

Resource Allocation and Business Operations

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Triennial Operations Peer Review

June 20th 2017



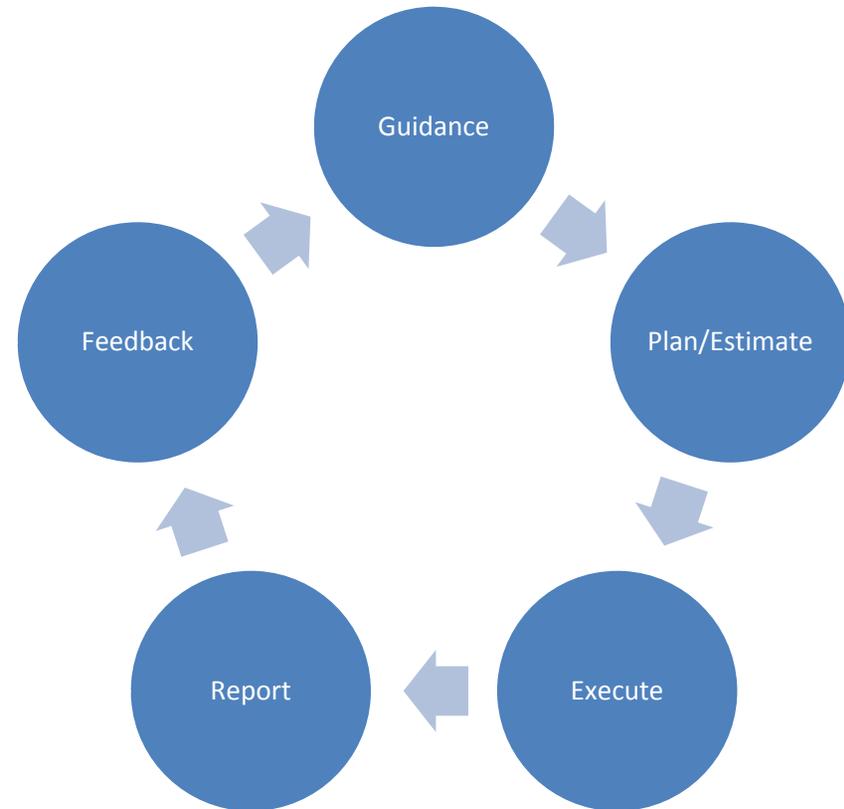
Outline

- Resource allocation
 - Setting priorities
 - Budget allocation
 - Tracking costs
 - Mid-year adjustments
- Overhead Rates
 - Laboratory overhead structure
 - Organizational burden
- Summary

Managing the Resources and Work- Overview

- Guidance is based on strategic objectives and includes input from many sources
- We estimate and execute based on that guidance
- We report progress regularly
 - Executive Mgmt Group (EMG)
 - Proj. Mgmt Oversight Group (PMOG)
 - Light Source Safety & Operations Council (LSSOC)
 - Business Council
 - Lab meetings
 - DOE calls/meetings
- Feedback informs us if our plans need to adjust and we continue the process

Continuous Process



Priority setting

- Priorities set by Facility Director with Executive Management Group (EMG) based on BNL Annual Lab Plan, NSLS-II mission statement and Strategic Plan, and incorporating input from stakeholders including DOE-BES, Scientific Advisory Committee (SAC), User's Executive Committee (UEC) and partners.
- Priorities reflect the need to deliver high quality user program and impactful user science and the short term and long term goals required to support this.

