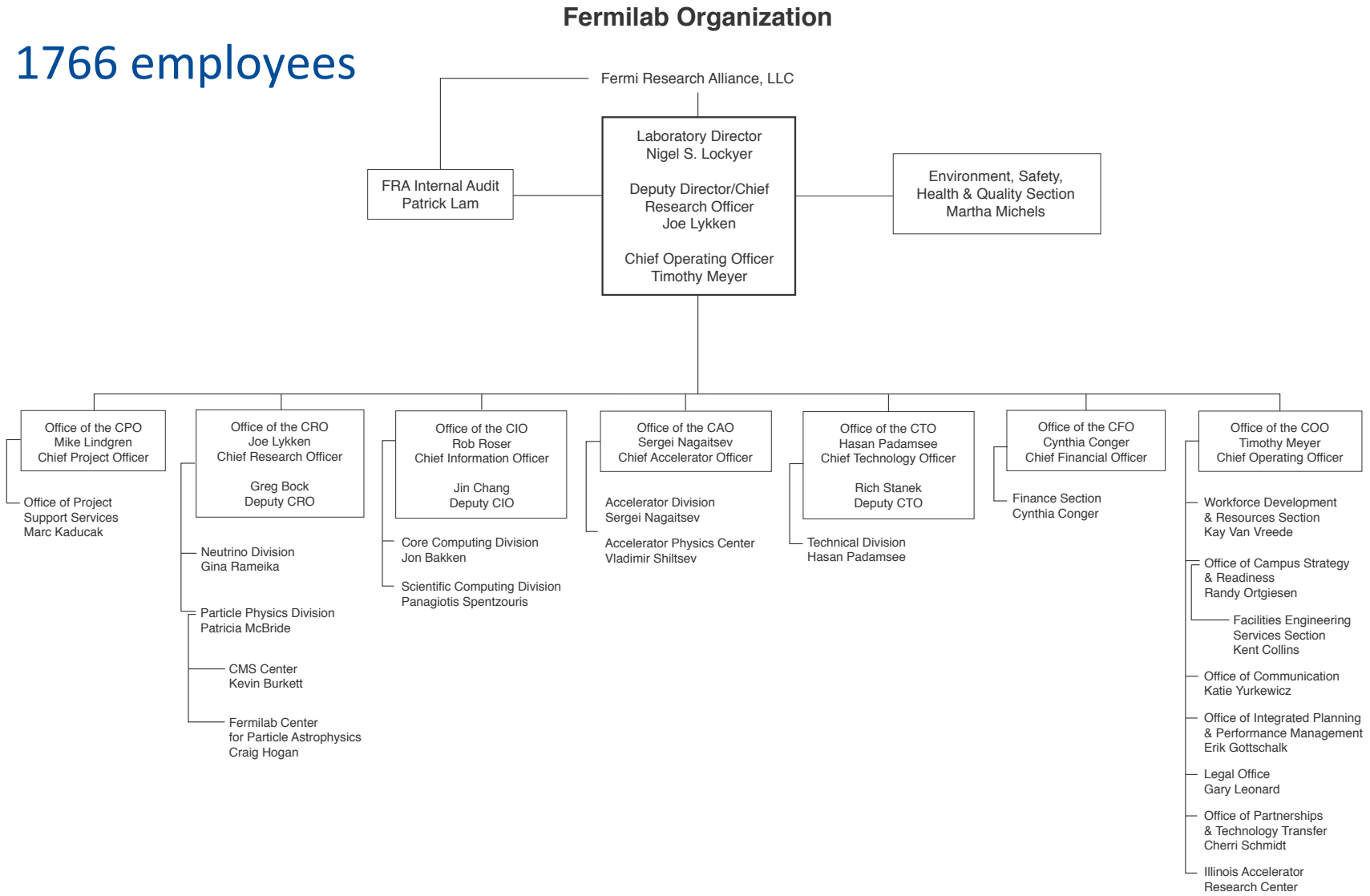
- Priorities understood and communicated
  - Aligned with field, SC/DOE, and P5 priorities
  - Communicate to all levels of lab
  - Understand they will change with time
- Transparent process for establishing priorities
  - P5, HEPAP, PAC, reviews, PMG's, portfolio reviews, EMG's
  - 2014 reviews, audits, assessments, inspections
    - 45 External, 230 Internal
    - Lab activities looked at by many groups
- Be organized and coordinated within the lab, and in working with other labs and universities.
  - Effective management of limited resources imperative
- Efficiently deliver projects and operations

