



Environment, Health,
& Safety Manual

2018 Annual Report

THE STEWARD OBSERVATORY ANNUAL SAFETY REPORT

2018



Mt. Lemmon Observatory



Environment, Health,
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Congratulations to all the Steward Observatory employees! This year we matched our best previous accident statistic. In 2016 and again in 2018, we had a total of three (3) OSHA Recordable accidents and no lost work days. Fortunately, none of the accidents resulted in broken bones or skin.

Twelve years ago when we started the Steward Observatory Safety Management System, our accident record was 14 OSHA Recordable Accidents and 164 Total Lost Work Days due to those accidents. Since then, there has been significant improvement! The goal is of course, ZERO accidents.

During 2018 there were three policy and procedure changes that influence our employees:

1. February 2018, Section V, *Wildfires at Telescope Sites*, was added to the Safety Manual. It outlines the guidelines and responsibilities for visitors and employees when visiting or working at mountain telescope sites. It also provides exit plans, and what to do following a mountain wildfire.
2. October 2018, Section IV, *Employee Career Conversations*, was added to the Safety Manual. The Career Conversation format incorporates employee accomplishments, key strengths, goals, and safety training requirements. This conversation between supervisor and employee, enables an in-depth review of job specific safety training requirements, accomplishments, certifications and desires for the upcoming year.
3. The University of Arizona Risk Management Services implemented a Fleet Policy Amendment on operating university vehicles and the use of mobile devices while driving. This policy prohibits the use of cell phones, tablets, 2-way radios, or laptop computers when operating a University vehicle. There is an exception for 2-way radio use on mountaintops. The policy can be found at <https://risk.arizona.edu/fleetsafetypolicy-3#section3> .



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The Steward Observatory Safety Committee's first bi-annual meeting was held on Tuesday, April 10, 2018.

- Jeff Kingsley, Associate Director, provided a safety update on the Safety Management System progress.
- Dr. John L Koprowski, Wildlife Conservation and Management from the School of Natural Resources and the Environment, provided guidelines for working safely at telescope sites and mitigating encounters with wildlife.
- Lorraine Santiago, Risk Management Services, presented an update on the Air Quality status of Steward Observatory, Building 65.
- Frank Perez, Health/Safety Officer from Risk Management Services, presented a first peek at the Fleet Policy Amendment and the restriction of mobile device use. Steward Observatory appreciated having an opportunity to provide feedback on mountain driving and the policy impact.
- The final Agenda item for this meeting was a proposed new policy on Safe Lead Soldering. After much discussion a motion was made to disapprove the new policy.

The Steward Observatory Safety Committee's second bi-annual meeting was held on Tuesday, October 9, 2018.

- The first agenda item was the announcement that Mark Buglewicz, Assistant Director, Business Services, was replacing Jeff Kingsley, as the head of the Steward Observatory Safety Committee (SOSC). It was noted that Mark has a passion for safety and was enthusiastic to bring our safety organization to the next level. Mark will report directly to Buell Jannuzi.
- Dale Webb, Safety Manager, presented an update of our safety progress over the past year, and since starting the Safety Management System in 2006.
- Lorraine Santiago, Risk Management Services, provided a quarterly update on the air quality evaluation in Steward Observatory, Building 65.
- Kerry Gonzales, formerly with the DKIST project located in Maui, HI, provided an in-depth look at the safety processes utilized at the DKIST site to include hazard assessments, and emergency preparedness program development.
- Pat McCracken, Jr, from HTS Bees, provided safety awareness on the patterns and behavior of bees.
- John Di Miceli, from the MMTO gave a presentation on lessons learned from a serious MMT incident and emergency response preparedness.



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SAFETY IMPROVEMENTS ACHIEVED IN 2018

This year there were many safety improvements made at the various facilities. The following is a list of the major improvements by site.