Budget Allocation

- Facility Director develops top-down budget allocations
- Managers develop bottom-up estimates based on detailed WBS for operations work and comparison is made to proposed allocations
- Assessment is made of what can be accomplished with the allocations in terms of present FY goals and long term goals for the user program. Reallocations are made if necessary.
- Allocations finalized and BA is distributed
- Develop and prioritize the list of items original budget couldn't support

	FY17
New Funds	111.8
Unobligated carryover from previous FY	19.2
Obligated carryover from previous FY	10.5
Total	141.5
Accelerator Operations	33.4
Experimental Operations	38.5
BL Development	19.7
Facilities	16.8
ESH	5.0
Unobligated carryforward into next FY (ops)	14.0
commitments from prior year	10.5
Add ins	3.6
NSLS stabilization	
Total	141.5

Work is planned in detail

- We follow a project-like approach to planning the operations work
- Work is planned through a detailed Work Breakdown Structure (WBS) down to the activity level
- Resources are estimated for a full operations year
 - Resource estimates include MS&T and labor
 - Each resource is assigned to Organizational unit (down to group level)
Labor type (if applicable)
- Budget is released to the CAMs for the WBS elements at the appropriate level

WBS #	Proj	Act	Activity
4.3.2.2			Direct Beamline Support
4.3.2.2.1			3-ID HXN Bml Operations
4.3.2.2.1.1	20361	20361	3-ID HXN Bml Management
4.3.2.2.1.2	20361	22375	3-ID HXN User Support
4.3.2.2.1.3	20361	22376	3-ID HXN Beamline Development & Research
4.3.2.2.1.4	20361	22377	3-ID HXN Maintenance & Improvements
4.3.2.2.2			5-ID-2 SRX Bml Operations
4.3.2.2.2.1	20362	20362	5-ID-2 SRX Bml Management
4.3.2.2.2.2	20362	22378	5-ID-2 SRX User Support
4.3.2.2.2.3	20362	22379	5-ID-2 SRX Beamline Development & Research
4.3.2.2.2.4	20362	22380	5-ID-2 SRX Maintenance & Improvements
4.3.2.2.3			18-ID FXI Bml Management
4.3.2.2.3.1	20745	20745	18-ID FXI Bml Operations
4.3.2.2.3.2	20745	22381	18-ID FXI User Support
4.3.2.2.3.3	20745	22382	18-ID FXI Beamline Development & Research
4.3.2.2.3.4	20745	22383	18-ID FXI Maintenance & Improvements

Fragment of the WBS
(Full WBS and Dictionary in the review materials)

Labor Estimates

Salary Assumptions:

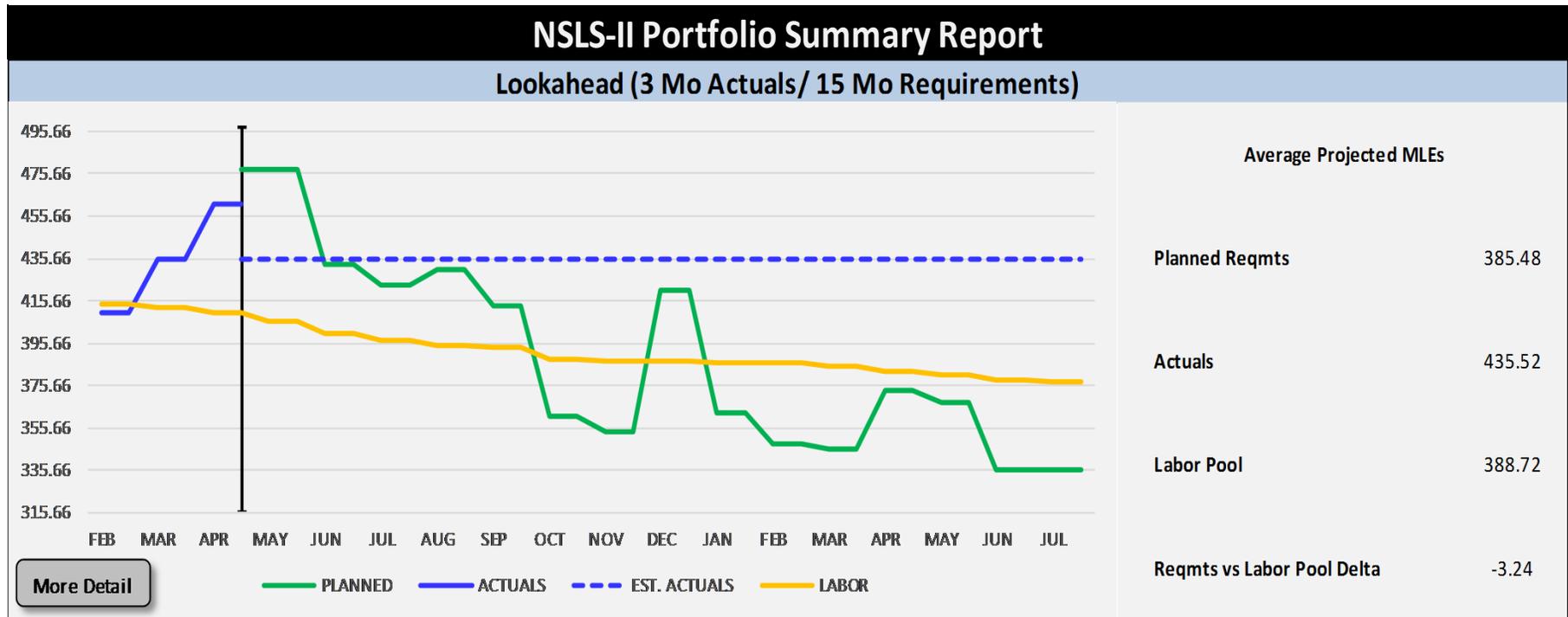
- Model has 37 Standard BNL labor bands to choose from.
- Additional group specific averages are also available.

