

Guide for

Sustainability Notations



December 2020



GUIDE FOR

...
SUSTAINABILITY NOTATIONS
DECEMBER 2020

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Foreword

In September 2015, the United Nations' (UN) 193 Member States unanimously adopted the 2030 Agenda for Sustainable Development, including the 17 Sustainable Development Goals (SDGs) and 169 related targets. Hailed as a historic agreement forging a pathway to sustainability, the 2030 Agenda has been called a plan of action for “people, planet, and prosperity”.

The Agenda emphasizes the need to simultaneously consider the three dimensions of sustainable development: social, economic, and environmental.

The International Maritime Organization (IMO) is actively working towards the 2030 Agenda for Sustainable Development and the associated SDGs. While SDG 14 (Life Below Water) is central to the IMO, aspects of the Organization's work can be linked to all individual SDGs.

While each SDG addresses a different aspect of sustainability, the SDGs are interconnected.

ABS responded to the above initiatives and recognized the growing interest in the SDGs from the maritime industry (owners, designers, financiers, ship managers, charterers, etc.) for green and sustainable operations. The result is the development of the ABS *Guide for Sustainability Notations*. This Guide provides a stepwise approach for vessels to meet the Environmental, Innovative, and Human Elements requirements contained in the strategic SDGs.

This Guide specifies requirements on sustainability-related topics and offers two (2) optional notations, **SUSTAIN-1(2020)** and **SUSTAIN-2(2020)**, that demonstrate adherence to certain SDGs related to vessel design, outfitting and layout that can be controlled, measured and assessed, and establishes a pathway for sustainability certification and reporting.

This Guide becomes effective on the first day of the month of publication.

Users are advised to check periodically on the ABS website www.eagle.org to verify that this version of this Guide is the most current.

We welcome your feedback. Comments or suggestions can be sent electronically by email to rsd@eagle.org.



GUIDE FOR

SUSTAINABILITY NOTATIONS

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1 Introduction

The United Nations (UN) Agenda for Sustainable Development, which includes 17 Sustainable Development Goals (SDGs), provides a blueprint for the transition to a healthier planet. The 17 SDGs are integrated, meaning that action in one area will affect outcomes in others, and that development must balance social, economic, and environmental sustainability.

Section 1, Figure 1, illustrates the different SDGs and Section 1, Table 1 provides a summary of each goal.

FIGURE 1
UN Sustainable Development Goals



With specific targets (Refer to UN Resolution 70/1) and indicators (refer to UN Resolution 71/313), the Goals, as applicable to the marine and offshore industries, address areas such as sea pollution, waste streams, air emissions, energy efficiency, ship recycling, low carbon fuels, and human element consideration.

TABLE 1
Summary of the UN SDGs

SDG	GOAL	DESCRIPTION
1	No Poverty	End poverty in all its forms everywhere
2	Zero Hunger	End hunger, achieve food security and improved nutrition and promote sustainable agriculture
3	Good Health and Well-Being	Ensure healthy lives and promote well-being for all at all ages
4	Quality Education	Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all
5	Gender Equality	Achieve gender equality and empower all women and girls
6	Clean Water and Sanitation	Ensure availability and sustainable management of water and sanitation for all
7	Affordable and Clean Energy	Ensure access to affordable, reliable, sustainable and modern energy for all
8	Decent Work and Economic Growth	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all
9	Industry, Innovation and Infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
10	Reduced Inequalities	Reduce inequality within and among countries
11	Sustainable Cities and Communities	Make cities and human settlements inclusive, safe, resilient and sustainable
12	Responsible Consumption and Production	Ensure sustainable consumption and production patterns
13	Climate Action	Take urgent action to combat climate change and its impacts
14	Life Below Water	Conserve and sustainably use the oceans, seas and marine resources for sustainable development
15	Life on Land	Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss
16	Peace, Justice and Strong Institutions	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels
17	Partnerships for the Goals	Strengthen the means of implementation and revitalize the Global Partnership for Sustainable Development

2 Application and Scope

The Guide is applicable to existing and new self-propelled marine vessels and offshore units (including liftboats), referred to as “vessels” in this Guide, for which the optional **SUSTAIN-1(2020)** or **SUSTAIN-2(2020)** notation has been requested.

The application of this Guide to non-self-propelled offshore units as well as to floating installations is subject to case-by-case review by ABS with consideration to the specific design and operational conditions of these vessels.

Appendix 3, Table 1 of this Guide shows the correlation between the requirements of this Guide to the requirements of other relevant ABS notations and shows the International Regulations and Standards covered by the requirements of this Guide.

The Guide demonstrates how sustainability can be directly linked to design and operations. It also provides means for demonstrating the compliance of a vessel with environmental and social requirements.

Vessels can demonstrate adherence to certain UN SDGs through the offered optional notations. The Guide offers a stepwise approach for vessels to meet sustainability-related requirements, reflecting the strategic sustainability goals adopted by the UN.

This Guide focuses on sustainability aspects of vessel design, outfitting, and layout that can be controlled, measured, and assessed. These are:

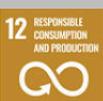
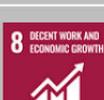
- i)* Oil and Chemical Pollution
- ii)* Waste Streams
- iii)* Coastal and Marine Ecosystems
- iv)* Air Emissions
- v)* Efficiency and Performance Monitoring
- vi)* Ship Recycling
- vii)* Low and Zero Carbon Fuels
- viii)* Human Element

The sustainability aspects covered in this Guide are directly linked to specific SDGs as follows:

- **SDG 3:** The Guide addresses vessel related pollution such as air emissions and water pollution, as well as hazardous material contained onboard, which can affect human health, both onboard but also in coastal areas. This SDG can also be linked to the occupational health and safety of the seafarer, and this Guide contains human element related requirement to address the workplace design.
- **SDG 7:** This SDG covers clean energy research and technology (energy-efficiency and advance, cleaner fossil-fuel technology) and promotes maritime clean-energy efficiency. The requirements for air emissions, efficiency and performance monitoring, and low/zero carbon fuels prescribed in this Guide, directly address the intent of this SDG as it relates to vessel design.
- **SDG 8:** This SDG addresses the seafarers' welfare on issues such as safety, fatigue, and promotes a safe and secure working environment for all seafarers. The promotion of decent work for all, ties in with SDG 3 which is focused on ensuring healthy living and the well-being of seafarers. From the perspective of vessel design, this Guide contains requirements covering both the design and the ambient environmental characteristics of the living and working spaces onboard.
- **SDG 9:** The innovation and technological advance covered in this SDG, as they relate to vessel design, are addressed in this Guide through the requirements on air emissions and efficiency and performance monitoring.
- **SDG 12:** One of the targets of this SDG, is reduced waste generation through prevention, reduction, recycling, and reuse. This Guide addresses waste generation from vessels such as garbage and sewage and also covers the safe and environmentally sound recycling of the vessels themselves.
- **SDG 13:** The Guide's requirements for air emissions as well as efficiency and performance monitoring, are all focusing on addressing climate change and its impacts.
- **SDG 14:** This SDG focuses on the conservation and sustainable use of the oceans and marine resources. This Guide, by addressing marine pollution, waste streams and marine and coastal ecosystems (e.g., ballast water, underwater radiated noise, etc.) links vessel design to the targets of this SDG.

Section 1, Table 2, shows the alignment between the topics in this Guide and the relevant UN SDGs. It also identifies the requirements applicable to each of the offered notations. A check mark (“✓”) in the table indicates the requirements section that applies to each notation.

TABLE 2
Alignment of Guide's Topics to the UN SDGs

ITEM	TOPIC	SDG	SUSTAIN-1 (2020)	SUSTAIN-2 (2020)
1	Oil and Chemical Pollution	 	✓	✓
2	Waste Streams	 	✓	✓
3	Coastal and Marine Ecosystems		✓	✓
4	Air Emissions	   	✓	✓
5	Efficiency and Performance Monitoring	  	✓	✓
6	Ship Recycling	 	✓	✓
7	Low-Carbon Fuels	 		✓
8	Human-Centered Design	 		✓

3 Notations

This Guide offers two (2) optional notations related to sustainability, **SUSTAIN-1(2020)** and **SUSTAIN-2(2020)**.

In general, the requirements of this Guide are based on applicable international regulations and standards. Where a flag or port Administration or local governmental authority has additional requirements related to environmental protection that are not addressed by this Guide, it is the responsibility of the Owner or Operator to comply with such regulations.

