

sPHENIX Director's Review Project Support Activities

August 2-4, 2017

BNL

The Three Parts of sPHENIX

MIE Cost range is \$29-35M

Upgrade Support is ~\$20M

Infrastructure/Facility Upgrade ~\$20M

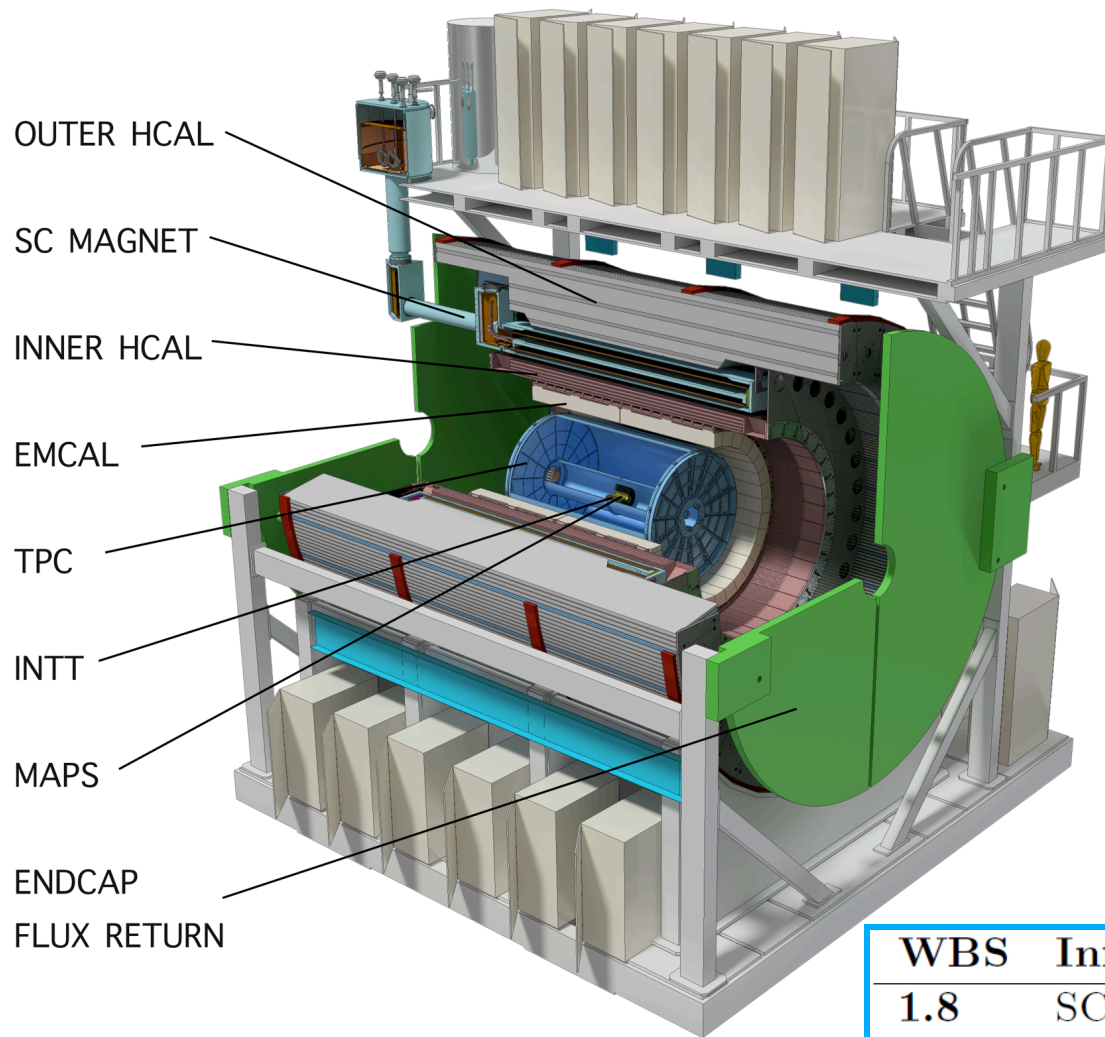
DOE funded & Managed

BNL Funded & Managed

BNL Funded & Managed

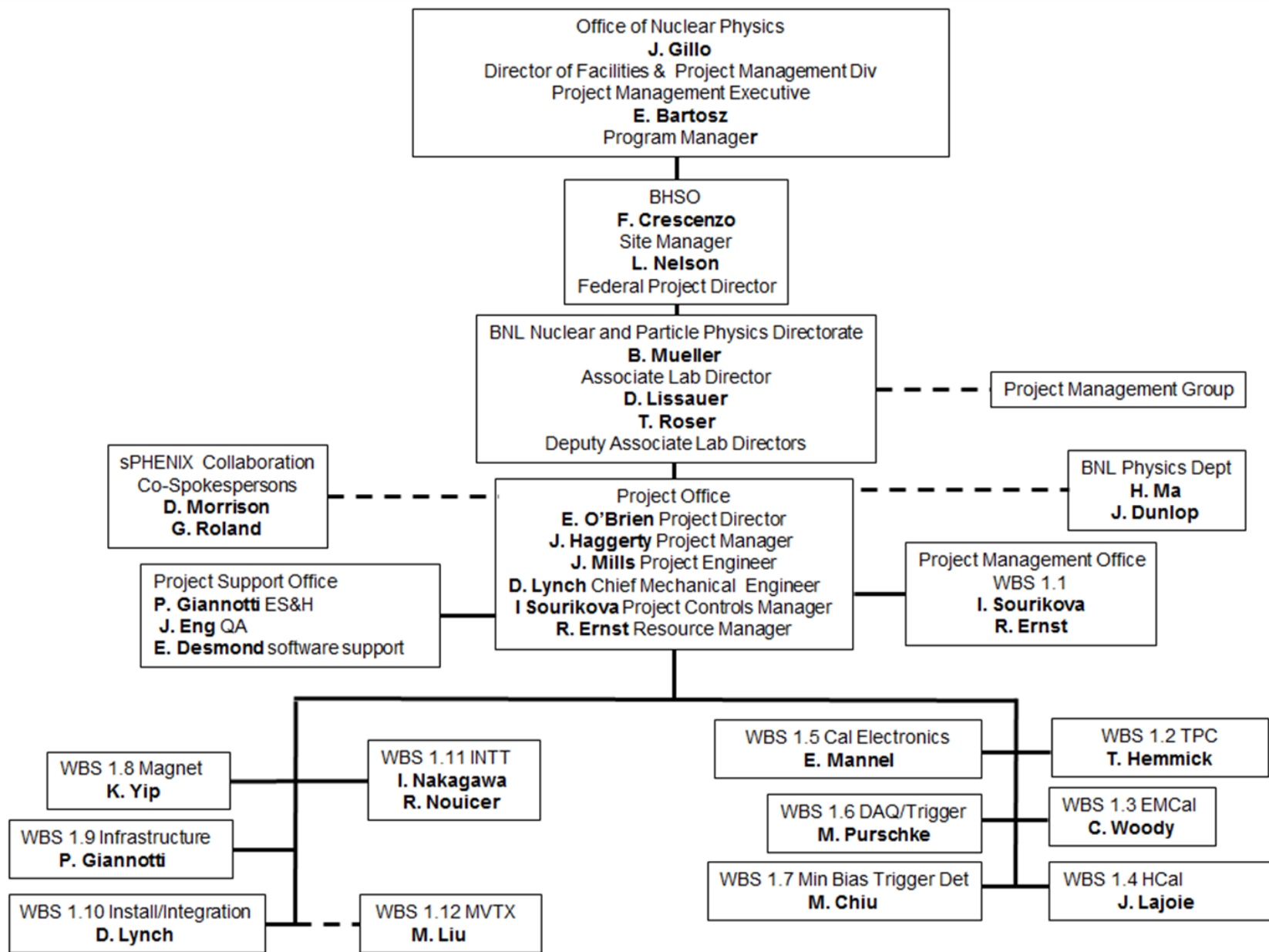
- A. sPHENIX MIE Upgrade** covering the detector (Project Management, TPC, EMCal, HCal, Calorimeter Electronics, DAQ/Trigger). Dominated by M&S costs. The MIE carries labor for Project Management and ~\$1M in paid University labor for building things.
- B. Upgrade Support** is 100% BNL labor that supports the sPHENIX MIE upgrade. Primarily the Phys Dept PHENIX/sPHENIX technical support group augmented by CAD, Magnet Div and Instrumentation Div.
- C. Infrastructure and Facility Upgrade** of the 1008 complex . Combination of M&S and Labor. Purpose is the upgrade of 1008 to modern standards. Enables cryo operations in 1008 and provides a facility optimized for the operation of a modern detector.