Ray White Campus Telescope:

- Safely secured the large counterweights
- Enclosed the azimuth roller system with plastic see through panels to keep fingers and hands out of the pinch points that have been present for many years
- Installed a new large sign at the entrance with safety warnings for visitors
- Removed old conduits and electrical parts from the floor walk area
- Installed security barrier around drop-off area on the Observers Platform

Kitt Peak:

- Installed a new ramp to move equipment to and from the platform
- Installed a new crane ground rail

12-Meter:

- Replaced all hydraulic hoses on the crane boom
- Installed new railings along the drop-off of the loading dock walkway
- Completed the remodel of the old library to the new observer lounge

SMT:

- Completed a major update on the existing fire alarm system which now enables communication with other sites and downtown
- Installed anti-flashback valves on welding torches

Mt. Lemmon and Mt. Bigelow:

- Modified lift cart at the 61-inch telescope to hold contents securely
- Purchased new safety equipment including safety harnesses, and face shields
- Converted the old generator building to the new current transfer switch enclosure
- Moved the current transformer from the bottom of the hill to the top of the hill
- In process of installing automation equipment for 61-inch telescope equipment hatch
- Installed new cable trays in UPS room
- Installed cement poles to protect the new standby generator
- Installed better water filters on Mt Bigelow pump house
- New lights were installed on the back porch of the Power House, to light the generator area
- A new roof was installed on the Fire Water Pump House, to stop leaks into house and engine
- New conduits and receptacles were installed in the 50-inch control room, to replace extension cords



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MGIO:

- Remodeled the laundry area
- Purchased new snow truck trac vehicle to replace old, slow, snow cat
- Installed a new retractable fence on the summit power-house, to prevent unauthorized access to the Power House electronics, back-up generators, and vehicle storage

Optics Shop:

- Designed and installed new mirror stands
- Installed new devices on airlines to prevent injury, in the event an air hose separates at the nozzle
- Completed cleanup of loading dock and mobile mini area
- Completely remodeled Room 106A

Imaging Technology Lab:

- Replaced all chemical containers in the lab with GHS labeled, color-coded containers
- Reorganized the waste chemical area

Mirror Lab:

- Replaced all overhead and emergency lights in the Integration Lab with new brighter LED bulbs
- Constructed a new storage room which replaces the conex storage areas that were removed during the stadium reconstruction
- Relocated the Refractory Dust Collection booth from south Casting to Murphy's Shed

MMTO:

- Purchased new safety equipment for the First Aid Station including, Petzel/Vertex Bump caps, full body splint, and vacuum mattress
- New lighting system was installed for stairs, that also assures darkness when not in use
- Installed new containment system around the compressors for oil leaks
- Installed new Black Line Personnel Warning System, which is now being tested for effectiveness

Cherry Avenue Offices and Labs:

- Completed clean-out and refreshed room 281, and lab room N134 for new occupants
- Cleaned out and remodeled lab in room N109 for GUSTO project clean room, and nearly finished with remodel of lab N135, as this will be the cleanroom anti-chamber



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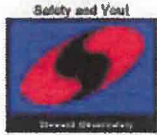
Large Binocular Telescope:

In 2018, the focus was on emergency response plan, continuing to eliminate or provide hazard controls for hazards throughout the facility, the continual development of the safety management system, and safety training. Enough cannot be said about the dedication and professionalism of the LBTO staff who value safety and are committed to the continual improvement of safety at the observatory. Many of the accomplishments below are the direct result of this remarkable team working together. Many thanks to all.

Major Safety improvements for the LBTO in 2018 along with LBTO Safety IssueTrak numbers (for reference):

Safety Management System and Program Development

1. Developed and released the following written procedures, programs and policies:
 - a. Stop Work Authority Program M004s00202 (IT 7415)
 - b. LBTO Safety Policy M004s00112
 - c. Fall Protection Program M004s00700 (IT 7278)
 - d. Fall Rescue Program M004s00012 and Fall Rescue Planning Template M004s00702 (IT 6297)
 - e. High Altitude Health Information M004s00320 (IT 6506)
 - f. Minimum Staffing Policy for the Observatory M004s00306
 - g. Injury, Illness, & Medical Incident Report Form M004s00307 (IT 7359)
 - h. Patient Information & Traveler Form M004s00308 (IT 6297)
 - i. Visitor Safety Brochure M004s00061 (IT 6478)
 - j. Waste Handling and Disposal/Recycling Protocol (IT 6517)
 - k. Refrigeration Compliance Management Plan M004s00560 (IT 6998)
 - l. Use and Update of Procedures Policy M004s90002 (IT 7113)
 - m. Safety Inspection Checklist M004s00803 (IT 6587)
 - n. Remote Observer Safety Information M004s00064 (IT 7279)
 - o. Upper Roof & Level 9 Catwalk Access Requirements M004s90003
 - p. Lockout/Tagout Logs (blank) and Log Stations for 4 unique locations in the building
2. Re-structured the "Safety" IssueType in the IssueTrak system to provide better categorization of and visibility to safety issues and trends, allowing for more intuitive searching, sorting, and categorizing of safety issues. IT 6529
3. Integrated Site Safety Orientation training enrollment for visitors into the existing LBTO visitor registration process. Although the process is still manual (visitor fills out form and submits, and training is assigned when needed), there is a process now to ensure that every visitor is enrolled in the Site Safety Orientation training upon visit registration. IT 6507
4. 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"



