



WBS 121.5 – Conventional Facilities

Management

Steve Dixon

PIP-II DOE Independent Project Review

12-14 December 2017

In partnership with:

India/DAE

Italy/INFN

UK/STFC

France/CEA/Irfu, CNRS/IN2P3

Charge Questions

Charge Question	Presentation
1. Has the project team documented a carefully considered analysis of alternates that supports the preferred alternate?	Plenary and Design and Scope Breakout
2. Does the conceptual design satisfy the performance requirements?	Design and Scope Breakout
3. Does the conceptual design report and supporting documentaton adequately justify the stated cost range and project duration?	Cost and Schedule Breakout
4. Does the project team have adequate management experience, design skills, and laboratory support to manage all aspects of this project and produce a credible technical, cost, and schedule baseline?	Management Breakout
5. Are the ES&H aspects of the project being properly addressed and is the ES&H planning currently sufficient for this stage of the project?	Plenary
6. Is the documentation required by DOE O413.b for CD-1 approval complete and in good order?	CD-1 Documentation Breakout
7. Is the allocation of the technical scope that will be contributed by international partners sufficiently understood and documented such that the conceptual design and cost range can be relied on?	Plenary
8. Has the project satisfactorily responded to the recommendations from previous reviews?	Plenary

Conventional Facilities Management Structure

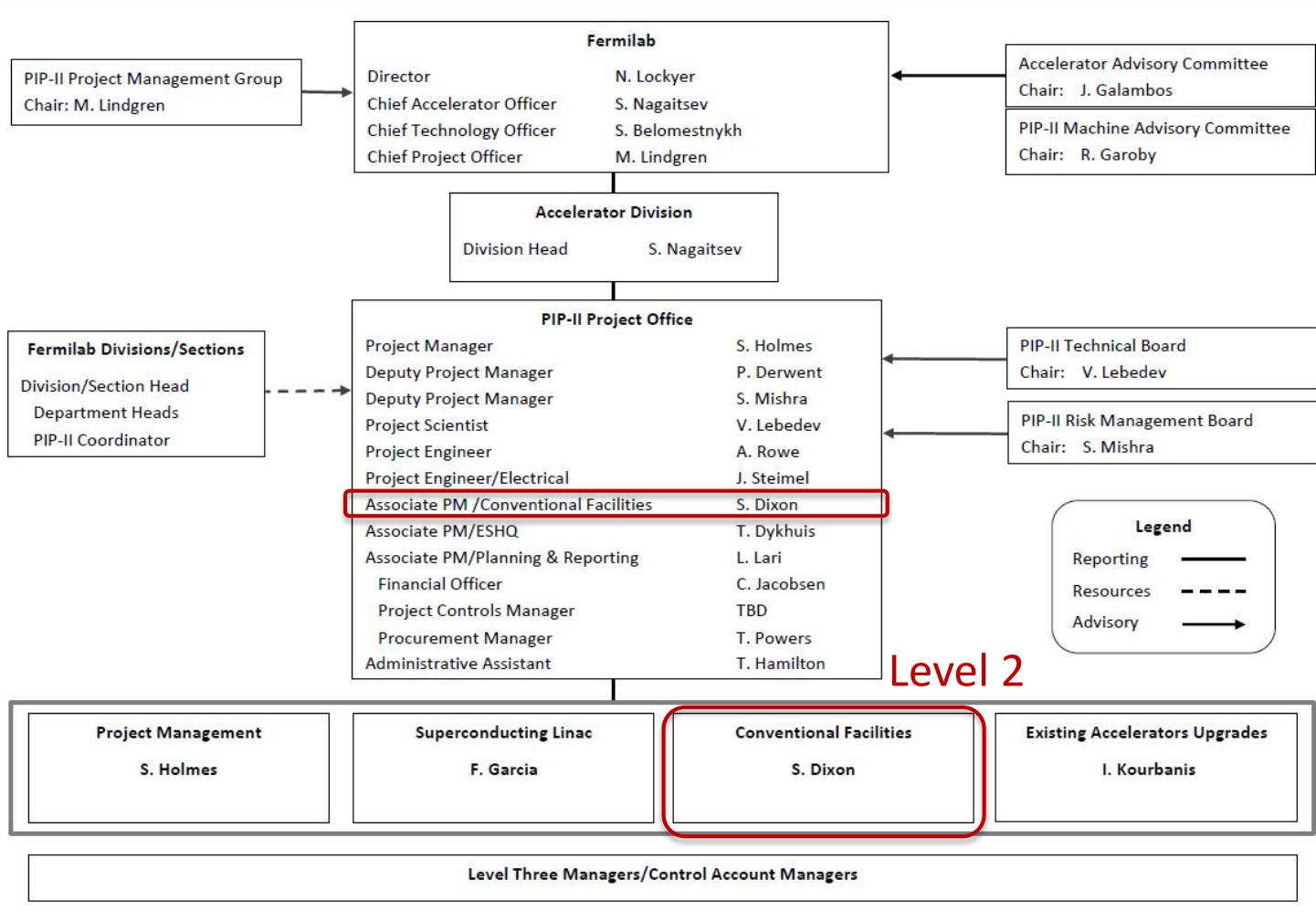
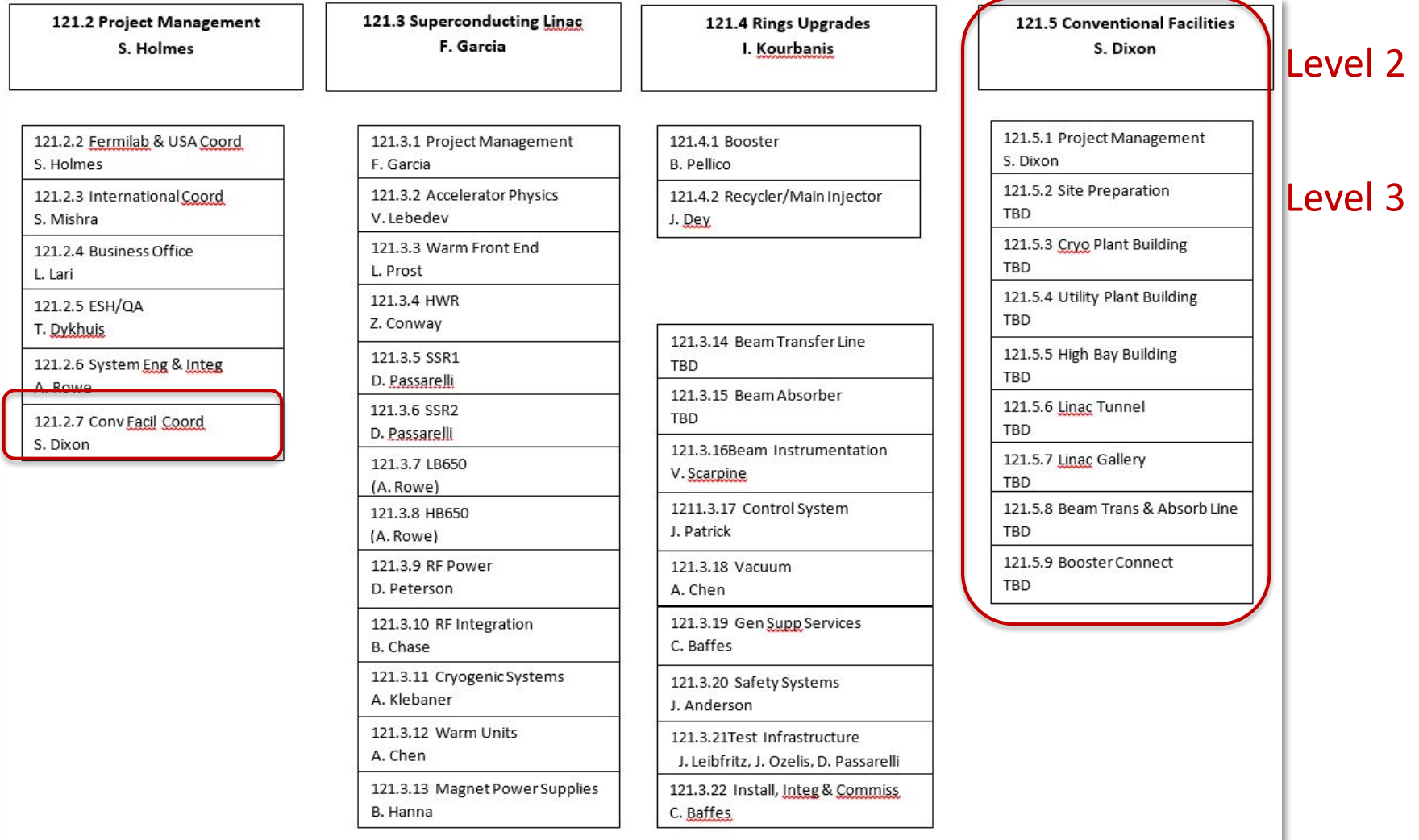