Organizational Changes

- Need structure tailored to help to carry out the P5 plan
- Lab organization should support goals
  - "flatter" organization – chiefs replace ALD's
  - Creation of a Neutrino division
  - Chief Project Officer, more staffing in OPSS, creation of IPPM office, new HCM and BPS systems
  - Better communication between top management and the division and section heads
    - Most division and section heads now report directly to the director, deputy director or COO
    - Closer connections between management across all organizations ("One Lab")
    - More flexible movement of resources to focus where needed
- Focus on successful delivery of projects

Lab Management structure and changes

1766 employees



Focus on Project Delivery

- Lab has a critical role in project management and construction
  - Project success/failure charged to laboratory
  - Work closely with DOE Program Managers and FSO PD's
- CPO, OPSS, IPPM, focused on project success
  - New Position – Lab Technical resource coordinator
- Oversight/engagement through monthly:
  - Project Management Group (PMG)
  - Performance Oversight Group (POG)
  - Cost and schedule (EV) performance reviewed at both
  - Resource issues brought up and discussed - schedule drivers
- Lab introducing better tools to plan, track, and manage labor
  - Not there yet

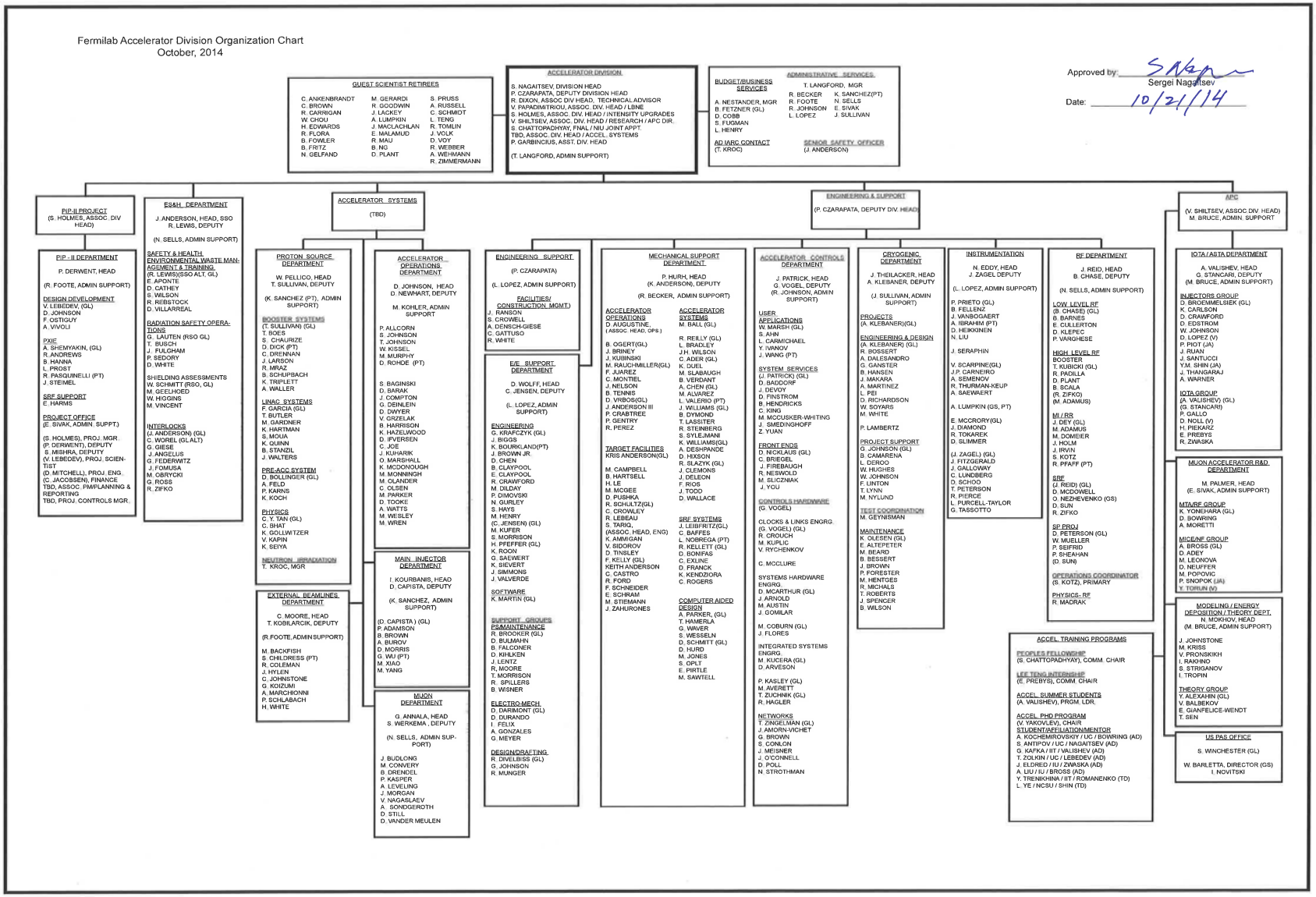
Project Support

- Projects charged to deliver scope on budget and schedule
- Fermilab divisions are hosts and vendors of deliverables
  - Must be competitive with Industry, universities, and other labs on cost, schedule, and capability
  - Example is NOvA – most detector construction done in industry and at universities. Was most cost effective. Accelerator work done at Fermilab – exclusive capability
