Office of Science Peer Reviews 101

Daniel R. Lehman, Director
Office of Project Assessment
Office of Science

Peer Review 101 Panel Members

Mr. Daniel Lehman, Director, Office of Project Assessment
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Mr. Hanley Lee, Deputy Manager, SLAC Site Office
(formerly SC Federal Project Director for the LCLS Project)

Mr. James Krupnick, Associate Lab. Director/Chief Operating Officer
Lawrence Berkeley National Laboratory
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Mr. Scott Samuelson, PMP
Acting Director, NNSA Office of Major Systems Acquisitions
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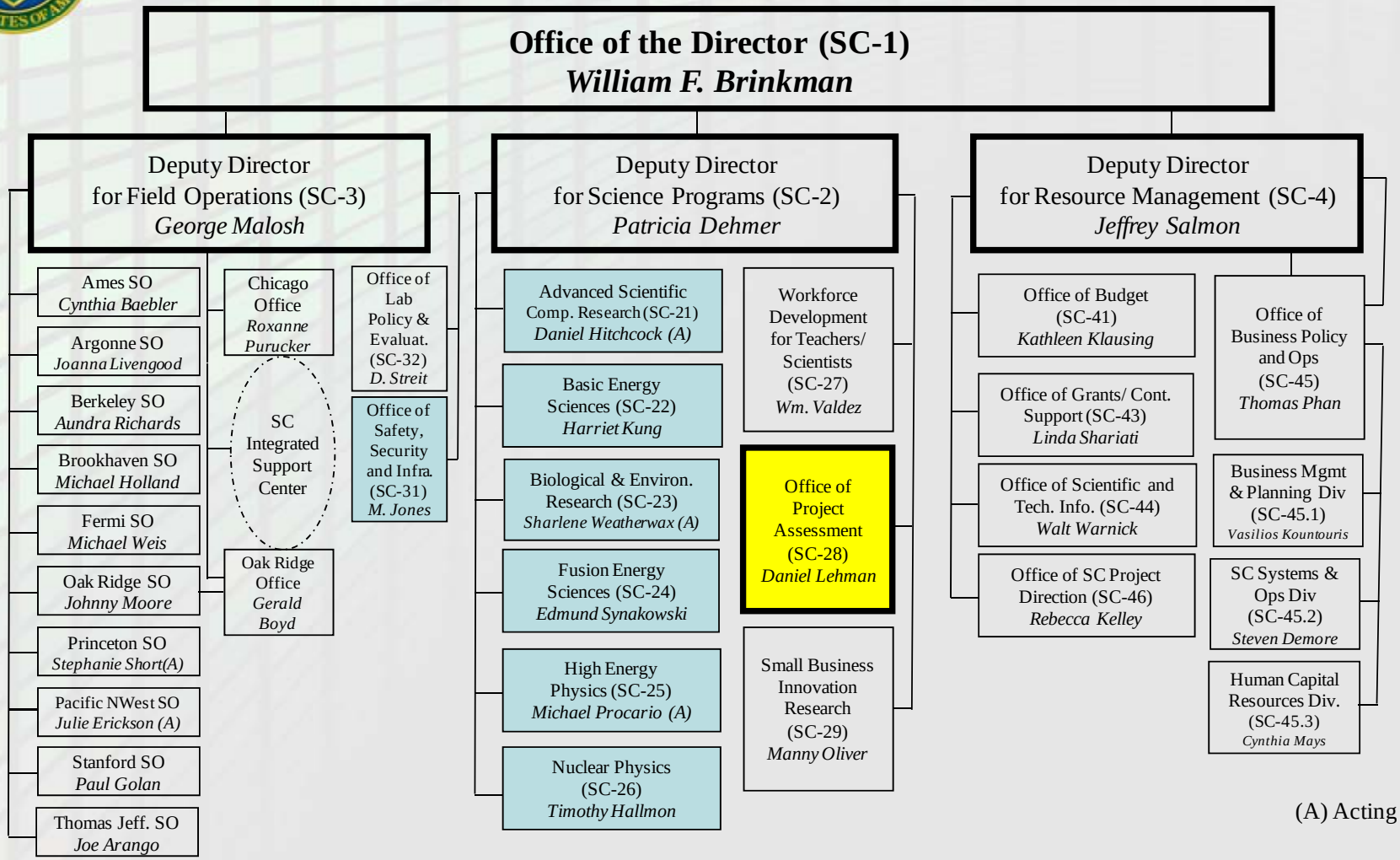

