



ABS Crew Habitability Notations



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What is Habitability?

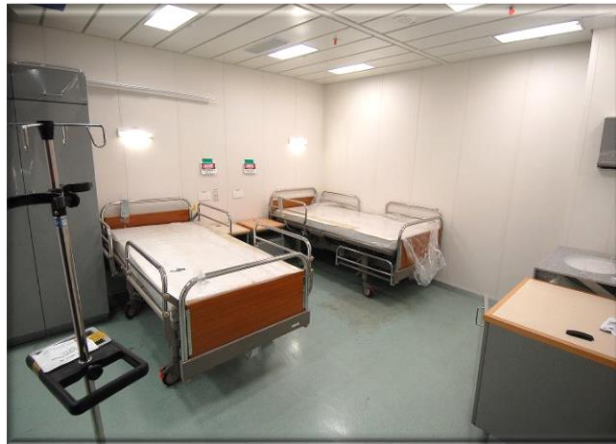
The **acceptability of a vessel** as determined by its **physical arrangements** (including outfitting), as well as by the **ambient environmental qualities** of vibration, noise, indoor climate and lighting in providing crew members an environment that is conducive to task performance and improved levels of safety.



Why Design for Habitability?

- Important for Crew Recruiting & Retention
- Improve the Crew Performance & Safety
- Improve the Quality of Life

Noise, motion, vibration, temperature, humidity & poor lighting serve as environmental stressors



ABS Habitability (HAB) Guides & Notations

Crew Habitability on Ships

HAB, HAB+, HAB++

Crew Habitability on Workboats

HAB(WB), HAB(WB)+, HAB(WB)++

Crew Habitability on Offshore Installations

HAB(OS), HAB(OS)+, HAB(OS)++

Crew Habitability on MODUs

HAB(MODU), HAB(MODU)+, HAB(MODU)++

Crew Habitability on Accommodation Vessels

HAB(ACCOM), HAB(ACCOM)+, HAB(ACCOM)++



Crew Habitability on Ships

- Applicability
 - Oil or Chemical tankers
 - Bulk or Combination carriers
 - Container carriers
 - Multi-purpose cargo vessels
 - Passenger vessels (crew areas only)



Crew Habitability on Workboats

- Applicability
 - Offshore support vessels
 - Tug boats
 - Tow boats
 - Dredgers
 - Research vessels
 - Anchor handling vessels
 - Pipe-laying vessels
 - Any other vessel providing services to offshore oil and gas exploration and production (including SPS)



Crew Habitability on Offshore Installations

- Applicability
 - Tension leg platforms (TLPs)
 - Floating production, storage and offloading (FPSOs)
 - Spars
 - Fixed platforms
 - Any other buoyant or non-buoyant structure supported by or attached to the seafloor



Crew Habitability on MODUs

- Applicability
 - Drill-Ships
 - Drill-Barges
 - Self-Elevating Drilling Units (SEDUs)
 - Column Stabilized Drilling Units (CSDUs)
 - Any other vessel used for the purpose of drilling