Chart from **PIP-II-doc-118**, *PIP-II Management Roles, Responsibilities, Authorities, and Accountabilities*

Conventional Facilities Management Structure



Conventional Facilities Management Structure

2.3.4.6 PIP-II Associate Project Manager for Conventional Facilities

The PIP-II Associate Project Manager for Conventional Facilities will assume the following specific authorities and responsibilities for organization and management of all conventional facilities construction activities on PIP-II. Specific responsibilities include:

- The PIP-II Conventional Facilities will be managed, planned, designed and constructed by an integrated team of design and construction professionals consisting of consultants and in-house experts, including members of FESS, to achieve the project goals. The PIP-II Associate Project Manager for Conventional Facilities will manage this integrated team.
- Ensure that PIP-II conventional facilities are designed, developed and installed in conformance with the Fermilab Engineering Manual and other applicable standards including: Fermilab ES&H Manual; Fermilab Radiological Control Manual; OSHA; and DOE Orders
- Develop design criteria for all conventional facilities in collaboration with the Project Engineers;
- Develop the PIP-II construction package and procurement strategy;
- Develop PIP-II conventional facilities construction cost estimates and schedules;
- Select and manage Architectural/Engineering firm(s) engaged in the development of conventional facilities construction drawings and specifications, as well as construction phase support;
- Provide coordination with Facilities Engineering Services Section, FI/Procurement and other Fermilab divisions/sections as required during the design, procurement and construction of the PIP-II conventional facilities;
- Review and approve all PIP-II conventional facilities construction drawings, specifications, estimates, and schedules;
- Review, approve, and monitor cost and schedule progress on all PIP-II conventional facilities design and construction sub-contracts.

From **PIP-II-doc-172**, *Project Management Plan for PIP-II Project*

Conventional Facilities Management Structure

2.3.4.14 PIP-II Project Level 2 (L2) Managers

The Project Manager appoints the WBS Level 2 managers. The Project Manager, in consultation with the relevant WBS Level 2 managers, appoints the WBS Level 3 managers. The L2 managers also appoint Control Account Managers for each Control Account in their L2 subsystem, with the concurrence of the Project Manager. The L2 Managers manage and direct their subprojects and report to the Project Manager. They are directly responsible for generating and maintaining the cost-estimate, schedule, and resource requirements for their subprojects. They are responsible for meeting the goals of their subproject within the accepted baseline cost and schedule and are responsible for completing their subprojects safely and with respect for the environment. Fig 2.3 shows the PIP-II Project Level 2 projects.