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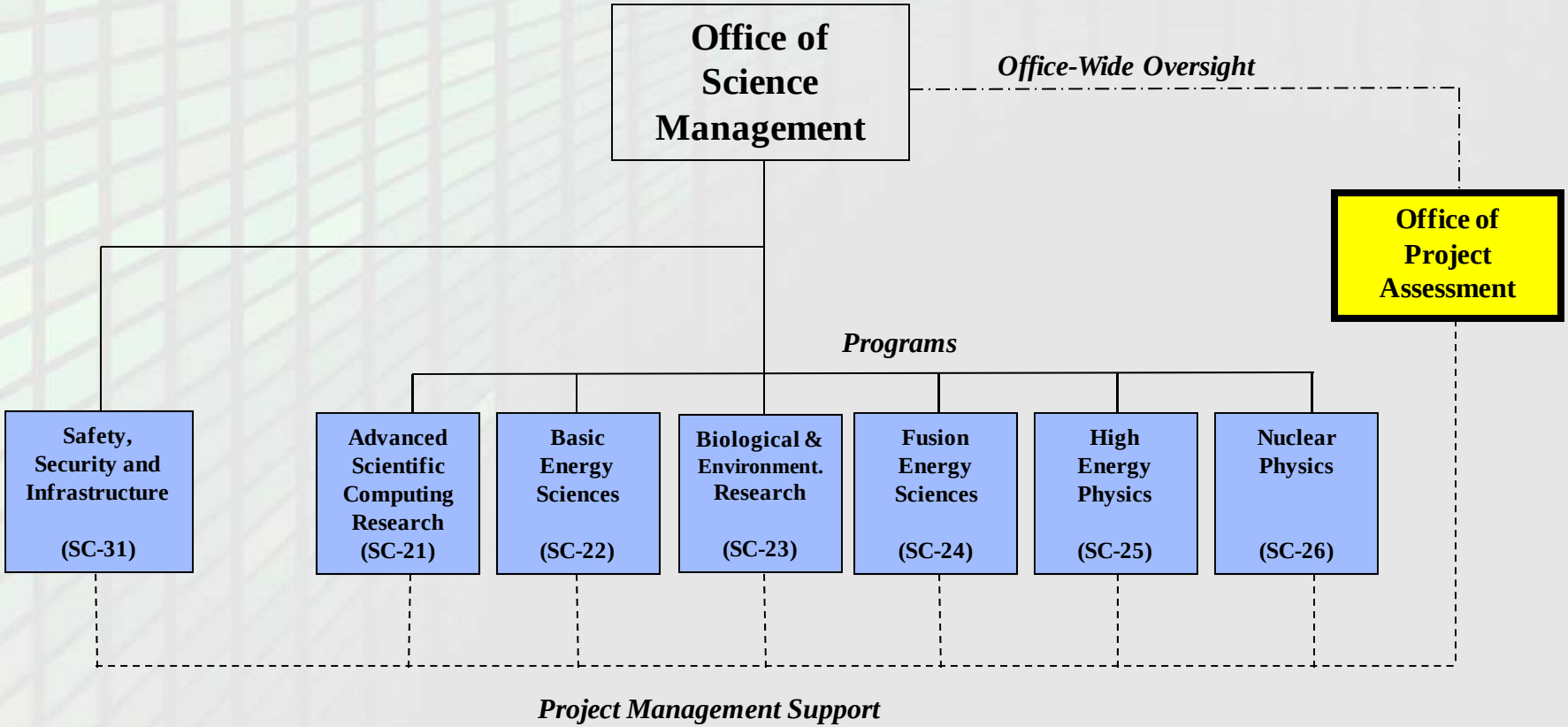
Office of Project Assessment



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Why SC Conducts Peer Reviews?

