

THE STEWARD OBSERVATORY

ANNUAL SAFETY REPORT

2016





This year Steward Observatory Safety Management System celebrates 10 years since we were first established. Our first Safety Committee Meeting was held on February 20, 2006.

The first scheduled Safety Inspection was completed at Mount Lemmon and Bigelow facilities on March 30, 2006, where we found 24 safety infractions. By the end of 2006 we made a total of 24 Safety Inspections and found a total of 271 safety infractions. At the end of 2006, 119 of the 271 infractions were resolved.

The first year we had six sections of the Steward Observatory Safety Manual written. The next year we realized the safety manual had to be an online manual that was compatible with the University of Arizona Risk Management Services manual, so we started over and now it is a complete document, filled with pertinent information that is required to be read by all employees.

The real test of a Safety Management System is of course provided by the Accident Statistics. In 2006 we had a total of 14 OSHA recordable accidents and 164 lost work days due to accidents. For 3 years, from 2013 to 2016, we averaged 4 OSHA recordable accidents and ZERO lost work days! This is not perfect but substantially better. For the year 2016 our OSHA recordable record was 3 injuries and ZERO lost work days, with a goal of ZERO in both categories.

To emphasize our progress, we completed 26 Safety Inspections in 2016 and found a total of 55 safety infractions. As of year-end a total of 19 infractions remain unresolved, which is exactly 100 less than 10 years earlier. In the 10 year span from 2006 to 2016, we noted a total of 1,116 safety infractions, many of which prevented an accident waiting to happen.

Over the past 10 years, the Executive Safety Committee met over 100 times. These meetings gave us the opportunity to discuss some 420 safety issues and/or tasks, and by December 2016, there were only 19 issues and/or tasks open and unresolved.

If you are interested in more history of the Steward Observatory Safety Management System, you can click on the links on the Steward Observatory Safety webpage, to see all of the previous Annual Reports.

Highlights of our 2016 accomplishments:

For 2016 we held three Trimester Safety Meetings with all Department Safety Management Members. The first meeting was held on April 13, 2016. At this meeting we introduced David Carroll, the new Safety Manager/Engineer at LBTO. We also discussed the various options for managing safety training and recording of progress in safety training. Carmen Otero proposed an Emergency Contacts folder to be distributed to all employees to keep by their phone.



- The second trimester meeting was held on July 27, 2016 on Mount Lemmon and was hosted by the Mountain Operations group. This meeting consisted of a tour of eight telescopes, various shops, and a newly constructed Learning Center, with a presentation on Mountain Driving Safety, by Deputy Lee Hays of the Pima County Sherriff's Department. The Mountain Operations group held our attention as they presented their recent experience and lessons learned from responding to a fall fatality on a nearby tower. In recognition of their response under such duress, the team was presented with "The Emergency Call to Duty Award".
- The third trimester meeting was held on December 12, 2016 and was a very well attended meeting, which is a testament to the general interest in Safety. The meeting included presentations by Jeff Kingsley, Associate Director of Steward Observatory; Steve Holland, Chief Risk Officer of Risk Management Services; Thomas Wilson, President of Secure Safety Consultants; and Eric Buckley and Shane Olsen of the MGIO in Safford.

The two major themes were an update on the status of air quality in the Steward Building by Steve Holland, and safe winter driving by Thomas Wilson, Eric Buckley, and Shane Olsen.

We spent most of the year evaluating four different accident training programs and record keeping systems. By December we decided to use the website that was developed by Dallan Porter with the guidance and encouragement of Cory Knop, both with MMTO. The "Login to the Safety Training Website" link is located at the bottom of the page on the Steward Observatory Safety website. The training website now has 78 training videos and records your progress as you complete each training. It also allows for you and your supervisor to log your progress and chart all outside training that you complete.

