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Allocation of Technical Resources in Particle Physics and Neutrino Divisions

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Criteria for Allocation

- As described in Mike Lindgren's plenary presentation, decisions regarding the allocation of technical resources at the laboratory are driven primarily by the director's list of priorities, factoring in both the importance and time-criticality of the individual tasks
- Technical resources in PPD and ND are typically focused on efforts related to their areas of expertise (design, construction, and operation of experimental detectors), which are primarily managed within these divisions
- However, in times of need, mechanisms exist to divert these resources to high-priority efforts being managed within other laboratory divisions
- The sharing of technical resources between divisions is coordinated by the lab-wide Projects Technical Resource Coordinator (Karen Kephart) who resides within the office of the Chief Project Officer

Creation of Neutrino Division

- The ND was created as a separate entity in October of 2014 to provide coordinated support across the broad spectrum of neutrino experiments being pursued by the laboratory
- At the time of its creation, technical resources within PPD identified as being primarily focused on neutrino experiments were transferred into the new division
- However, many of the resources within the original division were identified as resources that would be required by both PPD and ND and therefore needed to be shared
- The sharing of resources between PPD and ND is currently handled through direct communications between the technical resource coordinators for the two divisions (Eric James: PPD and Rob Plunkett: ND) incorporating input from the lab-wide Projects Technical Resource Coordinator as necessary

Example of Resource Splitting (Cryogenic Engineering)

Liquid Argon
Detector
Engineering
Group (ND)

Fluids and
Thermal
Engineering
Group (PPD)

Low
Temperature
Cryogenics
Group (PPD)

LBNF, SBN, LArIAT,
and MicroBooNE

g-2 and CMS

Mu2e and CDMS

Note that we maintain the ability to share resources between groups as necessary. Recent examples are contributions from members of both PPD groups to the LArIAT and MicroBooNE commissioning efforts

Examples of Shared PPD/ND Resources

Operations
Support
Group (ND)

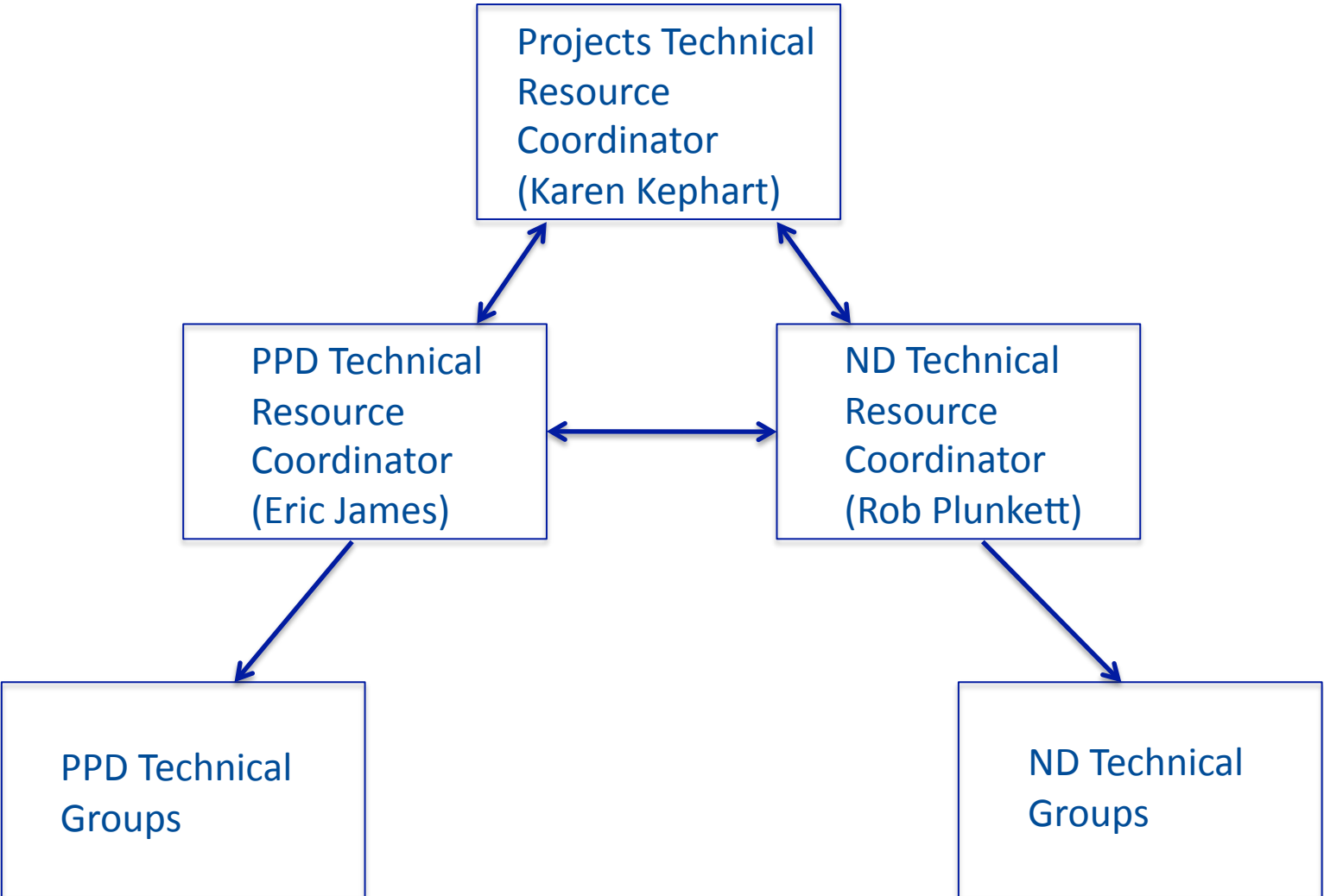
Process
Controls
Group (PPD)