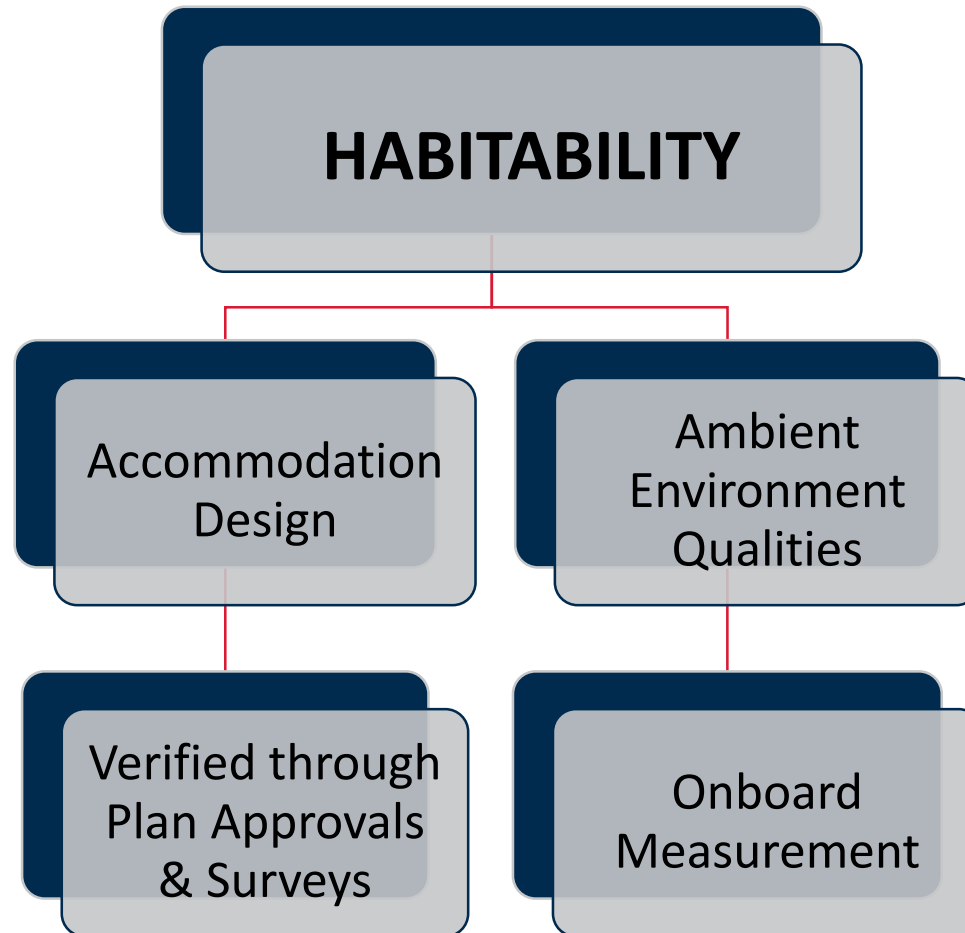


Crew Habitability on Accommodation Vessels

- Applicability
 - MOUs (a self-elevating or column-stabilized mobile offshore units),
 - Non-self-propelled barges & OSVs intended for accommodation



ABS HAB Guide Content



ABS HAB Guide Content

- Accommodations Area Design
 - Access/Egress
 - Crew cabins
 - Sanitary spaces
 - Offices
 - Food services areas
 - Recreational facilities
 - Laundry areas
 - Medical areas
- Compliance – engineering review of arrangement design drawings and of the design specifications for accommodation area
- Compliance is verified through follow-up physical verification performed by Survey



ABS HAB Guide Content

- Ambient Environment (AE) Qualities
 - Human whole-body vibration (WBV)
 - Noise
 - Indoor climate
 - Lighting
- Compliance is checked through engineering review of Test Plans for each AE aspect.
- Compliance is verified through onboard testing and data collection performed by an ABS Recognized Testing Specialist and witnessed by an ABS Surveyor.

Test Plans and Testing Specialists

Test Plans

- Developed for each ambient environmental aspect
 - WBV, Noise, Indoor Climate, Lighting
- Plans Include:
 - Documentation and Drawings
 - Test Personnel
 - Test Conditions
 - Measurement Locations
 - Data Acquisition & Instruments
 - Test Schedule
 - Sample Data Collection Sheets
- ABS approved copy of each Test Plan is part of the vessel's official documentation
- Resulting Test Reports are submitted to the Surveyor for Verification

