

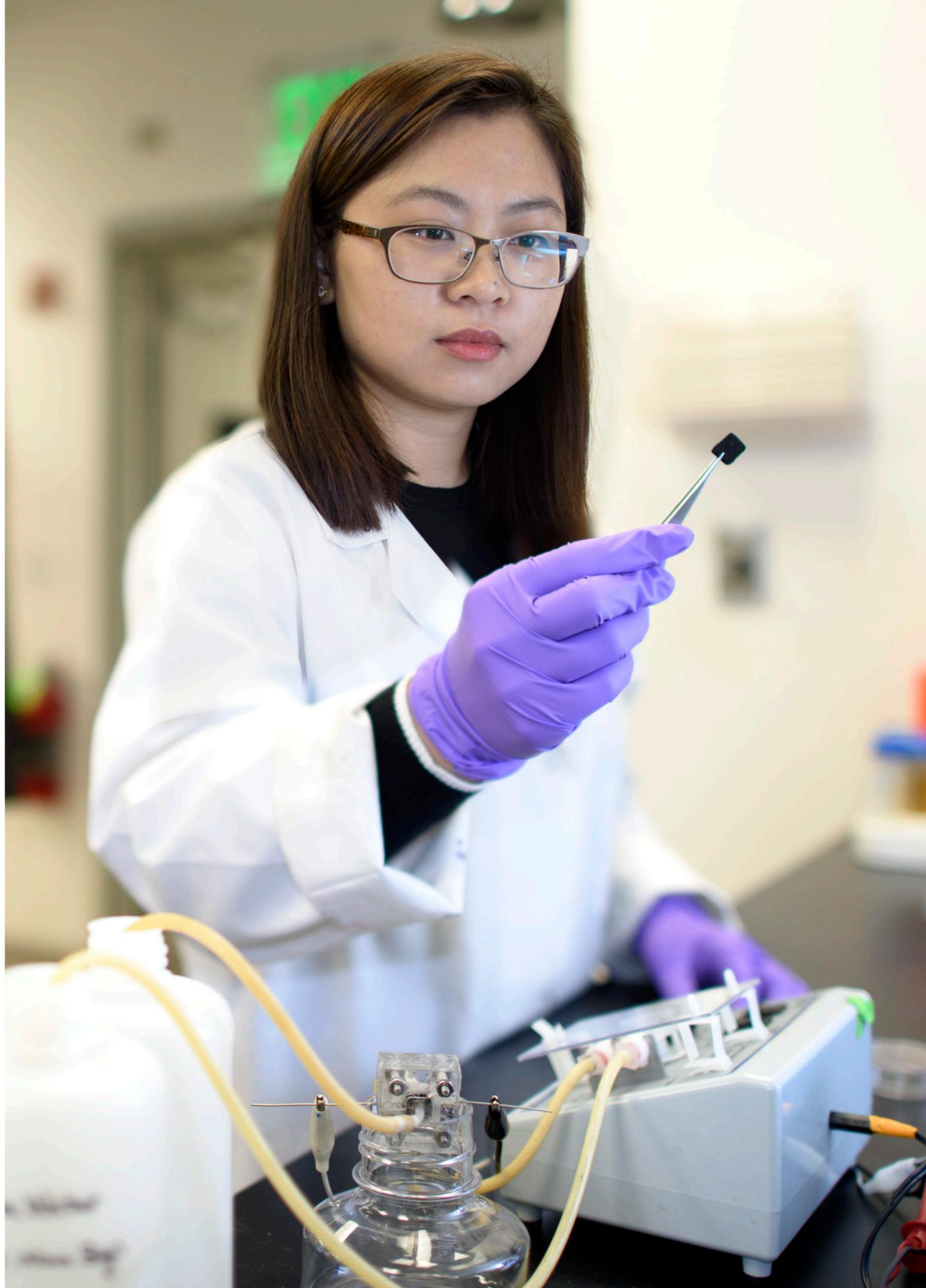
# ANNUAL REPORT

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Stanford University Environmental Health and Safety

2017





# GREETINGS

to our Stanford Community Partners

**To our Stanford Community Partners,**

**As 2017 draws to an end, Environmental Health and Safety is happy to present its FY 2016-2017 Annual Program Report.**

In our efforts to continue improving the well-being of the Stanford community, we have worked to ensure our approach is one that fosters health, safety, and environmental stewardship as an integral part of Stanford's intellectual and operational culture. This report marks the first year implementing the EH&S 2017-2020 Strategic Plan, which redefined priorities for the department and shifted how we approach our work.

**Throughout the past year EH&S actions have been guided by three strategic anchors.** The first is making safety integral to the way people work and think. One example implemented this year was a pilot lab safety training program for new graduate students in Chemical Engineering. This hands-on interactive program consisted of modules designed around a hypothetical experiment that taught safety and risk assessment as a part of the experimental research process. The second strategic anchor is adaptive problem solving. Ongoing program adjustments based on client feedback, compliance findings, and analysis of waste disposal data has allowed us to improve efficiency for laboratories with the "Sweeps" waste pick-up program, even as we continue to roll it out. The third strategic anchor relates to EH&S staff engaging with the campus community through valued partnerships. Efforts toward this goal has led to changes in EH&S organizational structure, and impacted the way we, as subject matter experts, have approached our work. For instance, Ergonomics professionals now work to empower supervisors and line staff to come up with their own best safety practices, while they provide technical knowledge and facilitate the effort to reduce the ergonomic risk. Making decisions based on these strategic anchors has not always been easy, but we are seeing positive results and believe the cumulative impact of this approach will be substantial.

**In reflecting on the past year, we are proud of the progress made so far, but we recognize we could not have embarked on this new path or accomplished so much without the institutional support and collaboration of our campus partners.** Over the next several years, we will continue to implement our strategic plan in EH&S programs and services. Like any new endeavor, we anticipate that there will be challenges along the way, but we look forward to this opportunity to better serve our campus community. We will continue to seek ways to improve and are confident that this new approach will help to further a culture of excellence for health, safety, and environmental protection here at Stanford.

A handwritten signature in black ink that reads "Larry Gibbs". The signature is written in a cursive, flowing style.

**Larry Gibbs**

*Associate Vice Provost for Environmental Health & Safety*

# CONTENTS

2017 Environmental Health and Safety Annual Report

EMERGENCY MANAGEMENT	6-7
FIRE SAFETY	8-9
OCCUPATIONAL SAFETY AND HEALTH	10-11
OCCUPATIONAL HEALTH CENTER	12-13
RESEARCH SAFETY	14-17
ENVIRONMENTAL PROTECTION	18-19
CLINICAL RADIATION SAFETY	20-21
DEPARTMENT METRICS	22-25



# EMERGENCY MANAGEMENT

The Stanford University Office of Emergency Management (OEM) serves as the administrative group charged with creating the framework for campus-wide units in preparing for, responding to, and recovering from disruptive events that impact the primary missions of the University.

The overarching goals of Stanford's Emergency Management Program are to reduce vulnerability and sensitivity to hazards and to cope with crisis and disaster situations through a rapid, coordinated, and efficient process.

In November of 2016, we were excited to kick off the QuakeSU exercise, for which our team had spent the previous year planning. Lessons learned from that event spurred a number of new projects including a plan to construct an emergency operations center (EOC), a project to establish a digital check-in process for students, staff, and faculty, and the potential for a centralized call/dispatch center for the University. In addition, our team made progress on establishing a continuity pilot program, which is expected to be completed by early 2018. We also conducted staff trainings across campus known as tabletop exercises and installed seismic restraints to laboratory equipment through our ProtectSU program.

