



**International
Standard**

ISO 19848

**Ships and marine technology —
Standard data for shipboard
machinery and equipment**

*Navires et technologie maritime — Données normalisées pour les
machines et équipements à bord des navires*

**Second edition
2024-02**

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Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Abbreviated terms	3
5 Data Channel	4
5.1 Data Channel ID	4
5.1.1 General	4
5.1.2 Universal ID	4
5.1.3 Local ID	5
5.1.4 Short ID	6
5.1.5 Example of Data Channel ID	6
5.2 Data Channel Property	7
6 Time Series Data	12
6.1 General	12
6.2 Type of Time Series Data	12
6.2.1 General	12
6.2.2 Tabular Data	12
6.2.3 Event Data	12
6.3 Time Series Data Composition	13
7 Data structure	13
7.1 General	13
7.2 Implementation language	14
7.3 Standard data types	14
7.4 Structure of Data Channel List	14
7.4.1 Data model	14
7.4.2 Logical structure	15
7.5 Structure of Time Series Data	20
7.5.1 Data model	20
7.5.2 Logical structure	21
Annex A (normative) General requirement of data implementation	26
Annex B (informative) Examples of Local ID definitions — jsmea_codebook	51
Annex C (informative) The “dnv-v2” naming scheme — explanations and examples of LocalID definitions	108
Bibliography	135

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology*, Subcommittee SC 6, *Navigation and ship operations*.

This second edition cancels and replaces the first edition (ISO 19848:2018), which has been technically revised.

The main changes are as follows:

- [Annex A](#) has been updated to define JSON as an equivalent implementation alternative to XML for DataChannelLists and TimeSeriesData. JSON schemas have been introduced to ensure precise definition and validation.
- The example of the codebook in [B.2](#) has been extended to include navigational information, voyage information, weather information around the ship, oil property information and ship motion information.
- In [B.3](#), a full set of standard data names has been added as references, to improve usability.
- In [Annex C](#), the naming scheme has been changed from “dnvgl-vis” to “dnv-v2”, as well as various updates to the rules for constructing the LocalID.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

On-board computer applications for safety and energy-efficient operations have become increasingly popular. These applications require access to the data of shipboard machinery and equipment.

To access data of navigational equipment, the IEC 61162 series, which covers data exchange, can be used. However, there are no existing standards covering the access of data from other on-board components and systems (e.g. machinery, safety equipment, and hull).

Exchanging nonstandardized data between and/or among applications requires name-based aggregation and format mapping. However, this involves a large amount of labour, which hinders the use of such data.

To improve such situations, this document defines unified requirements and guidelines for developing machine and human-readable identifiers and data structures for shipboard machinery and equipment, with the objective of facilitating the exchange and processing of sensor data from ships.

This document defines two concepts and their models for data exchange: one is Data Channel, and the other is Time Series Data. This document thus defines two distinct data structures and file formats: A Data Channel List, which contains the necessary meta-data, and a Time Series Data format for measurements. The time-series format is designed to be lightweight and therefore contains minimal meta-data information, only in the form of a reference to the channel list.

Data Channel is a concept that represents virtual data transmission channels, and defines time-invariant properties. Data Channel can be viewed as a static description for the different sensor data streams. Data Channel is composed of Data Channel ID and Data Channel Property. Data Channel ID uniquely identifies the logical data channels. Data Channel Property defines attributes of Data Channel.

The purpose of this document is to provide guidance and requirements on exchanging data on board a ship. However, in the future, it is possible that shipboard machinery and equipment will be connected directly to the Internet.

Therefore, considering the compatibility between Data Channel ID and URLs, which are used to identify data on the Internet, Data Channel ID has a hierarchical structure with slashes as delimiters. To represent a hierarchy, Data Channel is categorized in accordance with the standardized naming scheme, called Naming Rule, and named by concatenating these category names with slashes.

[Annexes B](#) and [C](#) provide two types of naming scheme, an example of a codebook and lists of standardized category names given according to these schemes.

These naming schemes provided in [Annexes B](#) and [C](#) are not designed to unify Data Channel ID, but it is assumed that some entities will develop, maintain and manage codebooks and that these codebooks will be disclosed widely.

Data Channel Property is assumed to be used to automate data processing and help understanding of data. Data Channel Property should be used because it is considered to be essential to both computer applications and humans for the reasons mentioned above.

Time Series Data is a concept that represents collection of time-stamped data. Time Series Data is assumed to be used for sharing latest data and for analysing trends made over time-stamped data.

For reliable data exchange, this document recommends the use of Extensible Markup Language (XML) and XML Schema for data encoding and data structure definition. Using XML and XML schemas makes it possible to define data structures precisely and validate data according to such definitions. As a result, data can be exchanged more reliably between and/or among computer applications.

Furthermore, for convenience and efficiency, this document also defines data structures in JavaScript Object Notation (JSON) and Comma Separated Values (CSV) format.

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Ships and marine technology — Standard data for shipboard machinery and equipment

1 Scope

This document provides requirements and guidance on the capture and processing of data from sensors monitoring:

- the structure of the ship;
- shipboard machinery and equipment on board the ship;
- ship operational information.

It is intended for implementers of software used to capture and process such data.

This document describes how to name the sensor and required data item, as well as how to describe the data for shipboard machinery and equipment.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8601-1, *Data elements and interchange formats — Information interchange — Representation of dates and times*

ISO 80000 (all parts), *Quantities and units*

IEC 80000 (all parts), *Quantities and units*

IEC 62923-1:2018, *Maritime navigation and radiocommunication equipment and systems — Bridge alert management — Part 1: Operational and performance requirements, methods of testing and required test results*

W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes, W3C Recommendation

RFC 4180, *Common Format and MIME Type for Comma-Separated Values (CSV) Files*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

alert data

information that represents abnormal conditions of shipboard machinery and equipment

3.2

analogue data

numerical information obtained from sensors such as temperature sensors and pressure sensors

Note 1 to entry: Analogue data are a physical value converted from raw electric signals, such as 4 mA –20 mA or 0 V –5 V.

3.3

codebook

list of standardized names

3.4

data

measurement value from shipboard machinery and equipment to which a time stamp is added

3.5

Data Channel

virtual channel for data transmission from shipboard machinery and equipment to shipboard data server, defining static properties of data

3.6

Data Channel ID

identifier for a *Data Channel* (3.5) that identifies Data Channel universally and on-board a ship

Note 1 to entry: There are three types of Data Channel ID: Universal ID, Local ID and Short ID.

3.7

Data Channel List

list of definitions for *Data Channel* (3.5) that define *Data Channel ID* (3.6) and *Data Channel Property* (3.8), and is shared through the shipboard data server

3.8

Data Channel Property

attributes of *Data Channel* (3.5), such as units and ranges

3.9

Data Set

set of *data* (3.4) having the same time stamp

3.10

Extensible Markup Language

XML

text-based data description language used for exchanging data on the Internet

3.11

Hyper Text Transfer Protocol

HTTP

communication protocol used to exchange Hyper Text Markup Language (HTML) or other content on the Internet

3.12

IMO Number

unique reference number for ships that is given by the International Maritime Organization (IMO)

3.13

logical structure

structure of *data* (3.4) that is independent of physical implementation

3.14

measurement value

numeric value or a status symbol, produced as a result of measuring, calculating or estimating the state of various objects

3.15

metadata

data that describes information about other data

3.16

Name Object

building block of *Data Channel ID* ([3.6](#)) used to define the hierarchical structure of Data Channel ID

3.17

namespace

set of names that is used in order to avoid conflicting names

3.18

shipboard data server

information hub of the ship that stores data from *shipboard machinery and equipment* ([3.19](#)), shares data at sea including machine data, and sends stored data outboard

Note 1 to entry: See ISO 19847 for details.

3.19

shipboard machinery and equipment

various systems located in ships, such as main engine, generator, pumps, fans, valves, pipelines and electric control systems

3.20

Time Series Data

collection of a *Data Set* ([3.9](#))

3.21

XML Schema

data definition language used for *Extensible Markup Language (XML)* ([3.10](#))

4 Abbreviated terms

ABNF	augmented Backus-Naur form
AMS	alarm monitoring system
BNF	Backus-Naur form
CSV	Comma Separated Values
IAS	integrated automation system
IMO	International Maritime Organization
HIN	hull identification number
HTML	Hyper Text Markup Language
HTTP	Hypertext Transfer Protocol
JSON	JavaScript Object Notation
RDBMS	Relational Data Base Management System
RFC	Request for Comments
SI	the International System of Units

URI	Uniform Resource Identifier
UTC	Coordinated Universal Time
UTF-8	UCS Transformation Format 8
XML	Extensible Markup Language

5 Data Channel

5.1 Data Channel ID

5.1.1 General

There are three types of Data Channel ID:

- Universal ID
- Local ID
- Short ID

Universal ID is intended for identifying an on-board Data Channel universally.

Local ID, meanwhile, is intended for identifying an on-board Data Channel locally. For instance, on-board computer systems, such as the integrated automation system (IAS) and the alarm monitoring system (AMS), have their own Data Channel List, which is composed of a unique Channel ID. This Channel ID can correspond to a Local ID.

Short ID is an optional short alternative identifier of Local ID for usability and data compression. This short identifier, for instance, can be used as a Data Channel identifier in the Time Series Data format.

Universal ID shall be universally unique, while Local ID and Short ID shall be unique for a ship.

These IDs shall be case-insensitive to avoid mistyping.

NOTE Data channels representing the same type of sensor data on different ships are expected to have the same Local ID. Conversely, even if the Data Channel has the same meaning, the Short ID can be different for each ship.

5.1.2 Universal ID

Universal ID is an URI conforming to the requirements in this subclause, in addition to the requirement of the URI specified in RFC 3986. The URI definition allows for many different compositions, but the Universal ID is a subset of these and shall be in the following format.

The format is defined by using Augmented BNF (ABNF), which is defined in RFC 5234, as follows.

UniversalID	= [protocol] "/" NamingEntity ShipID LocalID
NamingEntity	= authority
ShipID	= path-element
path-element	= "/" unreserved
path-elements	= path-element path-element path-elements

The definition of the "Local ID" element is mentioned in [5.1.3](#).

The “authority” and “unreserved” element is defined in the URI definition specified in RFC 3986. The “protocol” element is optional.

NOTE Although the path element of URI that is defined in RFC 3986 accepts many more characters, such as RFC 3986 “sub-delimiters”, “:”, “@”, etc., this document only accepts RFC 3986 “unreserved” characters since these characters can be used as control character in ISO 19847. The terms sub-delimiters and unreserved are defined in RFC 3986.

The slash (“/”) is a reserved character for describing hierarchies.

The definition of each element of the Universal ID is as follows.

a) Naming Entity

The Naming Entity element shall be domain owned or controlled by the entity producing the Local ID.

EXAMPLE 1

- data.shipdatacenter.jp
- data.dnv.com

b) Ship ID

Ship ID is for identifying ships universally.

Usually, an IMO number or HIN should be used for the Ship ID.

If ships have no IMO number or HIN, an identifier provided by countries or regions, or other means may be used instead.

EXAMPLE 2

- /IMO1234567
- /JP-HXAB7A33G293

5.1.3 Local ID

Local ID consists of the Naming Rule and Local Data Name.

Local ID composition is defined by using ABNF as follows.

LocalID	= NamingRule LocalDataName
NamingRule	= path-element
LocalDataName	= path-elements
path-element	= “/” unreserved
path-elements	= path-element path-element path-elements

The definition of each element of the Local ID is as follows.

a) Naming Rule

The Naming Rule shall be the designated name for a naming scheme used to name the Data Channel.

This name can be set freely under the supervision of the Naming Entity and shall have a symbol that represents the Naming Entity in front to eliminate duplications.

The naming scheme is a set of requirements that define an identification scheme for components and systems on board the ship. The naming scheme shall define how identification strings are composed, and the method of developing an identification string.

EXAMPLE 1

- /jsmea_mac
- /dnv-v2

The Naming Entity is responsible for defining a methodology for changing the naming scheme and its codebooks.

Impacts on existing users such as backwards compatibility shall be considered.

