

CERTIFICATION TEST REPORT

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19491-1
NAVIGATIONAL LIGHT TESTING
TO
ABYC AND NMMA REQUIREMENTS
OF
NAVI LIGHT ASSEMBLY
FOR
NAVISAFE

CUSTOMER:

NAVISAFE
OLA VALDRISVEI 8
1357 BEKKESTUA
NORWAY

**MANUFACTURER
OF TEST ARTICLE:** Navisafe

REPORT NO.: 19491-1

IMANNA JOB NO.: 19491

CUSTOMER P.O. NO.: verbal

CONTRACT: N/A

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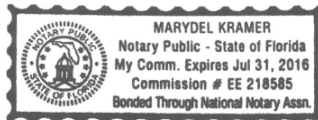
STATE OF FLORIDA

ROBERT L. WHITE, being duly sworn, deposes and says: The information contained in this report is the result of complete and carefully conducted tests and is to the best of his knowledge true and correct in all respects.

Robert L. White

SUBSCRIBED and sworn to before me this 25th day of October, 2012

Marydel Kramer



Imanna shall have no liability for damages of any kind to person or property, including special or consequential damages resulting from Imanna's providing the service covered by the report.

IMANNA LABORATORY, Inc.

TEST BY

ROBERT L. WHITE

PROJECT MANAGER

1. TEST ARTICLE

One combination - tri-color, red / port, green / starboard, white / stern, navigational light was received from Navisafe, Inc. for test. The light is designed to be mounted, via a magnetic base, above the sheer line on a boat deck. The light is battery operated, powered by three 1.5VDC IKEA alkaline batteries. The device consists of the following items: 1) a clear plastic lens / switch assembly that contained three 1.5 VDC AAA Alkaline batteries, the LEDs, reflector, and the assembly circuitry; 2) a black plastic base, containing 4 magnets; 3) a matching detachable base plate; 4) a rubber O-ring, attached to the clear plastic lens.

2. MODEL NUMBER

NaviSafe - Navi Light
designed to meet 2 Mile requirements

3. REQUIREMENTS

The requirements for this effort are to test the light in accordance with the USCG COLREG 1972 (IMO) standards and verify conformance with the navigation light regulations of ABYC A-16.

4. PROCEDURES

The procedure used in performing this test program is IMANNA Laboratory, Inc. Test Procedure NAV-LITE-1. This procedure details the requirements and procedures specified in the NMMA Certification Handbook under the section entitled Navigation Lights without additions or deletions. The procedure contains the detailed steps necessary to determine the compliance of the test specimen to the USCG IMO requirements.

5. TESTING SEQUENCE

- Receiving Inspection
- Functional Operation
- Chromaticity Test
- Luminous Intensity Tests
- Cut-off Angle Verification
- Weathertightness Test

6. RESULTS

The results of the tests performed are presented below by their order within the test sequence.

6.1 FUNCTIONAL OPERATION

The light was mounted on a panel simulating a boat deck surface then operated and tested using the batteries supplied with the light.

6.2 CHROMATICITY TEST

The Chromaticity of the light emissions from the "Red" light was measured and found to be within the "Red Light" range as specified by the standards. The light emissions from the "Green" light was measured and found to be within the "Green Light" range as specified by the standards. The light emissions from the "White" lights were measured and found to be within the "White Light" range as specified by the standards.

Chromaticity charts are included in the Appendix.

6.3 LUMINOUS INTENSITY TESTS

The luminous intensity of the light was measured to be above the 2 mile limit of 4.3 candela in the critical areas. The light, equipped with new batteries, maintained a measured intensity above the minimum requirements of the standard for a period of 4 hours.

6.4 CUT-OFF ANGLE VERIFICATION

The light intensity that was measured was graphed and included in the Appendix. The graph also includes the minimum required cut-off angle of 4.3 candela.

The data for the light sample shows that the light emits sufficient light in the required zones and prevents light from entering the "keep out" zones. This indicates that the light meets the photometric requirements of the standard.

6.5 WEATHERTIGHTNESS TEST

Since the light will be installed above the sheer line, it was subjected to the Weathertightness Test. This test consisted of a continuous water spray using nozzles over the entire top and all exposed sides of the structure for 15 minutes at a rate of at least two inches (50mm) per hour, at an operating pressure of five psi (0.352 kilograms per square centimeter).

No water intrusion was present after the 15 minute duration and therefore the light meets the weathertightness test.

7.0 COMMENTS AND OBSERVATIONS

The data from these tests show that the sample tested meets all of the requirements of the standards listed above power driven vessels up to 20 meters in length.

The results presented herein apply only to the test specimen as prepared and as tested on the date reported. All equipment used in the performance of these tests was calibrated to standards traceable to the N.I.S.T and/or verified at the time of the test using internationally recognized methods to validate the accuracy and repeatability of the values recorded or collected during the tests.