## 2016 QUAKE SU EXERCISE

Culminating a year of planning, on November 17, 2016, the Stanford Emergency Management Team responded to a simulated 7.0 magnitude earthquake on the San Andreas fault line. The realistic scenario



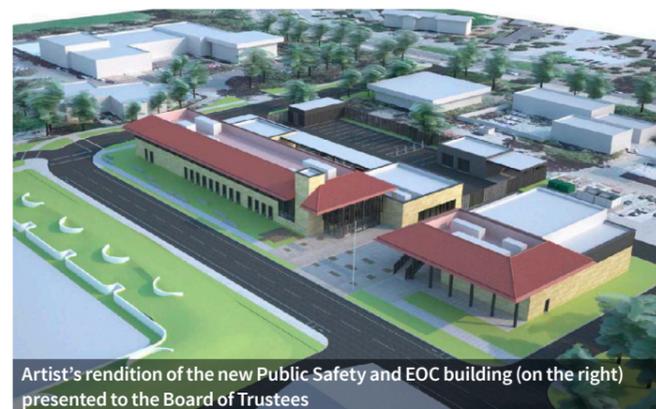
University President Marc Tessier-Lavigne addressing the EOC staff in a mock press conference during the QuakeSU exercise

depicted campus-wide damage and other disruptions that would likely accompany a major local earthquake. The exercise engaged all levels of the University's operational and academic units, from the executive team in the EOC to local schools. We conduct this type of exercise once every few years as the planning is extensive and execution of after-action plans can take multiple years to fully implement.

Following the exercise, we've now embarked on several new projects:

- New Emergency Operations Center
- Electronic Check-in process
- Campus Dispatch Project

The design and construction of a modern class I emergency operations center is scheduled to be completed in late 2019 or early 2020.



Artist's rendition of the new Public Safety and EOC building (on the right) presented to the Board of Trustees

Our team is now studying the advantages of establishing a central campus dispatch center to facilitate campus responses and enhance overall public safety at Stanford. In partnership with the Department of Public Safety, a new alerting system was selected to power the AlertSU system which will enable electronic check-in to account for students, faculty, and staff after an event.

## TABLETOP EXERCISES

Tabletop exercises train participants in Department Operations Center (DOC) procedures and help expose gaps in existing plans. Scenario-based discussions in a "no-fault" setting allow an exchange of ideas about how to organize response, coordination, and communications. Leading up to the QuakeSU exercise, OEM staff led 10 tabletop exercises for DOCs on campus.

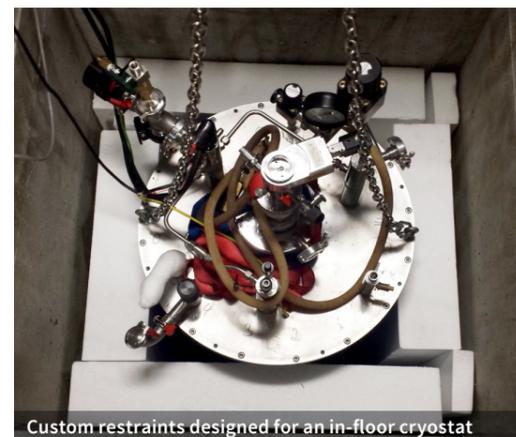


School of Earth, Environment & Energy staff participate in the 2017 tri-school tabletop exercise.

## ProtectSU

The ProtectSU program is a process designed to mitigate potential damage to high-value laboratory equipment that could occur during an earthquake. As part of ProtectSU, we install seismic restraints on high-value laboratory equipment. In the coming year, the ProtectSU team plans to develop a system for maintaining the existing restraint systems and to ensure that new laboratory construction projects include Universal Restraining Bar. Cumulatively, our team has installed:

**6,106 LINEAR FEET OF UNIVERSAL RESTRAINING BARS (URB) HAVE BEEN INSTALLED**  
**1,554 PIECES OF LABORATORY EQUIPMENT HAVE BEEN RESTRAINED**



Custom restraints designed for an in-floor cryostat

## CONTINUITY PLANNING PILOT PROJECT

At a Cabinet meeting in March 2017, University President Marc Tessier-Lavigne requested that a pilot project be conducted in conjunction with the School of Humanities and Sciences to test approaches for developing continuity plans for schools and departments. **This project is currently underway with completion expected in late 2017 or early 2018.**

## FUTURE DIRECTION

### Expanding Global Footprint

As Stanford continues to expand operations and research activities to more locations nationally and internationally, a more cohesive and comprehensive approach to emergency management for the distributed University should be explored.

### Continuity Planning

Expanding the scale and scope of continuity planning to include all units across the institution will be an ongoing initiative for OEM. One specific area of emphasis will be creative new solutions to encourage departments to participate.

### Exercise Programming

Conducting tabletop exercises and other exercises on a regular basis keeps units thinking about how to better prepare for disruptive events. All units benefit from engaging in realistic, scenario-based exercises that challenge their plans and identify areas for improvement. Executing these exercises takes a significant amount of time and resources. Planning the 2017 QuakeSU exercise required .75 FTE for nearly a full year with the help of an outside consultant.

# FIRE SAFETY

**The University Fire Marshal's Office oversees fire and life safety for University facility construction and renovation projects, provides code consultation, reviews construction and fire protection design drawings, serves as primary liaison with regulatory agencies on fire safety compliance, operates the Remote Supervising Fire and Intrusion Alarm Monitoring Station, and conducts annual fire and life safety inspections, evacuation drills, and post-fire investigations. Our office also provides ongoing fire safety training and prevention information to the campus community.**

Our Fire Marshal's Office is comprised of three working groups: Fire Protection Engineers, Fire Prevention Inspectors, and Fire Systems and Equipment Technicians. Twenty-two full time employees fill these three groups and serve the main campus, the School of Medicine, Hopkins Marine Station, and additional off-site buildings in neighboring cities, such as the SLAC National Accelerator Laboratory.



## TESTIMONIAL

**“Your technicians are the best group to work with on campus.”**

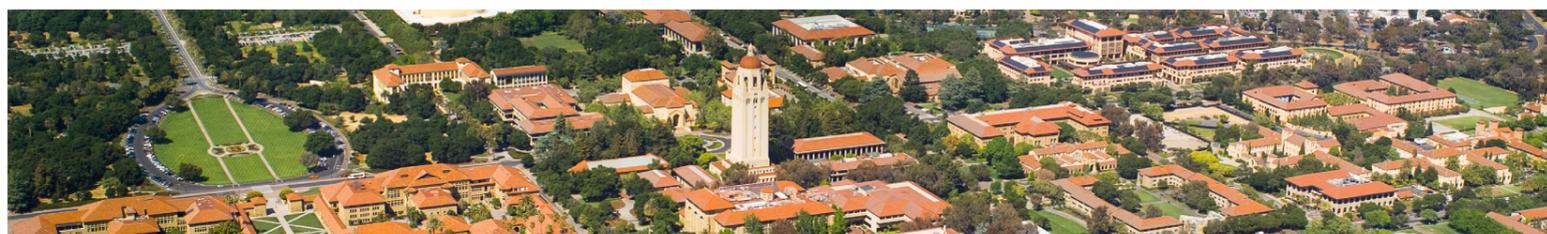
*General Contractor, Bay Area Builders*

We are on call 24 hours a day, available to respond at any time to emergencies and issues related to fire and life safety. This ensures that campus and residential housing buildings remain well-protected at all times. Our personnel respond to campus incidents to investigate emergencies and support the Palo Alto Fire Department during response operations. **As a unit, we pride ourselves on providing these critical services to the campus community:**

**1 Fire safety and prevention through education, training and program development**

**2 Safety by design through consultation, plan review, system inspections, device testing and maintenance**

**3 Effect institutional compliance with the fire and life safety codes and regulations, in order to keep our community safe and minimize regulatory risk**



## KEY PROGRAM ELEMENTS:

### Code Compliance: Plan Review, Consultation, and Inspection

Our Fire Protection Engineers provide technical consultation and oversight on Building and Fire Code compliance issues throughout all phases of project planning, design, and construction. In FY2017, the Fire Protection Engineers completed:

**372 PLAN REVIEWS, CODE CONSULTS, ETC.**

**48 LABORATORY PLAN REVIEWS**

**157 SMALL PROJECTS AND MINOR SYSTEM MODIFICATION PLAN REVIEWS**

**23 CALIFORNIA BUILDING CODE CHEMICAL INVENTORY HAZARD REPORTS**

**144 ALL OTHER ARCHITECTURAL PLAN REVIEWS**

### Fire and Life Safety: Annual Inspections, Training, and Fire Drills

The Fire Prevention Inspectors are responsible for ensuring that all campus buildings are inspected on an annual basis, conducting all fire drills, and providing fire and life safety training.