2016 training completed for the following sites, include:

RFC Mirror Lab

Annual Audiograms Job Hazard Assessment Machine Guarding Scissor Lift Training ARC Flash Awareness Peripheral Hearing Loss by Tom Muller, UA Speech and Hearing Clinic Workplace Violence by Leslie Porter, UA Sr. Director Human Resources Aerial Scaffolding Awareness for Casting by Action Equipment and Scaffolding Chemical Safety Program managed by UA Research Lab and Safety

- Services employee online registration
- * The Mirror Lab opened training to the College of Optical Sciences and Steward ETS groups. Some trainings were video-taped and have been made available to the Steward Observatory Safety Training Website.



✤ MGIO

1st Crane Training-MazBoom.com HOV Re-Certification Car Lift HOV Hands on Driver Portion Electrical 2nd Crane Training-MaxBoom.com Micro-AT Meter Training PMH9 HOV training for new employees MGIO Driving Safely Course Policies and Procedures Forklift Recertification and New Employee Training Aerial Lift Snow Tire Chain Safety Winter Driving Fall Protection

- Mountain Operations Wilderness and First Responder CPR/AED/ First Aid Job Hazard Assessment Arc Flash
- ✤ MMTO

Lockout/Tagout Fall Arrest Classes Wilderness and First Responder Arc Flash/NFPA 70E

* Three MMTO employees attended the National Safety Council Congress and Exposition which is a great motivator to improve safety.

LBTO Site Safety Orientation CPR/AED/First Aid Lockout/Tagout Authorized User Fall Protection Arc Flash/NFPA 70E Crane Operation and Rigging Fire Safety Laser Safety Machine Guarding Cryogenics Safety Winter Driving Chain Installation Office Ergonomics



- * In addition, a new staff member has qualified to be the Train-the-Trainer for scissor lift and fork lift training. As of year-end, all mountain staff have completed this training. They have also entered all of its staff into the Steward Online Training System and are beginning to utilize the available training videos.
 - ARO 12-Meter Scaffold Wilderness and First Responder CPR/AED/First Aid Fork Lift

In summary, we are very proud of all the training that has been completed in 2016. By the end of the first half of 2017, we expect to be able to print a report that summarizes all the training for each Steward employee that has completed training, which will be used as part of their yearly performance appraisal.

There have been many safety improvements made this year throughout Steward Observatory:

- Mount Lemmon
 - A new handrail has been installed at the KAS/OWL telescope dome
 - Two brand new telescopes have been installed and are now operational, with the foundation completed for a third new telescope
 - The leaking roof of the two door garage on Bigelow has been replaced
 - New, permanently lubricated shutter rollers for the 61 Inch telescope, have been fabricated although not yet installed
- ARO
 - Major projects include a new cover for the dome door of the 12m telescope. This project took several years to complete a contract and obtain funding, and was completed without an injury.
- SMT on Mount Graham
 - Employees made major repairs to the owned scaffolds and then trained to erect the scaffolds, so they could remove a large door crane that had been locked out for several years.
 - They also added a much needed tie off point on the dome door while the scaffold was in place.
- Imaging Technology Laboratory
 - Is always a leader in safety and a pleasure to inspect. They installed several new pieces of equipment this year and as always, they were installed to a high standard. One of the newest Safety improvements was the installation of an ergonomically designed microscope which is designed to eliminate neck and shoulder pain.



RFC Mirror Lab

Facility safety improvements at the Mirror Lab include:

- The design, fabrication, and installation of a new backdraft bench. This is to prevent respirable exposure to employees during the handling and inspecting of mirror mold material during removal of packaging from shipping containers and during the core proof testing procedure.
- Completion of a new multi-level platform on the East side of the Large Optical Generator. The platform provides safe entry and egress onto an 8.4m mirror surface and a protective barrier from rotating equipment.
- Installation of a fall protection guardrail that runs the length of the Large Optical Generator. This eliminates the requirement of fall protection for employees working and walking on top of the Large Optical Generator.
- Installation of a new air filter system which removes excess water from the air line before it gets to the aircart. This eliminates slips and trips from water sources on the floor and removal of oil vapor distribution throughout the lab.
- A new 600 gallon coolant tank was installed for the mirror generating process. It removes ground glass and recirculates temperature controlled water and coolant fluid back up to the mirror surface. This procedure reduces respirable silica glass exposures during the mirror generating process.
- Fabrication and installation of custom machine guard covers on the aircart drive shafts. This eliminated the risk of exposing employees to rotating drive shafts during mirror move operations using the aircart.
- Completed a joint inventory of all chemicals stored in the Mirror Lab with the Research Lab and Safety Program, and registered most of the Mirror Lab employees into the online Chemical Safety System.

✤ MMTO

- Safety improvements include new bright yellow markers along the highway to mark the way for snow plows
- A brand new cement roadway and drainage system that makes it much easier and safer to walk the last half mile or so to the summit.
- They now have all new first aid kits to meet the new OSHA standards and volunteers to check the first aid kits, fire extinguishers, and emergency lights on a monthly basis.
- They recently purchased a new system for administering oxygen to those needing it without a "competent person" to do the administering. There are five units available at several sites including the tour bus.
- A major safety improvement was the newly installed, large lift that now has safety railings installed.
- Another novel idea recently implemented is that employees are now allowed and encouraged, to have MMTO purchase personalized PPE, so they are more willing and likely to wear it.



- The new cement walkway to the microwave tower was another major safety improvement.
- A new steel walkway and handrail system around the new chiller equipment was constructed.
- Other safety improvements include: other new guardrails, a new contract to rid the buildings of pack rats, and a new fitness center for the base camp and Bowl area.
- OSC Optics Shop
 - Major changes include removing all the polishing equipment for 4.5m mirrors and converting the space to accommodate equipment to begin polishing 6.5m mirrors.
 - A new fall protection guardrail system for the hatch has been designed, and will be fabricated and installed by Facilities Management in 2017. This is a joint project with OSC, Facilities Management, and Risk Management Services.
- Cherry Ave. Offices
 - We had major safety improvements, especially in the area of air quality. It started with an air quality assessment by ATC Environmental Consultants.
 - There was also a building assessment by GLHN.
- * These assessments resulted in a complete review of moisture intrusion problems, and extensive evaluations of HVAC components and systems. Facilities Management actions included ground level window sealing, resealing roof joints, complete roof replacement, major shower and restroom restoration, and six large mixing boxes were replaced along with associated ductwork.

✤ LBTO

 Many projects were completed both in enhancing the safety management system and in improving the safety infrastructure at the observatory. To complement the Site Safety Orientation training that was developed, an LBTO safety web page has been created, and is still under development. This site <u>http://wiki.lbto.org/bin/view/Safety/WebHome</u>, covers a wide range of safety topics and references links to the LBTO document control system (CAN), Steward, MGIO, and University resources. Many of these pages have served as the "safety wiki of the week" page, which are communicated weekly to all staff. Work will continue into 2017 and beyond on the page, so that it can exist as a comprehensive resource to LBTO staff in the area of safety.



