STS - INTRODUCTION

WWW.SAPPHIRESTS.COM

ISO/IEC-17025 ACCREDITED LABORATORY

Introduction To STS

Presented by Michael Piscitelli

STS Headquarters – Charlotte, NC

Overview

- Photometric / Radiometric Testing Laboratory
- ATE (Automated Test Equipment) Mfg.
- Custom LabVIEW/Embedded Software
- On-Site / Remote Equipment Calibration and Support
- First ISO/IEC-17025 Accredited Laboratory for Optical Radiation Calibration in U.S., Only 3rd party independent calibration laboratory.

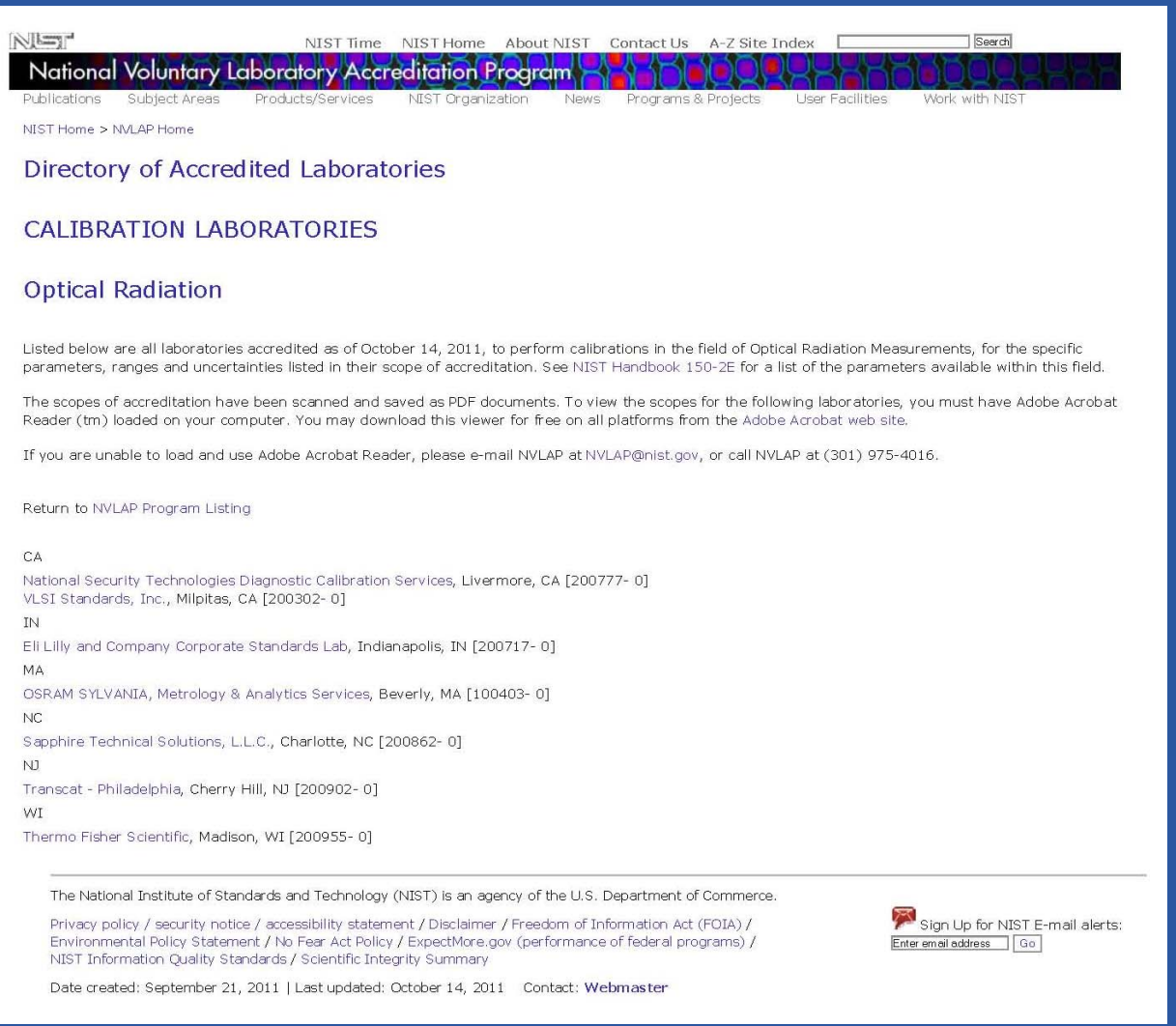
STS Products and Services

- Goniophometers – AP-60, AP-48, AP-24
- Photometers – Photo-100 for various industries
- Spectroradiometers – Spectro100
- Camera-based Photometer – VOA-100
- Integrating Spheres – SP-500, SP-1000, SP-1500
- Vertical Photometers – VP-100
- Inline Inspection Equipment – aiming stations
- Vibration/Impact Testing – VTM-100
- Custom Eq. – Windshield Wiper Switch Tester

STS Products and Services

- Third-Party ISO-17025 Accredited Testing and Calibration
  - Photometry – Intensity, Illuminance, Luminance, Total Luminous Flux, retro-reflex
  - Spectroradiometry – Radiant intensity, irradiance, radiance, total radiant flux, chromaticity, CCT
  - Environmental – Corrosion, Impact, Abrasion, Chemical, Temperature/Humidity, Dust

ISO-17025 Accreditation



NIST Time | NIST Home | About NIST | Contact Us | A-Z Site Index | Search

National Voluntary Laboratory Accreditation Program

Publications | Subject Areas | Products/Services | NIST Organization | News | Programs & Projects | User Facilities | Work with NIST

NIST Home > NVLAP Home

Directory of Accredited Laboratories

CALIBRATION LABORATORIES

Optical Radiation

Listed below are all laboratories accredited as of October 14, 2011, to perform calibrations in the field of Optical Radiation Measurements, for the specific parameters, ranges and uncertainties listed in their scope of accreditation. See NIST Handbook 150-2E for a list of the parameters available within this field.

The scopes of accreditation have been scanned and saved as PDF documents. To view the scopes for the following laboratories, you must have Adobe Acrobat Reader (tm) loaded on your computer. You may download this viewer for free on all platforms from the Adobe Acrobat web site.

If you are unable to load and use Adobe Acrobat Reader, please e-mail NVLAP at NVLAP@nist.gov, or call NVLAP at (301) 975-4016.

Return to NVLAP Program Listing

CA

National Security Technologies Diagnostic Calibration Services, Livermore, CA [200777- 0]
VLSI Standards, Inc., Milpitas, CA [200302- 0]

IN

Eli Lilly and Company Corporate Standards Lab, Indianapolis, IN [200717- 0]

MA

OSRAM SYLVANIA, Metrology & Analytics Services, Beverly, MA [100403- 0]

NC

Sapphire Technical Solutions, L.L.C., Charlotte, NC [200862- 0]

NJ

Transcat - Philadelphia, Cherry Hill, NJ [200902- 0]

WI

Thermo Fisher Scientific, Madison, WI [200955- 0]

The National Institute of Standards and Technology (NIST) is an agency of the U.S. Department of Commerce.

Privacy policy / security notice / accessibility statement / Disclaimer / Freedom of Information Act (FOIA) / Environmental Policy Statement / No Fear Act Policy / ExpectMore.gov (performance of federal programs) / NIST Information Quality Standards / Scientific Integrity Summary

Sign Up for NIST E-mail alerts: Enter email address Go

Date created: September 21, 2011 | Last updated: October 14, 2011 Contact: Webmaster

STS Products and Services

- Official Testing Laboratory for Transport Canada – TSD108 (CMVSS108)
  - Photometry – Intensity, Illuminance, Luminance, Total Luminous Flux, retro-reflex
  - Spectroradiometry – Radiant intensity, irradiance, radiance, total radiant flux, chromaticity, CCT
  - Environmental – Corrosion, Impact, Abrasion, Chemical, Temperature/Humidity, Dust

STS Products and Services

- Laboratory Audits
  - TS-16949 Photometric Calibration and Testing Requirements
  - AMECA compliance assistance
- Correlation Studies
  - Inter-laboratory comparisons
- Technician Training
  - Hands-On testing
  - Software and hardware
  - Regulations – Interpretation and implementation.

Goniophotometer - AP-60HD-1

Goniophotometer - AP-60HD-2

STS Goniometer Features

- 0.001 – 5,000,000 candela, single sensor @ 100ft.
- Strobe / flashing light / LED PWM measurement
- Remote technical support and software upgrades
- Bar code entry of part number, serial number, test function, etc.
- Individual files for lamps and functions can be shared amongst systems without databases and/or re-entry of testing parameters.
- Ethernet based, 2 cables run whole system.
- On-site calibrations ISO-17025 Accredited.

