

Report from the Project Manager

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USQCD All-Hands Meeting
Brookhaven National Laboratory

April 29-30, 2016

Outline

- ▶ LQCD-ext II progress to date
- ▶ Planned changes to our baseline operations plan
- ▶ Organizational changes
- ▶ FY16 hardware acquisition activities
- ▶ Project change requests
- ▶ User survey results

LQCD-ext II Project Status

- ▶ We're in the second year of the 5-year extension (funded from Oct 2014 thru Sep 2019)
- ▶ We've received \$5M of our planned \$14M in funding, in accordance with our baseline funding profile (\$2M in FY15; \$3M in FY16).
- ▶ The computing we've delivered to the collaboration through March 2016 has exceeded our baseline goals.

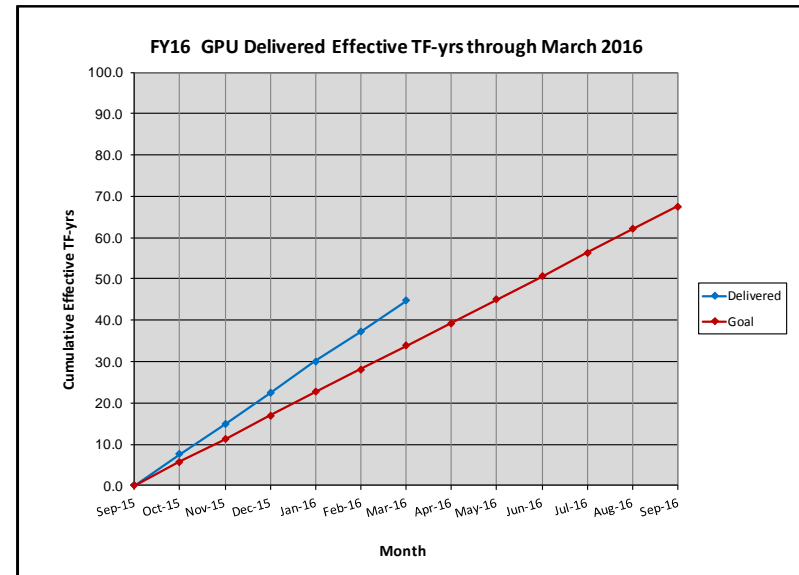
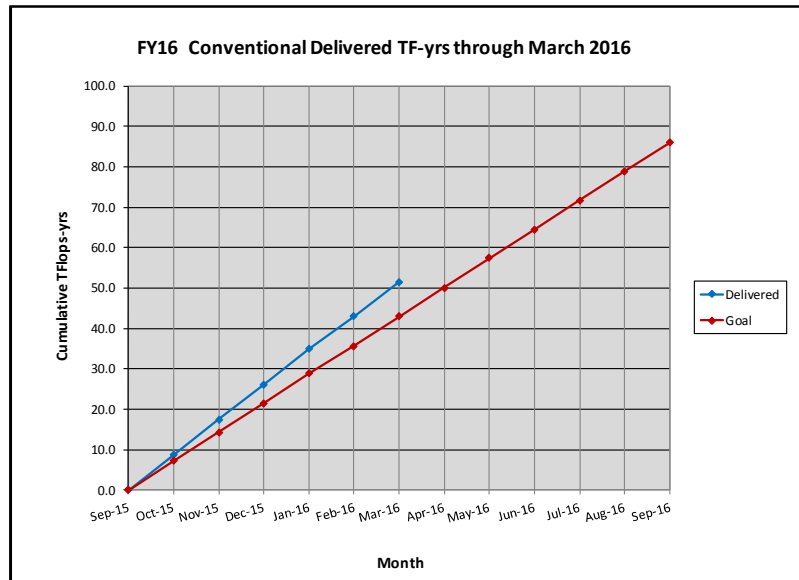
	<u>FY15</u>			<u>FY16 ¹</u>		
	Goal	Actual	% of Goal	Goal	Actual	% of Goal
Conventional Resources ²	95.1	105.7	111.3%	43.0	51.6	120.1%
GPU-accelerated Resources ³	142.8	144.1	100.9%	33.8	44.8	132.5%

1) FY16 performance through March 2016.

