



ABS Recognized Ambient Environmental Testing Specialist & Test Plans

ABS Habitability/Comfort Guidance

- Guides
 - Crew Habitability on Ships
 - Crew Habitability on Workboats
 - Crew Habitability on Offshore Installations
 - Crew Habitability on MODUs
 - Passenger Comfort on Ships
 - Passenger Comfort on Yachts
 - Guide for Compliance with the ILO MLC, 2006 Title 3 Requirements (MLC-ACCOM)



ABS Notations

- Crew Habitability related notations:
 - HAB for Ships: **HAB, HAB+, HAB++**
 - HAB for Workboats: **HAB(WB), HAB+(WB), HAB++(WB)**
 - HAB for Offshore Installations: **HAB(OS), HAB+(OS), HAB++(OS)**
 - HAB for MODUs: **HAB(MODU), HAB+(MODU), HAB++(MODU)**
- Passenger Comfort related notations:
 - **COMF, COMF+**
- Yacht Passenger Comfort
 - **COMF(Y), COMFY+(Y)**
- MLC 2006 related notations
 - **MLC-ACCOM, MLC-ACCOM(SPS), MLC-ACCOM(WB)**

COMF + and COMF (Y)+ require Motion Sickness Measurements (MSDV) at 0.1 – 0.5 Hz (BS6841)

Testing Specialists

- Provide testing/measurement services meeting the ABS Habitability/Comfort notation requirements.
- Objective – set basic standards for certifying specialists for the following:
 - Whole-body vibration measurements and analysis
 - Airborne noise measurements and analysis
 - Indoor climate measurement and analysis
 - Lighting measurement and analysis



Procedure for Approval/Certification

- Organizational chart showing Testing Group does not report to a production related function
- Review of documents (Appendix 2/4.1)
 - Company Experience/Test Personnel/Equipment Specs
 - Example Test Plans and Test Reports
 - Approval by Certifying Bodies (if any)
- General requirements (Appendix 2/4.2)
 - Supervisors shall have minimum of two (2) years experience in supervising tests in the ambient environmental aspect
 - Equipment – Posses the necessary for the ambient environmental aspect to be tested. Records about maintenance and calibration
 - Procedures - Documented procedures covering all ambient environmental test services

Procedure for Approval/Certification

- General requirements Appendix 2/4.2)
 - Supervisors shall have minimum of two (2) years experience in supervising tests in the ambient environmental aspect
- Auditing (Appendix 2/4.3)
 - The External Specialist shall be audited for the initial certification process and then every three (3) years
- Demonstration of expertise (Appendix 2/4.4)
 - Certification is conditional on a practical demonstration to ABS
- Quality system (Appendix 2/4.5)
 - Operating instructions & maintenance/reference calibration for Test Equipment
 - Training Programs for Test Personnel
 - Recording & Reporting of Information
 - Supervision and verification to ensure compliance with test procedures
 - Quality management of subsidiaries and subcontractors
 - Job Preparation

