



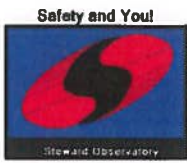
Environment, Health,
& Safety Manual

2019 Annual Safety Report

The Steward Observatory Annual Safety Report 2019



The Submillimeter Telescope



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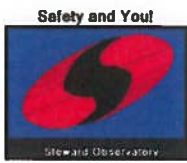
This has been a great year for the Steward Observatory Safety Management system. Various metrics indicate that Steward Observatory continues to meet its objective of maintaining a safe and healthy working environment. The success of the safety program relies upon participation of the Safety Committee members, site managers and employees to meet our objective.

- In 2019 Steward Observatory had two (2) OSHA recordable accidents with no lost time. This is the best record yet and a reduction from OSHA 2018.
- The Executive Safety Committee added five (5) new members whose experience and diverse backgrounds have broadened the goals and outreach of the Safety Committee. Steward Observatory also expresses our gratitude to Carmen Otero, Joe Hoscheidt, and Alyson Ford who stepped down from active duty on the Executive Safety Committee.
- The ability to conduct safety inspections twice a year at each site has resulted in eighty-one (81) safety improvements across the department.
- Implementation of the *Top Priority Safety Item List* keeps safety goals moving forward. Challenging safety issues are a joint effort between site managers, employees and the Executive Safety Committee. This collaborative approach has been successful in utilizing technical expertise from employees at other sites and in identifying funding sources to implement safety solutions.
- The bi-annual Safety Committee meetings provide training and awareness on a variety of safety topics.

2019 Themes and Goals

Each year the Executive Safety Committee reviews Steward Observatory's workplace safety and health program and then sets themes and goals based on noted program weaknesses or safety improvements that are needed or desired.

1. As part of the University of Arizona's Deferred Maintenance Project (DMP), Facilities Management in coordination with Steward Staff initiated a major effort to restore and upgrade the Steward Observatory building 65. By project completion, in excess of \$10 million dollars will have been expended to maintain and improve the Steward Observatory building. Major Accomplishments include:



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- HVAC
 - Cleaned all Supply and return main ductwork in Building 65, 65A, 65B/C and Dome.
 - Removed and replaced all air grilles in every room. Quantity 587.
 - Removed and replaced ductwork in every room. This also removed any ductwork that had internal insulation in it; replaced with externally wrapped insulation.
 - Replaced HVAC Equipment serving Building 65 and 65A including main Air Handling Units, individual room air boxes and installed digital controls with remote monitoring and diagnostics. Room air boxes 113.
 - Replaced Heating system serving Building 65B/C and individual room air boxes and installed digital controls with remote monitoring and diagnostics. Room air boxes 98.
 - Installed standalone HVAC for all Steward Program server rooms. Four total.
 - Replaced all lab exhaust fans, 11 total.
 - Fire Safety
 - Replacement of all sprinkler piping within the buildings
 - All fire alarm installations brought up to code, including the addition of message boards and new master control panel
 - Electrical
 - Brought electrical panels up to code throughout building. (50 total)
 - Updated labs to meet electrical code and their needs.
 - Upgrading of lighting to LED
 - Exterior
 - Removed and replaced roof of Building 65.
 - At Building 65A removed raised concrete tile roof deck. At 65 and 65A installed rubberized tiles, approximately 2,100 square feet.
 - Resealed exterior of all buildings and re-caulked windows.
 - Modified 3rd floor patio to minimize rain intrusion.
 - Plumbing
 - Replaced all restrooms and drinking fountains with touchless capability.
 - Added bathroom to annex trailer.
2. Made significant progress on the new Top Priority Safety Item list.
- Designed and built a personnel safety platform for the Sunnyside vacuum chamber.
 - Automated a hatch at the 1102 Telescope on Bigelow. Initiated the design and installation of a fall restraint and tie-off system for safe hatch operations.
 - Updated and modified procedures for slip ring changes and snow removal at the 90-inch telescope on Kitt Peak.
 - Updated fall arrest equipment and trained employees in its use.
3. Continued efforts to promote Safe Driving.



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- Safe driving was promoted at the October Safety Committee meeting. Also, published a new driving “Potty Poster”.
 - LBTO and MGIO accomplished major inroads through planning meetings to reduce driver risks when traveling to telescopes. LBTO also provided driver training for observers.
4. Continued efforts to promote full compliance with GHS (Global Harmony System) for classification and labeling of chemicals).
- Site safety inspections emphasized the proper use of chemical labels on containers and storage practices.
 - Verified the presence of updated Safety Data Sheets at all work sites.

Safety Committee Meetings

As per policy, this year the Steward Observatory held two meetings attended by most members of the Safety Committee. The presentations can be found at <https://www.as.arizona.edu/safety>.

The first meeting was held on April 9, 2019.

- Dr. Steven Dudley, (PRAR MD, DABAT) Director of the Arizona Poison and Drug Information Center at the UA presented on *Opiate Safety*. Dr. Dudley’s presentation defined the types of opiates, how to recognize the symptoms of an opiate user, and methods to intervene in an overdose situation through the use of Naloxone (opioid overdose reversal) and calling 911. Opiate abuse crosses all ages and ethnic groups. It is present in families, schools, Universities, and work sites. Dr. Dudley stated, “Drug overdose is responsible for more deaths than car crashes”.
- David L. Swihart (MC, LPC) UA Human Resources provided an overview of the “Ask A Question, Save a Life, QPR” method of suicide prevention. QPR stands for *Ask the Question, Persuade* the person to hold off, to stay alive and *Refer* them to help. Like opiates, suicide occurs across all age and ethnic groups. Suicides rates in Arizona are increasing and impact, families, schools, the University and our work sites.
- David Christian and Dylan Scott from Air Liquide provided a comprehensive overview of OSHA safety, training and emergency response requirements for employees and facilities that use gasses including cryogenic materials. There were many questions on safe handling, personal safety equipment, and training requirements from the committee members. The conversation prompted groups to review their procedures when using cryogenics at telescope sites and in laboratories. This presentation also resulted in changes to the existing policies in the Steward Safety Manual.
- We then reviewed the following changes to the Safety Management System.



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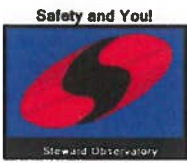
- ❖ Introduced the five (5) new members added to the Executive Safety Committee.
- ❖ Provided a description of the monthly *Top Priority Safety Item List*.
- ❖ Increased the maximum reimbursement of safety shoe/boots by an additional \$25.
- ❖ Added an additional AED to the 4th floor of Steward Observatory.

The second meeting was held on October 8, 2019.

