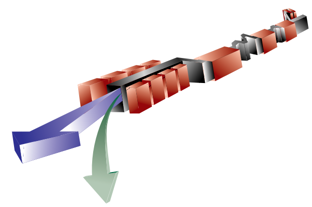
13 Environment, Safety and Health and Quality Assurance



It is SLAC's policy and objective to integrate safety and environmental protection into its management and work practices at all levels, so that its mission is accomplished while protecting the worker, the public, and the environment. To achieve this objective, SLAC has developed and implemented an Integrated Safety Management System plan (ISMS), required by DOE P450.4, Safety Management System Policy, which encourages and supports the use of: the Work Smart Standards process, development of measurable goals in the form of performance metrics, and uses existing programs and activities that have been deemed successful and which already incorporate the ISMS elements. (ISMS as a required element is implemented through the incorporation of a contract clause from the DOE Acquisition Regulations (DEAR), specifically DEAR 970.5204.-2, "Integration of Environment Safety and Health Into Planning and Execution". This clause was incorporated into the contract between DOE and Stanford University for operation of SLAC in February 1998.)

Fundamental to the ISMS process is the application of Guiding Principals (GPs) and Core Functions (CFs). GPs are a series of best management practices or "basic philosophy" that ensure start-to-finish management of ES&H issues. CFs provide the necessary structure that describes the scope of work, identifies and analyzes the hazard, develops and implements hazard controls, allows work to be performed within the controls, and uses feedback from the work performed to improve the safety system. Responsibility for achieving and maintaining excellence in this system rests with line management, who implement the SLAC ES&H policy with the personnel under their supervision.

Existing and mature programs at SLAC will be used to ensure that all aspects of the design, installation, testing and operational phases of the project are properly managed. The LCLS project will be presented to the SLAC Safety Overview Committee, which coordinates and assigns safety reviews for new projects or facility modifications to other citizen committees, which have knowledge or skills in a specific area. The hazards for the LCLS will require reviews from committees including but not limited to: Radiation Safety Committee, Electrical Safety Committee, Earthquake Safety Committee and the Fire Protection Safety Committee.

Operation of existing electron accelerators have given us an opportunity to identify the principal hazards and risks associated with them. They are: Ionizing Radiation, Electrical Safety Issues, Non-Ionizing Radiation, Seismic Safety Issues, Fire Safety (including

Emergency Preparedness), Construction Activities, Hazardous Material Issues and Environmental Protection; as they relate to the design, component manufacturing, system installation and operation of the LCLS facility. (See **Table 13-1**, which summarizes the hazards and mitigating controls.)

At SLAC, the LCLS project will not generate any hazards that have not already been defined and addressed within the Work Smart Standards and will not present any significant challenges from the ES&H perspective. All aspects of the project will conform to the applicable Work Smart Standards SLAC has adopted and written into its contract with the DOE.

Table 13-1 Hazard Identification and Mitigation.

Item	Hazard	Possible Causes	Mitigating Controls	Work Smart Standards
1	Ionizing radiation exposure, outside accelerator housing or experimental area - prompt radiation	- Personnel error - Interlock failure	- Safety Procedures - Design, maintenance and inspection of radiation safety systems - Training	10CFR835; Atomic Energy Act, DOE-N-441.4
2	Ionizing radiation exposure, inside accelerator housing or experimental area - prompt - residual - contamination	- Personnel error - Interlock failure	- Safety Procedures - Design, maintenance and inspection of radiation safety systems - Training	10CFR835; Atomic Energy Act, DOE-N-441.4
3	Fire; inside accelerator housing or experimental area - electrical - welding/cutting - smoking - hot work (soldering)	- Equipment failure - Personnel error	- Sprinklers - Smoke Detectors - Fire Alarms - Exit Routes - Training - On site Fire Department	Uniform Fire Code (UFC), National Fire Protection Association (NFPA), DOE-O-420.1
4	Fire; equipment and control areas - electrical - welding/cutting - smoking - hot work (soldering)	- Equipment failure - Personnel error	- Sprinklers - Smoke Detectors - Fire Alarms - Exit Routes - Training - On site Fire Department	Uniform Fire Code (UFC), National Fire Protection Association (NFPA), DOE-O-420.1
5	Electric shock - high voltage - low voltage/high current - exposed 110V	- Personnel error - Equipment failure - Interlock failure	- NEC Compliance - Design, maintenance and inspection of electrical interlock systems. - Procedures (Lock Out/Tag Out) - Training - PPE	National Electrical Code (NEC)

Table 13-1 Hazard Identification and Mitigation.