Therefore, the Naming Entity shall provide version information and change histories of the naming scheme and its codebook for each version, e.g. in a Naming Rule or on a website.

b) Local Data Name

The Local Data Name is an identifier for the Data Channel that is named in accordance with the Naming Rule.

The syntax of the identification string shall be disclosed and precisely defined using ABNF.

EXAMPLE 2

- /MainEngine/Cylinder1/ExhaustGas/Temp
- /vis-3-4a/ 511.11-3/C101/meta/qty-rotational.frequency

5.1.4 Short ID

Short ID is an optional short alternative to Local ID. There shall be a one-to-one correspondence between Data Channel and Short ID; Short ID shall therefore be unique for a ship.

The definition of Short ID is as follows.

ShortID = unreserved

Short ID shall be as short as practical and represented as machine-friendly symbols, human-friendly short words, or a combination of those symbols and short words.

EXAMPLE

- 0001
- TAH001
- ME_RPM

5.1.5 Example of Data Channel ID

In the following example, Ship ID, Naming Rule and Local Data Name are understood as the definitions in [5.1.2\(b\)](#), [5.1.3\(a\)](#) and [5.1.3\(b\)](#), respectively, but without the leading slash.

Universal ID	http://data.shipdatacenter.jp/imo1234567/jsmea_mac/MainEngine/Cylinder1/ExhaustGas/Outlet/Temp
Local ID	/jsmea_mac/MainEngine/Cylinder1/ExhaustGas/Outlet/Temp
Short ID	0001
Ship ID	imo1234567
Naming Entity	data.shipdatacenter.jp

Naming Rule	jsmea_mac
Local Data Name	MainEngine/Cylinder1/ExhaustGas/Outlet/Temp
Universal ID	http://data.dnv.com/imo1234567/dnv-v2/vis-3-4a/ 511.11-3/C101/meta/qty-rotational.frequency
Local ID	/dnv-v2/vis-3-4a/411.1/ 511.11-3/C101/meta/qty-rotational.frequency
Short ID	0001
Ship ID	imo1234567
Naming Entity	data.dnv.com
Naming Rule	dnv-v2
Local Data Name (coded)	vis-3-4a/511.11-3/C101/meta/qty-rotational.frequency
Local Data Name (verbose)	vis-3-4a/511.11-3/C101/~main.generator.engine.3/meta/qty-rotational.frequency

NOTE It is not a requirement that the Universal ID is a resolvable URI, i.e. the URI is not necessarily a valid URL. A detailed description of the above two naming schemes are described in [Annexes B](#) and [C](#).

5.2 Data Channel Property

Data Channel Property shall be defined to provide the attributes of the Data Channel.

The reserved property types are as follows.

- Data Channel Type
- Format
- Range
- Unit
- Quality Coding
- Name
- Remarks

The properties above shall be described in accordance with the requirements in this subclause.

Properties that are not listed above may be used if these are clearly distinguished from the properties defined in this document.

Details of each property are as follows.

a) Data Channel Type

Data Channel Type is used to identify the types of Data Channel, such as raw numeric value, average value, alarms and status. Data Channel Type is composed of the following sub-properties.

- Type

- Update Cycle
- Calculation Period

Type sub-property defines the type of Data Channel and the value of the sub-property shall follow [Table 1](#).

Table 1 — Type name of Data Channel Type

Type	Description
Inst	Measuring value at a certain point in time
Average	Average of the value within a certain time period; “Average” does not mean average of values from multiple sensors at the same time but average of time-series values from a single sensor.
Max	Maximum value within a certain time period; “Maximum” does not mean maximum of values from multiple sensors at the same time but maximum of time-series values from a single sensor.
Min	Minimum value within a certain time period; “Minimum” does not mean minimum of values from multiple sensors at the same time but minimum of time-series values from a single sensor.
Median	Median value within a certain time period; “Median” does not mean median of values from multiple sensors at the same time but median of time-series values from a single sensor.
Mode	Mode value (a value that appears most often in a set of data values) within a certain time period; “Mode” does not mean mode of values from multiple sensors at the same time but mode of time-series values from a single sensor.
StandardDeviation	Standard deviation of the value within a certain time period; “StandardDeviation” does not mean standard deviation of values from multiple sensors at the same time but standard deviation of time-series values from a single sensor.
Calculated	Value obtained from calculation or estimation instead of measurement
SetPoint	Target value for automatic control
Command	Control order to equipment; e.g. slowdown signal to the engine, run/stop order to the pump, opening to the position valve
Alert	Alarm values that can be obtained are also described.
Status	Status values that can be obtained are also described.
ManualInput	Value input by crew. Value assumed here is a reading of the indicator.

Update Cycle represents the cycle of updating measurement value. This sub-property shall be used when the measurement value is updated periodically.

When a value of Data Channel is a result of a calculation that uses a measurement value of specific time periods, the Calculation Period shall be used to describe the said period.

The Update Cycle and Calculation Period shall be described with a decimal number that is larger than zero. The unit of Update Cycle and Calculation Period shall be the “second”.

Type sub-property is mandatory and the others are optional.

EXAMPLE 1

- Type Average
- Calculation Period 60
- Update Cycle 1

b) Format

Format is used for describing data formats and defined by the following sub-properties.

- Type
- Restriction

Type sub-property is mandatory and Restriction sub-property is optional. More than one Restriction sub-property can exist under the Format property.

Available Types are as shown in [Table 2](#). Definitions of these data types shall comply with W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatype.

Table 2 — Available Datatype for format property

Type	Description
Decimal	Decimal represents a subset of the real numbers, which can be represented by decimal numerals. The value space of decimal is the set of numbers that can be obtained by dividing an integer by a non-negative power of 10, i.e. expressible as $i / 10^n$ where i and n are integers and $n \geq 0$. Precision is not reflected in this value space; the number 2,0 is not distinct from the number 2,00. The order relation on decimal is the order relation on real numbers, restricted to this subset.
Integer	Integer is derived from the decimal by fixing the value of fraction digits to be 0 and disallowing the trailing decimal point. This results in the standard mathematical concept of the integer numbers. The value space of integer is the infinite set $\{..., -2, -1, 0, 1, 2, ...\}$. The base type of integer is decimal.
Boolean	Boolean represents the values of two-valued logic.
String	The string datatype represents character strings in XML.
DateTime	Date and time data types are used for values that contain date and time. Format shall follow ISO 8601-1 “YYYY-MM-DDThh:mm:ssZ” where: YYYY indicates the year MM indicates the month DD indicates the day T indicates the start of the required time section hh indicates the hour mm indicates the minute ss indicates the second Z indicates UTC

[Table 3](#) shows restrictions defined in W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes. These restrictions are available to define acceptable values. Validation requirements and available constraint for each data types shall follow W3C XML Schema Definition Language (XSD) 1.1 Part 2: Datatypes.

EXAMPLE 2

- Type Decimal
- Restriction TotalDigits 8, FractionDigits 3

Table 3 — Restrictions for format property

Restriction	Description	Data Type
Enumeration	Defines a list of acceptable values.	string
FractionDigits	Specifies the maximum number of decimal places allowed. Shall be equal to or greater than zero.	nonNegativeInteger
Length	Specifies the exact number of characters or list items allowed. Shall be equal to or greater than zero.	nonNegativeInteger
MaxExclusive	Specifies the upper bounds for numeric values (the value shall be less than this value).	A value from the ·value space· of the {base type definition}.
MaxInclusive	Specifies the upper bounds for numeric values (the value shall be less than or equal to this value).	A value from the ·value space· of the {base type definition}.
MaxLength	Specifies the maximum number of characters or list items allowed. Shall be equal to or greater than zero.	nonNegativeInteger
MinExclusive	Specifies the lower bounds for numeric values (the value shall be greater than this value).	A value from the ·value space· of the {base type definition}.
MinInclusive	Specifies the lower bounds for numeric values (the value shall be greater than or equal to this value).	A value from the ·value space· of the {base type definition}.
MinLength	Specifies the minimum number of characters or list items allowed. Shall be equal to or greater than zero.	nonNegativeInteger
Pattern	Defines the exact sequence of characters that are acceptable.	string
TotalDigits	Specifies the exact number of digits allowed. Shall be greater than zero.	positiveInteger
WhiteSpace	Specifies how white space (line feeds, tabs, spaces, and carriage returns) is handled.	

c) Range

Range is intended for describing Data Range. Range property is composed of the following sub-properties.

- Low
- High

Low sub-property represents the lower limit of the analogue data, and High sub-property represents its upper limit.

The value type of these sub-properties is a decimal value or empty. The value of these sub-properties can be empty only if the lower and/or upper limit cannot be specified.

Furthermore, the high value shall be greater than and not equal to the low value.

Range property is mandatory only with the analogue data.

NOTE Range does not mean upper and lower boundary of the value. The value can exceed the range in case of sensor failure or other abnormal condition.

EXAMPLE 3

- Low 0
- High 120

d) Unit

Unit defines the unit and quantity applied to the measurement value. Unit property is composed of the following sub-properties.

- Unit Symbol

— Quantity Name

Unit symbols and quantity names defined in the ISO 80000 series, the IEC 80000 series or [Table 4](#) shall be used for the Unit Symbol and Quantity Name sub-properties.

The Unit Symbol sub-property represents the unit symbol of the measurement value (e.g. “m” for length and “kg” for mass). The value of the Unit Symbol sub-property can be empty only for non-dimensional quantities.

The Quantity Name sub-property may be used to identify the variable that is measured or computed for the physical item defined by the Data Channel.

The measurement value shall be described in accordance with the unit defined in this property.

NOTE On-board computer applications (Data consumer) can convert units according to the ISO 80000 series and the IEC 80000 series.

EXAMPLE 4

- Unit Symbol kW
- Quantity Name active power
- Unit Symbol Pa
- Quantity Name pressure

Table 4 — Additional units and quantities of measurement value

Quantity name	Unit symbol	Remarks
Cargo capacity	TEU	Twenty-foot equivalent unit
	FEU	Forty-foot equivalent unit
Number of pieces	pcs	pieces
Total revolution count	rev	Total number of rotations

e) Quality Coding

Quality Coding represents a name of data quality evaluation scheme and the scheme shall be able to distinguish at least between valid and invalid measurement values of the Data Channel.

EXAMPLE 5

- “OPC-QUALITY”
- “IEC 61162-STATUS”

In the case of “IEC 61162-STATUS”, “A” (Data valid) and “V” (Data invalid) are used for the data quality.

Channel state, such as “alert acknowledged”, “alert activated”, “alert temporarily disabled”, and “sensor disconnected”, may be included in the quality coding scheme.

f) Alert Priority

In the case in which Data Channel Type is “Alert”, Alert Priority shall be provided. Priority level and criteria for classification shall be in accordance with IEC 62923-1:2018, 6.2.2.1

g) Name

Name can be used to describe names assigned for on-board control systems and other instruments.

EXAMPLE 6

- “Main Engine Revolution”

h) Remarks

In Remarks, arbitrary complementary information on Data Channel is described.

Remarks should include locations, manufacturers and types of equipment.

EXAMPLE 7

— “Location: ECR, Manufacturer: AAA Company, Type: TYPE-AAA”

6 Time Series Data

6.1 General

Time Series Data are a collection of measurement values in which all the values have a corresponding time of measurement. Usually such data are arranged and recorded in chronological order.

6.2 Type of Time Series Data

6.2.1 General

For practical purposes (efficient data transport), two distinct representations of Time Series Data are defined:

- Tabular Data
- Event Data

These representations are used depending on update interval of measurement values.

6.2.2 Tabular Data

Tabular Data is a vector of a fixed number of values expected to be reported at regular intervals. Data Channel List defines the interval.

Some examples of Tabular Data are:

- multiple raw numeric values from sensors/transmitters sampled at the same time;
- the result of the calculation (e.g. time average, standard deviation, etc.) to be performed regularly.

Measurement values are grouped per time stamp, as shown in [Table 5](#).

Table 5 — Example of Tabular Data

Time stamp	Data channel 1	Data channel 2	Data channel 3	Data channel 4
2017-01-01T00:00:00Z	101	3	10	CLOSE
2017-01-01T00:00:01Z	0	3	10	CLOSE
2017-01-01T00:00:02Z	110	2	10	OPEN

6.2.3 Event Data

Event Data is a collection of data for which the number of values at a specific time is not fixed.