2) Conventional resources: Ds, Bc, Pi0, 9q, 10q, 12s, BG/Q, 10% of DD2 prototype BG/Q rack

3) GPU-accelerated resources: Dsg, Pi0g, 10g, 11g, 12k (9g retired Jun 27, 2015).

FY16 LQCD-ext II Project Performance



FY16 data for **conventional resources** are shown.
The uptime goal is 8000 hours per year (91.3%).

Performance goal is based on an average of the sustained performance of domain wall fermion (DWF) and highly improved staggered quark (HISQ) algorithms

Goals are being exceeded because of excellent uptime and the Pi0 expansion (which was not in the baseline plan).

FY16 data for **GPU-accelerated clusters** is shown.
The uptime goal is 8000 hours per year (91.3%).

Conversion from GPU-hrs to effective TF-yrs is 140 GF/GPU, based on allocation-weighted performance of GPU projects running from July 1, 2012 through Dec 2012.

Goals are being exceeded due to excellent uptime on most clusters and continued operation of 10g and 11g (beyond planned retirement dates).

Planned Changes to our Baseline Plan

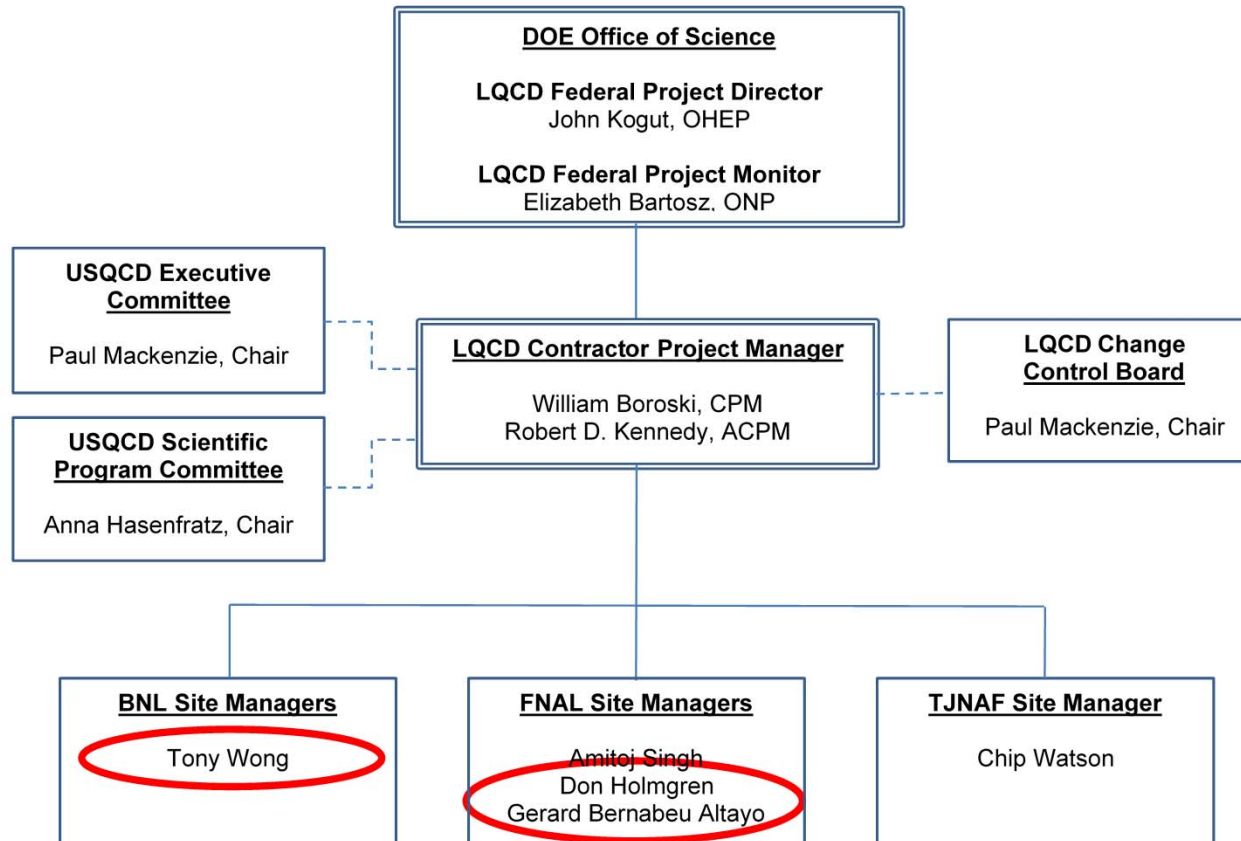
Performance Goals

- ▶ The approved baseline defined performance goals for conventional and GPU-accelerated machines.
- ▶ New computing architectures are requiring us to redefine these performance goals.

