

GUIDANCE NOTES

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China Classification Society

Guidelines for Digital Delivery of Ships 2025

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Chapter 1 General

Section 1 General Provisions

1.1.1 Scope of application

1.1.1.1 The Guidelines for Digital Delivery of Ships (hereinafter referred to as the "Guidelines") define the content and form of digital deliverables for ships and apply to any ship applying for class notations related to digital delivery of the China Classification Society (CCS).

1.1.2 General requirements

1.1.2.1 The digital delivery of ships is generally performed by a third-party organization or by the shipbuilder, as authorized by the shipowner.

1.1.2.2 The deliverer and the receiver of the digital delivery of ships shall prepare and jointly sign the delivery list and the implementation plan. The delivery list and implementation plan shall be submitted to CCS for approval.

1.1.2.3 The ship's digital deliverables shall be compiled in accordance with the delivery list and implementation plan approved by CCS. Upon completion, all deliverables shall be recorded in the agreed delivery application software. Supplementary handover methods, such as electronic media or information system interfaces, may also be used as specified in the implementation plan.

1.1.2.4 Parties involved in the digital delivery of ships shall not be exempt from statutory surveys conducted by the competent authority of the flag state, and shall retain ship information in compliance with the applicable rules and guidelines of the CCS.

Section 2 Terms, Abbreviations, and Normative References

1.2.1 Terms

1.2.1.1 Digital delivery of ships: The work process covering the digital creation of information generated during the design and construction stages of a ship through to its handover, hereinafter referred to as "delivery."

1.2.1.2 Digital deliverables of ships: Delivery information collected and compiled in accordance with delivery requirements and organized in a structured manner, hereinafter referred to as

"deliverables."

1.2.1.3 Delivery list: A list specifying the content and format of the information included in the deliverables of a designated ship.

1.2.1.4 Application software for digital delivery of ships: A type of computer software that manages all deliverables and provides the functionality for deliverable submission, hereinafter referred to as "delivery application software."

1.2.1.5 Deliverer: The party responsible for compiling and handing over the digital deliverables of ships.

1.2.1.6 Receiver: The party responsible for receiving the digital deliverables of a ship, typically the ship owner or the ship management company.

1.2.1.7 Electronic files: Unstructured data files from information systems, including common office documents, images, videos, audio, and other formats.

1.2.1.8 Structured data: A form of data representation in which each record, composed of data elements, has a consistent structure and can be effectively described using a relational model.

1.2.1.9 3D digital model: A collection of information in a computer that represents the geometric, constraint, and engineering elements of a product.

1.2.1.10 3D digital virtual ship: A digital representation of a ship created by adding relevant information about the vessel, its onboard systems, and equipment to the 3D digital model.

1.2.1.11 Metadata: Data that defines and describes other data.

1.2.1.12 Data model: An abstraction of a specific type of data that uses metadata to describe its static characteristics, dynamic behavior, and constraints.

1.2.1.13 Relay data model: A data model that describes an object or process and translates the data entered into a format that can be received and used by multiple target systems through a supporting information system.

1.2.1.14 Mechanism model: An accurate mathematical model established based on the inherent scientific laws and technical principles of the described object, capable of simulating its possible operational outcomes based on specific inputs.

1.2.1.15 Ship Maintenance System (CWBT): A modern, scientific, and practical ship maintenance management model that integrates planning, management, execution, supervision, and guidance by

combining traditional ship maintenance practices with computer-based management information systems for ship equipment, applicable both domestically and internationally.

1.2.2 Abbreviations

1.2.2.1 UML: Unified Modeling Language.

Section 3 Class Notations

1.3.1 Class notations

1.3.1.1 Upon application and successful completion of the CCS survey, the class notation for digital delivery of ships may be granted:

Digital Delivery (HF/HD/HM, EF/ED/EM)

"H" indicates that the deliverables contain ship information meeting the requirements of Section 2, Chapter 2 of the Guidelines. "E" indicates that the deliverables contain equipment information meeting the requirements of Section 3, Chapter 2 of the Guidelines. "H" and "E" may be granted separately. "F/D/M" is granted according to the delivery form, including:

- (1) F: The deliverables primarily consist of electronic files and meet the requirements of Section 2, Chapter 3 of the Guidelines.
- (2) D: The deliverables primarily consist of structured data and meet the requirements of Section 3, Chapter 3 of the Guidelines.
- (3) M: The deliverables are organized and presented as 3D digital virtual ship and equipment models and meet the requirements of Section 4, Chapter 3 of the Guidelines.

1.3.1.2 For the general requirements of each class notation, refer to the following table:

Scope and Form of Deliverables		F	D	M
Ship information (H)	Ship description	Electronic files	Structured data	Structured data
	Ship certificate	Electronic files	Electronic files Structured data	Electronic files Structured data
	Drawings and data	Electronic files	Electronic files Structured data (descriptive information)	Electronic files Structured data (descriptive information)
	Quality certificate	Electronic files	Electronic files Structured data	Electronic files Structured data
	Inventory of hazardous materials of ships	Electronic files	Electronic files Structured data	Electronic files Structured data
	The list of spares, spare parts and tools	Electronic files	Structured data	Structured data
	3D digital virtual ship	—	—	Structured data
Equipment information (E)	Equipment description	Electronic files	Structured data	Structured data
	Product certificate	Electronic files	Electronic files Structured data (descriptive information)	Electronic files Structured data (descriptive information)
	Equipment data	Electronic files	Electronic files Structured data (descriptive information)	Electronic files Structured data (descriptive information)
	Maintenance information	—	Structured data	Structured data
	Equipment model	—	—	Electronic files/Structured data

Symbol description:

—: No requirement for this level

1.3.2 Application for class notations

1.3.2.1 The applicant shall apply for a class notation related to the digital delivery of ships in accordance with the relevant requirements of Section 4, "Application and Fees," under Chapter 2, Volume 1 of the CCS Rules for Classification of Sea-Going Steel Ships.