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ITs.

Fall Protection and Safe Access Improvements

1. Eliminated the LUCI 2 pinch/crush hazard at the top of the LUCI platform ladder. A new ladder and landing to access the LUCI platform on the telescope was designed and installed. This eliminated a pinch/crush hazard that existed for years at the top of the old ladder, and thus eliminated the need to lock out the LUCI 2 rotator prior to accessing the platform. IT 5204
2. Designed and installed horizontal lifelines for fall arrest over SX and DX front bent Gregorian focal stations. The lifelines provide fall protection when washing/aluminizing the primary mirrors, installing/removing AGWs, and whenever accessing the LUCI calibration units and the top LUCI cable chains. Previously, tying off for fall protection was at unacceptable angles (from vertical), creating a swing hazard should someone fall. The lifelines are overhead and allow for optimal arrest while working at any part of the horizontal length of the cables. IT 6095
3. Installed an access ladder, platform and fall protection point for accessing the lower overhead crane. Previously, workers were exposed to fall hazards during the annual PM. IT 6658
4. Installed a Latchways vertical fall protection system for the 39-foot ladder in the front of the enclosure. IT 7290
5. Posted fall protection requirements for accessing upper roof and incorporated all roof areas into the Fall Protection written program and training. IT 6702

Lockout/Tagout and Control of Hazardous Energy Improvements

1. Installed dedicated isolation valves for compressed air services to instruments and components. Previously, configurations existed where single valves controlled air service to multiple instruments on the telescope. This now allows for less impactful isolation and lockout of equipment for service or repair. IT 6375
2. Installed a single-point means to lockout the shutter doors locally from level 9, including lock boxes and a 1-point procedure on how to lockout and safely access both the Level 9 catwalks and upper enclosure roof. Previously, lockout was on level 4 MCC and required 4 locks, a group lockbox, and a trip down/up 5 flights of stairs to safely access. IT 7340
3. Installed group lockout boxes in the upper right treehouse along with uniquely identified locks and a log to track. Implemented an equipment safety lockout station for control of equipment over multiple shifts.

Emergency Response Improvements

1. Revised the MGIO Emergency Response Contingency Plan (ERCP). Release was intended to coincide with Banner Medical Oversight and Training contract, which has been delayed in the Banner Legal Contracts process. Final draft completed 2018, plan to release early 2019. IT 6205
2. Acquired and programmed a satellite phone for LBTO lobby as a backup emergency means of communication. MGIO also added a satellite phone to the UA Police hut. IT 6967



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3. Facilitated the verification and reprogramming of all LBTO VHF Tucson and Mountain base-station, vehicle, and handheld radios, including those of MGIO partners. IT 7271
4. UA Fire Safety installed the MGIO radio annunciation system that communicates via radio any fire alarms at the SMT, VATT, and LBTO. IT 6880
5. Pursued 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. Unfortunately, this has been delayed due to it being caught up in an apparently overloaded Banner contract legal review process.