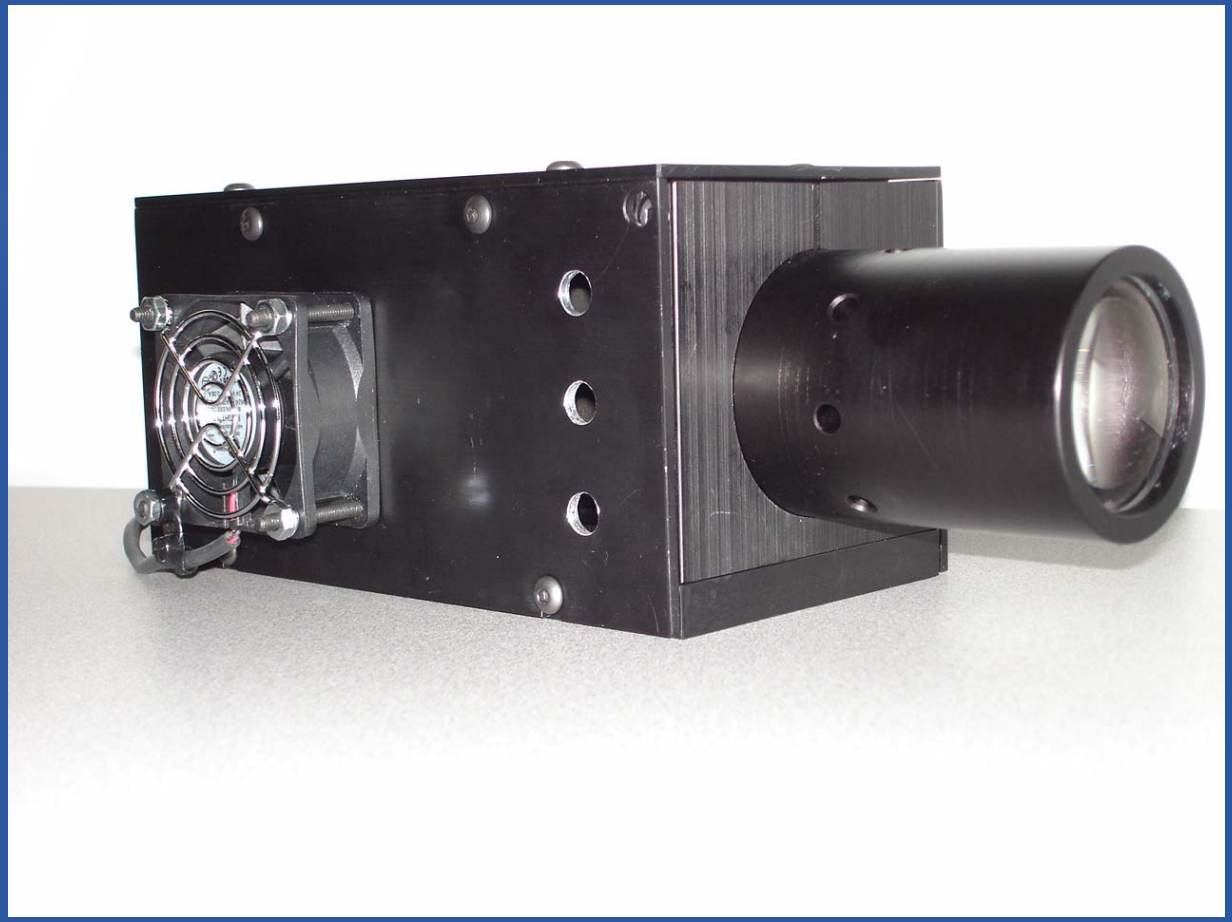
Goniophotometer - AP-48SD-1

Vertical Photometer – VP-100

Enclosed Goniometer - AP-48VP-1

Photometer – Photo-100

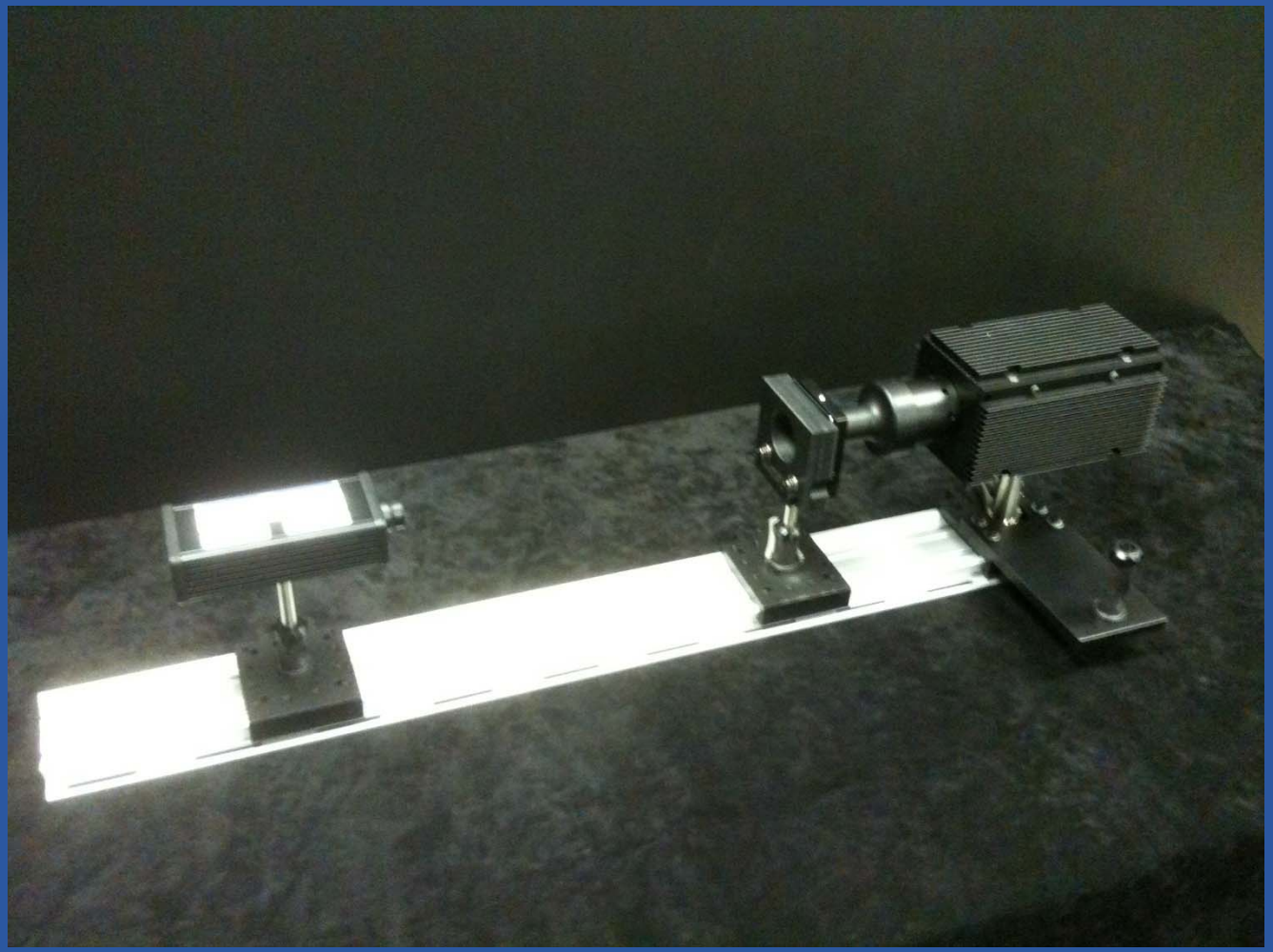
Projector Source – LS-100



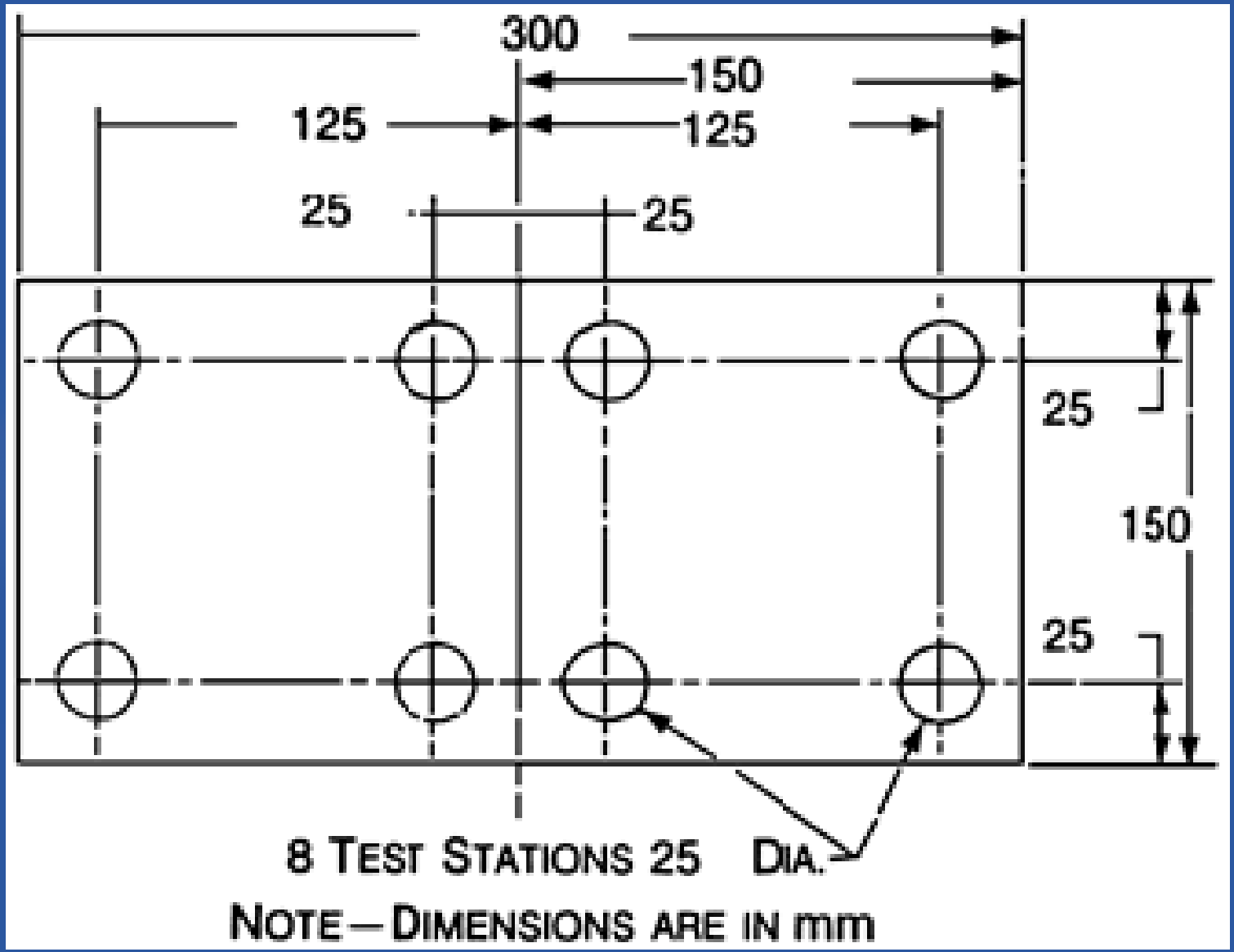
Reflex Color Testing – Spectro101

Spectroradiometer – Spectro-100

Transmission Testing – Spectro-100

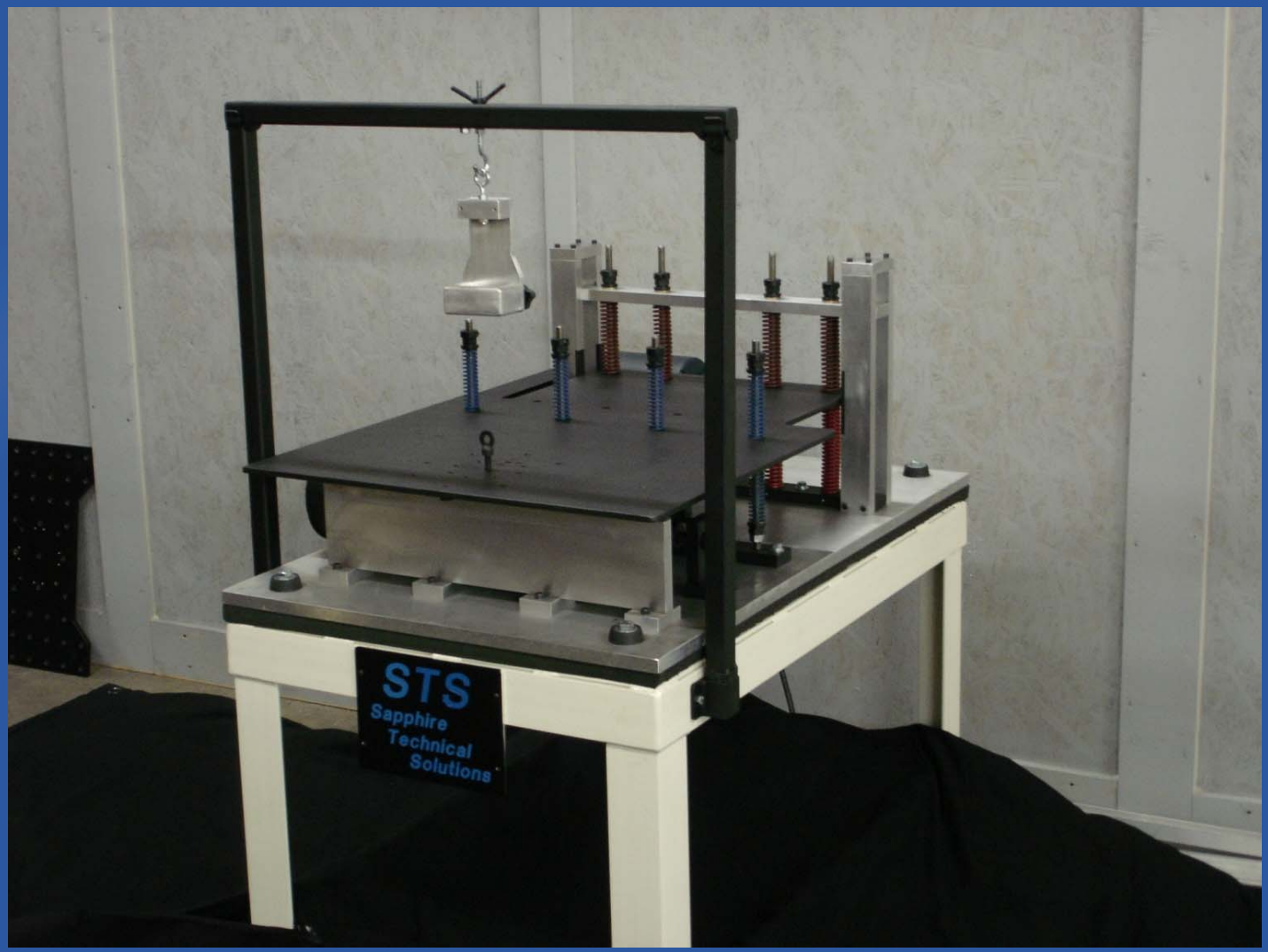


License Lamp Testing – Spectro-100



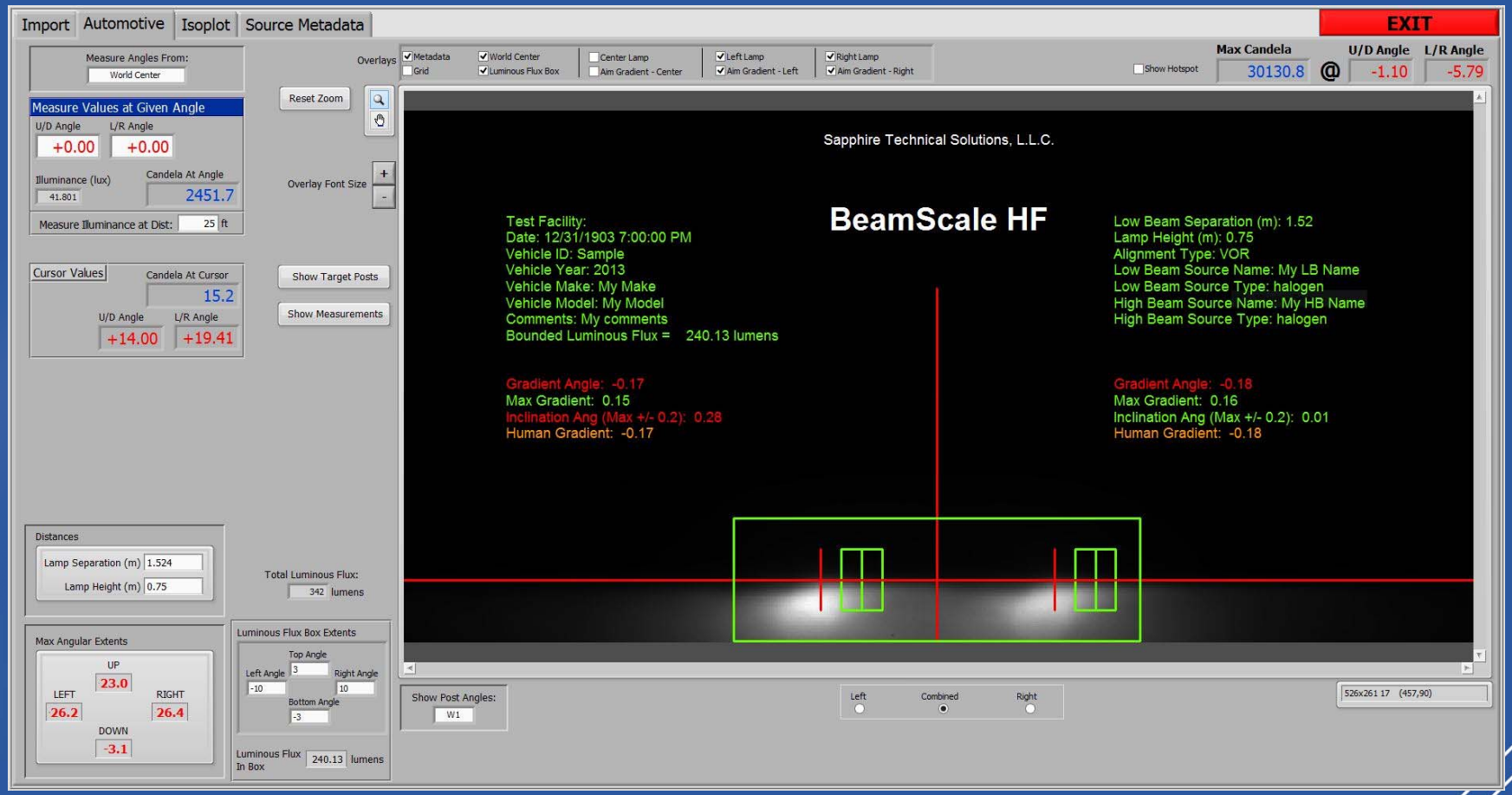
Integrating Sphere – SP-OEM-1

FMVSS108 Vibration Testing – VTM-100

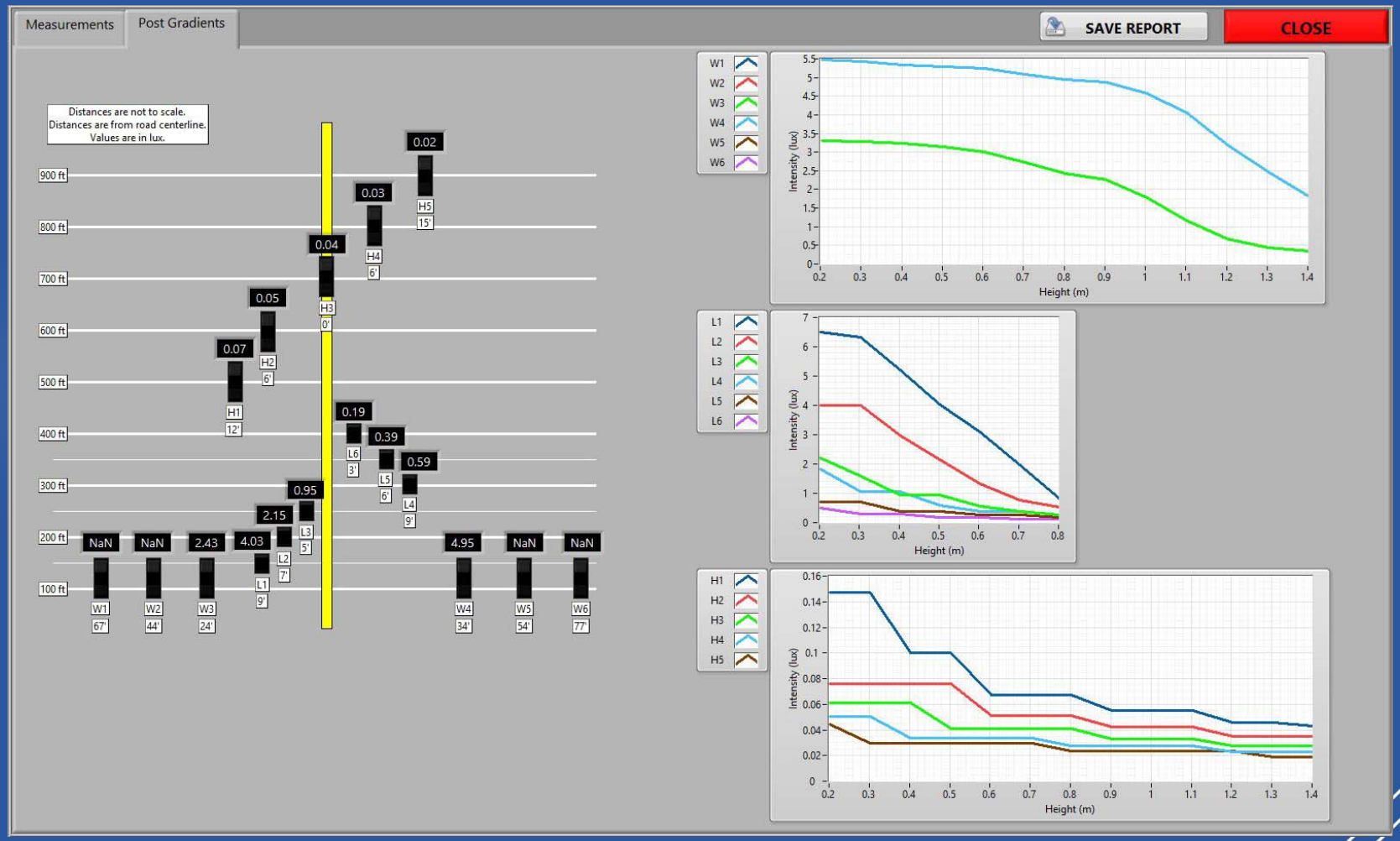


Camera-based Photometer – VOA-100

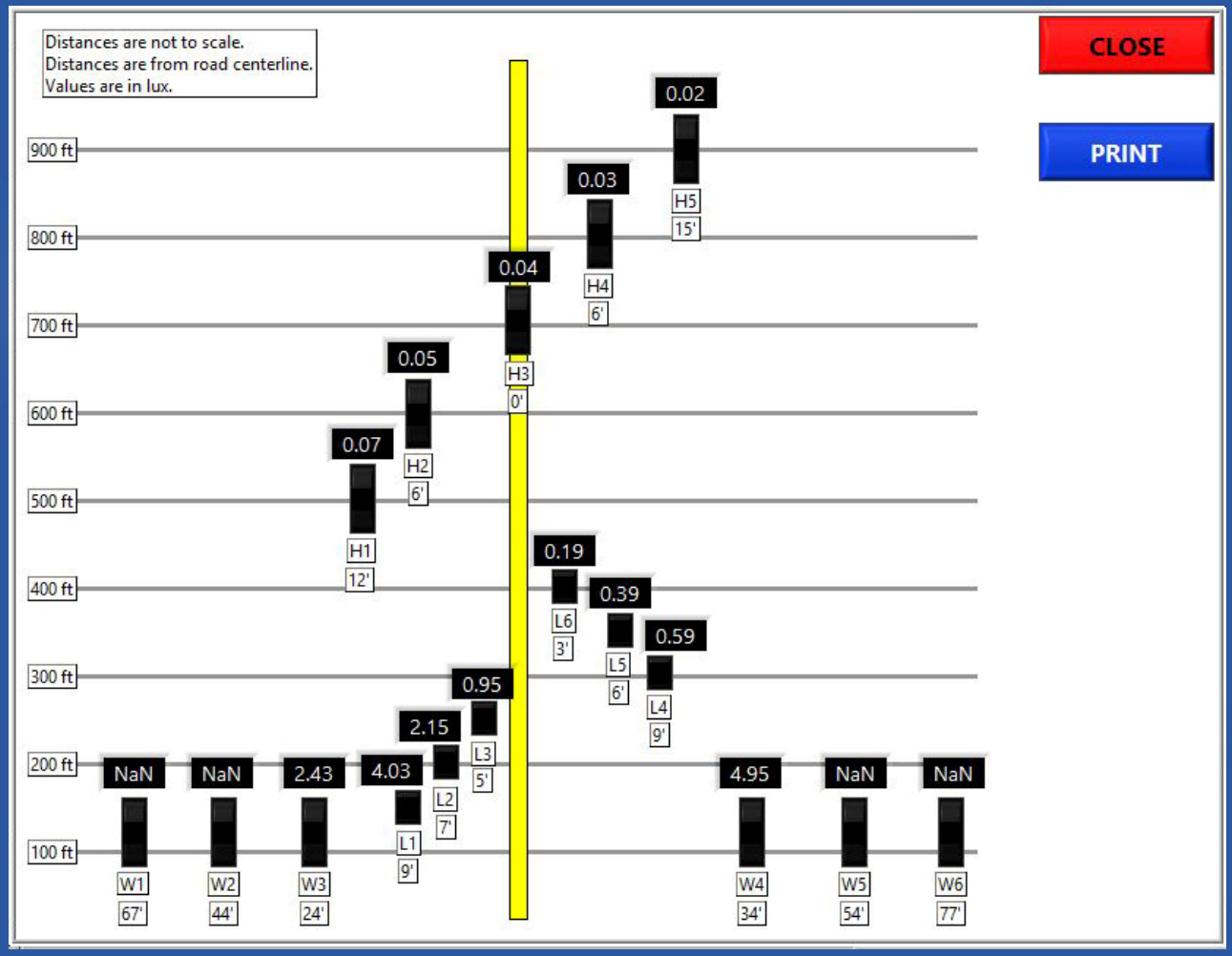
Camera-based Photometer – VOA-100



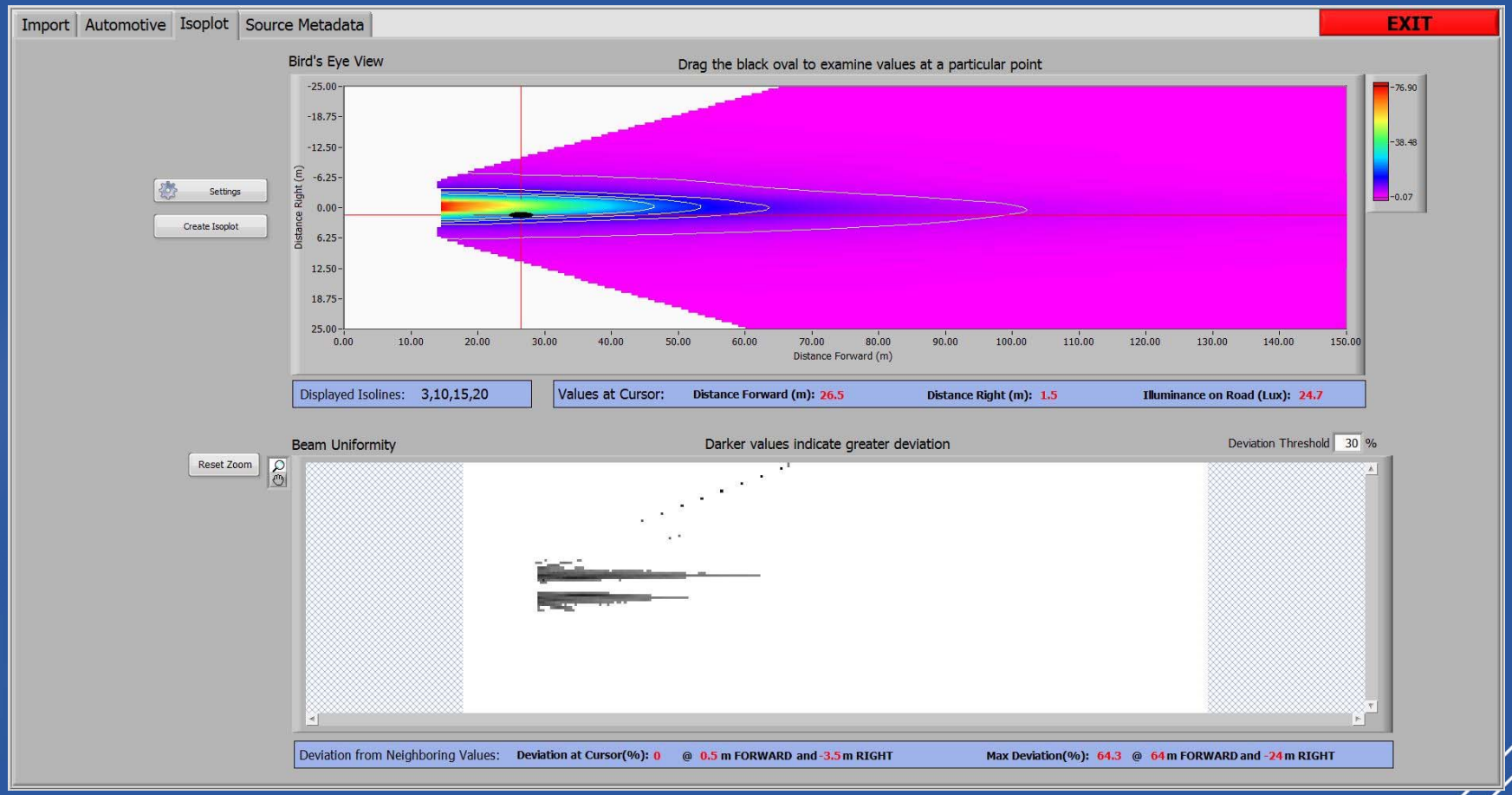