Infrastructure and Facility Upgrade



WBS	Infrastructure & Facility Upgrade
1.8	SC-Magnet
1.9	Infrastructure
1.10	Installation-Integration

Project Organization

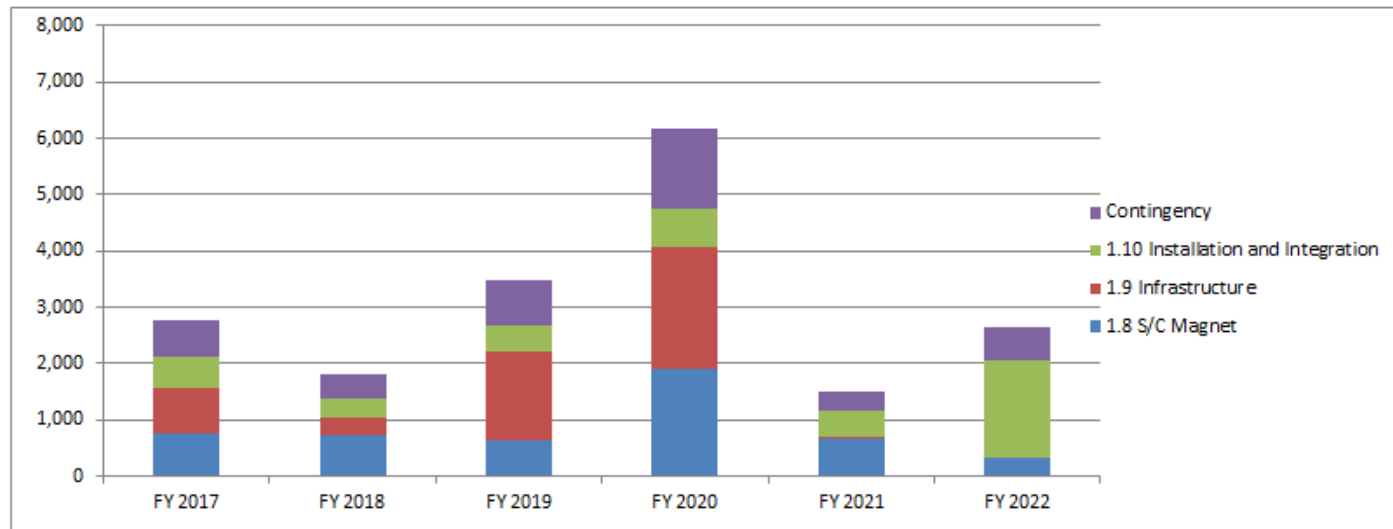


Scope of Work

- SC-Magnet
 - Providing cryogenics for SC operations from RHIC into 1008 IR
 - Transportation of magnet from 912 to 1008 and assembly in 1008
 - Power supplies and controls including quench protection
 - Field measurements
- Infrastructure
 - Carriage, racks and platforms, access, pole tips, off-detector structure and alignment features
 - Mods to existing systems, gas, cooling, safety including ODH, water systems, HVAC, AC power
 - Modest modifications to infrastructure of control room, rack room, gas pad.
- Installation and Integration
 - Infrastructure Installation
 - Detector subsystem installation

Facility and Infrastructure Upgrade

Baseline Scenario - Facility Upgrades (Labor and Non-labor)
AY k\$'s - with Extraordinary Construction Overhead Application



Baseline Scenario
AY k\$'s - with Extraordinary Construction Overhead Application