Compliance with the applicable requirements of Annexes I, II, IV, V, and VI to the International Convention for the Prevention of Pollution from Ships, MARPOL 73/78, as amended, is a prerequisite for receiving the class notations **SUSTAIN-1(2020)** or **SUSTAIN-2(2020)**.

For **SUSTAIN-1(2020)**, the Statutory requirements specifically cited in Section 2 of this Guide are only required for the notation if they are applicable for the specific type of vessel, irrespective of the flag Administration's requirements.

Appendix 2, Table 1, list the typical requirements that are additional to the applicable Statutory regulations for an international trading merchant ship.

3.1 SUSTAIN-1(2020) Notation

The **SUSTAIN-1(2020)** notation is awarded for compliance with the relevant requirements contained in Section 2 of this Guide. The year 2020 in the notation indicates the applicable edition of the Guide.

3.2 SUSTAIN-2(2020) Notation

The **SUSTAIN-2(2020)** notation is awarded for compliance with the relevant requirements contained in both Section 2 and Section 3 of this Guide. The year 2020 in the notation indicates the applicable edition of the Guide.

4 Documentation

Relevant plans and documentation, as applicable for the notation requested, and as prescribed by the corresponding International Regulations and Standards listed in Appendix 3, Table 1, are to be submitted for review and/or reference as shown in the following Tables:

- Table 3, Certification and Documentation
- Table 4, Operational Procedures
- Table 5, Drawing and Documents

If the vessel has the certificates and documents listed in Section 1, Table 3, there will be no Statutory related procedures and drawings (as listed in Section 1, Tables 4 and 5) required to be submitted except those specifically indicated in Section 2 of the Guide.

TABLE 3
Certification and Documentation

<i>Topic</i>		<i>Type of Document</i>	SUSTAIN-1 (2020)	SUSTAIN-2 (2020)
1	Oil and Chemical Pollution	Documentation verifying a contract with the ABS Rapid Response Damage Assessment (RRDA) program, or with a similar program of another IACS Member Society	✓	✓
		International Oil Pollution Prevention Certificate (IOPP Certificate)	✓	✓
		International Pollution Prevention Certificate for the Carriage of Noxious Liquid Substances in Bulk (NLS Certificate) or an International Certificate of Fitness for the Carriage of Dangerous Chemicals in Bulk, as applicable	✓	✓

<i>Topic</i>		<i>Type of Document</i>	SUSTAIN-1 (2020)	SUSTAIN-2 (2020)
2	Waste Streams	Certification for the sewage system and sewage treatment plant, in accordance with MARPOL 73/78 Annex IV	✓	✓
		Documentation verifying compliance with the requirements in MARPOL Annex V, Regulation for the prevention of pollution by garbage from vessels	✓	✓
3	Coastal and Marine Ecosystems	Certificates and documentation verifying compliance with the requirements in the International Convention for the Control and Management of Ship's Ballast Water and Sediments, 2004	✓	✓
		Documentation verifying compliance with the biological testing by sampling at ballast water management system (BWMS) commissioning	✓	✓
		International Anti-Fouling System Certificate or a Declaration on Anti-Fouling Systems (as applicable)	✓	✓
		Documentation/evidence of Underwater Noise (UWN) mitigating measures and/or technologies being employed	✓	✓
4	Air Emissions	International Air Pollution Prevention Certificate (IAPP Certificate), or a statement indicating equivalent compliance by Recognized Organization in accordance with Annex VI of MARPOL 73/78	✓	✓
		Incinerator type approval certificate in accordance with IMO Resolution MEPC.76(40) or MEPC 244(66) (whichever is applicable)	✓	✓
		International Energy Efficiency Certificate (IEE Certificate)	✓	✓
		EEDI Technical File or verification report of the implementation of Energy Efficiency Technologies in accordance with MARPOL Annex VI, Chapter 4	✓	✓
5	Efficiency and Performance Monitoring	Manufacturer's certification, Product Design Assessment (PDA) or any other evidence on the implementation of Efficiency and Performance Monitoring in accordance with IMO guidelines and industry recognized standards (e.g., ISO), as applicable.	✓	✓
6	Ship Recycling	Evidence of compliance with the ABS IHM notation	✓	✓
7	Low and Zero Carbon Fuels	Documentation verifying compliance with Subsection 3/4 of this Guide		✓
8	Human Element	Maritime Labour Convention Certificate		✓

TABLE 4
Operational Procedures

<i>Topic</i>		<i>Type of Document</i>	SUSTAIN-1 (2020)	SUSTAIN-2 (2020)
1	Oil and Chemical Pollution	Bilge Water Management Plan	✓	✓
2	Waste Streams	Sewage Management Plan	✓	✓
		Garbage Management Plan	✓	✓
3	Coastal and Marine Ecosystems	Ballast Water Management Plan	✓	✓
		Biofouling Management Plan	✓	✓
4	Air Emissions	VOC Management Plan	✓	✓
		Fuel oil management for control of the SO _x emission, including fueling management plan and procedure	✓	✓
		Refrigerant Systems Management Plan	✓	✓
		Instructions and procedures addressing operation and control of NO _x exhaust gas cleaning systems – To be furnished on board	✓	✓
		Instructions and procedures addressing operation and control of SO _x exhaust gas cleaning systems – To be furnished on board	✓	✓
		Ship Energy Efficiency Plan (SEEMP)	✓	✓
		EU MRV Monitoring Plan (as applicable)	✓	✓
5	Efficiency and Performance Monitoring	Functional description document for and example output report.	✓	✓

Note: See also Appendix 3, Table 1

TABLE 5
Drawings and Documents

<i>Topic</i>		<i>Type of Document</i>	SUSTAIN-1 (2020)	SUSTAIN-2 (2020)
1	Oil and Chemical Pollution	Fuel oil storage, settling, and service tanks arrangement, including overfilling prevention arrangement	✓	✓
		Arrangement for cargo and non-cargo loading and discharge facilities, including connections, spill trays, and drainage systems	✓	✓
		For tanker vessels, cargo, and ballast tanks arrangement, including piping systems and cargo overfilling prevention	✓	✓
2	Waste Streams	Details and diagrams of sewage system, including processing equipment	✓	✓
		List of equipment and arrangements for the handling/stowage of garbage	✓	✓

Topic		Type of Document	SUSTAIN-1 (2020)	SUSTAIN-2 (2020)
3	Coastal and Marine Ecosystems	Diagrammatic details of ballast system, including details of water treatment, if applicable	✓	✓
		Details of hull coating system, including anti-fouling coating specification	✓	✓
4	Air Emissions	Cargo vapor emission arrangements; tank gauging systems; cargo transfer rates; hazardous areas (see 5C-1-7/21.3 of the <i>ABS Rules for Building and Classing Marine Vessels (Marine Vessel Rules)</i>)	✓	✓
		Details and diagrams of incinerator to include the feed to the incinerator and the incinerator's operating system	✓	✓
		Details of NOx control and measurement procedures	✓	✓
		Diagrammatic details of fuel oil system, including details of SOx control	✓	✓
		Diagrammatic details of permanent refrigerant system	✓	✓
		Details of fire extinguishing media used in vessel's fixed fire-fighting systems and extinguishers	✓	✓
5	Human Element	Arrangement and outfitting drawings of the accommodation, machinery, and deck areas covered in the relevant requirements of the Guide		✓
		Ambient Environment Test Plans		✓

5 Process of Obtaining a Notation

5.1 Design Compliance Verification

The applicable documentation, operational procedures, and drawings listed in Section 1, Tables 3, 4, and 5 for the notation sought are to be submitted to ABS for review and/or reference. For new construction, the documentation, operational procedures, and drawings are to be provided to ABS during the detailed design phase. For existing vessels, the documentation, operational procedures, and drawings reflecting the current fittings and configurations are to be provided to and approved by ABS Engineering in advance of ABS Surveyor verifications.

5.2 Survey Verification

For the survey requirements, refer to Section 4 of this Guide.

The ABS Engineering assessment and ABS Surveyor verification are to be reviewed by the ABS Surveyor for determination of notation confirmation.

6 Correlation with other ABS Notations and International Regulations and Standards

Some of the requirements in this Guide are also addressed in other ABS Rules and Guides. Compliance of a vessel with the requirements of those ABS notations automatically shows compliance with the corresponding requirements in this Guide. However, compliance with the requirements of this Guide does not automatically shows compliance with the corresponding requirements of those ABS notations.

Appendix 3, Table 1 of this Guide shows the correlation between the requirements of this Guide to the requirements of other relevant ABS notations.

In addition, Appendix 3, Table 1 shows the International Regulations and Standards covered by the requirements of this Guide.