- In the area of document control at the LBTO, 13 new safety documents have been added to the LBTO safety management system and uploaded to CAN. Topics include lockout/tagout procedures, injury/illness management procedure, interlock bypass procedure, procedure to fly any item over the primary mirror, Job Hazard Analysis (JHA) form and completed assessments, confined space evaluation form and completed evaluations, safe entry procedures, and alternative means to lockout/tagout evaluation form and completed evaluations.
- To improve operational efficiency, safety and quality, a process has been developed outlining how Standard Operating Procedures (SOP), e.g. LUCI removal or AdSec Installation procedures, etc., are used by the LBTO mountain staff, to best ensure that consistent safety and quality control is maintained in operations.
- A process was also introduced to log and track document update requests using IssueTrak, to help the mountain crew get the lessons learned back to the instrument procedure owners in Tucson putting the lessons learned back into the procedures.
- In the area of incident investigation and corrective action, 91 IssueTrak reports were created for safety in 2016, compared to a total of 64 in years prior. Of the 91 opened in 2016, 65 are completed to date with corrective actions implemented. The goal in corrective actions is to address both the immediate problem and address the management system. As a result, many changes to procedures, training, signage, labels and best practices were made beyond simply eliminating the hazardous situation.
- * Many changes have been made to the LBTO telescope and building infrastructure to improve safety of employees and equipment.
 - Covers were installed on the CABEX track rollers to prevent a trip hazard.
 - Access to the PEPSI enclosure roof was restricted and fall restraint policy implemented.
 - Upper Right Tree House lockout switches were audited and corrected, removing the need of duplicate keys and correcting key capture issues.
 - Individual lock boxes were installed for each lockout point.
 - Fall arrest tie-offs installed and a procedure developed, addressing a 20foot fall hazard, for the AGW Retro-Cube install/removal.
 - Enhancements such as grip tape, steps, "do not step" stickers, a removable work platform, and 2 fall arrest davit arms, were installed to the LBTI structure for safe access.
 - Guards were installed on 4 different 14" unguarded fan blades.
 - Access platforms with compliant ladders and railings, were installed over LBTI and LINC Nirvana instruments and over the ICS pumps, for access to instrumentation.



- A set of tethered tools and bags were purchased and a policy on use was implemented.
- A lockout/tagout lock inventory was completed and sets of locks with identical keys were taken out of service. All locks are now issued through the safety manager to ensure no duplicates are issued.
- A risk assessment was completed for emergency response and a plan update is underway with additional training to start in 2017.
- Emergency vehicle kits and a check-out policy were assembled for travelers taking rental or personal vehicles, otherwise not equipped with gear, to the telescope.
- The upper crane limit switch was adjusted to prevent over-raising of the crane and the electrical box was repaired on the unit bringing it back into compliance.
- A removable platform was designed and fabricated to allow full inspection of the upper crane cables and labeling of the bridge, which had never occurred in the past.
- The annual crane inspection came up with less than 30 punch list items, all of which were completed in house by our certified crane inspectors.
- All building-wide e-Stops were labeled and tested.
- All hard hats were equipped with chin straps.
- All radios were equipped with belt clips to prevent falling.
- All dorm rooms were equipped with 90 degrees safety power strip plugs that no longer come loose when behind the beds.
- Both shutter doors were modified to allow safe access into the units, eliminating an 80 foot fall hazard.
- A safe access procedure was implemented, including LOTO.
- Fall arrest anchors were designed and installed on the telescope enclosure roof to allow for bulb seal replacement and other edge-work.
- An emergency eyewash/safety shower was placed and is being installed for the forklift battery station.
- A pilot study for improved emergency radio communication in the building was kicked off.
- 3 areas of the building were audited and scoped for fire alarm system installations in rooms and enclosures where we were non-compliant in fire safety systems. Fire stop pillows have been installed in all holes into stairwells per fire code, and the LBTO has established relations with Risk Management Code Compliance and began seeking approval for building modification projects.
- Both LBTO elevators were brought into compliance with the state inspector after a number of past attempts.



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

	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
0	03	04	04	06	07	08	08	04	08	13	14
Ι	03	05	06	05	14	13	12	11	23	25	06
IL	00	00	02	01	00	01	03	01	01	02	04
L	00	00	00	00	01	01	01	00	00	01	03
Т	00	00	00	00	10	33	06	00	00	07	164

This year we had the best ever accident rate record, with only three (3) OSHA Recordable Accidents. Since we began our Safety Management System we have shown a major reduction in Lost Work Days as well as OSHA Recordable Accidents. It should also be noted, statistics reported for 2006 to 2012 include all of Steward Observatory, Mirror Lab, LBT, and Vatican Observatory, but not MMTO. Since 2013, the MMTO is included in the above statistics, which results in an even larger improvement of our Safety Record.