Item	Hazard	Possible Causes	Mitigating Controls	Work Smart Standards
6	Non-Ionizing radiation exposure - RF	- Personnel error - Equipment failure - Interlock error	- Design, maintenance and inspection of interlock systems - Procedures - Training.	American Conference of Governmental Industrial Hygienists (ACGIH) TLV for UV and RF radiation
7	Construction activities - heavy equipment - material handling - slips/trip/falls - tunneling	- Personnel error - Equipment failure	- Prework hazard analysis - Barriers - Procedures - Training - Inspections	Uniform Building, Plumbing and Mechanical Codes (UBC, UPC & UMC), CCR, Chapter 4, Subchapter 20, Tunnel Safety Orders, 30CFR, “Mineral resources,” Subchapter I Mine Safety
8	Seismic hazards	- Earthquake	- Prework hazard analysis - Design, construction and upgrade of structures (buildings, accelerator housings) and equipment to building and structural codes - Field inspections	Executive Order 12699, Specification for Seismic Design of Buildings, Structures, Equipment and Systems at SLAC.Doc # SLAC-I-720-0A24E-002
9	Exposure to hazardous materials, including: - cryogenics - solvents - oils - welding/cutting fumes	- Personnel error - Equipment failure	- Engineering analysis and inspection of systems using hazardous materials - Procedures - PPE - Training - Ventilation	Hazard Communication 29CFR19190.1200, SLAC ES&H Manual
10	Adverse effects to the environment - Spills - Water discharges to sanitary and storm drains - Noise - Air emissions (dust, leaks) - Soil contamination	Construction and installation activities - Equipment failure - Personnel error	- Training - Procedures - Inspections	Federal and State regulations, SLAC ES&H Manual

13.1 Ionizing Radiation

The design and operation of all radiation-producing facilities at SLAC are governed by the ALARA (as low as reasonably achievable) policy. SLAC has always maintained radiation dose limits below the maximum allowed by regulation.

13.1.1 Radiation Shielding

Shielding for the LCLS will conform to the Radiation Safety Systems Technical Basis Document, Chapter 1 Radiological Guidelines for Shielding and Barriers (SLAC-I-720-0A05Z-002). Under normal operation the design criterion will be (i) 1 rem/yr at 30 cm from the shield surface, assuming a 2000 hr working year and an occupancy factor of 1. In addition the LCLS will have non-radiological workers (Users), additional shielding may be required to maintain their annual effective dose equivalent below 0.1 rem/yr taking exposure duration and occupancy factors into account. SLAC internal design criteria also requires that under a system failure (ii) the total effective dose equivalent shall not exceed 3 rem for a broad beam and 12 rem for a narrow beam, and that under an accident scenario that requires human intervention to turn off the beam (iii) the maximum dose equivalent shall not exceed 25 rem averaged over a 1 hour period for broad beam exposure or 100 rem averaged over 1 hour for narrow beam exposure.

An analysis of the present shielding indicates that potential beam losses from the LCLS during operation could produce high radiation doses. Local shielding, in some cases movable, will be used to mitigate these hazards to acceptable values. Defining the type and amount of local shielding is dependent on the final configuration of the LCLS for the experimental halls and experimenter hutches. Installation of radiation loss monitors at the hutches also will provide a diagnostic capability that may be used to determine where beam losses are taking place. Adding this monitoring package in addition to the Beam Containment System (BCS) will further help maintain dose levels below those limits allowed at SLAC.

13.1.2 Personnel Protection System

The personnel protection system (PPS) consists of electrical interlocks and mechanical barriers whose primary functions are to prevent entry of personnel into a beamline enclosure when prompt radiation and electrical hazards are operating, and to turn off the beam, RF, and electrical hazards when a security violation is detected. Other functions that it must also accomplish are: (i) provide interlocks for the orderly searching of an area before beam is turned on, (ii) allow for various access states, such as No Access, Controlled Access or Permitted Access, (iii) have emergency shut-off capabilities, and (iv) control the electrical hazards in beam housing areas. As installation of the LCLS will not require a significant change to the present shielding footprint, the PPS will undergo only necessary upgrades and enhancements to address the new facility and operating conditions. These upgrades include: additional status and control interfaces to accommodate new power supplies, access control modules for the injector and experimental areas, logic upgrades, and interlocks with beam stoppers, Beam Shut Off Ion

Chambers (BSOICs), and those burn-through monitors that are controlled through the PPS. The PPS will remain largely the same in terms of its design, function, and configuration as other PPS to installations used at SLAC and SSRL, and all additions will conform to the Radiation Safety Systems Technical Basis Document, Chapter 2 Personnel Protection Systems (SLAC-I-720-0A05Z-002).