7 Alternatives

7.1 General

ABS will consider alternative arrangements and criteria which can be shown to satisfy the criteria directly cited or referred to in this Guide. Such consideration may include satisfactory demonstration to equivalent standards with support documentation based on systematic analyses using valid engineering principles and documented satisfactory service experience.

7.2 Other Regulations

In conjunction with 1/7.1, ABS may consider acceptance of alternative arrangements and details which can be shown to comply with standards recognized in the country in which the vessel is registered (flag State), provided they are deemed not less effective.

8 Terminology

ABS Recognized Ambient Environmental Testing Specialists. Companies providing test or measurement services on behalf of the Owner of a vessel or shipyard for the purposes of meeting any of the ABS Habitability notation requirements. Approval of the Testing Specialist for vessels may also allow for testing and measurement services for other crew comfort related ABS notations.

Acceleration. The rate of change of velocity over time (i.e., meters-per-second squared, m/s²).

Accommodation Areas. Vessel areas where the primary purpose is to rest and recreate. Accommodation spaces include cabins, medical facilities (sick bays), offices, recreation rooms, and manned spaces within the accommodation block such as the bridge or control room. For the purposes of this Guide, accommodation areas also include service spaces such as mess rooms, laundry, and cabins.

Active Substance. A substance or organism, including a virus or a fungus, that has a general or specific action on or against harmful aquatic organisms and pathogens.

Ambient Environment. Ambient environment refers to the environmental conditions that the crew is exposed to during periods of work, leisure, or rest. Specifically, this Guide provides criteria and limits for whole-body vibration and noise.

Anti-Fouling System. A coating, paint, surface treatment, surface, or device used to control or prevent attachment of unwanted organisms to the external surface of the hull.

A-weighted Sound Pressure Level. The magnitude of a sound, expressed in decibels (i.e., 20 micropascals); the various frequency components are adjusted according to the A-weighted values given in IEC 61672-1 (2004) in order to account for the frequency response characteristics of the human ear. The symbol is L_A ; the unit is dB(A). The measurement L_{Aeq} is an equivalent continuous A-weighted sound pressure level, measured over a period of time.

Ballast Water. Water, including its suspended matter, taken on board to control trim, list, draft, stability, or stresses.

Ballast Water Management. Mechanical, physical, chemical, and biological processes, either singularly or in combination, to remove, render harmless, or avoid the uptake or discharge of harmful aquatic organisms and pathogens within ballast water and sediments.

Equivalent Continuous A-weighted Sound Pressure Level. The A-weighted sound pressure level of a noise fluctuating over a period of time, T , expressed as the amount of average energy. The symbol is L_{Aeq} ; the unit is dB(A).

Floating Installation. A mobile or non-mobile offshore structure designed for operation afloat, which provides hydrocarbon processing and/or hydrocarbon storage with the capacity to offload hydrocarbons. This includes such configurations as:

- i) Floating Production, Storage and Offloading System (FPSO)* – Processes, stores, and offloads hydrocarbons
- ii) Floating Production (and Offloading) System (FPS)* – Processes and offloads hydrocarbons without storage capacity
- iii) Floating Storage and Offloading System (FSO)* – Stores and offloads hydrocarbons without hydrocarbon processing facilities
- iv) Floating Offshore Installation (FOI)* – May process and offload hydrocarbons and may or may not have storage capacity, but the production facilities are not classed.

Food Wastes. Any spoiled or unspoiled victual substances such as fruits, vegetables, dairy products, poultry, meat products, food scraps, food particles, and all other materials contaminated by such wastes, generated on board, principally emanating from the galley and dining areas.

Frequency. The number of complete cycles of a periodic process occurring per unit time. Frequency is expressed in Hertz (Hz), which corresponds to the number of cycles observed-per-second.

Garbage. Various forms of victual, domestic, and operational waste, excluding fresh fish and parts thereof, generated during the normal operation of a vessel and liable to be disposed of continuously or periodically. Excluding Annex V, garbage does not consist of those substances which are defined or listed in other MARPOL Annexes.

Habitability. The acceptability of the conditions of a vessel in terms of whole-body vibration and noise, as well as physical and spatial characteristics, according to prevailing research and standards for human efficiency and comfort.

Hybrid Electric Power System (HEPS). Hybrid-electric power systems combine internal combustion engine driven generators and/or shaft generator/motor driven by main engine with an energy storage system (ESS) consisting of batteries, supercapacitors, fuel cells, or other technologies to form the power generation and propulsion system of the vessel. The architecture of a hybrid system can be designed specifically for the requirements of each vessel and thus optimize the use of each component for maximum efficiency.

Liftboat – A self-propelled, self-elevating vessel with a relatively large open deck capable of carrying equipment and supplies in support of various offshore mineral exploration and production or offshore construction activities; also has the capability of rapidly raising its hull clear of the water on its own legs so as to provide a stable platform from which maintenance and construction work may be conducted.

Offshore Unit – A self-propelled mobile offshore structure designed for operation afloat, which:

- i)* Engages in drilling operations for the exploration for or exploitation of resources beneath the seabed (e.g., MODU), or
- ii)* Provides support for various offshore exploration, exploitation, and production of seabed mineral resources or offshore construction activities (e.g., MOU).

Refrigerant Systems. Includes cargo refrigeration plants and systems, non-cargo refrigeration plants and systems, and centralized air conditioning systems.

Seafarer. Any person who is employed or engaged or works in any capacity on board the vessel. This term is used interchangeably throughout this document with “crew member”.

Sediments. Matter settled out of onboard ballast water.

Sewage (Black Water)

- i)* Drainage and other wastes from any form of toilets and urinals
- ii)* Drainage from medical premises (dispensary, sick bay, etc.) via wash basins, wash tubs, and scuppers located in such premises
- iii)* Drainage from spaces containing living animals
- iv)* Other waste waters when mixed with the drainages defined in *i)* through *iii)*

Test Plan. Document containing the requisite information regarding vessel design and layout, test personnel, test conditions, measurement locations, data acquisition, instruments, data analysis, and test schedule necessary for verifying the measurements for the ambient environmental aspects of habitability.

Test Report. Document containing the actual testing results from the ambient environmental tests including details of the testing conditions, measurement locations, measurement equipment, and the results of the data collected and analyzed.

Velocity. The rate of change of distance over time (i.e., millimeters per second, mm/s).

Vibration. The variation with time of the magnitude of a quantity which is descriptive of the motion or position of a mechanical system, when the magnitude is alternately greater and smaller than some average value.

Weighted Root-Mean-Square Acceleration Value (a_w). The weighted root-mean-square (RMS) acceleration, a_w , in meters-per-second squared, is defined by the expression:

$$a_w = \sqrt{\frac{1}{T} \int_0^T a_w^2(t) dt}$$

where $a_w(t)$ is the weighted acceleration as a function of time in meters-per-second squared (m/s^2) and t is the duration of the measurement in seconds.

Whole-body Vibration. Mechanical vibration (or shock) transmitted to the human body as a whole. Whole-body vibration is often due to the vibration of a surface supporting the body.

Work Spaces. Areas allocated for work. Categories of work spaces include, but are not limited to, navigation spaces, service spaces (e.g., galley), machinery spaces, and duty/control stations.

9 Symbols and Abbreviations

AFS	Anti-Fouling System
BWE	Ballast Water Exchange
BWM	Ballast Water Management
BWT	Ballast Water Treatment
CFC	Chlorofluorocarbons
CNG	Compressed Natural Gas
CO ₂	Carbon Dioxide

DCS	Data Collection System
DFD	Dual Fuel Diesel Engine Power Plant (ABS Notation)
EEDI	Energy Efficiency Design Index
EET	Energy Efficiency Technologies
ESS-SC	Supercapacitors (ABS notation)
ESS-LIBATTERY	Lithium Batteries (ABS notation)
FC-E	Fuel Cells – Essential Service (ABS notation)
GFS	Gas Fueled Ships (ABS notation)
HYBRID IEPS	Hybrid Electric Power Systems (ABS notation)
IACS	International Association of Classification Societies
IAPPC	International Air Pollution Prevention Certificate
IBWMC	International Ballast Water Management Certificate
IHM	Inventory of Hazardous Materials (ABS notation)
ILO	International Labor Organization
IMO	International Maritime Organization
IOPPC	International Oil Pollution Prevention Certificate
LFFS	Low Flashpoint Fueled Ship (ABS notation)
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MARPOL	International Convention for the Prevention of Pollution from Ships (IMO)
MEPC	Marine Environmental Protection Committee (IMO)
NLS	Noxious Liquid Substances
NO _x	Nitrogen Oxides
POT	Protection of Fuel and Lubricating Oil Tanks (ABS notation)
RRDA	Rapid Response Damage Assessment (ABS notation)
SDG	Sustainable Development Goal
SEEMP	Ship Energy Efficiency Management Plan
SGF	Single Gas Fuel Engine Power Plant (ABS notation)
SO _x	Sulfur Oxides
UWN	Underwater Noise (ABS notation)
VEC	Vapor Emission Control (ABS notation)
VOCs	Volatile Organic Compounds

SECTION 2 SUSTAIN-1(2020) Notation

1 General

Vessels complying with the requirements contained in this Section of the Guide may be assigned the notation **SUSTAIN-1(2020)**.