Meaningful Oversight	→ Independent assessment of all aspects of the project with strong emphasis on organization and **management**
Reality Checks	→ Projects have a **bias for optimistic** rather than **realistic** view of events
Breaks Down Barriers	→ Projects are **slow to look outside** for solutions or help; peers from other sites/projects provide technical and management expertise.

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Why SC Conducts Peer Reviews?

Ensures Progress	→ Preparing for reviews **focuses the project** on current status and future plans
Builds Credibility	→ A successful review usually signals to all stakeholders that the project **is on track** (reassessed at next review)
Shares Lessons Learned	→ Projects and reviewers **learn** from each other

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A Long Tradition in SC

- SC peer reviews evolved from practices over the **past 30 years**
- Embraced by Federal / Laboratory management as **essential component to successful** project completion
- SC benefits from a **large community** of specialized peer review practitioners
- Viewed as a **best practice** (OMB/Office of Science and Technology Policy)….but **takes significant effort** requiring constant, pro-active senior management support and engagement

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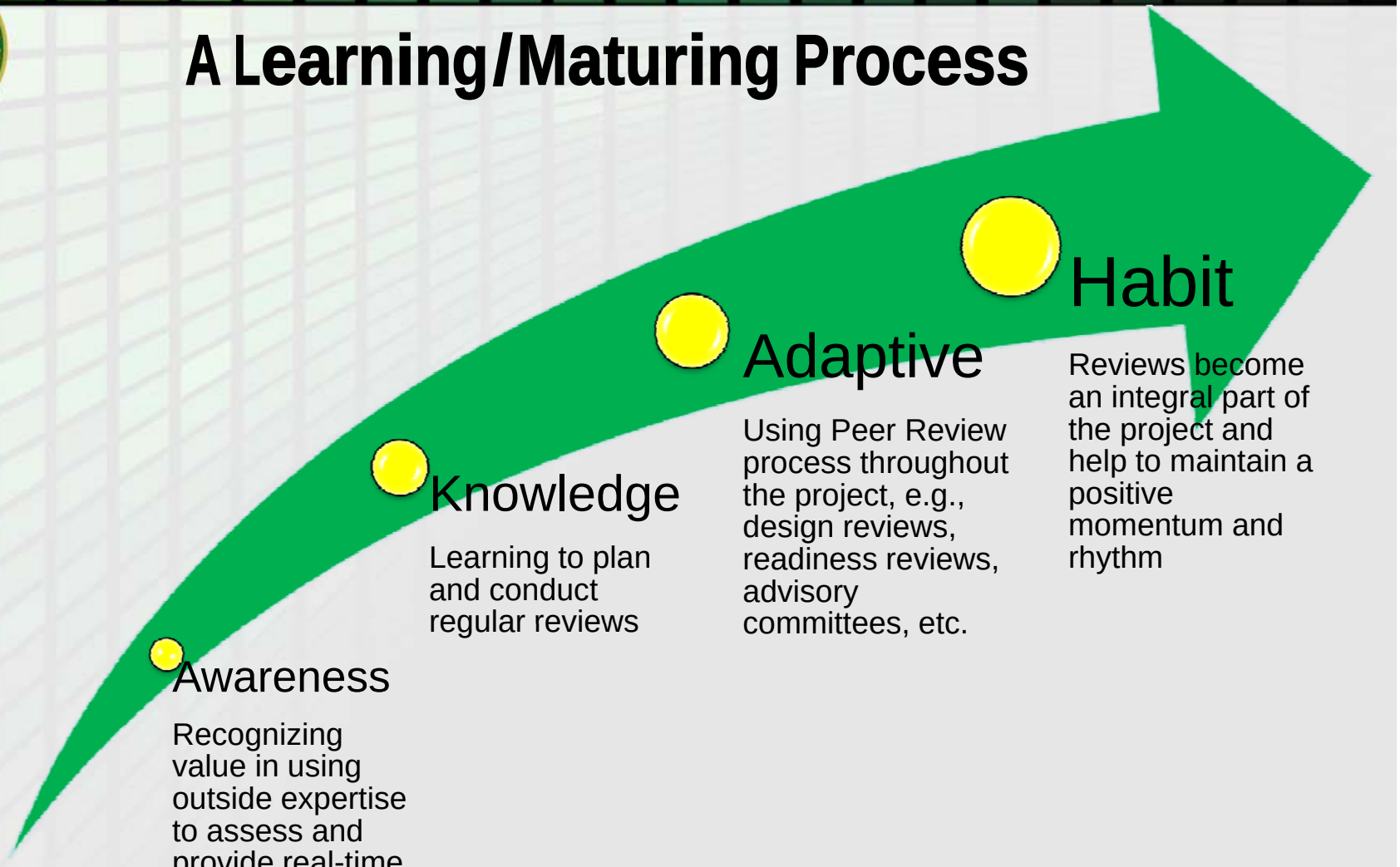
A Learning/Maturing Process