Ambient Environmental Testing Specialist

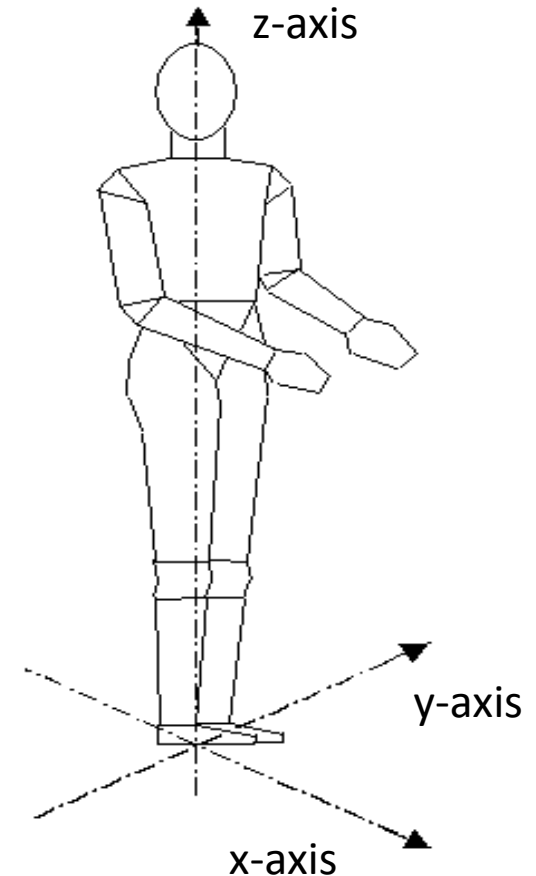
- ABS Recognized Testing Specialist:
 - Companies providing measurement services for AE qualities
 - Companies can be certified for any or all aspects of AE testing
- Ambient Environmental Testing Specialists:
 - Must have the **right equipment**
 - Must have the correct **knowledge and skill** to use the equipment
 - Testing equipment has current calibration certificates
 - Testing personnel can **develop appropriate Test Plans and Test Reports**
 - Testing personnel can **act independently** of any production related function within the yard

Human Whole-body Vibration (WBV)

- There are two main types of human vibration:
 - Whole-body vibration
 - Hand arm vibration
- Whole-body vibration is transmitted to the body as a whole, generally through the supporting surface (i.e. feet, buttocks, back, etc.)
- Human perception of WB vibration
 - Typical frequency range is 1-80 Hz
 - This range has a greater impact on human performance
 - Speech 1-20 Hz
 - Reading (instruments) 1-12 Hz
 - Reading (text or displays) 1-50 Hz
 - Control manipulation 1-30 Hz
 - Depth perception 25-50 Hz
 - Motion sickness < 1 Hz

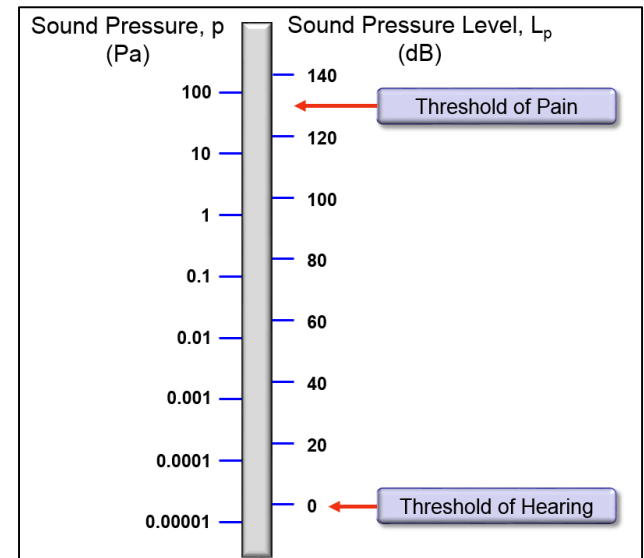
Human Whole-body Vibration (WBV)

- Basis of methodology
 - ISO 20283-5
 - ISO 2631
 - ISO 8041 (Instrumentation)
 - ISO 5348 (Mounting of accelerometers)
- Criteria based on:
 - Crew task performance
 - Enhanced habitability
 - Different sized vessels
 - Different operational modes