2 Oil and Chemical Pollution

This Subsection contains requirements aimed at the prevention of pollution to the sea environment by oil and noxious liquid substances (NLS) discharged from vessels.

2.1 Oil Pollution – Machinery Spaces

Vessels are to comply with the requirements of the **ENVIRO** notation in 2/13.1 of the *Guide for the Environmental Protection for Vessels (ENVIRO Guide)*. In addition, vessels are to comply with the following requirements:

2.1.1 High Level Alarms

Lubricating oil tanks and other oil tanks (e.g., hydraulic oil) are to be fitted with an alarm to warn of the level reaching a predetermined high level.

Fuel oil tanks, lubricating oil tanks and other oil tanks (e.g. hydraulic oil) with no risk of causing environmental contamination due to overfilling need not comply with this requirement (i.e., small internal tanks which will be filled locally from oil drums or their overflow vent pipes terminate in the engine room area).

2.1.2 Protection of Fuel Oil Tanks and Lubricating Oil Tanks

Arrangements of fuel oil tanks and lubricating oil tanks are to comply with the requirements for the class notation **POT** in 4-6-4/17.5 of the *Marine Vessel Rules* or 4-2-5/13 of the *ABS Rules for Building and Classing Mobile Offshore Units (MOU Rules)*, as applicable.

2.1.3 Oil Filtering Equipment and Sludge Tanks on Offshore Units

The oil filtering equipment for machinery spaces is not to be used to discharge oily waste which originates from any area other than machinery spaces, or to discharge machinery space oily waste mixed with oily waste, other than the collection trays in 2/2.1.3 of this Guide, which originates from any other area of the offshore unit, or liftboat.

The sludge tank is not to be used for the storage of sludge waste which originates from any area other than machinery spaces nor to be used for the storage of sludge from machinery spaces mixed with sludge or any other waste which originates from any other area of the offshore unit or liftboat.

2.2 Oil Pollution – Cargo Areas of Oil Tankers

Vessels are to comply with the requirements of the **ENVIRO** notation in 2/13.3 of the *ENVIRO Guide*. In addition, vessels are to comply with the following requirements:

2.2.1 Collecting Trays and Deck Coamings

In lieu of the requirement in 2/13.3.2 of the *ENVIRO Guide*, the cargo deck area is to be fitted with means and arrangements to reduce the likelihood of a cargo spill on deck reaching the sea. Collecting trays are to be fitted under cargo loading manifolds or transfer connections. Section 2, Table 1 of this Guide describes the minimum dimensions.

TABLE 1
Cargo Area Collecting Trays Dimensions

<i>Design Aspect</i>	<i>Requirement</i>
Length	Beyond forward and aft ends of the manifold
Width	At least 1.8 m (6 ft), though such that the collecting tray extends at least 1.2 m (4 ft) outboard of the end of the manifold flange
Depth	≥ 300 mm (12 in.)

In addition, collecting trays are to be provided with means for the disposal of any drainage without discharge into the sea.

2.3 Oil Pollution – Rapid Response Damage Assessment Program

Vessels are to comply with the requirements of the **ENVIRO** notation in 2/11.5 of the *ENVIRO Guide*.

2.4 Noxious Liquid Substances

Vessels are to comply with the requirements of the **ENVIRO** notation in Subsection 2/15 of the *ENVIRO Guide*. In addition, vessels are to comply with the following requirements:

2.4.1 Collecting Trays and Deck Coamings

In lieu of the requirement in 2/15.3 of the *ENVIRO Guide*, the vessel is to comply with the requirements of 2/2.2.1 of this Guide.

For vessels with bow or stern loading and unloading arrangements, continuous coamings are to be fitted on deck in accordance with 5C-9-3/7.7 and 5C-9-3/7.7 (IMO) of the *Marine Vessel Rules*. In addition, the deck drainage system is to be provided with means for the disposal of any cargo drainage without discharge into the sea.

3 Waste Streams

This Subsection contains requirements aimed at reducing the potential adverse effects on the marine environment by waste streams discharged from vessels.

The major waste streams generated by vessels include sewage, domestic wastewater, and garbage.

3.1 Sewage

Vessels are to comply with the requirements of the **ENVIRO** notation in Subsection 2/17 of the *ENVIRO Guide*.

3.2 Garbage

Vessels are to comply with the requirements of the **ENVIRO+** notation in Subsection 3/17 of the *ENVIRO Guide*.

4 Coastal and Marine Ecosystems

This Subsection contains requirements aimed at the prevention of transporting harmful aquatic organisms and pathogens via water ballast discharges and reducing the potential adverse effects of introducing organotin compounds to the sea environment by anti-fouling systems of vessels.

4.1 Ballast Water

Vessels are to comply with the D-2 performance standards of the International Convention for the Control and Management of Ships' Ballast Water and Sediments, 2004 (BWM Convention), as amended, as well as the relevant IMO Guidelines.

When an IMO Type Approved Ballast Water Management System (BWMS) is installed for ballast water management, the installed system is to comply with the requirements in Sections 4 and 5 of the *ABS Guide for Ballast Water Treatment*.

In addition to having an installed BWMS, the vessel is to maintain a ballast water record book on board and manage their ballast water in accordance with an approved ballast water management plan. A ballast water management plan is to be placed on board for the guidance of the crew. This plan is to be in accordance with IMO Resolution MEPC.127(53), "*Guidelines for Ballast Water Management and Development of Ballast Water Management Plans (G4)*" and MEPC 306(73), "*Amendments to the Guidelines for Ballast Water Management and Development of Ballast Water Management Plans (G4)*".

The Ballast Water Management plan is required to contain vessel specific contingency measures, based on but not limited to the examples as described in IMO circular BWM.2/Circ.62 – *Guidance on Contingency Measures Under the BWM Convention*.

4.2 Ballast Water Efficacy Testing During Commissioning

Biological testing by sampling, at ballast water management system (BWMS) commissioning, is to be performed to confirm that the BWMS installed on vessels meets the D-2 biological performance standard. The biological compliance test is to be carried out and a report is to be submitted in accordance with IMO BWM.2/Circ.70 – *Guidance for the commissioning testing of ballast water management systems* (as may be revised).

The sampling test is to be conducted by an ABS approved Service Provider who will collect and analyze the samples and provide the ABS Surveyor with the results/report. Upon satisfactory review by the attending Surveyor, an endorsement of the IBWMC (or Statement of Voluntary Compliance) indicating the completion of the biological commissioning testing is to be performed. If this occurs before the entry into force of the amended Regulation E-1 of the BWM Convention, the Surveyor can issue a statement of fact.

The purpose of commissioning testing is to validate the installation of a ballast water management system (BWMS) by demonstrating that its mechanical, physical, chemical, and biological processes are working properly. Commissioning testing is not intended to validate the design of type approved BWMS that are approved by the Administration.

4.3 Antifouling Systems

Vessels are to comply with the requirements of the **ENVIRO** notation in Subsection 2/23 of the *ENVIRO Guide*.

4.4 Biofouling Management Plan

Vessels are to be provided with a biofouling management plan and a Biofouling Record Book on board. The biofouling management plan is required to be approved in accordance with IMO Resolution MEPC.207(62), "*2011 Guidelines for the Control and Management of Ships' Biofouling to Minimize the Transfer of Invasive Aquatic Species*".

Further guidance is provided in the *ABS Guidance Notes on Biofouling Management Plans*.

4.5 Underwater Radiated Noise

Vessels are to implement at least one type of mitigation measure and/or quieting technologies to reduce underwater radiated noise. Evidence/documentation demonstrating that the selected mitigating measure(s) or technologies has been applied on the vessel design is to be submitted for review.

Some of the potential mitigating measures and/or quieting technologies that has been identified by the marine industry to contribute to the reduction of underwater radiated noise include, but are not limited to, the examples shown in Section 2, Table 2.