Consumer Reports Targets – VOA-100



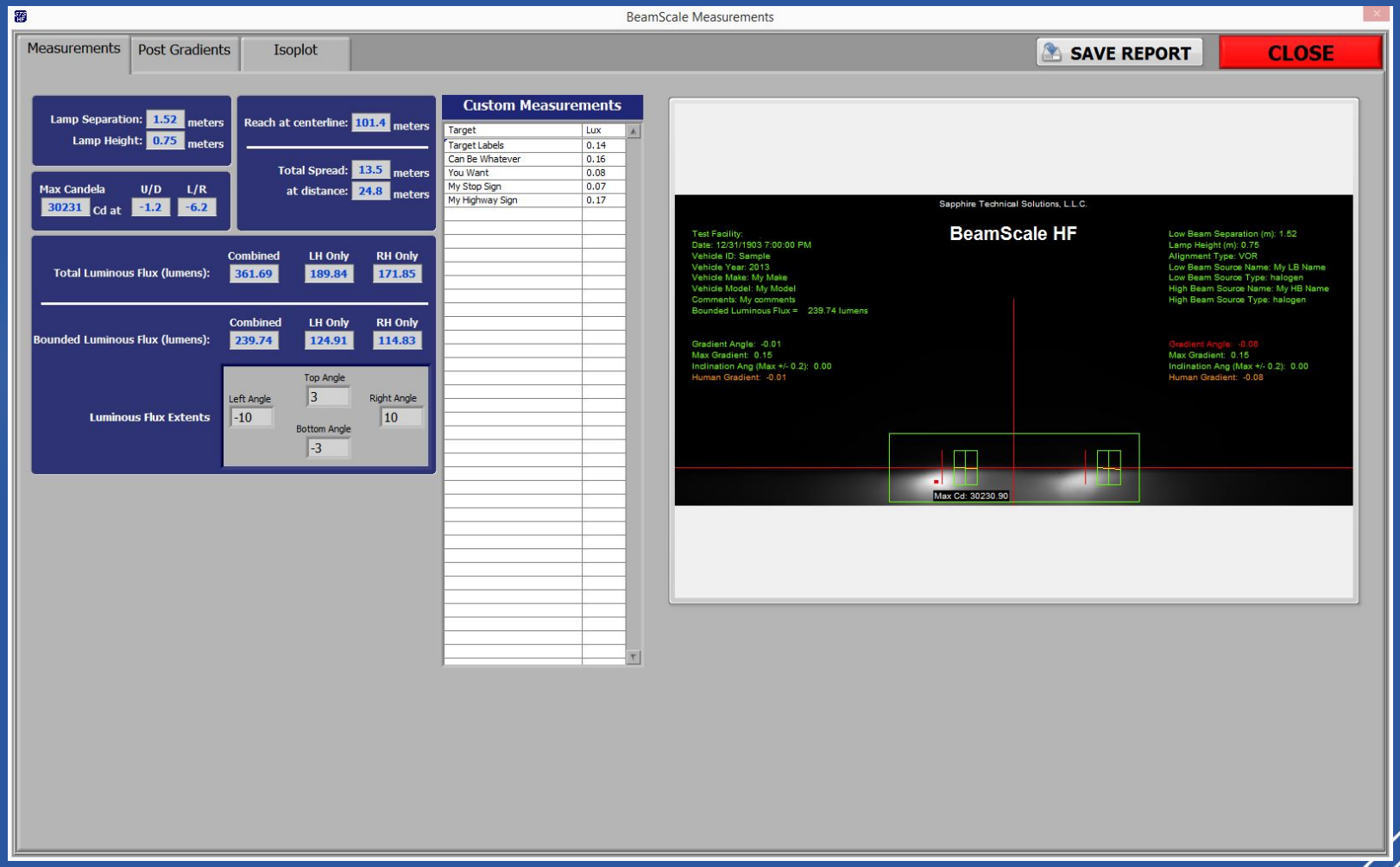
Consumer Reports Targets – VOA-100



Iso-Lux and "Uniformity" Graph – VOA-100



Camera-based Photometer – VOA-100



NHTSA Request – Performance-based Testing

SUPPLEMENTARY INFORMATION: Federal Motor Vehicle Safety Standard (FMVSS) No. 108, *Lamps, reflective devices, and associated equipment,* is a complex motor vehicle standard that has been in effect for several decades. The agency contracted for the preparation of a technical report, "Feasibility of New Approaches for the Regulation of Motor Vehicle Lighting Performance," which discusses the feasibility of new approaches to regulating motor vehicle lighting equipment. The report