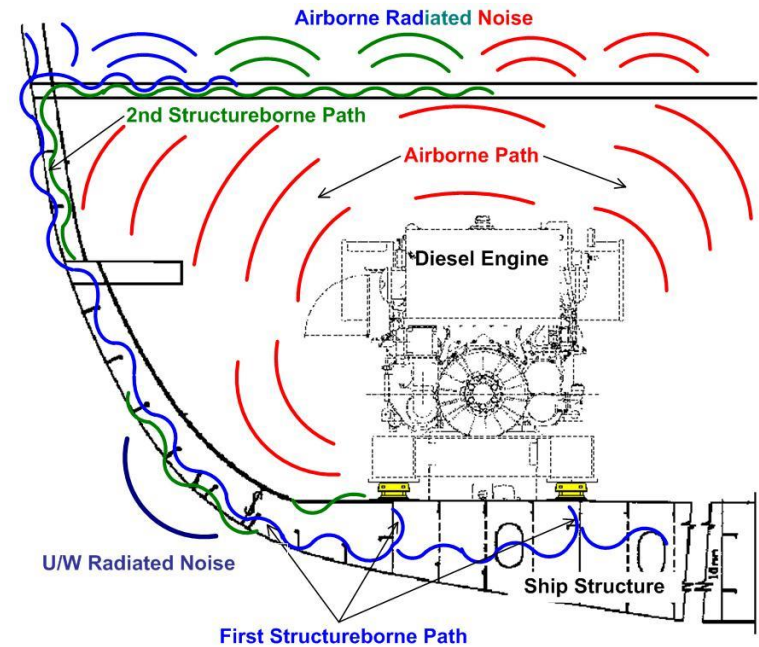
Noise

- Sound: Any pressure variation that the ear can detect ranging from the weakest sounds to sound levels which can damage hearing.
- Noise: Is a variety of sounds. It means any unwanted sound.
- Adverse and/or improper levels of noise can:
 - Cause speech interference
 - Interfere with concentration and thought processes
 - Disrupt sleep
 - Cause fatigue and aggression
- Big Contributor: HVAC Noise



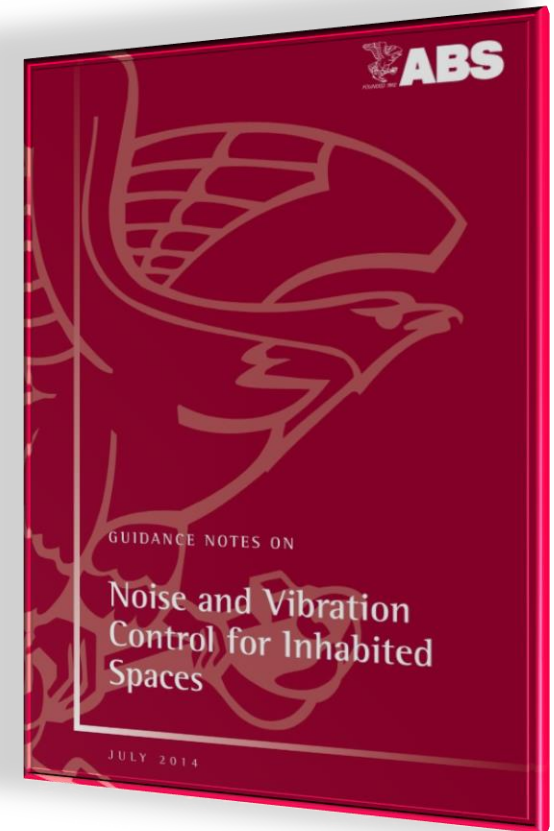
Noise

- Basis of methodology
 - ISO 2923
 - MSC.337(91) – IMO Code on Noise
 - IEC 61672 (Instrumentation)
- Criteria based on
 - Activities in a space
 - Communication needs
 - Different operational modes



GN Noise & Vibration Control

- Provides guidance on the critical factors controlling noise and vibration
- General discussion of noise and vibration control
 - Sources
 - Propagation
 - Structure response
 - Abatement: source, path, and receiver (in this case, the human)
- Vibration control
- Noise control



Indoor Climate

- What determines comfort?
 - Ambient environmental factors
 - Air temperature
 - Air speed
 - Humidity
 - Individual factors
 - Age, gender
 - Fitness level
 - Activities performed
 - Clothing insulation
- Basis of methodology
 - ANSI/ASHRAE 55
 - ISO 7726 (E) – Instrumentation
 - ISO 7547