TABLE 2
Underwater Radiated Noise Mitigation Measures

<i>Design Considerations</i>		<i>Machinery Noise Considerations</i>	<i>Additional Technologies Considerations</i>	<i>Operational and Maintenance Considerations</i>
<i>Propellers</i>	<i>Hull Design</i>			
High Skew Propeller Contracted Loaded Tip Propellers (CLT) Propeller Boss Cap Fin (PBCF) Propeller Cap Turbines (PCT)	Wake conditioning devices	Reduction of onboard machinery noise <ul style="list-style-type: none"> • Mounting engines on resilient mounts • Use of vibration isolation mounts for reciprocating machinery • Alternative means of main propulsion (i.e., gas/steam turbine, diesel electric or alternative power generation systems (e.g. fuel cells, batteries, etc.)) 	Air Lubrication Systems (<i>Bubble drag reduction</i>) (<i>Air layer drag reduction</i>) (<i>Partial cavity drag reduction</i>) Wind Assisted Propulsion (<i>Sails, Kites, Flettner Rotors</i>)	Propeller cleaning and/or polishing Underwater hull surface cleaning

5 Air Emissions

This Subsection addresses requirements aimed at reducing the potential adverse effects on the air environment by ozone-depleting substances, NO_x, SO_x, cargo vapor emission, CO₂, and shipboard incinerators.

5.1 Ozone-Depleting Substances

Vessels are to comply with the requirements of the **ENVIRO+** notation in Subsections 3/31 and 3/33 of the *ENVIRO Guide*.

5.2 Nitrogen Oxides (NO_x) Emissions

Vessels are to comply with the requirements of the **ENVIRO** notation in Subsection 2/25 of the *ENVIRO Guide*.

5.3 Sulphur Oxides (SO_x) Emissions

Vessels are to comply with the requirements of the **ENVIRO** notation in Subsection 2/27 of the *ENVIRO Guide*.

5.4 Volatile Organic Compounds (VOCs)

A Tanker is to hold and maintain the class notation **VEC** (Vapor Emission Control). See 5C-1-7/21 of the *Marine Vessel Rules*.

5.5 Carbon Dioxide (CO₂) Emissions

Vessels are to comply with the applicable requirements of MARPOL Annex VI, Regulations 19, 20, 21 and 22 and hold and maintain an International Energy Efficiency Certificate (IEE Certificate). This requirement is not applicable to vessels not propelled by mechanical means, offshore units, and drilling units, regardless of their propulsion.

New vessels are to exceed the requirements of their applicable Energy Efficiency Design Index (EEDI) Phase by the reduction rates shown in Table 3 of this Section, compared to the EEDI Phase 0 baseline (i.e. Reference Line) of their respective ship type.

Existing vessels are to meet the reduction rates shown in Table 3 of this Section, compared to the EEDI Phase 0 baseline (i.e. Reference Line) of their respective ship type.

If any of the innovative technologies under IMO categories A, B or C as defined in IMO MEPC.1/Circ.815 – 2013 *Guidance on treatment of innovative energy efficiency technologies for calculation and verification of the attained EEDI* have been implemented, these are required to be indicated in the EEDI Technical File or verification report of the implementation of Energy Efficiency Technologies in accordance with MARPOL Annex VI, Chapter 4.

Vessels are also required to have an ABS approved Ship Energy Management Efficiency Plan (SEEMP). SEEMPs Part I and Part II are to meet the requirements of IMO Resolution MEPC.282(70) – 2016 *Guidelines for the Development of a Ship Energy Efficiency Management Plan (SEEMP)*.

TABLE 3
EEDI Reduction Rates from Ship Type Reference Line

<i>Ship Type</i>	<i>Size</i>	<i>New Vessels Reduction Factor (%)</i>	<i>Existing Vessels Reduction Factor (%)</i>
Bulk Carrier	≥ 20,000 DWT	22	15
	< 200,000 but ≥ 20,000 DWT	22	20
	< 20,000 but ≥ 10,000 DWT	0-20*	0-20*
Gas Carrier	≥ 15,000 DWT	30	30
	< 15,000 but ≥ 10,000 DWT	22	20
	< 10,000 but ≥ 2,000 DWT	0-22*	0-20*
Tanker	≥ 20,000 DWT	22	15
	< 200,000 but ≥ 20,000 DWT	22	20
	< 20,000 but ≥ 4,000 DWT	0-22*	0-20*

<i>Ship Type</i>	<i>Size</i>	<i>New Vessels Reduction Factor (%)</i>	<i>Existing Vessels Reduction Factor (%)</i>
Containership	≥ 200,000 DWT	50	50
	< 200,000 but ≥ 120,000 DWT	45	45
	< 120,000 but ≥ 80,000 DWT	40	35
	< 80,000 but ≥ 40,000 DWT	35	30
	< 40,000 but ≥ 15,000 DWT	30	20
	< 15,000 but ≥ 10,000 DWT	15-30*	0-20*
General Cargo Ship	≥ 15,000 DWT	30	30
	< 15,000 but ≥ 3,000 DWT	0-30*	0-30*
Refrigerated Cargo Ship	≥ 5,000 DWT	15	15
	< 5,000 but ≥ 3,000 DWT	0-15*	0-15*
Combination Carrier	≥ 20,000 DWT	20	20
	< 20,000 but ≥ 4,000 DWT	0-20*	0-20*
LNG Carrier	≥ 10,000 DWT	30	30
Ro-Ro Cargo Ship (Vehicle Carrier)	≥ 10,000 DWT	15	15
Ro-Ro Cargo Ship	≥ 2,000 DWT	20	5
	< 2,000 but ≥ 1,000 DWT	0-20*	0-5*
Ro-Ro Passenger Ship	≥ 1,000 DWT	20	5
	< 1,000 but ≥ 250 DWT	0-20*	0-5*
Cruise Passenger Ship (having non-conventional propulsion)	≥ 85,000 GT	30	30
	< 85,000 but ≥ 25,000 GT	0-30*	0-30*

Note: *Reduction factor to be linearly interpolated between the two values dependent upon ship size. The lower value of the reduction factor is to be applied to the smaller ship size.

5.6 Shipboard Incinerator

Vessels are to comply with the requirements of the **ENVIRO** notation in Subsection 2/31 of the *ENVIRO Guide*.

6 Efficiency and Performance Monitoring

To be eligible for the **SUSTAIN-1(2020)** notation, vessels are to have the capability to collect, dashboard, and report efficiency and performance metrics, as part of the vessel's approved Ship Energy Efficiency Management Plan (SEEMP), on the following areas:

- i)* Emissions
- ii)* Main and Auxiliary Engines fuel consumption
- iii)* Voyage planning:
 - a)* Weather encountered

- b)* Speed
- c)* Vessel position
- d)* Estimated time of arrival (ETA)
- e)* Trim condition
- iv)* Efficiency monitoring of main and auxiliary engines through defined efficiency KPIs with the aim to provide to a more efficient operation and reduce carbon footprint through efficiency awareness.

Note that there are no specific functional requirements relating to monitoring. In the functional description document, the submitter should clearly define the goals of the vessel's SEEMP that are covered by the implementation of the monitoring function and a description of the methodology applied to meet the goals.

7 Ship Recycling

Vessels are to hold and maintain the class notation **IHM** (Inventory of Hazardous Materials). See the *ABS Guide for the Inventory of Hazardous Materials*.

SECTION 3 SUSTAIN-2(2020) Notation

1 Introduction

Vessels complying with the requirements for the **SUSTAIN-1(2020)** notation contained in Section 2 and the requirements in this Section, may be assigned the notation **SUSTAIN-2(2020)**.

2 Low and Zero Carbon Fuels

Vessels are to be equipped with single or dual fuel engines, or alternative power generation systems (e.g., fuel cells, hybrid electric power systems, etc.) for main propulsion designed to use low- or zero-carbon fuels per the list below:

- i)* LNG/CNG
- ii)* LPG
- iii)* Ethane
- iv)* Methanol
- v)* Biofuels
- vi)* Ammonia
- vii)* Hydrogen

Vessels are also required to provide evidence of use of these low- or zero-carbon fuels while the ship is in service, as follows:

- i)* For vessels subject to compliance with the IMO Data Collection System under Regulation 22 of MARPOL Annex VI, acceptable evidence is the fuel consumption data for each type of fuel used on board the vessel contained in the annual report submitted for each reporting period.
- ii)* For vessels outside of the scope of IMO DCS, acceptable evidence is the fuel type consumed through examination of Deck Logbook abstract reports, bunker delivery notes, and bunker remaining on board reports.

