



University Perspective

BPPAC Meeting at Fermilab

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CMS Trigger Project Manager

April 30, 2003

Topics:

Organization

University Role

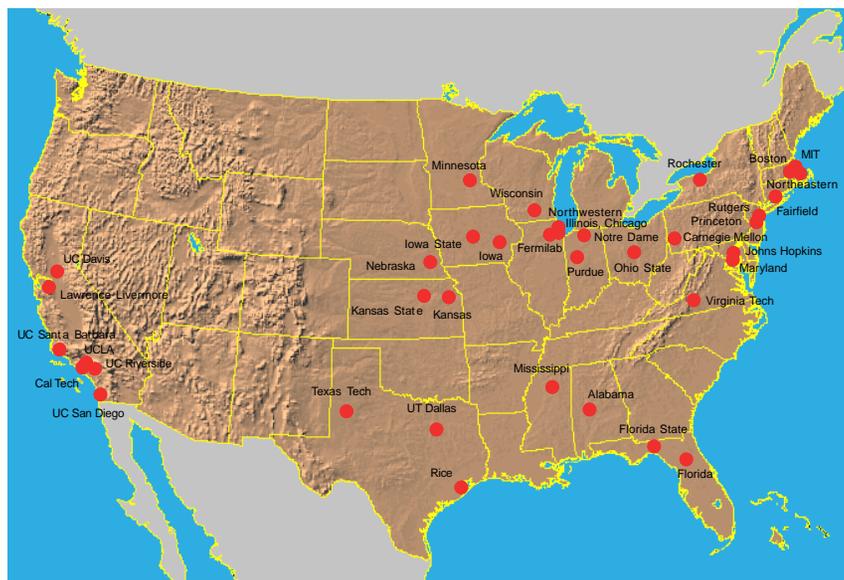
Management

This talk is available on:

http://hep.wisc.edu/wsmith/cms/plasma_wsmith_0403.pdf



The U.S. CMS Collaboration



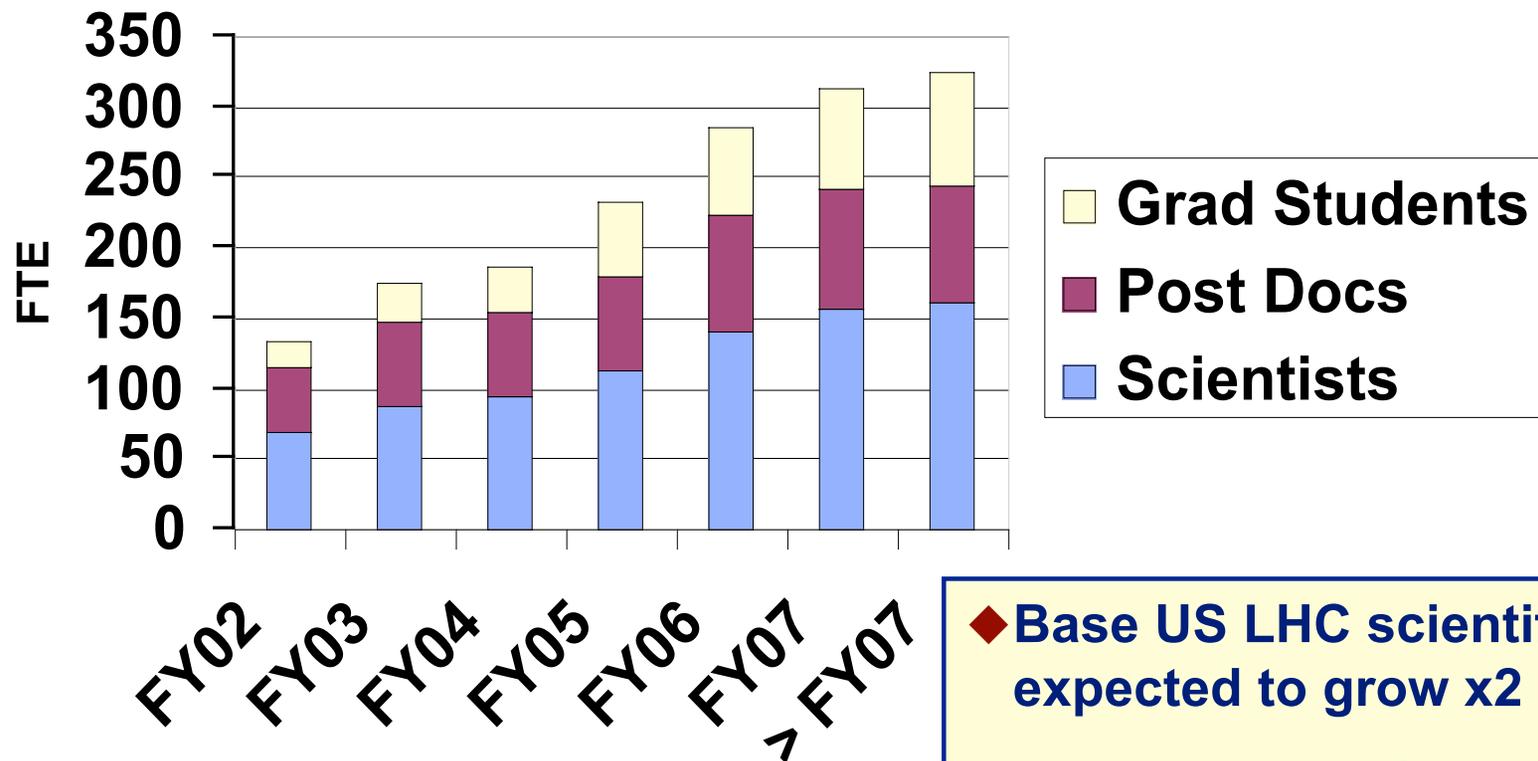
November 10, 2000

Subsystem	Institutions
Endcap Muon	UC-Davis, UC-Los Angeles, UC -Riverside, Carnegie Mellon, FNAL, Florida, Northeastern, Ohio State, Purdue, Rice, Wisconsin
Hadron Calorimeter	Boston, Fairfield, FNAL, Florida State, Illinois - Chicago, Iowa, Iowa State, Maryland, Minnesota, Mississippi, Nebraska, Northeastern, Notre Dame, Purdue, Rochester
Trigger	UC-Los Angeles, Florida, Rice, Wisconsin
Data Acquisition	UC-San Diego, FNAL, MIT
EM Calorimeter	Caltech, Minnesota, Northeastern, Princeton
Forward Pixels	UC-Davis, FNAL, Johns Hopkins, Mississippi, Northwestern, Purdue, Rutgers
Silicon Tracker	UC-Santa Barbara, FNAL, Kansas, Kansas State, Northwestern, Rochester, Illinois -Chicago



University Program is growing

Scientific Effort on US CMS



- ◆ Base US LHC scientific effort expected to grow x2
- ◆ Base Program Support is Critical (Travel, COLA)



International Collaboration

US Management & CMS Management

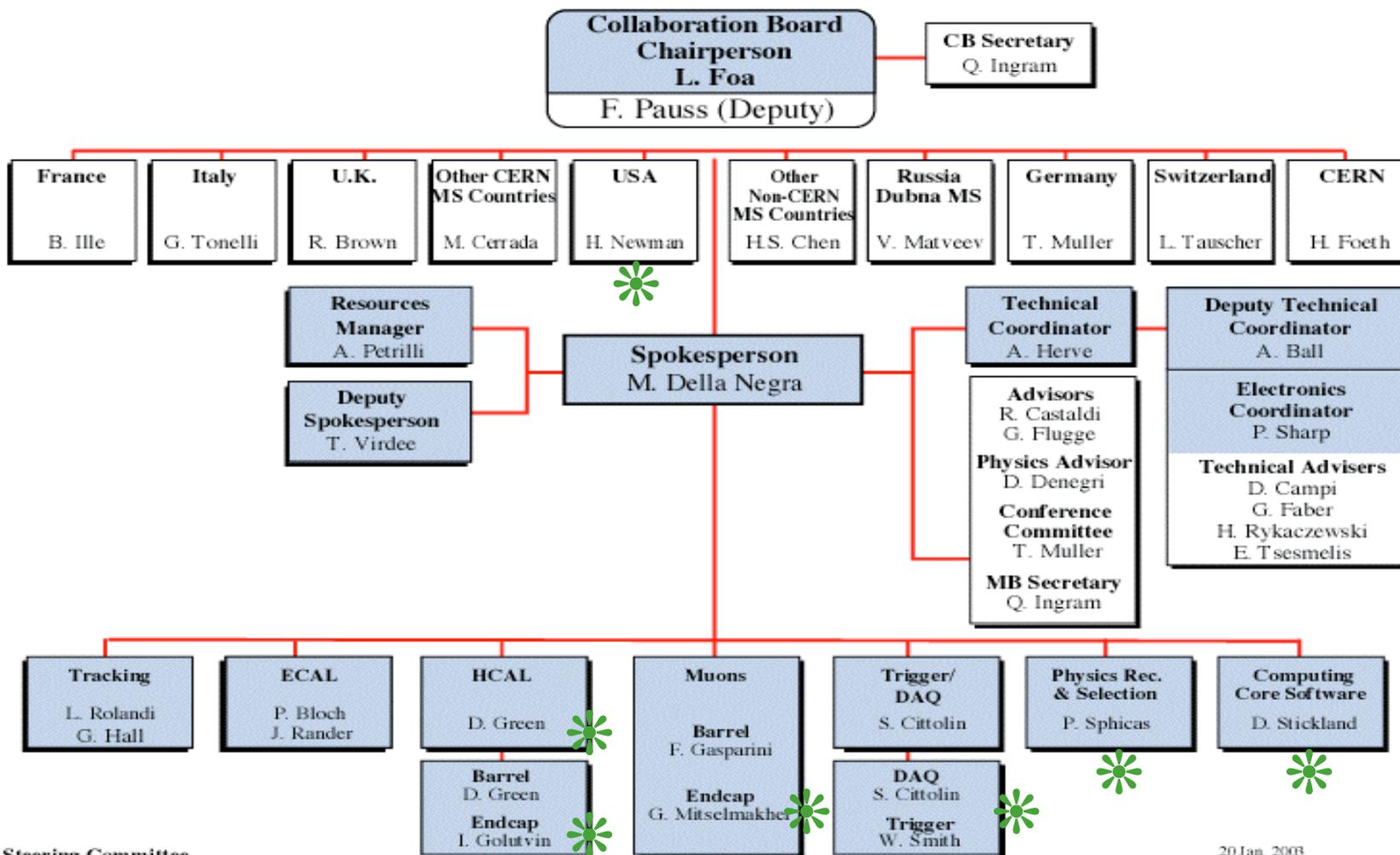
- CMS Project Managers are members of “Steering Committee” that is chaired by and advises Spokesperson, Michel Della Negra.
- US-CMS Level-2 Managers report to CMS Level-1 Project Manager, Dan Green, who is also the Hadronic Calorimeter Project Manager & sits on the Steering Committee.
- Two US-CMS Level-2 Managers (who are University Faculty) are also CMS Project Managers & sit on the Steering Committee.
- Other US-CMS Level-2 Managers (both University Faculty & Lab Scientists) report to their respective CMS Project Managers.