Themes and Goals for 2016:

1st Trimester: Implement Safety Training for all employees 2nd Trimester: Review, Emphasize and Encourage PPE use 3rd Trimester: Establish reliable Tour Personnel Training





Steward Observatory Site Inspections

Site	Inspected	Found	Inspected	Rem	+	New	Inspected	Rem	+	New	Inspected	Rem	+	New	Inspected	Rem	+	New
Mt Lemmon	3/30/06	24	8/9/06	6	+	2	3/15/07	3	+	4	7/5/07	3		8	12/5/07	2		9
KP & Sunny	4/25/06	24	8/17/06	7	+	0	1/25/07	2	+	0	7/6/07	1		7	11/28/07	0		0
MGIO	5/3/06	2	8/22/06	0	+	0	4/4/07	0	+	0	8/29/07	0		0	1/16/08	0		1
VATT	5/3/06	28	8/14/06	24	+	1	4/4/07	13	+	7	8/29/07	14		2	1/16/08	2		1
LBT	5/4/06	9	8/22/06	0	+	3	4/4/07	0	+	0	8/29/07	0		8	1/16/08	2		1
SO & Tele	5/25/06	72	11/28/06	38	+	10	5/3/07	27	+	21	9/5/07	22		5	2/4/08	13		15
Imaging Tech	5/31/06	9	11/29/06	0	+	1	4/16/07	0	+	0	9/11/07	0		3	2/4/08	1		0
SMP	6/2/06	5	11/29/06	4	+	6	5/24/07	3	+	2	9/20/07	1		2	2/6/08	0		3
Tumamoc Hill	-	-	8/23/06	3	+	-	2/20/07	0	+	0	mothballed							
12-Meter	4/25/06	9	8/7/06	0	+	6	1/25/07	4	+	5	8/7/07	5		2	11/28/07	1		2
SMT	5/3/06	15	8/22/06	9	+	12	4/4/07	3	+	4	8/29/07	4		3	1/16/08	2		1
RFC Mirror Lab	5/23/06	23	12/7/06	10	+	10	5/24/07	6	+	17	9/20/07	14		12	2/6/08	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





