



Environment, Health,
& Safety Manual

2013 Annual Report



THE STEWARD OBSERVATORY ANNUAL SAFETY REPORT

2013



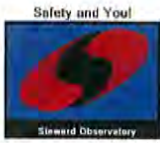
The first trimester of this year was an exciting time for the Safety Department at Steward Observatory. Buell Jannuzi, Director, and Jeff Kingsley, Associate Director, opened our first Trimester Safety Committee Meeting in February 2013. Buell Jannuzi provided a very positive Safety Policy Statement for the Observatory. The final sentence in his policy states “... **We expect all Department/Observatory members will work to ensure that the work environment for research, teaching, and outreach programs at Steward Observatory is safe and healthy.**”

Cory Knop demonstrated an on-line training and record keeping system developed for the MMT that could benefit the entire Observatory. The system currently exists on the Steward Safety site and is maintained by MMT. Cory requested that other departments contribute training videos to increase training opportunities. All members of the Safety Committee were charged with setting up their work groups and employees names into this system to take advantage of available training resources and to keep records.

The Executive Safety Committee was created to keep top management informed of critical safety issues so that a course of action could be determined, technical resources applied or funding allocated as necessary. The committee members include: Karen Kenagy, Dale Webb, Brian Duffy, Cory Knop, Jeff Kingsley, and Mirror Lab Safety Interns Leaton Jones and Jonathan Piakis. This group meets each month to discuss policy, future plans, near misses and new safety concerns. Other members of the Safety Committee are encouraged to participate.

Accomplishments for 2013 include:

1. The addition of the Optical Sciences Center, and Large Optics Group into the Steward Safety Management organization. The OSC Large Optics Group participates in regular inspections and has made dramatic safety improvements to their workplace.
2. Work began in a coordinated effort with UA Fire Marshall, Risk Management Services, to develop emergency exit maps for Steward Observatory. These exit route posters were installed in Steward Observatory, building 65. These exit maps are posted throughout the building near all stairwells and elevators.
3. GFCI and AFCI legislation was investigated to determine efforts and expenditures required in order to be in compliance with NFPA 70E. We decided that the UA Department of Risk Services and Facilities Management will need to make the decision on compliance.
4. Completed gravimetric flow sampling and visual inspections of air handler units for presence of active mold in the Polishing Lab at SOML. Tests show no difference between gravimetric samples and control samples. A visual inspection and sampling show no active mold in the air handler units or ductwork lining. This study is ongoing and includes a review of all mirror manufacturing processes that use polishing compounds.



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5. The Solar Group and Mirror Lab Integration Teams worked jointly with three UA departments to bring a newly constructed high voltage furnace on-line. Planning Design Construction worked to incorporate electrical safety design standards into the design and construction of the solar furnace. Frank Demer, Risk Management Services, worked with the SOML and SOLA teams to develop the custom lockout/tagout procedure and then trained employees on the lockout/tagout furnace procedure.
6. Jeff Kingsley developed a formal method to evaluate employee safety behavior and contributions. The Steward Observatory Safety Manual "Metrics for Safety Performance" describes the guidelines and the form is now standardized. This formal evaluation process is now required for all annual employee performance evaluations.
7. Updated the safety organizational chart to identify new members.
8. Updated the University Continuity of Operations plan for each department.
9. Updating the Safety website to make it more user friendly. Added two new sections to include potty posters and meeting minutes.
10. It is very encouraging to find there have been a lot of safety improvements that were implemented without being requested by myself or another safety person. A few of these items are:
 - On Kitt Peak, at the 90 Inch
 - a) a new wide field camera that eliminates the need for observers to wander in the telescope and climb ladders in the dark.
 - b) about 50 slip ring covers were installed on the power lines
 - At the LBT
 - a) there were quite a few improvements such as a new Laser Warning System
 - b) new material handling cranes
 - c) new pinch point signs and several new guards.
 - At SOML, installed an auto hose retractor wheel for the 1.5" diameter, 120 foot air cart hose. This eliminates trip hazards.