In addition, depending on the technology installed (e.g., single/dual fuel engines, fuel cells, batteries, etc.), vessels are to comply with the applicable ABS notations as listed in Section 3, Table 1.

TABLE 1
Required ABS Notations

<i>Technology Installed</i>	<i>ABS Notation</i>
Gas Fueled Ships	GFS
Low Flashpoint Fueled Ship	LFFS
Dual Fuel Diesel Engine Power Plant	DFD
Single Gas Fuel Engine Power Plant	SGF
Fuel Cells Power Systems	FC-E
Supercapacitors	ESS-SC
Lithium Batteries	ESS-LIBATTERY
Hybrid Electric Power Systems	HYBRID IEPS

3 Human Element

This Subsection covers specific human element aspects of vessel design, layout, and outfitting that can be controlled, measured, and assessed. These aspects are broken into two categories, as follows:

- i) Accommodation and Working Areas Design.* Areas covered under this Subsection include seafarer accommodation areas, machinery spaces, and open deck areas.
- ii) Ambient Environment Characteristics.* The ambient environmental aspects of human-centered design pertain to the environment that seafarers are exposed to during periods of leisure, rest, and work. The aspects covered are listed as follows:
 - Whole-body Vibration
 - Noise

The ambient environment requirements are applicable to manned spaces where a seafarer may be present for twenty (20) minutes or longer at any one time during normal, routine daily activities. Such spaces include working and living spaces. For machinery spaces, a manned space will be associated with the presence of a local work/control duty station manned for twenty (20) minutes or longer at one time during normal, routine daily activities. Normal inspection, walkthrough (patrolling), and maintenance tasks in machinery spaces are not considered tasks contributing towards a space being considered manned.

Enhanced levels of human-centered design, intended to improve seafarer habitability, safety, and comfort can be respectively found in the *ABS Guide for Crew Habitability on Ships* and the *ABS Guide for Ergonomic Notations*.

To be eligible for the **SUSTAIN-2(2020)** notation, vessels are to comply with the requirements of 3/3.1 and 3/3.2.

3.1 Accommodation and Working Areas Design

The accommodation and working area design criteria pertain to dimensional and outfitting aspects of spaces and open deck areas where seafarers live and work. Appropriate accommodation and work area design helps promote safety and performance by reducing the potential for fatigue and human error.

The accommodation and working areas design requirements are shown in Section 2, Table 2.

TABLE 2
Design Characteristics

<i>Design Aspect</i>		<i>Requirement</i>
Accommodation Area - General		
1	Compliance with ILO MLC 2006 Title 3.1 requirements (as applicable)	✓
2	An exercise room/gymnasium is provided	✓
3	Stairs are required in living quarters instead of inclined ladders.	✓
4	Walkway width – one-way traffic	≥ 700 mm (27.5 in.)
5	Walkway width – two-way traffic	≥ 900 mm (35.5 in.)
6	Doors in the accommodation area have a clear opening width:	≥ 700 mm (27.5 in.)
7	Doors to cabin toilet/bathrooms have a clear opening width:	≥ 600 mm (23.5 in.)
Accommodation Area - Stairways		
A	Angle of inclination	≤ 50°
B	Tread width	≥ 800 mm (31.5 in.)
C	Tread depth	≥ 190 mm (7.5 in.)
D	Riser height (this needs to be consistent throughout the entire flight)	≤ 230 mm (9 in.)
E	Height of Handrail/Storm rail	≥ 900 mm (35.5 in.) ≤ 1030 mm (40.5 in.)
Machinery Spaces and Deck Area - Walkways		
F	Walkway width	≥ 600 mm (23.5 in.)
G	Headroom below any covered overhead structure or obstruction	≥ 2.1 m (7 ft.)
H	Height of handrail	≥ 1000 mm (39.5 in.)
I	Gap between intermediate rail(s)	≤ 500 mm (19.5 in.)
J	Toeboard is to be provided	✓
Machinery Spaces and Deck Area - Inclined Ladders		
K	Angle of inclination	≤ 60°
L	Tread depth	≥ 100 mm (4 in.)
M	Riser height (this needs to be consistent throughout the entire flight)	≥ 200 mm – ≤ 300 mm (8 in. – 12 in.)
N	Tread width	≥ 600 mm (23.5 in.)
O	Maximum continuous height without the need for an intermediate platform	≤ 6 m (19.5 ft)
P	Headroom below any covered overhead structure or obstruction	≥ 2.1 m (7 ft)
Q	Height of Handrail	≥ 900 mm (35.5 in.)
Machinery Spaces and Deck Area - Vertical Ladders		
R	Angle of inclination from the horizontal	80 to 90 degrees
S	Distance between ladder rungs (this needs to be consistent throughout the entire flight)	≤ 340 mm (13.5 in.)
T	Stringer separation	≥ 350 mm (14 in.)

<i>Design Aspect</i>		<i>Requirement</i>
U	Ladder distance (gap accommodating toe space) from attached surface	≥ 150 mm (6 in.)
V	Horizontal Clearance (from ladder face and obstacles)	≥ 600 mm (23.5 in.)
W	Rung Design – (Can be round or square bar; where square bar is fitted, orientation should be edge up)	Round bar 25 mm (1 in.) Square bar 22 mm x 22 mm (0.9 in. x 0.9 in.)

Accommodation Area - Stairways	Machinery Space and Deck Area - Walkways
Machinery Space and Deck Area – Inclined Ladders	Machinery Space and Deck Area – Vertical Ladders

3.2 Ambient Environment Characteristics

Vibration and noise serve as environmental stressors that can affect the health and safety of seafarers, impair cognitive performance, distract attention from a task, and cause seafarers to adopt less than optimal performance strategies.

The whole-body vibration criteria are based on ISO 21984:2018 and are shown on Section 3, Table 3.

For the noise criteria, refer to Subsection 4/5 of the ABS *Guide for Crew Habitability on Ships* as they relate to the **HAB** notation.

TABLE 3
Whole-body Vibration

<i>Space</i>	<i>Maximum Frequency-Weighted R.M.S. (frequency range 1 Hz. to 80 Hz.)</i>
	<i>Velocity (Acceleration)</i>
Accommodation	5 mm/s (179 mm/s ²)
Work Spaces	6 mm/s (214 mm/s ²)
Offices	4.5 mm/s (161 mm/s ²)
Wheelhouse (excluding bridge wings)	6 mm/s (214 mm/s ²)
Engine Control Room	5 mm/s (179 mm/s ²)
Open Deck Recreation Spaces	4.5 mm/s (161 mm/s ²)

3.2.1 Test Plans

Ambient Environmental Test Plans for whole-body vibration and noise are to be prepared and submitted to ABS. The Test Plans are to be in accordance with Subsection 3/6 for whole-body vibration and Subsection 4/6 for noise of the ABS *Guide for Crew Habitability on Ships*.

3.2.2 Test Requirements

Ambient Environment testing for whole-body vibration and noise are to be in accordance with Subsection 3/7 for whole-body vibration and Subsection 4/7 for noise of the ABS *Guide for Crew Habitability on Ships*. In addition, the requirements of 1/8.2 of the ABS *Guide for Crew Habitability on Ships* are also applicable.

3.2.3 Test Reports

Upon completion of the ambient environmental testing, final Test Reports for each ambient environment characteristic are to be submitted to the ABS Surveyor. Test Reports are to be prepared in accordance with Subsection 3/8 for whole-body vibration and Subsection 4/8 for noise of the ABS *Guide for Crew Habitability on Ships*.

The ABS Surveyor is to determine whether the vibration and noise levels meet the relevant criteria and whether this part of the notation requirement has been met. In addition, a copy of the Test Reports is to become part of the vessel's official documentation.

SECTION 4 Survey Requirements

1 General

This Section outlines the survey requirements during construction and after construction to verify compliance with the requirements of this Guide

2 Surveys During Construction/Initial Survey

The ABS Surveyor is to verify that the machinery, equipment, systems, processes, mitigating measures identified and arrangements are in accordance with the approved documentation. The ABS Surveyor also is to verify resolution of outstanding comments noted from the ABS Engineering review and document deviations from criteria.

During the Initial Survey, the ABS Surveyor is to verify that the documents listed in Section 1, Tables 3 and 4 are maintained on board.

2.1 SUSTAIN-1(2020)

Applicable surveys for compliance with MARPOL Annexes I, II IV, V, VI, Antifouling, Inventory of Hazardous Materials, Ballast Water Management inclusive of commissioning testing validating compliance with Regulation D-2 of the Convention, if required by the Flag Administration, are completed.

