Meeting Minutes (Draft 1)
ASC-OP/TF7: Lasers

Sunday, January 29, 2017
Fremont Room, 5th Fl, Intercontinental Hotel, 888 Howard St., San Francisco, CA

CALL TO ORDER at 3:31 pm PDT

Michael Thomas, Chairman of TF7, called the meeting to order.

WELCOME AND INTRODUCTIONS

APOMA, Walt Czajkowski	Edmund Optics, Jay Nelson
NIST, Leonard Hanssen	NIST, Marla Dowell
Northrop Grumman, Donna Howland	Northrop Grumman, James Chung
REO, Trey Turner	Sandia National Labs, John Bellum
Savvy Optics, Dave Aikens	Spica Technologies, Michael Thomas
Triptar, Allen Krisiloff	Inphenix, Inc, Wei Gao (Observer)

Quorum Achieved: 9 out of 11 members represented (9/11 > 50%)

RECORDING SECRETARY

Allen Krisiloff

ADOPTION OF AGENDA

Replace J. Arenberg with Donna Howland. Correct date of previous meeting.
Motion by Dave A. Second by Marla D. Passed 100%

APPROVAL OF PREVIOUS MEETING'S MINUTES (Dec 20, 2016)

Corrected some grammar.
Motion by Dave A. Second by Trey T. Passed 100%

REVIEW OF STATISTICAL MODEL

Donna H. presented Jon Arenberg's presentation on the statistical model that he proposes for a laser damage standard. Testing a small area of the optic results in poor confidence with regard to predicting the number of defect sites over the entire area.

The discussion revolved around the practical implications of the proposed statistical model for specification and assessment. The model seems to show that the only valid testing protocol involves extensive probing.

Several members observed that there is an important difference between testing the intrinsic quality of a coating and testing for the number of defects. Common practice today is to test a small area at very high fluence, for example, 5x above the application's fluence. It is an intrinsic damage threshold approach. A successful test at high fluence indicates that the entire optic will perform acceptably at lower fluence. It is an easy and quick test that is attractive intuitively, is in general practice now, but lacks statistical rigor for defect analysis.

A standard should provide flexibility by defining different test methods that meet the needs of different applications and markets. Ideally, we need a low cost testing protocol that reliably predicts

the intrinsic strength and the number of defects on an entire surface. There is an important commercial difference between higher value optics, such as those for space flight, and lower value optics, such as those for low cost terrestrial instruments.

When the proposed, rigorous statistical interpretations are applied to a testing protocol, it will be too expensive for lower value optics because it offers very little certainty for inexpensive and fast testing. Can we design a low cost, statistically significant test? Is it possible for Jon to add a fluence dimension to the statistical model that would address a small area, very high (or very low) fluence test? Would such an extension of the model require assumptions or exact knowledge about the damage mechanisms? Might "Neyer D-statistics" provide some relevant insight?

Another part of the discussion addressed the issue of gradual degradation of an optic under test or in application. Sometimes a damage site does not grow after initial appearance; in certain applications, this is an acceptable damage site. In other applications, individual damage sites may grow or the number of damage sites may increase to some threshold of acceptability. Is it possible to incorporate this concept in a standard?

STATUS OF INVITATIONS TO OTHERS

Keith Murdoch of Coherent has been asked to join. So has an engineer from Infinix.

NEW BUSINESS

Retirement

John B. announced that he is planning to retire next month. He can become a personal contributor. John should ask if Sandia might still be willing to remain a member. John could represent it as he does now.

NASA Conference

Laser damage is one of the topics in a conference on contamination sponsored by NASA. A paper similar to the one delivered at the Laser Damage Symposium would be welcomed.

Survey

It still might be beneficial to create a short survey for the laser industry with one or two open ended questions. We could ask about power levels, pulsed or CW, and wavelengths.

NEXT MEETING

SPIE's DCS at Anaheim in April.

Motion by Michael T. Second by Marla D. Passed 100%.

ACTION ITEMS

Send comments to Jon Arenberg. Jon will try to incorporate suggestions made today into another draft document.

ADJOURNED at 5:10 PM

Motion by Marla D. Second by Dave A. Passed 100%.