- Charity Madrid Torres, Health Safety Specialist, from Risk Management Services described a new Risk Management program for forklift certification and train-the trainers. The intent of this program is provide OSHA regulation forklift training and comprehensive evaluation and training standards for University employees. The Astronomy department will be the first group to utilize this program. It consists of on-line training in UAccess, a written test, and an on-site practical administered by Risk Management Services. Steward Observatory's goal is to identify forklift trainer(s) for each site, complete the on-line training in UAccess, and then conduct a group on-site class for Train-the-Trainers. These trainers will then follow the specific protocol for conducting training and evaluation of forklift operators at their work sites.
- Anna Llamas, Workers Comp Coordinator, Sr. and State Analysis, with Risk Management Services provided an overview of the Workman's Compensation program separating myths from facts. The presentation detailed how employees can obtain medical treatment through the new Corvel 24/7 triage nurse program, the emergency room, or non-emergencies through various Occupational Clinics. The UAccess system has been revised to enable Supervisors ease in reporting incidents.
- Paul Smith, Steward Astronomer and Mountain Operations Manager spoke on the driving hazards to and from telescope sites. Paul provided key tips for "*Making it to the Summit Intact Without too Much Drama*". Based on personal experiences, Paul described narrowly avoiding a tragedy when he expectantly encountered a bicyclist on the Mt. Hopkins Forrest Road, Paul urges drivers to pay attention to weather, speed, visibility, to stay mentally alert and above all to "Stay in the Lines".

2019 Safety Improvements

This year there were many safety improvements made at the various facilities. Some improvements were made on a routine basis due to site manager and employee involvement others as a result of the safety inspections. Sites fixed more problems than we found in our formal safety inspections. For example, there were one hundred and twenty-one (121) safety improvements made in 2019, which is forty (40) more than the improvements noted in inspections. The following is a list of the major improvements by site.



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Steward Building

- ✓ All fire extinguishers were replaced
- ✓ Emergency lights were replaced
- ✓ Electrical switches unblocked
- ✓ Tripping hazards removed
- ✓ Electrical panels unblocked
- ✓ In room 487 three machines (chop saw, small grinder and drill press) were bolted down.
- ✓ Crowded hallways cleaned up to allow for proper aisle clearance
- ✓ Floor tiles replaced where broken
- ✓ Large isopropyl containers now stored properly in flammable cabinets
- ✓ Major portions of AC ductwork have been replaced or cleaned
- ✓ All of the fire piping and sprinklers have been replaced and brought up to code
- ✓ New emergency lights have been installed in clean rooms and labs where needed
- ✓ Approximately four large truck loads of surplus property have been taken to auction to clean aisles and labs
- ✓ New exhaust flow hood has been installed in Room N-101
- ✓ Most lighting has been replaced with modern LED lighting and the old fluorescent tubes have been removed
- ✓ A new roof has been installed on building 65 (old, original building)
- ✓ Many windows were sealed

Vatican Telescope

- ✓ Front steps have been repaired.
- ✓ Replaced the cover on electrical box.
- ✓ Exit sign lights were replaced.
- ✓ New face shield provided for use in nitrogen handling.

Sunnyside Mirror Aluminizing Facility

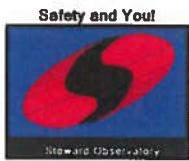
- ✓ Design and fabrication of a safety platform for vacuum chamber (not installed yet)
- ✓ New first aid kits installed.
- ✓ New chemical acid/base spill containment kit installed.
- ✓ New eyewash/shower station installed.
- ✓ New high voltage meter for glow discharge cabinet installed.
- ✓ Removed high voltage wires and connectors from cabinet.
- ✓ Installed fan in Pump Room to exhaust oil vapor from mechanical pump.
- ✓ Removed and replaced broken asbestos floor tiles.

Ray White Campus Telescope

- ✓ Tape installed on observer platform to warn people so they do not fall off.

Engineering & Technical Services Facility at Tech Park

- ✓ Extension cords in walkways are now covered.
- ✓ Emergency lights are no longer covered by shelf items.
- ✓ Updated and assured that First Aid Kits were stocked with current date supplies.



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- ✓ Completed and updated list of all chemicals at the electronics shop.
- ✓ Moved electronics shop and ETS personnel to Tech Park and had all personnel review the new Tech Park Safety Manual, rules and procedures.
- ✓ Had the Machine Shop install a fire barrier on the welding cart to update it to the new standards in our Safety Manual.

Imaging Technology Laboratory

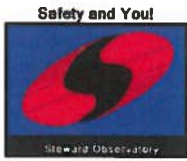
- ✓ Baldor buffer has been bolted down to the floor.
- ✓ Milling and drilling machines are now bolted to the floor.
- ✓ Major efforts on GHS were accomplished at the Imaging Technology Lab. ITL invited Margretta Murphy, Manager Environmental Health/Safety, from RLSS for a review of our HF acid protocols. Based on her recommendations ITL:
 - Modified our HF Emergency Poster, adding the UA phone number to call for HF spill cleanups.
 - Created two HF first aid kits with each including a tube of calcium gluconate, gloves, scissors, and a pre-filled eye wash bottle.
 - Added extra gloves to our HF spill kits.
 - Centralized all chemistry lab safety information to one location.
 - Updated obsolete posters with new GHN symbols.

Richard F. Caris Mirror Lab

- ✓ Fire extinguisher mounted in new storage area.
- ✓ Conduct monthly fire extinguisher inspections.
- ✓ Emergency exit from fenced area installed.
- ✓ Emergency lights were installed in the restrooms.
- ✓ Two new ladder storage systems were designed and installed to safely hold large ladders
- ✓ The design, fabrication and installation of a *Mirror Storage Rack* that is used to safely store 6.5m/8.4m mirrors and associated support equipment off of the production floor.
- ✓ A new Safety Rail System was designed and installed around the GMT Test Cell to protect workers.

Mount Lemmon and Bigelow

- ✓ At the 1102 Telescope on Bigelow the telescope hatch opening is now automated (this was a major project) and a Tie off was designed and installed to keep anyone from falling into the hatch.
- ✓ The elevator platform adjustable foot break was repaired and broken stair treads were all replaced to stop a tripping hazard.
- ✓ The 1103 Dorm room lighting was relocated and counterweights were replaced in the 1101 Schmidt telescope to eliminate protruding corners on the old counterweights.
- ✓ Exit signs have been installed above exit doors in two telescopes.
- ✓ A new GFCI circuit and warm room heater were installed in the 1401, 60 inch telescope.
- ✓ Mold remediation efforts were accomplished in the 1102, 61 inch telescope, which including replacing wood cabinets with metal cabinets.
- ✓ A waterproof plywood floor was installed in the equipment lift cage.



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- ✓ A leaky fire hydrant repaired near the 1412 Telescope.

Kitt Peak

- ✓ Major water leaks were repaired in the dome of the 90 inch and the 2nd floor into the electrical shop.
- ✓ The dormitory siding was replaced where necessary
- ✓ New fire alarms were installed in the dormitory.
- ✓ Monthly meetings were held to investigate, update and modify procedures for slip ring changes and for snow removal from the top of the dome (this has been another long time in getting fixed).
- ✓ New safety harnesses and other safety equipment have been purchased and training with the new equipment was given to each employee.
- ✓ The old furnace in the Dormitory was replaced with a new electric furnace.
- ✓ New fire and smoke detectors have been installed in the dormitory and they were set up in a sequence to be more effective.
- ✓ The Big Joe hydraulic lift has been repaired to stop leaking oil.