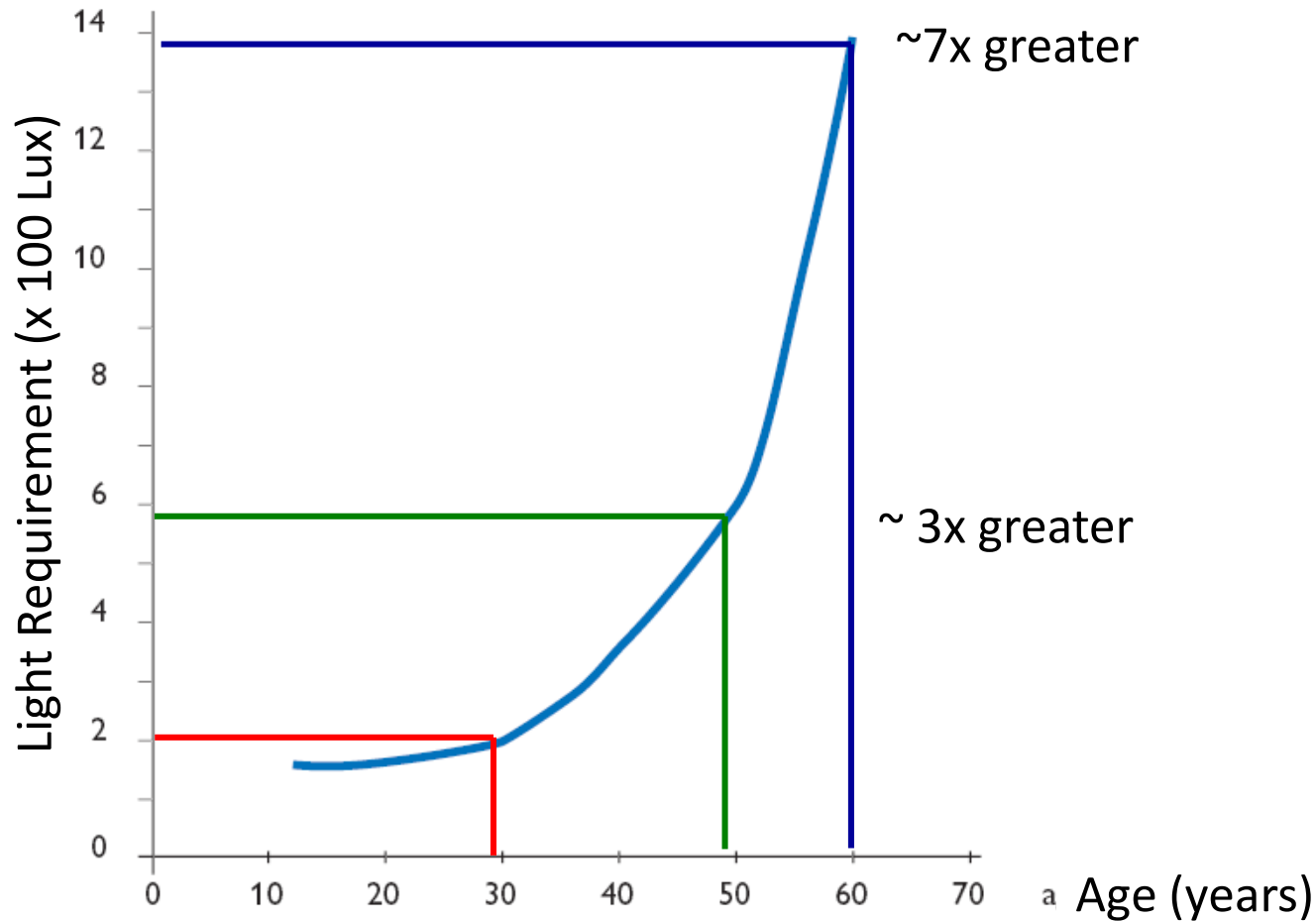
Lighting

- Objective is to provide lighting to accommodate crew visual task performance and safety
- Criteria provided for:
 - Crew/Personnel Accommodation Spaces
 - Entrances and Passageways
 - Navigation and Control Spaces
 - Service Spaces
 - Operating and Maintenance Spaces/Areas
 - Offshore & Drilling Operations
- Basis of methodology
 - ISO 8995
 - DIN EN 12464-1
 - DIN 5032-7
 - CIE S 023/E (Instrumentation)
 - BS 667 (Instrumentation)



Lighting Requirements

- Relationship of age and light required for reading small print



ILO Maritime Labour Convention (MLC) 2006

- Sets out seafarers' rights to decent conditions of work
- Creates conditions of fair competition
- Updates and consolidates 37 existing ILO Conventions
- Considered the 4th pillar of maritime regulations