Some examples of Event Data include:

- alarm information
- status information

— manually input data

Event Data typically appears in tabular form like [Table 6](#).

Table 6 — Example of Event Data in tabular form

Time Stamp	Data Channel 1	Data Channel 2	Data Channel 3	Data Channel 4
2017-01-01T00:00:00Z	101	—	—	—
2017-01-01T00:00:01Z	—	—	—	—
2017-01-01T00:00:02Z	110	2	—	OPEN

The tabular form shown in [Table 6](#) is not efficient for Event Data, thus measurement values are grouped per both time stamp and Data Channel ID, as shown in [Table 7](#):

Table 7 — Example of Event Data

Time Stamp	Data Channel ID	Value
2017-01-01T00:00:00Z	Data Channel 1	101
2017-01-01T00:00:02Z	Data Channel 1	110
2017-01-01T00:00:02Z	Data Channel 2	2
2017-01-01T00:00:02Z	Data Channel 4	OPEN

6.3 Time Series Data Composition

Each row of Tabular/Event Data is called a Data Set.

Tabular Data are composed of a collection of a Data Set without Data Channel IDs, since value can be identified by its order.

Tabular Data of [Table 5](#) is described as follows.

```
DataSet("2017-01-01T00:00:00Z","101","3","10","CLOSE")
DataSet("2017-01-01T00:00:01Z","0","3","10","CLOSE")
DataSet("2017-01-01T00:00:02Z","110","2","10","OPEN")
```

Event Data are composed of a collection of Data Set with Data Channel ID, since a number of values at a specific time cannot be fixed.

Event Data of [Table 7](#) is described as follows.

```
DataSet("2017-01-01T00:00:00Z", "DataChannel1", "101")
DataSet("2017-01-01T00:00:02Z", "DataChannel1", "110")
DataSet("2017-01-01T00:00:02Z", "DataChannel2", "2")
DataSet("2017-01-01T00:00:02Z", "DataChannel4", "OPEN")
```

7 Data structure

7.1 General

Data structure is the definition of logical structures that are independent from data implementation languages, such as XML, JSON and others.

This clause defines two types of data structure. One type is for Data Channel List, the list of Data Channel definitions in [Clause 5](#). The other type is for serialisation and transport of Time Series Data in [Clause 6](#).

These structures can be described by using XML and JSON.

CSV can be used only for DataSet element defined in [7.5 f\)](#) without the Quality element.

In addition, standard data type, which is used to define the data structure and also independent of implementation languages, is defined.

Standard data type can be replaced with the data types defined in the implementation language.

Data implemented in accordance with the data structure can be shared between and/or among computer applications.

7.2 Implementation language

The data structure defined in this Clause shall be implemented in XML or JSON in accordance with [Annex A](#).

7.3 Standard data types

To define the data structure, the following standard data types derived from UML primitive types listed in [Table 8](#) shall be used.

Table 8 — Standard data types

Standard data type	Primitive type	Restriction	Remarks
Integer	Integer		
NonNegativeInteger	Integer	larger than -1	
PositiveInteger	Integer	larger than 0	
Real	Real		
Boolean	Boolean		
String	String		
DateTime	String	formatted by ISO 8601-1	Refer to RFC 3339 for ABNF expression.
Null			Null specifies the lack of a value (can be used for any data types).

7.4 Structure of Data Channel List

7.4.1 Data model

The Data Channel List shall consist of the following five elements.

a) Package

Package is a data package that is made up of Header, which is a set of metadata, and DataChannel, which is a main data body.

b) Header

Header indicates when a Data Channel List is created and who creates it.

c) DataChannel

DataChannel consists of Property and DataChannelID, which indicates Data Channel definitions.

d) DataChannelID

DataChannelID is an identifier of Data Channel defined in [5.1](#).

e) Property

Property defines the attributes of Data Channel defined in [5.2](#).

These elements are represented in a hierarchical structure as shown in [Figure 1](#) using UML. For more information on UML notation, refer to ISO/IEC 19505-1 and ISO/IEC 19505-2.

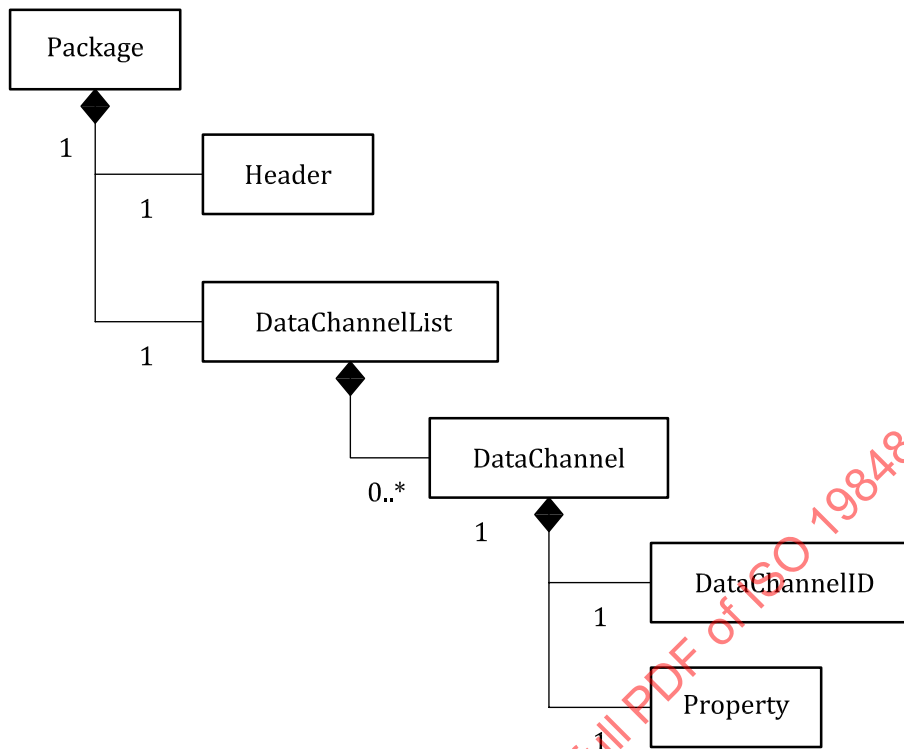


Figure 1 — Model of Data Channel List

7.4.2 Logical structure

The Data Channel List shall have the logical structure shown in [Figure 2](#), using UML. For more information on UML notation (i.e. [1], [0..*] shown in [Figure 2](#)), refer to ISO/IEC 19505-1 and ISO/IEC 19505-2.

The Data Channel List has a Package element. The Package element is composed of a Header and a DataChannelList element. The DataChannelList element includes one or more DataChannel elements with its IDs and properties.

Furthermore, the NameObject element can be added to define the structure of the Local ID.

ISO 19848:2024(en)

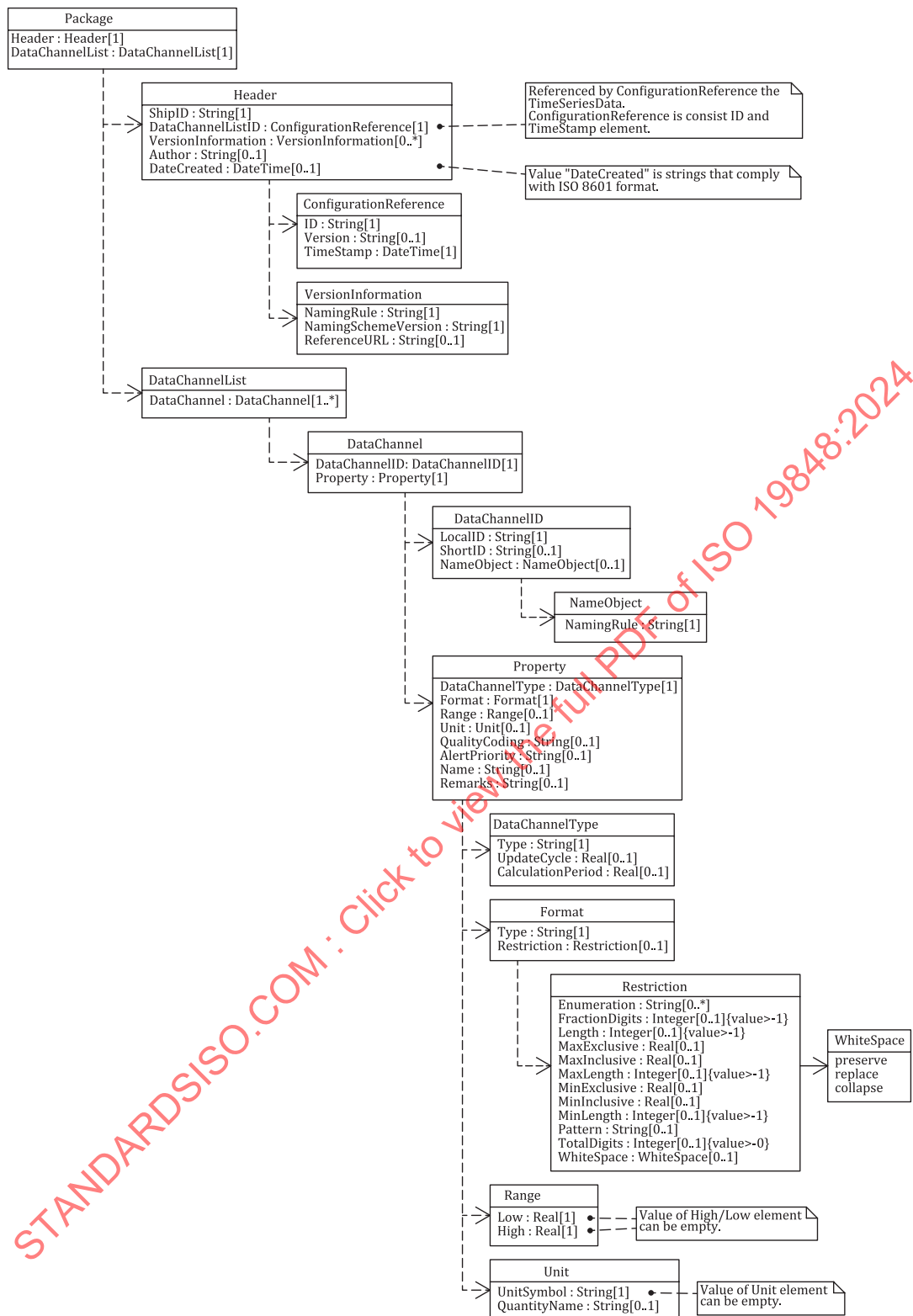


Figure 2 — Logical structure of Data Channel List

Details of each element are described in [Tables 9](#) to [22](#).