12-Meter Telescope on Kitt Peak

- ✓ Emergency lights have been repaired or replaced in several areas.
- ✓ A new pipe access water cage has been installed for the dormitory water supply.
- ✓ Two additional spark arrestors have been installed on the Oxy/acet welder and it is now legal.
- ✓ The crane, forklift and man lift have all been inspected by outside professionals.
- ✓ The observer lounge has been remodeled and panels replaced.
- ✓ New fall arrest harnesses for each 12-M employee were received May 8, 2019.

SMT

- ✓ There has been progress on obtaining additional fall arrest equipment and new safety harnesses for two employees.
- ✓ Tested the arc flash gloves.
- ✓ Repaired cracked guard on shop grinder.

MGIO

- ✓ Updated Oxy/Acetylene carts with divider and appropriate spark arrestors.

Optics Shop

- ✓ A new Emergency Stop was added to an older 60-inch grinder
- ✓ Air quality issues in Room 129 were improved significantly

MMTO

- ✓ Updated trauma bag and medical supplies at three sites 1) the summit 2) the ridge and 3) the basecamp.



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- ✓ Added a Mobilize First Aid Kit to the summit control room that is easier to use for an untrained person.
- ✓ Purchased Blackline Personal Safety Devices to help protect staff when minimal support is available.
- ✓ All observatory outdated electrical panels and battery backup systems have been updated to new standards.
- ✓ Purchased Kahtolla Microspikes for observatory staff that are boot traction devices to prevent slips and falls during icy conditions.

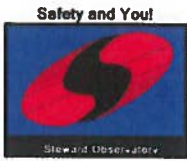
LBT

The focus in 2019 was on emergency planning and response, safety training, forest fire contingency, continuing to eliminate or provide hazard controls for hazards throughout the facility, the continual development of the safety management system, and establishing and maintaining a field safety presence (safety by walking around).

Major Safety improvements for the LBTO in 2019 along with LBTO Safety Issue Trak numbers (for reference):

Safety Management System and Program Development

1. Developed and released the following written procedures, programs and policies:
 - a. M004s00310 LBTO Emergency Action Plan (EAP) (IT 7623)
 - b. M004s00300 MGIO Emergency Response Contingency Plan (ERCP, complete re-write)
 - c. M004s00001 Forest Fire Contingency Plan (IT 7360). Only needs Instrument Shutdown review.
 - d. M004s00062 Safety Training Program (IT 6503)
 - e. M004s00323 Planning Tool for Restricted Access/Communication to the Observatory (IT 7627)
 - f. M004s00307 Injury, Illness, & Medical Incident Report Form (IT 7359)
 - g. M004s00308 Patient Information & Traveler Form (IT 6297)
 - h. M004s00012 Fall Rescue Program re-written (IT 6297)
 - i. M004s00702 Fall Rescue Planning Template (IT 6297)
 - j. M004s00340 LBTO Vehicle Emergency Kit Inventory List
 - k. M004s00342 LBTO Observatory First Aid Kit Inventory
 - l. M004s00341 LBTO Visitor Vehicle Emergency Kit Inventory List and Sign Out Sheet
 - m. M004s90040, 41, 42, 43 Pre-Use Inspection Checklists for Scissor, Boom, and Fork Lifts
 - n. M004s00049 ARGOS Dichroic Lifting Fixture Load Test
 - o. M004s00050 Brush Seal Indoor Inspection Platform Load Test
 - p. Docent Safety Training (for Discovery Park Tour Docents)
 - q. M004s00803 Safety Inspection Checklist (IT 6587)



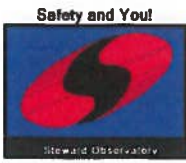
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2. Currently Developing the following written procedures, programs and policies, which have carried over into 2020:
 - a. M004s00113 LBTO Safety Manual (IT 6504)
 - b. M004s00312 LBTO Vehicle Travel Safety Requirements (IT 7520)
 - c. M004s00311 LBTO Inclement Weather Policy (IT 7520)
 - d. M004s00830 Hazard and Risk Analysis Plan (IT 6964)
 - e. M004s00720 Moth Mitigation and Health Management Plan (IT 7816)
 - f. M004s00320 Altitude Health Program (IT 6506)
 - g. M004s00490 Electrical Safety Program (IT 6513)

Safety Improvements

1. Facilitated MGIO-wide Emergency Planning Group meetings (every 8 weeks) and tracked progress on a variety of initiatives. Successes include fire alarm systems in Utility building, a trial of a tag in/tag out software, new microwave communication link to the summit, IT 7570
2. Established a medical oversight and training contractual agreement with Banner Emergency Medicine, including their review of the ERCP, a site evaluation, on-call physician service for medical incidents (our top personnel safety type), and training by their emergency/wilderness medicine staff. All elements are underway. IT 7570
3. Staffed summer shutdown so that suspended load (bell jar) no longer remains attached to the crane unattended. IT 7625
4. Conducted a moth allergy survey with Occupational Health and Risk Management. IT 7816. This precludes the 2020 Moth Mitigation Plan (to come).
5. Overseeing UA Engineering Moth Mitigation Senior Capstone Project.
6. Replaced 12 fall protection self-retracting lanyards that were recalled by the manufacturer. IT 7902
7. Facilitated 24 operations procedure revision requests. These are changes to engineering procedures (equipment install, removal, etc.). Update/revision of 20 operations procedures in the Engineering Group, which incorporated quality and safety improvement suggestions from the staff performing and overseeing the work. These were completed as "Document Change Request" ITs.
8. Performed regular LBTO safety inspections and bi-annual site-wide MGIO inspections.
9. Hired a new staff technician that will oversee the preventative maintenance (PMs) for all types of safety equipment, currently numbering 30+ types. Staff has been mentoring with the safety manager and day crew.
10. Welding carts upgraded with flash arrestors on both ends of hoses, and a separation barrier between oxygen and acetylene tanks per OSHA.
11. Installed Oxygen alarms with altitude (barometric pressure) compensation in the 2 computer rooms where there is an asphyxiate (freon) hazard.
12. Designed, installed, and tested an indoor inspection platform for the enclosure brush seal. IT 7621
13. Grating and Railings were installed/modified on rear of telescope platform to eliminate gaps, fall, and trip hazards. (IT 6080)



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14. Conducted engineering assessment of Utility Building structural elements to provide safe and legal fall protection plan for the level 2 area of the building (above the chillers).
15. Performed a number of construction-related projects (Utility Chiller, Winter Chiller, 47 degree water upgrade, clean room vestibule, etc.) with zero safety incidents.
16. NFPA 70E Arc Flash assessments and preventative maintenance on all facility (gray) panels in the observatory via Sabino Electric. This is carrying over into 2020: Arc Flash labels will be installed and an Electrical Safety Program drafted.
17. Developed Risk and Failure Mode Assessment tools in Smartsheet, which will carry over into 2020 assessments and risk management plan development.

2019 Safety Training

Safety Committee members have provided the following list of safety trainings completed for each work site.

