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SLAC Assurance Program Description

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Acronyms and Definitions

BCS	beam containment system
BES	DOE Office of Basic Energy Sciences
BIS	Business Information System
BSD	Business Services Division
CAMP	DOE Capital Asset Management Process
CAS	contractor assurance system, as driven by DOE Order 226.1, "Implementation of Department of Energy Oversight Policy"
CATS	corrective action tracking system
CEF	Conventional and Experimental Facilities Department
CGS	Chemical and General Safety Department
CM	configuration management
COO	chief operating officer
DOE	United States Department of Energy
EPAC	Experimental Program Advisory Committee
ES&H	environment, safety, and health
ES&HCC	Environment, Safety, and Health Coordinating Council
ESHAC	Environment, Safety, and Health Advisory Committee
FTP	field task proposal
GPP	general plant project
HEP	DOE Office of High Energy Physics
IPWG	Infrastructure Prioritization Working Group
IRC	Infrastructure Review Committee
ISEMS	integrated safety and environmental management system
JHAM	job hazard analysis and mitigation
MD	Mechanical Design Department
MFD	Mechanical Fabrication Department
MPS	machine protection system
MSDS	material safety data sheet
OA	SLAC Office of Assurance
ORPS	occurrence reporting and processing system
PAAA	Price-Anderson Amendments Act

PPS	personnel protection system
PR	purchase requisition
QA	quality assurance, as driven by DOE Order 414.1C, “Quality Assurance”
QIP	quality implementation procedure
SLAC	Stanford Linear Accelerator Center
SPC	SLAC Policy Committee
SSO	DOE Stanford Site Office
SSRL	Stanford Synchrotron Radiation Laboratory
STA	SLAC Training Assessment
WFO	work for others

Assurance system. A comprehensive and integrated system which identifies and addresses the following:

- Program and performance deficiencies
- Opportunities for improvement
- The means to report deficiencies to the responsible managers and authorities
- An effective implementation of corrective and preventive actions
- Lessons learned across all aspects of operations

Configuration management. As used here, configuration management refers to maintaining consistency and adequacy among the design requirements, physical configuration, and facility documentation necessary to protect workers, the public, and the environment during the operational life cycle of a facility or experiment.

Quality assurance (QA). To ensure that products and services meet or exceed customers’ expectations. To achieve QA all work is to be based upon the following principles.

- That quality is assured and maintained through a single, integrated, effective QA program (that is, management system)
- QA methods are applied consistently site-wide using a single approach created from the best practices of all participating groups
- That management support for planning, organization, resources, direction, and control is essential to QA
- That performance and quality improvement require thorough rigorous assessment and corrective action
- Line management is responsible for the quality, business, compliance, and operational goals of their units. This includes ensuring workers are successful at achieving and maintaining quality
- That environmental, safety, and health risks and impacts associated with work processes are minimized while maximizing reliability and performance of work products and services

1 Introduction

1.1 Overview and Purpose

This high-level policy document describes the Stanford Linear Accelerator Center (SLAC) assurance program, including all elements of quality assurance (QA) and program-specific assurance systems. Elements of both QA and assurance systems complement and are integrated with the SLAC environment, safety, and health (ES&H) system described in the *SLAC Integrated Safety and Environmental Management System Description.*[1]

The purpose of SLAC's assurance program is to ensure products and services meet or exceed customers' expectations. SLAC's customers include the Department of Energy (DOE), the many users who participate in experiments at SLAC using the laboratory's unique experimental facilities, and the sponsors of work done under the work-for-others (WFO) program. SLAC's assurance program also makes certain that SLAC meets the many commitments enumerated in the contract between the Stanford University Board of Trustees and the DOE for the operation of SLAC.

1.2 Scope

This document sets institutional standards and requirements, the implementation of which is described here and in lower-level assurance systems described in Section 4, "Assurance Systems – Program-specific".

1.3 Applicability

The policies in this document apply to SLAC's science and operations programs.

1.4 Applicable Standards

The assurance program is designed to meet the following standards:

- DOE Order 226.1, "Implementation of Department of Energy Oversight Policy"[2]
- DOE Order 231.1A, "Environment, Safety and Health Reporting"[3]
- DOE Order 414.1C, "Quality Assurance"[4]

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1 *SLAC Integrated Safety and Environmental Management System Description* (SLAC-I-720-0A00B-001), http://www-group.slac.stanford.edu/esh/general/isems/sms.pdf

2 DOE Order 226.1, "Implementation of Department of Energy Oversight Policy", http://www.directives.doe.gov/pdfs/doe/doetext/neword/226/o2261.html

3 DOE Order 231.1A, "Environment, Safety and Health Reporting", http://www.directives.doe.gov/pdfs/doe/doetext/neword/231/o2311ac1.html

- DOE Order 420.2B, "Safety of Accelerator Facilities"[5]
- American National Standards Institute/American Society for Quality (ANSI/ASQ) Z1.13-1999, "Quality Guidelines for Research" [6]

1.5 Organization and Responsibilities

Organization and responsibilities are described in Section 2, "Quality Assurance Program", including how SLAC meets all 11 criteria given by DOE Order 414.1C of a quality assurance program. Criterion one is the management description, contained in Section 2.1.

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4 DOE Order 414.1C, "Quality Assurance", http://www.directives.doe.gov/pdfs/doe/doetext/neword/414/o4141c.html

5 DOE Order 420.2B, "Safety of Accelerator Facilities", http://www.directives.doe.gov/pdfs/doe/doetext/neword/420/o4202b.html

6 American National Standards Institute/American Society for Quality (ANSI/ASQ) Z1.13-1999, "Quality Guidelines for Research", http://webstore.ansi.org/ansidocstore/find.asp

See the SLAC Library, http://www.slac.stanford.edu/library/, for available standards.

2 Quality Assurance Program

This section describes how SLAC meets the 11 criteria of the DOE standard on quality assurance, as well as the spirit of ANSI/ASQ Z1.13-1999. Sections primarily correspond to contractor QA program requirements of DOE Order 414.1C, "Quality Assurance".[7] Documents that implement SLAC QA policy are referenced.

2.1 Management Program

2.1.1 Mission and Organization

The SLAC mission is as follows:[8]

- Photon Science Discoveries – To make discoveries in photon science at the frontiers of the ultrasmall and ultrafast in a wide spectrum of physical and life sciences
- Particle and Particle Astrophysics Discoveries – To make discoveries in particle and particle astrophysics to redefine humanity's understanding of what the universe is made of and the forces that control it
- Operate Safely and Train the Best – To operate a safe laboratory that employs and trains the best and brightest students, helping to ensure the future economic strength and security of the nation

SLAC strives to meet this mission within the context of a safe and respectful workplace. (See the SLAC ES&H[9] and respectful workplace policies.[10])

SLAC's organization is depicted in Figure 1, the SLAC directorate-level organization chart. The director of the Office of Assurance, who reports to the laboratory director, is designated as the senior SLAC official responsible for the development, implementation, assessment, and improvement of all assurance activities, including quality assurance. The charter of the Office of Assurance and key activities in support of that charter are described in Section 2.1.2.2, "Office of Assurance".