- Host/oversight/vendor relationship has potential for confusion and conflicts of interest
  - Divisions (and projects) under financial pressure
  - Separation of roles - line management and “division as a vendor of deliverables”
  - Project resource control defined in PEP, PMP
    - Baseline and change control under Project Manager, FPD

Project Resource Control

- Project baseline determined by collaboration and project management team
- How the lab plans to manage a project (for the DOE) is defined in a Project Management Plan
  - "The definition of the project, control of its scope, proposals for allocation of project contingency within bounds established in the PEP, oversight and interaction with the collaborating institutions and agencies are the responsibility of the Mu2e Project Manager. "
- Change Control
  - Approval for changes from approved baseline are the responsibility of the Project Manager, and then the Federal Project Director, not the Fermilab line management
- PM's looking for best solutions at lowest cost

Accelerator Division



Accelerator Division

- Major responsibilities
  - Run accelerator complex
  - Beam physics research
  - Develop and build accelerators – PIP-II, MAP, ILC
- ~ 450 people, 18 departments
  - New target department
- Technical resources
  - Engineers - 38 Mechanical, 54 Electrical
  - Design/Draft - 9 Mechanical, 3 Electrical, 2 Cryo
  - Technicians - 66 Mechanical, 65 Electrical

225 employees

Technical Division – July 7, 2014

Approved: Hasan Padamsee

Hasan Padamsee – Division Head
David Harding – Deputy Division Head
Romesh Sood – Associate Head
Victor Yarba – Associate Head

Departments

- SRF Development
  V. Yakovlev
- Magnet Systems
  G. Velev
- Test & Instrumentation
  M. Tartaglia
- Design & Drafting
  M. Wong-Squires
- Quality and Materials
  J. Blowers
- Machine Shop
  J. Blowers