a) Package structure

Table 9 — Package structure

Name	Data type	Note	Mandatory/ Option	Max count
Header	b) Header	See Table 10	Mandatory	1
DataChannelList	e) DataChannelList	See Table 13	Mandatory	1

b) Header structure

Table 10 — Header structure

Name	Data type	Note	Mandatory/ Option	Max count
ShipID	String	See 5.1.2	Mandatory	1
DataChannelListID	c) ConfigurationReference	See Table 11	Mandatory	1
VersionInformation	d) VersionInformation	Version information of referenced standard for making DataChannelID; See Table 12	Optional	unlimited
Author	String	Author of Data Channel List	Optional	1
DateCreated	DateTime	Date when Package is created	Optional	1

c) ConfigurationReference structure

Table 11 — ConfigurationReference structure

Name	Data type	Note	Mandatory/ Option	Max count
ID	String	Identifier of Data Channel List itself	Mandatory	1
Version	String	Version of DataChannelList	Optional	1
TimeStamp	DateTime	Modified Date and Time	Mandatory	1

d) VersionInformation structure

Table 12 — VersionInformation structure

Name	Data type	Note	Mandatory/ Option	Max count
NamingRule	String	Name of naming scheme	Mandatory	1
NamingSchemeVersion	String	Version of naming scheme corresponding to the Naming Rule; When a DataChannelID string is changed, this shall be changed. Adding/removing DataChannel shall keep the version.	Mandatory	1
ReferenceURL	String	Definition of Local Data Name structure	Optional	1

e) DataChannelList structure

Table 13 — DataChannelList structure

Name	Data type	Note	Mandatory/ Option	Max count
DataChannel	f) DataChannel	See Table 14	Mandatory	unlimited

f) DataChannel structure

Table 14 — DataChannel structure

Name	Data type	Note	Mandatory/ Option	Max count
DataChannelID	g) DataChannelID	See Table 15	Mandatory	1
Property	h) Property	See Table 16	Mandatory	1

g) DataChannelID structure

Table 15 — DataChannelID structure

Name	Data type	Note	Mandatory/ Option	Max count
LocalID	String	See 5.1.3	Mandatory	1
ShortID	String	See 5.1.4	Optional	1
NameObject	n) NameObject	Definition of Local Data Name structure, see Table 22	Optional	1

h) Property structure

Table 16 — Property structure

Name	Data type	Note	Mandatory/ Option	Max count
DataChannelType	i) DataChannelType	See Table 17 and 5.2 a)	Mandatory	1
Format	j) Format	See Table 18 and 5.2 b)	Mandatory	1
Range	l) Range	See Table 20 and 5.2 c)	Mandatory ^a	1
Unit	m) Unit	See Table 21 and 5.2 d)	Mandatory ^a	1
QualityCoding	String	See 5.2 e)	Optional	1
AlertPriority	String	See 5.2 f)	Optional	1
Name	String	See 5.2 g)	Optional	1
Remarks	String	See 5.2 h)	Optional	1

^a Range and Unit are required only when Data Channel Type is “decimal”.

i) DataChannelType structure

Table 17 — DataChannelType structure

Name	Data type	Note	Mandatory/ Option	Max count
Type	String	Described in accordance with Data Channel Type format shown in 5.2 a)	Mandatory	1
UpdateCycle	Real		Optional	1
CalculationPeriod	Real		Optional	1

j) Format structure

Table 18 — Format structure

Name	Data type	Note	Mandatory/ Option	Max count
Type	String	Described in accordance with Data Channel Type format shown in 5.2 b) .	Mandatory	1
Restriction	j) Restriction		Optional	1

k) Restriction structure

Table 19 — Restriction structure

Name	Data type	Note	Mandatory/ Option	Max count
Enumeration	String	Described in accordance with Data Channel Type format shown in 5.2 b) Table 3	Optional	unlimited
FractionDigits	NonNegativeInteger		Optional	1
Length	NonNegativeInteger		Optional	1
MaxExclusive	Real		Optional	1
MaxInclusive	Real		Optional	1
MaxLength	NonNegativeInteger		Optional	1
MinExclusive	Real		Optional	1
MinInclusive	Real		Optional	1
MinLength	NonNegativeInteger		Optional	1
Pattern	String		Optional	1
TotalDigits	PositiveInteger		Optional	1
WhiteSpace	One of the following: "Preserve" "Replace" "Collapse"		Optional	1

l) Range structure

Table 20 — Range structure

Name	Data type	Note	Mandatory/ Option	Max count
Low	Real	Lower limit of measuring range	Mandatory	1
High	Real	Upper limit of measuring range	Mandatory	1

m) Unit structure

Table 21 — Unit structure

Name	Data type	Note	Mandatory /Option	Max count
UnitSymbol	String	Unit symbol defined in the ISO 80000 series, the IEC 80000 series or Table 4	Mandatory	1
QuantityName	String	Quantity name defined in the ISO 80000 series, the IEC 80000 series or Table 4	Optional	1

n) NameObject structure

Table 22 — NameObject structure

Name	Data type	Note	Mandatory/ Option	Max count
NamingRule	String	See 5.1.3	Mandatory	1

7.5 Structure of Time Series Data

7.5.1 Data model

Time Series Data shall consist of the following elements.

a) Package

The Package element is data made up of a Header, which is a metadata, and TimeSeriesData, which is a main data body.

b) Header

The Header element contains the necessary metadata to link the Data in the Package to the right channels in the Data Channel List and the time in the real world.

This can be achieved by indicating when Time Series Data are created, who creates Time Series Data, an explicit reference to a specific Data Channel List, what Data Channels are included, the number of data and the measurement period of the Time Series Data.

If such kind of metadata are shared in advance by any means the Header element itself may be omitted or just formed by a list of Short IDs.

c) TimeSeriesData

The TimeSeriesData element is a main body of the Package and contains the Time Series Data defined in [Clause 6](#).

The TimeSeriesData element also represents a group of DataSet and is grouped by Data Channel List editions. Once the Data Channel List is updated and the updates affect the value of Time Series Data, this element shall be newly generated.

d) TabularData

The TabularData element contains a list of values defined in [6.2](#).

Tabular means an ordered list of measurement values that is reported with the same time stamp and the same update interval.

TabularData shall be grouped by the update interval.

e) EventData

The EventData element contains a list of (typically) irregularly updated values where a reference to the Data Channel List (LocalID or ShortID) is given for each data point (see [6.2](#) for details).

f) DataSet

The DataSet is a set of measurement values having the same time stamp. There are two types of DataSet, one is for TabularData, and the other is for EventData.

These elements are arranged in the hierarchical structure shown in [Figure 3](#), using UML. For more information on UML notation, refer to ISO/IEC 19505-1 and ISO/IEC 19505-2.

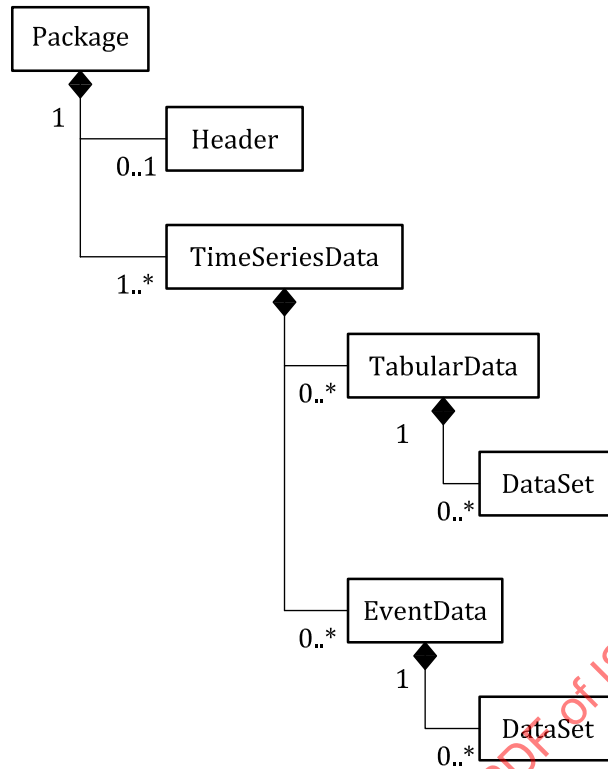


Figure 3 — Model of Time Series Data

7.5.2 Logical structure

The Time Series Data shall have the logical structure shown in [Figure 4](#), using UML. For more information on UML notation, refer to ISO/IEC 19505-1 and ISO/IEC 19505-2.

Time Series Data has Package. Package has Header and TimeSeriesData. TimeSeriesData includes one or more DataSet. DataSet has one TimeStamp and one or more Data.

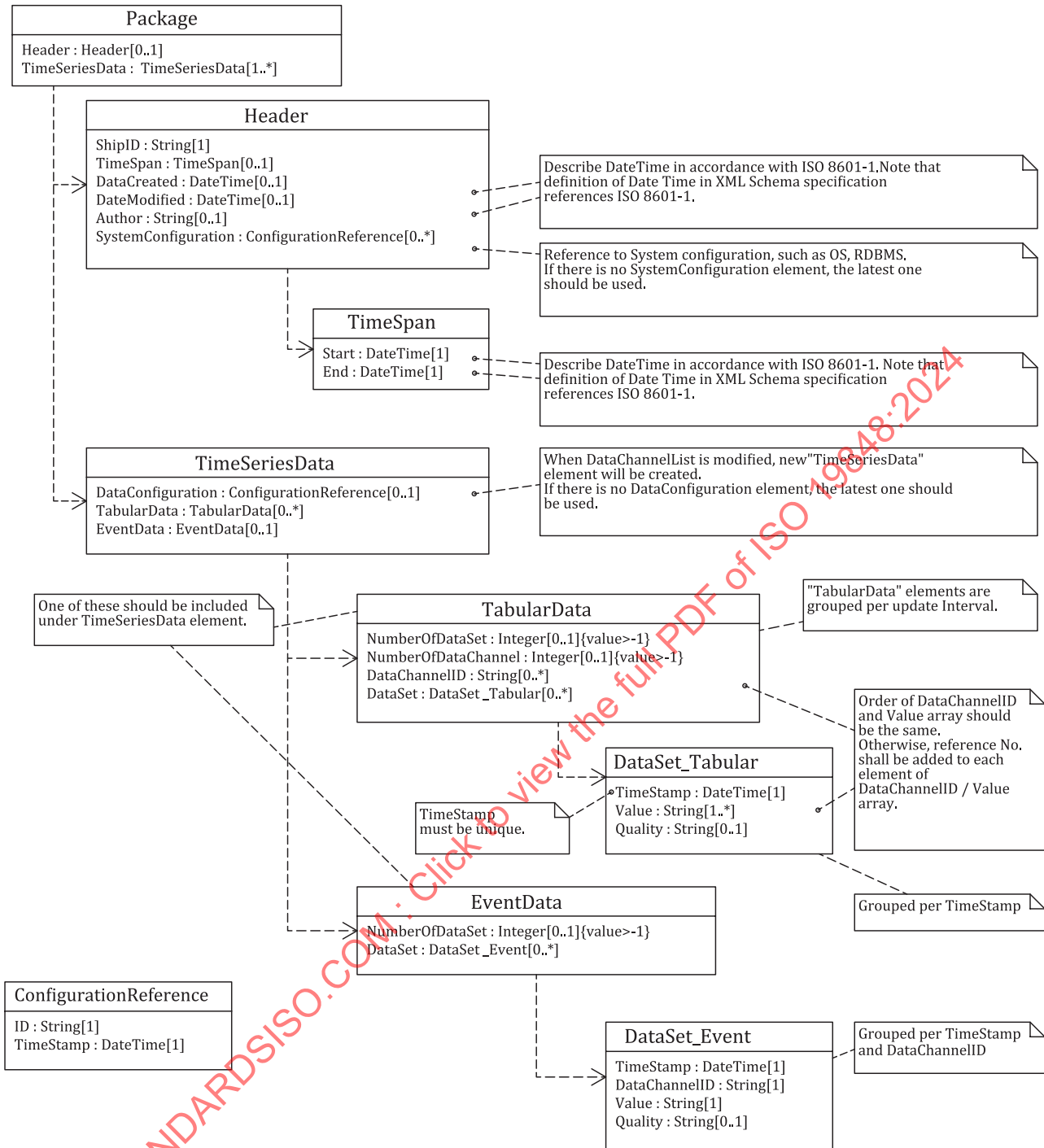


Figure 4 — Logical structure of Time Series Data

Details of each element are as described in [Tables 23](#) to [31](#).