2.3.4.15 PIP-II Project L3 Managers/Control Account Managers

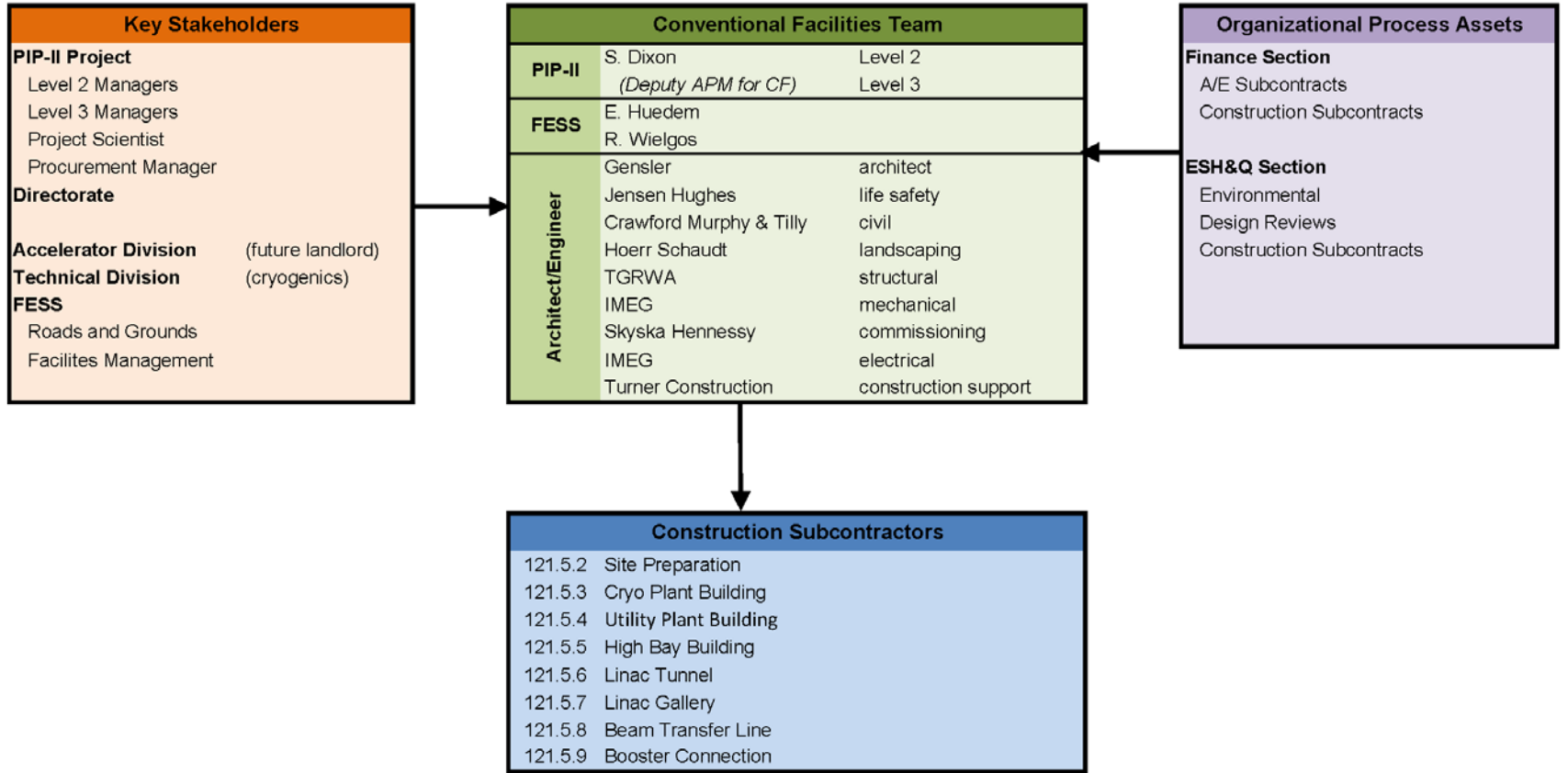
Each PIP-II major sub-project at level three of the WBS will be managed by a Level Three Manager (L3M). The primary responsibility of the L3M is to organize and execute the development and construction activities at the major subsystem level. WBS Level 3 managers may select, in consultation with the WBS Level 2 managers, WBS Level 4 managers and delegate some responsibility to them. Control Account Managers are members of the project team who are responsible for planning and control within their control account(s) and the identification, analysis, and reporting of significant variances that may occur during project execution. Control Accounts will generally be created through the amalgamation of a small number (1-4) of closely related level three accounts. It is anticipated that the CAMs will be a subset of the L3Ms. Specific responsibilities include:

- Level Three Manager: Organizes and executes work at level three of the PIP-II Work Breakdown Structure. This includes planning, budgeting, scheduling, developing resource estimates, tracking and reporting progress against technical, cost, and schedule goals.
- Control Account Manager: Manages the work within the proscribed Earned Value Management System (EVMS) framework.