**Avg. Productive Person
Year – 1760 Hours/FTE**

Productive FTE Buildup	Value [hr]	Balance [hr]
52 wk/yr, 5 day/wk, 8 hr/day	2080	2080
Lab Holidays 11½ days/yr	92	1988
Vacation (1½ day/mo ave)	144	1844
Other (sick, or other excused absence)	84	1760

A detailed staffing plan is developed

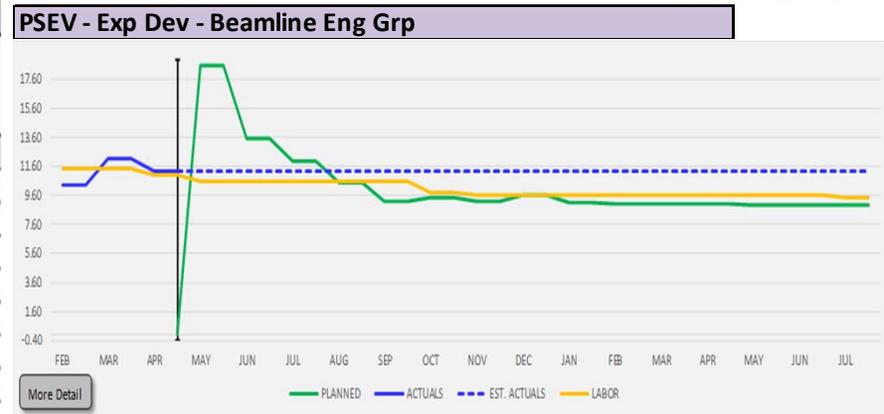
- The staffing requirements generated by the operations plan are combined with those generated by the construction projects, SPP work, LDRD work etc to generate an **integrated** staffing plan for the entire organization