a) Package structure

Table 23 — Package structure

Name	Data type	Note	Mandatory/ Option	Max count
Header	b) Header	See Table 24 . For periodic data exchange, this element can be omitted to reduce data size.	Optional	1
TimeSeriesData	e) TimeSeriesData	See Table 27 . TimeSeriesData are grouped by DataChannelList editions.	Mandatory	unlimited

b) Header structure

Table 24 — Header structure

Name	Data type	Note	Mandatory/ Option	Max count
ShipID	String	IMO number, HIN, etc.	Mandatory	1
TimeSpan	c) TimeSpan	See Table 25	Optional	1
DateCreated	DateTime	Date when Package is created	Optional	1
DateModified	DateTime	Date when Package is modified	Optional	1
Author	String	Author of data	Optional	1
SystemConfiguration	d) ConfigurationReference	See Table 26 . Reference to the configuration of systems, such as OS, RDBMS, etc.	Optional	unlimited

c) TimeSpan structure

Table 25 — TimeSpan structure

Name	Data type	Note	Mandatory/ Option	Max count
Start	DateTime	Time stamp of the oldest Data Set	Mandatory	1
End	DateTime	Time stamp of the newest Data Set	Mandatory	1

d) ConfigurationReference structure

Table 26 — ConfigurationReference structure

Name	Data type	Note	Mandatory/ Option	Max count
ID	String	Identifier of the configuration	Mandatory	1
TimeStamp	DateTime	Modified date and time of the configuration	Mandatory	1

e) TimeSeriesData structure

Table 27 — TimeSeriesData structure

Name	Data type	Note	Mandatory/ Option	Max count
DataConfiguration	d) ConfigurationReference	See Table 26 Reference to the DataChannel- List If there is a no reference, the latest DataChannelList shall be used.	Optional	1
TabularData	f) TabularData	See Table 28 and Clause 6	Optional	unlimited
EventData	g) EventData	See Table 29 and Clause 6	Optional	1

f) TabularData structure

Table 28 — TabularData structure

Name	Data type	Note	Mandatory/ Option	Max count
NumberOfDataSet	NonNegativeInteger	Number of DataSet in the Tabu- larData element	Optional	1
NumberOfDataChannel	NonNegativeInteger	Number of DataChannel in the TabularData element	Optional	1
DataChannelID	String	Array of one of the Data Chan- nel ID in 5.1 Order of DataChannelID ele- ments shall be same as Table 28 TabularData/Value. If the order of DataChannelID elements cannot be specified, reference number shall be added. Further, if the order of Data- ChannelID elements can be fixed and never changed, these elements may be omitted.	Optional	unlimited
DataSet	h) DataSet_Tabular	See Clause 6	Optional	* unlun- limited

g) EventData structure

Table 29 — EventData structure

Name	Data type	Note	Mandatory/ Option	Max count
NumberOfDataSet	NonNegativeInteger	Number of DataSet in the EventData element	Optional	1
DataSet	i) DataSet_Event	See 6.3 b)	Optional	unlimited

h) DataSet_Tabular structure

Table 30 — DataSet_Tabular structure

Name	Data type	Note	Mandatory/ Option	Max count
TimeStamp	DateTime	Time of measurement	Mandatory	1
Value	String	Array of measurement value of each data channel at TimeStamp. Order of Value elements shall be same as Table 28 . TabularData/DataChannelID. If the order of Value elements cannot be specified, reference number shall be added.	Mandatory	unlimited
Quality	String	Data quality of the Value above	Optional	1

i) DataSet_Event structure

Table 31 — DataSet_Event structure

Name	Data type	Note	Mandatory/ Option	Max count
TimeStamp	DateTime	Time of measurement	Mandatory	1
DataChannelID	String	One of the Data Channel ID in 5.1	Mandatory	1
Value	String	Measurement value	Mandatory	1
Quality	String	Data quality of the Value above	Optional	1

Annex A (normative)

General requirement of data implementation

A.1 General

A.1.1 Exchanging Data

Data which have a structure as written in Clause 7, will be implemented by XML, JSON or CSV.

Regardless of the implementation language, data shall comply as follows.

- Data shall be written by text and encoded by UTF-8 WITHOUT Byte Order Mark (BOM).

XML/JSON is recommended to exchange a snapshot of Time Series Data containing a single or a small number of Data Set(s), or a Data Channel List.

When using XML/JSON, since there is no schema validation mechanism, it is recommended that applications are developed with an environment that can communicate with the actual shipboard data server. CSV is recommended for especially large Time Series Data. In this case, the Data Channel List shall be shared in advance. XML/JSON is recommended for exchanging the Data Channel List.

A.1.2 Exchanging data as a file

The data file shall be designed to allow processing in various file systems.

To do this, the file shall comply with the following requirements.

- The name of the file shall be case-insensitive.
- The name of the file shall not start with "." (period).
- The name of the file shall not contain [\] [/] [:] [*] [?] ["] [<] [>] [|] and any white space characters.
- The length of the name of the file shall be less than or equal to 255 characters.

A.2 XML implementation

A.2.1 General

In this clause, requirements are shown of cases in which the data formats discussed in [Clause 7](#) are implemented using XML and XML Schemas.

XML implementation is not mandatory but when it is implemented, it shall be implemented in accordance with the requirements in [A.2](#).

XML Schema is formulated in accordance with the requirements and guidance described below.

- The minimum and maximum numbers of occurrences shall be defined.
- XML Schema shall be created to command XML to add Namespace to all elements and attributes. The following example shows the use of Namespace "nr".

EXAMPLE < nr:NamingRule nr:ID = "Naming_Scheme_ID"/ >

- The naming scheme's specific elements and attributes should belong to its own Namespace.

— Any newline or indent characters in the file shall not be treated as significant information.

A.2.2 Standard and XML schema data type

Standard data type in 7.3 is replaced with XML Schema data type in Table A.1.

Table A.1 — Correspondences between standard data type and XML schema data type

Standard data type	XML schema data type	Note
Integer	Integer	Integer number
PositiveInteger	PositiveInteger	Integer number that is 1 or larger
NonNegativeInteger	NonNegativeInteger	Integer number that is 0 or larger
Real	Decimal	Decimal number
DateTime	DateTime	ISO 8601-1 time and date
CharacterString	String	Random string of characters
Boolean	Boolean	Truth value
Null	XML Schema < element name = "example" type = "float" nillable = "true" /> XML Document < example nil = "true" />	When designating Null, designate Attribute nillable = "true" in the Element definition of XML Schema, and Attribute nillable = "true" in the corresponding Element in XML Document.

A.2.3 Data Channel List

a) Namespace

The following Namespace (sdd) shall be added to all the elements and attributes in Data Channel List.

XMLNamespace:sdd = urn:ISO19848:Ship_Data_Definition

In case of using naming scheme specific elements/attributes, namespace shall be used to avoid duplication.

The following example shows the use of Namespace "nr".

EXAMPLE XMLNamespace:nr = urn:ISO19848:Ship_Data_Definition:Naming_Scheme

b) XML Schema

When using XML, data structures in 7.4 shall be defined and validated by using the following XML Schema.

```
<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:sdd="urn:ISO19848:SHIP_DATA_DEFINITION"
  attributeFormDefault="unqualified" elementFormDefault="qualified"
  targetNamespace="urn:ISO19848:SHIP_DATA_DEFINITION"
  xmlns:xs="https://www.w3.org/2001/XMLSchema">

  <!--7.4.2 a) Package structure-->
  <xs:element name="Package" type="sdd:Package"/>

  <!--7.4.2 a) Package structure-->
  <xs:complexType name="Package">
    <xs:sequence>
      <!--7.4.2 b) Header structure-->
      <xs:element name="Header" type="sdd:Header" minOccurs="1" maxOccurs="1"/>
      <!--7.4.2 e) DataChannelList structure-->
      <xs:element name="DataChannelList" type="sdd:DataChannelList" minOccurs="1"
maxOccurs="1"/>
    </xs:sequence>
  </xs:complexType>
```

```

<!--7.4.2 b) Header structure-->
<xs:complexType name="Header">
  <xs:sequence>
    <!--IMO Number, HIN or other ship's identification number-->
    <xs:element name="ShipID" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <!--Identifier of this list, see 7.4.2 c)-->
    <xs:element name="DataChannelListID" type="sdd:ConfigurationReference"
      minOccurs="1" maxOccurs="1"/>
    <!--Version information of this list, see 7.4.2 d)-->
    <xs:element name="VersionInformation" type="sdd:VersionInformation"
      minOccurs="0" maxOccurs="unbounded"/>
    <!--Author of data-->
    <xs:element name="Author" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <!--Date when data are created-->
    <xs:element name="DateCreated" type="xs:dateTime" minOccurs="0" maxOccurs="1"/>
    <!--Extension point for custom headers-->
    <xs:any processContents="lax" namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<!--7.4.2 c) ConfigurationReference structure-->
<xs:complexType name="ConfigurationReference">
  <xs:sequence>
    <xs:element name="ID" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="Version" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <xs:element name="TimeStamp" type="xs:dateTime" minOccurs="1" maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>

<!--7.4.2 d) VersionInformation structure-->
<xs:complexType name="VersionInformation">
  <xs:sequence>
    <xs:element name="NamingRule" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="NamingSchemeVersion" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="ReferenceURL" type="xs:string" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>

<!--7.4.2 e) DataChannelList structure-->
<xs:complexType name="DataChannelList">
  <xs:sequence>
    <!--7.4.2 f) DataChannel structure-->
    <xs:element name="DataChannel" type="sdd:DataChannel" minOccurs="1"
maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<!--7.4.2 f) DataChannel structure-->
<xs:complexType name="DataChannel">
  <xs:sequence>
    <!--7.4.2 g) DataChannelID structure-->
    <xs:element name="DataChannelID" type="sdd:DataChannelID" minOccurs="1" maxOccurs="1"/>
    <!--7.4.2 h) Property structure-->
    <xs:element name="Property" type="sdd:Property" minOccurs="1" maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>

<!--7.4.2 g) DataChannelID structure-->
<xs:complexType name="DataChannelID">
  <xs:sequence>
    <xs:element name="LocalID" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="ShortID" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <!--7.4.2 n) NameObject structure-->
    <xs:element name="NameObject" type="sdd:NameObject" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>

<!--7.4.2 h) Property structure-->
<xs:complexType name="Property">
  <xs:sequence>
    <!--5.3 a) Identifier of Data Channel Type, such as raw numeric value,
average value, alarm and status, etc.-->

```

```

<xs:element name="DataChannelType" type="sdd:DataChannelType" minOccurs="1"
maxOccurs="1"/>
<!--5.3 b) Formats are for describing data formats-->
<!--Assumed data types are "Float","Integer","Boolean","Text" and "Symbol"-->
<xs:element name="Format" type="sdd:Format" minOccurs="1" maxOccurs="1"/>
<!--5.3 c) Range of measurement value-->
<xs:element name="Range" type="sdd:Range" minOccurs="0" maxOccurs="1"/>
<!--5.3 d) Unit and quantity of measurement value-->
<xs:element name="Unit" type="sdd:Unit" minOccurs="0" maxOccurs="1" />
<!--5.3 e) Name of data quality evaluation scheme-->
<xs:element name="QualityCoding" type="xs:string" minOccurs="0" maxOccurs="1"/>
<!--5.3 f) Priority of the alert if the DataChannel represents an alert-->
<xs:element name="AlertPriority" type="xs:string" minOccurs="0" maxOccurs="1"/>

<!--5.3 g) Names assigned in on-board control systems and other instruments-->
<xs:element name="Name" type="xs:string" minOccurs="0" maxOccurs="1"/>
<!--5.3 h) Remarks shall contains location, manufacturer and type of equipment-->
<xs:element name="Remarks" type="xs:string" minOccurs="0" maxOccurs="1"/>
<!--Extension point for custom properties-->
<xs:any processContents="lax" namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
</xs:complexType>

<!--7.4.2 i) DataChannelType structure-->
<!--5.3 a) Identifier of Data Channel Type, such as raw numeric value,
average value, alarm and status, etc.-->
<xs:complexType name="DataChannelType">
  <xs:sequence>
    <xs:element name="Type" minOccurs="1" maxOccurs="1">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="Inst"/>
          <xs:enumeration value="Average"/>
          <xs:enumeration value="Max"/>
          <xs:enumeration value="Min"/>
          <xs:enumeration value="StandardDeviation"/>
          <xs:enumeration value="Calculated"/>
          <xs:enumeration value="SetPoint"/>
          <xs:enumeration value="Output"/>
          <xs:enumeration value="Alert"/>
          <xs:enumeration value="Status"/>
          <xs:enumeration value="ManuallyInput"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <xs:element name="UpdateCycle" type="xs:decimal" minOccurs="0" maxOccurs="1"/>
    <xs:element name="CalculationPeriod" type="xs:decimal" minOccurs="0" maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>

<!--7.4.2 j) Format structure-->
<!--5.3 b) Format of measurement value-->
<xs:complexType name="Format">
  <xs:sequence>
    <!--Type of the Format-->
    <xs:element name="Type" minOccurs="1" maxOccurs="1">
      <xs:simpleType>
        <xs:restriction base="xs:string">
          <xs:enumeration value="Decimal"/>
          <xs:enumeration value="Integer"/>
          <xs:enumeration value="Boolean"/>
          <xs:enumeration value="String"/>
        </xs:restriction>
      </xs:simpleType>
    </xs:element>
    <!--7.4.2 k) Restriction of the value-->
    <xs:element name="Restriction" minOccurs="0" maxOccurs="1">
      <xs:complexType>
        <xs:choice maxOccurs="unbounded">
          <xs:element name="Enumeration" type="xs:string" minOccurs="0"
maxOccurs="unbounded"/>
          <xs:element name="FractionDigits" type="xs: nonNegativeInteger " minOccurs="0"