Sunnyside

- ✓ Fall Arrest Training at Certex Facility
- ✓ Active Shooter Training
- ✓ Fire Extinguisher Training
- ✓ Respirator Training

Mountain Operations/Kitt Peak

- ✓ Fall arrest Training at Certex facility
- ✓ Active shooter training
- ✓ Fire extinguisher training
- ✓ Respirator training for all mountain employees

SMT

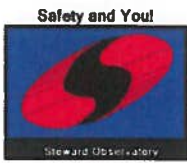
- ✓ Three employees went through Wilderness EMT Training and completed all assigned courses on Steward Observatory web site
- ✓ Two employees fitted for and trained in safety harness wear at Certex Facility and advanced first aid training

Vatican Telescope

- ✓ Took courses in Blood borne Pathogens
- ✓ Defensive driving
- ✓ Security awareness
- ✓ Fall Protection
- ✓ 2-day class as First Responder

12-Meter Telescope

- ✓ CPR/AED and basic First Aid



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- ✓ Fire Extinguisher training

Imaging Technology Laboratory

- ✓ ITL staff were required to read through the Steward Observatory safety manual.
- ✓ ITL staff were required to review the ITL Laboratory Chemical Hygiene Plan as required by UA Research Laboratory & Safety Services (RLSS).

Richard F. Caris Mirror Lab

- ✓ ARC Flash Refresher
- ✓ CPR/AED First Aid
- ✓ Ladder Safety Awareness
- ✓ Respirator Refresher with Annual Fit Testing
- ✓ Medical Surveillance/Medical Respiratory
- ✓ Fall Arrest Authorized User
- ✓ Scissor Lift Refresher
- ✓ Articulating Boom
- ✓ Forklift
- ✓ Hearing Conservation
- ✓ Laser Radiation Protection
- ✓ Annual Audiograms
- ✓ UA Requirements Defensive Driving
- ✓ Water/Fluid Safety Awareness

Engineering & Technical Services

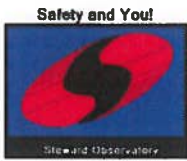
- ✓ All folks needing Fall Arrest training and recertification and articulating boom and scissor lift recertification and defensive driving recertification are current.
- ✓ All folks are current on the Steward Observatory required training videos that are job applicable.

MMT Observatory

- ✓ Two employees attended Wilderness First Responder Training, obtained certifications that are good for two years.
- ✓ Two other employees completed their Wilderness First Responder Training refresher class and obtained two year extensions for their certification.
- ✓ A monthly safety/medical training was started in March, 2019 at the MMT and streamed to the town offices that includes safety and medical topics to keep MMT staff trained on topics of interest.

Mount Lemmon and Bigelow Operations

- ✓ Scissor Lift/Articulated Boom training.
- ✓ NFPA 70E Electrical Safety training.
- ✓ Two employees maintained their Federal Wildlife Firefighter certification.



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MGIO

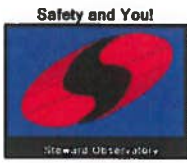
- ✓ All employees had advanced first aid training in October.

LBT

1. Implemented an online safety training learning management system (Vivid LMS) (IT 6503)
2. Site Safety Orientation training is now hosted on Vivid LMS with a required quiz
3. Visitor safety orientation is now part on-line, part in-person, to optimize users' time
4. Decent safety training provided for Discovery Park decent class
5. Began Banner Emergency Medical Training (Advanced First Aid) for mountain staff

Training was completed on the following topics:

- ✓ OSHA 30 for Mountain Managers and Supervisors
- ✓ Banner emergency medicine
- ✓ Site safety orientation (industrial and observer levels)
- ✓ Chemical safety
- ✓ Confined space entry
- ✓ Confined spaces
- ✓ Earthquake preparedness
- ✓ Eyewashes and safety showers
- ✓ Fatigue and stress awareness
- ✓ First aid (6 lessons)
- ✓ Flammable liquid safety
- ✓ Hand and power tool safety
- ✓ Hand safety
- ✓ Hearing conservation overview
- ✓ Heat stress
- ✓ Incident investigation
- ✓ Indoor air quality
- ✓ Loading dock safety
- ✓ Mold and mildew hazards
- ✓ Pallet jack safety
- ✓ Ladder safety
- ✓ Arc flash NFPA 70E
- ✓ Fall protection authorized user and competent person
- ✓ Laser safety
- ✓ Lockout tagout
- ✓ Radio communications
- ✓ Safety audits
- ✓ Workplace cleanliness
- ✓ Material storage
- ✓ Site security
- ✓ Machine guarding
- ✓ Chlorine safety



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- ✓ Personal safety
- ✓ Environmental management fundamentals
- ✓ Hot work with arc welding
- ✓ Hexavalent chromium hazards
- ✓ Lead awareness
- ✓ Overhead and gantry crane safety
- ✓ Personal fall arrest systems
- ✓ Powered industrial truck safety
- ✓ Scaffold safety
- ✓ Safety and injury prevention
- ✓ Cold stress
- ✓ Cold
- ✓ Flu and transmissible illness prevention
- ✓ Emergency and fire preparedness
- ✓ Industrial ergonomics
- ✓ Portable fire extinguisher safety
- ✓ Winter weather driving
- ✓ Aerial and scissor lift safety
- ✓ Behavior-based safety
- ✓ Blood borne pathogens (BBP)
- ✓ CPR/First Aid
- ✓ Distracted driving
- ✓ Compressed gas safety
- ✓ Electrical safety overview
- ✓ Office ergonomics overview
- ✓ PPE (7 lessons)
- ✓ Slips, trips, and falls overview