**CONDUCTED 220 FIRE INSPECTIONS, CLEARING 170 (77%)**

**SUPERVISED 317 FIRE DRILLS**

**ADMINISTERED 28 FIRE SAFETY TRAINING PROGRAMS TO 1,057 PERSONS**

### Maintenance and Testing of Fire Systems and Equipment

The California Code of Regulations mandates periodic inspection and testing of fire protection systems and equipment. In FY2017, the Fire Systems and Equipment Technicians conducted:

**671 FIRE ALARM SYSTEM INSPECTIONS AND TESTS**

**1,544 FIRE SPRINKLER SYSTEM INSPECTIONS**

**9,694 FIRE EXTINGUISHER INSPECTIONS**

### Alarm Monitoring: Operation of Remote Supervising Fire and Intrusion Alarm Monitoring Station

The Fire Systems and Equipment Technicians group operates and maintains the Remote Supervising Fire and Intrusion Alarm Monitoring Station. **THE STATION RECEIVES ALARM, SUPERVISORY, AND TROUBLE SIGNALS FROM 467 CAMPUS BUILDINGS.** The signals are then transmitted to the Palo Alto 911 Emergency Dispatch Center to dispatch the Palo Alto Fire Department and Stanford Department of Public Safety personnel.



## PROGRAMMATIC DIRECTION:

The Stanford University Fire Marshal's Office takes pride in meeting the fire and life safety needs and ensuring a high level of fire protection is afforded to the Stanford community. We will continue to support Stanford's core mission of teaching, learning, and research by working strategically with external agencies to achieve equitable interpretation and application of codes to minimize undue constraints on operations, prevent fires before they start, and keep our community safe.



# OCCUPATIONAL SAFETY AND HEALTH

**The Occupational Safety and Health (OSH) group supports Stanford University's education and research mission by developing and managing institutional programs that protect employee health and safety in all campus work environments. Core OSH services focus around the risk control strategy of anticipating, recognizing, evaluating, and mitigating potential workplace hazards.**

## MAKING HISTORY

### Asbestos, Lead, and Construction Safety

This year our program played a major role in the kickoff of the largest construction project in Stanford's history, the Escondido Village Graduate Residence complex. We managed the initial hazardous material assessment and remediation of twenty-eight 1960's era apartment buildings that were demolished to make room for new high-rise apartments. We helped shepherd this community-sensitive project by contributing expert technical information and advice through town hall meetings, student residence communications, and press releases. Our oversight ensured that the asbestos and lead-based paint hazards were abated properly and in accordance with Cal/OSHA and EPA regulations.

Our team supports supervisors and staff with health and safety hazard assessments of their work activities. The majority of OSH assessment efforts are dedicated to addressing risks including, but not limited to: workstation ergonomics, potential chemical and noise hazards, potential safety hazards, and indoor air quality concerns. Of all OSH efforts, the most common services provided across campus are ergonomic evaluations for computer use, laboratory operations, and other manual handling activities. Besides hazard assessment, OSH routinely assists supervisors with incident investigation to help identify root causes and determine best corrective actions. In these follow-ups, we help resolve workplace safety issues ranging from commonplace trip/slip hazards, to complex processes issues involving industrial equipment and handling of highly hazardous materials.

As a part of EH&S' permits and work approval processes, our group regularly provides safety trainings, respirator use approvals, confined space entry permits, forklift operator certifications, and laboratory closure permits. These efforts help ensure that potentially risky activities are conducted in a safe manner, in compliance with current environmental health and safety regulations (e.g., Cal/OSHA, County of Santa Clara, City of Palo Alto).

We aid local units and the University as a whole with various workplace health and safety compliance requirements, offering services that include: developing and maintaining required safety programs, informing campus units whenever regulations are newly established, and supporting local units with compliance efforts. We also serve as the University's liaison for California Occupational Safety and Health Administration (Cal/OSHA) regulatory inquiries and inspections.

## ACCOMPLISHMENTS

This year, new program leadership initiated several strategic shifts to emphasize injury prevention.

### Specific projects included:

**Facilitation of participatory ergonomics initiatives** with work groups in Land Building and Real Estate's Event Services, and the Veterinary Service Center.

**Finalizing the proof-of concept for an electronic incident reporting system** and beginning initial development of the campus-wide tool.

**Development of new user-friendly online formats** for our Hazard Communication and Respiratory Protection trainings.

**Re-evaluation of medical surveillance requirements** for the Facilities Maintenance and Utilities groups and updating their guidelines and requirements.



## ERGONOMICS TESTIMONIAL

Dear Mark and Connor,

It was great working with YOU!

I am amazed at how helpful your suggestions have been in reducing muscle strain and pain, already, and look forward to even more improvement with the equipment you suggested.

*Psychologist, in Counseling and Psych Services*



## PROGRAM DIRECTION

Key projects we are working on in FY2018 include:

One major project that will be launched in the coming year is the **TRANSITION TO AN ELECTRONIC INCIDENT REPORTING SYSTEM.**

The tool will include features that help supervisors identify incident root causes and facilitate follow-up investigations.

We also plan to develop **NEW SAFETY MANAGEMENT TOOLS** for supervisors to foster leadership fundamentals in order to cultivate a strong, sustainable safety culture across our campus community.

Finally, our group plans to **EXPAND ITS DATA COLLECTION ABILITIES**, helping campus units more easily track their local safety management performance. Such performance metrics on incident trends, as well as leading safety indicators, will provide departments valuable feedback on the effectiveness and progress of their local safety management efforts.



# SUOHC OFFERS:

**ILLNESS AND INJURY CARE**

- Abrasion/laceration
- Acute overexertion
- Chemical/biologic exposure
- Needlestick
- Repetitive motion
- Slip/trip/fall

**SURVEILLANCE PROGRAMS**

- Biological agent research
- Healthcare worker clearance
- Lab animal research
- OSHA-mandated testing
- Travel medicine

**SLAC ADDITIONAL SERVICES**

- Fitness for duty/return-to-work evaluations
- Wellness physicals
- Non-occupational injury/illness consultations

# OCCUPATIONAL HEALTH CENTER

**The Occupational Health Center aims to improve the health and safety of University employees by providing outstanding clinical care and leveraging a multidisciplinary approach to total worker health.**

The Stanford University Occupational Health Center (SUOHC) is a medical clinic that serves a population of over 21,000 individuals, including all University and SLAC employees, student researchers, and Stanford-affiliated visiting scholars.

Our clinic provides evaluation and treatment for work-related injuries and illnesses. We aim to foster a culture of health and safety across Stanford and to create actionable strategies to support the whole health of every worker, with the synergistic goal of integrating workplace safety with health and wellness programs.

Through collaboration with EH&S and University partners, including Risk Management and the BeWell wellness program, we strive to improve the work environment and adopt holistic policies that are conducive to promoting health and wellness throughout the entire Stanford community.

Our ultimate goal is to provide a positive patient experience. We plan to expand our service offerings to support the University's mission, improve outcomes via early diagnosis of issues through surveillance, and better utilize available data.