```

```

maxOccurs="1"/>
  <xs:element name="Length" type="xs:nonNegativeInteger" minOccurs="0"
maxOccurs="1"/>
  <xs:element name="MaxExclusive" type="xs:decimal" minOccurs="0" maxOccurs="1"/>
  <xs:element name="MaxInclusive" type="xs:decimal" minOccurs="0" maxOccurs="1"/>
  <xs:element name="MaxLength" type="xs:nonNegativeInteger" minOccurs="0"
maxOccurs="1"/>
  <xs:element name="MinExclusive" type="xs:decimal" minOccurs="0" maxOccurs="1"/>
  <xs:element name="MinInclusive" type="xs:decimal" minOccurs="0" maxOccurs="1"/>
  <xs:element name="MinLength" type="xs:nonNegativeInteger" minOccurs="0"
maxOccurs="1"/>
  <xs:element name="Pattern" type="xs:string" minOccurs="0" maxOccurs="1"/>
  <xs:element name="TotalDigits" type="xs:positiveInteger" minOccurs="0"
maxOccurs="1"/>
  <xs:element name="WhiteSpace" minOccurs="0" maxOccurs="1">
    <xs:simpleType>
      <xs:restriction base="xs:string">
        <xs:enumeration value="preserve"/>
        <xs:enumeration value="replace"/>
        <xs:enumeration value="collapse"/>
      </xs:restriction>
    </xs:simpleType>
  </xs:element>
</xs:choice>
</xs:complexType>
</xs:element>
</xs:sequence>
</xs:complexType>

<!--7.4.2 l) Range structure-->
<!--5.3 c) Range of measurement value-->
<xs:complexType name="Range">
  <xs:sequence>
    <!--Higher limit of measurement value-->
    <xs:element name="High" type="sdd:emptyOrDecimal" minOccurs="1" maxOccurs="1"/>
    <!--Lower limit of measurement value-->
    <xs:element name="Low" type="sdd:emptyOrDecimal" minOccurs="1" maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>

<!--7.4.2 m) Unit structure-->
<!--5.3 d) Unit and quantity of measurement value-->
<xs:complexType name="Unit">
  <xs:sequence>
    <!--Symbol of the unit-->
    <xs:element name="UnitSymbol" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <!--Quantity name of the measurement value, that is defined in ISO 80000, IEC 80000 or
Table2 -->
    <xs:element name="QuantityName" type="xs:string" minOccurs="0" maxOccurs="1"/>
    <!--Extension point for custom Unit element, such as Quantity Symbol, Scale Factor,
etc.-->
    <xs:any processContents="lax" namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<!--7.4.2 n) NameObject structure-->
<xs:complexType name="NameObject">
  <xs:sequence>
    <!--Name of NamingRule, see 5.2.3-->
    <xs:element name="NamingRule" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <!--Extension point for custom NameObjects, Definition of LocalDataName structure-->
    <xs:any processContents="lax" namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<!--empty value acceptable decimal-->
<xs:simpleType name="emptyOrDecimal">
  <xs:union memberTypes="sdd:empty xs:decimal"/>
</xs:simpleType>
<xs:simpleType name="empty">
  <xs:restriction base="xs:string">
    <xs:enumeration value=""/>
  </xs:restriction>
</xs:simpleType>

```

```

    </xs:restriction>
  </xs:simpleType>
</xs:schema>

```

c) XML representation

This example uses namespace:nr for custom elements. Custom elements are italicized for reference.

```

<?xml version="1.0" encoding="utf-8"?>
<Package xmlns="urn:ISO19848:SHIP_DATA_DEFINITION"
  xmlns:nr="urn:ISO19848:SHIP_DATA_DEFINITION:NAMING_SCHEME">
  <Header>
    <ShipID>IMO1234567</ShipID>
    <DataChannelListID>
      <ID>DataChannelList.xml</ID>
      <Version>1.0</Version>
      <TimeStamp>2016-01-01T00:00:00Z</TimeStamp>
    </DataChannelListID>
    <VersionInformation>
      <NamingRule>Naming_Scheme</NamingRule>
      <NamingSchemeVersion>2.0</NamingSchemeVersion>
      <ReferenceURL>http://somewhere.net</ReferenceURL>
    </VersionInformation>
    <Author>Author1</Author>
    <DateCreated>2015-12-01T00:00:00+00:00</DateCreated>
    <nr:CustomHeaderElement>Vender specific headers</nr:CustomHeaderElement>
  </Header>
  <DataChannelList>
    <DataChannel>
      <DataChannelID>
<LocalID>/Naming_Scheme/MainEngine/AirCooler1/CoolingFreshWater/Outlet/Temp
</LocalID>
        <ShortID>0010</ShortID>
        <NameObject>
          <NamingRule>Naming_Scheme</NamingRule>
          <nr:CustomNameObject>Vender specific NameObject</nr:CustomNameObject>
        </NameObject>
      </DataChannelID>
      <Property>
        <DataChannelType>
          <Type>Inst</Type>
          <UpdateCycle>1</UpdateCycle>
        </DataChannelType>
        <Format>
          <Type>Decimal</Type>
          <Restriction>
            <FractionDigits>1</FractionDigits>
            <MaxInclusive>200.0</MaxInclusive>
            <MinInclusive>-150.0</MinInclusive>
          </Restriction>
        </Format>
        <Range>
          <High>150.0</High>
          <Low>0.0</Low>
        </Range>
        <Unit>
          <UnitSymbol>°C</UnitSymbol>
          <QuantityName>Temperature</QuantityName>
        </Unit>
        <QualityCoding>OPC_QUALITY</QualityCoding>
        <Name>M/E #1 Air Cooler CFW OUT Temp</Name>
        <Remarks> Location: ECR, Manufacturer: AAA Company, Type: TYPE-AAA </Remarks>
        <nr:CustomPropertyElement>Vender specific Property</nr:CustomPropertyElement>
      </Property>
    </DataChannel>
    <DataChannel>
      <DataChannelID>
<LocalID>/Naming_Scheme/MainEngine/AirCooler1/CoolingFreshWater/Outlet/Press
</LocalID>
        <ShortID>0020</ShortID>

```

```

<NameObject>
  <NamingRule>Naming_Scheme</NamingRule>
  <nr:CustomNameObject>Vender specific NameObject</nr:CustomNameObject>
</NameObject>
</DataChannelID>
<Property>
  <DataChannelType>
    <Type>Average</Type>
    <UpdateCycle>60</UpdateCycle>
    <CalculationPeriod>3600</CalculationPeriod>
  </DataChannelType>
  <Format>
    <Type>Integer</Type>
    <Restriction>
      <FractionDigits>1</FractionDigits>
      <MaxInclusive>200.0</MaxInclusive>
      <MinInclusive>-150.0</MinInclusive>
    </Restriction>
  </Format>
  <Range>
    <High>150.0</High>
    <Low>0.0</Low>
  </Range>
  <Unit>
    <UnitSymbol>°C</UnitSymbol>
    <QuantityName>Temperature</QuantityName>
  </Unit>
  <QualityCoding>OPC_QUALITY</QualityCoding>
  <Name> M/E #1 Air Cooler CFW OUT Average Temp </Name>
  <Remarks> Location: ECR, Manufacturer: AAA Company, Type: TYPE-AAA </Remarks>
  <nr:CustomPropertyElement>Vender specific Property</nr:CustomPropertyElement>
</Property>
</DataChannel>
<DataChannel>
  <DataChannelID>

<LocalID>/Naming_Scheme/MainEngine/AirCooler1/CoolingFreshWater/Outlet/Temp/Alert
</LocalID>
  <ShortID>0011</ShortID>
  <NameObject>
    <NamingRule>Naming_Scheme</NamingRule>
    <nr:CustomNameObject>Vender specific NameObject</nr:CustomNameObject>
  </NameObject>
</DataChannelID>
<Property>
  <DataChannelType>
    <Type>Alert</Type>
  </DataChannelType>
  <Format>
    <Type>String</Type>
    <Restriction>
      <Enumeration>High</Enumeration>
      <Enumeration>Low</Enumeration>
      <Enumeration>Normal</Enumeration>
    </Restriction>
  </Format>
  <QualityCoding>OPC_QUALITY</QualityCoding>
  <Name> M/E #1 Air Cooler CFW OUT Temp Status </Name>
  <Remarks> Location: ECR, Manufacturer: AAA Company, Type: TYPE-AAA </Remarks>
  <nr:CustomPropertyElement>Vender specific Property</nr:CustomPropertyElement>
</Property>
</DataChannel>
<DataChannel>
  <DataChannelID>

<LocalID>/Naming_Scheme/MainEngine/AirCooler1/CoolingFreshWater/Outlet/Press/Alert
</LocalID>
  <ShortID>0021</ShortID>
  <NameObject>
    <NamingRule>Naming_Scheme</NamingRule>
    <nr:CustomNameObject>Vender specific NameObject</nr:CustomNameObject>
  </NameObject>

```

```

</DataChannelID>
<Property>
  <DataChannelType>
    <Type>Alert</Type>
  </DataChannelType>
  <Format>
    <Type>String</Type>
    <Restriction>
      <Enumeration>High</Enumeration>
      <Enumeration>Low</Enumeration>
      <Enumeration>Normal</Enumeration>
    </Restriction>
  </Format>
  <QualityCoding>OPC_QUALITY</QualityCoding>
  <AlertPriority>Alarm</AlertPriority>
  <Name> M/E #1 Air Cooler CFW OUT Press Status </Name>
  <Remarks> Location: ECR, Manufacturer: AAA Company, Type: TYPE-AAA </Remarks>
  <nr:CustomPropertyElement>Vender specific Property</nr:CustomPropertyElement>
</Property>
</DataChannel>
</DataChannelList>
</Package>

```

A.2.4 Time Series Data

a) Namespace

In Time Series Data, the following Namespace (sdt) shall be added.