Site Operations

- ▶ Baseline operations plan called for cluster hosting at FNAL and JLab through Sep 2019, and operation of the BG/Q half-rack at BNL through Sep 2017.
- ▶ Through recent discussions with Kerstin Kleese Van Dam, Director of the Computational Science Initiative at BNL, and others, BNL has expressed interest in hosting LQCD clusters in addition to the BG/Q.
 - BNL will begin delivering cluster computing resources in 2016.
 - BNL will purchase and deploy new LQCD clusters in future years.

Changes in our LQCD-ext II Project Team



Organizational changes:

- Tony Wong has replaced Frank Quarant as BNL Site Manager.
- We have introduced the role of Site Architects into our org structure.
 - Don Holmgren and Chip Watson are Site Architects at FNAL and JLab.
 - Shigeki Misawa will join Bob Mawhinney as co-Site Architect at BNL.
- Gerard Bernabeu Altayo is replacing Don Holmgren as co-Site Manager at FNAL.

FY16 Acquisition Activities

- ▶ The LQCD-ext II Acquisition Strategy calls for the procurement and deployment of new computing systems in FY16, FY17, FY18, and FY19.
 - No new hardware deployment was planned for in FY15.
- ▶ The FY16 hardware acquisition is well underway.
 - Led by Chip Watson, as the new FY16 system will be deployed at Jefferson Lab.
 - Activities will be discussed in detail in a later session.
- ▶ Newly-available architectures are carefully being considered.
 - In coordination with the Paul Mackenzie (EC Chair), I have formed an internal review committee to help ensure that the project is making the most effective use of project resources to further the USQCD scientific program.
 - The purpose of this committee is to review and consider the proposed computing hardware acquisition plan for FY16 and provide input to the Project Manager regarding the alignment of the proposed procurement with the anticipated computing needs of the scientific program.
 - Committee membership includes Site Architects, Site Managers, and collaboration representatives
 - Carleton Detar
 - Steve Gottlieb
 - Balint Joo
 - James Osborn
 - The committee is being chaired by Rob Kennedy; report is due by end of May 2016.

Project Change Requests

Rob Kennedy

LQCD-ext II Associate Contractor Project Manager

Project Change Requests

▶ CR16-01: 3 Cluster Host Sites

- Baseline: Cluster Hosting at FNAL, TJNAF. IBM BlueGene hosted at BNL
- Concern: BlueGene commercially a dead-end. BNL interest in cluster hosting realized after project was baselined. Project wishes to keep all three Labs involved.
- Change: Adjust project baseline to accommodate acquisition of a BNL-hosted cluster in FY17-FY18.
- Status: Change is substantial and will have to be approved by CCB (May 2016) and Federal Director (June 2016 if CCB approves). Post-CR MOUs, PEP negotiated and doc'd.
 - More details about this in next slide.

▶ CR16-02: Unified Performance Goals

- Baseline: Project has Deployed and Delivered Computing goals for Conventional Computing and for Accelerated Computing
- Concern: New MIC technologies do not neatly fit into either category, constraining the computing project to only invest in Conventional and Accelerated Computing at a certain level each year in order to be judged a success.
- Change: Combine Conventional & Accelerated Computing goal values to 1 goal per year.
- Status: Agreed amongst the Integrated Project Team. To present with CR16-02.