Chapter 2 Requirements for Content of Deliverables

Section 1 General Provisions

2.1.1 General requirements

2.1.1.1 This chapter specifies the information items and requirements that may be included in the digital delivery of ships. Upon implementation, they shall be delivered in accordance with the class notations applied for and the requirements of the delivery list.

2.1.1.2 The information contained in the deliverables shall comply with the following requirements:

- (1) **Completeness:** The delivery information shall include all information required by the Guidelines corresponding to the class notation applied for, as well as all information required by the delivery list.
- (2) **Accuracy:** The delivery information shall provide a true and valid representation of the ship and its equipment, and all relationships within the information shall be correct.
- (3) **Consistency:** Identical information shall be consistent across all deliverables in which it appears. The delivery information shall also align with the status of the ship at the time of delivery.
- (4) **Standardization:** The data format of the delivery information shall conform to that specified in the delivery list.
- (5) **Accessibility:** The deliverables shall meet the receiver's access and usage requirements and shall support necessary updates and expansions.

2.1.1.3 The electronic files in the deliverables shall be provided in a file format that is as easy to read and use as possible, and shall include descriptive information. The descriptive information generally includes the classification, version, compiling organization, compiler, reviewer (if any), compilation time, description, and other relevant details of the electronic files.

2.1.1.4 Files in the deliverables that are required to be signed may be submitted in the following formats:

- (1) Electronic files signed with electronic signatures and seals that meet the requirements of the *Electronic Signature Law of the People's Republic of China*.
- (2) Electronic files created by scanning or photographing signed and stamped paper

documents, page by page.

2.1.2 Requirements for the delivery list

2.1.2.1 The delivery list shall accurately describe the scope and form of the deliverables, as well as the specific requirements for each information item, including whether a signature is required, the data items, data formats, and data collection methods.

2.1.2.2 The delivery list shall, at a minimum, include information on the statutory and classification requirements of the competent authority of the ship's flag state, as well as the requirements for the class notation being applied for.

2.1.2.3 If the delivery list specifies the delivery of high-intellectual property or sensitive information, the parties shall define provisions regarding data usage scope, data security, and confidentiality in the delivery list or the service contract.

2.1.2.4 The delivery list may specify requirements regarding the form of the deliverables, such as:

- (1) When delivered as electronic files, the delivery list may specify the file classification directory, naming and numbering conventions, delivery medium, and other relevant details.
- (2) When delivered as structured data, the data source, collection method, etc., may be specified.
- (3) When delivered as a 3D digital virtual ship, the parties may mutually agree on the requirements for the format and precision of the 3D digital model.

2.1.2.5 If the deliverables specified in the delivery list contain structured data, the data model used for compilation shall be recognizable and compatible with the receiver's information system. The model can be:

- (1) Data model involving delivery data in the receiver's information system.
- (2) Relay data model that is approved by CCS and can be connected to the receiver's system.
- (3) Other data models approved by the receiver.

Section 2 Requirements for Ship Information

2.2.1 Ship description

2.2.1.1 The ship description shall, at a minimum, provide the ship's basic information, tonnage, main

dimensions, and other relevant details.

2.2.1.2 The delivery list may also require the provision of summary descriptive information on the ship's compartments, hull structure, outfitting equipment, life-saving appliances, and other relevant items.

2.2.2 Ship certificate

2.2.2.1 It shall include all statutory and classification certificates of the ship as agreed in the construction contract, and provide descriptive information such as the issuing authority, date of issuance, and validity period of each certificate.

2.2.2.2 If the ship certificate exists in electronic files, the original shall be handed over. If it exists in paper form, both a scanned version and the original shall be handed over.

2.2.2.3 The ship survey status (STS/SE) corresponding to each certificate, along with the related survey requirements, shall be provided.

2.2.3 Drawings and data

2.2.3.1 Drawings and data shall at least include as-built drawings and data that meet the requirements of Section 4 under Chapter 4, Volume 1 of the *CCS Rules for Classification of Sea-Going Steel Ships* and relevant statutory requirements. Paper materials required to be kept on board shall be handed over at the same time.

2.2.3.2 The delivery list may also require the provision of partial or complete sets of approved or construction drawings. Prior to submission, the appropriate intellectual property licenses for these drawings must be obtained.

2.2.4 Quality certificate

2.2.4.1 The shipyard quality certificates and test reports for the hull, machinery, electrical systems, and other components, as agreed in the construction contract, shall be provided.

2.2.4.2 The delivery list may also require the provision of survey records for each survey item, as well as records of issue resolution during ship construction. To submit records for surveys not attended by the receiver, a prior authorization must be obtained from the shipbuilder.

2.2.5 Inventory of hazardous materials of ships

2.2.5.1 Volume I of the inventory of hazardous materials of ships, conforming to the *2009 Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships* or

Regulation (EU) No 1257/2013, shall be provided.

2.2.5.2 The material declaration, supplier's declaration of conformity and necessary supporting documents of the equipment shall be provided according to the scope of equipment listed in the order list that meets the requirements of *CCS Guidelines for Development and Survey of the Inventory of Hazardous Materials of Ships*.

2.2.6 The list of spares, spare parts and tools

2.2.6.1 The list of spares, spare parts and tools shall be provided in accordance with the template and file format specified in the delivery list, and shall, at a minimum, include the name, material category, corresponding shipboard equipment code (if any), model/specification, spare parts code, unit, and inventory quantity at the time of delivery.

2.2.7 3D digital virtual ship

2.2.7.1 The 3D digital model of the ship shall be provided in accordance with the format, geometric expression precision, and information granularity agreed upon in the delivery list, and shall be consistent with the information of other deliverables.