**FY2017 ACCOMPLISHMENTS**

**This year our team launched a new employee occupational health record portal.** The portal helps ease the amount of paper used and further alleviates administrative burden on staff and patients by letting them fill out online questionnaires and view vaccination immunizations digitally on their laptop or mobile device.

We streamlined the billing process for workers' compensation claims and now fully manage accounts receivable, which significantly enhances recovery for services rendered.

We integrated the demographic feed and employment status data between the Stanford registry and the SUOHC electronic health record, advancing our care team's accessibility to updated patient information, and presenting a more complete profile of our patients, allowing for better care.

In anticipation of a new and expanded clinic space in 2019, we have brought on an additional board-certified Occupational Medicine physician, Dr. Rajan Puri, to round out our clinical staff along with Dr. Richard Wittman who has been with EH&S since 2011.

**EXPERTISE**

- Injury and illness prevention and management
- Musculoskeletal medicine/urgent care
- Travel medicine



# PROGRAM DIRECTION

**Our team plans to expand the online portal** for supervisors and employees in order to integrate injury reporting, work status communication, and medical surveillance program assignments. Once implemented, employees will be able to access this information online their Stanford Login.

**In the coming years we plan to expand the travel medicine program** to provide a mechanism for pre-travel medical clearance in addition to the currently offered consultative care and risk discussion. This will allow us to provide more comprehensive care for our patients and campus community members whose work requires overseas travel.

**Our consultations have helped both supervisors and employees rest assured that workers can safely perform their essential job duties, and we plan to increase these evaluations.** We will also add on-site physical therapy, which will allow for same-day treatment at a single point-of-care location and eliminate the cost of referrals to outside clinics.

**The mixture of acute and chronic musculoskeletal injuries at the OHC provides an excellent environment for both teaching and for studying clinical outcomes.** Goals include expansion of medical teaching and rotations, including Stanford Residents, medical students, and undergraduates.

# RESEARCH SAFETY

Research Safety supports Stanford University's research and teaching community in proactively managing chemical, biological, radiological, laser, and physical hazards.

Stanford's Research Safety programs support over 750 Principal Investigators (PIs) and approximately 8000 researchers in managing their safety activities in a complex and diverse research environment. We have three specialized groups within Research Safety: Laboratory Chemical & Physical Safety; Radiological & Laser Safety; and Biosafety & Biosecurity.



Our functions include training, conducting health and safety consultations, providing incident response, assisting with external inspections, serving on and/or working closely with University committees and review panels, and developing new health and safety programs. For example, the Biosafety & Biosecurity group assists in oversight of research protocols and work practices, in addition to providing training relevant to these matters. The Laboratory Chemical & Physical Safety group evaluates proposed work with high-hazard chemicals, such as toxic gases and highly reactive chemicals, and provides guidance

to PIs and researchers on how to effectively carry out their health and safety responsibilities. Members of the Radiological & Laser Safety team ensure safe setup and proper use of radioactive materials, x-ray devices, and lasers, and also assist labs in related risk assessments.

Technical health and safety guidance and consultation with individual labs and researchers are fundamental services that we provide to the campus community. In-person consultations afford researchers direct contact with health and safety specialists knowledgeable in their field, many of whom are former researchers. Consultations on standard operating procedures, protocols, experimental setups, and hazard assessments augment the PI's review of safety practices and their associated controls. Our collaborative approach to consultations often results in learning opportunities for researchers and procedural changes that produce better, safer science.

A number of regulatory bodies and grant-making agencies require extensive review and panel approval for certain types of work. To facilitate this process and guide researchers and faculty through a complex regulatory environment, we serve on committees, panels, and manage work-authorization programs. Members of our group serve on a diverse set of panels and committees, including panels on biosafety, radiological safety, laboratory animal care, and human subjects, as well as committees on health and safety, and unmanned flying vehicles. We also manage programs on controlled substances, select agent toxins, and toxic gases.

Students participate in a training session to work in a BSL-3 lab



CERTAIN HIGH-HAZARD MATERIALS REQUIRE OVERSIGHT AND APPROVAL BY EH&S PRIOR TO USE. **THE AUTHORIZATION PROCESS IS DESIGNED TO ENSURE SAFE USE OF THESE MATERIALS BY UTILIZING EXPERT ADVICE TO ALTER PROCEDURES AND HELP RESEARCH PROCEED SAFELY.**

**3,828**  
AUTHORIZATIONS  
BY RESEARCH  
SAFETY  
FY2017

RESEARCH SAFETY  
SUPPORTED  
**\$1 Billion**  
IN RESEARCH  
FUNDING IN FY2017

Cyclotron Maintenance



# HIGHLIGHTS

Highlights this year include expanding our in-person interactions with researchers, developing a new risk assessment tool, updating protocols to reduce PI administrative burden, and providing special outreach and training for researchers working in high-hazard settings.



## EXPANDED INTERACTION WITH RESEARCHERS

This year we expanded our outreach and interactions with labs in order to strengthen working relationships and support hands-on problem solving. In-person informational and hands-on training sessions are now available by request for new researchers and as refreshers for existing laboratory members. We have expanded the hands-on safety trainings provided during Fall New Graduate Student Orientation to include Chemistry and Chemical Engineering. Also, we now offer information sessions on mentoring minors and other novice researchers in laboratories.

## NEW RISK ASSESSMENT TOOL

We developed a new laboratory risk assessment tool in order to provide a systematic approach for PIs and researchers to identify hazards and integrate safety controls. This tool maps onto the scientific method to integrate into the process that researchers already do to prepare for an experiment. Key advantages:

- Can be used for chemical, biological, radiological, and physical hazards giving researchers flexibility and providing a better method for evaluating interdisciplinary research.
- Establishes trigger points for researchers to work with their PIs and EH&S to mitigate risk.
- Emphasizes iterative learning and enduring understanding to educate future scientists and thought leaders on essential safety skills.

## DECREASING PI ADMINISTRATIVE BURDEN

Another key objective this year was continuing to decrease PI administrative burden to enable faculty to focus on higher-impact safety responsibilities. Toward that end, we modified an Administrative Panel on Laboratory Animal Care (APLAC) protocol for non-human primate tissues to distinguish between tissue and animal research. The new process will reduce the amount of information required for many labs. We also deployed an electronic EH&S management system called BioRaft. BioRaft provides a streamlined method for PIs and lab supervisors to document health and safety responsibilities.

## HIGH-HAZARD ASSESSMENT & TRAINING

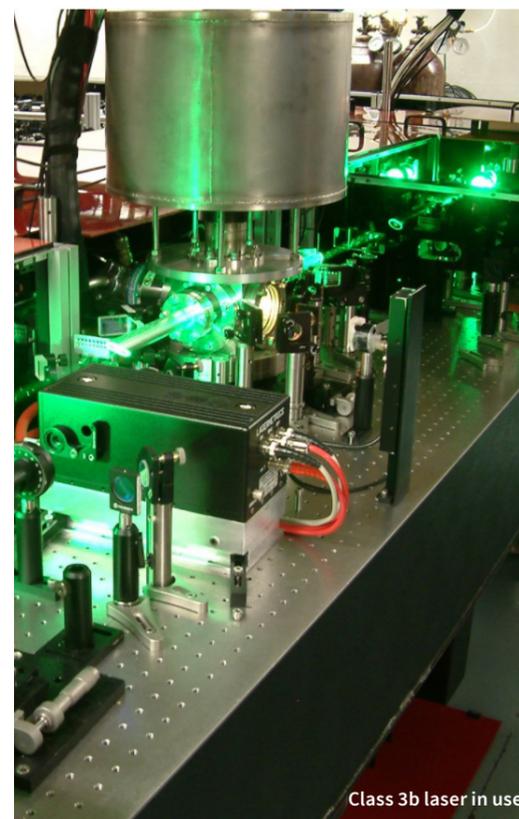
Some research is higher risk and requires increased support and resources to help researchers work safely. To aid this, we selected certain types of high-hazard work for outreach and special training.

