



Environment, Health,
& Safety Manual

2011 Annual Report



THE STEWARD OBSERVATORY ANNUAL SAFETY REPORT 2011





After an exciting fifth year of implementation of the Steward Observatory Safety Management System and having received the ASSE (American Society of Safety Engineers) Community Safety Award we started the year of 2011 trying to decide on what improvements we could make to our system. This was very challenging in view of the significantly reduced budgets of our department and the University. We decided on the following Safety Themes for 2011:

- 1st Quarter: Safe Driving
- 2nd Quarter: Safety Awareness for All Employees
- 3rd Quarter: Safety Management System Assessment
- 4th Quarter: Review of all Training Activities

We started the first quarter with three near misses of vehicle accidents on Mount Graham and that prompted a lot of meetings, investigations, and extra training activities in the area of safe driving. By the end of the quarter we had trained many employees in the safe and effective installation of chains, and we had a major training class for about 30 employees in our Safety Committee on Safe Driving put on by Janet Brown, a certified Driving Instructor and President of the Southern Arizona ASSE organization. We tried to implement a Distracted Driving Policy that we wrote, but in the end we could not get agreement so we opted to wait for the state of Arizona or the University to put out a policy.

Another major effort in the first quarter was to begin implementation of NFPA 70E by having an outside contractor perform insulation and resistance tests on the panels in our high voltage casting area. Although it was expensive, we knew we would be casting another mirror in the next year and we wanted to be assured that it would be safe to do so as the equipment was beginning to age. Our hope of course, was to get the University Facilities department involved and anxious to implement NFPA 70 E under their budgets.

Other training accomplished in the first quarter included a presentation by Captain Ian Cassidy on Trauma Suspension, Fall Protection and Rescue training. Next was respirator training and fit tests, training on disposal and handling of fluorescent bulbs, lockout/tag out training and noise induced hearing loss.

The other first quarter problems and accomplishments had to do with odors and chemicals being used on the loading docks, smells in offices, and efforts to get a comprehensive fire warning system on Mount Graham. The result was implementation of new policy on loading dock activities, many tests of ventilation systems, and no final warning system on Mount Graham.



One other major effort the first quarter that deserves special mention is the development of a respiratory protection monitoring program for Casting to encompass mold machining and mirror assembly. The purpose is to measure the employee's actual exposure to silica dust during the entire mirror fabrication process. The critical element is that sampling results are provided in a written format that is relayed immediately to all employees on the Casting team. This in turn, leads to the development of engineering controls that are immediately implemented to lower exposures and risks to employees.

The methodology developed allows for documentation of ventilation, existing conditions and ergonomics. This effort, led by IH Intern Jonathan Piakis has been extremely effective in communicating hazard awareness with the Casting team, leading to innovative engineering changes, and for some tasks reducing the amount of labor operations and costs.

This type of monitoring is critical as the silica exposure PEL's are due to be tightened within the next few months which will have an impact upon all industries.

The theme for the second quarter was Safety Awareness for All Employees. Karen developed a new form designed to be signed by all employees when they finished reading the Steward Observatory Safety Manual. In general, the response was quite good in the operational departments where there are the most hazards, however not all employees have been firmly instructed/required to read the manual. We also updated the Safety Organization Chart and finalized several changes to our Safety Manual with votes from the Safety Committee and signatures of management and Risk Management. We continued to work on odor problems in a couple offices and we dealt effectively with some crane problems.

Finally after five years effort, we were able to get a fire warning system at the three telescopes on Mount Graham. It cost more than we expected and it is far from satisfactory in some ways. For example, if a fire starts in any one of the telescopes, it sends a message to the downtown U of A Police Department dispatch and they have updated their response / notification plan accordingly. Also, UAPD Mt. Graham Division will be notified. Unfortunately, the system still does not send immediate notification of a fire to whoever may be present at each of the telescopes so that they could go immediately to assist. That is a major downfall of the new system and as we prepare this report we are still trying to get it right.

During the second quarter both Dale and Karen attended the SCF Safety Works Training Program. That has proven to be useful at very low cost. Again this year there has been no money available for travel to attend the American Society of Safety Engineer Professional Development Conference and Exposition (100 Year Program), or the National Safety Council Conference. Also during this quarter several new Potty



Posters were created to enhance that program which has been well received by most all employees.

As we entered the third quarter we had hoped to get our management system assessment performed. Again, money was the stumbling block so we were unable to obtain adequate funds to do the kind of system review that we hoped to obtain. However, that is not to say there were no accomplishments as there were several major accomplishments. The first one was a major new process for cleaning in the polishing lab. Another useful accomplishment was the audio testing and carbon monoxide testing that was performed on Mount Lemmon and with Mount Lemmon employees.

The major issue that we had to deal with this quarter was an accident at the Large Binocular Telescope on Mount Graham in which an employee fell about 10 feet on to a steel platform. Fortunately he survived in remarkably good shape, but it reminded us that there is still much more to do in the way of looking for safety hazards and getting corrections done quickly.

During the third quarter we had one day of training for managers, we had scissor lift and articulating boom training and we had Lori Chavez perform emergency response training for all of the Safety Committee.

The fourth quarter brought a few new safety problems to deal with such as nail protrusions and access problems from a solar furnace roof, a new high power laser on the fourth floor that requires a special operation plan, discovery of very inadequate wiring and fire protection in the historic telescope and dome attached to our building, and an arc flash incident with succulator arc flash in the Polishing Lab. The last problem was development of a new operation plan for locking out the solar tracker system in the old bear down pool area. All of these safety concerns have been vigorously tackled and solved except for the fire warning system in the dome and telescope.