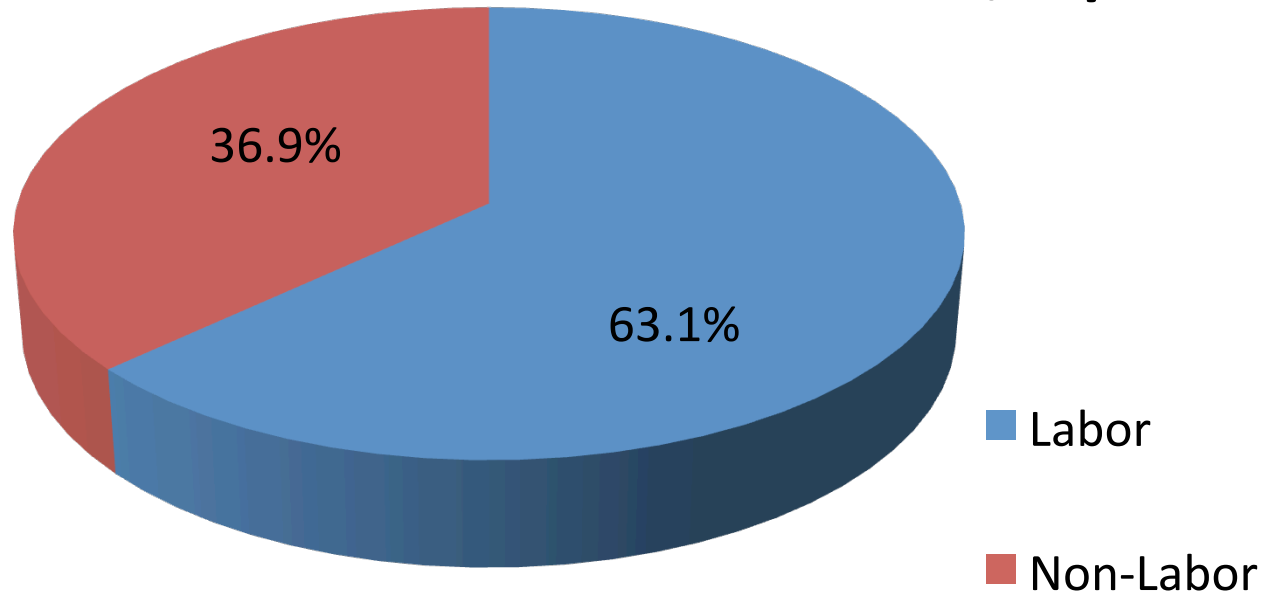
WBS	SYSTEM	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	Total
1.8 S/C Magnet		771	727	623	1,890	660	340	5,011
1.9 Infrastructure		781	301	1,586	2,178	50	0	4,896
1.10 Installation and Integration		572	360	468	685	451	1,704	4,240
Baseline Total		2,124	1,388	2,677	4,753	1,161	2,044	14,147
Contingency		637	416	803	1,426	348	613	4,244
MIE Total		2,761	1,804	3,480	6,179	1,509	2,657	18,391

WBS	SYSTEM	Baseline	Contingency	Total
1.8 Magnet		5,011	1,503	6,514
1.9 Infrastructure		4,896	1,469	6,365
1.10 Installation and Integration		4,240	1,272	5,512
Facility Upgrade Totals		14,147	4,244	18,391