2.2.7.2 The 3D digital model of the ship shall cover:

- (1) Compartments: cargo holds, ballast tanks, fuel oil tanks, lubricating oil tanks, fresh water tanks, other liquid tanks, void spaces, machinery spaces, passageways, living quarters, and other compartments.
- (2) Hull structure: shell plating, deck structures, inner hull structures, longitudinal bulkheads, transverse bulkheads, longitudinal supports, transverse supports, horizontal supports, and other related structures.
- (3) Outfitting: pipe outfitting, iron outfitting, internal outfitting, electrical outfitting, etc.

2.2.7.3 For the 3D digital model of the ship, each component shall include the following attribute data:

- (1) Structural dimensions, including data such as the shape and size of components.
- (2) Material properties, including data such as material specifications and design thickness.

2.2.7.4 The 3D digital model of the ship shall be able to measure geometric information data such as size, distance, angle, and area of each structural member.

2.2.7.5 Equipment for which delivery information is provided shall be displayed in the 3D digital

model, and the model shall indicate the corresponding equipment code from the deliverables. The equipment model can appropriately filter and simplify object details and features.

Section 3 Requirements for Equipment Information

2.3.1 General requirements

2.3.1.1 The deliverables shall include information on all equipment listed in the ship certificate list approved by the CCS for the ship being delivered.

2.3.1.2 Each delivered piece of equipment shall be assigned an equipment classification code in accordance with the equipment classification method specified in the delivery list.

2.3.2 Equipment description

2.3.2.1 The equipment description shall include:

- (1) Manufacturing information: manufacturer, specification, and model, production batch or production date, equipment code (if any), and other relevant details.
- (2) Main technical parameters.
- (3) Equipment classification code.

2.3.3 Product certificate

2.3.3.1 It shall include the factory approval certificate, type approval certificate, marine product certificate, and factory quality certificate as required by the ship product certificate list, and shall provide descriptive information such as the issuing authority, date of issuance, and validity period of each certificate.

2.3.4 Equipment data

2.3.4.1 The equipment data shall include as-built drawings, product instructions, installation manuals, operation manuals, and other relevant documents for the equipment.

2.3.4.2 The equipment data provided shall, at a minimum, include a description of the product specifications, performance, and usage, as well as the product's operation mode, operational steps, maintenance requirements, common troubleshooting methods, and other relevant information.

2.3.5 Maintenance information

2.3.5.1 The maintenance information for the equipment shall be compiled and provided in accordance with the requirements specified in the following documents:

- (1) Chapter 5, Volume 1 of *CCS Rules for Classification of Sea-Going Steel Ships*, Appendix 16: Guidelines on Planned Maintenance System (PMS) for Marine Machinery.
- (2) Requirements in documents related to the maintenance system of ship operating companies.
- (3) Equipment maintenance requirements provided by the product manufacturer.

2.3.5.2 The maintenance information provided shall include a detailed description of the cycle period for maintenance and the corresponding work content. For equipment requiring classification maintenance, this data shall be provided as multiple records.

2.3.6 Equipment model

2.3.6.1 The equipment model shall support guidance for the crew in the operation, maintenance, and replacement of consumable parts. It may take the form of 3D interactive videos, 3D digital models, or other formats, as agreed in the delivery list.

2.3.6.2 The 3D interactive video of the equipment shall provide a step-by-step demonstration from preliminary preparation to the completion of operation according to the type of work, and support step-by-step queries according to the steps in the equipment manual or specific parts of the equipment.

2.3.6.3 The 3D digital model of the equipment shall provide an accurate single-hull model consistent with the actual equipment dimensions, and the corresponding geometric precision and information granularity of the model shall meet the requirements specified in the delivery list. Assembly of components in the model shall be performed hierarchically from the inside out, supporting disassembly of single-hull equipment component modules as well as disassembly of major maintenance and repair parts.

Section 4 Other Information

2.4.1 Other information

2.4.1.1 For a ship applying for class notation H_M/E_M that concurrently seeks class notations $HMS(X)$, $CBM(X)$, and i-Ship ($A_i, R_i, N_x, H_x, M_x, E_x, C_x, I$), its 3D digital model/equipment model should support the acquisition and display of sensor data corresponding to the class notation.

2.4.1.2 The following models may be provided as agreed upon in the delivery list as required:

- (1) Other dynamic monitoring models generated from real-time ship sensor data, with capabilities for data processing, display, alarm, and storage.
- (2) An equipment working condition maintenance analysis model that simulates and analyzes the overall deterioration of equipment based on equipment working condition monitoring data and equipment/component degradation monitoring data, and provides maintenance recommendations.
- (3) An equipment mechanism model developed from the internal mechanisms of the equipment or the transfer mechanisms of material flow, capable of simulating and calculating the physical or operating conditions of the equipment.

2.4.1.3 The following test data may be provided, as required, in accordance with the delivery list:

- (1) Detailed data from ship inclining tests, mooring tests, voyage trials, and other related tests, collected either manually or automatically via sensor equipment.
- (2) Factory test reports of major ship equipment, with complete test data provided in the form of structured data.

Chapter 3 Requirements for Delivery Form

Section 1 General Provisions

3.1.1 General requirements

3.1.1.1 For electronic files included in the deliverables, the deliverer shall provide a trusted verification method enabling the relevant parties to confirm that the delivered electronic files originate from the declared data source. For structured data in the deliverables, the deliverer shall compile it according to the metadata model agreed in the delivery list.

3.1.1.2 The deliverables shall be organized by content classification and other appropriate methods to facilitate their use by the receiver. Appendix 1 provides an organizational example of deliverables.

3.1.1.3 The deliverer shall implement appropriate security measures (such as media encryption, data encryption, and secure transmission channels) to prevent information leakage during compilation and handover.