CR16-01: 3 Cluster Host Sites

- ▶ What stays the same
 - Project will deliver the same level of computing as the baseline.
 - In fact, we will deliver a little more computing in any case.
- ▶ What is new
 - BNL Institutional Cluster (IC) Allocation, performant disk storage, tape storage
 - Offsets the cost (\$, CPU) of additional per-site cluster management overheads
 - Agreement is for allocation of about 40 BNL IC nodes time-averaged.
 - Later talk will detail the GPU-based BNL IC.
 - Revised acquisition schedule for the project for FY17-FY18
 - FY16: JLab (new buy)
 - FY17: JLab 1/3 (options) ; BNL 2/3 (new buy)
 - FY18: BNL 2/3 (options) ; FNAL 1/3 (defer)
 - FY19: FNAL (new buy early in year)

User Survey Results

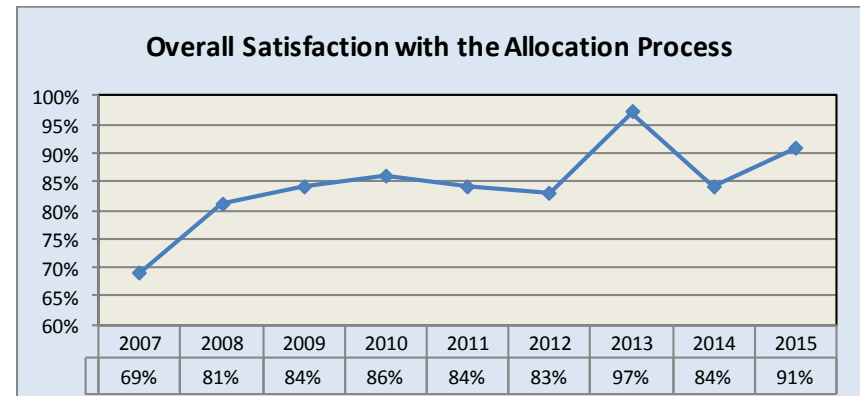
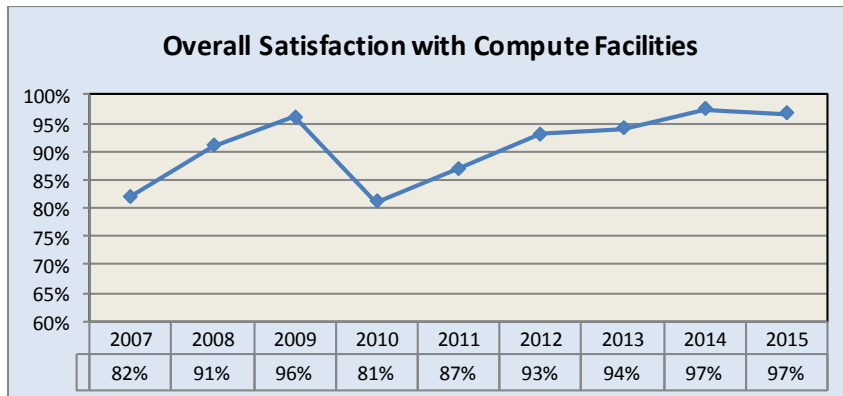
Rob Kennedy

LQCD-ext II Associate Contractor Project Manager

FY15 Survey Results

- ▶ The FY15 User Survey:
 - Measured user satisfaction from October 2014 through September 2015
 - Survey open from through November 16, 2015 to January 15, 2015
 - Same format as in recent years, 29 questions designed to measure satisfaction with
 - LQCD Compute Facilities
 - USQCD Resource Allocation Process
- ▶ The User Survey was distributed to all scientific members of USQCD
 - Responses were received from 66 individuals vs. 61 in FY14
 - 30 of 35 PI's responded: 86% response rate vs. 74% in FY1
 - 32 of 64 most Active Users responded: 50% response rate vs. 50% in FY14
- ▶ FY14 overall satisfaction rating with Compute Facilities = 97%
 - Exceeds LQCD Computing Project KPI goal of 92%
- ▶ FY14 overall satisfaction rating with Resource Allocation Process = 91%
 - Up from FY14's rating (84%) and above the level in FY12 and earlier (ratings in mid-80's)

FY15 Survey Results



- ▶ **User Comment Topics: suggested by ≥ 2 user comments**
 - LQCD: User Documentation at BNL – *action plan documented*
 - LQCD: Simplify Moving Projects from Site to Site – *discussing*
 - USQCD: Make better use of resources when major allocations are not ready to run – *SPC policy*
 - USQCD: Elected members on EC and SPC – *Election of EC member now*
- ▶ **User Survey Report: near-final draft... but not final yet.**
 - Please, talk to Bill or Rob at break if you have comments. Still time to provide input to report.
 - And you can always send email to Bill or Rob... do not have to wait for an annual survey.