	Site	Inspected	Rem	+	New	Inspected	Rem	+	New	Inspected	Rem	+	New	Inspected	Rem	+	New
Continued from	MT Lem & C-Tele	3/31/08	4	+	13	9/4/08	8	+	5	1/21/09	3		3	7/7/09	1	+	3
previous:	KP & Sunny	5/8/08	0	+	4	8/7/08	1	+	1	12/16/08	2		0	6/4/09	2		7
	MGIO	6/16/08	0	+	0	10/1/08	0	+	0	3/11/09	0		0	7/13/09	0		0
	VATT	6/16/08	0	+	0	10/1/08	0	+	0	3/11/09	0		0	7/13/09	0		0
	LBT	6/16/08	0	+	4	10/1/08	0	+	1	3/11/09	0		1	7/13/09	0		0
	SO Office & labs	6/19/08	17	+	11	11/5/08	10	+	10	4/2/09	8		30	7/28/09	10		6
	Imaging Tech		0	+	0	11/6/08	0	+	2	5/18/09	0		1	8/25/09	0		0
	LBTI Lab & So Te	6/17/08	0	+	2	11/20/08	0	+	11	4/ /06	1		4	8/19/09	0		2
	Tumamoc Hill	mothballed		+		mothballed		+		mothballed				7/7/09	0		0
	12-Meter	5/8/08	2	+	2	8/7/08	0	+	0	12/16/09	0		3	6/4/09	0		3
	SMT	6/16/08	1	+	4	10/1/08	1	+	2	3/11/09	1		2	7/13/09	3		2
	RFC Mirror lab	6/17/08	8	+	7	11/20/08	3	+	2	4/15/09	0		29	7/28/09	6		2
	Totals		32	+	47		23		34		15		73		22		25
Total items fixed			389				445				487				553		
Total infractions			203		468		445		502		407		575		555		600
			-								-						
	Site	Inspected	Rem	+	New	Inspected	Rem	+	New	Inspected	Rem	+	New	Inspected	Rem	+	New
Continued from	MT Lem & C_Tele	11/9/09	1	+	0	4/29/10	0	+	2	12/8/10	1		0	4/28/11	1	Ш	1
previous:	KP & Sunny	11/18/09	0	+	1	4/14/10	0	+	4	11/30/10	0		2	3/8/11	0	Ш	0
	MGIO	11/10/09	^	+	0		~	+	1	0/01/10			0				0
			0			5/12/10	0			9/21/10	0		-	5/26/11	0	$ \rightarrow $	0
	VATT	11/10/09	0	+	0	5/12/10	0	+	0	9/21/10	0		1	5/26/11	0		
	LBT	11/10/09 11/10/09	0 0	++	0 0	5/12/10 5/12/10	0 0	+	0	9/21/10 9/21/10	0 0		1 3	5/26/11 5/26/11	0 1		2
	LBT SO & Annex	11/10/09 11/10/09 2/4/09	0 0 7	+++++++++++++++++++++++++++++++++++++++	0 0 12	5/12/10 5/12/10 6/22/10	0 0 5	+ + +	0 0 6	9/21/10 9/21/10 1/6/10	0 0 6		1 3 14	5/26/11 5/26/11 7/19/11	0 1 5		18
	LBT SO & Annex Imaging Tech	11/10/09 11/10/09 2/4/09 3/2/09	0 0 7 0	+ + + +	0 0 12 0	5/12/10 5/12/10 6/22/10 7/21/10	0 0 5 0	+ + +	0 0 6 2	9/21/10 9/21/10 1/6/10 1/6/10	0 0 6 0		1 3 14 0	5/26/11 5/26/11 7/19/11 7/12/11	0 1 5 0		18 0
	LBT SO & Annex Imaging Tech LBTI & Solar Tech	11/10/09 11/10/09 2/4/09 3/2/09 2/8/09	0 0 7	+ + + +	0 0 12	5/12/10 5/12/10 6/22/10 7/21/10 6/23/10	0 0 5	+ + + +	0 0 6	9/21/10 9/21/10 1/6/10 1/6/10 12/14/10	0 0 6		1 3 14	5/26/11 5/26/11 7/19/11 7/12/11 7/12/11	0 1 5		18