STCW



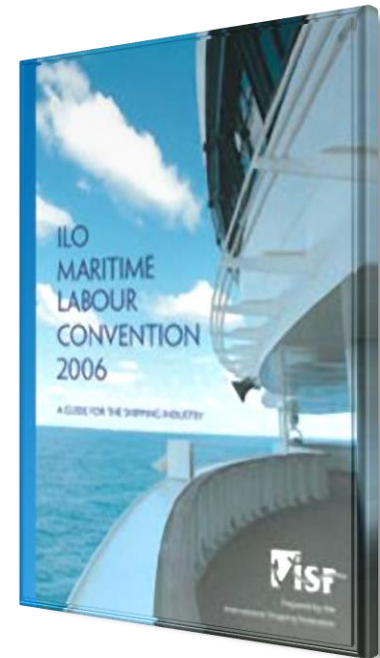
SOLAS



MARPOL



ILO MLC

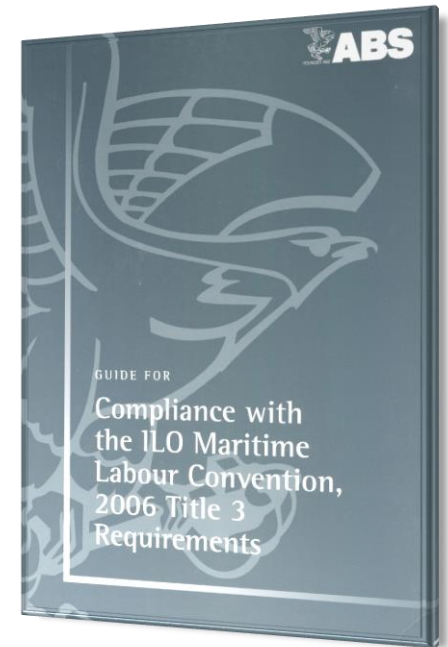


ILO Maritime Labour Convention (MLC) 2006

- The Convention is organized into three main parts:
 - The Articles, set out the broad principles and obligations.
 - The Regulations, which are written in very general terms, are complemented by the more detailed Code of the MLC, 2006.
 - The Code of the MLC, 2006 which has two parts: Part A (mandatory Standards) and Part B (non-mandatory Guidelines).
- The conventions is organized in 5 areas called Titles:
 - Title 1: Minimum requirements for seafarers to work on a ship
 - Title 2: Conditions of employment
 - Title 3: Accommodation, recreational facilities, food and catering
 - Title 4: Health protection, medical care, welfare and social security protection
 - Title 5: Compliance and enforcement