Both groups perform functions that necessitate having multiple group members with complimentary skill sets (preventing group splitting) but at the same time provide critical contributions to efforts managed within both divisions

Efficient Usage of Resources

- We strive to avoid duplication of resources in PPD and ND where the level of required effort does not warrant maintaining two independent (but overlapping) sets of resources
- Good example is the current effort to develop a common cryogenics operations group for the two divisions
 - The g-2 and mu2e experiments will require 24/7 operations coverage for their cryogenics systems and the superconducting magnets fed by these systems
 - Working on a plan to cross-train the technicians who will run these operations shifts so that they can also monitor cryogenic systems associated with the liquid argon detectors operated by the neutrino division
 - By avoiding duplication of effort we free up additional resources for other tasks
- Currently, ES&H and building management resources are shared between the two divisions

PPD/ND Technical Resource Allocation Flow Chart



Allocating PPD/ND Resources

- PPD and ND juggle providing technical resources for projects (experiment design and construction), operating experiments, and detector R&D
- Projects request specific technical resources from each division, and we attempt to satisfy these to the greatest extent possible
- Typically, the actual amount of technical resources utilized by projects in a given year turns out to be greater than what was originally requested (often driven from the utilization of project contingency funds)
- Allocations of technical resources to operating experiments and detector R&D efforts are typically constrained by the funding available for those efforts
- In the majority of cases, we find that our technical resources are fully loaded from these different sources and there is no need to “shop” for additional work

Lab-wide Technical Support

- PPD and ND support a number of unique technical resources that are utilized across the laboratory
- Some examples ...
 - Alignment and Metrology Group
 - ASIC Development Group
 - Engineering Analysis Group
 - Rapid Prototyping & Special Materials Group
- In addition, PPD/ND provide significant technical resources on an ongoing basis to assist with work being performed on the accelerators during shutdown periods
- ND has taken on management of the remote operations centers on the first floor of Wilson Hall

Technical Facilities

- PPD maintains a number of world-class technical facilities that play important roles in both construction projects and detector R&D efforts here at the laboratory
- These facilities also serve as technical resources for the entire HEP community and contribute to numerous efforts not directly connected to the laboratory
- Some examples ...
 - Fermilab Test Beam Facility
 - Silicon Detector Facility
 - Scintillator Detector Development Facility
 - Thin-Film Facility
- Customers using the technical Resources associated with these facilities typically pay for the cost of these services, although the lab does have funding to cover some of the required facility maintenance activities

Summary

- Technical resources with PPD/ND are typically focused on efforts related to the design, construction, and operation of experimental detectors
- Mechanisms exist to divert these resources into other high priority projects at the laboratory in times of need
- The recent creation of the ND has led to the ongoing process of understanding how to most efficiently divide/share technical resources between the two divisions
- Currently, this process is being handled through direct communications between the division technical resource coordinators with input from the Project Managers Office