13.1.3 Beam Containment System

The Beam Containment System (BCS) prevents accelerated beams from diverging from the desired channel, and detects excessive beam energy or intensity that could cause unacceptable radiation levels. Beam containment is usually accomplished by a combination of passive devices such as collimators, which are designed to absorb errant beams, and active devices such as electronic monitors that shut off the beam when out of tolerance conditions are detected. The present BCS in the Linac consists of passive mechanical devices (such as slits, collimators, magnets, electron beam stoppers, and dumps) and active electronic devices such as average current monitors, burn through monitors, and beam shut off ion chambers. Additionally the LCLS will install photon stoppers, ion chambers, and burn-through monitors for the proposed beamlines. Gas absorption cells are planned to be installed in critical places, for attenuating the beam as needed.

13.1.4 Radiation Safety Training

In accordance with SLAC's Site Access and Identification Badges Policies and Procedures (SLAC-I-720-0A0Z-002-R001), all individuals at SLAC who enter the Radiologically Controlled Area (RCA) or the Accelerator Area must be either properly trained or escorted by a properly trained individual. Levels of training depend on the area to be accessed and in some cases the duration of the individual’s stay. (See **Table 13-2**.)

Table 13-2 Minimum Training Requirements for Unescorted Access

Access Required	Duration of Access	Potential Dose (mrem/yr)	Required Training Level					Dosimeter		
			Safety Orientation	EOESH	GERT	RWT I	RWT II	None	Annual	Quarterly
Industrial Areas Accelerator Area - No RCA	<60 days (within a year)	0	X					X		
Industrial Areas Accelerator Area - No RCA	>60 days (within a year)	0		X				X		
Accelerator Area RCA’s	Any	<100		X	X				X	
Accelerator Area RCA’s High Rad. Area	Any	Any		X	X	X				X
Accelerator Area RCA’s Contamination Area	Any	Any		X	X	X	X			X

13.2 Electrical Safety

An accelerator facility by nature has subsystems that either produce or use high voltage or high current, either of which can present an electrical hazard to personnel if not managed properly. As the LCLS will operate in a similar mode to other electron producing machines at SLAC, control and work procedures for electrical subsystems, as well as entry into the accelerator housing are well understood. Primary mitigation of the hazard will be through de-energization of equipment, placement of barriers and the effective use of Lock Out and Tag Out (LOTO) procedures.

In as much as the design, upgrade, installation and operation of electrical equipment will be in compliance with the National Electrical Code, Title 29 Code of federal Regulations, Parts 1910 and 1926 (as applicable) and SLAC's policy on Electrical Safety, SLAC ES&H Manual, Chapter 8 (SLAC-I-720-0A29Z-001-R007); entry into the accelerator housing requires the mitigation of electrical hazards through either the lockout of power supplies or selective use of mechanical barriers, interlocked to further reduce the risk of exposure to electrical shock. Various levels of electrical safety training and LOTO training are provided by SLAC for those personnel who may work on or near potential electrical hazards.

Infrequently it may be necessary to complete work on energized equipment. This is conducted under very limited and controlled conditions, using qualified employees and where appropriate, under the full approval of the Associate Director. (Refer to: SLAC ES&H Bulletin #47A, “Safe Work Practices for Exposed, Energized AC and DC Electrical Systems”.)

Special procedures will be developed to permit authorized personnel to occupy areas adjacent to energized magnets. These are called Electrical Hazard Test Procedures and allow local control of the electrical power supply feeding a single magnet, or unique string of magnets, that are to be tested.

13.3 Non-Ionizing Radiation

The LCLS rf system will produce radio frequency radiation in the 2856 MHz and 11424 MHz ranges, which when not controlled could have an adverse health effect on personnel working on or near the system. The LCLS will incorporate safety measures based on present operations. These include interlocked waveguides and vacuum chambers and strict adherence to procedures for installation and testing of the rf system.