To be in full compliance with the USCG regulations a light must also be in compliance with the marking requirements listed in 33 CFR 183.810 that state in part that a light must:

- (3) Bear a permanent and indelible label that is visible without removing or disassembling the light and states the following:
 - (i) "USCG Approval 33 CFR 183.810."
 - (ii) "Meets ABYC A-16."
 - (iii) "Tested by Imanna Lab, Inc." if tested by Imanna or other appropriate lab if not
 - (iv) Name of manufacturer.
 - (v) Number of model.
 - (vi) Visibility of the light in nautical miles.
 - (vii) Date on which the light was type-tested.
 - (viii) Identification and specifications of the bulb used in the compliance test.

If a light is too small to attach the required label –

- (1) Place the information from the label in or on the package that contains the light: and
- (2) Mark the light "USCG" followed by the certified range of visibility in nautical miles. Once installed, this mark must be visible without removing the light.



Figure 1: view of tested light consumer packaging

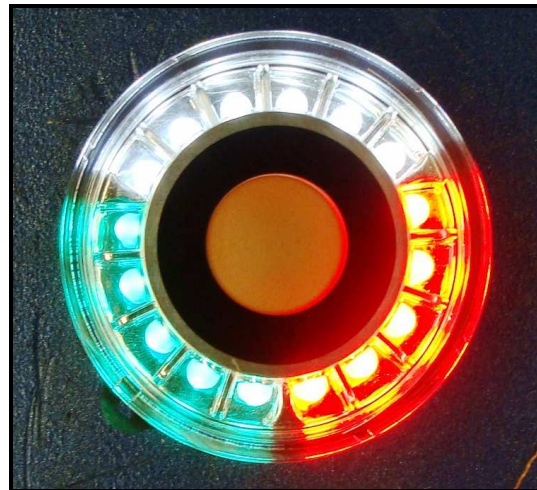