Procedure for Approval/Certification

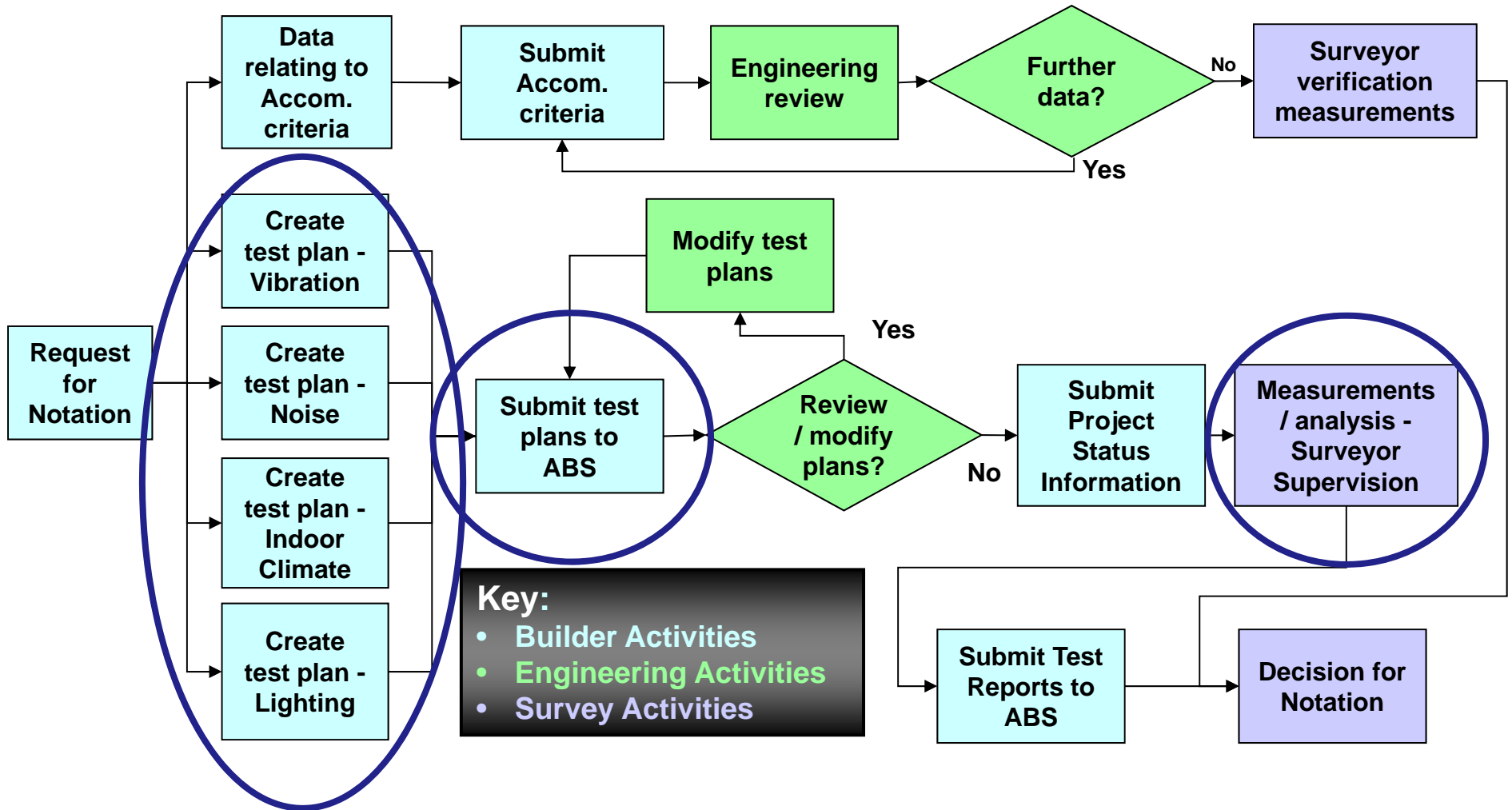
- Certificate of Approval (Appendix 2/5)
 - Specialist's processes, test and analysis processes found satisfactory
- Renewal (Appendix 2/5.1)
 - The Certificate is subject to renewal at intervals not to exceed three years
- Alterations (Appendix 2/6)
 - Alterations to test / analysis services require ABS to be notified
- Cancellation of Approval (Appendix 2/7)
 - ABS approval may be cancelled