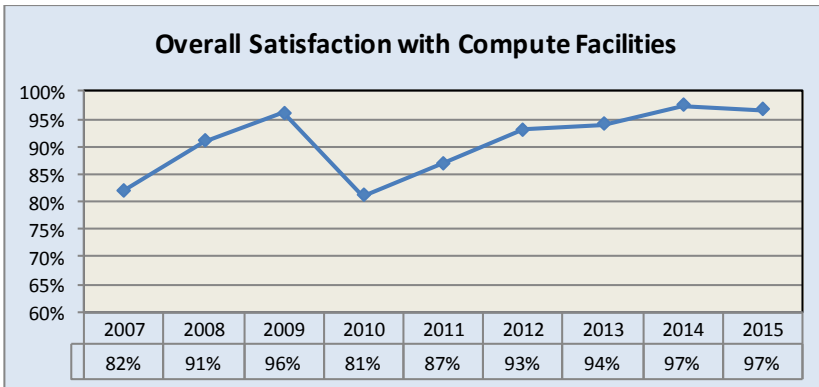
Questions?

User Survey Results – More Detail

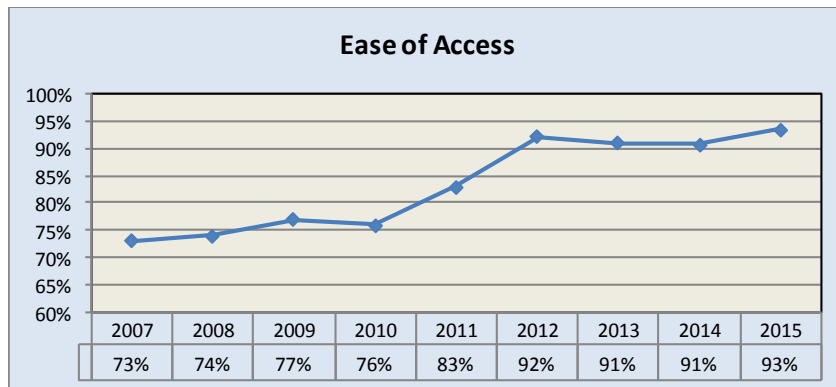
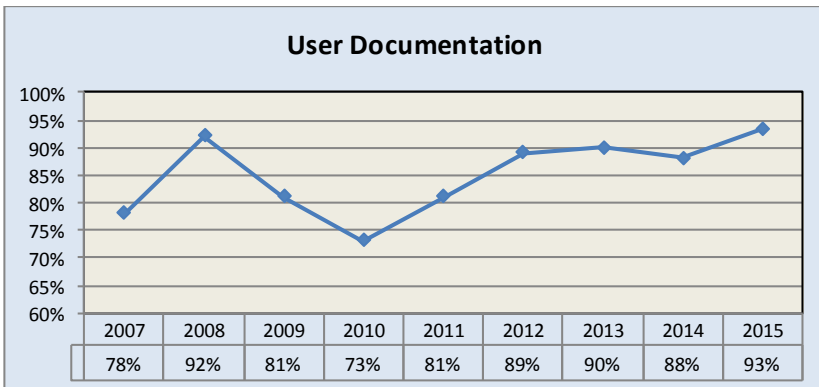
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Compute Facility Satisfaction Trends