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7 DOE Order 414.1C, "Quality Assurance", http://www.directives.doe.gov/pdfs/doe/doetext/neword/414/o4141c.html

8 SLAC Mission Statement, http://home.slac.stanford.edu/welcome/mission.html

9 Stanford Linear Accelerator Center Environment, Safety and Health Policy (SLAC-I-720-0A00B-003), http://www-group.slac.stanford.edu/esh/about_esh/eshpolicy.htm

10 Stanford Linear Accelerator Center Respectful Workplace Policy, http://home.slac.stanford.edu/welcome/respectful.html

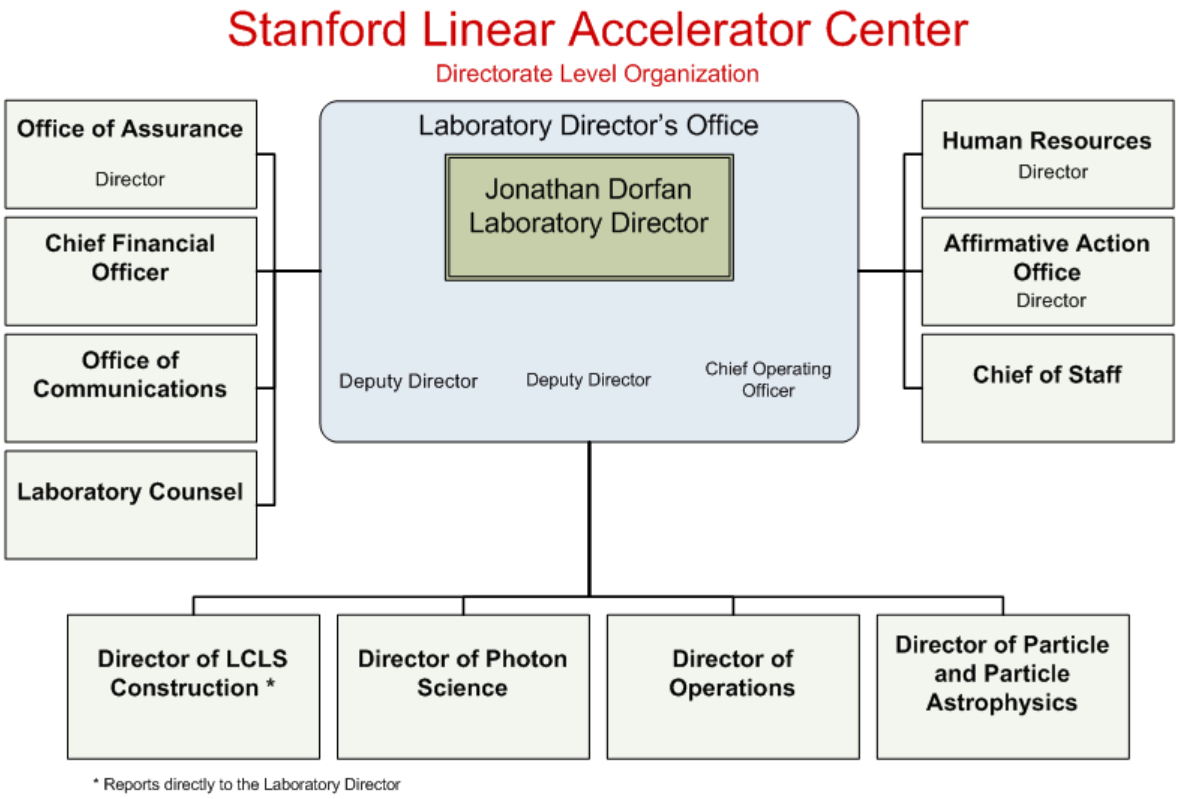

Figure 1 SLAC Directorate-level Organization Chart

2.1.2 Functional Responsibilities and Levels of Authority

2.1.2.1 Laboratory Director

The laboratory director is responsible for all aspects of SLAC's science and operations programs. He or she has accountability to the DOE through the DOE Stanford Site Office (SSO) and the DOE Office of Science, as well as the president and provost of Stanford University. Part of the director's responsibility is to implement a program that assures Stanford University and the SSO that SLAC programs

- Are safe, secure, adhere to ethical and compliant business practices, meet customer requirements, and meet reasonable standards of formality
- Meet requirements and standards specified in the contract between Stanford University and the Department of Energy for operation of SLAC
- Meet or exceed customer requirements

2.1.2.2 Office of Assurance

The charter of the Office of Assurance (OA) follows.

Through a formally described program, to include quality assurance and program-specific contractor assurance systems, the director of OA assures the laboratory director and DOE's Stanford Site Office

(SSO) that SLAC programs are safe, secure, adhere to ethical and compliant business practices, meet customer requirements, meet reasonable standards of formality, and satisfy all contractual requirements.

The director of the Office of Assurance reports to the laboratory director. This is necessary to ensure that the independent internal assessments conducted by the OA are free from the management influence of the organizations, programs, and facilities that are assessed.

The key activities of the OA follow:

- Maintain current performance information. Apprise the laboratory director throughout the performance year of performance against all contract performance measures, internal goals and metrics, and standards SLAC must or has agreed to follow
- Work closely with programs of the Operations Directorate to coordinate the development and maintenance of program-specific assurance systems, incorporate existing assurance activities and documents whenever possible, and avoiding duplication with requirements in other DOE standards
- Maintain institutional standards for formality of operations, management descriptions, documents, procedures and records, and verify adherence to such standards
- Undertake appropriate independent assessments, validations, and other similar activities designed to confirm the efficacy of self-assessment activities. This will include verification of closeout of corrective actions from both assessments and incidents. OA will also confirm that such corrective actions were effective.
- Respond to concerns expressed by individuals that relate to quality assurance or contractor assurance systems. OA will fully investigate concerns and notify appropriate levels of management.
- Serve as the primary point-of-contact with SSO on all matters of assurance. Work to make the SLAC and SSO assurance systems complementary where it is advantageous to do so.
- Formally document the overall assurance program

2.1.2.3 Program Directors and Subordinate Line Managers

Program directors and subordinate line managers are responsible for ensuring QA principles and requirements defined here are implemented within their directorates. This includes conducting effective line self-assessment as described in the program-specific assurance systems (see Section 4, “Assurance Systems – Program-specific”) and developing effective requirements documents at the directorate and subordinate levels.

2.1.2.4 Program Managers Responsible for Assurance System Development

2.1.2.4.1 Associate Director, ES&H Division

The associate director of the ES&H Division is responsible, with the director, Office of Assurance, for developing and maintaining assurance systems for the ES&H and emergency management programs.

2.1.2.4.2 Associate Director, Business Services Division

The associate director of the Business Services Division is responsible, with the director, Office of Assurance, for developing and maintaining the physical security assurance system.

2.1.2.4.3 Assistant Director, Scientific Computing and Computing Services Group

The associate director of the Scientific Computing and Computing Services Group is responsible, with the director, Office of Assurance, for developing and maintaining the cyber security assurance system.

2.1.2.5 Individuals

Management is responsible for leadership and commitment to quality achievement and improvement within a framework of public, worker, and environmental safety. Management retains the primary responsibility and accountability for the scope and implementation of the assurance management system. Each individual is also responsible for achieving quality in his or her activities.

2.1.3 Management Processes

2.1.3.1 Planning and Scheduling

Overall funding levels are set by DOE following submission of SLAC's field task proposals (FTPs), line item requests, and infrastructure program justifications. Priorities are set through discussions with the two primary DOE sponsors of SLAC, the Office of High Energy Physics (HEP) and the Office of Basic Energy Sciences (BES). Dialogue with both offices continues throughout the year as annual programs are implemented. As well, discussions with both sponsors must include work-for-other (WFO) funding and how it impacts SLAC's core operations.

2.1.3.2 Resource Allocation

DOE and SLAC invest in programs and projects in pursuit of SLAC's scientific missions. Balanced priorities, that is, keeping the need for investments in ES&H with investments in programs that pursue SLAC's scientific objectives, are ensured by both organizations.