As the rf energy is fully contained within the envelope of these wave guides or vacuum chambers under ultra-high vacuum, opening the system up will trigger the interlock through a pressurization of the system and effectively prevent the source from being energized. Running the RF in this mode precludes microwave leakage, as failure of the vacuum system will occur before exposure to non-ionizing rf radiation.

Procedures are also in place that ensure all flange bolts are torqued to a predetermined value as well as the completion of rf leak testing after all installations and maintenance activities, and periodically before start up of the system after scheduled shutdowns.

13.4 Emergency Preparedness

It has been estimated by the U. S. Geological Survey that the chance of one or more large earthquakes (magnitude 7 or greater) in the San Francisco Bay area in the coming 30 years is about 67 percent. This represents the emergency situation most likely to arise at SLAC. All SLAC personnel are trained in the immediate response to earthquakes and other emergencies via their supervisors and employee orientation.

13.4.1 Seismic Safety

SLAC structures are designed and constructed to minimize the effects of a major earthquake to acceptable levels. The majority of LCLS components will be installed in an existing facility, whose seismic stability is well documented and deemed acceptable. To further ensure and maintain a safe and healthful workplace, the design and construction of new experimental facilities' buildings as well as the design and installation of experimental equipment for the LCLS will also be reviewed by the Earthquake Safety Committee, as mandated by the Safety Program.

13.4.2 Emergency Planning

The design, review, installation and operation of all experimental equipment at SLAC is done in a manner that minimizes the risk of accident or injury to personnel and property in the event of either a natural disaster or emergency situation. SLAC's formal emergency planning system as described in the SLAC Emergency Preparedness Plan (SLAC-I-730-0A14A-001) will help ensure a logical, organized, and efficient site wide response to any emergency. Facility specific procedures, which supplement the SLAC emergency plan, support a timely initial response, further decreasing the probability of personal injury and limiting potential loss or damage to both property and the environment.

13.5 Construction Safety

13.5.1 General

During construction operations, oversight of subcontractor activities and safety compliance remains a line organization responsibility through the University Technical Representative (UTR) or Project Engineer, if a UTR is not assigned to the activity. Detailed activities and job functions are clearly set forth in the SLAC University Technical Representative Guide (SLAC-11-01-07-01) and Quality Assurance and Compliance Design

Assurance and Construction Inspection Procedure (SLAC-I-770-0A22C-001-R003). Responsibilities of UTRs or Project Engineers include, but are not limited to:

- Apprising subcontractors of SLAC and DOE safety criteria prior to construction.
- Informing subcontractors of the hazards routinely found at SLAC.
- Conducting periodic inspections of subcontractor construction areas to evaluate the quality of the subcontractor's safety compliance program and quality of work.
- Providing information to SLAC Citizen Safety Committees as required or requested.
- Communicating and resolving safety or quality deficiencies identified by SLAC personnel with the subcontractor.
- Receiving subcontractor accident reports and compiling information for reporting to the DOE.

Enforcement of subcontractor requirements is carried out by the SLAC Purchasing Department and may involve with holding payment(s) if applicable codes and standards are not met.

13.5.2 Tunnel

The LCLS configuration provides for two experimental areas (near and far hall), joined by a tunnel housing that contains the beam transport line. Early discussions and review of the tunnel portion of the project, helped determine the need for two separate tunneling techniques. Both of which may be required during construction. The two techniques that may be used include: “cut and cover”, which in essence is akin to trenching but on a much larger scale; and the use of tunnel boring equipment, for those portions of the beamline housing that cut and cover would be either technically or economically infeasible. While both of these methods have been used at SLAC for previous projects, they are infrequent operations and the hazards encountered are not familiar ones to the SLAC community. Accordingly the safety scope of this type of operation is well defined in both: the California Code of Regulations, Chapter 4. Division of Industrial Safety, Subchapter 20, Tunnel Safety Orders, and Title 30, Code of Federal Regulations, “Mineral resources,” Subchapter I Mine safety and Health Administration, Department of Labor. Subcontractors with mine safety expertise and experience will be used to provide the tunneling service.

13.6 Hazardous Materials

During the installation and operation phases of the LCLS it is anticipated that a minimum amount of hazardous materials will be used, examples would be paints, epoxies, solvents, oils and lead in the form of shielding, etc. There are no current or anticipated activities at the

LCLS that would expose workers to levels of contaminants (dust, odors, fumes) above acceptable levels.

The SLAC Industrial Hygiene Program detailed in the SLAC ES&H Manual addresses potential hazards to workers from the use of hazardous materials. The program identifies how to evaluate workplace hazards at the earliest stages of the project and implement controls to eliminate or mitigate these hazards to an acceptable level.