Your Safety Committee thanks you for your thoughtfulness!!

The second trimester Safety Committee meeting was held on Thursday October 17, 2013. Mr. Mark Norton presented ***"Is Our Safety Culture Where It Should Be?"*** Mark challenged Steward Observatory to be alert to the indifference and complacency toward safety that can set in over time. Strategies to keep the safety of culture moving forward include:

- checking to see if situational safety exists
- are shortcuts being allowed in order to get work done
- do violations of safety rules occur

Lastly, the greatest monitor of safety culture is leadership behavior. Directors, managers and supervisors are the greatest influence on employee attitudes and the safety system. This video may be viewed on the Safety website.

During the third trimester, at the behest of Jeff Kingsley, we began an anonymous **work hazard survey** that was sent to six sections within Steward Observatory. This survey was intended to determine employee perceptions of individual job specific hazards.

One survey was sent to employees and a second survey was sent to supervisors. Both groups received the same set of questions. The questions asked were:

1. What do you believe are the three worst personnel threats to you?
2. What do you believe are the two worst threats to your work group?

We received a total of 53 responses and below is a summary of all statistics.

Table 1. Responses by type of Hazard

Department	Physical Hazard	Chemical Hazard	Ergonomic Hazard	Behavioral
SOML (S)	10	1	0	4
SOML	32	11	5	10
Mt. Operations (S)	6	0	0	2
Mt. Operations	10	1	0	1
SOBO (S)	0	0	0	0
SOBO	4	0	8	2
MMTO	53	5	14	12
ITL (S)	1	4	0	0
ITL	0	0	0	0
Directors Office	7	0	0	3
ARO	3	0	0	0
CAAO (S)	2	0	0	1
ETS	4	0	0	2
ETS (S)	3	0	0	3
MGIO	6	0	0	0
Sky Center	4	0	0	0
Totals	145	22	27	40

(S)- Indicates supervisor survey

Noted Summary:

Physical Hazards: Includes working from heights, ladders, cluttered work areas, machine interference i.e., crushing potential, noise, electrocution, driving and air quality issues.

Chemical Hazards: Includes not following procedures, improper use of chemicals, and/or exposures to RCF/Silica, polishing compounds, glass and asbestos.

Ergonomic Hazards: Includes general aches and pains, lifting, repetitive motion strains and eye strain.

Behavioral Hazards: Includes safety complacency, lack of accountability, workplace violence, lack of training, lack of information, and stress.

The information obtained from this work hazard survey will be evaluated based on a risk assessment matrix and working with the user group, develop plans for action, funding and any training required.

Training: All departments within Steward Observatory train their employees based on their specific work hazards and needs. Some of the training provided in 2013 include: Asbestos Removal, ARC Flash Renewal, CPR/AED, Forklift Renewal, Hydrofluoric Acid, Lockout/Tagout, Fall Arrest Authorized User, Fall Protection Competent Person Training, Crane and Rigging Training, Authorized Crane Trainer, Noise/Hearing Conservation, Supervisor Safety Management, First Responder, Globally Harmonized System, GFCI and AFCI.

Near Misses. No near misses were recorded from any departments.

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

	2013	2012	2011	2010	2009	2008	2007	2006
O	06	07	08	08	04	8	13	14
I	05	14	13	12	11	23	25	6
IL	01	00	01	03	01	01	02	04
L	00	01	01	01	00	00	01	03
T	00	10	33	06	00	00	07	164

This year we had a significant improvement in our accident rate from last year and a very large improvement since we started our Safety Management System. This year the MMTO Observatory is also included in the above statistics so there is an even larger improvement in our Safety Record. In all of the previous years the MMTO was reported on a separate report. The statistics reported for 2006 to 2012 include all of Steward Observatory, the Mirror Lab, the LBT, and the Vatican Observatory, but not MMTO.

Themes and Goals for 2014:

1. The theme for the first trimester is Emergency Preparedness and Fire Protection.
2. The second trimester theme is Review of Personal Protective Equipment.
3. The third trimester theme is Final Implementation of Training and Record Keeping throughout Steward Observatory.