During this last quarter a major effort was expended on Test Tower rescue training. We also had compressed gas training in the form of a video and both first aid and CPR training were made available to all departments of the Observatory. We also spent considerable time trying to obtain a Safety Management System Assessment to be completed in the first quarter of 2012 at an affordable cost.

Both Karen and Dale continued their efforts at attending all ASSE meetings and all of the safety training and information meetings held at Granite construction. We have also continued our close cooperation with the Risk Management and Safety Department of the U of A. Their employees have partnered with or assisted the observatory on the solutions to many observatory problems or safety concerns this past year.



In the area of safety inspections, we went from doing a three times a year inspection of all facilities to a two times per year inspection. During the 2011 year we made a total of 20 inspections. As of the end of the 13th complete inspection cycle we had discovered 736 safety infractions since we started the inspections. At this time we had corrected 697 of the 706 safety infractions noted through the twelfth cycle for a fix rate of 98.7 %!

One of the more encouraging aspects of our Safety Management System is to see the increasing number of safety activities or improvements made by our employees and their supervisors without a request from the official safety committee or safety personnel. Here are some of them:

01. Sunnyside personnel arranged for Julia Rosen from Risk Management and Safety to review their new chemical safety plan before implementation of a new process.
02. The Mount Lemmon personnel replaced the (frequently changed) lead weights used for balance on the 61 inch telescope with steel weights that are lighter and easier to use and without the obvious disadvantages of handling lead.
03. At the Vatican telescope this year there were three new pieces of equipment that were designed and fabricated to make the handling of observing instruments easier and safer. The first one is a new camera handling dolly, next is a new GUF1 Instrument cart and last is a new cart for the spectrograph.
04. At the MGIO base camp the old (improper) stair in the Maintenance shop has been removed and a new proper stairway added to make access to the second floor much safer.
05. At the MGIO Mountain propane facility, new meters have been installed to eliminate the need to crawl up on the very high propane tank to dip stick the tank for purposes of determining quantity on hand.
06. At the Vatican Telescope I noticed that a new, no-slip paint had been added to the outside balcony.....much safer.
07. Implemented process managing grinding and polishing particulates in the SOML Polishing Lab. Process included removal of flooring that collected particulates, frequency of cleaning floor and plastic covers, and monitoring frequency of Air Handler filter changes.
08. There were new handrails installed on the curve wall in the Schmidt #1101. This was done at the request of an observer who just had a new knee installed. Good service!



2011 Annual Report



Other Training not mentioned above: Respirator training and respirator fit tests, fall protection, rescue training drills.

Statistics According to Official U of A Data:

	2011	2010	2009	2008	2007	2006
OSHA Record Accidents	08	08	04	8	13	14
Injuries	13	12	11	23	25	6
Illnesses	01	03	01	01	02	04
Lost Time Accidents	01	01	00	00	01	03
Total Lost Work Days	33	06	00	00	07	164

This year again, we had a step back in our accident record although still an improvement over the first three years in terms of total injuries, but still not ZERO, which is the goal! It should be noted that all of the above statistics include the Steward Observatory, the LBT, and the Steward Observatory Mirror Laboratory. None of the above totals include injury information on the MMT Observatory. The MMT Observatory totals for 2011 were excellent with no recordable injuries. We do not have comparable statistics for MMT for the first three years.

Goals for 2012:

At the end of 2011 we decided to go from a Quarterly Meeting system to a Bi-annual Safety Committee Meeting with a Bi-annual Training Meeting Plan that would allow mountain employees the opportunity twice a year to come to Tucson and participate in all of the training sessions they need to be current for the year. The Safety Committee Meetings will be held in April and September. The dates for the Training meetings will be decided by the Mountain Operation managers and have not been decided as of this publication date.

The published goal and Theme for the first half of 2012 is: "Safety Management System Assessment" and the second half is "Safety Awareness and Training for all Employees."



2011 Annual Report



STEWARD OBSERVATORY SITE INSPECTION INFORMATION

Display of Tables:

Steward Observatory Site Inspections

Site	Inspected	Rem. + New	Inspected	Rem. + New	Inspected	Rem. + New	Inspected	Rem. + New
Continued from previous:								
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
LBT1 & 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			

Site	Inspected	Rem. + New	Inspected	Rem. + New	Inspected	Rem. + New	Inspected	Rem. + New
Continued from above:								
MT Lem & C Tele	11/17/11	0 + 2	05/16/12	0 + 7				
KP & Sunny	11/22/11	0 + 2	05/29/12	0 + 0				
MGIO	09/19/11	0 + 1	05/09/12	0 + 1				
VATT	09/19/11	0 + 0	05/09/12	0 + 0				
LBT	09/19/11	0 + 4	05/09/12	1 + 0				
SO & Annex	02/27/12	8 + 18		+				
Imaging Tech	05/01/12	0 + 1		+				
Solar Tracker	03/20/12	0 + 1		+				
NOAO Test Towe		+		+				
12-Meter	11/22/11	0 + 0	05/29/12	0 + 1				
SMT	09/19/11	1 + 0	05/09/12	0 + 0				
SO Mirror Lab	02/29/12	0 + 11		+				
Totals		9 + 40	1 + 9	0 + 0	0 + 0			

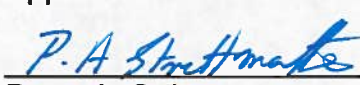


Prepared by:


Dale A. Webb
Safety Manager


Karen Kenagy
Assistant Safety Manager

Approver:


Peter A. Strittmatter
Director


Jeffrey S. Kingsley
Associate Director