- i)* Ballast Water Management function testing and commissioning testing validating compliance with Regulation D-2 of the Convention is to be carried out. Sampling testing to be done by ABS approved service provider.
- ii)* Underwater Radiated Noise mitigating measures and/or technologies are to be installed in accordance with approved drawings.
- iii)* Energy Efficiency Technologies fitted are to be confirmed in accordance with approved drawings. Arrangements for efficiency and performance monitoring are to be verified functional.

2.2 SUSTAIN-2(2020)

In addition to **SUSTAIN-1(2020)** requirements, the following are applicable:

- i)* The single, dual fuel engines or alternative power generation systems (e.g., fuel cells, batteries, etc.) for main propulsion using low or zero carbon fuels are to be installed as per approved drawings and tested in accordance with requirements in MVR.
- ii)* Accommodation and Work Areas are to be constructed in accordance with approved drawings.
- iii)* The ambient environment testing for whole-body vibration and noise is required to be witnessed by an ABS Surveyor to verify compliance with the applicable criteria and methodology as prescribed in 3/3.2.2 and 3/3.2.3 of this Guide.

3 Surveys After Construction

As applicable, all annual, intermediate, and renewal or periodical surveys for the various Statutory requirements (MARPOL Annexes I, II, IV, V, VI, Antifouling, Inventory of Hazardous Materials, Ballast Water Management, Ballast Water Management) are to be satisfactorily completed, as well as completion of the periodical survey requirements of machinery, as specified in Chapter 6 of the *ABS Rules for Survey After Construction (Part 7)* and survey requirements of Section 7-9-7 of the *ABS Rules for Survey After Construction (Part 7)*. The machinery, equipment, systems, processes, mitigating measures and arrangements required for the notations are to be available and/or operational in accordance with the approved documentation.

3.1 Annual Surveys

3.1.1 SUSTAIN-1(2020)

At each Annual Survey, the attending Surveyor is to verify the following are maintained on board:

3.1.1(a)

Certification and documentation as outlined in Section 1, Table 3

3.1.1(b)

Operational procedures as outlined in Section 1, Table 4

As required by the **ENVIRO** notation, the Surveyor is to examine the refrigerant leakage records and verify that the annual leakage is less than 10% of the initial charge.

The Surveyor is to confirm that the underwater radiated noise mitigating measures and/or technologies are operational.

During the ABS Surveyor's review of the submitted information, a determination is to be made as to whether changes or alterations have taken place that could affect the notation including damage that could affect the vessel's energy efficiency fittings and the underwater noise characteristics. An initial survey to this Guide is required when modifications are carried out.

3.1.2 SUSTAIN-2(2020)

In addition to **SUSTAIN-1(2020)** requirements, the following are applicable:

3.1.2(a)

The Surveyor is to request a copy of the latest verified annual DSC report together with the statement of compliance to verify the use of low/zero carbon fuels as per Section 3/2 of this Guide. For vessels outside of the scope of IMO DCS, the Surveyor is to confirm the fuel type consumed through examination of Deck Logbook abstract reports, bunker delivery notes, and bunker remaining onboard reports.

3.1.2(b)

With regard to the Human Element Design requirements, the following information is to be reviewed by the attending ABS Surveyor for issues that could affect the notation:

- i) Collision, grounding, fire, repair, and damage reports, if any, since the last Annual Survey are to be provided by the Master (refer to 7-3-2/1.1 of the *ABS Rules for Survey After Construction (Part 7)*).
- ii) A list of all structural or mechanical modifications to the vessel, if any, since the last Annual Survey is to be provided by the Master (refer to 7-3-2/1.1 of the *ABS Rules for Survey After Construction (Part 7)*).

The ABS Surveyor is to verify that all relevant areas covered in 3/3.1 remain unchanged. No ambient environment verification measurements are required during Annual Surveys.

During the ABS Surveyor's review of the submitted information, a determination is to be made as to whether changes or alterations have taken place that could affect the notation. An Initial Survey to this Guide is required when modifications are carried out.

3.2 Special Periodical Surveys

3.2.1 SUSTAIN-1(2020)

In addition to the requirements of 4/3.1.1, the following are applicable:

3.2.1(a)

Energy Efficiency Technologies – Equipment or fittings on the underwater body are to be examined during the dry-docking survey and if applicable, operationally tested during the dock trial required by Special Survey of Machinery.

3.2.1(b)

Equipment and/or mitigating measures installed to reduce the underwater radiated noise on the underwater body are to be examined during the dry-docking survey. Vessel's hull and fittings are to be verified to have no conditions that would change the underwater noise characteristics, such as engine isolator blocks, damaged bilge keels, propeller tips or rudder surface and fouling of the propeller. Vessel active measures are to be operationally tested during the dock trial required by Special Survey of Machinery.

3.2.2 SUSTAIN-2(2020)

In addition to the requirements of 4/3.1 and 4/3.2.1, the following is applicable with regard to the Human Element Design aspect.

The owner in cooperation with ABS is to develop a specific Special Periodical Survey Test Plan for each ambient environmental aspect in accordance with the criteria stated below. The approved initial Test Plans are to be used as a basis for creating the Special Periodical Survey Test Plans.

The survey is to include witnessing of ambient environmental testing and verification of measured results of the accommodation and working areas by an approved service provider against the initial test reports and the criteria of this Guide. The Survey will cover both ambient environmental characteristics.

For specifying measurement locations for the Special Periodical Survey Test Plans, the following selection of spaces where measurements are to be conducted for each ambient environmental aspect is to be followed:

- i)* For all ambient environmental aspects, measurements are to be taken in 25% of crew cabins identified in the initial Test Plans.
- ii)* For all ambient environmental aspects, measurements are to be taken where a single instance of one (1) type of a manned space exists within the vessel (e.g., officer's mess, gymnasium, library, etc.).
- iii)* Where multiple instances of the same type space exist, a representative sample of at least 25% of each type is to be selected for measurement for all ambient environmental aspects.

Prior to commencing any part of the Special Periodical Survey Test Plan, a survey planning meeting is to be held between the attending Surveyor(s), the Owner's representative in attendance, the Ambient Environment Testing firm operator (as applicable), and the Master of the vessel or an appropriately qualified representative appointed by the Master or company for the purpose of ascertaining that all the arrangements envisaged in the survey program are included in the Test Plan.

3.3 Modifications and Damage

No alterations which affect or may affect the vessel's awarded Sustainability notation (**SUSTAIN-1(2020)** or **SUSTAIN-2(2020)**), including alterations to the structure, machinery, electrical systems, piping, furnishings or any other system covered by this Guide, are to be made to the vessel unless plans and/or relevant documentation associated with the proposed alterations are submitted and approved by ABS before the work of alteration is commenced. If ABS determines that the alteration will affect the vessel's Sustainability notation, the altered vessel may be subject to the review, verification, and ambient environmental testing requirements of the Guide.

Non-compliance with the requirements of this Guide including damage and mechanical failure may result in Condition(s) of Class or withdrawal of the optional notation.

1 ABS

- 1) *Rules for Building and Classing Marine Vessels – ABS*
- 2) *Rules for Building and Classing Mobile Offshore Units – ABS*
- 3) *Guide for Ergonomic Notations – ABS*
- 4) *Guide for the Classification Notation Underwater Noise – ABS*
- 5) *Guide for Crew Habitability on Ships – ABS*
- 6) *Guide for the Environmental Protection Notations for Vessels – ABS*
- 7) *Guide for the Environmental Protection Notation for Offshore Units, Floating Installations, and Liftboats – ABS*
- 8) *Guide for the Inventory of Hazardous Materials – ABS*
- 9) *Guide for Fuel Cell Power Systems for Marine and Offshore Applications – ABS*
- 10) *Guide for Hybrid Electric Power Systems for Marine and Offshore Applications – ABS*
- 11) *Guide for Use of Lithium Batteries in the Marine and Offshore Industries – ABS*
- 12) *Guide for Use of Supercapacitors in the Marine and Offshore Industries – ABS*

2 International Standards, Guidelines, and Recommendations

- 1) The following international standards, guidelines, and recommendations were considered in developing this Guide:
 - IMO MARPOL 73/78 Annex I – Regulations for the Prevention of Pollution by Oil
 - IMO MARPOL 73/78 Annex II – Regulations for the Control of Pollution by Noxious Liquid Substances in Bulk
 - IMO MARPOL 73/78 Annex IV – Regulations for the Prevention of Pollution by Sewage from Ships
 - IMO MARPOL 73/78 Annex V – Regulations for the Prevention of Pollution by Garbage from Ships
 - IMO MARPOL 73/78 Annex VI – Regulations for the Prevention of Air Pollution from Ships
- 2) *Acoustics – Rating of sound insulation in buildings and of building elements – Part 1: Airborne Sound Insulation - ISO 717-1: 2013 - International Organization for Standardization, Geneva*
- 3) *Anti-Fouling Systems – IMO International Convention on the Control of Harmful Anti-Fouling Systems on Ships, 2001 (AFS Convention) and associated Conference resolutions*