3.1.1.4 The deliverables may be handed over through one or more of the following methods, with item (1) being mandatory:

- (1) Provide the delivery application software that complies with the requirements of the Guidelines.
- (2) Provide an electronic medium, such as a CD or flash drive, for storing the deliverables.
- (3) Upload files and fill in information in the receiver's information system as agreed.
- (4) Provide the delivery information to the receiver's specified information system via the system's interface.
- (5) Other agreed handover methods.

3.1.2 Requirements for the implementation plan

3.1.2.1 The implementation plan is a plan for data collection, preparation, and handover, developed based on the delivery list.

3.1.2.2 The implementation plan shall include a technical solution for delivering data to the receiver's information system. When a relay data model is used, it may be substituted with proof of interface completion with the receiver's information system, as provided by the relay data model.

3.1.2.3 The implementation plan shall specify the data source for each content item and define the methods and schedule for data collection and processing. If the data source involves third-party intellectual property rights, the method of authorization shall be clearly specified.

3.1.2.4 The implementation plan may specify one or more handover methods and outline the associated specific requirements.

3.1.3 Delivery application software

3.1.3.1 The delivery application software shall be capable of managing and displaying all deliverables specified in the delivery list.

3.1.3.2 The delivery application software may be provided by the deliverer as agreed in the contract, or it may be a receiver-owned information system that complies with the requirements of the Guidelines.

3.1.3.3 At least one instance of the delivery application software shall be deployed on board (ship side). When required on shore, delivery application software capable of supporting multi-ship management may also be deployed (shore side). The shore-side system shall support regular data synchronization with the ship-side software and shall enable the provision of delivery data to other authorized shore-based information systems.

Section 2 Delivery Requirements for Class Notation F

3.2.1 General requirements

3.2.1.1 The deliverables shall be classified and organized in a logical manner, with a multi-layer directory structure established for storage. Each directory and file shall be assigned a unique code and name to facilitate retrieval and use.

3.2.1.2 In addition to signed documents (contracts, certificates, etc.) and design documents, all text-based information in the deliverables shall be provided in text format.

3.2.2 Scope of deliverables

3.2.2.1 For the class notation HF, the deliverables shall include, at a minimum, electronic files containing the following information items:

- (1) Ship description (see 2.2.1)
- (2) Ship certificate (see 2.2.2)

- (3) Drawings and data (see 2.2.3)
- (4) Quality certificate (see 2.2.4)
- (5) Inventory of hazardous materials of ships (see 2.2.5)
- (6) The list of spares, spare parts and tools (see 2.2.6).

3.2.2.2 For the class notation EF, the deliverables shall include at least the following electronic files:

- (1) Equipment description (see 2.3.1)
- (2) Product certificate (see 2.3.3)
- (3) Equipment data (see 2.3.4)

3.2.2.3 Descriptive information for the above electronic files shall be provided in the form agreed in the delivery list.

3.2.3 Requirements for delivery application software

3.2.3.1 Requirements for retrieval and display functions:

- (1) All delivered electronic files shall be organized in a convenient and user-friendly manner.
- (2) It shall support file retrieval by file name and descriptive information.
- (3) It shall support the retrieval of text content from all electronic files using a single keyword or a combination of multiple keywords.

3.2.3.2 Requirements for file management function:

- (1) It shall support the addition, modification or replacement, and deletion of electronic files and their descriptive information.
- (2) It shall support the addition, modification, and deletion of file directories.

3.2.3.3 Requirements for system functions:

- (1) It shall support the version management function to record and back up each change.
- (2) It shall support role management by enabling the assignment of different viewing and operational permissions for deliverables to users based on their roles.

Section 3 Delivery Requirements for Class Notation D

3.3.1 General requirements

3.3.1.1 Upon completion of delivery, the information in the deliverables shall be identifiable and usable by the receiver's information system, except for any information beyond the management

scope of the receiver's system.

3.3.2 Scope of deliverables

3.3.2.1 For the class notation HD, the deliverables shall include the electronic files required in Section 3.2.2.1 of the Guidelines, and descriptive information of the above files shall be provided in the form of structured data.

3.3.2.2 For the class notation HD, the following information items shall also be provided in the form of structured data:

- (1) Ship description (see 2.2.1)
- (2) Inventory of hazardous materials of ships and material declarations from involved suppliers (see 2.2.5).
- (3) The list of spares, spare parts and tools (see 2.2.6).

3.3.2.3 For the class notation HD, survey process records (see 2.2.4.2), if so required in the delivery list, shall be provided in the form of structured data.

3.3.2.4 For the class notation ED, the deliverables shall include the electronic files required in Section 3.2.2.2 of the Guidelines, and descriptive information of the above files shall be provided in the form of structured data.

3.3.2.5 For the class notation ED, the following information items shall also be provided in the form of structured data:

- (1) Equipment description (see 2.3.2)
- (2) Information on main parts and components
- (3) Maintenance information (see 2.3.5).

3.3.2.6 If the handover method (2) described in Section 3.1.1.4 of the Guidelines is used, an index of all data enabling rapid retrieval by the computer system shall be provided. The index shall support fuzzy searches and multi-dimensional combined retrieval of all deliverables, and shall allow quick association of retrieval results with the relevant ship and equipment data.

3.3.2.7 For the class notation ED, a tree model of the ship-wide equipment shall also be provided if the handover method (2) described in Section 3.1.1.4 of the Guidelines is used.

3.3.3 Requirements for delivery application software

3.3.3.1 Requirements for retrieval and display functions:

- (1) It shall be capable of displaying all delivery data and documents in a convenient and user-friendly organization, and shall support step-by-step retrieval and display of shipwide equipment in the form of a ship equipment tree.
- (2) It shall support fuzzy searches and combined retrieval of all delivery data and electronic file text content, and shall allow quick association of retrieval results with the relevant data and files when viewed.