	LBT SO & Annex Imaging Tech LBTI & Solar Tech Tumamoc Hill	11/10/09 11/10/09 2/4/09 3/2/09 2/8/09 mothballed	0 0 7 0 1	+ + + + + +	0 0 12 0 1	5/12/10 5/12/10 6/22/10 7/21/10 6/23/10 mothballed	0 0 5 0 0	+ + + + +	0 0 6 2 5	9/21/10 9/21/10 1/6/10 1/6/10 12/14/10 mothballed	0 0 6 0 0		1 3 14 0 2	5/26/11 5/26/11 7/19/11 7/12/11 7/12/11 mothballed	0 1 5 0 0		18 0 2
	LBT SO & Annex Imaging Tech LBTI & Solar Tech Tumamoc Hill 12-Meter	11/10/09 11/10/09 2/4/09 3/2/09 2/8/09 mothballed 11/18/09	0 0 7 0 1	+ + + + + + +	0 0 12 0 1 1	5/12/10 5/12/10 6/22/10 7/21/10 6/23/10 mothballed 4/14/10	0 0 5 0 0	+ + + + + +	0 0 6 2 5 3	9/21/10 9/21/10 1/6/10 1/6/10 12/14/10 mothballed 11/30/10	0 0 6 0 0		1 3 14 0 2 2	5/26/11 5/26/11 7/19/11 7/12/11 7/12/11 mothballed 3/8/11	0 1 5 0 0 0		18 0 2 1
	LBT SO & Annex Imaging Tech LBTI & Solar Tech Tumamoc Hill 12-Meter SMT	11/10/09 11/10/09 2/4/09 3/2/09 2/8/09 mothballed 11/18/09 11/10/09	0 0 7 0 1 0 2	+ + + + + + + + + +	0 0 12 0 1 1 1 1	5/12/10 5/12/10 6/22/10 7/21/10 6/23/10 mothballed 4/14/10 5/12/10	0 0 5 0 0 1 0	+ + + + + + + + + +	0 0 6 2 5 5 3 4	9/21/10 9/21/10 1/6/10 1/6/10 12/14/10 mothballed 11/30/10 9/21/10	0 0 6 0 0 1 2		1 3 14 0 2 2 0	5/26/11 5/26/11 7/19/11 7/12/11 7/12/11 mothballed 3/8/11 5/26/11	0 1 5 0 0 0 2		18 0 2 1 2
	LBT SO & Annex Imaging Tech LBTI & Solar Tech Tumamoc Hill 12-Meter SMT RFC Mirror Lab	11/10/09 11/10/09 2/4/09 3/2/09 2/8/09 mothballed 11/18/09	0 0 7 0 1 0 2 1	+ + + + + + + + + + +	0 0 12 0 1 1 1 28	5/12/10 5/12/10 6/22/10 7/21/10 6/23/10 mothballed 4/14/10	0 0 5 0 0 1 0 3	+ + + + + +	0 0 6 2 5 3 4 4	9/21/10 9/21/10 1/6/10 1/6/10 12/14/10 mothballed 11/30/10	0 0 0 0 1 2 0		1 3 14 0 2 2 0 7	5/26/11 5/26/11 7/19/11 7/12/11 7/12/11 mothballed 3/8/11	0 1 5 0 0 0 2 0		18 0 2 1 2 4
Fotal items fixed	LBT SO & Annex Imaging Tech LBTI & Solar Tech Tumamoc Hill 12-Meter SMT	11/10/09 11/10/09 2/4/09 3/2/09 2/8/09 mothballed 11/18/09 11/10/09	0 0 7 0 1 0 2	+ + + + + + + + + +	0 0 12 0 1 1 1 1	5/12/10 5/12/10 6/22/10 7/21/10 6/23/10 mothballed 4/14/10 5/12/10	0 0 5 0 0 1 0	+ + + + + + + + + +	0 0 6 2 5 5 3 4	9/21/10 9/21/10 1/6/10 1/6/10 12/14/10 mothballed 11/30/10 9/21/10	0 0 6 0 0 1 2		1 3 14 0 2 2 0	5/26/11 5/26/11 7/19/11 7/12/11 7/12/11 mothballed 3/8/11 5/26/11	0 1 5 0 0 0 2		18 0 2 1 2