- We met weekly with researchers working in the cyclotron/radiochemistry facility to discuss radiation use and the management of new animal and human imaging drugs that contain highly radioactive material.
- We provided formal training for BSL-3 users to ensure that researchers have consistent and accurate information and understand best practices to work in a BSL-3 lab. We also conducted training exercises to prepare researchers, facility management, and first responders on appropriate response to a potential hazardous incident in a BSL-3 lab.
- We initiated a campus-wide assessment of the highest-risk explosive and self-reactive chemicals to ensure labs have correct controls and management practices in place.

# AWARDS/RECOGNITION

In partnership with the Chemistry Department, we accepted the Safety Stratus Award from the American Chemical Society for excellence in undergraduate chemical safety education programs.

Stanford underwent a radioactive material licensing audit by the state Radiological Health Branch and was considered a “model” program by state auditors.



## EMERGING RESEARCH TRENDS & IMPACTS

Our group tracks emerging technologies so that we can equip researchers with guidance on safe handling and compliance with regulatory bodies.

- Genome editing is one such emerging technology, and our “Genome Editing and Gene Drives at Stanford” document provides guidance on using tools like CRISPR in human clinical studies, basic research, and animal and plant experiments.
- Lasers are increasingly used for research at Stanford. During FY2017, the number of Class 3b and 4 lasers increased 17% to nearly 1,100. All laser installations are reviewed for safety and are approved by committee.
- Partnerships with other universities, requiring cross-institutional coordination, are on the horizon. For example, the Chan Zuckerberg Biohub is expected to broaden interinstitutional interactions with UCSF and UC Berkeley.
- Given Stanford’s leading role in advancing radiotherapies for cancer treatment, including Lu177, we will advise the state Radiological Health Board and other institutions on radiation safety precautions associated with this novel therapy.

# PROGRAM DIRECTION

In the coming year, we plan to continue building on our progress in helping Stanford researchers proactively manage hazards and safety issues in their laboratories.

Develop more hands-on training and experiential learning to enhance interaction with researchers.

Expand our outreach to labs that engage in higher-risk research activities to increase awareness and mitigate risks.

Develop tools to support PIs in incident investigation and root cause analysis.

Expand laboratory incident follow-up to include increased development of Lessons Learned.

Develop PI and researcher onboarding processes that promote establishment of a positive safety culture within the PI’s individual laboratory.

# ENVIRONMENTAL PROTECTION

The Environmental Protection Programs (EPP) group provides critical services to the University each and every day. Our guiding principles are engagement with our customers, timely and courteous service, protection of the environment, and cost effectiveness.

## OUR WIDE RANGE OF SERVICES:

Collect, store, and ship hazardous wastes off-site

Collect surplus chemicals and redistribute them for free

Collect, recycle, and dispose of e-waste and fluorescents

Audit off-site disposal and recycling facilities to reduce long-term liability

Obtain air emission permits

24/7 spill response and cleanup

Manage environmental remediation projects such as contaminated soils

Proper and safe management of hazardous wastes reduces the degree of hazard at the source, and protects the environment by minimizing releases. Our group is mindful of the costs of managing hazardous wastes and the associated liability. We measure and improve the effectiveness of our services with ongoing customer outreach and strive to develop close working relationships with the campus research community.

With our two flagship programs – Sweeps and Surplus – we have made great strides in reducing hazardous waste, as well as saving both time and money for researchers.

### ACCOMPLISHMENTS

#### Sweeps Program – Label it, place it, it's gone!

Prior to implementing the Sweeps program, the lab user assumed the burden of requesting pickup of their wastes. The Sweeps Program relieves researchers of this burden with the introduction of a scheduled, periodic pick-up time. In the past year we have expanded the program throughout the School of Medicine. Sweeps has enabled us to increase our field presence in laboratories and establish a regular presence with researchers. By establishing a designated “Place For Chemical Waste” in each lab, Sweeps improves housekeeping and reduces the potential for “hidden” waste.

Our Sweeps technicians engage regularly with lab personnel, strengthening relationships and providing the opportunity to help with questions or concerns. This engagement fosters an open line of communication to provide advice, explain the breadth of services that EH&S has to offer, and develop closer working relationships with the laboratory community. According to the results of a survey sent to over 900 customers, the Sweeps approach provides greater engagement with our customers, and much desired certainty about service timing.

Sweeps makes lab cleanouts simple and straightforward. The initial request triggers an on-site visit to assess the scope of the project, remove easily-managed wastes, and advise on any follow-up information. This system also provides Stanford construction Project Managers with a single point of contact.

#### WASTE DISPOSAL COST CONTROL

Our team is passionate about maintaining low-cost, high-quality options for waste management, so we partner with Stanford Procurement to analyze metrics and data to ensure that our waste disposal methods are sustainable and affordable. This effort has resulted in a 10% (on average) savings per unit of waste.



### SURPLUS PROGRAM TO REDUCE CHEMICAL WASTE

Through our Surplus Program, we maintain an inventory of unused chemicals for research purposes that are freely available to the Stanford community. It's like asking your neighbor for a cup of sugar instead of going to the supermarket to buy a whole bag. The Surplus Program helps reduce the amount of chemicals that are purchased, remain unused, and then disposed of as waste. It has become an integral part of Stanford's ongoing commitment to environmental sustainability. To date we have saved nearly \$225,000 in avoided chemical purchase and hazardous waste disposal costs.

### PROGRAMMATIC DIRECTIONS

Our overarching goal for the next year is to expand the Sweeps and Surplus chemical programs and provide additional tools for managing waste. We plan to expand Sweeps to additional labs and do outreach to customers of the Surplus program to determine how we can enhance it. We also aim to develop a toolkit to help labs classify the hazard for their specific wastes and determine which are incompatible with each other.

## TESTIMONIAL

“The Sweeps program has made my job as a lab tech so much easier. Communication is easy and friendly, and if I ever need more supplies, Shelby can drop them off. I can also get my tricky questions answered easily, which makes waste disposal faster and safer. I can't say enough good things about the program, I'm definitely a happy customer.”

*Life Science Technician,  
Dept. of Genetics*



# CLINICAL RADIATION SAFETY

The Clinical Health Physics group supports the safe use of radioactive materials and ionizing radiation in standard clinical and human research settings at multiple Stanford-affiliated healthcare facilities, and the Veterans Affairs Palo Alto Health Care System.

The clinical health physics group primarily works at the Stanford Hospital, the Stanford Cancer Center South Bay, the Stanford Medicine Outpatient Center and Stanford Children's Health where SU physicians conduct research and administer patient care. We work side-by-side with a range of experienced practitioners including Nuclear Medicine, Radiation Oncology, Radiology, the Catheterization Angiography Laboratory, and other departments.

A major project our team took on this year was helping to get the new Children's Hospital up and running. Members of our team have donned hard hats and ventured into the building site to inspect the facilities and provide valuable input on safety with regards to the building materials needed in rooms that house X-ray machines and patient therapy rooms. We also focused on the design of the nuclear medicine laboratory and are overseeing X-ray and radiation safety protocols, licensing requirements, as well as staff training moving forward.

## HUMAN RESEARCH PROTOCOL SERVICES

The clinical health physics group provides a wide variety of services to assist researchers within the Stanford community who conduct investigations and explorations into human health. If their research involves humans and ionizing radiation, then scientists will need to submit an Investigational Review Board application and go through the eProtocol process. Our team helps facilitate this process by providing estimates of radiation exposure (or dose) for subjects involved in the study and providing informed consent language. We work with researchers to generate informed consent language based on estimates of radiation dose and types of exposure.

Our group also helps facilitate research with novel radioactive drug tracers that do not yet have Federal Drug Administration approval and are not under an Investigational New Drug approval. Within our Clinical Radiation Safety Committee, we have a Radioactive Drug

Research Committee (RDRC) for these special cases and can help guide researchers through the RDRC approval process.