Sections 2.1.3.2.1, "HEP", and 2.1.3.2.2, "BES", discuss how safety is balanced with program proposals contained in DOE FTPs for the HEP and BES funded activities as well as DOE line-item requests.

Section 2.1.3.2.3, "General Plant Projects (GPP) and Infrastructure", discusses how environment, safety, and health considerations are balanced with program needs in the annual infrastructure investment process. In this process, a pool of funds is created each year by setting aside program money received from DOE and other entities, and also general plant project (GPP) funds prioritized for SLAC projects.

Individual DOE FTPs, DOE line-item requests, and even WFO proposals must include funding sufficient to ensure proposed work will meet customer expectations and be performed both safely and in an environmentally sound manner. SLAC programs that submit FTPs and WFO proposals are directly responsible for this as are SLAC managers at all review levels. Line-item requests submitted to DOE's Office of Science (larger, usually facility-level investments) will follow DOE acquisition management orders to ensure the same.

2.1.3.2.1 HEP

The Experimental Program Advisory Committee (EPAC) advises the SLAC director on the selection of facilities and experiments for the HEP programs and on modifications of facilities, basic installations, and resource requirements that would substantially influence experimental programs. The SLAC director receives EPAC input and consults with the ES&H division associate director on ES&H impacts of each

proposal. The director notifies project proponents of his decision. The approved work may commence subject to normal review requirements of the Safety Overview Committee (see the *ES&H Manual,* Chapter 31, "Institutional ES&H Committees"[11]), institutional safety officers, or the ES&H Division. Such reviews verify that the proponent for a new project, program, or experiment has done an adequate hazard analysis and that controls will adequately eliminate or reduce hazards to workers, the public, and the environment.

2.1.3.2.2 BES

For proposals using the Stanford Synchrotron Radiation Laboratory (SSRL), users are guided by instructions for submitting proposals posted on the SSRL web site. After proposals are submitted, they are ranked by peer review and receive a safety analysis by SSRL staff. Work may usually commence without additional ES&H reviews as the experiment specific hazards are generally small and well addressed by SSRL staff who oversee the experiments.

2.1.3.2.3 General Plant Projects (GPP) and Infrastructure

ES&H considerations are an integral part of planning infrastructure improvements. The annual SLAC Infrastructure Review Committee (IRC) process issues a call for proposals each summer. Project managers develop proposals with input from ES&H subject matter experts, end-users, Purchasing, and the Budget Office.

Proposals are reviewed and initially prioritized by the Infrastructure Prioritization Working Group (IPWG). The group uses the DOE's Capital Asset Management Process (CAMP – DOE 4320.2) to rate projects. CAMP's major category rating criteria are

1. Health and Safety
2. Environment
3. Safeguards and Security
4. Programmatic Impact

Likelihood of risk is considered for each project in each category. Results are summarized and presented to the IRC for review and adjustment as appropriate.

The IPWG and IRC review and prioritize projects as needed during the year in addition to the main yearly summer prioritization session. The IPWG chair and IRC coordinator are staffed by the chief operating officer's (COO) budget and financial planner. This person reports on ES&H GPP and infrastructure projects quarterly to the ES&H Coordinating Council (ES&HCC), which is comprised of senior SLAC management and key advisors.

2.2 Personnel Training and Qualification

Ensuring adequate qualifications and training of individuals, employees and non-employees alike, is the responsibility of all elements of line management, including program directors, department heads, and group leaders. Line management is responsible for articulating qualification requirements for each job position as noted in the corresponding position summary and included in the qualifications section of

11 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 31, "Institutional ES&H Committees", http://www-group.slac.stanford.edu/esh/committees/chapter/policies.htm

employment requisitions used to fill positions. The annual employee performance evaluations review the performance and the competence of employees with respect to their current job activities. Also done in conjunction with the employee performance evaluations, supervisors validate the employee's job hazard analysis and mitigation (JHAM) document and SLAC Training Assessment (STA) to ensure the employee has completed or will soon complete all required training. Training to improve quality of work is also considered in the annual employee performance evaluation. The ES&H Division provides information about training classes, administrative techniques for training, and guidance to departments or groups on training plan preparation in Chapter 24, "Training", of the *ES&H Manual*.[12]

Program directors, department heads, and group leaders are responsible for specifying adequate qualifications for each job. In addition, they are responsible for providing any on-the-job training needed for particular jobs or tasks. Personnel directly responsible for operation of accelerators receive specific training relevant to their jobs. Records of such training are kept by the applicable directorate.

Personnel who are responsible for safety systems, for example, the personnel protection system (PPS) or the beam containment system (BCS) or monitoring environment, safety, and health systems, such as Operational Health Physics or Radiation Physics, receive highly specialized training keyed to their job. Records of specific training are to be retained by the appropriate directorate.

Specific sections supporting the employee training and qualification program follow.

2.2.1 Hiring Qualified Candidates

The web site, "Employment – SLAC Human Resources", describes the hiring process, including how essential and desirable job responsibilities are articulated for each candidate search.[13]

2.2.2 Maintaining Proficiency

This program is described at the "Training & Development – SLAC Human Resources" web site[14] and also at the "ES&H Training" web site.[15]

2.2.3 User Training and Qualifications

User training programs are described for both main user populations, that is, those who use the Stanford Synchrotron Radiation Laboratory (SSRL) light source and those who participate in the BaBar project. For SSRL users, training is described at "Training & Safety".[16] For BaBar users it is described at "Instructions for BABAR Users at SLAC".[17]

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12 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 24, "Training", http://www-group.slac.stanford.edu/esh/training/chapter/policies.htm

13 "Employment – SLAC Human Resources", http://www-group.slac.stanford.edu/hr/e/

14 "Training & Development – SLAC Human Resources", http://www-group.slac.stanford.edu/hr/t/

15 "ES&H Training", http://www-group.slac.stanford.edu/esh/training/

16 "Training & Safety", http://www-ssrl.slac.stanford.edu/users/user_admin/training.html

17 "Instructions for BABAR Users at SLAC", http://www.slac.stanford.edu/BFROOT/www/Organization/Spokesperson/safety/safety_checklist.htm

2.2.4 Supervisor Training

This program is described at the "Certificate in Supervision Program" web site.[18]

2.3 Quality Guidelines for Research and Processes for Quality Improvement

2.3.1 Quality Guidelines for Research

As stated in Section 1.4, "Applicable Standards", SLAC has adopted ANSI/ASQ Z1.13-1999, "Quality Guidelines for Research". Sections that follow are keyed to this standard's requirements.

2.3.1.1 Planning Research at SLAC

Strategic planning for scientific programs is conducted by the SLAC director. He is aided in this effort by external bodies such as the DOE High Energy Physics Advisory Panel and the Stanford University SLAC Policy Committee. The goal is to position SLAC to be on the forefront of scientific discovery and maximizing the value of its physical and intellectual assets.

Research planning for a specific year begins with DOE field task proposals (FTPs), which are high-level documents describing to SLAC's main sponsors/customers within the Office of Science, Basic Energy Science (BES), and High Energy Physics (HEP) what research is planned for a coming year and what facilities will be used. As funding levels are set, the SLAC director assigns priorities for the two main scientific programs at SLAC, Photon Science and Particle and Particle Astrophysics. For the HEP program, he uses the Experimental Program Advisory Committee (EPAC) to assist in program selection decisions.

At the project levels, various documents will be used to clarify roles and responsibilities and research methodologies that will be used.