Equipment and Facility Safety

1. Performed brush seal inspection (after years of being on hold for lack of safe access). A failure of the brush seal could prevent the enclosure from rotating. This included qualified engineering test and approval of a man basket system along with implementation of an S-5 clamp fall arrest system on the high-bay roof to safely access the hatch needed to perform the work. ITs 6715 and 7158
2. Posted floor loading labels indicating the maximum acceptable weight allowed per engineering design throughout the facility to facilitate the safe storage of items (shelves and on floors, etc.). IT 6434
3. Load tested a number of lifting fixtures to 125% of the load per M004s00040, meeting OSHA 3. This completed for all 8 fixtures identified as needing the test. IT 6838 (and a number of others).
4. Following a significant rainwater leak into the building that impacted the Core A server in Computer Room A, we identified an area of persistent and significant water intrusion around the areas of electrical panels in an electrical room on level. M. The leak points were identified and resealed, preventing any leaks since. IT 7108
5. Replaced all control room chairs with new chairs (following some failures in hardware). New chairs have full adjustability for ergonomics. IT 7120
6. Replaced an existing style of lightning protection rods on the roof with reinforced rods after 1 rod was found nearly separated from its base. Rods are located near the shutter door opening, and failed rods could have fallen into the chamber. IT 7193
7. Implemented software changes and limit switches to prevent the telescope from moving to horizon with the ARGOS swing arms deployed. This change now ensures the swing arms are parked in their safe home position before the telescope can move. ITs 6217 and 6470
8. Re-routed LUCI air lines after a few pinched line incidents that caused frosting of the LUCI window. IT 7107



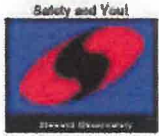
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Training

1. Began implementation of an online safety training learning management system (LMS). Vivid LMS was selected. The LMS includes many off-the-shelf interactive safety trainings, including exercises and quizzes. The system can also host LBT-specific training (such as Site Safety Orientation, etc.) and documents can be attached such as procedures, policies, etc. Site development was primarily completed in 2018, and roll-out was in January 2019. IT 6503
2. The 7-Minute Trainer (7MT) suite of trainings includes 150+ short toolbox talk type training sets. LBTO has utilized 7MT modules at times in the past. In the second half of 2018, a recurring 2-year training schedule and weekly training material tote was prepared and implemented. The tote, including weekly trainings on the mountain. IT 6503

Training was completed on the following topics:

- ✚ Eye protection
- ✚ EPA Refrigerant Management
- ✚ Work Stress
- ✚ Injury Illness Incident Reporting and Coverage
- ✚ Compressed Gas Safety
- ✚ Analyzing Jobs for Hazards
- ✚ Near Misses
- ✚ Medical Emergencies
- ✚ Lockout/Tagout Authorized User
- ✚ Lockout/Tagout General Awareness
- ✚ High Altitude Health
- ✚ Quit Smoking
- ✚ AED/CPR/First Aid
- ✚ Accident Prevention Signs and Tags
- ✚ Electrical Hazards
- ✚ Hand Tool Safety
- ✚ Behavior Based Safety
- ✚ Crane Rigging
- ✚ Horseplay
- ✚ Machine Safety and Guarding
- ✚ Alcohol Use
- ✚ Working in The Cold
- ✚ Safety Rules for Maintenance Work
- ✚ Crane and Sling Safety
- ✚ Fall Protection Authorized User
- ✚ Fall Protection General Awareness
- ✚ Site Specific Fall Protection Requirements
- ✚ Electrical Arc Flash
- ✚ Boom/Scissor Lift Operator
- ✚ Laser Safety Training



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STEWARD OBSERVATORY SAFETY TRAINING ACHIEVED IN 2018

Mountain Operations: 60%

FA, CPR, AED for all
Competent training on Scaffolds
Regular training on Scaffolds
Red Card Fire Training
Fall protection training
Fire Extinguisher Training
NFPA70E/Arc Flash Training

ARO, 12-Meter. SMT: 40%

Current on CPR, AED, And FA
Current on Fork Lift
Safety Harness Training
Fall Arrest Training

Mirror Lab: 82%

FA, CPR, and AED
ARC Flash
Hearing conservation

MMT Observatory: 77%

National Safety Council training
FA, CPR and AED
New Safety Equipment Training

VATT: 36 %

Arc Flash Training

Solar: 92%

Electronic Technical Services: 72%

Directors Office: 79%



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MGIO: 63%

Everyone completed CPR, FA, AED, and Scaffold Training
Maintenance group completed ARC Flash Training
Three employees completed Wild Fire Training

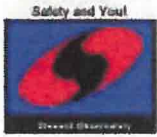
LBTO: 53%

Themes and Goals for 2018

1. Continue efforts to improve employee training
2. Focus on driver safety and driver training
3. Obtain full compliance with GHS (**Globally Harmonized System**) of classification and labelling of chemicals