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The goals for 2014 are:

1. To update the entire Safety Manual to make it more readable and user friendly
2. To review and decide on action for Fire Safety in the Campus Dome offices
3. To make safety performance evaluation a more regular occurrence
4. To follow up on safety concerns expressed in the Hazard Work Survey



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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	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
SO Mirror Lab	5/23/06	23	2/7/06	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



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Site	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New
MT Lem & C-Tele	3/31/08	4	+	13	9/4/08	8	+	5	1/21/09	3	+	3	7/7/09	1	+	3
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
LBT 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
SO 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																
Total infractions		389		468		445		502		487		575		553		600

Continued from previous:

Site	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New
MT Lem & C-Tele	11/9/09	1	+	0	4/29/10	0	+	2	12/8/10	1	+	0	4/28/11	1	+	1
KP & Sunny	11/18/09	0	+	1	4/14/10	0	+	4	11/30/10	0	+	2	3/8/11	0	+	0
MGIO	11/10/09	0	+	0	5/12/10	0	+	1	9/21/10	0	+	0	5/26/11	0	+	0
VATT	11/10/09	0	+	0	5/12/10	0	+	0	9/21/10	0	+	1	5/26/11	0	+	0
LBT	11/10/09	0	+	0	5/12/10	0	+	0	9/21/10	0	+	3	5/26/11	1	+	2
SO & Annex	2/4/09	7	+	12	6/22/10	5	+	6	1/6/10	6	+	14	7/19/11	5	+	18
Imaging Tech	3/2/09	0	+	0	7/21/10	0	+	2	1/6/10	0	+	0	7/12/11	0	+	0
LBTI & Solar Tech	2/8/09	1	+	1	6/23/10	0	+	5	12/14/10	0	+	2	7/12/11	0	+	2
Tumamoc Hill	mothballed		+		mothballed		+		mothballed		+		mothballed		+	
12-Meter	11/18/09	0	+	1	4/14/10	1	+	3	11/30/10	1	+	2	3/8/11	0	+	1
SMT	11/10/09	2	+	1	5/12/10	0	+	4	9/21/10	2	+	0	5/26/11	2	+	2
SO Mirror Lab	3/5/09	1	+	28	7/15/10	3	+	4	11/22/10	0	+	7	8/2/11	0	+	4
Totals		12	+	44		9		31		10		31		9		30
Total items fixed																
Total infractions		588		644		635		675		665		706		697		736



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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	5/16/12	0	+	7	11/19/12	5	+	2	5/28/13	3	+	2
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
SO 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																
Total infractions		727		776		766		797		783		844		827		884

Continued from previous:

Site	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New	Inspected	Rem.	+	New
MT Lem & C Tele	11/5/13	3	+	3	4/8/14	4	+	2		0	+			0	+	
KP & Sunny	11/12/13	1	+	3	4/1/14	2	+	2		0	+			0	+	
MGIO	9/25/13	0	+	4	5/13/14	0	+	1		0	+			0	+	
VATT	9/25/13	0	+	0	5/13/14	0	+	1		0	+			0	+	
LBT	9/25/13	0	+	0	5/13/14	0	+	0		0	+			0	+	
MMTO	10/24/13	0	+	32	6/11/14	0	+	0		0	+			0	+	
SO & Annex		0	+		5/21/14	14	+	6		0	+			0	+	
Imaging Tech		0	+		5/20/14	0	+	0		0	+				+	
Solar Tracker		0	+		5/19/14	0	+	0		0	+				+	
Optics Shop	11/26/13	0	+	12	6/3/14	2	+	6		0	+				+	
12-Meter	11/22/13	0	+	0	4/1/14	0	+	0		0	+			0	+	
SMT	9/25/13	2	+	3	5/13/14	3	+	0		0	+			0	+	
SO Mirror Lab		0	+		5/22/14	0	+	1		0	+			0	+	
Totals		6	+	57		25		19		0		0		0		0
Total Items Fixed																
Total Infractions		878		941		916		960		0		0		0		0




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