2.3.1.2 Performing and Documenting the Research

Work is performed by generally accepted scientific methods and in anticipation of publication in peer reviewed journals. The SLAC Info Media Solutions Department aids in this process, providing assurances that articles are adequately prepared for publication and are archived appropriately following publication.

2.3.1.3 Assessing the Performance of the Research

Research staff members assess performance of their research ethically and in anticipation of publication in peer reviewed journals and review by DOE. Problems with experiment performance are identified and corrected at the earliest possible stage. Research staff remains vigilant for ways to improve the scientific output.

2.3.1.4 Transferring the Results of Research

SLAC does not engage in significant technology transfer and all of its work is published in open literature. The main scientific output, technical papers, are published in peer reviewed journals.

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18 "Certificate in Supervision Program", http://www-group.slac.stanford.edu/hr/t/supervision.html

2.3.1.5 Quality Management Planning and Leadership

SLAC adheres to the DOE standard for a quality assurance (QA) system. One key element of QA is contract performance measures, which are heavily weighted to the science and technology measures. This, plus the yearly DOE program reviews, helps ensure scientific output attains quality acceptable to both the primary customer, DOE, and to SLAC itself.

2.3.1.6 Research Assessments

As stated, not only do research staff members conduct their experimental work in anticipation of publication in peer-reviewed journals, their work is subject to review by the Stanford University SLAC Policy Committee and by DOE during its annual program reviews.

2.3.1.7 Quality Improvement

The process of peer review, DOE program reviews, and contract performance measurement help ensure scientific output and products satisfy the needs of SLAC's customers and stakeholders.

2.3.2 Quality Improvement

It is management's responsibility to identify, analyze causes of, resolve, and follow up on recurring technical and compliance problems. The degree of these efforts should be commensurate with the degree of programmatic significance, financial impact, compliance, public relations, or environment, safety, and health risks associated with the problems. Management documents the failures and non-conformances that are identified from these efforts. Lessons learned incorporated into designs and operations allow for continuous improvement. Additional guidance on these topics as relates to ES&H accidents and incidents is provided in the *ES&H Manual,* Chapter 28, "Incident Investigation",[19] Chapter 33, "Line Management Self-assessment",[20] and in the *SLAC ISEMS Description.*[21]

For significant incidents, management is also responsible for ensuring that problems are reported to the occurrence reporting program facility manager, and that causes are identified and corrected under the requirements of the SLAC *Workbook for Occurrence Reporting.*[22] This workbook is intended to meet the requirements of DOE Order 231.1A, "Environment, Safety and Health Reporting", and associated guides and manuals.[23]

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19 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 28, "Incident Investigation", http://www-group.slac.stanford.edu/esh/general/incident/policies.htm

20 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 33, "Line Management Self-assessment", http://www-group.slac.stanford.edu/esh/general/self_assessment/policies.htm

21 *SLAC Integrated Safety and Environmental Management System Description* (SLAC-I-720-0A00B-001), http://www-group.slac.stanford.edu/esh/general/isems/sms.pdf

22 *Workbook for Occurrence Reporting,* https://www-internal.slac.stanford.edu/operations/orps/Workbook.pdf

23 DOE Order 231.1A, "Environment, Safety and Health Reporting", http://www.directives.doe.gov/pdfs/doe/doetext/neword/231/o2311ac1.html

Management encourages the use of causal and statistical analysis in the review of the performance of operations where appropriate. Statistical techniques are helpful in evaluating failures, near misses, and *close calls* (defined in the *ES&H Manual,* Chapter 28, "Incident Investigation"[24]) and identifying significant trends in processes where statistical techniques are applicable. These responsibilities are shared with the Office of Assurance.

The Office of Assurance also plays an important role in quality improvement. OA validates that corrective actions have been implemented and that they are effective. In this area, QA standards and contractor assurance system standards often overlap. This role is described both in the OA charter and in the program-specific assurance systems described in Section 4, "Assurance Systems – Program-specific".

Management encourages a no-fault attitude where employees feel free to identify and report problems so that deficiencies are quickly identified and resolved. Even when employees do not feel free to share concerns with their line management, SLAC offers ways to communicate concerns and lessons learned through e-mail and by phone (see "Close Calls and Concerns" for information[25]).

When possible, SLAC uses peer review to improve continually designs, processes, and programs. Special teams will also be used to review deficiencies and to recommend proposals for corrective actions to solve problems.

2.3.2.1 Role of Assurance Systems

Assurance systems driven by DOE Order 226.1[26] are designed to identify and address program and performance deficiencies through a system of assessments; opportunities for improvement; provide the means and requirements to report deficiencies to the responsible managers and authorities; establish and effectively implement corrective and preventive actions; and share lessons learned across all aspects of the SLAC operations. SLAC has or is developing assurance systems for the ES&H, cyber security, physical security, and emergency management programs. SLAC's ES&H assurance system and other improvement processes are contained in the *SLAC ISEMS Description.*[27]

2.3.2.2 Root Cause Assessment and Effective Corrective Action

Each assurance system (see Section 4, "Assurance Systems – Program-specific") describes a system of assessments designed to identify issues, a process to deal with issues that are both assessment and incident related, how root cause analysis is to be done, and how corrective actions are to be assigned through the SLAC Corrective Action Tracking System (CATS), the SLAC issues management system. Additionally, the Office of Assurance validates that corrective actions have been completed and that they are effective.

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24 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 28, "Incident Investigation", http://www-group.slac.stanford.edu/esh/general/incident/policies.htm

25 "Close Calls and Concerns", http://www-group.slac.stanford.edu/esh/concerns/

26 DOE Order 226.1, "Implementation of Department of Energy Oversight Policy", http://www.directives.doe.gov/pdfs/doe/doetext/neword/226/o2261.html

27 *SLAC Integrated Safety and Environmental Management System Description* (SLAC-I-720-0A00B-001), http://www-group.slac.stanford.edu/esh/general/isems/sms.pdf

2.4 Documents and Records

2.4.1 Document Hierarchy

SLAC categorizes its documents into one of four tiers, as described below.

2.4.1.1 Tier 1 Documents

Tier 1 documents are laboratory-wide policies. Tier 1 documents are reviewed by the Policy Steering Committee and the laboratory director prior to approval, as detailed in SLAC Policy Generation and Maintenance Policy.[28]

Approved Tier 1 and 2 documents, addressed in the following section, are available in the Policy Repository.[29]

2.4.1.2 Tier 2 Documents

Tier 2 documents are laboratory-wide requirements documents including notices, directives, and guidelines. Tier 2 documents include such important documents as the

- *SLAC Integrated Safety and Environmental Management System Description*[30]
- *SLAC Environment, Safety, and Health Manual*[31]
- *SLAC Guidelines for Operations*[32]
- *SLAC University Technical Representative Guide*[33]
- Safety assessment documents[34]

Such documents implement policy and may be approved by program directors. However, Tier 2 documents that create ES&H requirements must be reviewed and approved by the ES&H Coordinating Council (ES&HCC). The ES&HCC is described in the *ES&H Manual,* Chapter 31, "Institutional ES&H

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28 SLAC Policy Generation and Maintenance Policy (SLAC Policy 0001), http://www2.slac.stanford.edu/policy/docs/SLACPolicyGenerationMaintenance.pdf

29 "Policy Repository Home", http://www2.slac.stanford.edu/policy/default.asp

30 *SLAC Integrated Safety and Environmental Management System Description* (SLAC-I-720-0A00B-001), http://www-group.slac.stanford.edu/esh/general/isems/sms.pdf

31 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), http://www-group.slac.stanford.edu/esh/eshmanual/

32 *SLAC Guidelines for Operations* (SLAC-I-010-00100-000), https://www-internal.slac.stanford.edu/ad/addo/gfo/gfoindex.html

33 *SLAC University Technical Representative Guide* (SLAC-11-01-07-01), https://www-internal.slac.stanford.edu/operations/manuals/UTRManual.pdf [to be revised]

34 "Safety Assessment Documents", https://www-internal.slac.stanford.edu/ad/addo/SAD/sadindex.html

Committees".[35] The ES&H policy and requirements process is detailed in Chapter 1, "General Policy and Responsibilities".[36]

2.4.1.3 Tier 3 Documents

Tier 3 documents are requirements documents that apply within a directorate, division, department, group, or project. Tier 3 documents include work procedures, instructions on work processes, and *quality implementing procedures (QIPs)*. Such documents are approved by program directors or other responsible managers.