Site and facility specific procedures are also in place for the safe handling, storing, transporting, inspecting and disposing of hazardous materials. These are contained in the SLAC Introduction to Pollution Prevention, Hazardous Material and Waste Management "A Hazardous Materials Management Handbook" (SLAC-I-750-0A06G-001), and the ES&H Manual Chapter 4, "Hazard Communication" (SLAC-I-720-0A29Z-011-R012) which describes minimum standards to maintain for compliance with Title 29, Code of Federal Regulations, Part 1910.1200.

The UTR or Project Engineer has added responsibilities with respect to the management of hazardous materials. They ensure subcontractor personnel are aware of, and remain in compliance with SLAC's written Hazard Communication Plan, also keeping affected SLAC personnel informed of hazardous material usage and the associated hazards and risks.

13.7 Fire Safety

The probability of a fire in the LCLS is expected to be similar to that for present operations, as accelerator and beamline components are primarily fabricated out of similar, non-flammable materials and combustible materials in general are kept to a minimum. The most "reasonably foreseeable" incident or event with any substantial consequences would be a fire in the insulating material of the electrical cable plant caused by an overload condition. This differs from the maximum credible fire loss, which assumes proper functioning of the smoke detector system and a normal response from the on-site fire department. In this case, losses would be confined to isolated components, but includes magnets, vacuum chamber and associated cabling. The ES&H Manual Chapter 12, "Fire Safety" (SLAC-I-720-0A29Z-001-R007) address all fire safety issues.

Installation of new cables for the LCLS will meet the current SLAC standards for cable insulation and comply with National Electric Code (NEC) standards concerning cable fire resistance. While this reduces the probability of a fire starting, an aspiration type smoke detection system (VESDA) in the accelerator housing and fire breaks in the cable trays will mitigate fire travel. Support buildings for power supplies, electronic equipment or experimental areas are protected by automatic heat activated wet sprinkler systems and smoke detectors. Fire extinguishers are located in all buildings and accelerator housings for use by trained personnel. The combination of smoke detection systems, sprinklers and on-site fire department (response time ~3 minutes) affords an early warning and timely response to fire or smoke related incidents.

Burn injuries caused by a fire are not expected because nowhere in either the Linac accelerator housing or Final Focus Test Beam area or support buildings are personnel further than 150 ft from an exit and there is no location where two directions of egress are not available. Multiple entry/exit points also helps in keeping property damage to a minimum.

13.8 Environmental Protection

Installation of the LCLS will require the removal of some hardware (that is, magnets, vacuum chambers, FFTB magnets) and replacement with new components suited to the proposed facility (that is, new gun, injector and re-configuration of existing magnets and addition of a long undulator). Electrical distribution systems will be upgraded or renewed as appropriate and minor modifications to the Low Conductivity Water (LCW) system will be made to accommodate heat transfer needs. Some limited removal of asphalt and concrete will be required in the relocation of the FFTB beam dump. Removal of these materials and the subsequent installation activities will produce small quantities of hazardous, non-hazardous and radioactive waste that need to be managed through defined channels. Past history indicates that normal operation of the accelerator does not typically produce waste. However, some hardware may have induced radioactivity associated with it from its proximity and time close to the beam. Other components may contain hazardous materials as part of their design, e.g., mineral oil in electrical components, or have radioactive contamination from the LCW system.

All material removed from within the accelerator housing will be surveyed for residual radioactivity or contamination. If none is detected, then items would be salvaged; for re-use, as recyclable scrap material or disposed of as non-hazardous waste in an approved off-site landfill. Items that show residual radioactivity or contamination would be stored on site in the Radioactive Material Storage Yard for future reuse or ultimate disposal. Any hazardous waste would be disposed of in accordance with SLAC procedures and ultimately to a permitted Treatment, Storage and Disposal Facility, under regulations set forth in the Resource, Conservation and Recovery Act (RCRA).

Component manufacturing and system installation may also produce hazardous wastes, such as used solvent from degreasing baths or spent cutting fluids. These are ongoing operations at SLAC, disposal of wastes is routine, and in full compliance with SLAC's policies on the management of hazardous materials and waste minimization.