examines ways to effectively achieve the purposes of the performance requirements of FMVSS No. 108, which is to reduce crashes and injuries by increasing the conspicuity of motor vehicles and adequately illuminating the roadway. The report is available in the docket NHTSA–2011–0145.

The report identifies several potential opportunities for performance requirements in the following areas: headlighting photometry, headlamp test voltage, sensitivity of headlamps to vertical aim, luminance of signaling and marking lamps, masking of front turn signals, and reliability of photometric testing. The report also examines other areas, including physical lamp testing and signal lamp angular photometry.

NHTSA Request – Performance-based Testing

- Whole-vehicle testing (lower and upper beam headlighting)
- Headlamp test voltage
- Asymmetrical headlighting
- Headlamp aim
- Signal lamp luminance (EPLLA?)

STS Products and Services

- IIHS – Insurance Institute for Highway Safety
- NCAP – NHTSA “New Car Assessment Program”
- SAE J3100 Camera-based Photometer – VOA-100 from STS.

IIHS – Insurance Institute for Highway Safety

- IIHS – Insurance Institute for Highway Safety
- Proposed Headlight Test and Rating Protocol
- Some parameters can be evaluated in a "static" condition for an "approximation" of the field test using camera-based photometer
- STS "VOA-100" Camera-based Photometer has adjustable target locations and can measure all future "positions" when finalized.

