

EFCOG Best Practice #157

Best Practice Title: Using Laser safety questionnaires to gather assessment information and performance metrics data.

Facility: SLAC National Accelerator Laboratory

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Brief Description of Best Practice: Two survey questionnaires are used to help assess the laser safety program and safe laser operations at SLAC. Both questionnaires are multiple choice with allowance for additional comments for each question. Both are conducted with SurveyMonkey, which provides an easy interface for developing questions and analyzing responses.

The first questionnaire is an annual survey completed anonymously by SLAC's laser operators. It includes questions on the following:

- i. quality and effectiveness of training (site-specific as well as laser program), supervision, safety oversight and assistance, engineering controls, administrative procedures, and PPE;
- ii. observations of safe practices and compliance with requirements for safety procedures and laser eyewear PPE;
- iii. estimates of rates for near misses and injuries; and
- iv. estimates of probabilities for reporting near misses and injuries.

The second questionnaire, not anonymous, is completed by laser operators receiving approval for one of the following: annual laser operation approval, revision to a laser safety procedure document, or a laser service subcontractor visit. It includes questions on the quality and timeliness of the approval process, and if the associated review comments and action items were appropriate.

Why the best practice was used: The annual operator survey was developed as part of an internal laser safety management assessment that focused on risk assessment: assessing risk for a laser injury accident and risk for meeting science program goals, and then identifying ways to mitigate these risks. The laser operations approval survey was subsequently developed to assess the approval process for laser operations and the customer satisfaction associated with that.

What are the benefits of the best practice: The surveys are used to identify areas of risk or concern, which need attention or additional resources. The information gathered helps determine appropriate corrective actions and improvement opportunities. Some of the survey results are used as performance metrics that can be tracked for determining trends. Survey results are made available to laser personnel and to SLAC's ESH management.

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What problems/issues were associated with the best practice: No problems were associated with the surveys. The first annual laser operator survey was done in May 2011, the second was done in July 2012 and the third survey is completing in early December 2013. Some updates for the 2012 and 2013 surveys were done based on analysis of the earlier survey results. The laser operations approval survey was ready for use in May 2012 and has not needed any updates since.

How the success of the Best Practice was measured: The annual laser operator survey results helped justify requests for a Deputy Laser Safety Officer position and a laser mentor/coordinator position which were both subsequently created. A comparison of results between the 2011 and 2012 annual surveys was done. Improved results were identified in some areas such as the perception that laser safety is an integral part of laser operations and that safety oversight does not impede science program goals. The laser operations approval survey results give very high satisfaction ratings for the approval review process, which helps alleviate concerns on this due to results in the 2011 annual laser operator survey and other related informal comments.

Description of process experience using the Best Practice: The annual laser operator survey takes 15-20 minutes to complete, while the laser operations approval survey takes 5 minutes to complete. Development of the surveys and subsequent analysis of the results is done primarily by the laser safety officer, but with discussion and input from the laser safety committee. The survey results are used for some performance metrics and are important for assessment and continuous improvement.

References

1. M. Woods, *Performance Metrics for Safe Laser Operations at SLAC National Accelerator Laboratory*, [SLAC-PUB-15356](#), contributed to the 2013 International Laser Safety Conference, Orlando, FL. .
2. M. Woods, *Performance Metrics Using Laser Operator and Laser Approval Surveys*, presented at [9th Annual DOE Laser Safety Officer Workshop](#), September 2013.