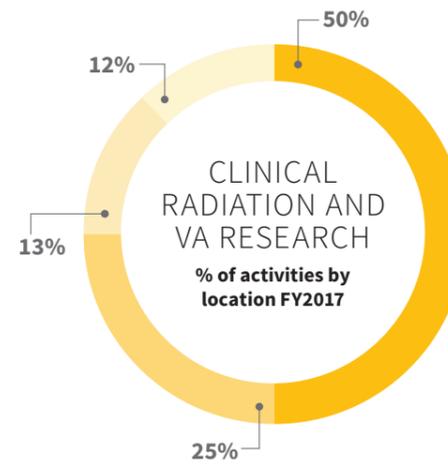
## CLINICAL SERVICES

Our clinical health physics group provides many services to support medical settings that involve the use of radioactive materials or ionizing X-rays as part of patient care. The foundation of our clinical health physics technical machine services involves Computed Tomography (CT) accreditation, annual X-ray compliance testing, and survey instrument calibration. We also provide program reviews and audits for nuclear medicine and radiation oncology; 24/7 emergency response; patient safety (e.g., skin burn risk assessment due to fluoroscopy) as well as pediatric CT protocol dose optimization; and technical consultation on construction projects.

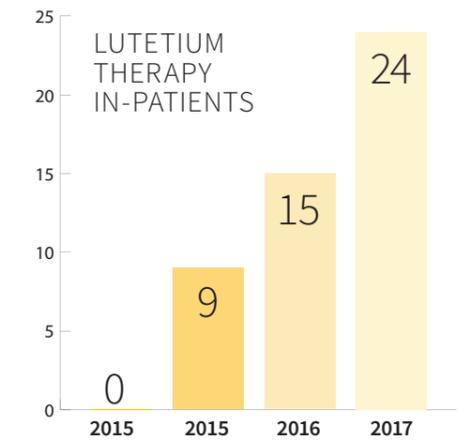
We provide State of California license administration services to ensure compliance with regulatory bodies and act as technical subject experts during audits such as those from the Joint Commission on Accreditation of Healthcare Organizations.

## FUTURE DIRECTION

Hadron therapy is coming! In October, Stanford Medicine and the Veterans Affairs Palo Alto Health Care System announced a collaboration to establish the nation's first center to deliver hadron therapy to cancer patients, and although it is a couple of years away, we look forward to contributing to this innovative project that is part of the Cancer Breakthroughs 2020 program. Our group will also be a contributing member on teams designing clinical locations and outpatient centers opening in the Bay Area and will be participating in new radionuclide therapies, such as targeted I-131 metaiodobenzylguanidine (MIBG) therapy which can be used to treat high-risk neuroblastoma in infants and young children.



- 50% **STANFORD HOSPITALS AND CLINICS**
- 25% **VA PALO ALTO HEALTH CARE SYSTEM CLINICAL AND RESEARCH**
- 13% **STANFORD CHILDREN'S HOSPITAL**
- 12% **OFF CAMPUS CLINICS**



## CLINICAL RADIATION AND VA RESEARCH

% Safety Program Activities by Area FY 2017

42%	<b>NUCLEAR MEDICINE</b>	18%	<b>VAPAHCS</b>
35%	<b>X-RAY/CT/FLUOROS</b>	5%	<b>RADIATION ONCOLOGY</b>

## CT SAFETY

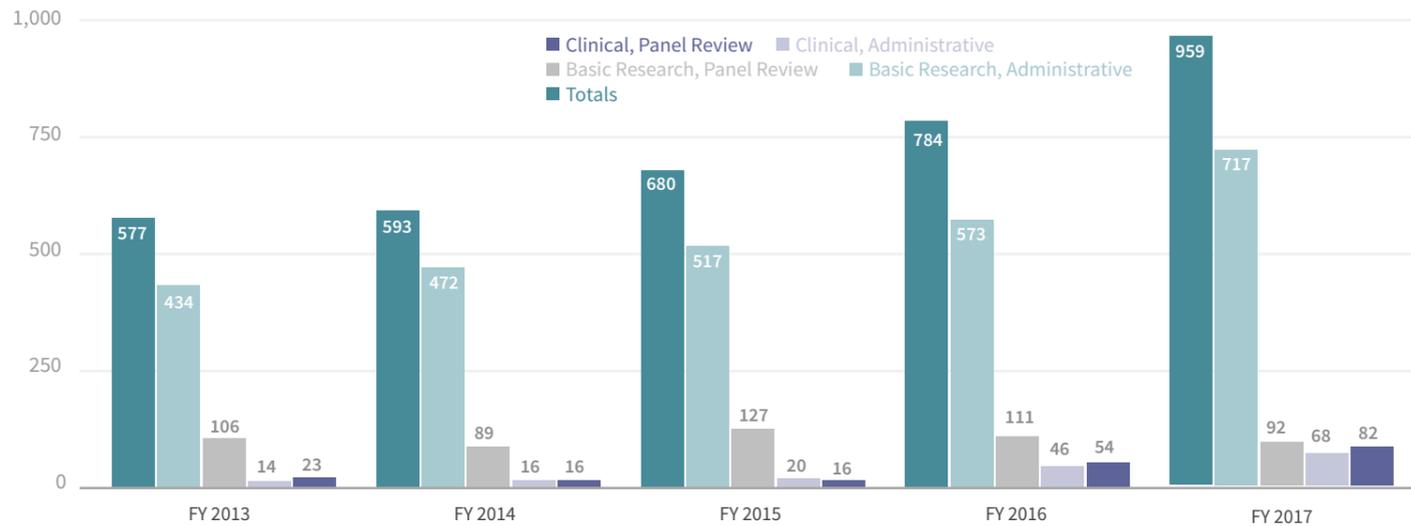
Our goal is to provide a safe working environment and reduce patient radiation exposures during procedures such as CT, interventional fluoroscopy, and nuclear medicine therapies.



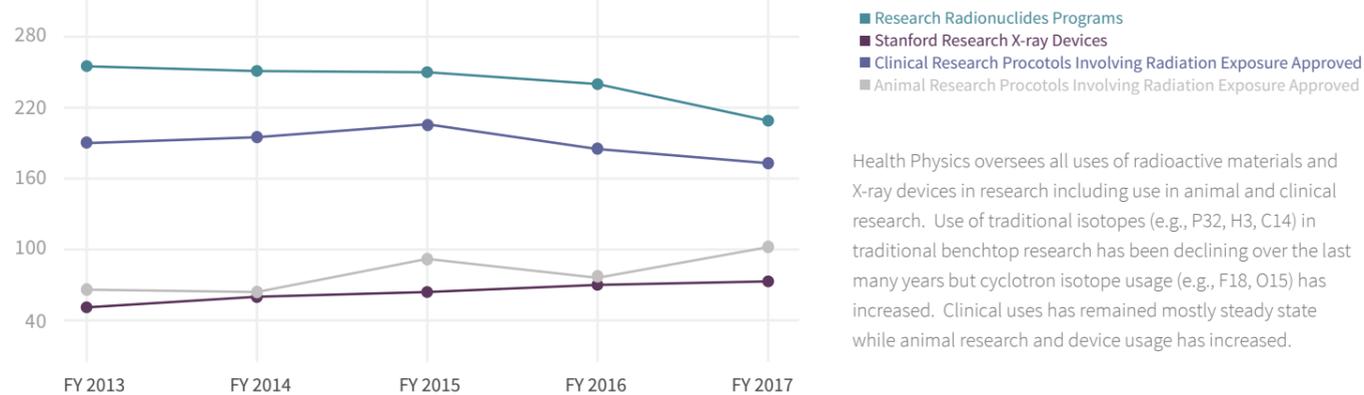
# DEPARTMENTAL METRICS

**RISK ASSESSMENT AND WORK AUTHORIZATIONS** | Certain high-hazard materials and activities require oversight and approval by EH&S prior to use or operation. The authorization process is designed to provide subject matter expertise to faculty, staff and students in order to foster a safe work environment. In addition, EH&S supports the Stanford community through performance of risk assessment and hazard identification activities.