How does this work?

- It works well because the US-CMS Level-1 Project Manager synchronizes US-CMS and CMS activities through the Steering Committee decision-making process with the Spokesperson.
- It would not work if the US PM were to act unilaterally



CMS Management Board and Steering Committee



Steering Committee

20 Jan. 2003

US is Well-Represented, with Appropriate Level of Leadership



International Risks

Schedule integration amongst international partners

- Impact of actions in international project outside control of US project

Changing specifications

- Need to make decisions early to keep R&D and redesign costs down, limit schedule slip
- Not generally as high a priority as in the US

Culture of Personnel Costing

- European Institutes generally do not cost labor and generally do not know the cost well nor as carefully consider labor cost implications of decisions

Culture of Contingency

- European planning generally does not include contingency and regards the US contingency as a bank to finance their shortfalls



Choice of Tasks

Vertical Integration: unified subprojects

- Reduces international interfaces
- Allows management of tasks within the US, reducing need to integrate international partners

Choose exciting/challenging projects

- Continued development of field in US
- Attract top postdocs, students, engineers

Choose projects doable at a University

- Electronics, sensors, instrumentation
- Leverage Faculty & University program resources

Plan Maintenance & Operations, Upgrades

- Projects should have a future that allows continued development of talent, training of students & postdocs



University Mechanical Projects: U. Wisconsin Endcap Disks





University Electronics Projects: Wisconsin Calorimeter Trigger



18 Crate 160 MHz system processing 4×10^{12} bits/sec

- **Pattern logic identifies electron, jet, tau, muon candidates**



Project Office

Host lab provision of Project Office is essential

- Assistance with project tracking, management tools
- Unified interface to funding agencies
- Structure for Reviews
- Feedback on performance -- asking questions
- Single point of contact for tracking down expenditures

Host Lab should not be owner but a collaborator

- Project should be organized as a consortium of Universities & Labs with a base of operations at a Lab
- Parts of the project should be clearly associated with and credited to individual Universities & Labs.



University Management

Statements of Work

- Single Yearly document that lays out funding is useful

Salaries in Grant Supplements

- Planning for people is long term
- University administrations view as awarded grants
- Much easier for handling salaries than MPO

Materials & Supplies in Memorandum Purchase Orders

- Allows more direct control by Project Office
- Single MPO with sections better than multiple MPOs.
- Reporting of % complete vs. billing can cause problems

Overhead

- Both Lab pass-through & University charges need to be carefully worked out in advance.



University Management

How does a University Faculty Member act as a US-CMS Level-2 Manager when the funding & contracts flow through a National Lab?

- Level-2 University Faculty Manager makes decisions
- Implements them in a Microsoft Project File
- Submits this to the Fermilab Project Office
- Fermilab PO derives Statements of Work from the Project File and sends them to the Level-2 University Faculty Manager for approval.
- These statements of work are used to generate letters to DOE for University Grant Supplements



Computing

Opportunity for major University Role if there are large computing needs:

- Calculations
- Modeling

Collaborate at Universities with Computer Science Colleagues

- NSF & DOE have funding for such collaborations
- Examples: Wisconsin HEP-Condor Collaboration and Larger LHC-Grid HEP-Computer Science Collaborations

Develop Computational & Collaborative tools to enable competitive US analysis of results



Other Observations

Embrace Contingency!

- You will need it. Be generous (better to ask now), particularly if the cost is capped.
- Develop a uniform scheme but apply it at the lowest WBS level. Its determination will help in the project planning.

Erosion of University Base Resources

- University base program engineering & technical personnel supportable by the project end up supported by the project and not by the base program.
- Loss of University independence, creativity, flexibility.