2019 Safety Metrics

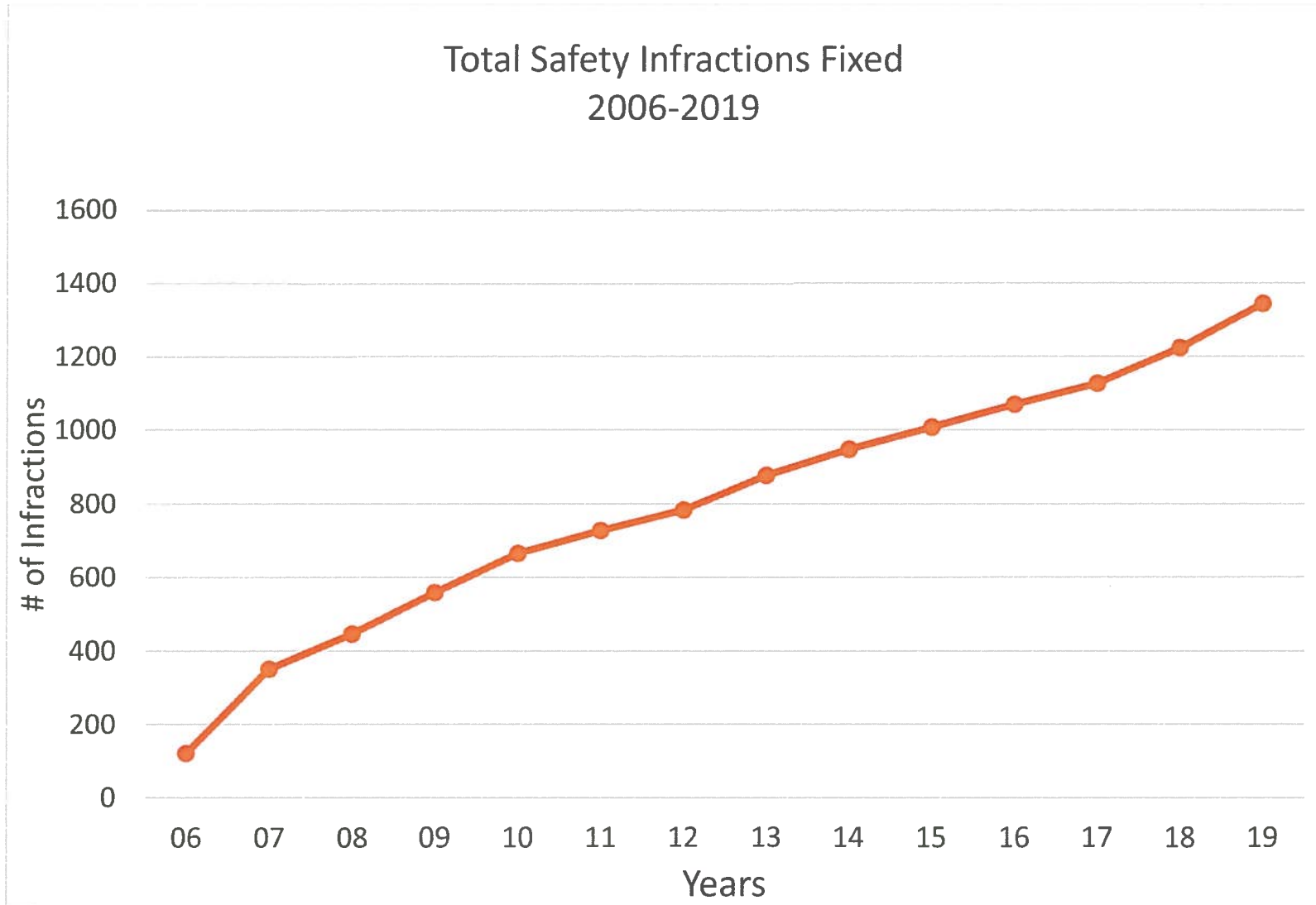
Steward Observatory uses the following metrics to evaluate the safety culture and effectiveness of the safety program. These include, the record of site inspections, documented safety fixes and the OSHA record of injury report.

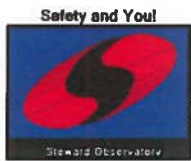
Appendix A - Risk Management OSHA Record of Injury

Appendix B – Historical accounting of accomplishments to date detailing number of infractions and fixes resulting from inspections.



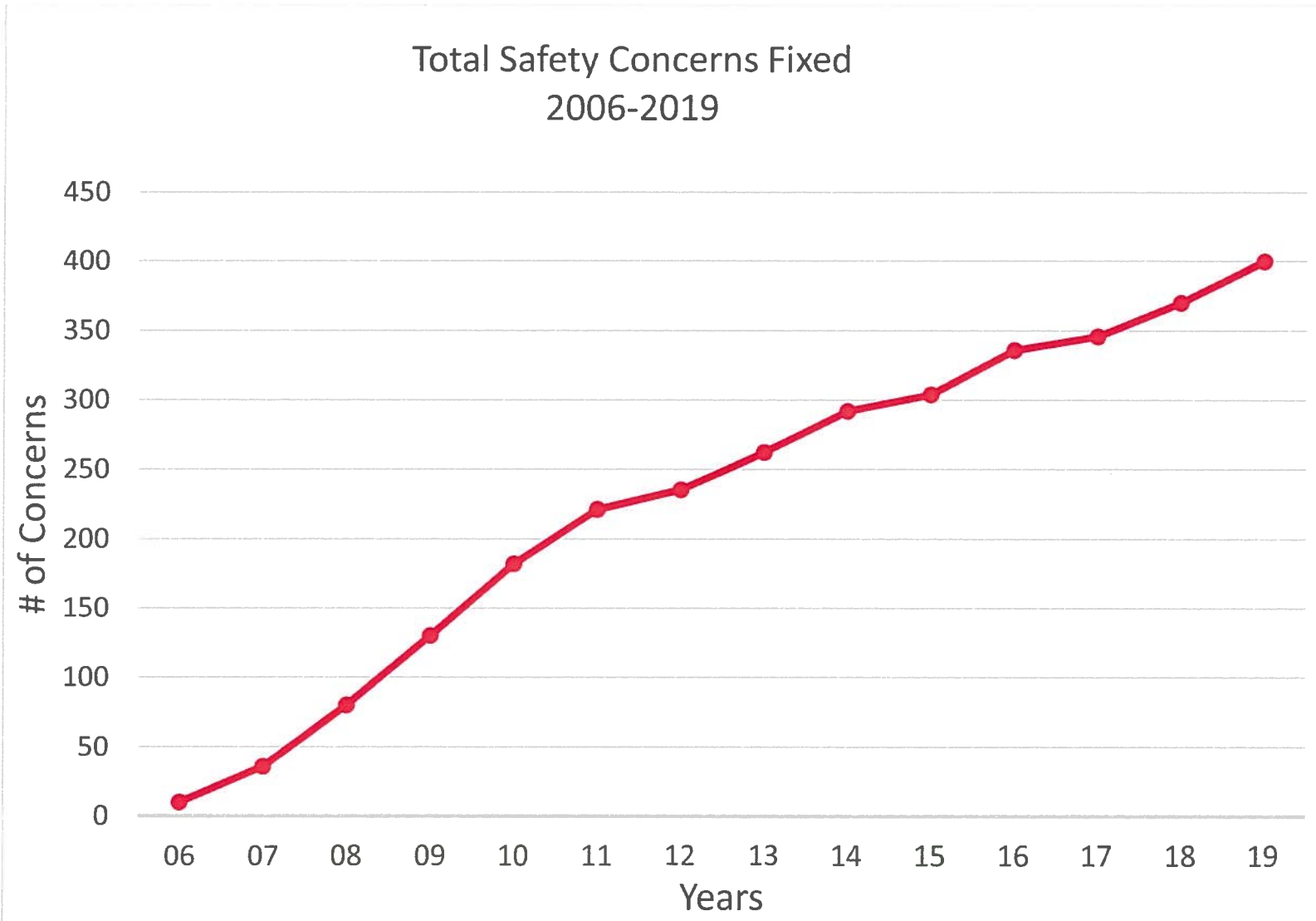
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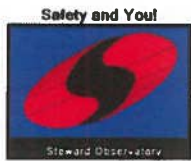