Figure 2: view of tested light operating in the tri-color light mode



Figure 3: view of tested light

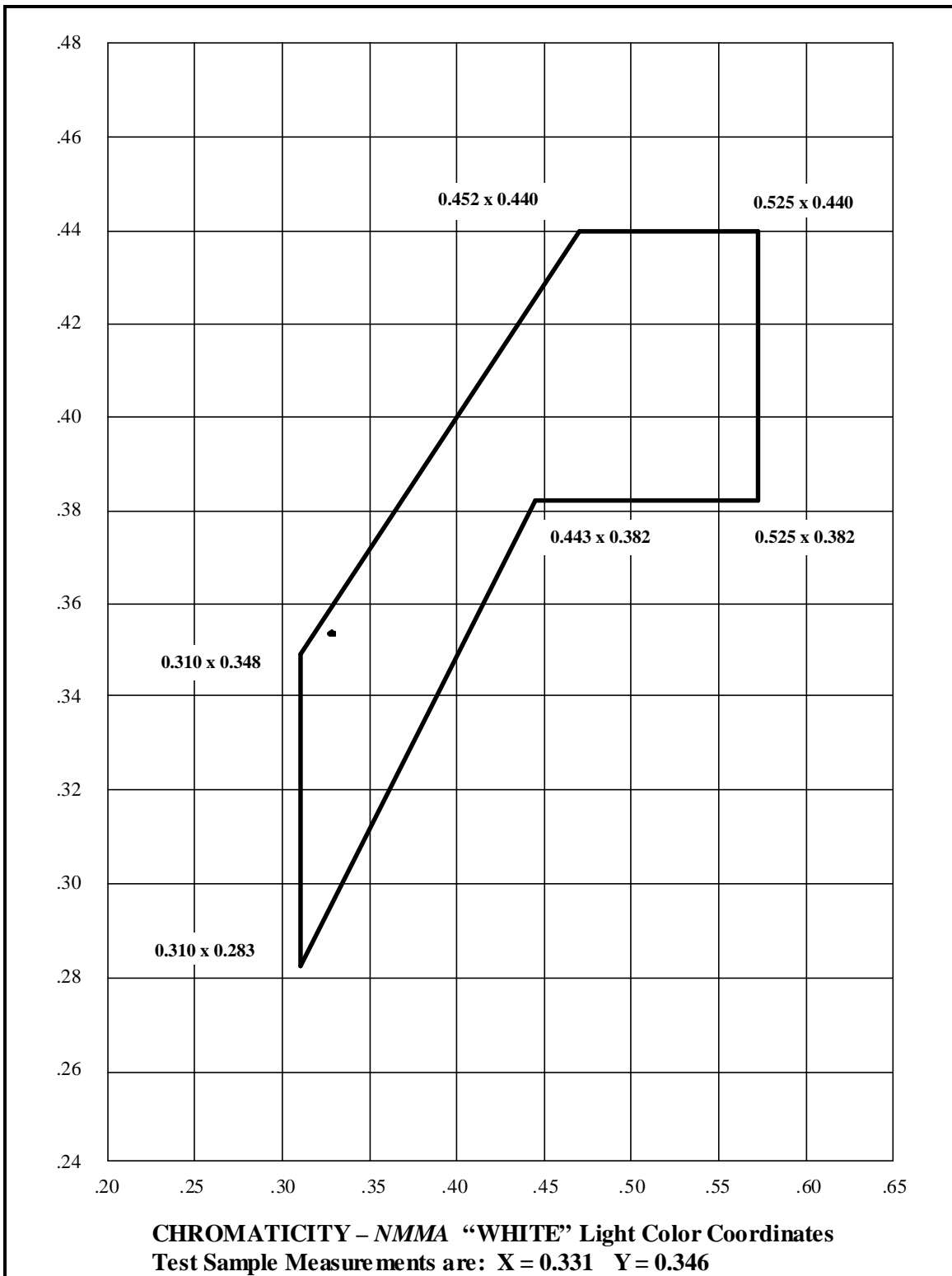


Figure 4: Chromaticity Plot of Stern Light / White / 2 mile

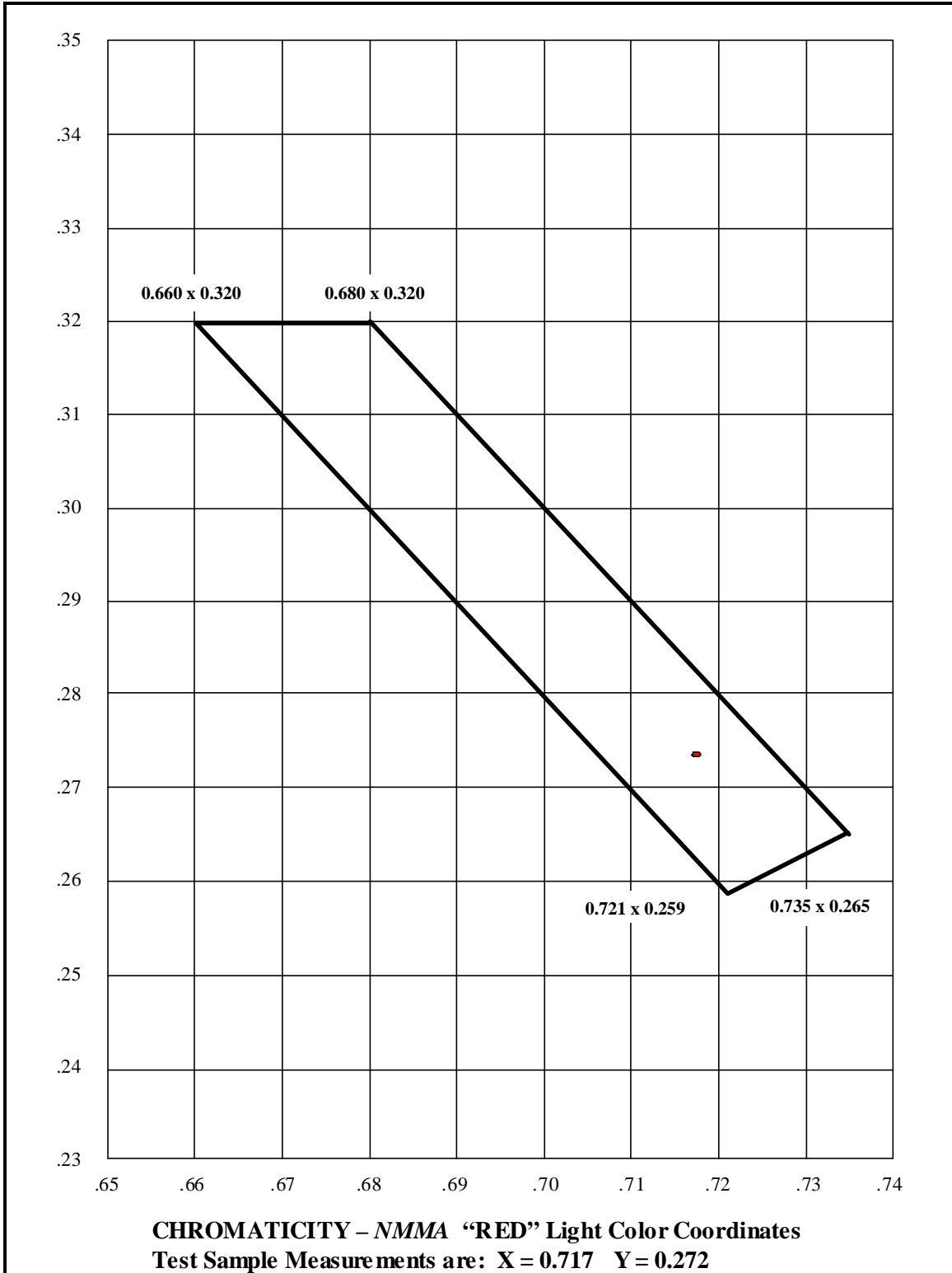


Figure 5: Chromaticity Plot of Port Side Light / Red / 2 mile