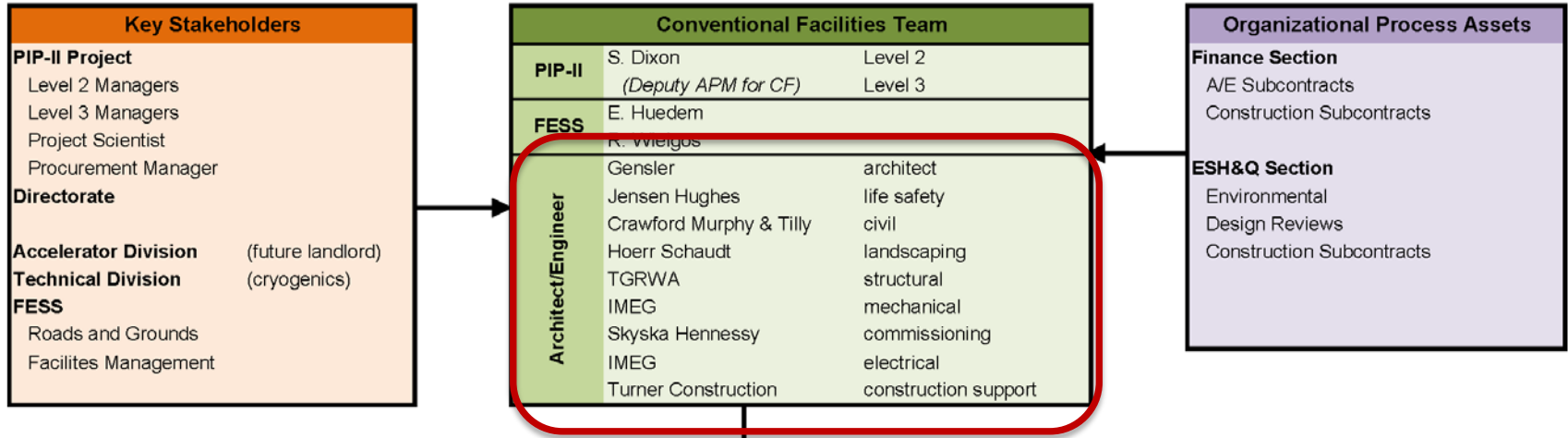
In addition, a subset of these positions will carry responsibilities as the Sub-Project Manager within the International Collaboration with responsibilities for coordinating work with his/her International counterpart.