2.4.1.3.1 Work Procedures

Work procedures are Tier 3 documents that identify work processes having a significant impact on any of the following:

- Programs
- Financial systems
- Potential impacts on environment, safety, and health

Work procedures are the responsibility of the issuing directorate, division, department, group, or project line managers. Line management creates work procedures that will ensure quality, financial integrity, compliance, and safety.

Examples of collections of work procedures include

- Accelerator Systems Division documentation[37]
- Klystron documentation[38]
- Mechanical Fabrication Department procedures[39]

2.4.1.3.2 Quality Implementing Procedures (QIPs)

Quality implementing procedures (QIPs) are Tier 3 documents that are used to define quality work practices for an entire project. Examples include the LCLS quality assurance[40] and the QIP Configuration

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35 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 31, "Institutional ES&H Committees", http://www-group.slac.stanford.edu/esh/committees/chapter/policies.htm

36 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 1, "General Policy and Responsibilities", http://www-group.slac.stanford.edu/esh/general/general_policy/policies.htm

37 "Accelerator Systems Division Documentation", https://www-internal.slac.stanford.edu/ad/addo/addo.html

38 "Klystron Safety & Documentation", https://www-internal.slac.stanford.edu/kly/klystron_safety_page.htm

39 "MFD Documentation Archive", https://www-internal.slac.stanford.edu/mfd/procedures.html

40 [access restricted] https://www-lcls-internal.slac.stanford.edu/projectspace_L2/QA/QAMain_default.htm

Management – Electrical Systems documents.[41] Requirements for creating QIPs are given in Assurance: Quality Implementing Procedure (QIP) Requirements.[42]

2.4.1.4 Tier 4 Documents

Tier 4 documents include permits and approvals required by Tier 2 or Tier 3 requirements documents. These may be issued by the ES&H Division, one of the institutional safety officers, or the Safety Overview Committee and its system of citizen committees. It may also include formal approvals issued by program directors and applicable only to a single directorate.

2.4.2 Document Control

Documents and records are arranged hierarchically and each is assigned a unique number for the purposes of document control. To ensure the accuracy and usability of a document each document should have a document plan (Section 2.4.2.1, "Document Plan") and follow a documentation process (Section 2.4.2.2, "Documentation Process").

As a minimum each page of a document should contain the document number, revision number, and the date of the last approved revision.

2.4.2.1 Document Plan

A document plan clarifies expectations at the outset by identifying the purpose of the document and the audience. It also specifies the originator, reviewers, and approvers as well as information about related documents and revision plans. A document plan prevents duplication of information and effort and makes the task of writing the document easier.

It is recommended that a document plan be completed for every document. Document plans are also appropriate for major revisions of existing documents.

The document plan includes the following information:

- Document title
- Document number
- Originator (who establishes the requirements)
- Reviewers
- Approvers
- Purpose of the document
- Audience
- Related documentation
- Distribution

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41 Quality Implementing Procedure: Configuration Management – Electrical Systems, http://www-group.slac.stanford.edu/esh/references/QIPconfelectrical.pdf

42 Assurance: Quality Implementing Procedure (QIP) Requirements (SLAC-I-770-0A17S-001), https://www-internal.slac.stanford.edu/OA/documents/assuranceReqsQIP.pdf

- Planned revisions to ensure that documents are current and up-to-date
- Archive requirement

2.4.2.2 Documentation Process

The document plan is the first step in the documentation process.

The documentation process consists of the following basic steps. If a document is released before each step of the process has been completed, there is likelihood that the document will contain incomplete and inaccurate information.

1. Create a document plan
2. Write the first draft
3. Review first draft
4. Resolve issues and incorporate valid comments
5. Format and/or edit
6. Approve the document
7. Publish and distribute
8. Archive document in appropriate storage place

The originating organization maintains a master index and cumulative copies of all approved versions of a document.

2.4.3 Computer Code

Directorate, department, group, and project leaders are responsible for implementing programs that ensure that computer codes critical to the success of programs within the directorate are controlled with respect to unauthorized access and stored in a fashion to prevent uncontrolled changes or accidental loss.

Note *SLAC does not have safety software under the definition of DOE Order 414.1C, "Quality Assurance".*

2.4.4 Records Management

The Business Services Division is responsible for the site-wide program for records management and records.[43] Items such as essential transaction documents, safety and health records, and other records required by the site-wide program will be archived through the central records management system, and backed up as appropriate. Directorates, departments, groups, or project leaders are responsible for working with the BSD in maintaining records.

Apart from the mandated site-wide records management program, directorates, departments, groups, or project leaders must ensure that sufficient records exist to reflect accurately the present and final status of completed work. A well developed records management system will

43 "Records Management at SLAC", https://www-internal.slac.stanford.edu/bsd/rm/

- Have a record inventory
- Have a record storage area that is appropriate to the level of records maintained
- Have a record review schedule that identifies records that are to be maintained or removed from the system
- Be approved by the appropriate level of management

2.4.5 Configuration Management

The purpose of configuration management (CM) is to establish consistency and discipline among the design requirements, physical configuration, and facility documentation necessary to protect workers, the public, and the environment during the operational life cycle of a facility. The purpose of this section is to identify the requirements and approaches to implementing configuration management for SLAC facilities.

SLAC has used a graded approach in applying configuration management standards and three programs have been established to date. They are described in the following sections. SLAC is actively evaluating other configuration control programs that help ensure work planning can accurately assess hazards of work.

2.4.5.1 Radiation Configuration Management

Radiation configuration management is described in the *SLAC Guidelines for Operations*, Guideline 14, "Configuration Control of Radiation Safety Systems".[44] This guideline implements configuration management for important safety systems such as the Personnel Protection System and the Beam Confinement System.

2.4.5.2 Electrical Systems Configuration Management

Electrical systems configuration management is addressed in Quality Implementing Procedure: Configuration Management – Electrical Systems.[45] This QIP sets standards to ensure electrical systems are well documented and are not altered without approval of a central authority. In so doing, electrical work planning by the Conventional and Experimental Facilities (CEF) Department and work reviews by the electrical safety officer will be more effective and provide a greater assurance that work can be conducted safely.

2.4.5.3 Mechanical Design Document Control

Records for all formally released SLAC engineering documents are housed in the MD Draw database.[46]

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44 *SLAC Guidelines for Operations* (SLAC-I-010-00100-000), Guideline 14, "Configuration Control of Radiation Safety Systems", https://www-internal.slac.stanford.edu/ad/addo/gfo/[010-00100-000_GFO]14_R000.pdf

45 Quality Implementing Procedure: Configuration Management – Electrical Systems, http://www-group.slac.stanford.edu/esh/references/QIPconfelectrical.pdf

46 "MD Document Control", http://mdweb.slac.stanford.edu/Doc%20Control.php

2.5 Work Processes

Line management is required to evaluate and ensure that people performing work have the appropriate skills, background, and academic qualification or professional certification to carry out the work. See Section 2.2, "Personnel Training and Qualification".