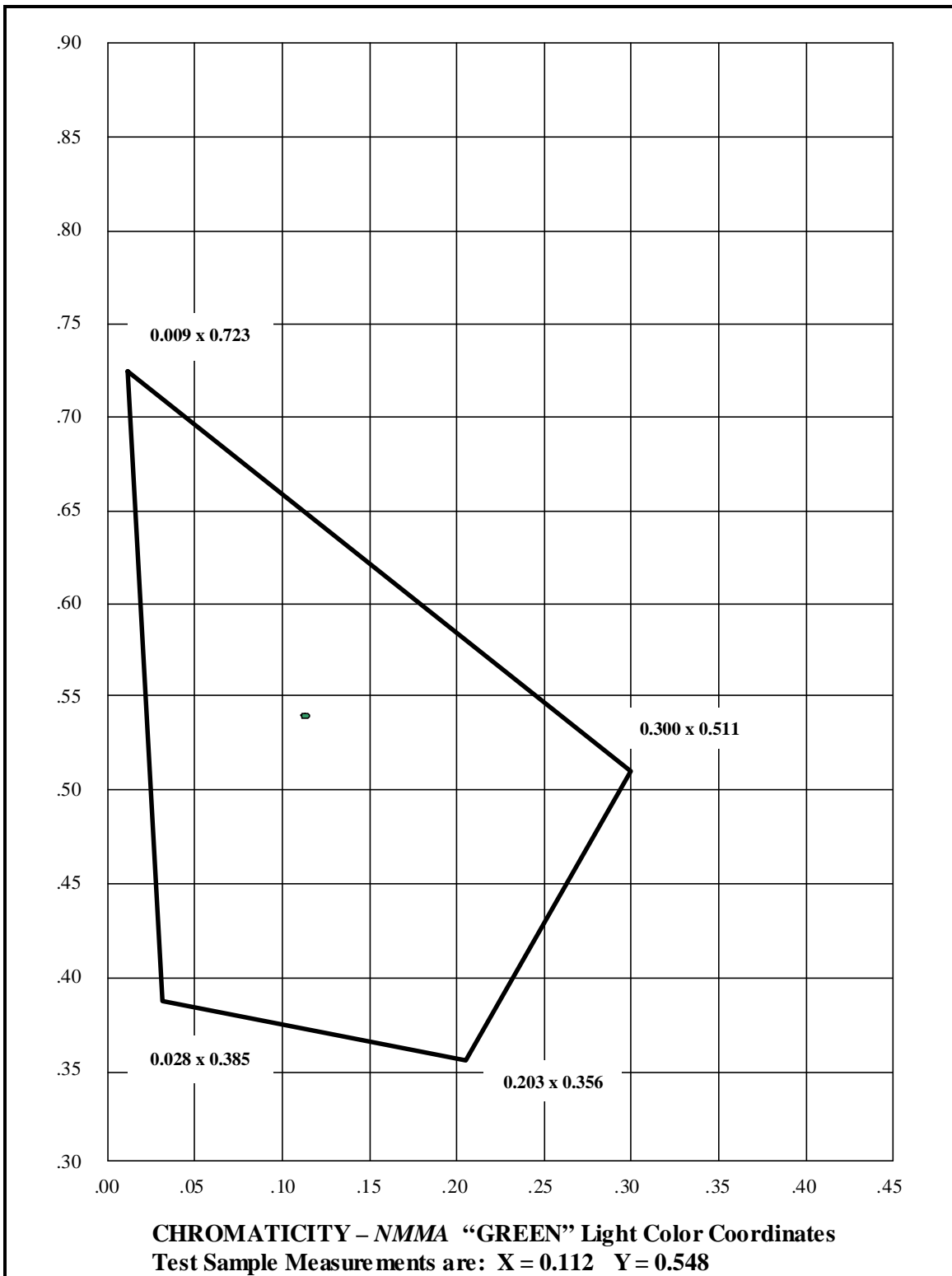


Figure 6: Chromaticity Plot of Starboard Side Light / Green / 2 mile

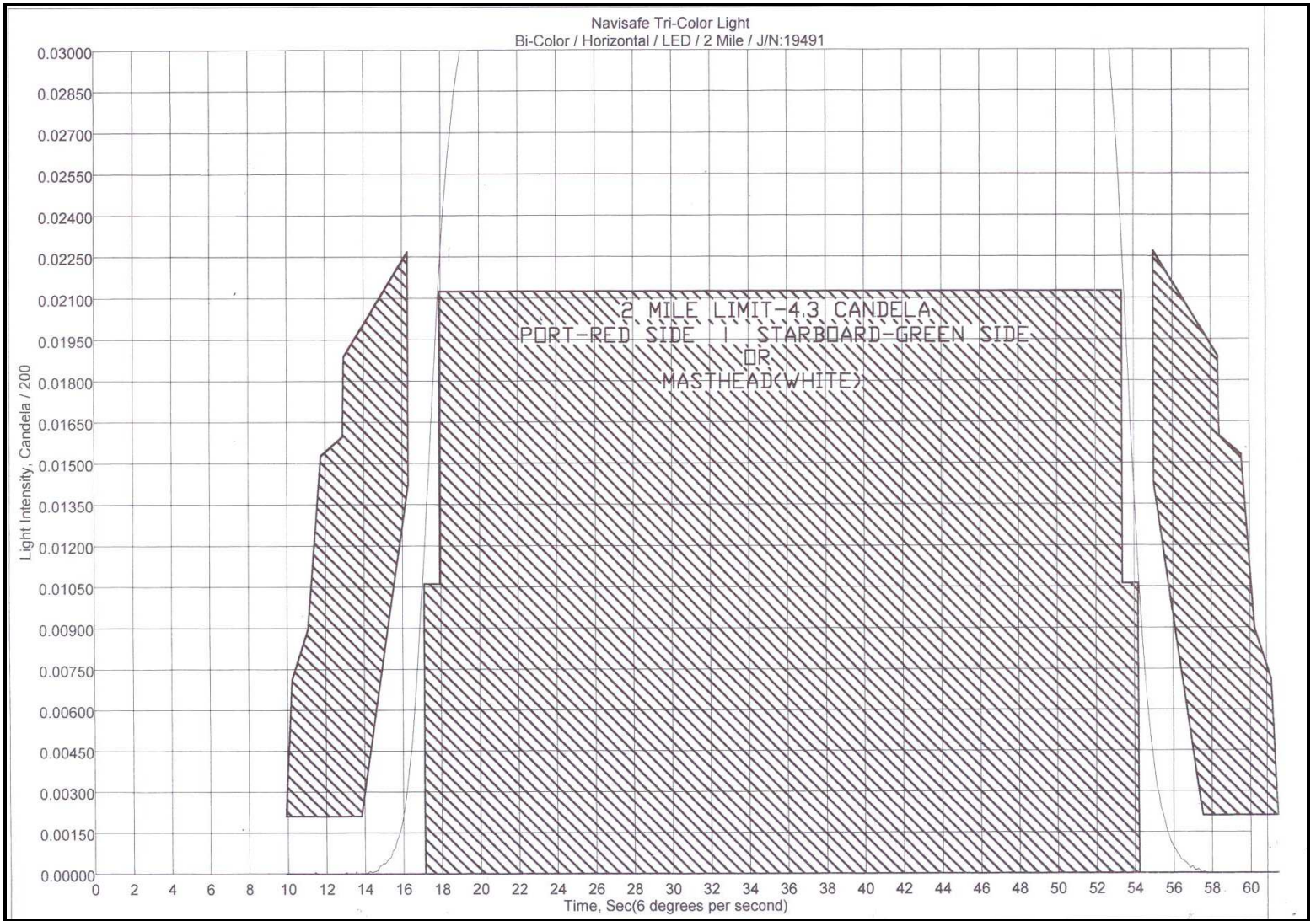


Figure 7: bi-color combination - horizontal cut-offs

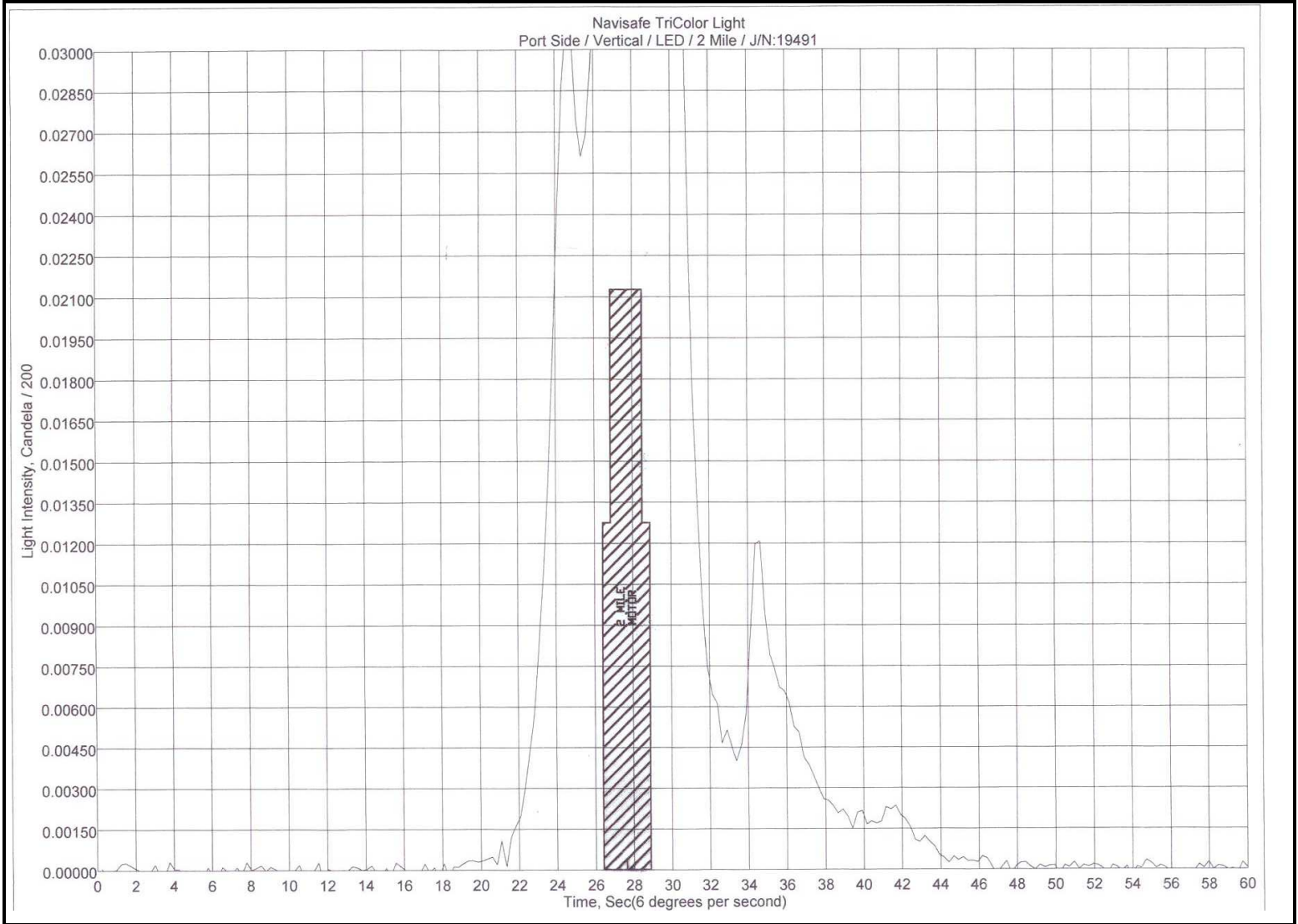


Figure 8: port side light - vertical cut-offs