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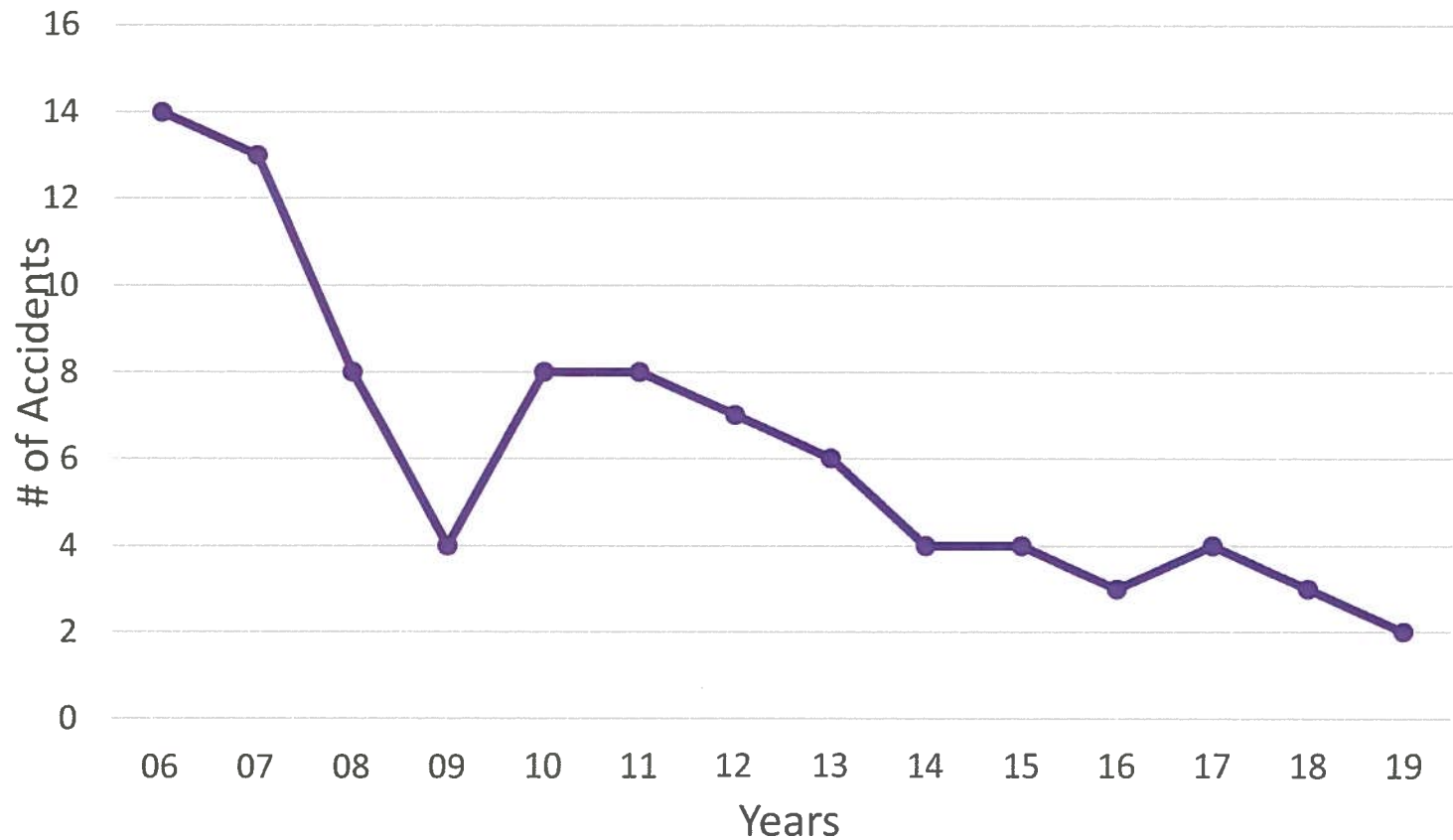


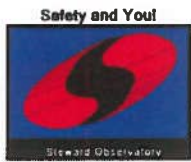


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OHSA Recorded Accidents Steward Observatory 2006-2019





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APPENDIX A

OSHA Record of Injuries & Lost Time 2006 to 2019

- I = Injury Report
- O = OSHA Recordable Accidents and injuries
- IL = Illnesses
- L = Lost time Accidents
- T = Total lost work days

	2019	2018	2017	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
O	02	03	04	03	04	04	06	07	08	08	04	08	13	14
I	02	03	00	03	05	06	05	14	13	12	11	23	25	06
IL	00	00	01	00	00	02	01	00	01	03	01	01	02	04
L	00	00	01	00	00	00	00	01	01	01	00	00	01	03
T	00	00	18	00	00	00	00	10	33	06	00	00	07	164

(Statistics according to official UArizona Risk Management data)



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OSHA's Form 300A (Rev. 01/20) Summary of Work-Related Injuries and Illnesses

Year 2019

U.S. Department of Labor
Occupational Safety and Health Administration
Form revised OSHA no. 1219-0113

All establishments covered by Part 1904 must complete this Summary page, even if no injuries or illnesses occurred during the year. Remember to review the Log to verify that the entries are complete.

Using the Log, count the individual entries you made for each category. Then write the totals below, making sure you've added the entries from every page of the log. If you had no cases write "0."

Employees (non-employees, and their representatives have the right to review the OSHA Form 300 in its entirety. They also have limited access to the OSHA Form 301 or its equivalent. See 29 CFR 1904.35, in OSHA's recordkeeping rule, for further details on the access provisions for these forms.

Number of Cases

Total number of deaths	Total number of cases with days away from work	Total number of cases with job transfer or restriction	Total number of other recordable cases
0	0	0	2
(D)	(A)	(R)	(O)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
0	0
(D)	(R)

Injury and Illness Types

Total number of...	(1) Injury	(2) Skin Disorder	(3) Respiratory Condition	(4) Poisoning	(5) Hearing Loss	(6) All Other Illnesses
(A)	2	0	0	0	0	0

Post this Summary page from February 1 to April 30 of the year following the year covered by the form.

Public reporting burden for this collection of information is estimated to average 20 minutes per response, including time to review the instructions, search existing data sources, gather the data, and complete and review the collection of information. Persons are not required to respond to the collection of information if it displays a currently valid OMB control number. If you have any comments about these estimates or any aspect of this data collection, contact: US Department of Labor, OSHA Office of Statistics, Room H-2044, 200 Constitution Ave, NW, Washington, DC 20310. Do not send the completed forms to this

Establishment Information	
Your establishment name	<u>STEWART OBSERVATORY - ALL</u>
Street	<u>833 N CHERRY AVE</u>
City	<u>TUCSON</u> State <u>AZ</u> Zip <u>85711</u>
Industry description (e.g., Manufacture of motor truck trailers)	<u>COLLEGES AND UNIVERSITY</u>
Standard Industrial Classification (SIC), if known (e.g., SIC 5710)	
OR North American Industrial Classification (NAICS), if known (e.g., NAICS 236210)	
Employment Information	
Annual average number of employees	<u>0</u>
Total hours worked by all employees last year	<u>0</u>
Sign here	
Knowingly falsifying this document may result in a fine.	
I certify that I have examined this document and that to the best of my knowledge the entries are true, accurate, and complete.	
<u>Steve Walker</u> Company Executive	<u>CRO</u> Title
<u>520-621-1556</u> Phone	<u>1/29/20</u> Date



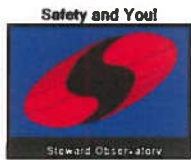
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APPENDIX B