Figure 2
Measurement Locations

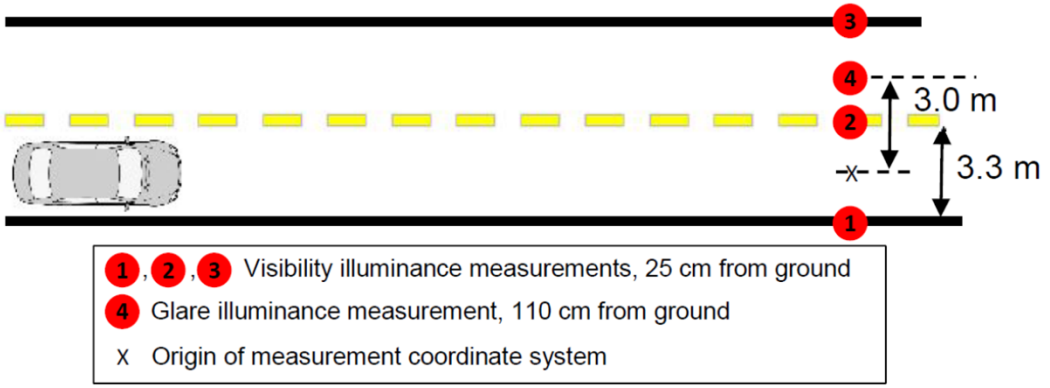


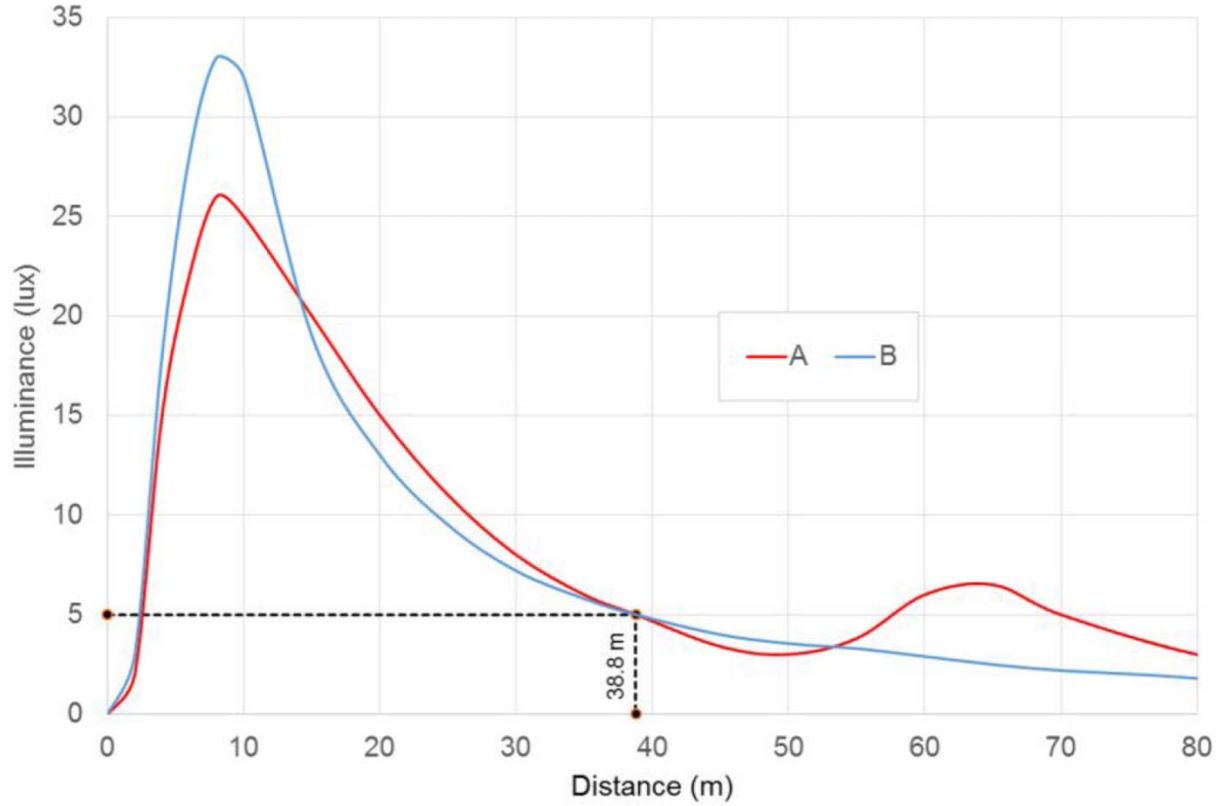
Table 3
Test Conditions

Approach	Length	Test speed	Location of visibility measurements (Fig. 2)
150 m radius right curve	120 m	65 km/h	Points 1, 2
150 m radius left curve	120 m	65 km/h	Points 1, 2
250 m radius right curve	120 m	80 km/h	Points 1, 2
250 m radius left curve	120 m	80 km/h	Points 1, 2
Straightaway	250 m	65 km/h	Points 1, 3

Visibility Metric

Visibility performance is assessed as the distance at which 5 lux is reached and continuously maintained until the vehicle is at most 10 m away. The distance is defined as the travel distance of the vehicle along the center of the travel lane (the arc of the curve for curved tests) to the origin ('x' in Figure 2). For each visibility illuminance measurement point listed in Table 3, the overall 5 lux distance is obtained by averaging the results from three valid tests. Example visibility illuminance data are shown in Figure A1 in the Appendix.

Figure A1
Example Visibility Illuminance Measurements



Glare Metric

The glare illuminance produced by the low beams on a given approach will be considered acceptable if it meets two criteria. First, the maximum glare from 5-10 m must not exceed 10 lux. Second, the glare illuminance for the remainder of the approach (i.e., 10-120 m for curves and 10-250 m for the straightaway) must not exceed the cumulative exposure distance limits shown in Figure 3. The distance value for the glare limit reflects the maximum cumulative distance traveled during the approach for which the glare illuminance may exceed a given threshold lux level. The cumulative distance can include multiple illuminance peaks and is independent of the distance from the measurement point at which the glare illuminance occurred. Example glare illuminance data are shown in the Appendix. Glare illuminance at distances below 5 m is ignored due to sensor inaccuracies associated with greater light incidence angles.