3.3.3.2 Requirements for data input and output functions:

- (1) It shall support automatic updating of ship certificates and survey plans at regular intervals.
- (2) It shall support the creation of an export list and the export of the latest version of the specified electronic files according to that list.
- (3) It shall support the provision of delivery information to other onboard systems via interfaces, perform identity authentication when accessing the delivery application software interface, and enforce data permission restrictions based on verified identity information.

3.3.3.3 Requirements for system functions:

- (1) It shall support onshore backup of all changes made to the information in the delivery application software.
- (2) It shall support the version management of deliverables, recording and backing up each change.
- (3) It shall support role management by enabling the assignment of different viewing and operational permissions for deliverables to users based on their roles.
- (4) It shall support an operation log function to record the operator and the time of various operations, such as information review, modification, and deletion.

Section 4 Delivery Requirements for Class Notation M

3.4.1 Scope of deliverables

3.4.1.1 For the class notation HM, the deliverables shall include all information required by Sections 3.3.2.1 and 3.3.2.2 of the Guidelines.

3.4.1.2 For the class notation HM, the deliverables shall include a 3D digital virtual ship.

3.4.1.3 For the class notation EM, the deliverables shall include all the information required in Sections 3.3.2.3 and 3.3.2.4 of the Guidelines.

3.4.1.4 For the class notation EM, the deliverables shall include equipment models of the main engine, generator, windlass, steering gear, and boiler, as well as other equipment of the ship agreed in the delivery list.

3.4.2 Requirements for delivery application software

3.4.2.1 It shall comply with the requirements of Section 3.3.3 of the Guidelines.

3.4.2.2 It shall support 3D visual display of the ship and main equipment, and enable common operations such as rotation, scaling, measurement, and annotation.

3.4.2.3 It shall support the highlighting of some contents, including:

- (1) Highlight the ship's main systems and their associated equipment, pipelines, and other components based on user selection.
- (2) Display the layout, system, and equipment of any area based on user selection.

3.4.2.4 It shall support the placement of information points on various ship components and equipment within the 3D digital model, enable viewing of the corresponding delivery information, and allow navigation to detailed information or operational function pages.

3.4.2.5 Equipment displayed in the 3D digital model shall support acquisition and display of maintenance information, status information, and other relevant data from onboard information systems, and shall provide alerts using color changes or special symbols based on the information.

3.4.2.6 It shall support the placement of real-time data points at any position within the 3D digital model or on equipment models, and shall enable connection to and display of real-time data from ship or equipment sensors. It shall support setting status rules, reminding, or switching the set area color, depending on real-time data changes.

Chapter 4 Survey for Digital Delivery of Ships

Section 1 General Provisions

4.1.1 Scope of application

4.1.1.1 This Chapter applies to ships applying for the class notation of digital delivery.

4.1.2 Drawings and data

4.1.2.1 For ships applying for class notations related to digital delivery of ships, the following drawings and data shall be submitted:

- (1) A delivery list that complies with the requirements of Section 2.1.2 of the Guidelines.
- (2) Implementation plan that meets the requirements in Section 3.1.2 of the Guidelines.

Section 2 Initial Classification Surveys

4.2.1 Preparation before surveys

4.2.1.1 Before applying for a survey, the deliverer shall prepare the following documents and data for information:

- (1) Delivery list and implementation plan approved by CCS.
- (2) Compiled deliverables and the metadata used for compilation.
- (3) Documents related to the delivery application software, including detailed design specifications for the software and database, deployment manual, maintenance manual, and operation manual.
- (4) Description of the verification environment for deliverables and delivery application software.

4.2.1.2 The delivery application software shall be deployed in a test environment identical to the shipboard application environment, with corresponding operation permissions provided for the verification environment's server and database.

4.2.2 Survey items

4.2.2.1 For ships applying for class notations related to digital delivery of ships, the following survey items shall be completed:

- (1) Verify that the deliverables contain all information items specified in the delivery list and conform to the formats and forms stipulated therein.
- (2) Verify that the relevant information in the deliverables is consistent with the ship drawing approvals, construction surveys, and product survey records of the CCS.
- (3) Verify that the delivery application software meets the corresponding requirements of the class notation to be applied for in the Guidelines, and assess the suitability, completeness, accuracy, security, and other relevant aspects of its functions.
- (4) Verify that the as-built drawings in the deliverables are consistent with the ship's final delivery condition.
- (5) On-site verification of the storage and operational environments for onboard deliverables and the delivery application software.
- (6) On-site verification of the deployment of the delivery application software environment on board, and on-site spot checks to ensure that all functions described in the operation manual operate normally.

4.2.2.2 The deliverer shall collaborate with CCS to establish the mapping between deliverable metadata and CCS survey data. When the relay data model is used, it can be replaced by the relay data model verification report issued by CCS.

4.2.2.3 The survey items listed in paragraphs (1), (2), and (3) of Section 4.2.2.1 may be verified by an organization approved by CCS. Upon completion, the approved organization shall issue a verification report, which the CCS surveyor will review and, if necessary, perform additional verification.

4.2.3 Granting of class notations

4.2.3.1 After the survey is completed, CCS grants the ship the corresponding class notation.

Appendix 1 Organization Example of Deliverables

1 Overview

1.1 In this appendix, UML is used to describe the composition of the deliverable information model.

The UML symbols used are as follows:

- ◇ 1:1 It indicates that the metadata entity is required and appears only once.
- ◇ 1:n It indicates that the metadata entity is required and appears at least once, but can appear multiple times.
- ◇ 0:1 It indicates that the metadata entity is optional and will only appear once if it appears.
- ◇ 0:n It indicates that the metadata entity is optional and can appear multiple times.

1.2 This appendix serves as a reference for the content, organization, coding, and naming of deliverables. The deliverables shall be compiled based on actual conditions and needs.