Staffing plan updated monthly

Staffing plan reports are generated

Project Breakdown	Current FY					
	Average MLEs			Deltas		
	Labor Pool	FY Actuals	FY Remaining Reqmts	Labor Pool vs Reqmts	Labor Pool vs Actuals	Actuals vs Remaining
<i>(Click on Project to jump to work group chart set)</i>						
PHOTON DIVISION	172.66	185.02	186.37	-13.70	-12.36	1.35
PSEA - Photon Division Management	5.41	5.46	5.56	-0.15	-0.05	0.09
PSEB - Complex Scattering	15.35	15.74	14.77	0.58	-0.39	-0.97
PSED - Soft X-ray Scattering Spectroscopy	16.03	16.08	12.57	3.46	-0.05	-3.51
PSEG - Diffraction & In-Situ Scattering	8.66	8.68	10.14	-1.48	-0.02	1.46
PSEH - Imaging & Microscopy	13.78	14.20	13.66	0.12	-0.42	-0.54
PSEI - Hard X-ray Spectroscopy	5.88	5.94	7.23	-1.35	-0.06	1.29
PSEO - User Programs	6.75	7.34	8.60	-1.85	-0.59	1.26
PSEP - Exp Dev - Res Ops Support Grp	7.19	7.27	4.96	2.23	-0.08	-2.31
PSER - Exp - Program Management	2.19	2.21	1.43	0.76	-0.02	-0.79
PSET - Exp Dev - Optics & Metrology Grp	10.02	10.22	12.61	-2.59	-0.20	2.39
PSEU - Directors and Group Leaders - Experimental	4.21	5.25	5.06	-0.85	-1.04	-0.19
PSEV - Exp Dev - Beamline Eng Grp	10.37	11.74	11.60	-1.23	-1.37	-0.14
PSEW - Experimental Development	9.14	9.20	6.38	2.76	-0.06	-2.82
PSFE - Structural Biology	20.32	20.56	21.96	-1.64	-0.24	1.40
PSHA - Controls	2.07	2.47	1.24	0.83	-0.40	-1.23
PSHC - Motion Control	3.02	3.07	1.95	1.07	-0.05	-1.12
PSHD - Data Acquisition and Management	7.34	7.51	7.90	-0.56	-0.17	0.39
PSHE - IT Infrastructure	6.42	6.46	6.86	-0.44	-0.04	0.40
PSHF - Controls Infrastructure (EPS)	2.78	3.15	6.12	-3.34	-0.37	2.97
PSHG - Controls Infrastructure	2.20	7.54	0.00	2.20	-5.34	-7.54
PSHH - Beamline Controls	13.54	14.94	25.77	-12.23	-1.40	10.83



	MAY	JUN	JUL	AUG	SEP
PSEV - Exp Dev - Beamline Eng Grp					
PLANNED REQUIREMENTS	18.56	13.53	11.95	10.47	9.20
PROF	18.24	13.22	11.64	10.16	8.88
TECH	0.31	0.31	0.31	0.31	0.31
ACTUALS					
PROF					
LABOR POOL DATA	10.60	10.60	10.60	10.60	10.60
PROF	10.60	10.60	10.60	10.60	10.60
DELTA	7.96	2.93	1.35	-0.13	-1.40
PROF	7.64	2.62	1.04	-0.44	-1.72
TECH	0.31	0.31	0.31	0.31	0.31
AVE MONTHLY EST. ACTUALS	12.08	12.08	12.08	12.08	12.08
PROF	12.08	12.08	12.08	12.08	12.08

- Data is available for analysis

Work is tracked against the plan

- Costs are reported monthly and compared to the plan at a number of levels of detail.
- Under-runs and over-runs are tracked and understood
 - Under-runs – Work is late; overestimated; cancelled
 - Was the work planned completed? If so, can execute items the original budget wouldn't support.
 - Over-runs - Work was completed early; underestimated;
 - Need to understand why and what, if any, mitigation needs to take place.
- With feedback from Mgmt., CAM's or their designee, the staffing plan is updated monthly
- The projected carryforward into the succeeding FY is updated monthly

Reporting on Progress

- Monthly reporting
 - Standard BNL reports for labor and costs
 - Budget & Expense reports
 - Preliminary & final labor reports
 - Monthly Managers workbook is updated
 - Additional tailored reporting is completed
- Monthly and weekly meetings
 - EMG
 - PMOG
 - Business Council
 - Staffing Plan

Actuals are tracked and reported at all levels

Actuals are tracked compared to the plan and projections made to the end of the FY at the Division level:

Departmental Overview-Photon Science Division



	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
FUNDING	17,433.0	17,448.1	33,490.9	33,490.9	33,490.9	31,531.2	31,531.2	39,957.1	39,957.1	39,957.1	39,957.1	39,957.1
Baseline Spending	2,227.9	5,089.7	7,953.4	10,697.9	13,458.4	16,738.2	20,095.0	23,275.3	26,423.8	29,809.1	33,343.2	38,033.5
Encumbrances	1,704.7	1,701.5	1,775.0	1,723.8	1,814.7	1,438.0	1,404.1					
YTD Actual Cost	2,015.0	4,573.7	7,158.9	9,442.4	12,302.3	15,033.2	18,597.1	22,224.0	25,819.3	29,337.7	33,170.5	37,822.4
Projected Spending	2,015.0	4,573.7	7,158.9	9,442.4	12,302.3	15,033.2	18,597.1	22,224.0	25,819.3	29,337.7	33,170.5	37,822.4

**Encumbrances = Other Dir LB Totals Commit + Pur-Labor Totals Commit + Cen-Rechrg Totals Reqs. + MSTC-LV Totals Commit & Reqs. + Pur-HV Totals Commit & Reqs. + Equip Totals Commit. & Reqs.



Actuals are tracked and compared to the plan by work group and labor category:

Project Breakdown	Current FY					
	Average MLEs			Deltas		
(Click on Project to jump to work group chart set)	Labor Pool	FY Actuals	FY Remaining Reqmts	Labor Pool vs Reqmts	Labor Pool vs Actuals	Actuals vs Remaining
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PSEI - Hard X-ray Spectroscopy	5.88	5.94	7.23	-1.35	-0.06	1.29
PSEJ - User Programs	6.75	7.34	8.60	-1.85	-0.59	1.26
PSEP - Exp Dev - Res Ops Support Grp	7.19	7.27	4.96	2.23	-0.08	-2.31
PSEK - Exp - Program Management	2.19	2.21	1.43	0.76	-0.02	-0.79
PSET - Exp Dev - Optics & Metrology Grp	10.02	10.22	12.61	-2.59	-0.20	2.39
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Differences between plan and available resources are used to adjust forward planning

Mid-year adjustments

As performance is tracked against the plan, opportunities are taken to review the items the original budget wouldn't support. As stated previously, these items are evaluated based on the impact to the user program and maintained throughout the year along with decision dates.

FY17 List (partial)

Item	Description	Cost (\$k)	Impact on user program	Reduced performance (user-days)	Lost beam (user-days)	Cost benefit
AD-4	klystron modulator (refurbish Toshiba)	160.5	Spare unit	0	612	0.05
AD-1	miscellaneous, BPM, high priority	113.1	potential for lost beam in a number of subsystems	0	408	0.06
AD-2	linac klystron	176.4	Failure would take down SR for 3 weeks. As of 6/5/17 one is avail to be used with modulator	0	612	0.06
AD-8	DI water system cpts	92.8	accelerator shutdown	0	204	0.09

OVERHEAD RATES

Laboratory Overhead Structure

- Governed by BNL's Cost Accounting Disclosure Statement
 - Disclosure Statement is submitted annually to DOE-BHSO for review and approval
 - Changes must be reviewed and approved by Contracting Officer
 - BNL cannot unilaterally make changes to the cost accounting rates
- Laboratory Rates are applied to an allocated base
 - Material Burden
 - Traditional General and Administrative (G&A) Burden
 - Common Support G&A Burden
 - Laboratory Directed Research and Development (LDRD) Burden

Lab Level Services Provided by Overhead Rates

The following rates provide for the labor material, supplies and other support costs necessary to support their respective functions.

Material Burden -Covers the Procurement function, Accounts Payable and Foreign Travel groups of the Fiscal Services Division and the net cost of the Travel Office after commissions.

Traditional G&A Burden -Covers the Administrative, Management, and Technical Staff having Laboratory wide oversight and support responsibilities.

Common Support G&A Burden -Covers costs required to maintain the Laboratory's infrastructure and support the research and development mission of the Laboratory.