Figure 3
Glare Exposure Limits for Distances Greater Than 10 m

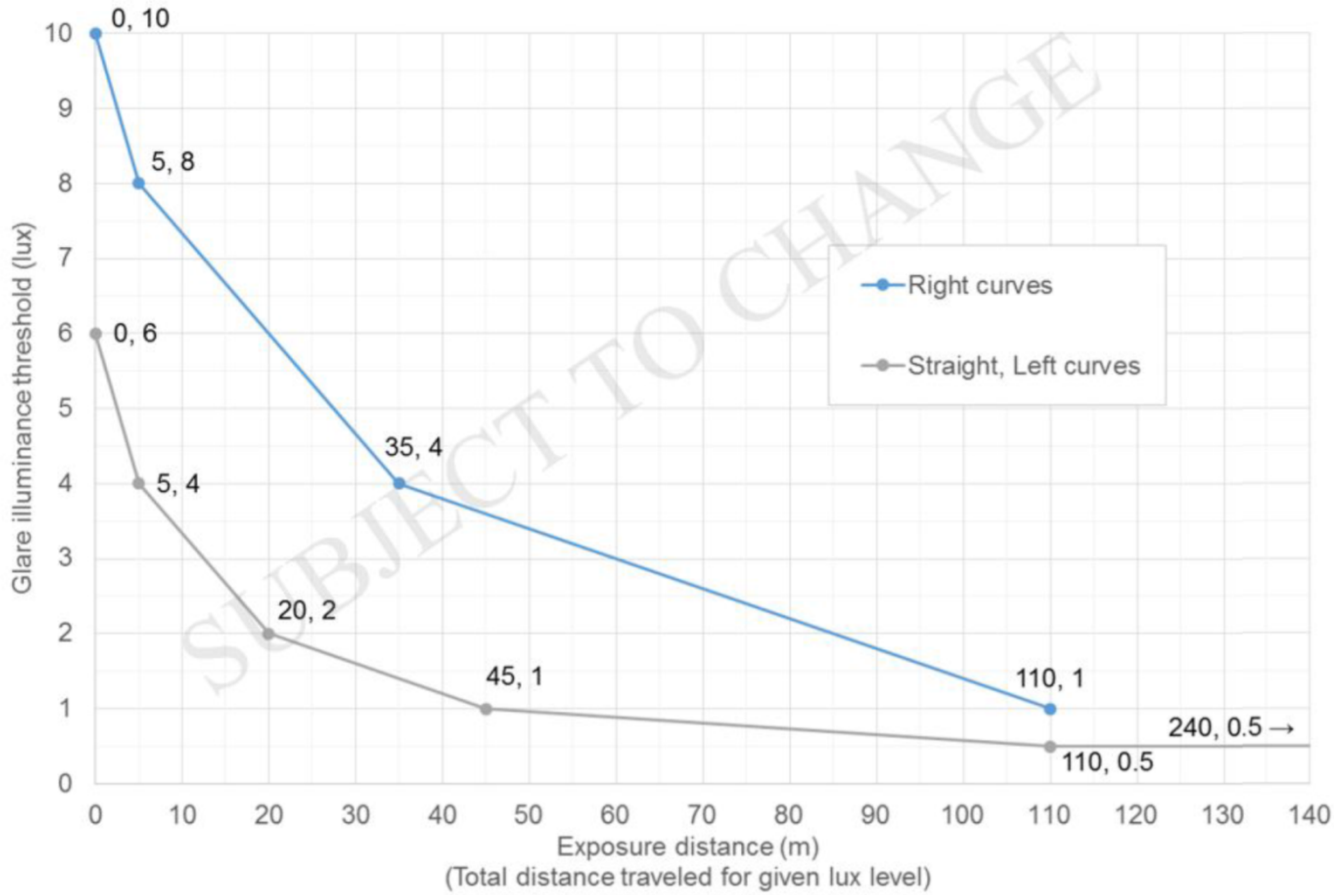
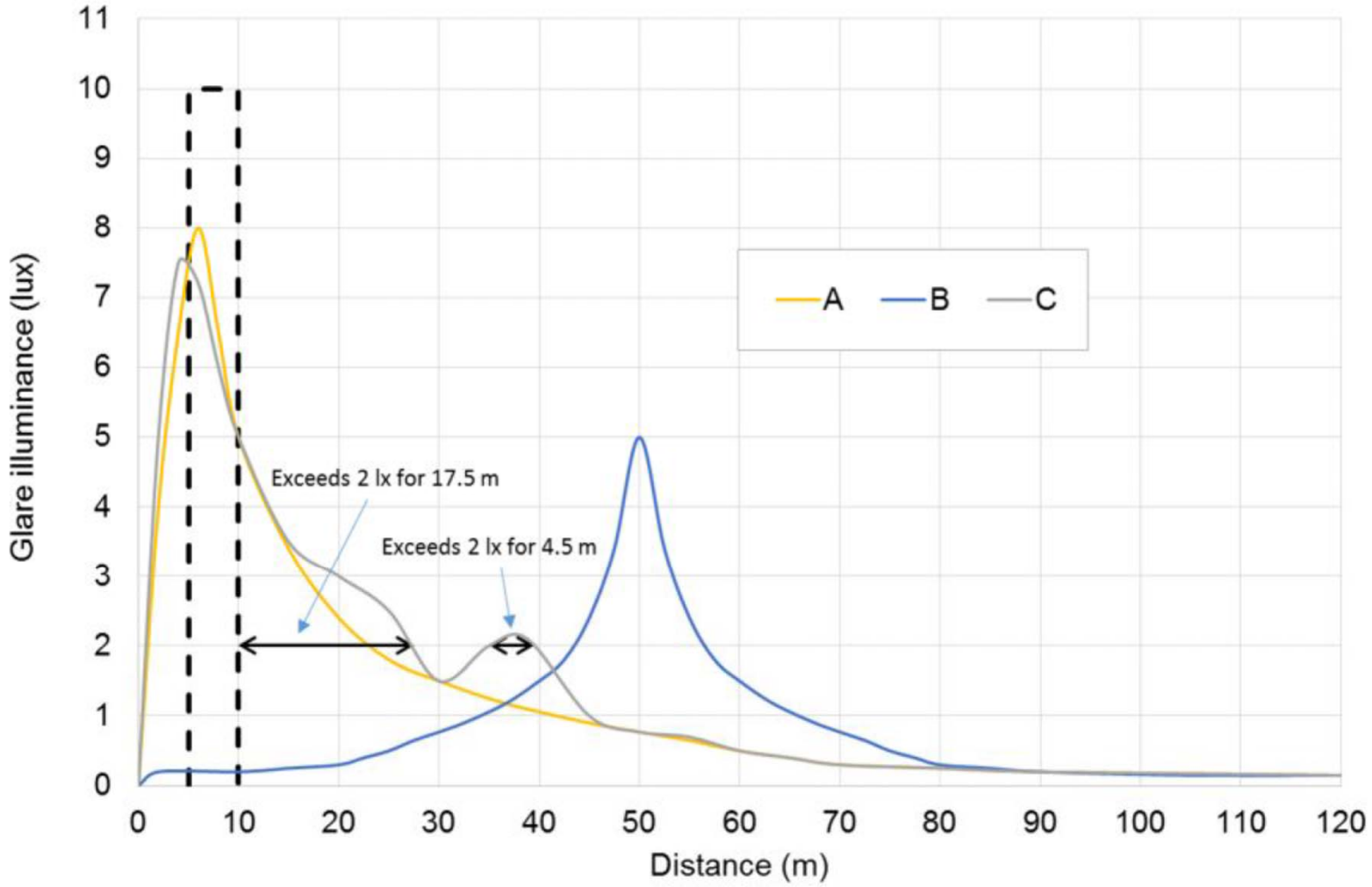
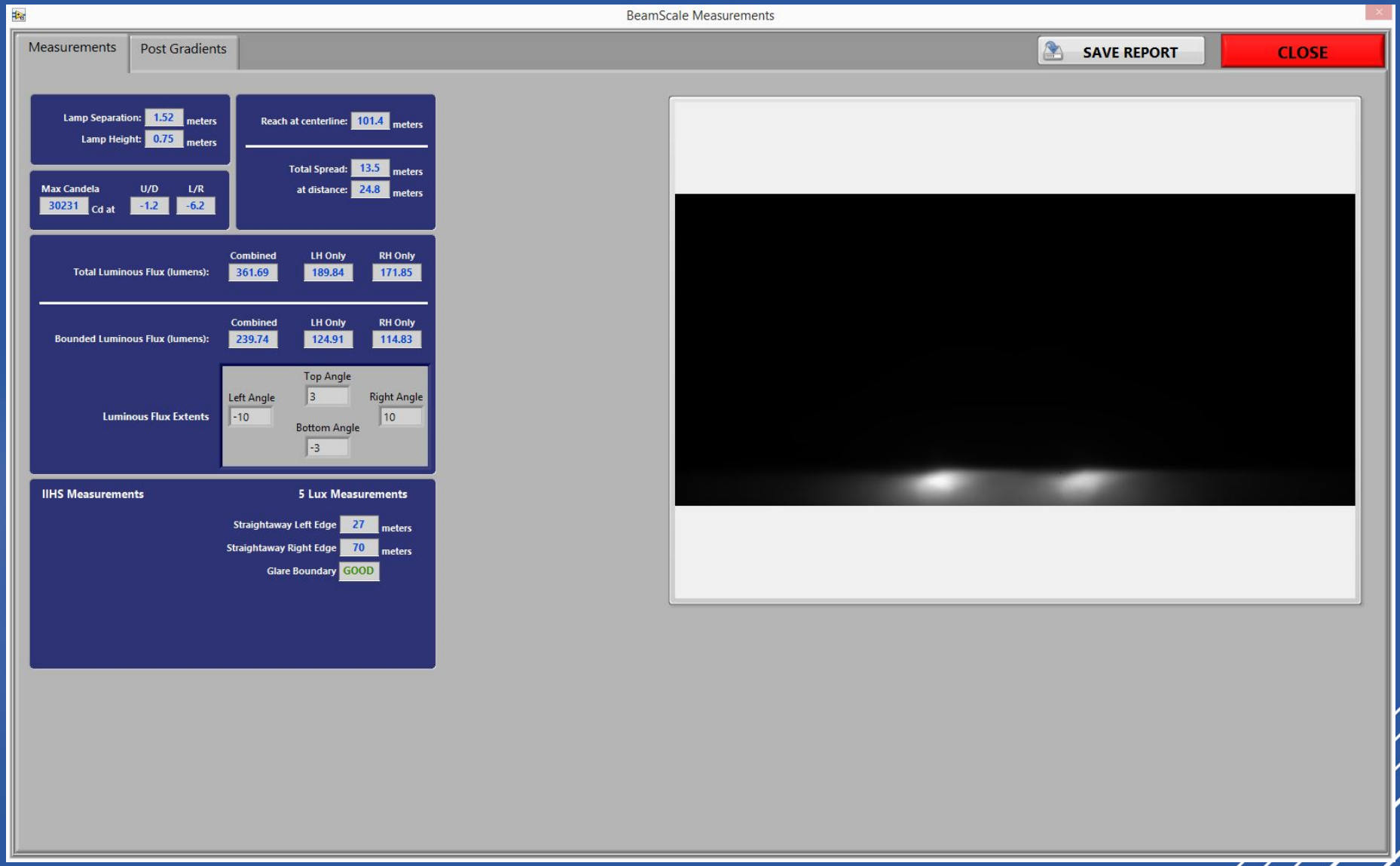