Environment, Health, & Safety Manual



	Site	Inspected	Rem	+	New												
Continued from	MT Lem & C Tele	11/17/11	0	+	2	5/16/12	0	+	7	11/19/12	5		2	5/28/13	3		2
previous:	KP & Sunny	11/22/11	0	+	2	5/29/12	0	+	0	11/15/12	0		0	5/21/13	0		6
-	MGIO	9/19/11	0	+	1	5/9/12	0	+	1	11/8/12	0		0	5/2/13	0		0
	VATT	9/19/11	0	+	0	5/9/12	0	+	0	11/8/12	0		0	5/2/13	0		0
	LBT	9/19/11	0	+	4	5/9/12	1	+	0	11/8/12	0		1	5/2/13	0		3
	SO & Annex	2/27/11	8	+	18	9/17/12	8	+	6	4/9/12	9		11	11/20/13	12		14
	Imaging Tech	5/1/12	0	+	1	1/14/12	0	+	0	6/10/12	0		2	11/4/13	0		0
	Solar Tracker	3/20/12	0	+	1	8/14/12	1	+	1	3/26/12	0		2	11/25/13	0		0
	Optics Shop			+				+		12/18/12	0		18	5/23/13	2		4
	12- Meter	11/22/11	0	+	0	5/29/12	0	+	1	11/15/12	0		0	5/21/13	0		0
	SMT	9/19/11	1	+	0	5/9/12	0	+	0	11/15/12	0		0	5/2/13	0		3
	RFC Mirror Lab	2/29/12	0	+	11	10/4/12	0	+	5	4/9/12	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			121		776		700		797		705		844		027		884
	Site	Inspected	Rem	+	New												
Continued from	MT Lem & C Tele	11/5/13	3	+	3	4/8/14	4	+	2	10/01/14	2		2	4/14/15	1		3
previous:	KP & Sunny	11/12/13	1	+	3	4/1/14	2	+	2	11/12/14	2		1	4/8/15	0		2
	MGIO	9/25/13	0	+	4	5/13/14	0	+	1	09/18/14	0		0	5/19/15	0		0
	VATT	9/25/13	0	+	0	5/13/14	0	+	1	09/18/14	0		1	5/19/15	0		0
	LBT	9/25/13	0	+	0	5/13/14	0	+	0	09/18/14	0		0	5/19/15	0		2
	MMTO	10/24/13	0	+	32	6/11/14	0	+	0		0		0		0		0
	SO & Annex		0	+		5/21/14	14	+	6	11/24/14	6		15	5/18/15	3		12
	Imaging Tech		0	+		5/20/14	0	+	0	12/02/14	0		3	5/11/15	0		2
	Solar Tracker		0	+		5/19/14	0	+	0	11/20/14	0		4	5/20/15	1		0
	Optics Shop	11/26/13	0	+	12	6/3/14	2	+	6	11/19/14	2		0	5/12/15	1		0
	12-Meter	11/22/13	0	+	0	4/1/14	0	+	0	11/12/14	0		7	4/8/15	4		3
	SMT	9/25/13	2	+	3	5/13/14	3	+	0	09/18/14	0		1	5/19/15	1		1
	RFC Mirror Lab		0	+		5/22/14	0	+	1		0			2/9/15	0		4
	Totals		6	+	57		25		19		12		34		11		29
Total Items Fixed			878				916				948				983		



Environment, Health, & Safety Manual



	Site	Inspected	Rem	+	New	Inspected	Rem	+	New	Inspected	Rem	+	New	Inspected	Rem	+	New
Continued	MT Lem & C Tele	09/30/15	1	+	6	04/05/16	3	+	10	09/06/16	7		10		0		
from above:	KP & Sunny	11/10/15	1	+	0	03/29/16	0	+	1	10/11/16	0		0		0		
	MGIO	09/16/15	0	+	0	05/10/16	0	+	0	09/21/16	0		0		0		
	VATT	09/16/15	0	+	1	05/10/16	0	+	0	09/21/16	0		0		0		
	LBT	09/16/15	0	+	1	05/10/16	0	+	5	09/21/16	0		3		0		
	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		0		
	Imaging Tech	11/23/15	0	+	0	04/11/16	0	+	1	11/29/16	0		0		0		
	Solar Tracker	12/09/15	0	+	1	05/03/16	0	+	2	12/19/16	0		2		0		
	Optics Shop	10/19/15	1	+	2	04/13/16	1	+	3	11/21/16	2		1		0		
	12-Meter	11/10/15	5	+	5	03/29/16	2	+	0	10/11/16	2		0		0		
	SMT	09/16/15	0	+	0	05/10/16	0		0	09/21/16	0		0		0		
	RFC Mirror Lab	12/14/15	0	+	7	05/09/16	0	+	3	12/05/16	0		0		0		
	Totals		15	+	38		11		28		19		27		0		0
Total items fixed			1008				1050				1070				0		
Total infractions					1061				1089				1116				0



Environment, Health, & Safety Manual

2016 Annual Report



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