ABS MLC-ACCOM Guide

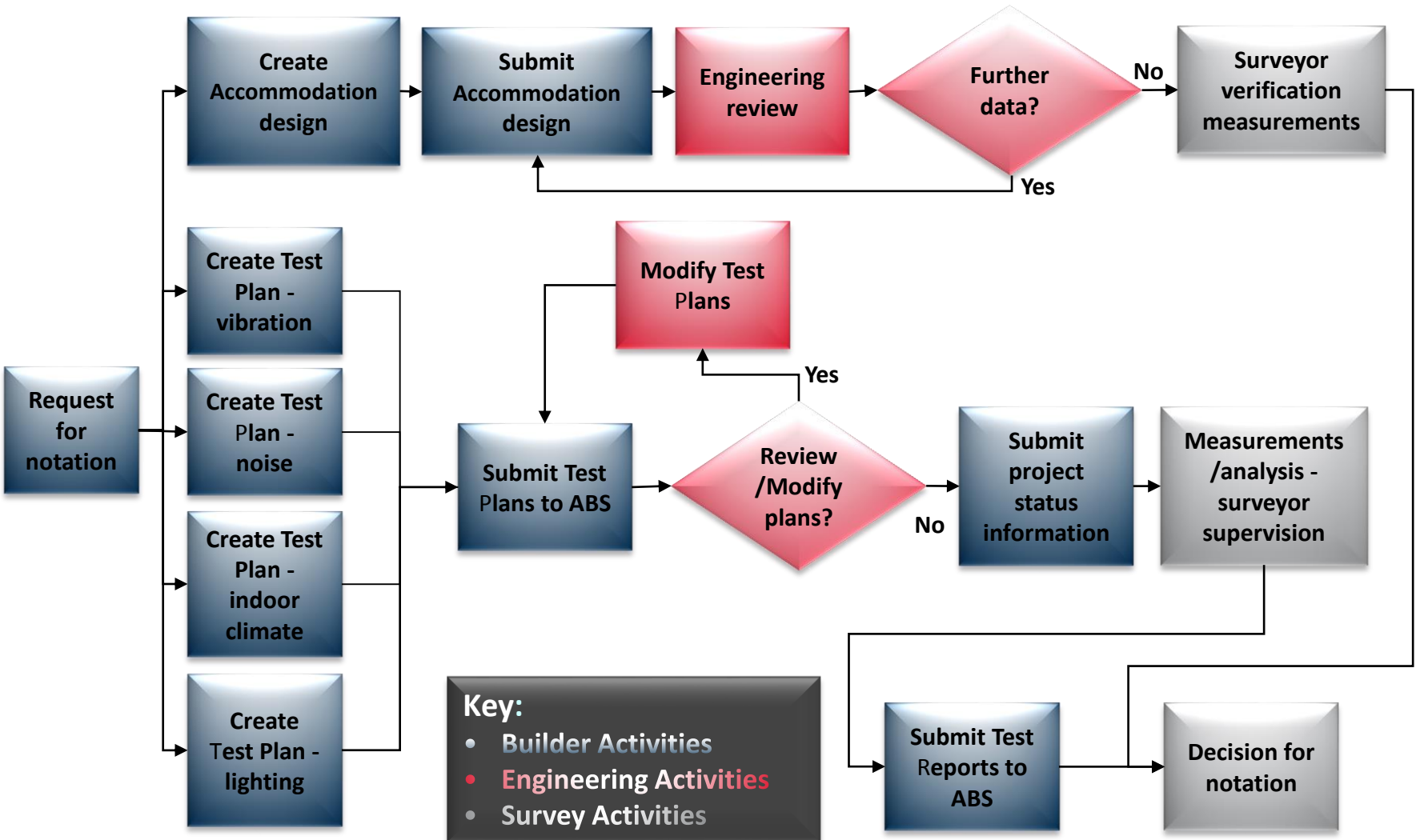
- Focuses on ILO MLC Title 3 requirements
- Addresses five categories of design:
 - Accommodation Area Design
 - Whole-Body Vibration
 - Noise
 - Indoor Climate
 - Lighting
- Does not address managerial or procedural issues
- Partially based on ABS' interpretation of the intent of the ILO MLC 2006 Part A & Part B requirements and on what ABS considers satisfactory compliance with these requirements



ABS MLC-ACCOM Guide

- Notations Offered
 - MLC-ACCOM
 - For vessels flagged in signatory countries
 - Applicable to vessels complying with the criteria contained in the Guide relating to Regulation 3.1 of the ILO MLC
 - MLC-ACCOM(SPS)
 - For vessels flagged in non-signatory countries
 - Applicable to Special Purpose Ships (SPS) obtaining the ABS SPS notation complying with the criteria contained in the Guide with consideration given to allowances permitted for SPS vessels as provided in the ILO MLC 2006 convention
 - MLC-ACCOM(WB)
 - For vessels flagged in non-signatory countries
 - Applicable to Workboats wanting to demonstrate compliance with the ILO MLC 2006 with consideration given to specific flag State ILO MLC guidance, as applicable

HAB/MLC-ACCOM Notation Process



HAB/MLC-ACCOM Departures

- In case of departures from the criteria, consideration is given to:
 - Magnitude of the departure
 - e.g., HAB/MLC-ACCOM requirements for floor area is 7.0 m² and actual measurement is 6.8 m²
 - Location of the departure
 - e.g., Excessive noise near crew cabins
 - Type of space(s) and/or outfitting aspects impacted
 - e.g., sleeping room, stairs
 - Frequency and number of departure(s)
 - e.g., All areas vs isolated departures
 - Potential impact on the safety of the crew
 - e.g., All areas vs isolated departures

Human Factors Engineering Team Assistance

Training of Engineers and Surveyors

Drawing and sketch review for compliance to criteria

Test Plan and Test Report reviews

Clarification of roll and identification of AE Testing Specialists

Certification of AE Testing Specialists

Clarification and interpretation of AE & Accommodations Design criteria



Thank You

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