From **PIP-II-doc-172**, *Project Management Plan for PIP-II Project*

Conventional Facilities Team



Conventional Facilities Team

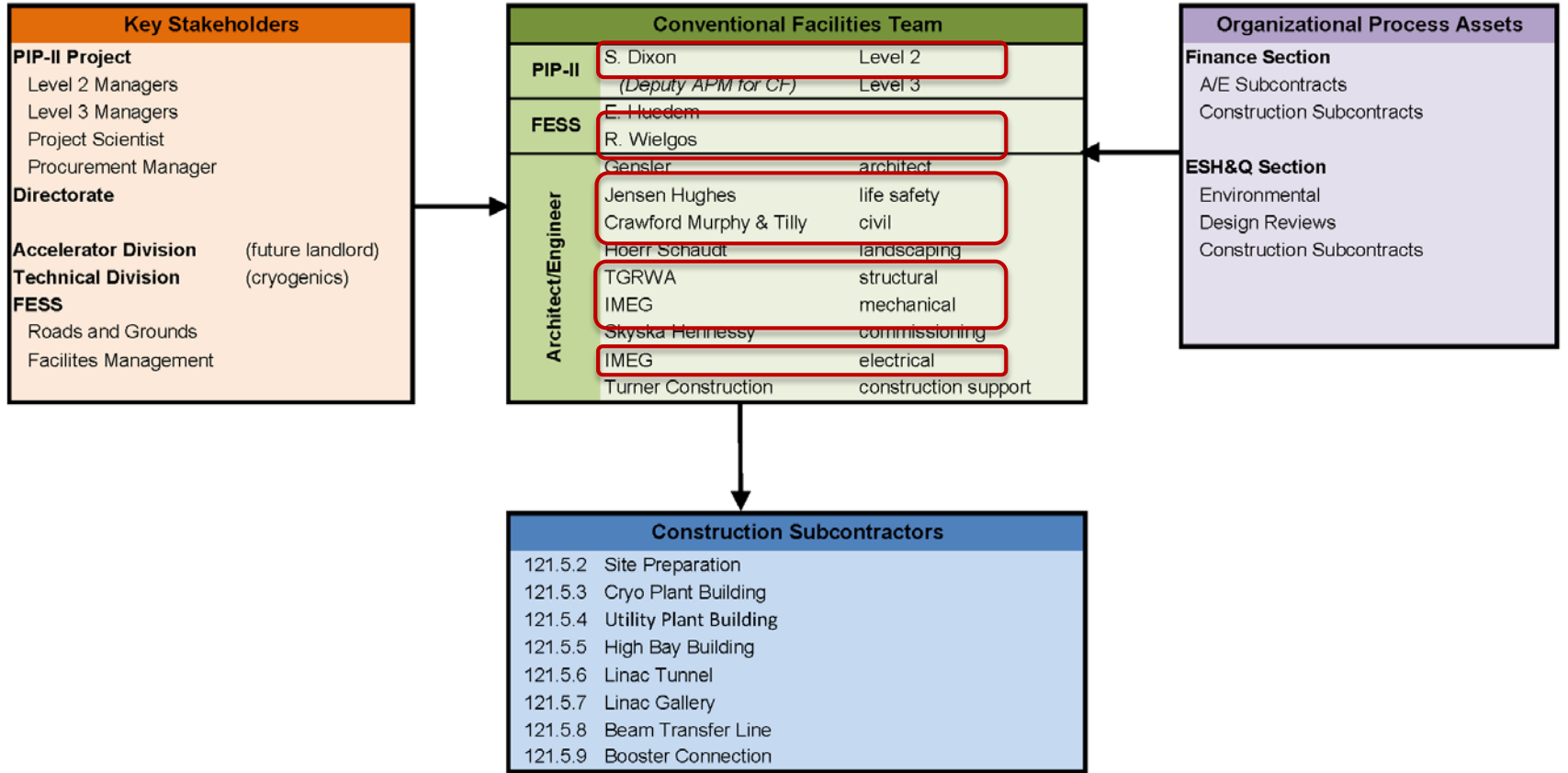


- A/E team selected in February 2017;
- Utilized standard Finance/Procurement procedures;
- Selection Panel included PIP-II, Procurement, FESS/Engineering and ESH&Q representatives;
- Selected for Preliminary Design, Final Design and Construction Phase support;

Construction Subcontractors

121.5.1	Beam Transfer Line
121.5.2	Booster Connection
121.5.3	Cryo Plant Building
121.5.4	Utility Plant Building
121.5.5	Target Building
121.5.6	Linac Tunnel
121.5.7	Target Building
121.5.8	Beam Transfer Line
121.5.9	Booster Connection

Conventional Facilities Team



- Previous experience at Fermilab shown in red
- Consultants with previous experience make up ~85% of project scope

Approach

- Broken the work into reasonable work packages;
 - Assumes funding will be available over a number of FYs;
 - Construction packages can be combined if funding changes;
 - Logical construction sequence;

Construction Subcontractors	
121.5.2	Site Preparation
121.5.3	Cryo Plant Building
121.5.4	Utility Plant Building
121.5.5	High Bay Building
121.5.6	Linac Tunnel
121.5.7	Linac Gallery
121.5.8	Beam Transfer Line
121.5.9	Booster Connection

Approach

- “Design-bid-build” for construction packages;
 - Standard Fermilab procurement methods and requirements;
- *“Conventional Facilities construction will primarily be accomplished through a number of competitively solicited, fixed price construction packages in order to achieve best value procurements.” [1]*

[1] – from Section 6 of PIP-II Assumptions Document in PIP-II-doc-144

Summary

- Experienced team with knowledge of Fermilab processes and procedures;
- Work packages are assembled in a logical manner to provide a reasonable construction sequence with flexibility built in;
- Design and Construction approach is based on standard Fermilab procedures;
- Management team is ready for CD-1 approval.

Questions