Steward Observatory Site Inspections

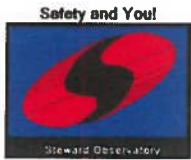
Site	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New
MT Lem & C Tele	10/22/19	8	+	4	0	+	0	0	0	0	+	0	0	0	+	0
KP & Sunny	09/23/19	9	+	6	0	+	0	0	0	0	+	0	0	0	+	0
MGIO	10/28/19	2	+	6	0	+	0	0	0	0	+	0	0	0	+	0
VATT	10/28/19	0	+	2	0	+	0	0	0	0	+	0	0	0	+	0
LBT	10/28/19	1	+	8	0	+	0	0	0	0	+	0	0	0	+	0
MMTO		0	+	0	0	+	0	0	0	0	+	0	0	0	+	0
SO & Annex	11/26/19	0	+	1	0	+	0	0	0	0	+	0	0	0	+	0
Imaging Tech	12/17/19	0	+	0	0	+	0	0	0	0	+	0	0	0	+	0
ETS Facility	12/18/19	0	+	0	0	+	0	0	0	0	+	0	0	0	+	0
Optics Shop	12/17/19	2	+	3	0	+	0	0	0	0	+	0	0	0	+	0
12-Meter	09/23/19	3	+	2	0	+	0	0	0	0	+	0	0	0	+	0
SMT	10/28/19	2	+	6	0	+	0	0	0	0	+	0	0	0	+	0
SO Mirror Lab	12/16/19	0	+	2	0	+	0	0	0	0	+	0	0	0	+	0
Totals		27	+	40	0	+	0	0	0	0	+	0	0	0	+	0
Total items fixed		1296			0				0				0			
Total infractions				1363				0				0				0



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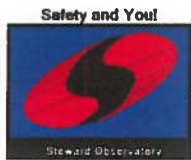
Site	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New
MT Lem & C Tele	10/03/17	7	+	4	04/16/18	4	+	2	09/18/18	4		1	05/15/19	2		8
KP & Sunny	10/10/17	3	+	3	03/19/18	4	+	4	09/25/18	6		1	08/14/19	3		9
MGIO	09/26/17	1	+	0	05/07/18	1	+	0	09/12/18	1		3	06/25/19	0		1
VATT	09/26/17	0	+	0	05/07/18	0	+	0	09/12/18	0		0	06/25/19	0		5
LBT	09/26/17	0	+	2	05/07/18	0	+	1	09/12/18	0		1	06/26/19	0		2
MMTO	11/13/17	0	+	3		0	+	0	10/10/18	1		5		0		0
SO & Annex	10/24/17	11	+	38	04/02/18	14	+	4	10/29/18	6		25	06/01/19	9		6
Imaging Tech	11/20/17	0	+	0	06/06/18	0	+	0	11/26/18	0		2	07/02/19	0		0
ETS Facility		0	+	0	Closed	0	+	0		0		0	08/07/19	0		2
Optics Shop	11/14/17	0	+	4	05/22/18	2	+	2	11/19/18	1		2	05/07/19	2		0
12-Meter	10/10/17	3	+	5	03/19/18	2	+	1	10/10/18	1		0	04/22/19	1		3
SMT	09/26/17	0	+	0	05/07/18	0	+	1	09/12/18	0		0	06/26/19	0		2
SO Mirror Lab	12/11/17	0	+	5	06/11/18	0	+	4	12/09/18	0		8	07/30/19	1		2
Totals		25	+	64		27	+	19		20		48		18		40
Total items fixed		1127				1189				1215				1265		
Total infractions				1216				1235				1283				1323



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Site	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New
MT Lem & C Tele	09/30/15	1	+	6	04/05/16	3	+	10	09/06/16	7	+	10	03/29/17	9	+	3
KP & Sunny	11/10/15	1	+	0	03/29/16	0	+	1	10/11/16	0	+	0	03/23/17	0	+	5
MGIO	09/16/15	0	+	0	05/10/16	0	+	0	09/21/16	0	+	0	05/11/17	0	+	2
VATT	09/16/15	0	+	1	05/10/16	0	+	0	09/21/16	0	+	0	05/11/17	0	+	1
LBT	09/16/15	0	+	1	05/10/16	0	+	5	09/21/16	0	+	3	05/11/17	0	+	2
MMTO	10/20/15	0	+	6	05/03/16	0	+		10/31/16	1	+	5		0	+	
SO & Annex	11/09/15	7	+	9	05/02/16	5	+	3	11/14/16	7	+	6	04/11/17	10	+	8
Imaging Tech	11/23/15	0	+	0	04/11/16	0	+	1	11/29/16	0	+	0	04/19/17	0	+	3
Solar Tracker	12/09/15	0	+	1	05/03/16	0	+	2	12/19/16	0	+	2	05/30/17	0	+	0
Optics Shop	10/19/15	1	+	2	04/13/16	1	+	3	11/21/16	2	+	1	05/01/17	3	+	3
12-Meter	11/10/15	5	+	5	03/29/16	2	+	0	10/11/16	2	+	0	03/23/17	2	+	4
SMT	09/16/15	0	+	0	05/10/16	0	+	0	09/21/16	0	+	0	05/11/17	0	+	0
SO Mirror Lab	12/14/15	0	+	7	05/09/16	0	+	3	12/05/16	0	+	0	05/08/17	0	+	5
Totals		15	+	38		11		28		19		27		24		36
Total items fixed		1008				1050				1070				1092		
Total infractions				1061				1089				1116				1152



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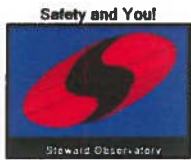
Site	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New
MT Lem & C Tele	11/05/13	3	+	3	04/08/14	4	+	2	10/01/14	2		2	04/14/15	1		3
KP & Sunny	11/12/13	1	+	3	04/01/14	2	+	2	11/12/14	2		1	04/08/15	0		2
MGIO	09/25/13	0	+	4	05/13/14	0	+	1	09/18/14	0		0	05/19/15	0		0
VATT	09/25/13	0	+	0	05/13/14	0	+	1	09/18/14	0		1	05/19/15	0		0
LBT	09/25/13	0	+	0	05/13/14	0	+	0	09/18/14	0		0	05/19/15	0		2
MMTO	10/24/13	0	+	32	06/11/14	0	+			0				0		
SO & Annex		0	+		05/21/14	14	+	6	11/24/14	6		15	05/18/15	3		12
Imaging Tech		0	+		05/20/14	0	+	0	12/02/14	0		3	05/11/15	0		2
Solar Tracker		0	+		05/19/14	0	+	0	11/20/14	0		4	05/20/15	1		0
Optics Shop	11/26/13	0	+	12	06/03/14	2	+	6	11/19/14	2		0	05/12/15	1		0
12-Meter	11/22/13	0	+	0	04/01/14	0	+	0	11/12/14	0		7	04/08/15	4		3
SMT	09/25/13	2	+	3	05/13/14	3		0	09/18/14	0		1	05/19/15	1		1
SO Mirror Lab		0	+		05/22/14	0	+	1		0			02/09/15	0		4
Totals		6	+	57		25		19		12		34		11		29
Total items fixed		878				916				948				983		
Total infractions				941				960				994				1023