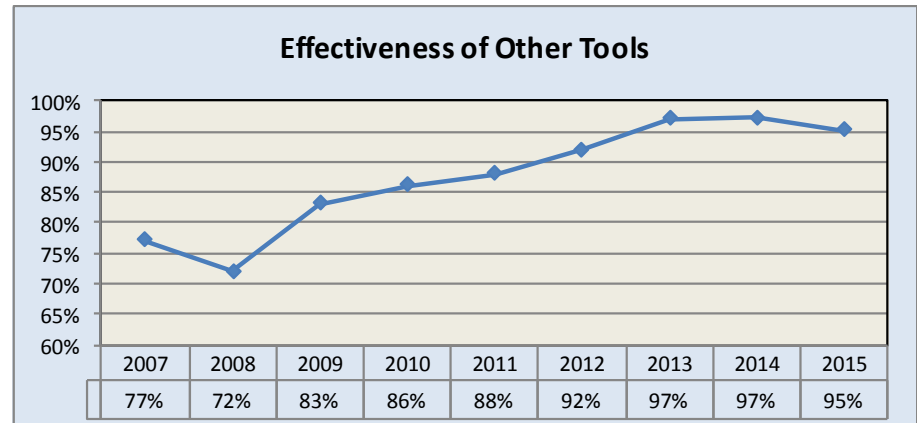
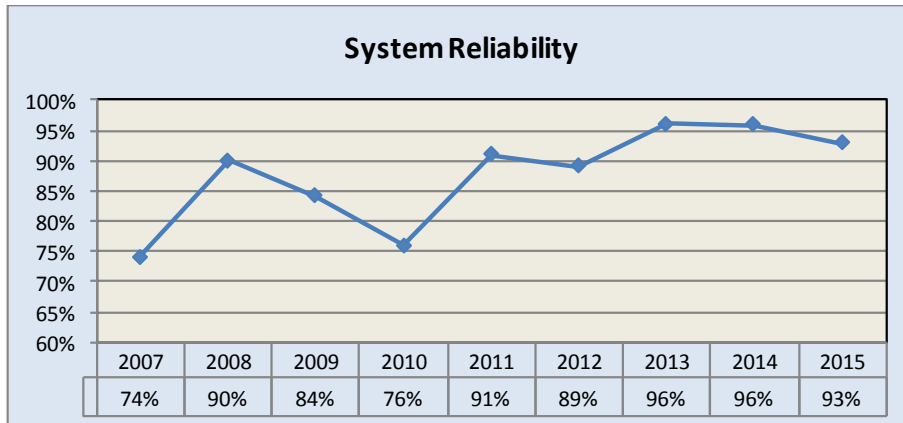
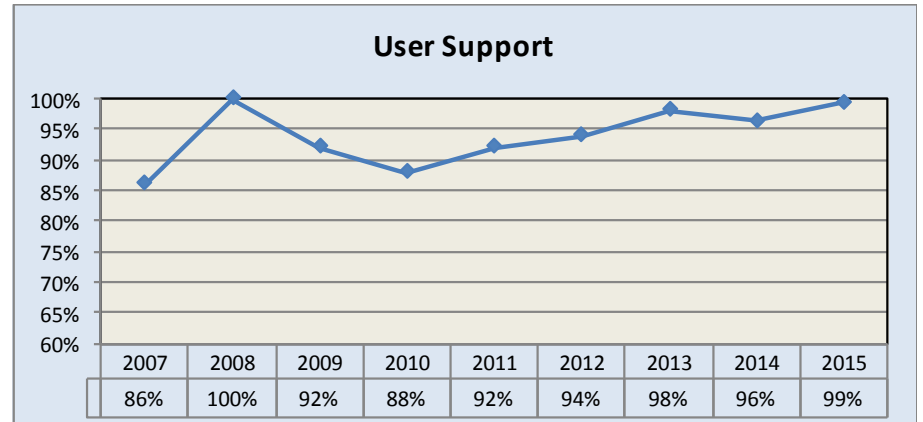
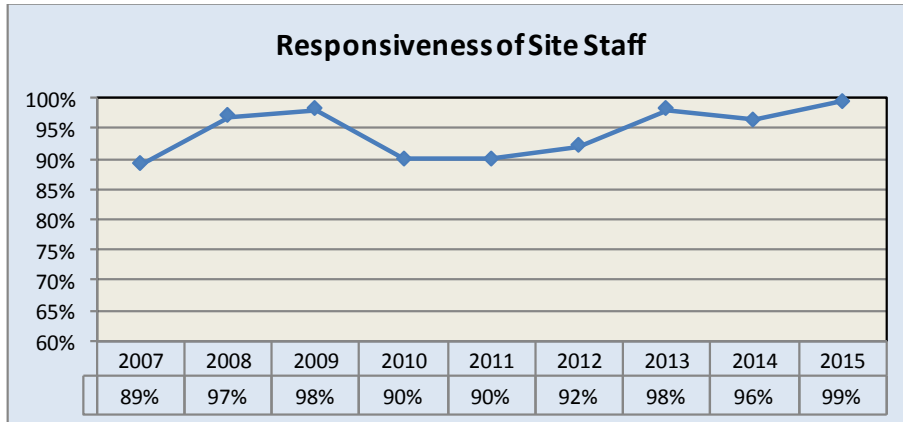