Key Elements of an SC Review

- Diverse, experienced, objective, and **balanced committee** of experts that covers the full breadth of the project – technical, cost, schedule, and management
- Current **project information** – at any level of detail may be required by the committee – must be **openly shared** and honestly presented
- Committee conducts the review using a flexible, yet disciplined process of probing, **inquiry**, and feedback – **not checklists**
- The Committee must **target the most pressing issues** / barriers to project success
- Reviews are used to **help the project** – Committee and project share goal of ensuring a successful project

Key Elements of an SC Review

- Committee **recommendations must be reasonable**, actionable, and represent the consensus of the committee
- Committee recommendations (including reasonable due dates) are shared with the project prior to closeout to **eliminate surprises**
- **Closeout briefing** delivered by the Committee to the entire project team and management chain **before leaving** the site
- Project is **expected** to make reasonable effort to **address** and status recommendations continuously by next review
- **Debriefing of Senior HQ Mgmt / Acquisition Executive** jointly by the Review Chair and Program on Committee results within a week; basis for management action/attention

The Review Committee

- Committee size commensurate with scale and phase of project
  - An appropriate balance of scientists, engineers, and managers
  - An appropriate balance of member institutions
  - An appropriate balance of personalities
- Pool of experts developed in close consultation with program, project, and subcommittee chairs
- Review Chair is the final authority on committee membership

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Department of Energy Review of the
National Synchrotron Light Source-II (NSLS-II) Project
November 15-17, 2010

Daniel R. Lehman, DOE, Chairperson

SC1 Accelerator Component Production WBS 1.03.01/04/06/07/08	SC2 Accelerator Installtion and Commissioning WBS 1.03.02	SC3 Experimental Facilities WBS 1.04 / 1.02.02	SC4 Controls Systems WBS 1.03.05
Rod Gerig, ANL	* John Seeman, SLAC	* Mark Beno, ANL	* Ned Arnold, ANL
Richard Boyce, SLAC	Graeme Murdoch, ORNL	Zahid Hussain, LBNL	Mark Heron, Diamond LS
Pat Den Hartog, ANL	David Rice, Cornell	Jorg Maser, ANL	Karen White, ORNL
Will Oren, TJNAF	James Safranek, SLAC	Mohan Ramanathan, ANL	
Bill Merz, TJNAF	Richard Walker, Diamond LS	Wolfgang Sturhahn, NASA	
Ali Nassiri, ANL			