The line is also required to evaluate and to implement calibration programs so that incorrect calibration does not affect critical programmatic or financial results, or lead to additional environment, safety, and health risks. All mechanical and electronic measuring and testing devices, such as instruments, tools, gauges, and reference and transfer standards, that are used in any of the following applications, will be controlled, calibrated, and adjusted at specific intervals. These intervals will be determined by manufacturer recommendations if specified or by the required accuracy, stability characteristics, and other conditions affecting the measurement.

Calibration programs will be applied to

- Ensure personnel safety
- Inspect, calibrate, and determine acceptability of equipment or processes
- Prevent costly equipment damage
- Measure critical values as determined by each directorate, department, group, or project leader
- Measure critical values related to the machine protection system (MPS), personnel protection system (PPS), and beam containment system (BCS)
- Measure critical environment, safety, and health related values

Activities are to be performed according to procedures for any work with significant programmatic, financial, or ES&H impacts where such procedures provide control and assurance. Work must also be performed according to existing SLAC design standards and fabrication standards as applicable, and in accordance with routine and non-routine JHAMs.

In addition to R&D work, a major portion of work processes at the laboratory involve the operation and, during some periods, construction of accelerator facilities. Work that is to be performed according to the requirements of this section includes:

- Production of equipment which is to be (part of) a long-term facility
- Modifications to an existing long-term facility
- Activities which have potentially significant environment, safety, and health impacts

The operation of accelerators is described in the *SLAC Guidelines for Operations*. Responsibilities, authorities, policies, and requirements for work using and maintaining the accelerator facility are also specified in the guidelines.

2.6 Design Activities

The QA program requires that sound engineering and scientific principles and appropriate technical standards be incorporated into designs of SLAC facilities, equipment, and experiments to ensure that they all will perform as intended. Design requirements are to be employed to a level of detail that is

commensurate with the scale, cost, complexity, hazards, design phase (conceptual to final), and programmatic significance of the design. The risk assessment obtained through safety analysis reviews or other risk assessment processes should also be used as applicable to define the degree of rigor associated with the design.

Appropriate controls are to be in place within directorates, departments, groups, or projects to assure that designs are correctly translated into specifications and drawings where required. Input from interfacing organizations (especially the ES&H Division, the Conventional and Experimental Facilities Department, and the Safety Overview Committee) is essential in developing compliant and supportable designs.

Final designs, field changes, and modifications are to be approved and documented by the original design organization, or a designee. Design interfaces and corresponding responsibilities are to be defined so that design efforts are effectively coordinated among the participating organizations.

Design drawings and records must be maintained as part of the configuration management program described in Section 2.4.5, "Configuration Management". The Conventional and Experimental Facilities Department is the repository for information on building and support system design, including electrical systems. The Mechanical Design Department is responsible for engineering document control, which includes all specifications and drawings.

Design inputs, processes, outputs, and changes are to be reviewed by qualified individuals or groups other than those who performed the original design, but who may be from the same organization. The level of detail of review and the methods used should be appropriate to the scale, cost complexity, hazards, and programmatic significance of the design. Design verifications are normally completed before manufacture, installation, or construction.

The level of design review and validation of designs of computer software should be appropriate to the complexity, cost, hazards, and programmatic significance of the program code.

The ES&H Division will maintain designs and records associated with the engineering controls designed to protect human health and the environment. ES&H-related design input and design review requirements for experimental apparatus (including those designed by outside users) is provided as described in the SLAC *ES&H Manual*.

2.7 Procurement

Purchasing of all items and services is under the control of the purchasing officer within the Business Services Division (BSD). This includes automated data processing equipment, construction, materials, services and consulting agreements. See the Business Services Purchasing Procedures for a complete description of the SLAC procurement program that addresses the key criteria:[47]

- Procured items and services meet established requirements and perform as specified
- Prospective suppliers are evaluated and selected on the basis of specified criteria
- Processes are established and implemented to ensure approved suppliers continue to provide acceptable items and services

47 Business Services Purchasing Procedures (the "Red Book"), https://www-internal.slac.stanford.edu/bsd/pur/forms/redbook2000.pdf

Specifications for procurement of items or services will be developed to the degree necessary to ensure that items ordered are fit for their intended use. The degree of specification will be based on the potential for costly failure, cost of the item, impact of failure on schedule, experience with procurement of the item, and environment, safety, and health risks. The level of specification required is determined by agreement between the Purchasing Department and the user, in keeping with the requirements of this plan. Three levels of specifications in the sections that follow are to be used depending on the circumstances:

2.7.1 Formal Technical Specifications

This specification is used for procurement of costly and typically complex items. Users of the item or service are responsible for drafting formal technical specifications. The user and the Purchasing representative are to review the specifications prior to issuing the solicitation. Formal technical specifications may include SLAC designated drawings, part numbers, schematics, and/or numbered technical specifications.

2.7.2 User-defined Specifications

This specification is to be used for procurement of somewhat less critical or costly items. The creation of this specification is the responsibility of the user (see Section 2.6, “Design Activities”) in coordination with the Purchasing representative. Examples of a user-defined specification are a specific vendor item or a university-approved equal.

2.7.3 Part Numbers

Part numbers are used to place orders on items that are procured on a regular or off-the-shelf basis. The user is responsible for specifying the vendor part number.

The requestor of the item is responsible for providing or referencing on drawings, specifications, or purchase requisitions all of the requirements regarding an appropriate receiving inspection, source inspection, vendor certification, lot traceability, material safety data sheet (MSDS) requirement, industry standards, and acceptance sampling as necessary.

2.7.4 Procurement of Materials Having a Major Potential Impact

For purchased materials with major operation impact or potential environment, safety, and health impact, users will require appropriate materials certifications. Examples of situations where certifications might be used include

- Items that have critical performance characteristics, where the performance characteristics cannot be measured on-site without duplicating costly measuring equipment
- Assembled products where access to the area in question cannot be obtained without costly disassembly
- Examples of procured items or services with environment, safety, and health impact that require certifications include but are not limited to
  - Pressure and vacuum vessels (to demonstrate compliance to the American Society of Mechanical Engineers [ASME] code requirements). Specific experimental vessels are approved on a case by case basis by review of the Hazardous Experimental Equipment Committee

- Hazardous and radioactive waste drums (to demonstrate requirements under Department of Transportation regulations)
- Analytical services for environmental work (to demonstrate qualification under the applicable California Department of Health Services laboratory certification program)

2.7.5 Inspections

The requestor is responsible for defining the requirement for incoming inspection on the purchase requisition (PR) and attaching sufficient details so as to allow potential vendors to properly bid on the work. Ongoing, incoming inspection services for items are performed by line organizations and outside organizations as necessary. If the inspection is beyond the scope of these inspection facilities, the user is responsible for providing for the inspection.

Where inspection is required, items purchased are to be accepted by the user on a material acceptance report prior to payment to the vendor. Purchasing has the responsibility for selecting vendors, with the user providing recommendations for preferred suppliers. In special circumstances where there may be a special environment, safety, and health impact, a vendor-survey team may be formed comprised of:

- A representative from Purchasing
- The applicable environment, safety, and health operations department
- A member of the Office of Assurance

See Section 2.8, “Inspection and Acceptance Testing”, for more on inspection and acceptance testing.