LDRD Burden -Covers costs required to support the Laboratory's LDRD program.

BNL Indirect Rates			
	FY15 Actual	FY16 Actual	FY17 Estimated
Standard Operating Rates			
Material Burden	7.50%	7.50%	7.50%
Traditional	7.22%	7.38%	8.25%
Common	31.95%	32.35%	32.35%
LDRD	3.70%	2.30%	2.30%
ECR-Previously granted			
Material Burden	0.00%	0.00%	0.00%
Traditional	4.00%	4.00%	4.00%
Common	6.50%	6.50%	6.50%
LDRD	0.00%	0.00%	2.30%
EPR (Requires Approval)			
Material Burden			7.50%
Traditional			5.30%
Common			11.10%
LDRD			2.30%

Space Rates and Assumptions

- **NSLS-II Complex – 628,000sf in 9 buildings**
 - NSLS-II accelerator building and supporting buildings and 5 LOBs
- **NSLS-II occupies space in 12 additional buildings across the Laboratory – 56,680sf** (offices, labs, assembly & test facilities, storage space)
- **Space charge** – provides conventional facility operations, maintenance, repair and custodial services
- **Space rate** - flat FY15-17

Laboratory Space Rates			
	FY15 (actual)	FY16 (actual)	FY17
	\$/sf/year		
Storage	10.19	10.19	10.19
Industrial	26.46	26.46	26.46
Lab Office	38.36	38.36	38.36

NSLS-II experimental floor billing is being phased-in as beamlines are authorized for General User Operations

- Full industrial space rate paid for footprint of beamlines in GUO
- Actual costs (“pay by the drink”) for remainder of experimental floor
- FY17 savings of \$3.9 M compared to full space charge on 100% of experimental floor

NSLS-II Organizational Burden (O/B)

Organizational Burden is a small additional rate NSLS-II applies to support the common costs of the NSLS II Department.

- Pays for costs with the following characteristics:
 - Cannot be identified or direct charged to a particular program;
 - Benefit the entire facility
- At NSLS-II, O/B pays for:
 - Departmental support costs, as well as common space and facility services.
 - Labor- various groups are included
 - MST– represent materials, training and travel per person. It also covers service contracts for various business machines.
 - Space- i.e. the space costs for the labor supported by Org Burden
 - Reserve – covers unplanned costs (e.g major repair of a business machine not covered under warranty).
- Programs charged O/B are operations, SPP (WFO; other grants), LDRD and non-project Cap/Fab and AIP work.

Organizational Burden

NSLS II Org Burden

	FY15- Actual		FY16- Actual		FY17-Estimated	
	FTE's	\$K	FTE's	\$K	FTE's	\$K
ACCEL	0.48	\$ 134.7	0.60	\$ 179.1	0.48	\$ 130.4
BUS OPS	8.67	\$ 1,053.3	8.81	\$ 1,032.0	10.38	\$ 1,266.3
ESH	0.00	\$ -	0.40	\$ 65.0	0.50	\$ 81.4
FACIL MGMT	1.14	\$ 126.0	1.17	\$ 132.8	1.02	\$ 114.2
HR	0.65	\$ 134.3	2.52	\$ 325.4	1.85	\$ 262.5
IT SUPPORT	0.00	\$ -	1.90	\$ 283.4	2.88	\$ 434.6
MGMT	2.62	\$ 668.6	2.09	\$ 562.4	1.70	\$ 566.7
PHOTON	1.39	\$ 347.9	1.23	\$ 332.4	1.35	\$ 367.4
QA	2.05	\$ 364.7	2.09	\$ 412.7	2.00	\$ 397.9
TOTAL	17.00	\$ 2,829.4	20.81	\$ 3,325.2	22.14	\$ 3,621.3
MATERIALS		\$ 227.90		\$ 27.10		\$ 265.30
SPACE		\$ 95.10		\$ 84.90		\$ 84.10
RESERVE		\$ -		\$ -		\$ 200.00
O/B RATE		7.43%		8.83%		9.50%
ELEC PWR -BLDG		0.85%		1.2%		1.2%