2 Content and Organization Example of Deliverables

2.1 For the composition of the first and second layers of the deliverables, refer to the figure below:

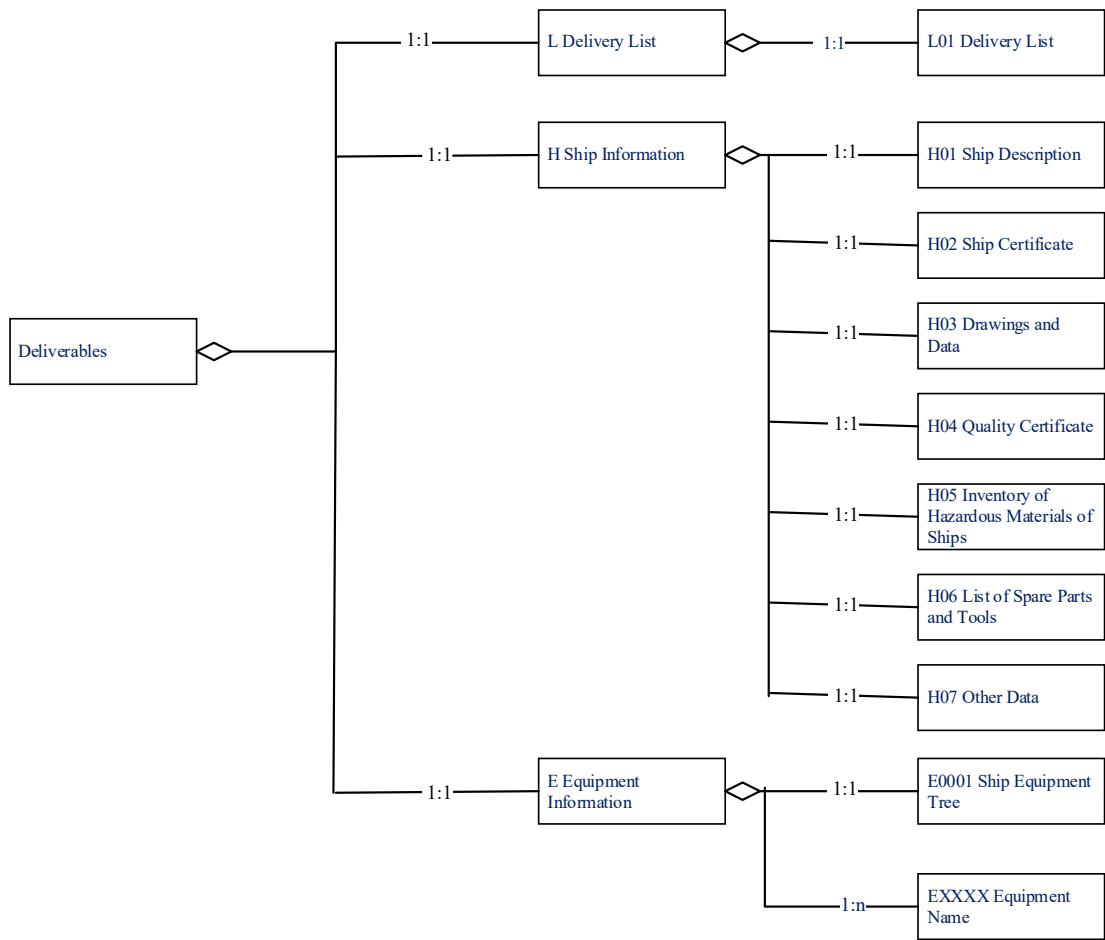


Figure 2-1 Composition Examples of the First and Second Layers of Deliverables

2.2 The ship description primarily includes basic ship information, compartment and machinery details, and other documents to be submitted. For its composition, refer to the figure below:

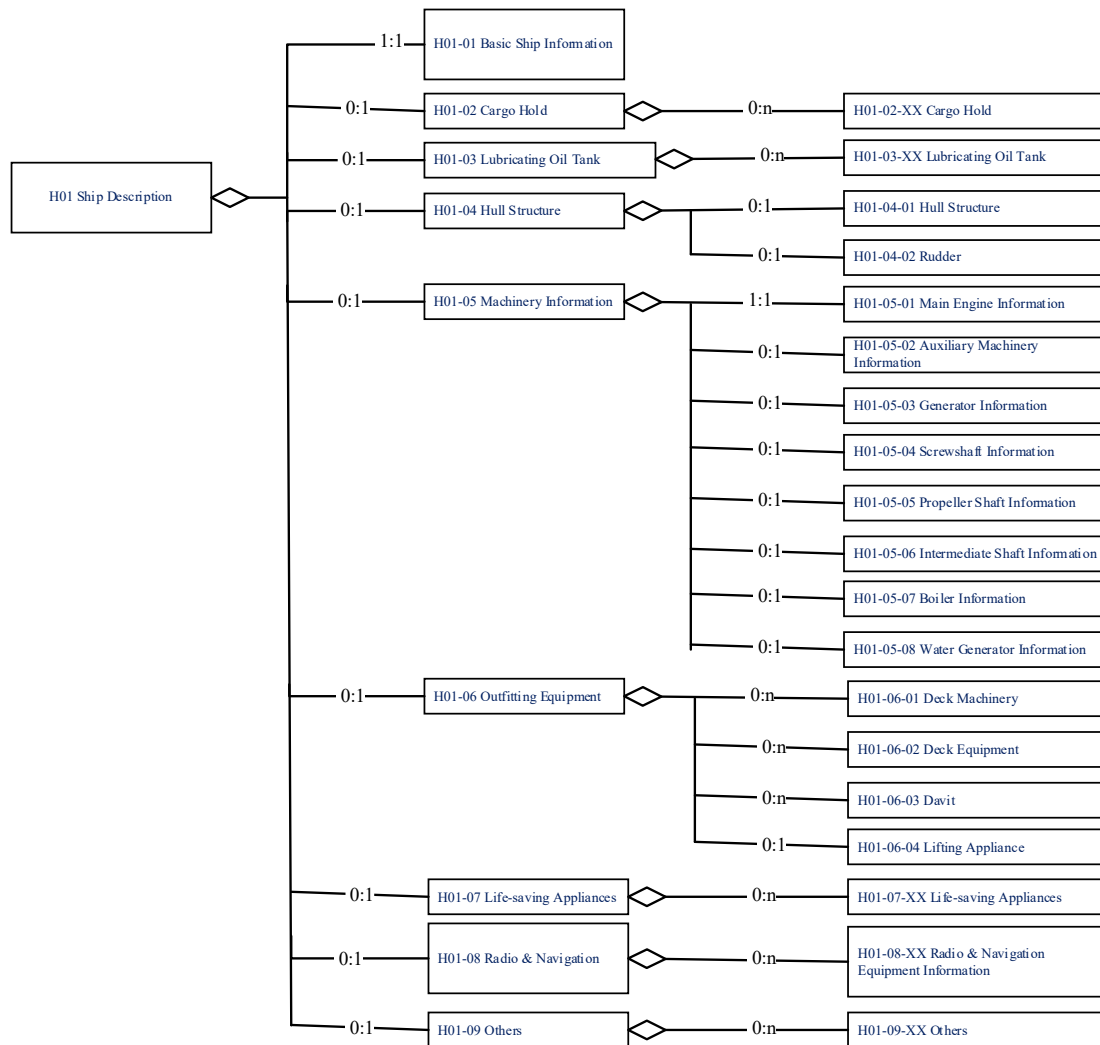


Figure 2-2 Composition Examples of Ship Information

2.3 Ship certificates include statutory certificates, classification certificates, and other related documents. For their composition, refer to the figure below:

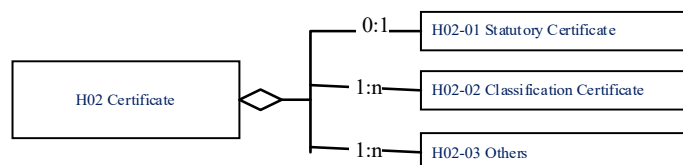


Figure 2-3 Composition Examples of Certificates

2.4 Drawings and data include approved drawings (including calculations) and as-built drawings (including calculations). For their composition, refer to the figure below:

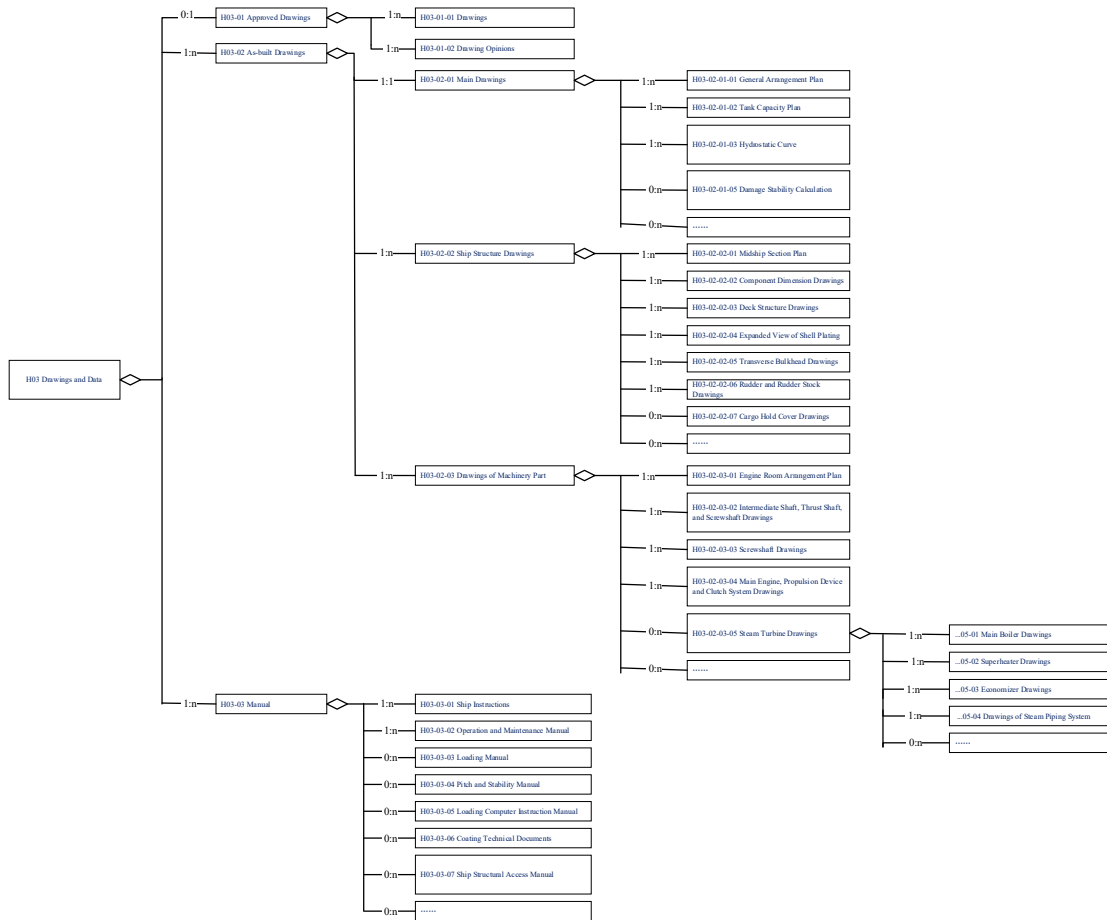
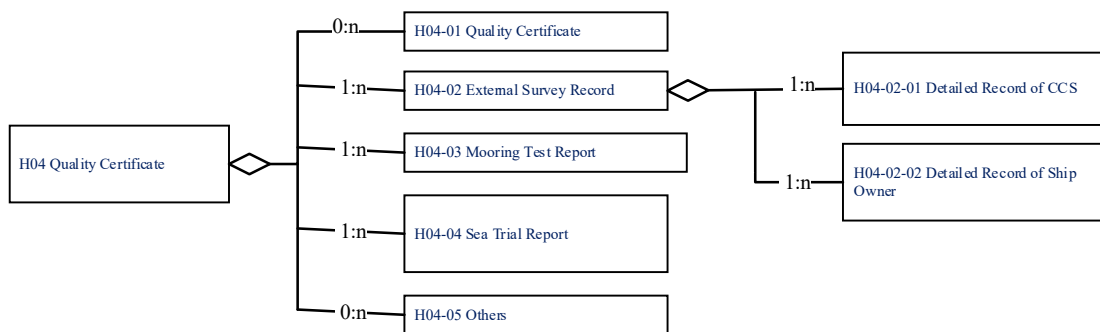