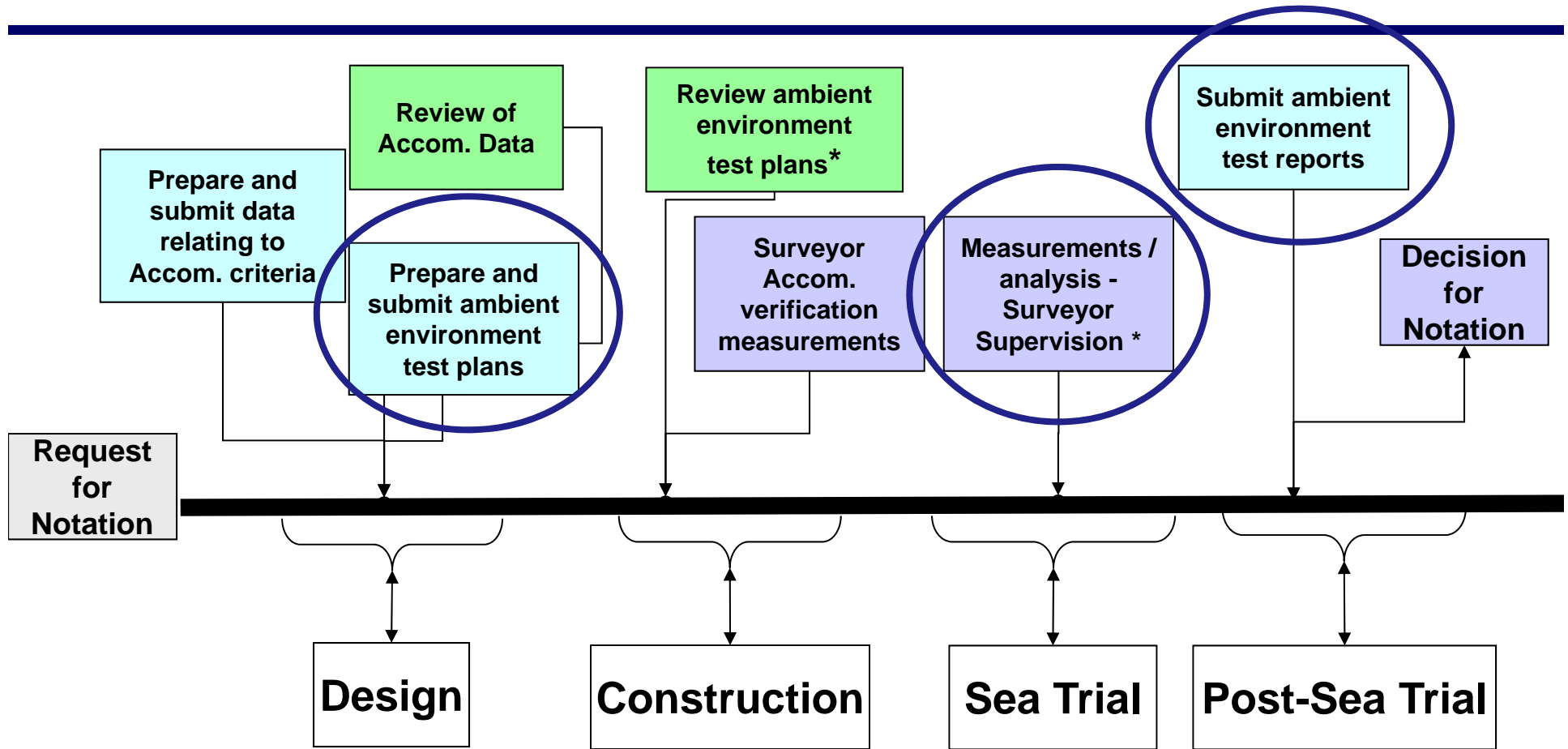
External Specialist – Objective

- ABS Recognized Ambient Environmental Specialists act as **Independent** Third Parties

ABS Notation Process



ABS Notation Event Schedule



* Lighting and indoor climate measurements may be taken during construction or dockside after construction

Key:

- Builder Activities
- Engineering Activities
- Survey Activities

Test Plans (General)

- Developed for each ambient environmental aspect
 - WBV, Noise, Indoor Climate, Lighting
- Plans include:
 - Documentation and drawings
 - Test personnel
 - Test conditions
 - Measurement locations
 - Data acquisition and instruments
 - Test schedule
- Resulting test reports will go the attending surveyor



Walkthrough Inspection Locations

- Walkthrough inspection locations
 - An additional sample of manned crew compartments not covered by physical measurements shall be subject to a walkthrough verification inspection
 - The ABS surveyor shall identify these compartments from those that were not selected for physical measurement during sea trials
 - The purpose of the walkthrough verification is to subjectively assess the ambient environmental qualities of the space
 - If any compartment is suspected to be in non-compliance, it shall be verified by the external specialist by conducting spot measurements and the results recorded in the test report

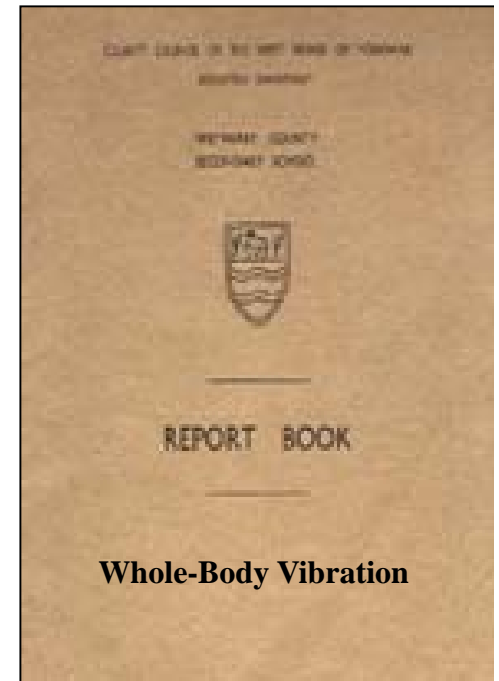
WBV Test Requirements

- Conditions During Test
 - Power Output: contractual service conditions (Transit/DP)
 - Equipment Operation: All rotating machinery essential for vessel operation should be operating
 - HVAC systems running for normal seagoing conditions
 - Vibration arising from every kind of unnecessary human activity shall be avoided
- Instrumentation shall conform with ISO 8041
- Measurement locations/spaces
 - Accommodation areas
 - Manned workspaces
 - As directed by the Test Plan