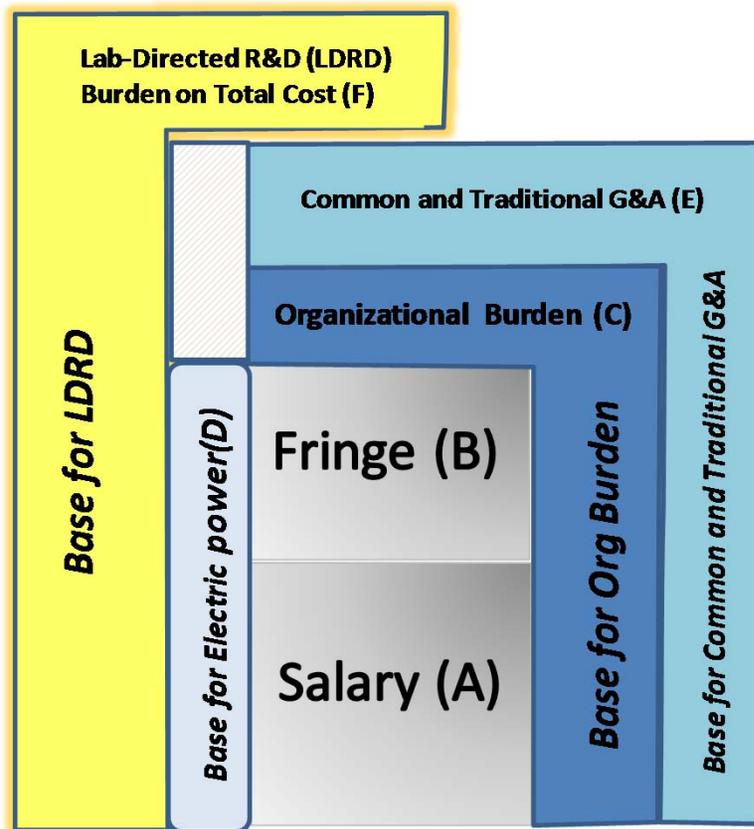
Costs paid for by org. burden

Rate required to cover those costs

NSLS-II FY16 Labor multiplier was 2.19

Labor multiplier $((((A*(1+ B)))*(1+C))*(1 + E)+ (((A*(1+B))))*D)) * (1+ F) = 2.19$

i.e. \$100k salary incurred a \$219k burdened cost.



LDRD is then applied to the total cost through G&A.



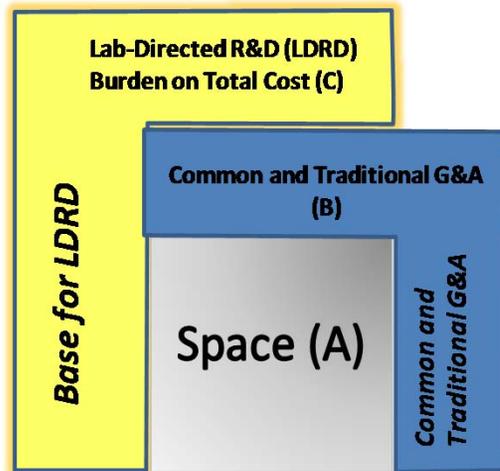
Common and Traditional G&A is applied to salary, fringe, and O/B.



The NSLS-II Dept. org burden rate and distributed electric power. Both are applied on salary and fringe base.

BNL's fringe rate for FY16 was 39.7% paying for all labor related taxes, health care coverage for staff and retirees, and other benefits.