2.7.6 Subcontractors, Special Qualification

The requirements for special qualifications of subcontractors for activities of high environment, safety, and health impact are to be defined in the request for proposal. The qualification process is to include a review of the vendor’s QA program, review of any state or federal certifications required to perform the work, and, as practical, a site visit from the appraisal team. The complete subcontractor safety program is described in two chapters of the *ES&H Manual*: Chapter 42, “Subcontractor Construction Safety”,[48] and Chapter 49, “Services Subcontractor Safety”.[49]

2.8 Inspection and Acceptance Testing

Directorate, department, group, or project leaders are responsible for staffing, documenting, and performing inspection and testing activities in a manner consistent with the programmatic and environment, safety, and health risks associated with the work. Inspection and testing is required prior to installing equipment into long-term facilities, if technically possible, and as necessary to assure a reasonable probability of successful operation of equipment on installation and use. Special inspection and testing is to be undertaken by

48 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 42, “Subcontractor Construction Safety”, http://www-group.slac.stanford.edu/esh/hazardous_activities/subcon_construction/policies.htm

49 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 49, “Services Subcontractor Safety”, [forthcoming]

Directorate, departments, groups, or project leaders on items with a potential for safety, health, or environmental risks.

The Hazardous Experimental Equipment Committee reviews the test programs for experimental pressure and vacuum vessels. When inspection and testing is performed, the attributes to be inspected or tested, the inspection procedures, hold points, and specification for acceptance are to be defined. The results of inspections and tests are to be recorded and retained. In cases of failure, the causes of the failure, if known, will be documented.

Equipment used for ongoing inspection or test programs is to be calibrated as necessary to assure measurement error is small compared to the requirements of the measurements. Requirements for calibration programs are covered in more detail in Section 2.5, “Work Processes”.

2.9 Management Assessments

SLAC managers are responsible to assess their management processes and identify and correct problems that hinder SLAC and the directorates from achieving objectives. Specific responsibilities are described in the program-specific assurance systems where systems of assessments are described (Section 4, “Assurance Systems – Program-specific”).

2.10 Independent Assessments

Independent assessments complement management assessments ensuring that assessment activities are free from management influence of the facilities, staff, and processes being assessed. Independent assessments are conducted in several ways:

1. The DOE conducts multiple independent assessments each year. Some of these are in the role of contract overseer; some are in the role as regulator. All results are evaluated for corrective actions that are tracked through completion in the SLAC’s issues tracking system, CATS
2. There are non-DOE regulators that conduct independent assessments at SLAC. Here again, corrective actions stemming from such assessments (usually described as inspections) are tracked in CATS
3. The Office of the President, Stanford University, conducts independent assessments. This includes both the science and technology programs and some operations programs
4. The Office of Assurance, which reports directly to SLAC’s laboratory director, will also conduct independent assessments often teaming with subject matter experts external to SLAC. As with other forms of assessment, corrective actions stemming from such assessments are tracked in CATS

Each program-specific assurance system describes in greater detail the assessment system unique to each.

2.11 Suspect/Counterfeit Items Prevention Process

Counterfeit and suspected counterfeit parts are a problem because they frequently do not meet the standards of the genuine parts they imitate and, as a consequence, may be both a quality and safety hazard to SLAC’s workers, missions, and property. To avoid this risk, those in the SLAC community who obtain bolts, fasteners and circuit breakers should do so through SLAC Stores. SLAC Stores orders only from reliable

vendors and verifies the items are not counterfeit, thus assuring the safety of the end-user. Information about SLAC Stores is available at the "BIS – Stores" web site.[50]

Not all procurements of bolts, fasteners and electric circuit breakers are made through SLAC Stores, however. Those who procure these items directly from vendors may run a higher risk of obtaining counterfeits and need to be vigilant. Staff members who have concerns over the authenticity of items obtained outside of SLAC Stores may contact the following:

- Bolts, fasteners, and hoisting and rigging equipment: contact the Chemical and General Safety Department, ES&H Division[51]
- Electric circuit breakers: contact the electrical safety officer[52]
- For all other items contact the ES&H Division[53] or the Office of Assurance[54]

50 "BIS – Stores", http://www-bis1.slac.stanford.edu/main/stores.asp

51 "CGS Contacts", https://www-internal.slac.stanford.edu/esh/departments_groups/cgs/contacts.htm

52 "Electrical – Contacts", http://www-group.slac.stanford.edu/esh/hazardous_activities/electrical/contacts.htm

53 "Contact List", http://www-group.slac.stanford.edu/esh/about_esh/contacts.htm

54 "Contact: Office of Assurance at SLAC", https://www-internal.slac.stanford.edu/OA/contact.htm

3 Assurance Systems – General

This section speaks to general requirements for assurance systems. Sections relate directly to contractor requirements in DOE Order 226.1, "Implementation of Department of Energy Oversight Policy".[55] Documents that implement SLAC assurance system policy are appended.

3.1 Assessments

3.1.1 Management Self-assessments

Programs are in place for ES&H and emergency management. They are described in the *ES&H Manual,* Chapter 33, "Line Management Self-assessment",[56] and in the *Building Manager Program Manual*.[57] Programs for management self-assessments in physical security and cyber security are under development.

3.1.2 Independent Internal Assessments

3.1.2.1 Office of Assurance Validation of Line Self-Assessment

The Office of Assurance will validate results of line management assessment by observing self-assessment activity or through independent assessments.

3.1.2.2 Office of Assurance Validation of CATS Issue Closeouts

The Office of Assurance will also validate that issues reported as being closed out were in fact appropriately addressed and that corrective action has been effective.

3.1.2.3 Office of Assurance-led Assessments

The Office of Assurance will also lead or arrange for independent reviews of sub-programs within the programs subject to assurance system requirements.

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55 DOE Order 226.1, "Implementation of Department of Energy Oversight Policy", http://www.directives.doe.gov/pdfs/doe/doetext/neword/226/o2261.html

56 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 33, "Line Management Self-assessment", http://www-group.slac.stanford.edu/esh/general/self_assessment/policies.htm

57 *Building Manager Program Manual* (SLAC-I-720-0A03Z-001), http://www-group.slac.stanford.edu/esh/references/BMPM.pdf

3.1.3 External Assessments

3.1.3.1 Stanford University

Stanford University's Internal Audit Department conducts independent assessments of SLAC financial accounting and other business practices. The SLAC Policy Committee (SPC) also reviews SLAC's science and technology programs as well as its ES&H program.

3.1.3.2 ES&H Advisory Committee

The ES&H Advisory Committee (ESHAC) is an external committee that works in conjunction with the SPC. A high-level goal of the SPC is to review the state of the overall SLAC ES&H program as well as other ES&H issues that could affect Stanford University or SLAC.

The ESHAC is assembled by the SLAC director. The goals of the ESHAC are to review the SLAC ES&H vision, mission, strategy, plans, progress against the plans, performance, and significant issues that could affect Stanford University or the institution. Twice each year, the ESHAC conducts external assessment designed to evaluate the state of the SLAC-wide ES&H systems and performance.

3.1.3.3 External Regulatory Agencies

SLAC is subject to multiple jurisdictions, including the DOE for radiation protection and occupational safety. Other agencies include the state of California, local counties, the Bay Area Air Quality Management District, and the Bay Area Regional Water Quality Control Board.