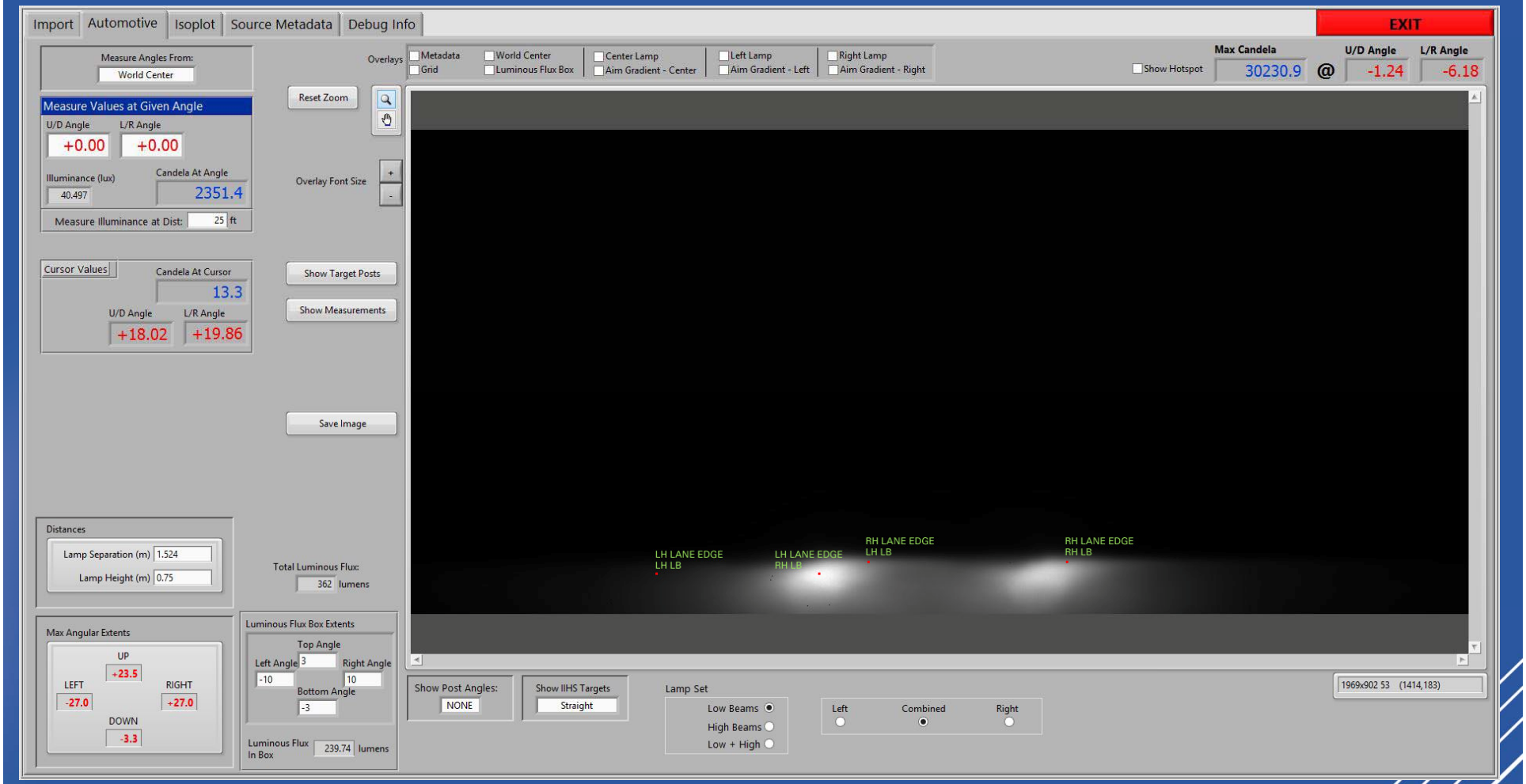
Figure A2
Example Glare Illuminance Measurements



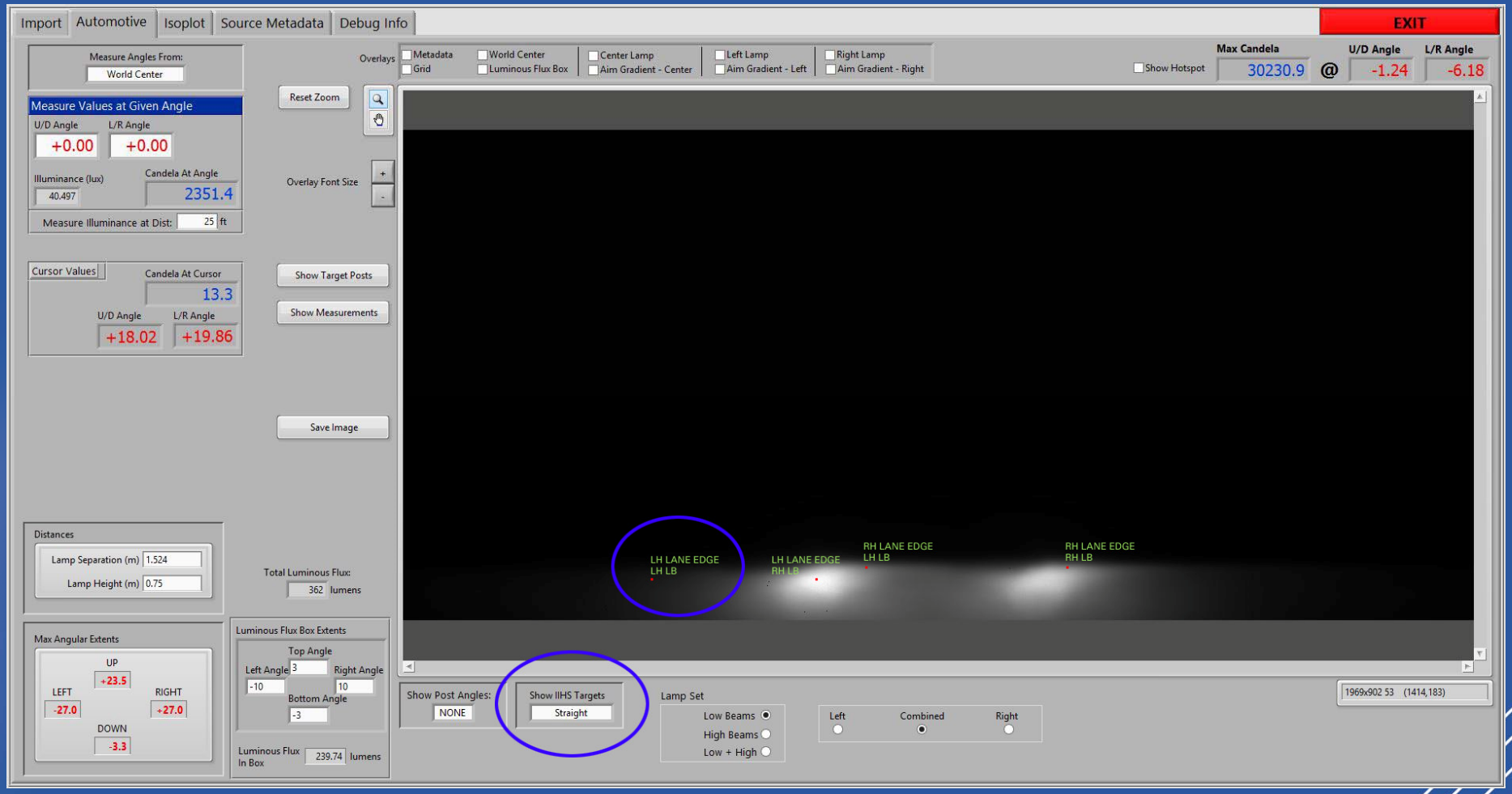
IIHS - Measurements



IIHS – Angular Position of Edges



IIHS – Edge of "Straight" Test



IIHS – Sample Data Listing

Target	Distance Forward (m)	Distance Right (m)	Height off Ground (m)	Lux
IIHS L.B. Straight Right Edge	70	1.65	0.25	5.03
IIHS L.B. Straight Left Edge	27	-4.95	0.25	5.03
IIHS L.B. Straight Glare	5	-3	1.1	0.8
	6	-3	1.1	0.33
	7	-3	1.1	1.05
	8	-3	1.1	1
	9	-3	1.1	0.96
	10	-3	1.1	1.16
	20	-3	1.1	0.95
	30	-3	1.1	0.77
	40	-3	1.1	0.72
	50	-3	1.1	0.62
	60	-3	1.1	0.53
	70	-3	1.1	0.46
	80	-3	1.1	0.4
	90	-3	1.1	0.35
	100	-3	1.1	0.31
	110	-3	1.1	0.28
	120	-3	1.1	0.26
	130	-3	1.1	0.23
	140	-3	1.1	0.21
	150	-3	1.1	0.19
	160	-3	1.1	0.18
	170	-3	1.1	0.17
	180	-3	1.1	0.16
	190	-3	1.1	0.15
	200	-3	1.1	0.14
	210	-3	1.1	0.13
	220	-3	1.1	0.12
	230	-3	1.1	0.11
	240	-3	1.1	0.11
	250	-3	1.1	0.1

Coordinates used for the points in the Measurements screen are shown to the left

For Glare to Pass, you must meet 2 criteria:

Maximum glare from 5-10 meters must not exceed 10 lux.

Glare illuminance for the rest of the approach (10-250 meters for the straightaway)
must not exceed the cumulative exposure distance limits shownin figure 3 of the spec.

NCAP – New Car Assesment Program

- NHTSA requested comments from SAE and other groups.
- SAE prepared a statement of possible testing alternatives to the original NHTSA proposal.
- Still in it's "infancy", not a regulation.
- STS VOA-100 can be modified to include "targets" at whatever positions become the final ruling.

NCAP – New Car Assesment Program

SAE Proposal using NHTSA procedure