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Site	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New
MT Lem & C Tele	11/17/11	0	+	2	05/16/12	0	+	7	11/19/12	5	+	2	05/28/13	3	+	2
KP & Sunny	11/22/11	0	+	2	05/29/12	0	+	0	11/15/12	0	+	0	05/21/13	0	+	6
MGIO	09/19/11	0	+	1	05/09/12	0	+	1	11/08/12	0	+	0	05/02/13	0	+	0
VATT	09/19/11	0	+	0	05/09/12	0	+	0	11/08/12	0	+	0	05/02/13	0	+	0
LBT	09/19/11	0	+	4	05/09/12	1	+	0	11/08/12	0	+	1	05/02/13	0	+	3
SO & Annex	02/27/12	8	+	18	09/17/12	8	+	6	04/09/13	9	+	11	11/20/13	12	+	14
Imaging Tech	05/01/12	0	+	1	01/14/13	0	+	0	06/10/13	0	+	2	11/04/13	0	+	0
Solar Tracker	03/20/12	0	+	1	08/14/12	1	+	1	03/26/13	0	+	2	11/25/13	0	+	0
Optics Shop			+				+		12/18/12	0	+	18	05/23/13	2	+	4
12-Meter	11/22/11	0	+	0	05/29/12	0	+	1	11/15/12	0	+	0	05/21/13	0	+	0
SMT	09/19/11	1	+	0	05/09/12	0	+	0	11/15/12	0	+	0	05/02/13	0	+	3
SO Mirror Lab	02/29/12	0	+	11	10/04/12	0	+	5	04/09/13	0	+	11	11/27/13	0	+	8
Totals		9	+	40		10	+	21		14	+	47		17	+	40
Total items fixed		727				766				783				827		
Total infractions				776				797				844				884



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Site	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New
MT Lem & C_Tele	11/09/09	1	+	0	04/29/10	0	+	2	12/08/10	1	+	0	04/28/11	1	+	1
KP & Sunny	11/18/09	0	+	1	04/14/10	0	+	4	11/30/10	0	+	2	03/08/11	0	+	0
MGIO	11/10/09	0	+	0	05/12/10	0	+	1	09/21/10	0	+	0	05/26/11	0	+	0
VATT	11/10/09	0	+	0	05/12/10	0	+	0	09/21/10	0	+	1	05/26/11	0	+	0
LBT	11/10/09	0	+	0	05/12/10	0	+	0	09/21/10	0	+	3	05/26/11	1	+	2
SO & Annex	02/04/10	7	+	12	06/22/10	5	+	6	01/06/11	6	+	14	07/19/11	5	+	18
Imaging Tech	03/02/10	0	+	0	07/21/10	0	+	2	01/06/11	0	+	0	07/12/11	0	+	0
LBTI & Solar Tra	02/08/10	1	+	1	06/23/10	0	+	5	12/14/10	0	+	2	07/12/11	0	+	2
Tumamoc Hill	mothballed		+		mothballed		+		mothballed		+		mothballed		+	
12-Meter	11/18/09	0	+	1	04/14/10	1	+	3	11/30/10	1	+	2	03/08/11	0	+	1
SMT	11/10/09	2	+	1	05/12/10	0	+	4	09/21/10	2	+	0	05/26/11	2	+	2
SO Mirror Lab	03/05/10	1	+	28	07/15/10	3	+	4	11/22/10	0	+	7	08/02/11	0	+	4
Totals		12	+	44		9	+	31		10	+	31		9	+	30
Total items fixed		588				635				665				697		
Total Infractions				644				675				706				736

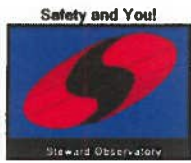


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Site	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New
MT Lem & C-Tele	03/31/08	4	+	13	09/04/08	8	+	5	01/21/09	3		3	07/07/09	1		3
KP & Sunny	05/08/08	0	+	4	08/07/08	1	+	1	12/16/08	2		0	06/04/09	2		7
MGIO	06/16/08	0	+	0	10/01/08	0	+	0	03/11/09	0		0	07/13/09	0		0
VATT	06/16/08	0	+	0	10/01/08	0	+	0	03/11/09	0		0	07/13/09	0		0
LBT	06/16/08	0	+	4	10/01/08	0	+	1	03/11/09	0		1	07/13/09	0		0
SO Office & Labs	06/19/08	17	+	11	11/05/08	10	+	10	04/02/09	8		30	07/28/09	10		6
Imaging Tech		0	+	0	11/06/08	0	+	2	05/18/09	0		1	08/25/09	0		0
LBTI Lab & So Te	06/17/08	0	+	2	11/20/08	0	+	11	04/9&5/6	1		4	08/19/09	0		2
Tumamoc Hill	mothballed		+		mothballed		+		mothballed				07/07/09	0		0
12-Meter	05/08/08	2	+	2	08/07/08	0	+	0	12/16/08	0		3	06/04/09	0		3
SMT	06/16/08	1	+	4	10/01/08	1	+	2	03/11/09	1		2	07/13/09	3		2
SO Mirror Lab	06/17/08	8	+	7	11/20/08	3	+	2	04/15/09	0		29	07/28/09	6		2

Totals		32	+	47		23		34		15		73		22		25
Total items fixed		389				445				487				553		
Total infractions				468				502				575				600



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Site	Inspected	Found	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New
Mt Lemmon	03/30/06	24	08/09/06	6	+	2	03/15/07	3	+	4	07/05/07	3	8	12/05/07	2	9		
KP & Sunny	04/25/06	24	08/17/06	7	+	0	01/25/07	2	+	0	07/06/07	1	7	11/28/07	0	0		
MGIO	05/03/06	2	08/22/06	0	+	0	04/04/07	0	+	0	08/29/07	0	0	01/16/08	0	1		
VATT	05/03/06	28	08/14/06	24	+	1	04/04/07	13	+	7	08/29/07	14	2	01/16/08	2	1		
LBT	05/04/06	9	08/22/06	0	+	3	04/04/07	0	+	0	08/29/07	0	8	01/16/08	2	1		
SO & Tele	05/25/06	72	11/28/06	38	+	10	05/03/07	27	+	21	09/05/07	22	5	02/04/08	13	15		
Imaging Tech	05/31/06	9	11/29/06	0	+	1	04/16/07	0	+	0	09/11/07	0	3	02/04/08	1	0		
SMP	06/02/06	5	11/29/06	4	+	6	05/24/07	3	+	2	09/20/07	1	2	02/06/08	0	3		
Tumamoc Hill	-	-	08/23/06	3	-	-	02/20/07	0	+	0	mothballed							
12-Meter	04/25/06	9	08/07/06	0	+	6	01/25/07	4	+	5	08/07/07	5	2	11/28/07	1	2		
SMT	05/03/06	15	08/22/06	9	+	12	04/04/07	3	+	4	08/29/07	4	3	01/16/08	2	1		
SO Mirror Lab	05/23/06	23	12/07/06	10	+	10	05/24/07	6	+	17	09/20/07	14	12	02/06/08	10	5		
Totals		220		101	+	51		61		60		64		52		33		38
Total items fixed				119				210				267			350			
Total infractions		220				271				331				383				421



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Prepared by:

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Director, Steward Observatory

Mark Buglewicz
Associate Director, Steward Observatory
Head of Business Services, Astronomy