SC5 Conventional Facilities WBS 1.05	SC6 Env., Safety and Health WBS 1.01.02 / 1.1.4	SC7 Cost and Schedule	SC8 Project Management WBS 1.01 / 1.06
Joe Harkins, LBNL	* Ian Evans, SLAC	* Ron Strykowsky, PPPL	* Mark Reichanadter, SLAC
Steve Jack, SLAC	Jim Healy, SLAC	Kin Chao, DOE/SC	Larry Dardzinski, SLAC
Ron Lutha, DOE/AS		Liz Dahlen, SLAC	Joe May, DOE/TJSO
			Steve Meador, NSF
			Don Rej, LANL

Observers

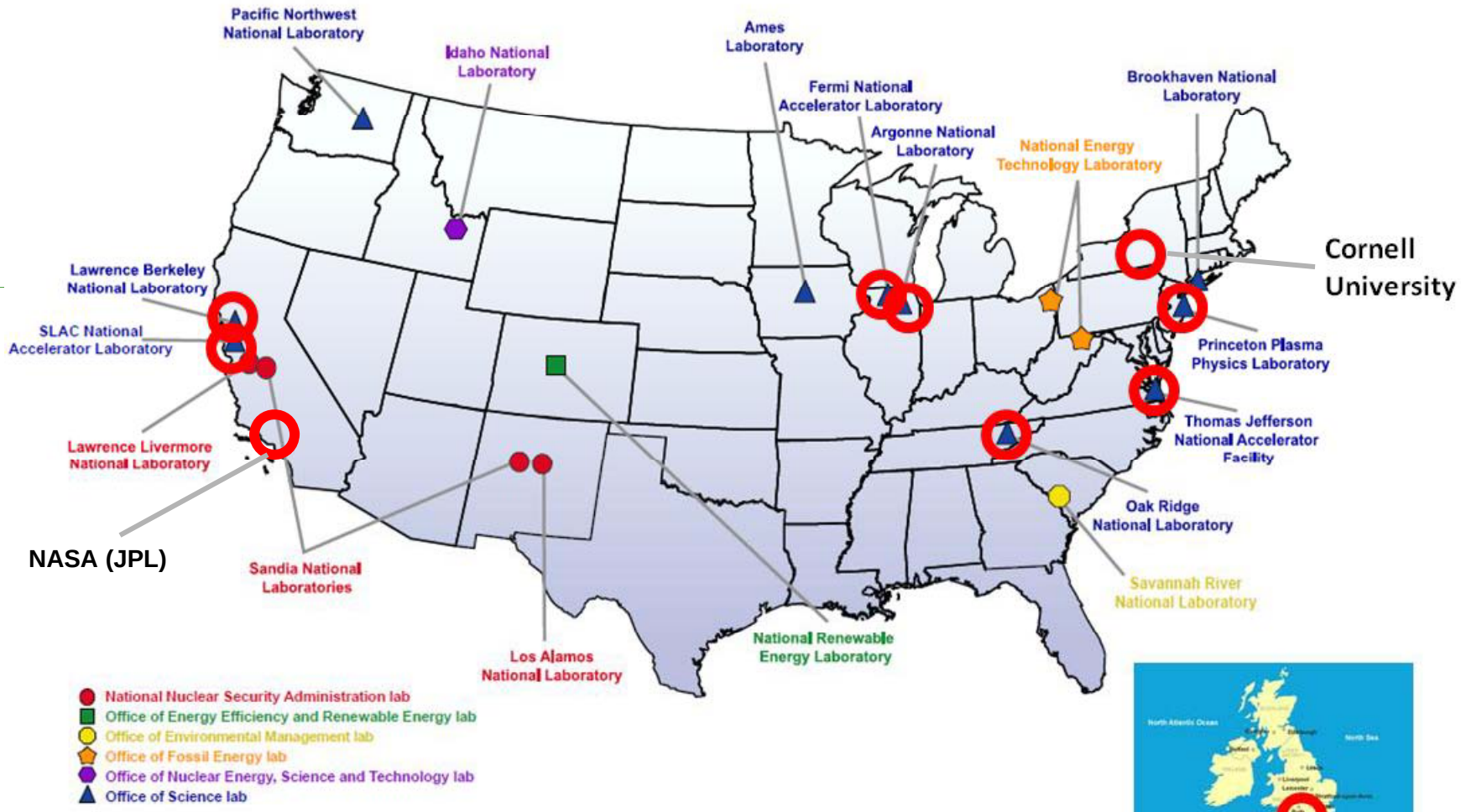
Harriet Kung, DOE/SC	John Tapia, DOE/SC	Brian Huizenga, DOE/OECM	
Pedro Montano, DOE/SC	P. Thiyagarajan, DOE/SC	Evelyn Landini, DOE/BHSO	
Phil Kraushaar, DOE/SC	Mike Holland, DOE/BHSO	Angela Harvey, DOE/ASO	
Peter Lee, DOE/SC	Frank Crescenzo, DOE/BHSO	Dean Haeffner, ANL	
Susan Weber, DOE/SC	Joseph Eng, DOE/BHSO	Garth Duncan, Bech	
Walter Lowe, DOE/SC			