Basis of Funding

Infrastructure & Facility Upgrade

18.4 AY k\$ w/Contingency

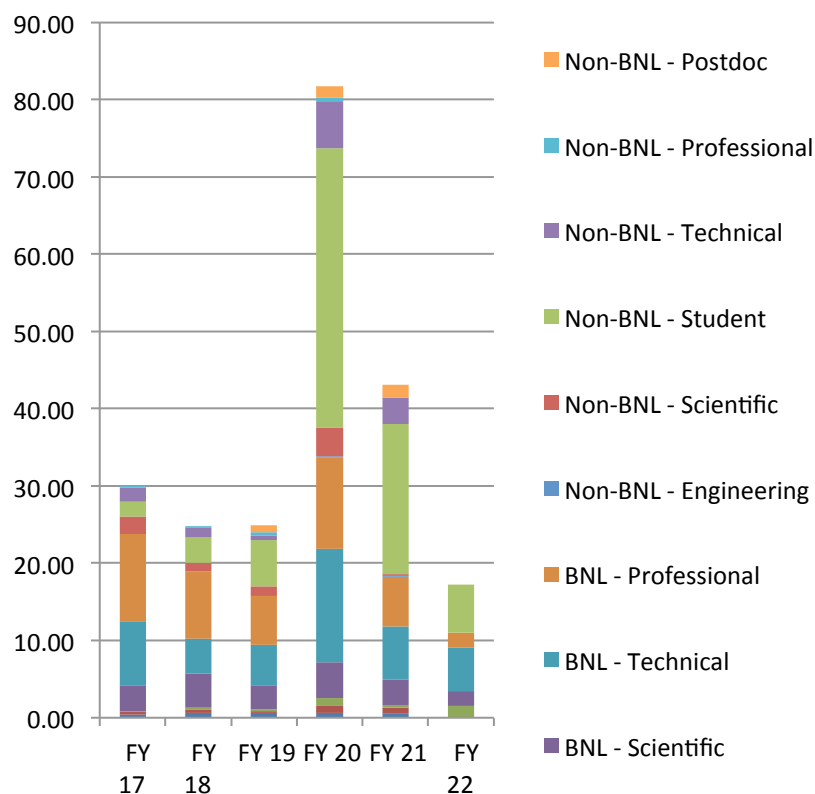


WBS	SYSTEM	Baseline	Contingency	Total
1.8	Magnet	5,011	1503	6,514
1.9	Infrastructure	4,896	1469	6,365
1.10	Installation and Integration	4,240	1272	5,512
Facility Upgrade Totals		14,147	4244	18,391

Labor Support Staffing: BNL and Contributed

WBS 1.1 – 1.11

FTE Profile by Category



FTE Profile by Fiscal Year

WBS Level	Group	FY 17	FY 18	FY 19	FY 20	FY 21	FY 22
BNL	Purchased Services	0.05	0.22	0.26	1.04	0.37	1.47
	Scientific	3.29	4.39	3.03	4.64	3.21	1.94
	Technical	8.35	4.59	5.28	14.71	6.93	5.58
	Professional	11.64	9.12	6.62	12.75	7.20	1.94
	Administrative	0.40	0.59	0.59	0.59	0.57	0.09
BNL Sum		23.73	18.90	15.78	33.73	18.29	11.02
Non-BNL	Scientific	2.31	1.13	1.21	3.68	0.20	0.00
	Student	1.96	3.29	6.05	36.16	19.43	6.27
	Technical	1.80	1.28	0.56	6.01	3.42	0.00
	Professional	0.15	0.23	0.46	0.71	0.10	0.00
	Postdoc	0.00	0.00	0.82	1.46	1.61	0.00
Non-BNL Sum		6.23	5.94	9.10	48.01	24.75	6.27
Grand Total		29.95	24.84	24.88	81.75	43.04	17.29

BNL Labor for MIE Upgrade and Facility/
Infrastructure Upgrade support

Features of the Infrastructure & Facility Upgrade

- Managed by the sPHENIX Management team
- All work expected to be performed by BNL with the exception of the cryo tie-in which likely will be an outside vendor
- SC-Magnet work is 95% CAD and Magnet Division
- Infrastructure work is 50/50 Physics/CAD
- Installation and Integration 90% Physics with the remainder CAD
- Will establish Memoranda of Agreements between Physics Dept, CAD, and SMD governing the responsibilities and assignment of resources.
- Planning and Design has been going on for the last 3 year. Much of the work will be extensions of practices followed during the 16 years of PHENIX Ops)
- Work will be performed within well-established protocols for:
 - **Safety (CAD and BNL safety reviews)**
 - **Work Planning (Many years of experience with Work Control Coordination)**
 - **Configuration control and Written procedures (Long established policies)**
- This work **does not** have to wait for CD-1 to begin. It is not governed by 413.3b

Summary

- Detailed plans exists for the Infrastructure and Facilities upgrade 1.8-1.10
- This work will be managed by BNL and is not subject to 413.3b rules
- Some engineering design work has started, like magnet cryo design and Integration/Installation design. Most work for the next year is design.
- We have identified most of the people to do the engineering and design work but resource availability will be challenging due to a number of competing project.

Back Up