Themes and goals for 2018 progressed with the following actions:

- ✓ Steward Observatory adopted the University's new *Career Conversation* for annual performance appraisals to include a review and documentation of employee safety training. The program goal is to create an opportunity for the supervisor and employee to identify training requirements that are specific to the job duties and worksite.
- ✓ LBTO initiated a new on-line safety-training program called Vivid LMS. LBTO's success with this training tool could lead other departments to invest in and pursue this method of training.
- ✓ Driver safety awareness and training continued to be a focus because driving to and from telescope sites are a significant employee hazard.
- ✓ There was a sustained effort to clean out and organize safety chemical cabinets. Most departments inventoried chemical cabinets to remove expired or unused chemicals and obtain updated Safety Data Sheets. In addition, some departments such as ITL, adopted the new GHS labeling requirements.



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Themes and Goals for 2019

1. Make significant progress on the new Top Priority Safety Item List
2. Continue efforts to promote and require Safe Driving

Near Misses: 1 Reported

Injury Report - Statistics According to Official U of A Data:

OSHA Recordable Accidents = O

Injuries = I

Illnesses = IL

Lost Time Accidents = L

Total Lost Work Days = T

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



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OSHA's Form 300A (Rev. 01/2004) Summary of Work-Related Injuries and Illnesses

Year 2018



U.S. Department of Labor
Occupational Safety and Health Administration
Form approved OMS no. 1218-0170

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, former 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	1	23
(G)	(H)	(I)	(J)

Number of Days

Total number of days away from work	Total number of days of job transfer or restriction
0	132
(K)	(L)

Injury and Illness Types

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

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

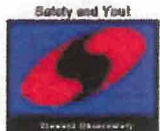
This reporting burden for the collection of information is estimated to average 30 minutes per response, including time to review the instruction, search and gather the data needed, and examine and review the collection of information. Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number. If you have any comments about these estimates or any aspects of this data collection, contact US Department of Labor, OSHA Office of Statistics, Room N-3644, 200 Constitution Ave, NW, Washington, DC 20210. Do not send the completed forms to this office.

Establishment information	
Your establishment name	<u>STEWARD OBSERVATORY - ALL</u>
Street	<u>833 N. CHERRY AVE.</u>
City	<u>TUCSON</u> State <u>AZ</u> Zip <u>85721-0085</u>
Industry description (e.g., Manufacture of motor truck trailers)	<u>COLLEGES AND UNIVERSITY</u>
Standard Industrial Classification (SIC), if known (e.g., SIC 3715)	
OR North American Industrial Classification (NAICS), if known (e.g., 330212)	
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.	
 Compliance executive	<u>CRO</u> Title
<u>570-621-1790</u> Phone	<u>1/31/19</u> Date

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Steward Observatory Site Inspections

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	09/5/07	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
RFC 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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Continued
from above:

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

Continued
from above:

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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from above:

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

Total infractions

776

766

797

783

844

827

884

Continued
from above:

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

Total infractions

941

916

960

948

994

983

1023



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from above:

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

Continued
from above:

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		0		0
KP & Sunny	10/10/17	3	+	3	03/19/18	4	+	4	09/25/18	6		1		0		0
MGIO	09/26/17	1	+	0	05/07/18	1	+	0	09/12/18	1		3		0		0
VATT	09/26/17	0	+	0	05/07/18	0	+	0	09/12/18	0		0		0		0
LBT	09/26/17	0	+	2	05/07/18	0	+	1	09/12/18	0		1		0		0
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		0		0
Imaging Tech	11/20/17	0	+	0	06/06/18	0	+	0	11/26/18	0		2		0		0
Solar Tracker		0	+	0	Closed	0	+	0		0		0		0		0
Optics Shop	11/14/17	0	+	4	05/22/18	2	+	2	11/19/18	1		2		0		0
12-Meter	10/10/17	3	+	5	03/19/18	2	+	1	10/10/18	1		0		0		0
SMT	09/26/17	0	+	0	05/07/18	0	+	1	09/12/18	0		0		0		0
SO Mirror Lab	12/11/17	0	+	5	06/11/18	0	+	4	12/09/18	0		8		0		0

Totals		25	+	64		27		19		20		48		0		0
Total items fixed		1127				1189				1215				0		
Total infractions				1211				1235				1283				0



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