Projects & Programs

- Accelerator Support - TD
  (G. Chlachidze)
- High Field Magnet - TD
  A. Zlobin
- LARP - TD
  G. Apollinari
- LCLS-II - TD
  (R. Stanek)
- SRF R&D - TD
  (H. Padamsee)
- PIP II R&D - AD
  (S. Holmes – APC)
- Mu2e - PPD
  G. Ginther – Beam Line M. Lamm - Magnets
- Muon Accelerator Program - APC
  (M. Palmer)

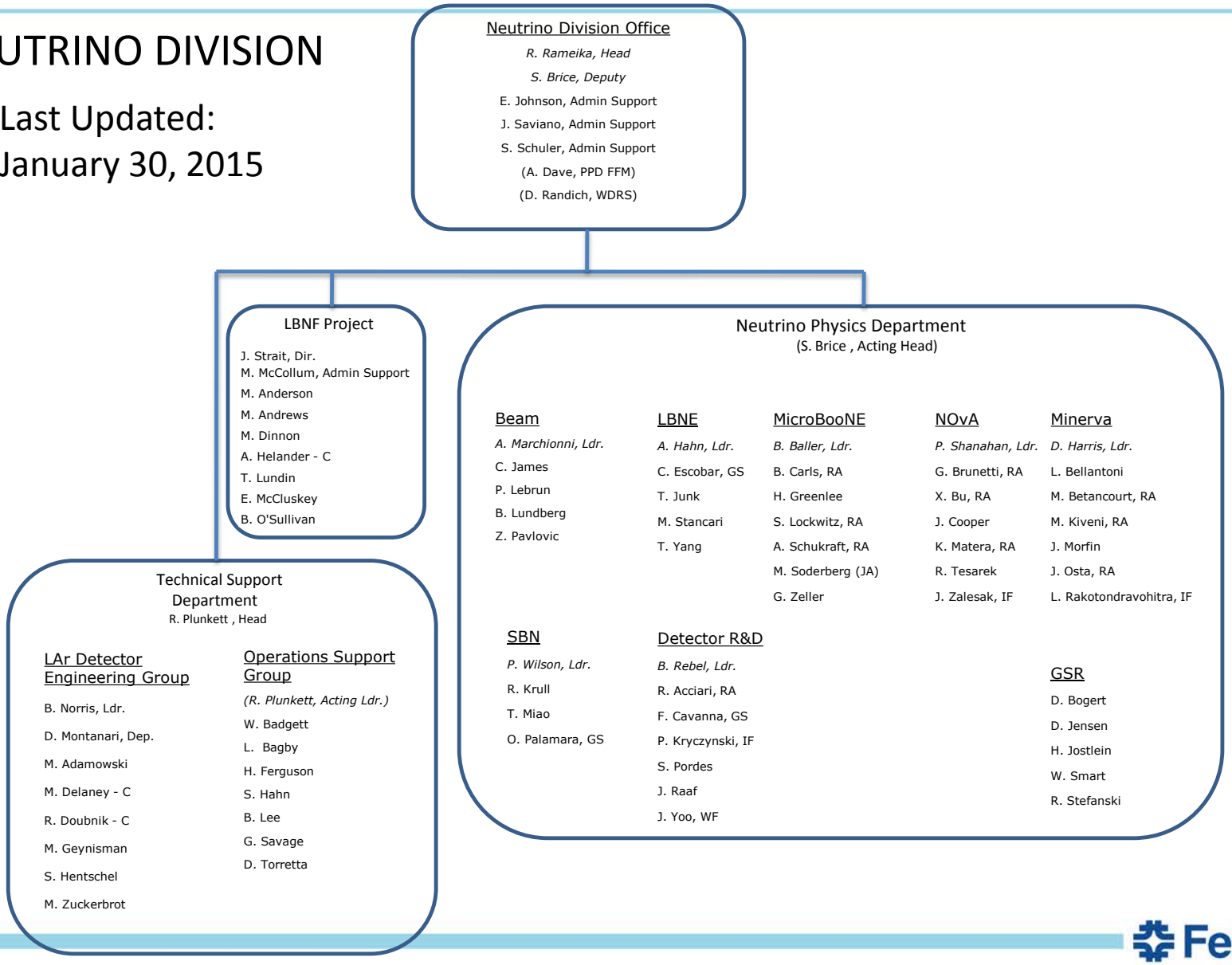
Technical Division

- Major responsibilities
  - Design and build magnets and accelerator systems
  - LCLS-II, LARP
- ~ 225 people, 6 departments
- Technical resources
  - Engineers - 49 Mechanical, 23 Electrical
  - Design/Draft - 7 Mechanical,1 Cryo
  - Technicians - 49 Mechanical, 7 Electrical