FY15 Computing Facilities	All Sites	BNL	FNAL	JLab
Overall Satisfaction	97%	89%	100%	92%
Documentation	93%	83%	96%	94%
User Support	99%	100%	99%	100%
Responsiveness	99%	100%	99%	100%
Reliability	93%	100%	94%	89%
Ease of Access	93%	100%	95%	88%
Other Tools	95%	100%	93%	97%



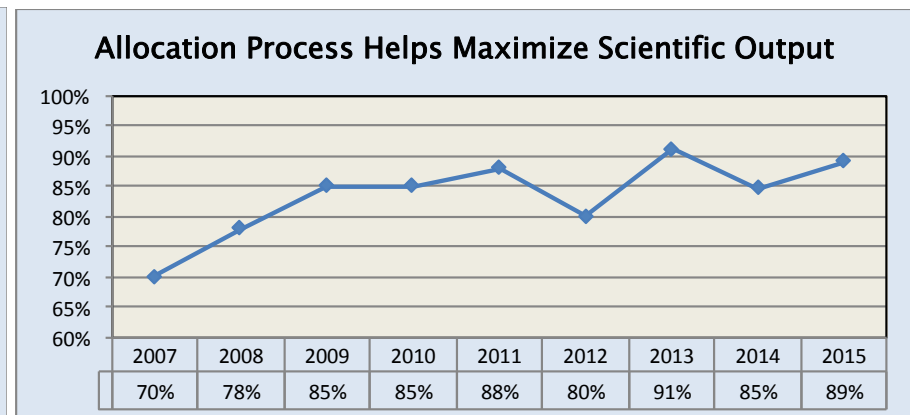
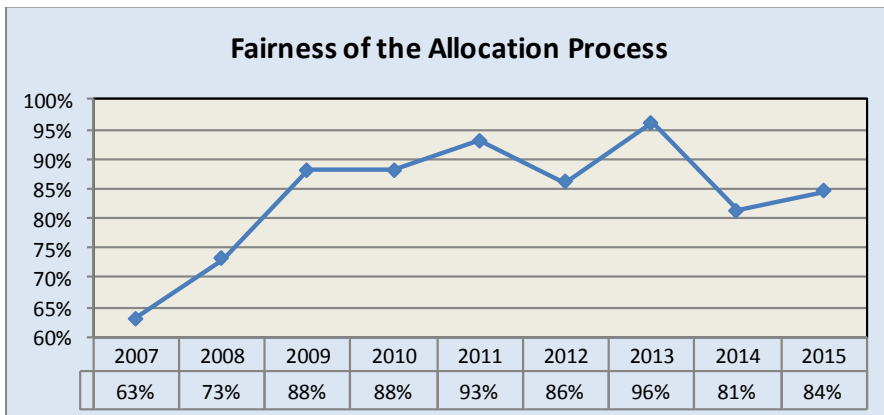
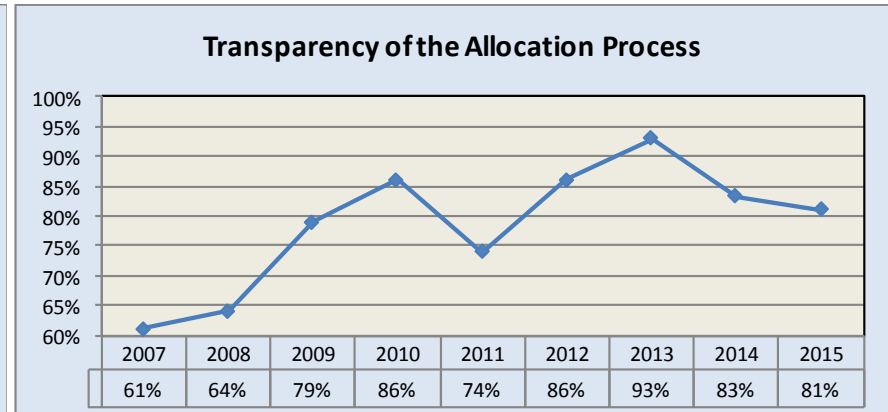
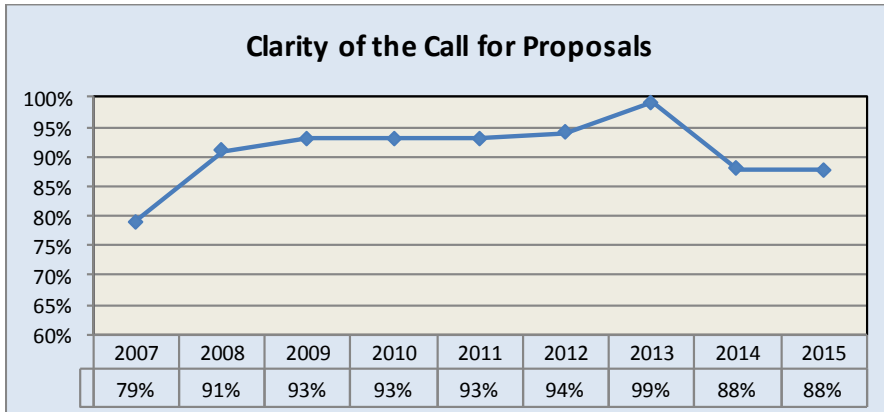
- ▶ FY15 Overall Satisfaction rating of 97% exceeds our goal of 92%, similar to recent past.
- ▶ BNL's rating for User Documentation was still below par (88%), but improving.
 - Action Plan defined to improve BG/Q documentation handling and prepare for possible cluster-oriented documentation