LEGEND

SC Subcommittee
* Chairperson
[ ] Part-time Subcommittee Member

Count: 33 (excluding observers)

Marks the Home Institution of NSLS-II Review Committee Members



Diamond Light Source

Simplified Review Process

Pre-Review	Review	Post-Review
o Charge o Committee o Agenda o Logistics o Project Information o Internal Project Reviews	o Plenary o Breakouts o Executive Sessions o More Breakouts o More Executive Sessions o Closeout Briefing	o Review Summary o Management Debriefing o Final Report o Track Actions and Recommendations
← 3-4 Months →	← 2-3 Days →	← 1-2 Months →

Notable Observations

- The **specific areas to be assessed** determine the needed experience and expertise of committee members
- **Influencing committee** by slanting, withholding, or overwhelming with information **is not useful**
- "**Homework**" assignments for the project are frequent and necessary to support the committee in real-time during the review
- Those new to the SC review process are often pleasantly surprised at **how well the closeout comes together** – a reflection of the effort invested over many months/careful management during the review
- Many remark about the opportunity to **share lessons learned** – reviewers and project alike

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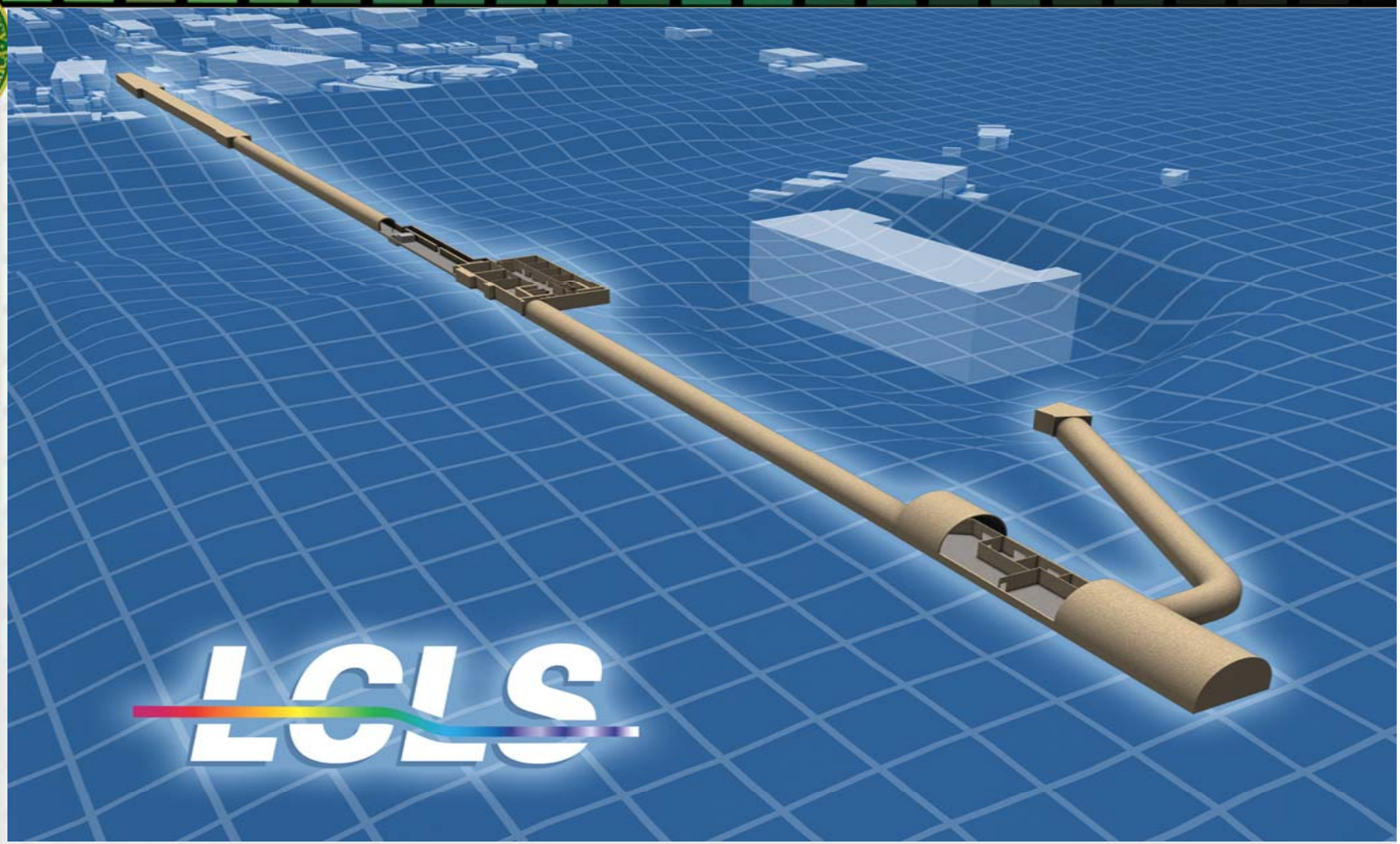
Owner's Perspective

Hanley Lee

(formerly) SC Federal Project Director

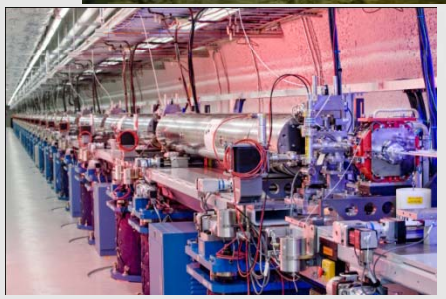
for the LCLS Project

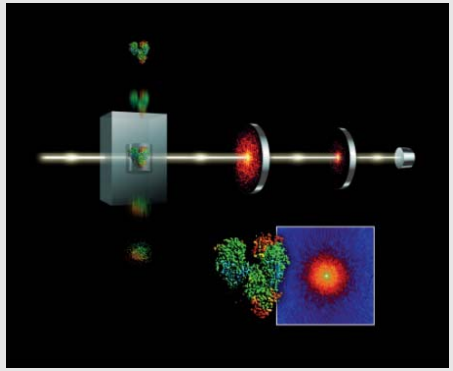


Linac Coherent Light Source

Linac Coherent Light Source

- Conventional Facility
  - Half mile tunnel extension of existing accelerator
  - Two experimental halls
  - Utilities and service facilities
  - Office building
- Technical Equipment
  - Electron Injector
  - Undulator magnets
  - Electron and x-ray transport systems
  - Controls and diagnostics
- Science program started October 2009
  - Three user runs have been completed
  - Scientific proposals have increased exponentially
  - 314 proposals by 1100 scientist from 25 countries
  - LCLS can only provide beam-time to 25% of proposals
  - Four instruments are currently operational
  - Two more instruments being installed
- **Next expansion phase approved April 2010**