3.2 Event Reporting

3.2.1 Occurrence Reporting

SLAC adheres to standards and requirements of DOE occurrence reporting as described in the DOE Manual 231.1-2, "Occurrence Reporting and Processing of Operations Information".[58] The occurrence reporting function lies within the Office of Assurance, though responsibility is shared with the Operations Directorate. The complete ORPS program as implemented at SLAC is described at "Occurrence Reporting Processing System (ORPS) Program".[59]

Occurrence reporting covers primarily ES&H events but also includes certain events related to emergency management. Event reporting in the other assurance system programs (cyber security and physical security) are government by specific DOE requirements in those programs and are addressed in the program-specific assurance systems (Section 4, "Assurance Systems – Program-specific").

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58 DOE Manual 231.1-2, "Occurrence Reporting and Processing of Operations Information", http://www.directives.doe.gov/pdfs/doe/doetext/neword/231/m2311-2.html

59 "Occurrence Reporting Processing System (ORPS) Program", https://www-internal.slac.stanford.edu/operations/orps/

3.2.2 Price-Anderson Amendments Act

To date, Price-Anderson Amendments Act (PAAA) reports have been rarely generated for actual or potential violations of 10 CFR 835, DOE's rule on Occupation Radiation Protection.[60] With the advent of the new rule 10 CFR 851,[61] DOE's worker safety and health program and the requirement to use the PAAA reporting system, more activity may take place. Reporting thresholds are being developed that will clarify when non-compliance tracking system reports are required. While PAAA reporting is an Office of Assurance function, it is a shared responsibility with the ES&H Division, as described in its program-specific assurance system.

3.2.3 Lower-Level

Non-ORPS, non-PAAA events will be investigated, tracked in CATS if appropriate, and, where appropriate, reported to the SSO. (See the *ES&H Manual*, Chapter 28, "Incident Investigation".[62])

3.3 Worker Feedback Mechanisms

All staff members are instructed annually on providing feedback in the ES&H, emergency preparedness, physical security, and the cyber security program areas. Concerns are normally communicated to an individual's supervisor. But there are other means of doing so:

- ES&H and emergency management concerns and feedback can be communicated as described on the "Safety or Environmental Concerns" web site.[63]
- Cyber security concerns and feedback can be communicated as described at "SLAC Computer Security".[64]
- Physical security concerns and feedback can be communicated as described at "Laboratory Safeguards & Security".[65]
- Business operations concerns and feedback can be communicated as described at "Waste, Fraud, Abuse Reporting"[66]

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60 Title 10, *Code of Federal Regulations*, Part 835, "Occupational Radiation Protection" (10 CFR 835), "Code of Federal Regulations: Main Page", http://www.gpoaccess.gov/cfr/index.html

61 Title 10, *Code of Federal Regulations*, Part 851, "Worker Safety and Health Program" (10 CFR 851). As of September 2006, 10 CFR 851 has not but published in the *Code of Federal Regulations*, but the final rule is available from the following site: "Worker Safety and Health Program Final Rule - 10 CFR 851", http://www.eh.doe.gov/health/rule851/851final.html

62 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 28, "Incident Investigation", http://www-group.slac.stanford.edu/esh/general/incident/policies.htm

63 "Safety or Environmental Concerns", http://www-group.slac.stanford.edu/esh/concerns/concerns/

64 "SLAC Computer Security", http://www2.slac.stanford.edu/computing/security/

65 "Laboratory Safeguards & Security", https://www-internal.slac.stanford.edu/ssec/Security/emergency.html

66 "Waste, Fraud, Abuse Reporting", https://www-bis1.slac.stanford.edu/public/dirsearch.asp?name=&firstname=&mailid=&phone=3317&gone=active (SLAC access only)

3.4 Issues Management/Corrective Action Tracking

3.4.1 CATS

The SLAC Corrective Actions Tracking System (CATS) is an issues management system.[67] It is intended for use with ES&H and emergency management issues but will be expanded in the near future to track issues in the other program-specific assurance systems.

3.4.2 ES&H Incident Investigation

Incident investigation is described the *ES&H Manual,* Chapter 28, "Incident Investigation".[68] Events subject to DOE occurrence reporting or PAAA reporting requirements are governed by the appropriate DOE directive.

3.5 Lessons Learned

The SLAC ES&H "Lessons Learned" web site[69]describes the sources of incidents used in the ES&H lessons learned program, methods of dissemination, and responsibilities of both the lessons learned program manager and line management.

3.6 Performance Measurement and Reporting

3.6.1 Contract Performance Measures

The Office of Assurance works with the SSO to develop annual performance measures for inclusion in the contract between the DOE and the Stanford University Board of Trustees for operation of the SLAC. Those performance measures that are ES&H-related may go through the ES&HCC for review and approval. Other measures are reviewed and approved by appropriate levels of SLAC management for example, BSD, Scientific Computing and Computing Services.

3.6.2 Internal Goals and Metrics

Beyond contract performance measures, which where possible are translated into measures and metrics for each directorate, SLAC may develop internal goals and metrics. This most often happens in the ES&H program. How each program decides on internal goals and metrics is described in the program-specific assurance system.

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67 "CATS System", https://www-internal.slac.stanford.edu/esh-db/slaccats/bin/start.asp (SLAC access only)

68 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 28, "Incident Investigation", http://www-group.slac.stanford.edu/esh/general/incident/policies.htm

69 "Lessons Learned", http://www-group.slac.stanford.edu/esh/concerns/lessons_learned/

3.6.3 Reporting

3.6.3.1 The Office of Assurance coordinates the annual SLAC self-evaluation against the contract performance measures preparing a report that is submitted to the SSO.

3.6.3.2 Program-specific assurance systems, such as is the case with the ES&H assurance system, may have additional annual reports that include internal goals and metrics.

4 Assurance Systems – Program-specific

4.1 ES&H Assurance System

The ES&H Assurance System, owing to its integral role in the SLAC Integrated Safety and Environmental Management System (ISEMS) is described in the *SLAC ISEMS Description.*[70] The line's role in ES&H self-assessment as part of the ES&H Assurance System is described in the *ES&H Manual,* Chapter 33, "Line Management Self-assessment".[71]

4.2 Other Assurance Systems

Further development of the following program-specific assurance systems awaits a DOE decision on applicability of DOE Order 226.1, "Implementation of Department of Energy Oversight Policy",[72] to these program areas (see Deputy Secretary Sell's July 5, 2006 memo in response to the DNFSB Recommendation 2004-1 Implementation Plan report submitted by Undersecretary Brooks by his memo of June 1, 2006).

1. Emergency Management Assurance System
2. Physical Security Assurance System
3. Cyber Security Assurance System

Regarding cyber security, the SSO and SLAC have agreed that, until applicability of DOE Order 226.1 is clarified, the SLAC cyber security system certification and accreditation, which DOE approved on June 26, 2006, and compliance with DOE Order 205.1, "Department of Energy Cyber Security Management Program", constitutes a cyber security assurance system.[73]

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70 *SLAC Integrated Safety and Environmental Management System Description* (SLAC-I-720-0A00B-001), http://www-group.slac.stanford.edu/esh/general/isems/sms.pdf

71 *SLAC Environment, Safety, and Health Manual* (SLAC-I-720-0A29Z-001), Chapter 33, "Line Management Self-assessment", http://www-group.slac.stanford.edu/esh/general/self_assessment/policies.htm

72 DOE Order 226.1, "Implementation of Department of Energy Oversight Policy", http://www.directives.doe.gov/pdfs/doe/doetext/neword/226/o2261.html

73 DOE Order 205.1, "Department of Energy Cyber Security Management Program", http://www.directives.doe.gov/pdfs/doe/doetext/restrict/neword/205/o2051.html