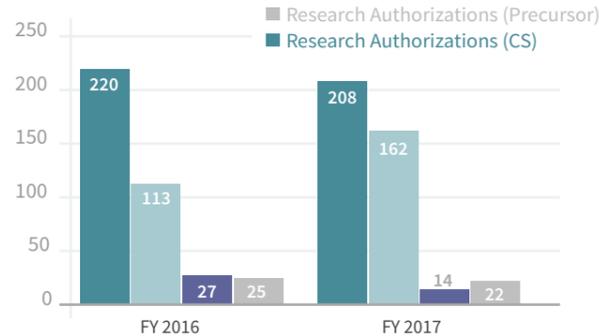
## Administrative Panel on Biosafety Approvals



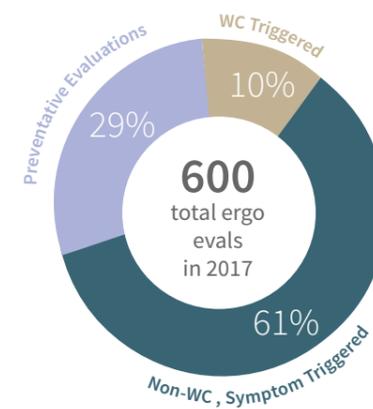
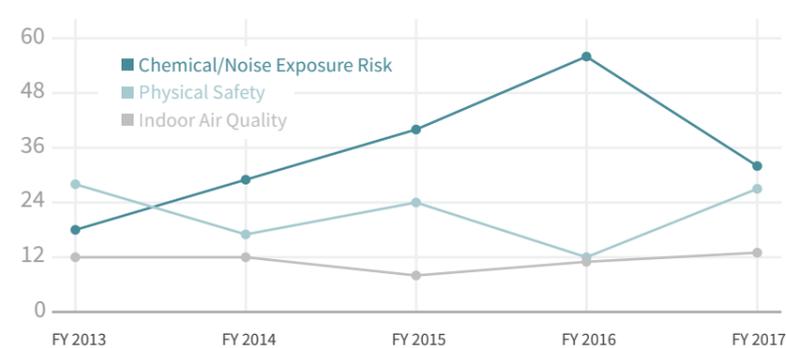
## Health Physics Research Program Approvals



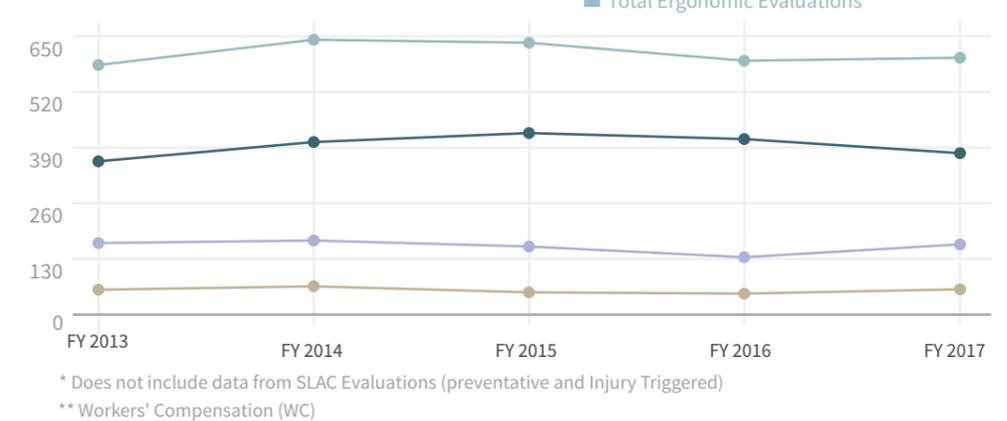
## Research Authorizations



## Workplace Safety Assessments | Industrial Hygiene



## Ergonomic Evaluations Completed\*

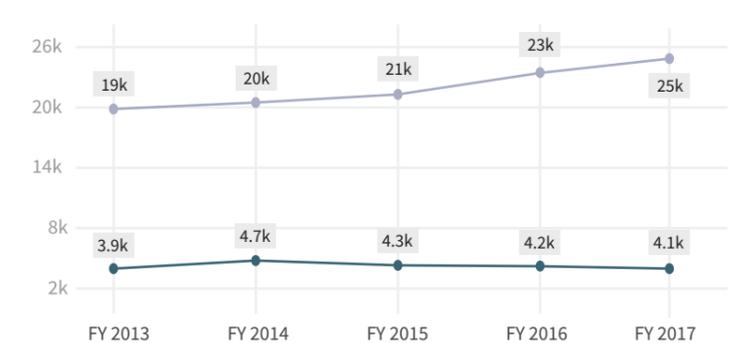


**EDUCATION AND TRAINING** | We offer a wide variety of safety trainings for faculty, staff, and students based on work demands, hazards, and regulatory requirements. Training courses are available on multiple platforms including: online, in-person, and hands-on.

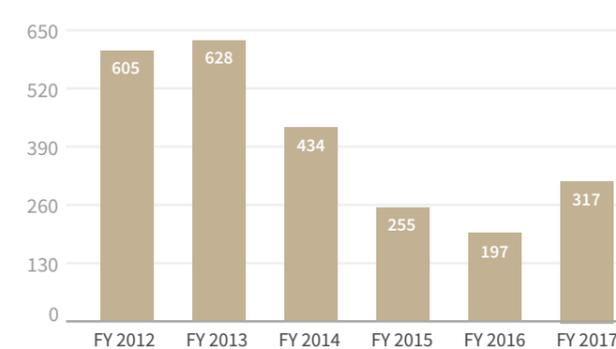
By delivering learning opportunities in a wide variety of formats including classroom courses, web based, and on-demand, we allow Stanford faculty staff and students to gain the skills and training they need to succeed, in a setting that best suits their particular circumstance.



## Learning Participation



## Fire Drills Conducted



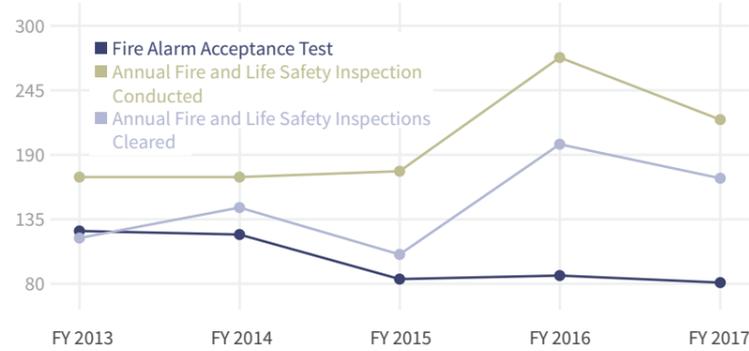
In the past year (FY 2017) our staff has onboarded more than

284

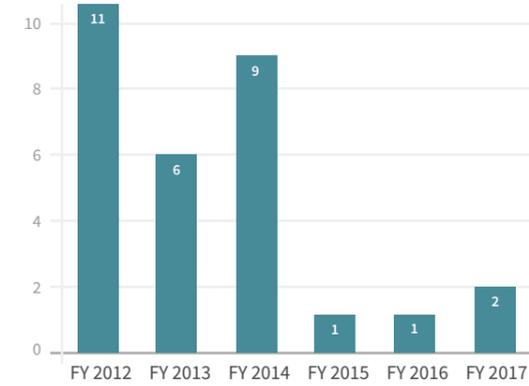
Principal Investigators into the BioRaft Safety, Compliance, and Training Software System

**INSPECTIONS, INVESTIGATIONS, AND REGULATORY VISITS** | With a large footprint and wide variety of hazards, Stanford is subject to regulation by several agencies. We work alongside these agencies to ensure compliance and assist local units in our campus community in preparation for inspection. With greater than 35,000 faculty, staff, and students in over 700 buildings totaling more than 15 million square feet, incidents and regulatory findings are bound to occur. We respond to ameliorate or investigate incidents and correct regulatory findings.