- FPD Responsibilities/Expectations
  - Owner's field representative accountable for project execution
  - Independent assessment of project performance
  - Seamless partnership with the laboratory
  - Make course corrections when needed
- Office of Science Peer Reviews
  - 18 Peer Reviews of the project
  - Mix of full formal reviews and shorter status reviews
  - Committee membership from DOE complex, universities, and international laboratories
  - Expert-based, in-depth reviews of all aspects of the project
  - Preparation is a key benefit to the project

Linac Coherent Light Source

- External Assessment of Project
  - Provides a check and balance to the owner
  - Validates ground level evaluation of performance
  - Independent analysis
    - Conceptual design alternatives
    - Civil Construction bids
- Aligns Project Organization
  - Fosters seamless communication and interaction
  - Focuses project organization
  - Ensures critical issues are managed and resolved
  - Reviews are adaptable to evaluate emerging problems
- Benefit from Lessons Learned
  - Experts from across the complex bring their experiences
  - Provide external advice where the project may not know to ask
  - Ensures a consistent approach to project management within SC

Peer Review
at the Molecular Foundry

Jim Krupnick, PMP
(formerly) Project Director
Molecular Foundry Project
Lawrence Berkeley National Lab

- Office of Science Nanoscale Science Research Center
- $85.0 million TPC (new research facility & equipment)
- CD-0 approved in June 2001
- CD-1 review failed in December 2001
  - Project buried 4 levels down within an LBNL scientific division
  - Inadequate project management expertise
  - Contingency too low
- Management team replaced; project rescoped
- Second CD-1 review passed in April 2002
- CD-4 achieved May 2006
- Project completed within budget, on time, with enhanced scope

Molecular Foundry

Molecular Foundry

- Lehman review every 6 months for 4 years.
- Benefits the project and the reviewers
- Project
  - Focused the team on visible milestones
  - Proper preparation requires thoughtful planning and rigorous analysis of project risk
- Reviewers
  - Best practices of other projects/Labs
  - Time to think about your own project

Molecular Foundry

- LBNL's prep for Lehman Reviews
  - Main responsibility lies with project team
  - LBNL Project Management Officer provides oversight; represents senior management
  - Formal dry run presentations
    - Initially internal to the project
    - Later with external project management experts and other SMEs, as appropriate.
  - Proper preparation provides assurance to Lab senior management and deepens the project team's understanding of risks

Molecular Foundry

Peer Review
at the National Ignition Facility

Scott L. Samuelson, PMP

(formerly) NNSA Federal Project Director

for the NIF Project

- Conceptual Design Start 1993
- CD-3 Baseline:
  - TPC = $1.2 B
  - Completion (end of) FY03
- Major Rebaseline – FY 2000
  - TPC $2.25B (plus explicit program cost of $1.2B)
  - Completion (end of FY 08)
- Minor Baseline Modifications due to Directed Changes
  - TPC held at $2.25B (program cost increased to $1.25B)
  - Completion Date moved to Q2 FY 09
- Between 2000 and Project Completion in 2009, NIF was the subject of <u>many</u> major external reviews

National Ignition Facility

- Prior to 2000, NIF Reviews were largely internal to the Program
- In 2000, we had reviews by the SEAB and GAO
  - Ultimately S-1 Certified the new baseline to Congress
- After the new baseline was in place, we needed something different to help keep the project on track, and to provide evaluations credible to our stakeholders
  - We turned to the review process that was recognized as credible and effective – peer review

National Ignition Facility

- There were a total of 4 Lehman-style reviews for NIF
  - When the right team is assembled, and focus is maintained, these are extremely useful
    - Member credibility and attitude are critical
    - Team Leader plays a vital role – experience required!
  - There is great value in preparing for the review, as well as in the feedback from the team
  - Follow-up is essential

National Ignition Facility

Summary

Summary

- Peer reviews don't guarantee success, but have proven to be **useful to the "owner"** and the project to identify and address major issues
- Projects too often have **optimistic** rather than **realistic** view of events
- Projects **slow to look outside** for solutions

Management, Management, Management!

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