The addition of two experimental halls and the subsequent earth removal, tunneling and construction activities will necessitate conducting an Environmental Assessment under the National Environmental Protection Act. This document will look carefully at the consequences of siting a new facility at SLAC, taking into consideration environmental values and other technical and economic consequences. National Environmental Policy Act (NEPA) also includes provisions to include coordination and integration of reviews of other environmental laws and executive orders. Examples are the endangered species act, floodplain/wetlands regulations, fish and wildlife coordination act, "Greening the Government" initiatives, and the national historic preservation act.

All activities will be managed to prevent adverse impact on ground water and storm water quality, air quality and to minimize any ground disturbing activities.

13.9 Quality Assurance

A Quality Assurance Program Plan (SLAC-I-770-0A17M-001-R001) conforming with DOE Order 414.1A, "Quality Assurance", was established at SLAC to provide laboratory management with guidance and requirements toward achieving quality in pursuit of the laboratory mission. Overall responsibility for the implementation of this program lies with the SLAC Director, while accountability for managing the program at the divisional level rests with the respective Associate Director (AD). For the LCLS project, the "Project Leader" has been assigned by the SSRL Division AD and given responsibility for staffing, documenting, generating Quality Implementing Procedures and implementing the QA program. At the project level this includes developing and maintaining required management systems, or using management systems that are already available.

The QA plan describes SLAC's approach to implementing the ten criteria of DOE Order 414.1A:

Criterion 1 - requires specific Quality Implementing Procedures for all SLAC projects where total project costs exceed $5,000,000.

Criterion 2 - as appropriate defines specific requirements and assures adequate qualification and training for individuals connected with the project, including retention of training records.

Criterion 3 - defines requirements for management's responsibility with respect to identification, analysis, resolution and follow up of ES&H, technical and compliance issues.

Criterion 4 - provides policy for identification of documents (policy, procedures, drawings etc.), records and other specific elements that will have a significant impact on the project and need to be entered into a document control system.

Criterion 5 - requires project leaders to define and maintain work processes for R&D efforts that have a significant programmatic impact.

Criterion 6 - establishes a responsibility for line management to conduct design reviews and to promote the use of design standards.

Criterion 7 - discusses a graded approach to the development of specifications for procurement of items and services based on cost and failure impact.

Criterion 8 - established responsibility for the staffing, documenting, and performing of inspection and testing activities related to the project.

Criterion 9 - requires participation in the SLAC Institutional Self-Assessment Program.

Criterion 10 - provides the authority for the Quality Assurance and Compliance Department to conduct independent assessments of all SLAC facilities and projects as warranted to verify the degree of conformance to QA and ES&H requirements.

Effective use of these criteria will enable the LCLS project to:

- Design in quality and reliability.
- Promote early detection of problems to minimize failure costs and impact on schedule.
- Develop appropriate documentation to support upgrade and operational requirements.
- Establish methods to identify critical systems and to release these systems based on demonstrated performance.
- Define the general requirements for design and readiness reviews for all aspects of the project.
- Assuring personnel are trained before performing critical activities, especially those that have ES&H consequences.

13.10 SLAC References

SLAC Work Smart Standards http://www.slac.stanford.edu/esh/reference/worksmart.htm

SLAC Safety Management System http://www.slac.stanford.edu/esh/isms/sms.pdf

SLAC Environment, Safety & Health Manual
http://www.slac.stanford.edu/esh/manuals/eshmanual.html

SLAC Radiation Safety Systems Technical Basis Document (SLAC-I-720-0A05Z-002)

http://www.slac.stanford.edu/esh/techbas/rss/rss.pdf

Specification for Seismic Design of Buildings, Structures, Equipment, and Systems at the Stanford Linear Accelerator Center (SLAC-I-720-0A05Z-002)

http://www.slac.stanford.edu/esh/techbas/seismic.pdf

Lock and Tag Program for the Control of Hazardous Energy (SLAC-I-730-0A10Z-001)

http://www.slac.stanford.edu/esh/manuals/locktag.pdf

Electrical Hazard Test Procedures (SLAC-I-040-30460-002)

Introduction to Pollution Prevention, Hazardous Material and Waste Management (SLAC-I-750-0A06G-001-R001)

http://www.slac.stanford.edu/esh/training/study_guides/hmh.pdf

SLAC Emergency Preparedness Plan (SLAC-I-730-0A14A-001)

http://www.slac.stanford.edu/esh/manuals/epp2000.pdf

SLAC Institutional Quality Assurance Program Plan (SLAC-I-770-0A17M-R002)

http://www.slac.stanford.edu/esh/manuals/QAplan.pdf