- 4) *Ballast Water* – International Convention for the Control and Management of Ships’ Ballast Water and Sediments, 2004 (BWM Convention), IMO BWM/CONF/36 and associated Guidelines
- 5) *Cargo Vapor Emission Control* – IMO MSC/Circ. 585 Standard for Vapor Emission Control Systems or USCG Title 46 CFR Part 39 Vapor Control System (See 5C-1-7/21 of the *ABS Rules for Building and Classing Marine Vessels*)
- 6) *Code on Noise Levels on-Board Ships* - IMO Resolution MSC.337(91) International Maritime Organization. (2012). London
- 7) *Diesel Engine Exhaust NOx Content* – Technical Code on Control Emission of Nitrogen Oxides from Marine Diesel Engines (NOx Technical Code, 2008), IMO Resolution MEPC.177(58)
- 8) *Directive 2008/56/EC of the European Parliament and of the Council Establishing a Framework for Community Action in the Field of Marine Environmental Policy*
- 9) *Exhaust Gas Cleaning Systems* – IMO Resolution MEPC.184(59) 2009 Guidelines for Exhaust Gas Cleaning Systems
- 10) *Garbage Management* – IMO MEPC Circular 317 Guidelines for the Development of Garbage Management Plans
- 11) *Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address Adverse Impacts on Marine Life* – IMO MEPC.1/Circ.833
- 12) *Maritime Labour Convention* - International Labor Organization., 2006. Geneva
- 13) *Refrigerants and Fire-fighting Gases* – UNEP The Montreal Protocol on Substances that Deplete the Ozone Layer
- 14) *Regulation (EU) 2015/757 on the Monitoring, Reporting and Verification of Carbon Dioxide Emissions from Maritime Transport, and Amending Directive 2009/16/EC*
- 15) *Sewage Treatment Plants* – IMO Resolution MEPC.227(64) 2012 Guidelines on Implementation of Effluent Standards and Performance Tests for Sewage Treatment Plants, as amended by IMO Resolution MEPC.284(70)
- 16) *Ship Underwater Radiated Noise* – Vard Marine, Report 368-000-01, Rev.4, 2019
- 17) *Shipboard Incinerators* – IMO Resolution MEPC 244(66) Standard Specification for Shipboard Incinerators
- 18) *Ships and Marine Technology—Guidelines for measurement, evaluation and reporting of vibration with regard to habitability on specific ships* – ISO 21984:2018 – International Organization for Standardization. (2018). Geneva
- 19) *Transforming Our World: The 2030 Agenda for Sustainable Development (A/RES/70/1)*, United Nations
- 20) *Work of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development (A/RES/71/313)*, United Nations

APPENDIX 2

Typical Additional Requirements to the Applicable Statutory Regulations for an International Trading Merchant Ship

TABLE 1
Typical Additional Requirements for an International Trading Merchant Ship ^(1, 2)

<i>Item</i>	<i>Topic</i>	<i>Subtopic</i>	<i>Additional Requirements to the Applicable Statutory Regulations</i>
SUSTAIN-1(2020)			
1	Oil and Chemical Pollution	Oil Pollution – Machinery Spaces	ENVIRO notation and 2/2.1.1 through 2/2.1.4
		Oil Pollution – Cargo Areas of Oil Tankers	ENVIRO notation and 2/2.2.1
		Oil Pollution – Rapid Response Damage Assessment Program	ENVIRO notation
		Noxious Liquid Substances	ENVIRO notation and 2/2.5.1
2	Waste Streams	Sewage	ENVIRO notation
		Garbage	ENVIRO+ notation
3	Coastal and Marine Ecosystems	Ballast Water	2/4.1
		Ballast Water Efficacy Testing During Commissioning	2/4.2
		Antifouling Systems	ENVIRO notation
		Biofouling Management Plan	2/4.4
		Underwater Radiated Noise (UWN)	2/4.5
4	Air Emissions	Ozone-Depleting Substances	ENVIRO+ notation
		Nitrogen Oxides (NOx) Emissions	ENVIRO notation
		Sulphur Oxides (SOx) Emissions	ENVIRO notation
		Volatile Organic Compounds	VEC Notation
		Carbon Dioxide (CO ₂)	2/5.5
		Shipboard Incinerator	ENVIRO notation
5	Efficiency and Performance Monitoring		2/6

<i>Item</i>	<i>Topic</i>	<i>Subtopic</i>	<i>Additional Requirements to the Applicable Statutory Regulations</i>
6	Ship Recycling		IHM notation
SUSTAIN-2(2020)			
1	Low and Zero Carbon Fuels		3/2
2	Human Element	Accommodation and Working Areas Design	3/3.1
		Ambient Environment Characteristics	3/3.2

Notes:

- 1 Merchant Ship in the context of this Table refers to the typical Oil/Chemical Tanker, Bulk Carrier, and Containership.
- 2 For other vessel types, applicability of the additional requirements contained in the Guide is to be determined on a case-by-case basis based on consideration to the specific design and operational conditions of these vessels.

Correlation with other ABS Notations and International Regulations and Standards

TABLE 1
Correlation with other ABS Notations and International Regulations and Standards

<i>Item</i>	<i>Topic</i>	<i>Subtopic</i>	<i>Corresponding ABS Notation⁽¹⁾</i>	<i>Applicable International Regulations & Standards</i>
SUSTAIN-1(2020)				
1	Oil and Chemical Pollution	Oil Pollution – Machinery Spaces	ENVIRO+	MARPOL Annex I, Ch. III
		Oil Pollution – Cargo Areas of Oil Tankers	ENVIRO	MARPOL Annex I, Ch. IV and VII
		Oil Pollution – Rapid Response Damage Assessment Program	ENVIRO	MARPOL Annex I, Ch. V
		Noxious Liquid Substances	ENVIRO	MARPOL, Annex II, Ch. IV
2	Waste Streams	Sewage	ENVIRO	MARPOL Annex IV, Ch. III
		Garbage	ENVIRO+	MARPOL Annex V, Ch. I
3	Coastal and Marine Ecosystems	Ballast Water	BWT	BWM Convention
		Ballast Water Efficacy Testing During Commissioning	<i>None</i>	IMO BWM.2/Circ.70
		Antifouling Systems	ENVIRO	AFS Convention
		Biofouling Management Plan	<i>None</i>	IMO Res. MEPC.207(62)
		Underwater Radiated Noise (UWN)	UWN	IMO MEPC.1/Circ.833; EU MSFD 2008/56/EU
4	Air Emissions	Ozone-Depleting Substances	ENVIRO+	MARPOL Annex VI, Ch. III
		Nitrogen Oxides (NOx) Emissions	ENVIRO	
		Sulphur Oxides (SOx) Emissions	ENVIRO	
		Volatile Organic Compounds	VEC	
		Carbon Dioxide (CO ₂)	<i>None</i>	MARPOL Annex VI, Ch. IV
		Shipboard Incinerator	ENVIRO	MARPOL Annex VI, Ch. III

<i>Item</i>	<i>Topic</i>	<i>Subtopic</i>	<i>Corresponding ABS Notation⁽¹⁾</i>	<i>Applicable International Regulations & Standards</i>
5	Efficiency and Performance Monitoring		<i>None</i>	
6	Ship Recycling		IHM	Hong Kong Convention
<i>Item</i>	<i>Topic</i>	<i>Subtopic</i>	<i>Corresponding ABS Notation⁽¹⁾</i>	<i>Applicable International Regulations & Standards</i>
SUSTAIN-2(2020)				
1	Low and Zero Carbon Fuels		<i>See Note 2</i>	<i>None</i>
2	Human Element	Accommodation and Working Areas Design	HAB and ERGO ES or ERGO TOP	ILO MLC 2006 Title 3.1
		Ambient Environment Characteristics	HAB+	ISO 21984:2018 and IMO Code on Noise

Notes:

- 1 Compliance with the requirements of those ABS notations automatically shows compliance with the corresponding requirements in this Guide. However, compliance with the requirements of this Guide does not automatically shows compliance with the corresponding requirements of those ABS notations.
- 2 Section 3, Table 2, indicates that, depending on the installed technology, compliance with the requirements of certain ABS Notations is mandatory.