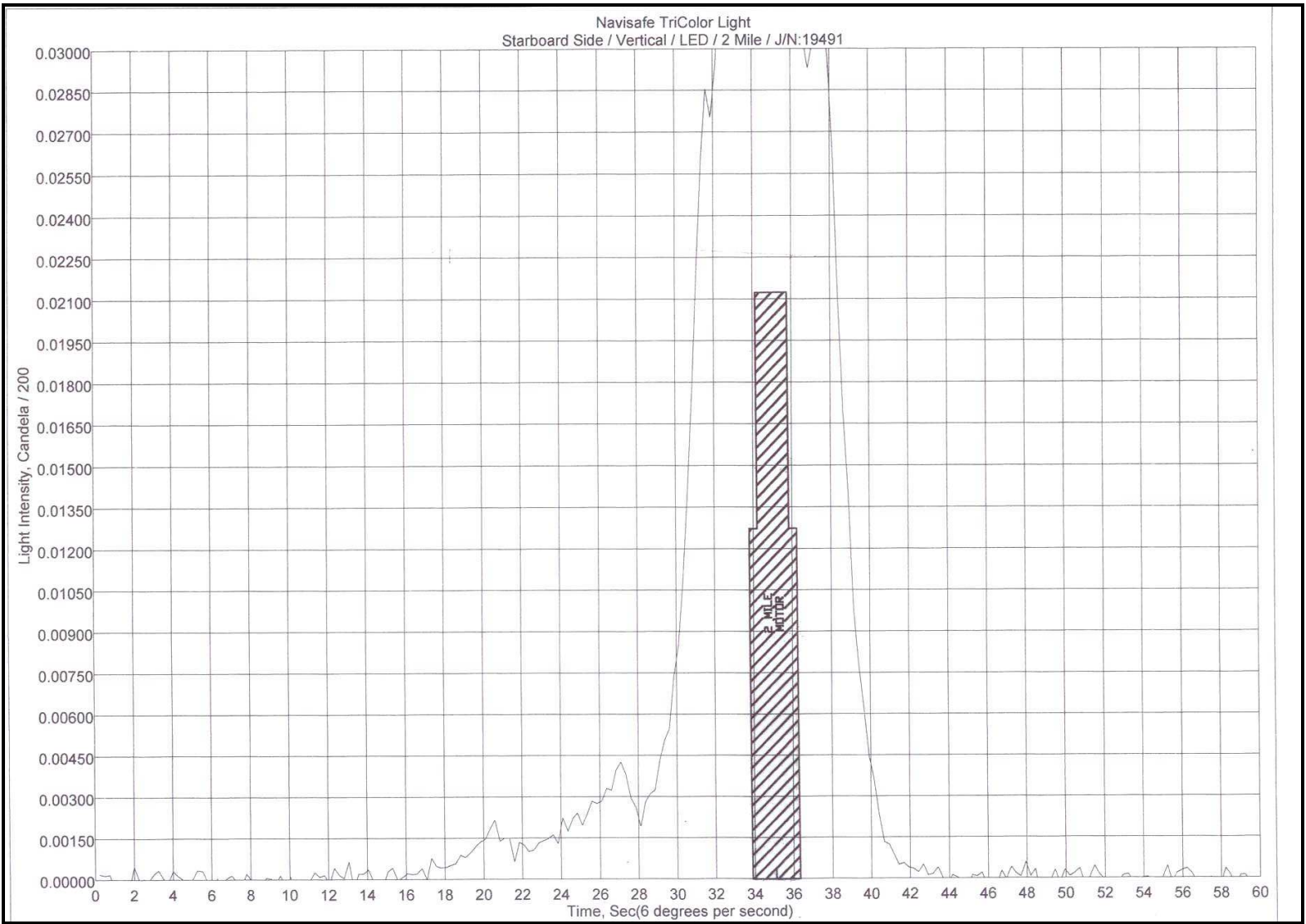


Figure 9: starboard side light - vertical cut-offs

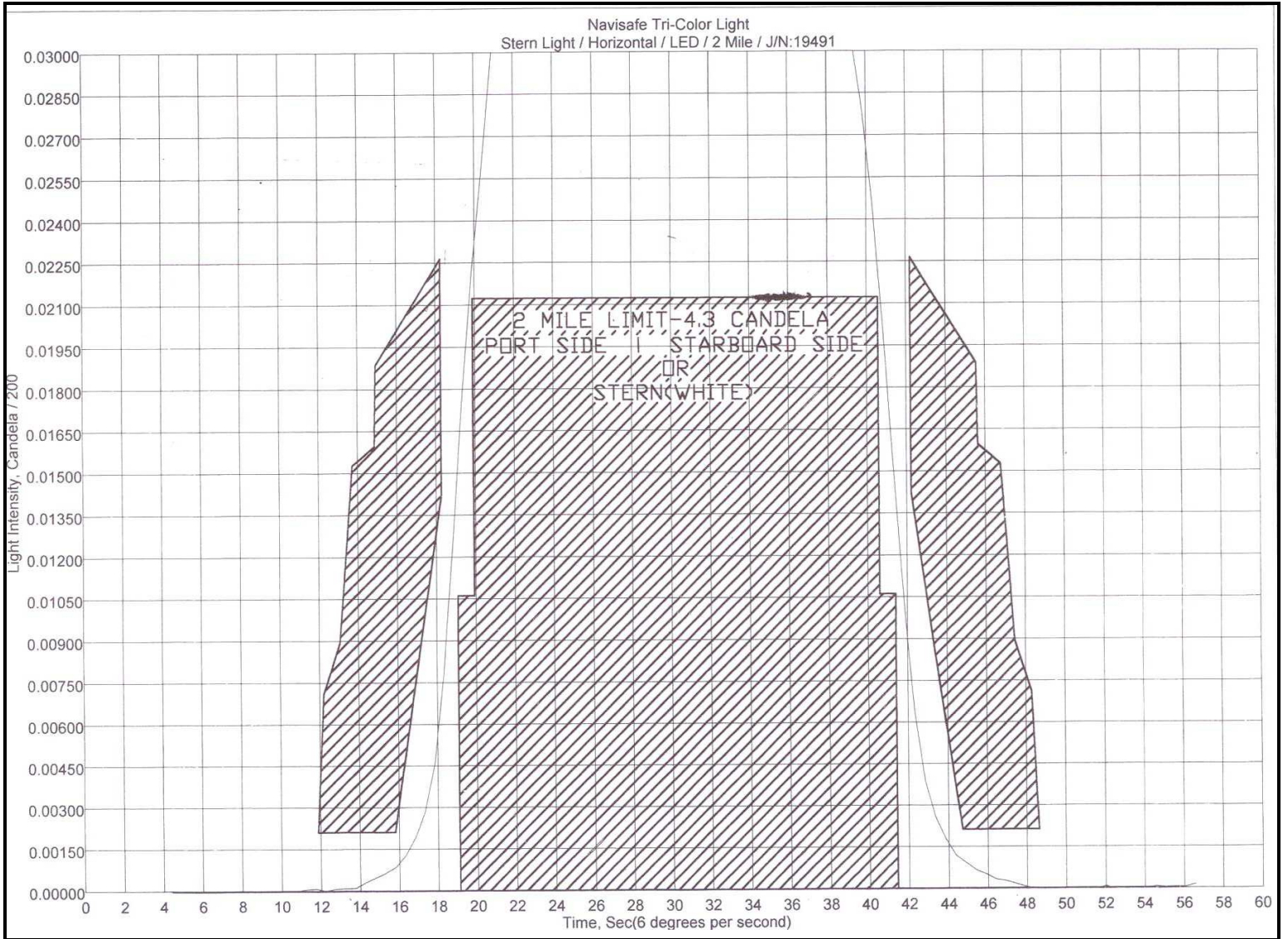


Figure 10: stern light - horizontal cut-offs

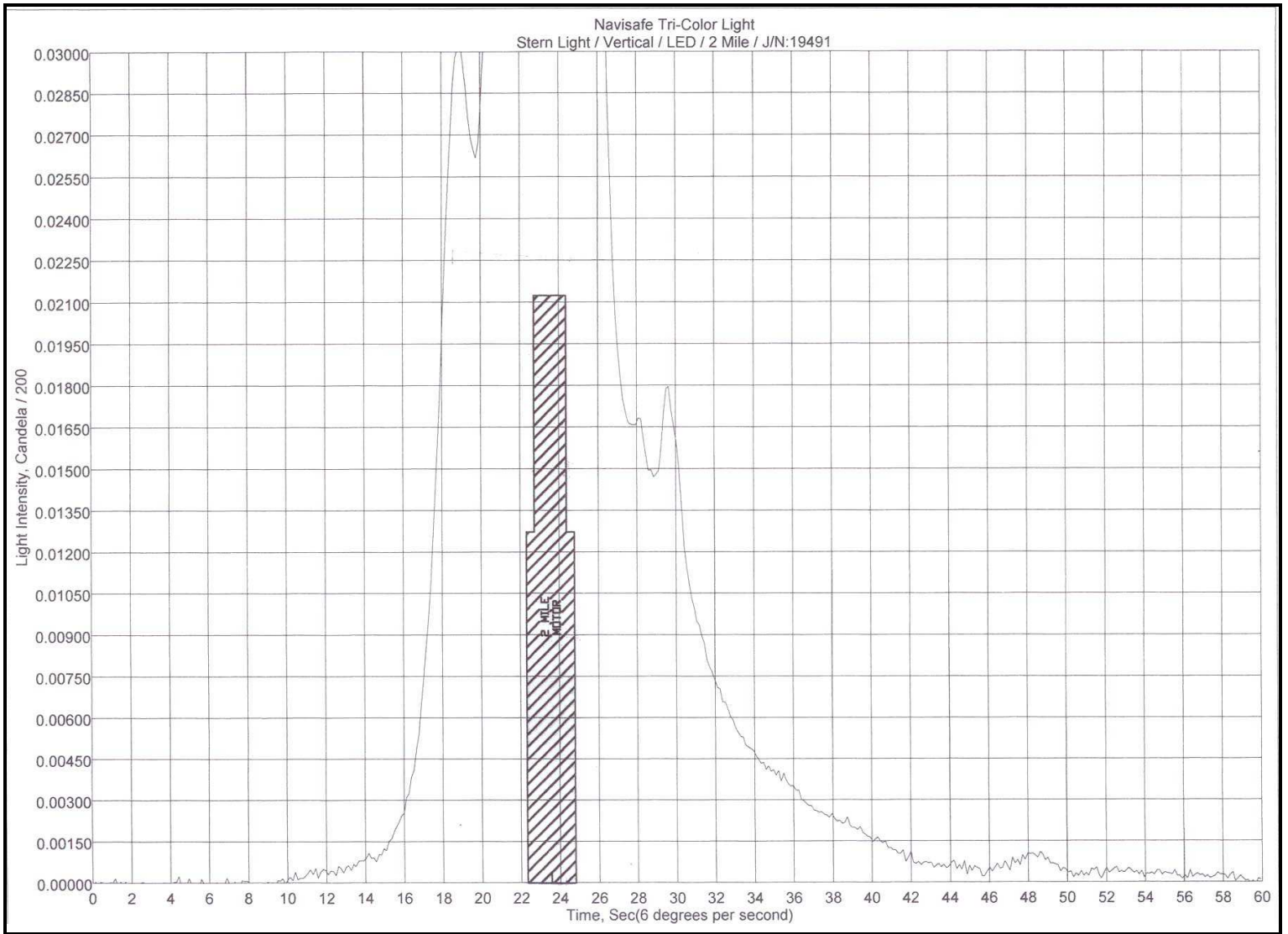


Figure 11: stern light - vertical cut-offs