Neutrino Division

NEUTRINO DIVISION

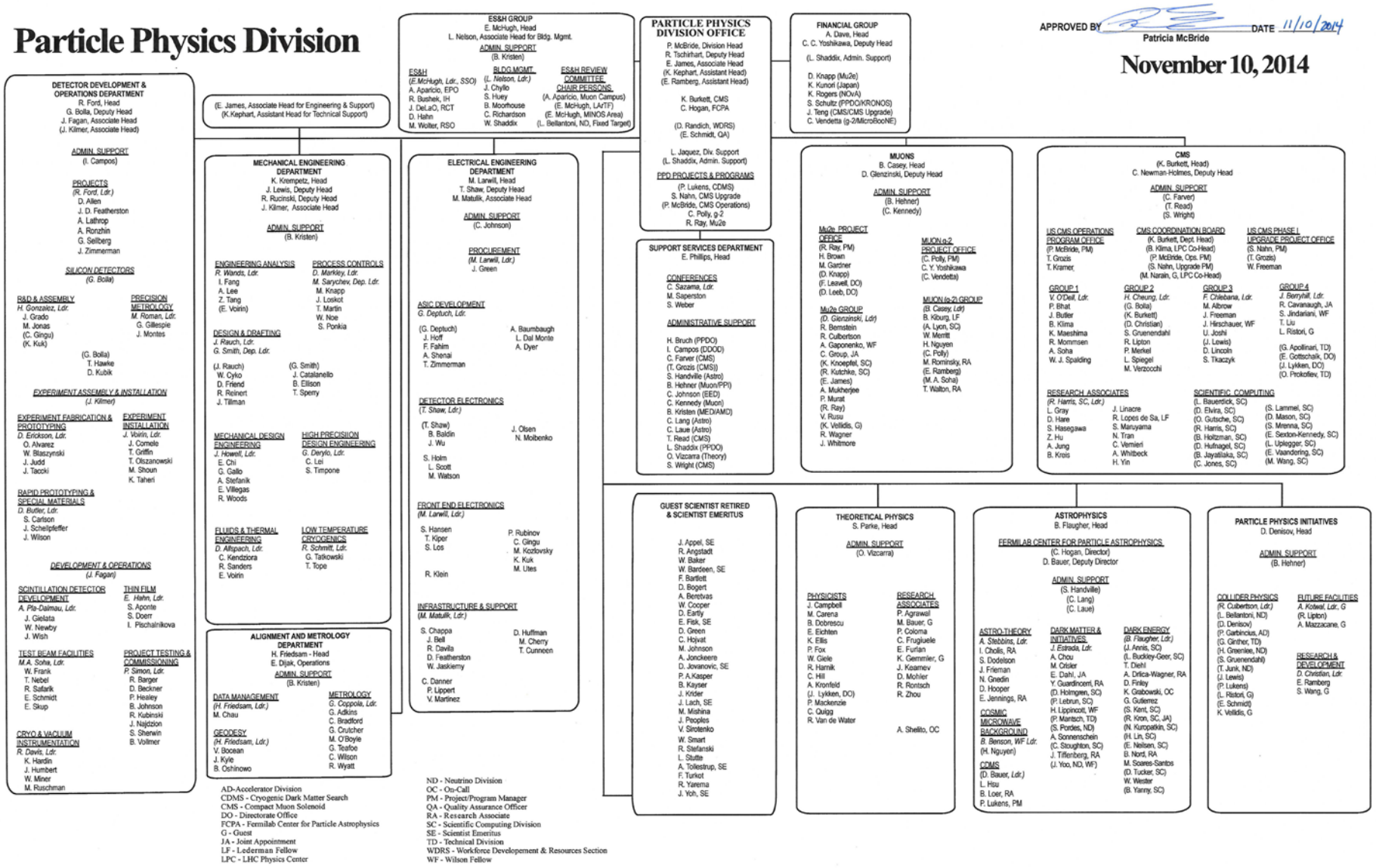
Last Updated:
January 30, 2015



Neutrino Division

- Major responsibilities
  - Neutrino physics and experiment operations and support
  - SBN, LBNF
- ~ 65 people, 3 departments
- Technical resources
  - Engineers - 4 Mechanical, 1 civil, 1 Electrical
  - Design/Draft - 1 Mechanical