### Fire Inspection and Test Activities



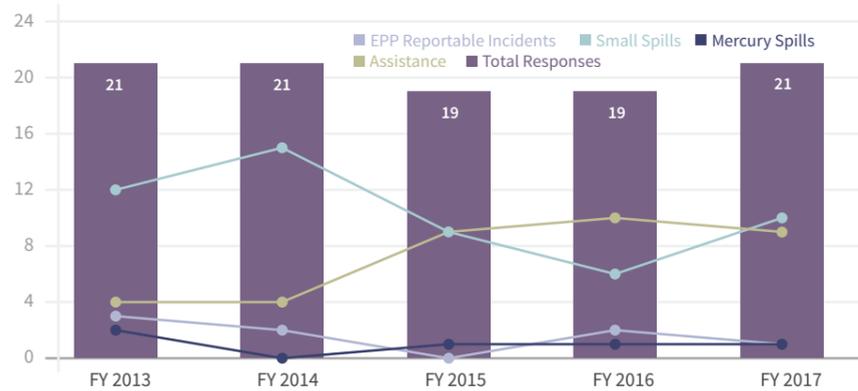
### Emergency Response Activations



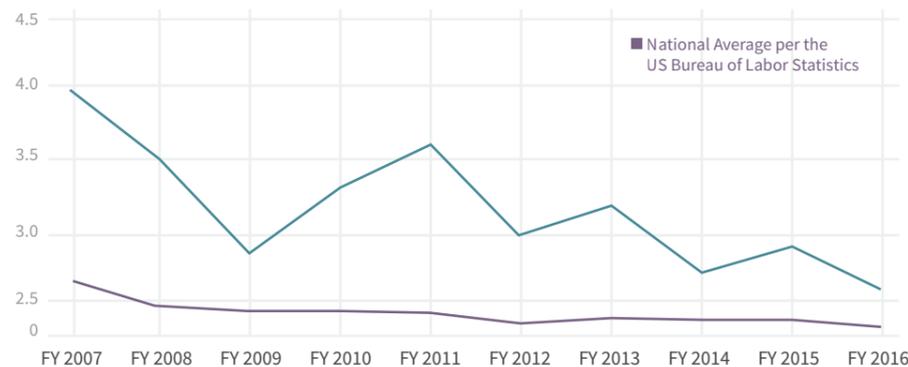
The Situation Triage & Assessment Team (STAT) activates for campus emergencies requiring reallocation of resources and greater coordination of response. Higher numbers in earlier years represent responses to mainly gas line breaks. Improvement in response in later years eliminated the need to activate the STAT for these events.

### Environmental Protection Response Activities

Environmental Protection Programs includes services related to chemical, radioactive and biological waste management, disposal of legacy controlled substances, hazardous material spill prevention and response, air emission permits, surplus chemical exchange, and shipping of hazardous materials. We also manage a variety of environmental projects such as underground tank remediation and soils remediation related to hazardous material spills.

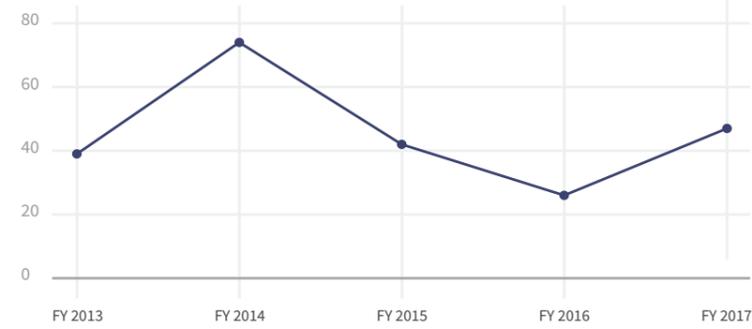


### University Total Recordable Case Rate (OSHA)



The Total Recordable Case Rate is the rate of OSH Recordable Injuries per 100 employees. A case is OSHA recordable if it involves medical treatment beyond First Aid or diagnosis of a significant injury or illness.

### Santa Clara County HazMat Inspections



Displayed above is the number of buildings inspected for hazardous chemical and waste management by Santa Clara County Hazardous Materials Division.

Our expert Biosafety staff completed over

300

Biosafety and Biosecurity visits within the past year to a wide variety of labs on campus.



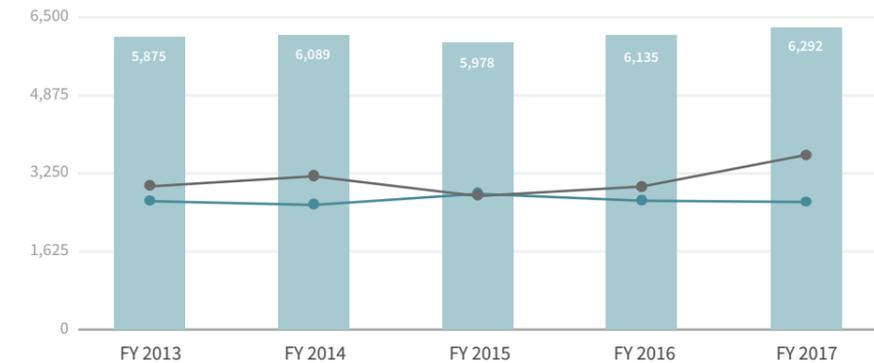
In 2017 our staff completed over

407

general lab safety consultations within our research community

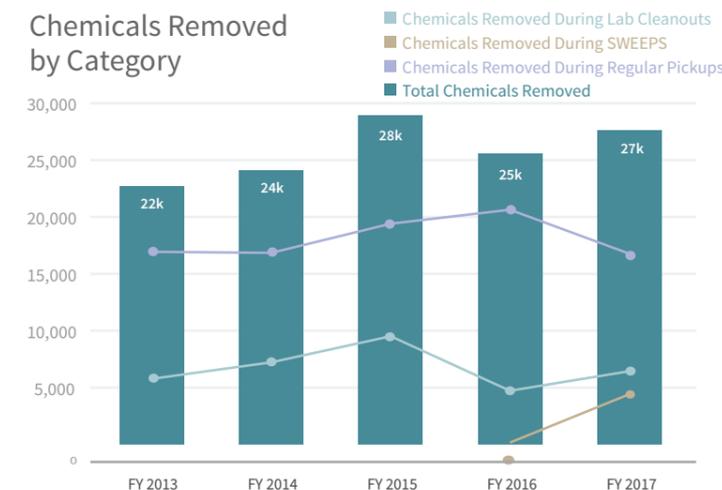
**OPERATIONS** | EH&S serves many important logistical functions for the university. This includes fire system care and maintenance, receiving, dispersing, and removing certain chemicals, and campus-wide flu clinics. All of these activities ultimately contribute to a safer and healthier campus community.

### Occupational Health Clinic Visits\*



The Stanford University Occupational Health Center (SUOHC) is dedicated to providing outstanding clinical care to improve the health and safety of university employees. We provide evaluation and treatment for work-related injuries and illnesses, work-related preventive medical services, travel medicine, and OSHA and departmentally-mandated medical surveillance programs for university staff.

### Chemicals Removed by Category



9,694

Fire extinguishers were serviced in 2017 by our trained technicians along with over

11,909

Fire Protection Systems Preventive Maintenance Inspections completed.