WBV Test Report

- Test report shall include the following:
 - Results of testing (pass / fail determination)
 - Sea trial details
 - Equipment operated during test
 - Course, speed, latitude and longitude coordinates during test
 - Weather and meteorological data
 - Measurement positions
 - Details of measuring equipment
 - Copies of calibration certificates
 - Surveyor witnessing documentation



WBV Results

- The Test Report shall be reviewed by the ABS Surveyor against the requirements for notation
- Results demonstrating vibration levels in noncompliance shall be forwarded to the Shipbuilder for mitigation and shall be retested as appropriate to verify compliance
- The Final WBV Test Report and mitigations and retest results shall be forwarded to ABS



Noise Test Requirements

- Conditions During Test
 - Power Output: contractual service conditions (Transit/DP)
 - Equipment Operation: All rotating machinery essential for vessel operation should be operating
 - HVAC systems running for normal seagoing conditions
 - Noise arising from every kind of unnecessary human activity shall be avoided
- The sound level meter shall meet the requirements for a Type 1 (IEC 61672-1)
- Measurement locations/spaces
 - Accommodation areas
 - Manned workspaces
 - As directed by the Test Plan



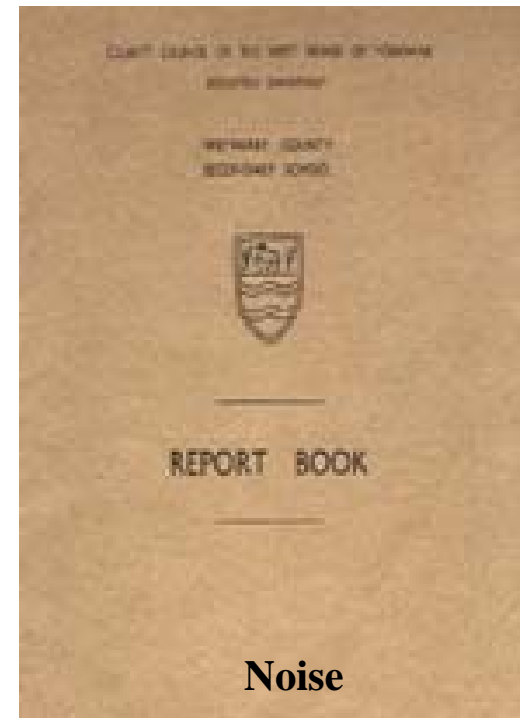
Noise Test Requirements

- Measurement Positions
 - Where persons will be seated or standing
 - In accommodation spaces, measured in the middle of the space
- Spaces with intermittent / cyclic noise shall be measured



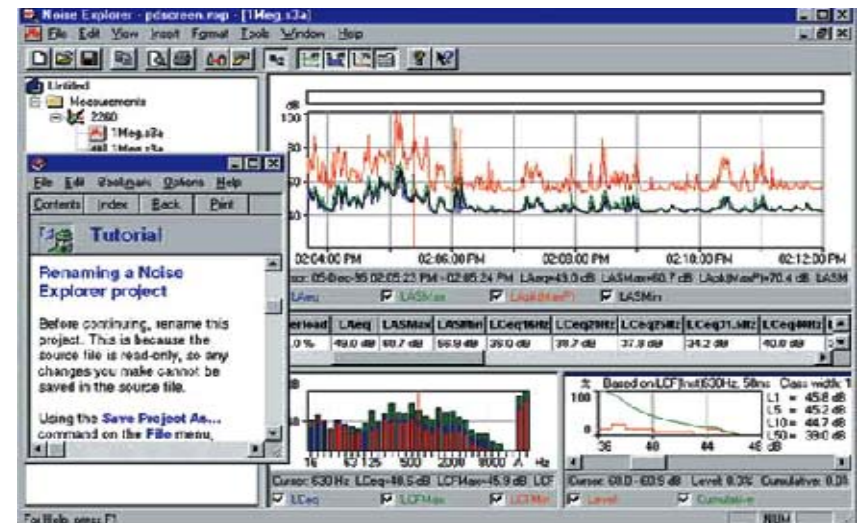
Noise Test Report

- Test report shall include the following:
 - Results of testing (pass / fail determination)
 - Sea Trial Details
 - Equipment operated during test
 - Course, speed, latitude and longitude coordinates during test
 - Weather and meteorological data
 - Measurement positions
 - Details of measuring equipment
 - Copies of calibration certificates
 - Surveyor Witnessing Documentation