Compute Facility Satisfaction Trends



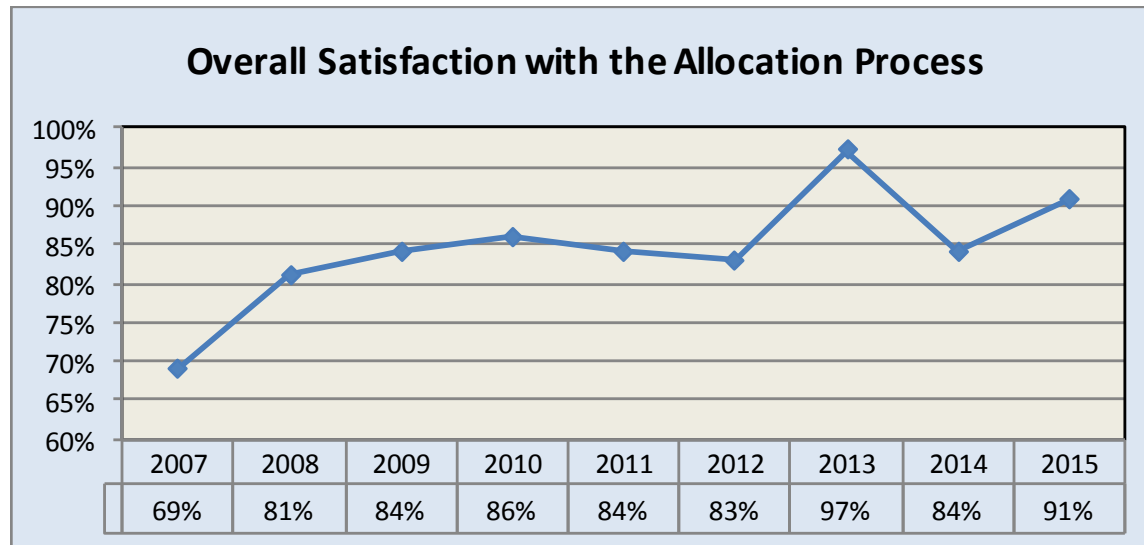
- ▶ Responsiveness of Site Staff and User Support maintain high satisfaction ratings.
- ▶ System Reliability and Online Tools also continue to maintain high satisfaction ratings.
 - Some systems are aging, past warranty, but still in use, which may explain slight downtick in System Reliability

Allocation Process Satisfaction Trends



- ▶ Clarity and Transparency ratings remained at FY14 levels.
- ▶ Fairness and Maximize Scientific Output ratings rose a bit from FY14 levels.

Allocation Process Satisfaction Trends



- ▶ The overall satisfaction rating for the Allocation Process was 91% in FY14.
 - This is a noticeable improvement over the 84% rating in FY14.
- ▶ Related user feedback included:
 - Acknowledgement of the challenges of allocating over-subscribed resources
 - Concern about some allocations not being used for a large part of the year while proposals that had been turned down were ready to run
 - Concern about the EC and SPC having no elected members
 - Suggestions to streamline or improve the allocation process