FY16 Space and Electric Multipliers



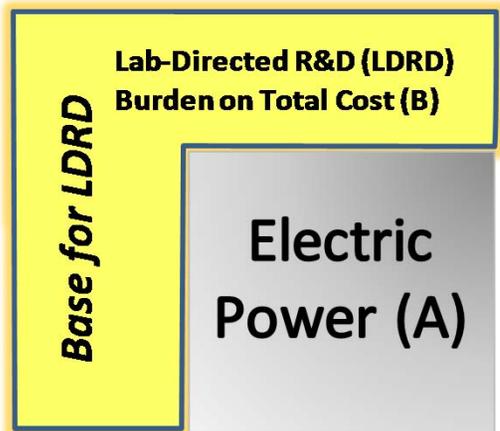
Total FY16 Space multiplier: 1.43



BNL charges projects for the space occupied via three space rates (lab/office, industrial, and storage).

NSLSII pays for its space charge directly rather than as an adder on labor.

G&A and LDRD rates apply on top of space charges.



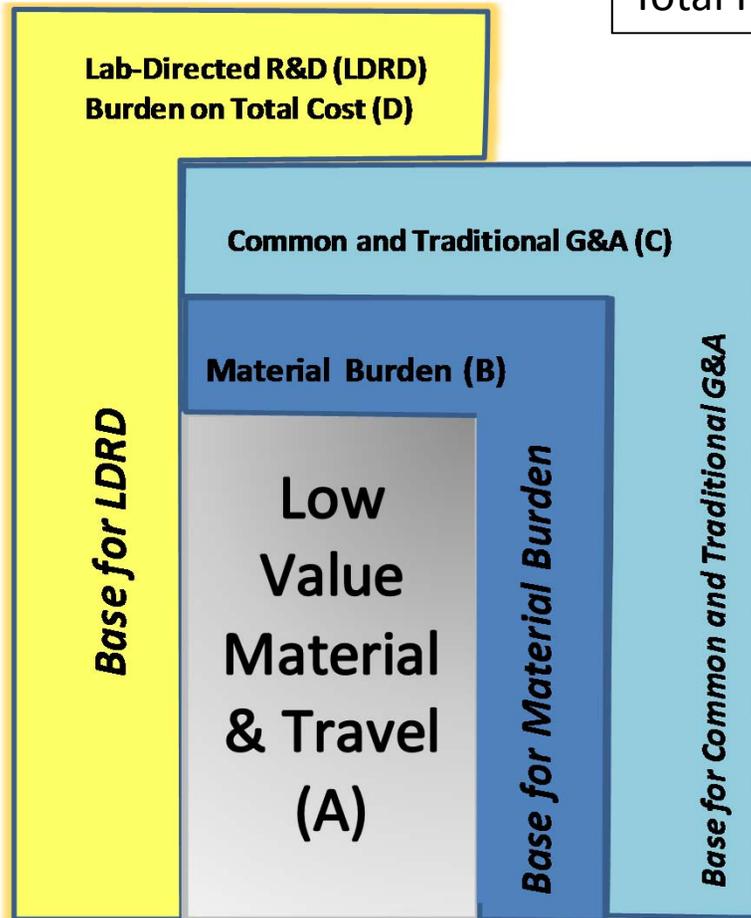
Total FY16 Electric multiplier: 1.02



BNL has negotiated a very favorable electric utility rate with NYS. Almost all of the electric power is directly charged to NSLSII operations. A small percentage is allocated via labor. Only LDRD burden is assessed.

Material and Travel multiplier

Total FY16 Material and travel multiplier: 1.54



LDRD is then applied to the total cost through G&A.



Common and Traditional G&A is applied to material and/or travel base and material burden.



BNL's material burden rate for FY16 was 7.5% and gets applied to the material and/or travel base

Note: Large, single procurements are charged only LDRD burden after the first \$2M

Summary

- Processes and tools are in place to provide valid estimates and evaluate costs
 - Priorities are established and reviewed regularly
 - The estimates are reviewed and finalized by Management
 - Plans are executed and managed
 - Potential risks that would impact user program are known and managed
 - Plans are adjusted regularly based on feedback throughout the year
- Rates are known and applied according to our Cost Accounting Disclosure Statement