Noise Results

- The Test Report shall be reviewed by the ABS Surveyor against the noise standard for meeting the requirements for classification
- A copy of the Test Report including any mitigation of unsatisfactory results and retesting of same will be approved by ABS



Indoor Climate Test Requirements

- Indoor climate measurements performed in accordance with ANSI/ASHRAE 55a and ANSI/ASHRAE 15
- The measurement instrumentation shall meet ISO 7726
- The following quantities are measured in each of the spaces or zones identified
 - Air temperature
 - Relative humidity
 - Air velocity
 - Vertical gradient
 - Horizontal gradient (in cabin spaces only)
- HVAC system is tested, adjusted, and balanced

Indoor Climate Test Requirements

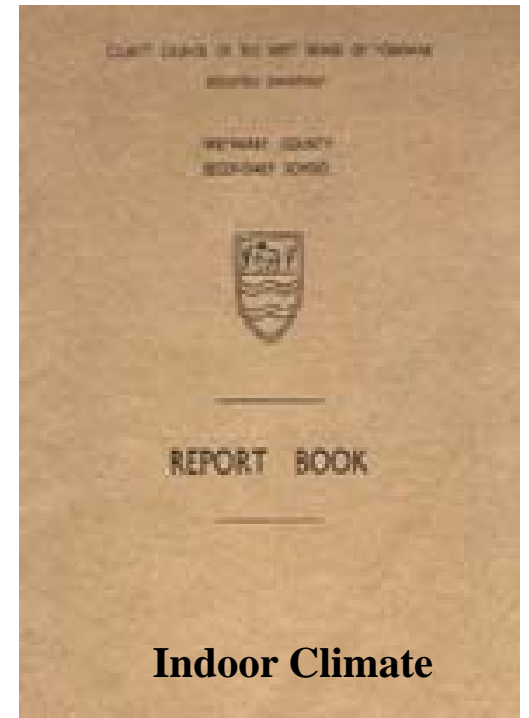
- Air temperature and humidity measurements are made at least every 5 minutes for a minimum period of 1-hour
- The minimum, maximum, and average values for the 1-hour period shall be reported for each space measured
- The measuring period for determining the average air velocity at any location shall be three (3) minutes



Picture displays an **example** temperature only data logger

Indoor Climate Test Report

- Report Contents
 - Test Results (pass/fail determination)
 - The equipment calibration certificates
 - A copy of the witnessing document shall be given to the person conducting the testing and the original shall be retained for the ABS files
- Results
 - The Indoor Climate Test Report and test results shall be reviewed by the ABS surveyor against the indoor climate criteria for classification confirmation



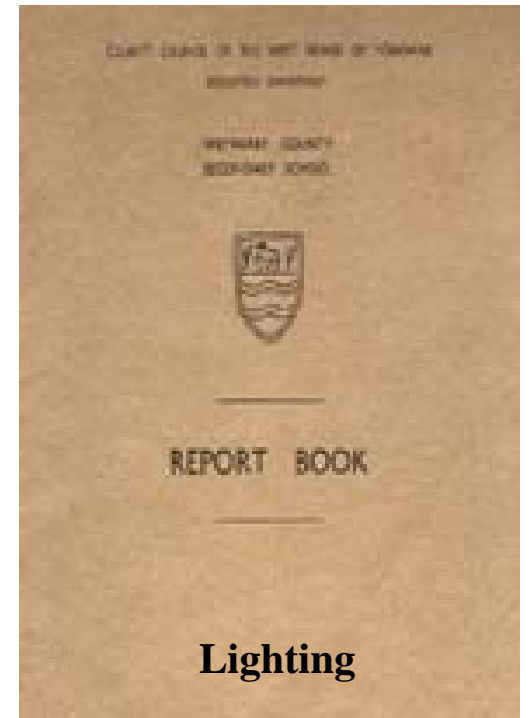
Lighting Test Requirements

- The light meter shall meet the requirements any of:
 - DIN 5032-7:1985
 - CIE S 023/E:2013 (ISO/CIE 19476:2014)
 - BS 667:2005
- Test Conditions
 - Lighting measurements may be taken in port, at sea or both
 - Stray light masked out, as far as practicable
 - Lighting measurements in cabins, staterooms with curtains, shutters, etc. closed



Lighting Reports

- Report Contents
 - Test results (pass/fail determination)
 - The equipment calibration certificates
 - A copy of the witnessing document shall be given to the person conducting the testing and the original shall be retained for the ABS files
- Results
 - The Lighting Test Report and test results shall be reviewed by the ABS surveyor against the indoor climate criteria for classification confirmation





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