Particle Physics Division

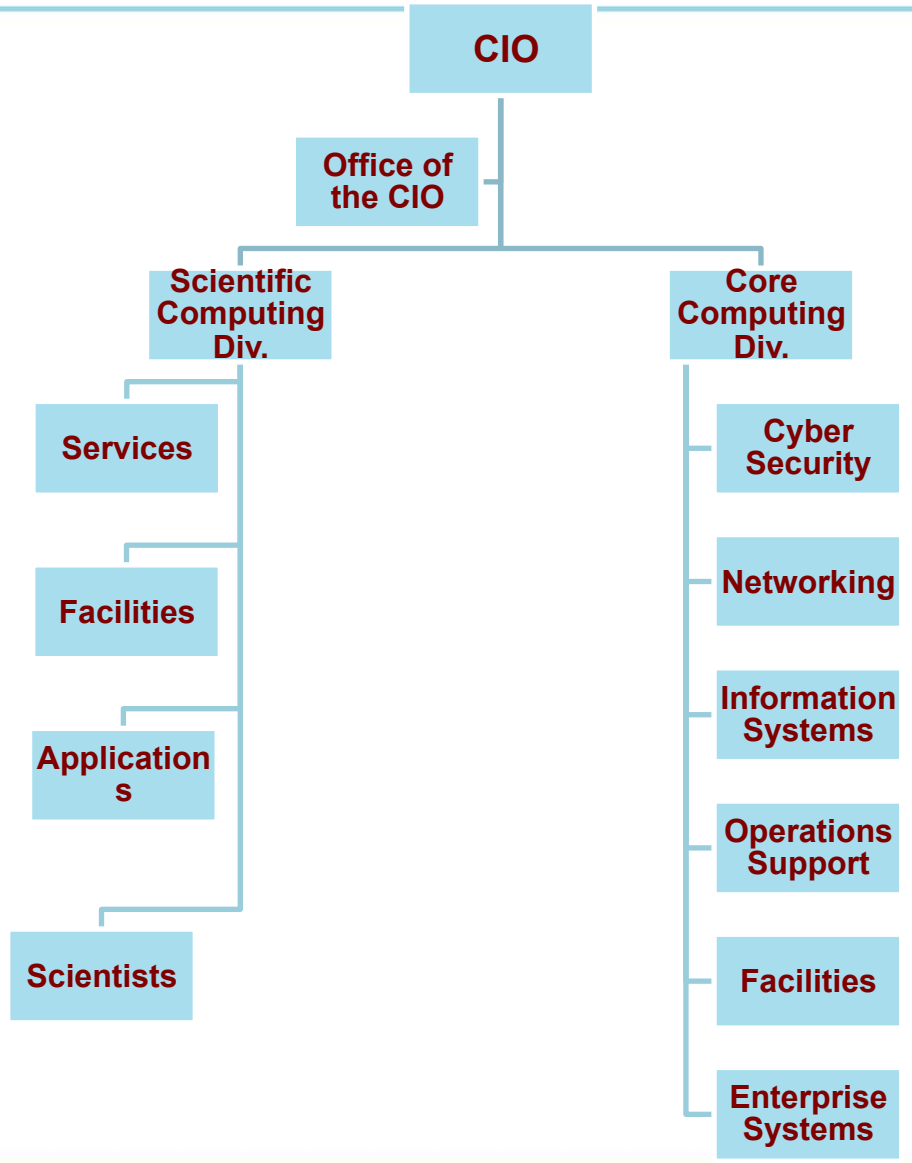


Particle Physics Division

- Major responsibilities
  - LHC ops, Cosmic ops, research
  - CMS phase I and phase II upgrades, Mu2e, Muon g-2,
  - Dark energy, dark matter and CMB projects
- ~ 315 people, 11 departments
- Technical resources
  - Engineers - 27 Mechanical, 23 Electrical
  - Design/Draft - 9 Mechanical, 1 Electrical,
  - Technicians - 51 Mechanical, 13 Electrical

CIO- Scientific and Core Computing

~300 people



CIO – Scientific and Core Computing Divisions

- Major Responsibilities
  - Computing services for the lab and users
  - databases, business apps, networking, security, etc.
  - Software and facilities for science, research
- ~310 people, 11 departments
- Technical resources
  - Engineers - 1 Mechanical, 9 Electrical
  - Technicians – 3 Electrical
  - Computing Professionals

FESS, Directorate, ESH&Q, Finance, WDRS

- Major support organizations to keep lab running
  - People largely not re-directable
- ESH&Q has large regulatory compliance task
- Finance not only pays bill and makes purchases, they also have a large audit/compliance task
- WDRS does HR, users, visa, diversity and education offices
- Facility, roads, and building maintenance, construction of new buildings, property, etc.
  - FESS – 23 civil engineers
  - Important resource for projects
- ~ 400 people in total

Resource Planning

- 1766 employee's organized in 6 divisions, 3 Sections, and Directorate
  - Coordination through Strategic planning, Senior management meetings, Budget planning, Retreats
  - Divisions participate in overall lab budget planning
  - Annual budgets set scope/direction of effort
- Division Leaders manage division personnel
  - FTE levels on activities set in annual budget planning
  - Department heads make/coordinate/manage individual assignments
  - Many individual experts in specialized areas
    - Heavily matrixed, heavy demand in operations and projects
  - Changes (from plan) of peoples effort in response to issues
    - One area with problems impacts others schedules

Resource Planning - Projects

- Projects inform Divisions of needs in annual budget process
  - All Fermilab FTE's in project schedule accounted for
  - Projects and Division resource providers agree on plan
    - Understanding base commitments, Scenario planning
  - Fractional efforts common - projects pay for work done, no standing armies in technical staff
- Common resource needs among projects
- Demand for more technical skills than are available
  - Eg. Cyrogenic engineering is latest example
- Resource allocations in response to requests are weighed by project priority
    - Most projects do not get everything they want, even when they have the funding available
- Multiple iterations frequently needed to finalize annual plan

In Closing

- Resource management is difficult
- Resource management recognized as a key component of successful delivery of projects
- Organizational changes made to support projects
  - Major change takes time and effort
  - Lab committed to making the change
- Peoples assignments guided by priorities
  - Conflicts will happen – more scope of work available than funds or people – matrix management required

Thanks for being here and taking the time to help. We welcome your questions, insights and recommendations