Figure 2-4 Composition Examples of Drawings and Data

2.5 Quality certification includes a quality certificate, external survey record, test report, etc. For the composition, reference can be made to the figure below:



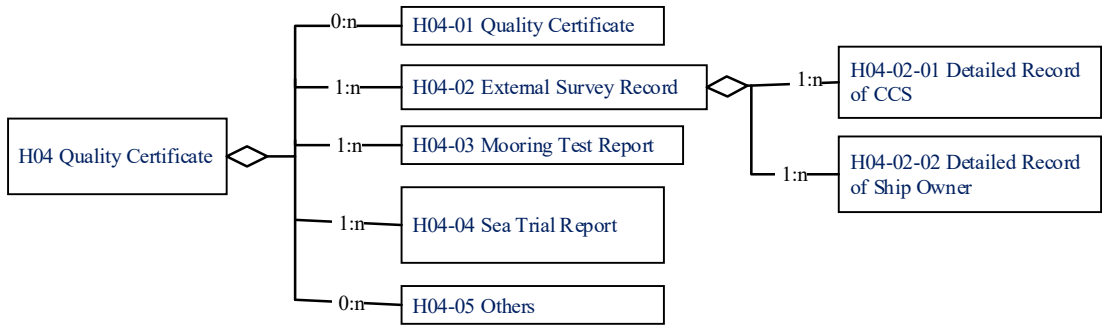


Figure 2-5 Composition Examples of Quality Certificates

2.6 The inventory of hazardous materials of ships shall include the first part of the list and its supporting documents. For the composition, reference can be made to the figure below:

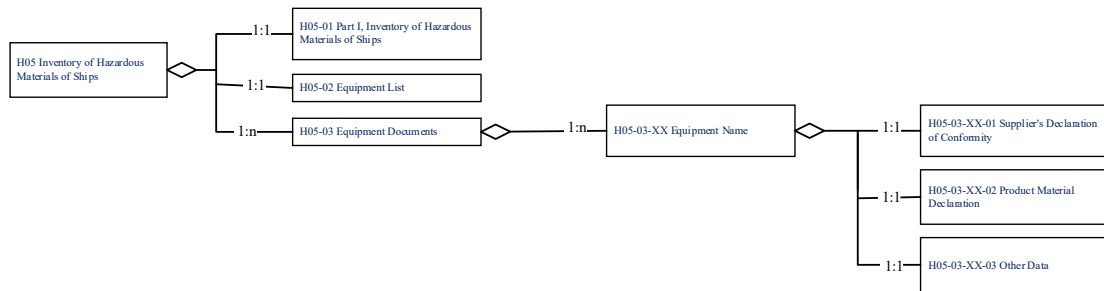


Figure 2-6 Composition Examples of the Inventory of Hazardous Materials of Ships

2.7 The list of spares, spare parts and tools may be delivered as a single document or in separate documents. For their composition, refer to the figure below:

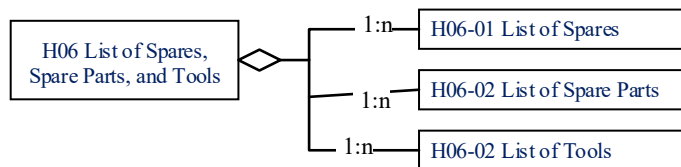


Figure 2-7 Composition Examples of List of Spares, Spare Parts and Tools

2.8 For the composition of equipment information, refer to the figure below:

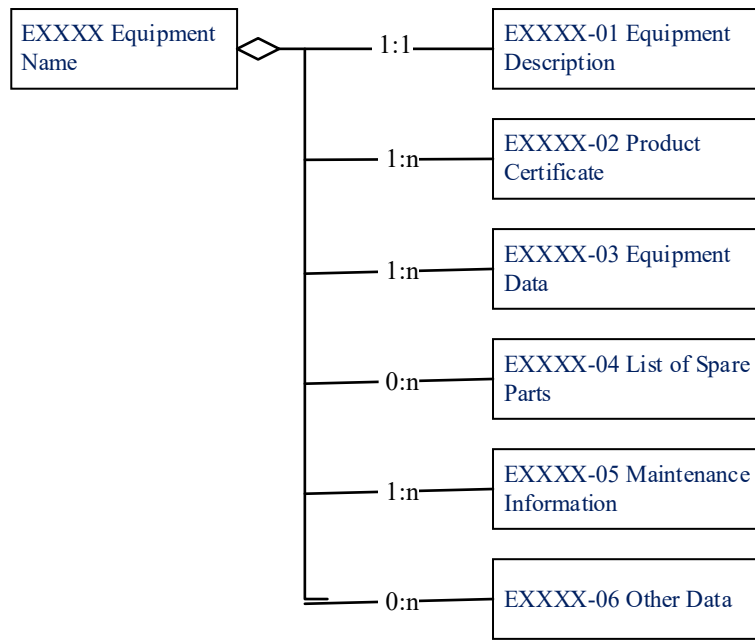


Figure 2-8 Composition Examples of Equipment Information