XMLNamespace:sdt = urn:ISO19848:Ship_Data_Transport

b) XML Schema

When using XML, data structures in 7.5 shall be defined and validated by using the following XML Schema.

```

<?xml version="1.0" encoding="utf-8"?>
<xs:schema xmlns:sdt="urn:ISO 19848:SHIP_DATA_TRANSPORT"
  attributeFormDefault="unqualified" elementFormDefault="qualified"
  targetNamespace="urn:ISO 19848:SHIP_DATA_TRANSPORT"
  xmlns:xs="https://www.w3.org/2001/XMLSchema">

  <!--7.5.2 a) Package structure-->
  <xs:element name="Package" type="sdt:Package"/>

  <!--7.5.2 a) Package structure-->
  <xs:complexType name="Package">
    <xs:sequence>
      <!--7.5.2 b) Header structure-->
      <xs:element name="Header" type="sdt:Header"
        minOccurs="0" maxOccurs="1"/>
      <!--7.5.2 c) TimeSeriesData structure -->
      <xs:element name="TimeSeriesData" type="sdt:TimeSeriesData"
        minOccurs="1" maxOccurs="unbounded"/>
    </xs:sequence>
  </xs:complexType>

  <!--7.5.2 b) Header structure-->
  <xs:complexType name="Header">
    <xs:sequence>
      <!--IMO Number, HIN or other ship's identification number-->
      <xs:element name="ShipID" type="xs:string"
        minOccurs="1" maxOccurs="1"/>
      <!--7.5.2 c) TimeSpan structure-->
      <xs:element name="TimeSpan" type="sdt:TimeSpan"
        minOccurs="0" maxOccurs="1"/>
      <!--Date when data are created-->
      <xs:element name="DateCreated" type="xs:dateTime"
        minOccurs="0" maxOccurs="1"/>
      <!--Date when data are modified-->

```

```

<xs:element name="DateModified" type="xs:dateTime"
  minOccurs="0" maxOccurs="1"/>
<!--Author of data-->
<xs:element name="Author" type="xs:string"
  minOccurs="0" maxOccurs="1"/>
<!--7.5.2 d) Reference to system configuration -->
<xs:element name="SystemConfiguration" type="sdt:ConfigurationReference"
  minOccurs="0" maxOccurs="unbounded"/>
<!--Extension point for custom headers-->
<xs:any processContents="lax" namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
</xs:sequence>
</xs:complexType>

<!--7.5.2 c) TimeSpan structure-->
<xs:complexType name="TimeSpan">
  <xs:sequence>
    <!--TimeStamp of the oldest DataSet-->
    <xs:element name="Start" type="xs:dateTime" minOccurs="1" maxOccurs="1"/>
    <!--TimeStanp of the newest DataSet-->
    <xs:element name="End" type="xs:dateTime" minOccurs="1" maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>

<!--7.5.2 d) ConfigurationReference structure-->
<xs:complexType name="ConfigurationReference">
  <xs:sequence>
    <xs:element name="ID" type="xs:string" minOccurs="1" maxOccurs="1"/>
    <xs:element name="TimeStamp" type="xs:dateTime" minOccurs="1" maxOccurs="1"/>
  </xs:sequence>
</xs:complexType>

<!--DataChannelID structure-->
<!--Value must be Local ID or Shor ID strings. see 6.1 for the details.-->
<xs:complexType name="DataChannelID">
  <xs:simpleContent>
    <xs:extension base="xs:string">
      <!--Ordinal number of the DataChannelID array-->
      <xs:attribute name="id" type="xs:positiveInteger" use="required" />
    </xs:extension>
  </xs:simpleContent>
</xs:complexType>

<!--7.5.2 e) TimeSeriesData structure -->
<xs:complexType name="TimeSeriesData">
  <xs:sequence>
    <!--7.5.2 d) ConfigurationReference structure -->
    <xs:element name="DataConfiguration" type="sdt:ConfigurationReference"
      minOccurs="0" maxOccurs="1" />
    <!--7.5.2 f) TabularData structure -->
    <xs:element name="TabularData" type="sdt:TabularData"
      minOccurs="0" maxOccurs="unbounded" />
    <!--7.5.2 g) EventData structure -->
    <xs:element name="EventData" type="sdt:EventData"
      minOccurs="0" maxOccurs="1" />
    <!--Extension point for custom data kinds-->
    <xs:any processContents="lax" namespace="##other" minOccurs="0" maxOccurs="unbounded"/>
  </xs:sequence>
</xs:complexType>

<!--7.5.2 f) TabularData structure -->
<xs:complexType name="TabularData">
  <xs:sequence>
    <!--Number of DataSet elements under the hierarchy -->
    <xs:element name="NumberOfDataSet" type="xs:nonNegativeInteger"
      minOccurs="0" maxOccurs="1" />
    <!--Number of DataChannels for each DataSources-->
    <xs:element name="NumberOfDataChannel" type="xs:nonNegativeInteger"
      minOccurs="0" maxOccurs="1"/>
    <!--Identifiers of target DataChannels-->
    <xs:element name="DataChannelID" type="sdt:DataChannelID"
      minOccurs="0" maxOccurs="unbounded"/>
    <!--7.5.2 h) DataSet structure -->

```

```

        <xs:element name="DataSet" type="sdt:DataSet_Tabular"
            minOccurs="0" maxOccurs="unbounded" />
    </xs:sequence>
</xs:complexType>

<!--7.5.2 g) EventData structure -->
<xs:complexType name="EventData">
    <xs:sequence>
        <!--Number of DataSet elements under the hierarchy -->
        <xs:element name="NumberOfDataSet" type="xs:nonNegativeInteger"
            minOccurs="0" maxOccurs="1" />
        <!--7.5.2 i) DataSet structure -->
        <xs:element name="DataSet" type="sdt:DataSet_Event"
            minOccurs="0" maxOccurs="unbounded" />
    </xs:sequence>
</xs:complexType>

<!--7.5.2 h) DataSet structure for Tabular Data -->
<xs:complexType name="DataSet_Tabular">
    <xs:sequence>
        <!--Measurement value -->
        <!--Measurement value can be empty-->
        <xs:element name="Value" type="sdt:Value"
            minOccurs="1" maxOccurs="unbounded"/>
    </xs:sequence>
    <!--ISO 8601-1 date & time structure shall be used-->
    <xs:attribute name="timeStamp" type="xs:dateTime" use="required"/>
</xs:complexType>

<!--7.5.2 i) DataSet structure for Event Data-->
<xs:complexType name="DataSet_Event">
    <xs:sequence>
        <xs:element name="DataChannelID" type="xs:string"
            minOccurs="1" maxOccurs="1"/>
        <!--Measurement value -->
        <!--Measurement value can be empty-->
        <xs:element name="Value" type="xs:string"
            minOccurs="1" maxOccurs="1"/>
    </xs:sequence>
    <!--ISO 8601-1 date & time structure shall be used-->
    <xs:attribute name="timeStamp" type="xs:dateTime" use="required"/>

    <xs:attribute name="quality" type="xs:string" use="optional"/>
</xs:complexType>

<!--Value structure for Tabular Data -->
<xs:complexType name="Value">
    <xs:simpleContent>
        <xs:extension base="xs:string">
            <!--Ordinal number of the Value array.
            Order of the array shall be the same as TabularData/DataChannelID array.-->
            <xs:attribute name="ref" type="xs:positiveInteger" use="required" />
            <xs:attribute name="quality" type="xs:string" use="optional"/>
        </xs:extension>
    </xs:simpleContent>
</xs:complexType>
</xs:schema>

```

c) XML representation

An example of XML representation is as follows.

```

<?xml version="1.0" encoding="utf-8" ?>
<Package xmlns="urn:ISO19848:SHIP_DATA_TRANSPORT">
    <Header>
        <ShipID>IMO1234567</ShipID>
        <TimeSpan>
            <Start>2016-01-01T12:00:00Z</Start>
            <End>2016-01-03T12:00:00Z</End>
        </TimeSpan>
        <DateCreated>2016-01-03T12:00:00Z</DateCreated>
    </Header>

```

```

<DateModified>2016-01-03T12:00:00Z</DateModified>
<Author>Shipboard data server</Author>
<SystemConfiguration>
  <ID>SystemConfiguration.xml</ID>
  <TimeStamp>2016-01-01T00:00:00Z</TimeStamp>
</SystemConfiguration>
<SystemConfiguration>
  <ID>SystemConfiguration.xml</ID>
  <TimeStamp>2016-01-03T00:00:00Z</TimeStamp>
</SystemConfiguration>
</Header>
<TimeSeriesData>
  <DataConfiguration>
    <ID>DataChannelList.xml</ID>
    <TimeStamp>2016-01-01T00:00:00Z</TimeStamp>
  </DataConfiguration>
  <TabularData>
    <NumberOfDataSet>2</NumberOfDataSet>
    <NumberOfDataChannel>2</NumberOfDataChannel>
    <!--ShortID of the DataChannel -->
    <DataChannelID id="1">0010</DataChannelID>
    <DataChannelID id="2">0020</DataChannelID>
    <DataSet timeStamp="2016-01-01T12:00:00Z">
      <!--TabularData/DataSet/Value@ref references TabularData/DataChannelID@id -->
      <!--measurement value of Data Channel:0010 at 2016-01-01T12:00:00Z -->
      <Value ref="1" quality="0">100.0</Value>
      <!--measurement value of Data Channel:0020 at 2016-01-01T12:00:00Z -->
      <Value ref="2" quality="0">200.0</Value>
    </DataSet>
    <DataSet timeStamp="2016-01-02T12:00:00Z">
      <!--measurement value of Data Channel:0010 at 2016-01-02T12:00:00Z -->
      <Value ref="1" quality="0">100.5</Value>
      <!--measurement value of Data Channel:0020 at 2016-01-02T12:00:00Z -->
      <Value ref="2" quality="0">205.0</Value>
    </DataSet>
  </TabularData>
  <TabularData>
    <NumberOfDataSet>3</NumberOfDataSet>
    <NumberOfDataChannel>1</NumberOfDataChannel>
    <DataChannelID id="1">0010</DataChannelID>
    <DataSet timeStamp="2016-01-01T12:00:00Z">
      <Value ref="1" quality="0">100.0</Value>
    </DataSet>
    <DataSet timeStamp="2016-01-02T00:00:00Z">
      <Value ref="1" quality="0">100.2</Value>
    </DataSet>
    <DataSet timeStamp="2016-01-02T12:00:00Z">
      <Value ref="1" quality="0">100.5</Value>
    </DataSet>
  </TabularData>
  <EventData>
    <NumberOfDataSet>3</NumberOfDataSet>
    <DataSet timeStamp="2016-01-01T12:00:01Z" quality="0">
      <DataChannelID>0011</DataChannelID>
      <Value>HIGH</Value>
    </DataSet>
    <DataSet timeStamp="2016-01-01T12:00:01Z" quality="0">
      <DataChannelID>0021</DataChannelID>
      <Value>HIGH</Value>
    </DataSet>
    <DataSet timeStamp="2016-01-01T12:00:23Z" quality="0">
      <DataChannelID>0011</DataChannelID>
      <Value>NORMAL</Value>
    </DataSet>
  </EventData>
</TimeSeriesData>
<TimeSeriesData>
  <DataConfiguration>
    <ID>DataChannelList.xml</ID>
    <TimeStamp>2016-01-03T00:00:00Z</TimeStamp>
  </DataConfiguration>
  <TabularData>

```

```

<NumberOfDataSet>1</NumberOfDataSet>
<NumberOfDataChannel>2</NumberOfDataChannel>
<DataChannelID id="1">0010</DataChannelID>
<DataChannelID id="2">0020</DataChannelID>
<DataSet timeStamp="2016-01-03T12:00:00Z">
  <Value ref="1" quality="0">101.0</Value>
  <Value ref="2" quality="0">210.0</Value>
</DataSet>
</TabularData>
<TabularData>
  <NumberOfDataSet>2</NumberOfDataSet>
  <NumberOfDataChannel>1</NumberOfDataChannel>
  <DataChannelID id="1">0010</DataChannelID>
  <DataSet timeStamp="2016-01-03T00:00:00Z">
    <Value ref="1" quality="0">100.8</Value>
  </DataSet>
  <DataSet timeStamp="2016-01-03T12:00:00Z">
    <Value ref="1" quality="0">101.0</Value>
  </DataSet>
</TabularData>
</TimeSeriesData>
</Package>

```

NOTE This example shows that both system configurations and Data Channel List are modified at 2016-01-03T00:00:00Z, therefore this example has two Time Series Data elements. Further, Data Channel 0010, 0020 have 24 h update intervals and 0110 have 12 h update intervals. Therefore, this example has two TabularData elements for each TimeSeriesData element.

A.3 JSON implementation

A.3.1 General

This clause defines how to describe the data by using JSON.

JSON implementation is not mandatory but when it is implemented, it shall be implemented in accordance with the requirements in [A.3](#).

- Extension of the file shall be “json”.
- Any newline or indent characters in the file shall not be treated as significant information.
- XML element with namespace shall convert to JSON element as it is. For example, <xml:Element>Value</xml:Element> is converted to {“xml:Element”: “Value”}.

A.3.2 Standard and JSON schema data type

Standard data type in [2.3](#) is replaced with JSON schema data type in [Table A.2](#).

Table A.2 — Correspondences between standard data type and JSON schema data type

Standard data type	JSON schema data type	Note
Integer	integer	Integer number
PositiveInteger	integer (with minimum:1)	Integer number that is 1 or larger
NonNegativeInteger	integer (with minimum:0)	Integer number that is 0 or larger
Real	number	Decimal number
DateTime	string (with format:date-time)	ISO 8601-1 time and date
CharacterString	string	Random string of characters
Boolean	boolean	Truth value
Null	null	Empty value

A.3.3 Data Channel List

a) JSON schema

When using JSON, data structures in [7.4](#) shall be defined and validated by using the following JSON schema.

```
{
  "$schema": "https://json-schema.org/draft/2020-12/schema",
  "$id": "urn:ISO19848:Ship_Data_Definition",
  "title": "DataChannelListPackage",
  "description": "A DataChannelList package for ISO19848",
  "type": "object",
  "properties": {
    "Package": {
      "$ref": "#/definitions/Package"
    }
  },
  "additionalProperties": false,
  "required": [
    "Package"
  ],
  "definitions": {
    "Package": {
      "type": "object",
      "properties": {
        "Header": {
          "$ref": "#/definitions/Header"
        },
        "DataChannelList": {
          "$ref": "#/definitions/DataChannelList"
        }
      },
      "required": [
        "Header",
        "DataChannelList"
      ],
      "additionalProperties": false
    },
    "Header": {
      "type": "object",
      "properties": {
        "ShipID": {
          "type": "string"
        },
        "DataChannelListID": {
          "$ref": "#/definitions/ConfigurationReference"
        },
        "VersionInformation": {
          "$ref": "#/definitions/VersionInformation"
        },
        "Author": {
          "type": "string"
        },
        "DateCreated": {
          "type": "string",
          "format": "date-time"
        }
      },
      "required": [
        "ShipID",
        "DataChannelListID"
      ]
    },
    "VersionInformation": {
      "type": "object",
      "properties": {
        "NamingRule": {
          "type": "string"
        },
        "NamingSchemeVersion": {
          "type": "string"
        }
      }
    }
  }
}
```

```

    },
    "ReferenceURL": {
      "type": "string"
    }
  },
  "required": [
    "NamingRule",
    "NamingSchemeVersion"
  ],
  "additionalProperties": false
},
"DataChannelList": {
  "type": "object",
  "properties": {
    "DataChannel": {
      "type": "array",
      "items": {
        "$ref": "#/definitions/DataChannel"
      }
    }
  },
  "required": [
    "DataChannel"
  ],
  "additionalProperties": false
},
"DataChannel": {
  "type": "object",
  "properties": {
    "DataChannelID": {
      "$ref": "#/definitions/DataChannelID"
    },
    "Property": {
      "$ref": "#/definitions/Property"
    }
  },
  "required": [
    "DataChannelID",
    "Property"
  ],
  "additionalProperties": false
},
"DataChannelID": {
  "type": "object",
  "properties": {
    "LocalID": {
      "type": "string"
    },
    "ShortID": {
      "type": "string"
    },
    "NameObject": {
      "$ref": "#/definitions/NameObject"
    }
  },
  "required": [
    "LocalID"
  ],
  "additionalProperties": false
},
"NameObject": {
  "type": "object",
  "properties": {
    "NamingRule": {
      "type": "string"
    }
  },
  "required": [
    "NamingRule"
  ]
},
"Property": {

```

```

"type": "object",
"properties": {
  "DataChannelType": {
    "$ref": "#/definitions/DataChannelType"
  },
  "Format": {
    "$ref": "#/definitions/Format"
  },
  "Range": {
    "$ref": "#/definitions/Range"
  },
  "Unit": {
    "$ref": "#/definitions/Unit"
  },
  "QualityCoding": {
    "type": "string"
  },
  "AlertPriority": {
    "type": "string"
  },
  "Name": {
    "type": "string"
  },
  "Remarks": {
    "type": "string"
  }
},
"required": [
  "DataChannelType",
  "Format"
],
},
"DataChannelType": {
  "type": "object",
  "properties": {
    "Type": {
      "type": "string"
    },
    "UpdateCycle": {
      "type": "number"
    },
    "CalculationPeriod": {
      "type": "number"
    }
  },
  "required": [
    "Type"
  ],
  "additionalProperties": false
},
"Format": {
  "type": "object",
  "properties": {
    "Type": {
      "type": "string"
    },
    "Restriction": {
      "$ref": "#/definitions/Restriction"
    }
  },
  "required": [
    "Type"
  ],
  "additionalProperties": false
},
"Range": {
  "type": "object",
  "properties": {
    "High": {
      "type": "number"
    },
    "Low": {

```

```

        "type": "number"
      },
    ],
    "required": [
      "High",
      "Low"
    ],
    "additionalProperties": false
  },
  "Unit": {
    "type": "object",
    "properties": {
      "UnitSymbol": {
        "type": "string"
      },
      "QuantityName": {
        "type": "string"
      }
    },
    "required": [
      "UnitSymbol"
    ]
  },
  "Restriction": {
    "type": "object",
    "properties": {
      "Enumeration": {
        "type": "array",
        "items": {
          "type": "string"
        }
      },
      "FractionDigits": {
        "type": "integer",
        "minimum": 0
      },
      "Length": {
        "type": "integer",
        "minimum": 0
      },
      "MaxExclusive": {
        "type": "number"
      },
      "MaxInclusive": {
        "type": "number"
      },
      "MaxLength": {
        "type": "integer",
        "minimum": 0
      },
      "MinExclusive": {
        "type": "number"
      },
      "MinInclusive": {
        "type": "number"
      },
      "MinLength": {
        "type": "integer",
        "minimum": 0
      },
      "Pattern": {
        "type": "string"
      },
      "TotalDigits": {
        "type": "integer",
        "minimum": 1
      },
      "WhiteSpace": {
        "type": "string",
        "enum": [
          "Preserve",
          "Replace",

```

```

        "Collapse"
      ]
    }
  },
  "additionalProperties": false
},
"ConfigurationReference": {
  "type": "object",
  "properties": {
    "ID": {
      "type": "string"
    },
    "Version": {
      "type": "string"
    },
    "TimeStamp": {
      "type": "string",
      "format": "date-time"
    }
  },
  "required": [
    "ID",
    "TimeStamp"
  ],
  "additionalProperties": false
}
}
}

```

b) JSON representation

An example of a JSON representation is given below.

```

{
  "Package": {
    "Header": {
      "ShipID": "IMO1234567",
      "DataChannelListID": {
        "ID": "DataChannelList.xml",
        "Version": "1.0",
        "TimeStamp": "2016-01-01T00:00:00Z"
      },
      "VersionInformation": {
        "NamingRule": "Naming_Scheme",
        "NamingSchemeVersion": "2.0",
        "ReferenceURL": "http://somewhere.net"
      },
      "Author": "Author1",
      "DateCreated": "2015-12-01T00:00:00Z",
      "nr:CustomHeaderElement": "Vender specific headers"
    },
    "DataChannelList": {
      "DataChannel": [{
        "DataChannelID": {
          "LocalID":
"/Naming_Scheme/MainEngine/AirCooler1/CoolingFreshWater/Outlet/Temp",
          "ShortID": "0010",
          "NameObject": {
            "NamingRule": "Naming_Scheme",
            "nr:CustomNameObject": "Vender specific NameObject"
          }
        }
      ]
    },
    "Property": {
      "DataChannelType": {
        "Type": "Inst",
        "UpdateCycle": 1
      },
      "Format": {
        "Type": "Decimal",
        "Restriction": {
          "FractionDigits": 1,
          "MaxInclusive": 200.0,

```

```

        "MinInclusive": -150.0
    },
    "Range": {
        "High": 150.0,
        "Low": 0.0
    },
    "Unit": {
        "UnitSymbol": "°C",
        "QuantityName": "Temperature"
    },
    "QualityCoding": "OPC_QUALITY",
    "Name": "M/E #1 Air Cooler CFW OUT Temp",
    "Remarks": " Location: ECR, Manufacturer: AAA Company, Type: TYPE-AAA ",
    "nr:CustomPropertyElement": "Vender specific Property"
}, {
    "DataChannelID": {
        "LocalID":
"/Naming_Scheme/MainEngine/AirCooler1/CoolingFreshWater/Outlet/Press",
        "ShortID": "0020",
        "NameObject": {
            "NamingRule": "Naming_Scheme",
            "nr:CustomNameObject": "Vender specific NameObject"
        }
    },
    "Property": {
        "DataChannelType": {
            "Type": "Average",
            "UpdateCycle": 60,
            "CalculationPeriod": 3600
        },
        "Format": {
            "Type": "Integer",
            "Restriction": {
                "FractionDigits": 1,
                "MaxInclusive": 200.0,
                "MinInclusive": -150.0
            }
        },
        "Range": {
            "High": 150.0,
            "Low": 0.0
        },
        "Unit": {
            "UnitSymbol": "°C",
            "QuantityName": "Temp"
        },
        "QualityCoding": "OPC_QUALITY",
        "Name": "M/E #1 Air Cooler CFW OUT Average Temp ",
        "Remarks": " Location: ECR, Manufacturer: AAA Company, Type: TYPE-AAA ",
        "nr:CustomPropertyElement": "Vender specific Property"
    }, {
        "DataChannelID": {
            "LocalID":
"/Naming_Scheme/MainEngine/AirCooler1/CoolingFreshWater/Outlet/Temp/Alert",
            "ShortID": "0011",
            "NameObject": {
                "NamingRule": "Naming_Scheme",
                "nr:CustomNameObject": "Vender specific NameObject"
            }
        },
        "Property": {
            "DataChannelType": {
                "Type": "Alert"
            },
            "Format": {
                "Type": "String",
                "Restriction": {
                    "Enumeration": [
                        "High",

```

```

        "Low",
        "Normal"
    ]
}
}, {
    "QualityCoding": "OPC_QUALITY",
    "AlertPriority": "Alarm",
    "Name": " M/E #1 Air Cooler CFW OUT Temp Status ",
    "Remarks": " Location: ECR, Manufacturer: AAA Company, Type: TYPE-AAA ",
    "nr:CustomPropertyElement": "Vender specific Property"
}
}, {
    "DataChannelID": {
        "LocalID":
            "/Naming_Scheme/MainEngine/AirCooler1/CoolingFreshWater/Outlet/Press/Alert",
        "ShortID": "0021",
        "NameObject": {
            "NamingRule": "Naming_Scheme",
            "nr:CustomNameObject": "Vender specific NameObject"
        }
    },
    "Property": {
        "DataChannelType": {
            "Type": "Alert"
        },
        "Format": {
            "Type": "String",
            "Restriction": {
                "Enumeration": [
                    "High",
                    "Low",
                    "Normal"
                ]
            }
        }
    },
    "QualityCoding": "OPC_QUALITY",
    "Name": " M/E #1 Air Cooler CFW OUT Press Status ",
    "Remarks": " Location: ECR, Manufacturer: AAA Company, Type: TYPE-AAA ",
    "nr:CustomPropertyElement": "Vender specific Property"
}
}]
}
```

A.3.4 Time Series Data

a) JSON schema

When using JSON, data structures in 7.5 shall be defined and validated by using the following JSON schema.

```
{
  "$schema": "https://json-schema.org/draft/2020-12/schema",
  "$id": "urn:ISO19848:Ship_Data_Transport",
  "title": "TimeSeriesDataPackage",
  "description": "A TimeSeriesData package for ISO19848",
  "type": "object",
  "properties": {
    "Package": {
      "$ref": "#/definitions/Package"
    }
  },
  "additionalProperties": false,
  "required": [
    "Package"
  ],
  "definitions": {
    "Package": {
      "type": "object",
      "required": [
        "TimeSeriesData"
      ]
    }
  }
}
```

```

    "properties": {
      "Header": {
        "$ref": "#/definitions/Header"
      },
      "TimeSeriesData": {
        "type": "array",
        "items": {
          "$ref": "#/definitions/TimeSeriesData"
        }
      }
    },
    "additionalProperties": false
  },
  "Header": {
    "type": "object",
    "required": [
      "ShipID"
    ],
    "properties": {
      "ShipID": {
        "type": "string"
      },
      "TimeSpan": {
        "$ref": "#/definitions/TimeSpan"
      },
      "DateCreated": {
        "type": "string",
        "format": "date-time"
      },
      "DateModified": {
        "type": "string",
        "format": "date-time"
      },
      "Author": {
        "type": "string"
      },
      "SystemConfiguration": {
        "type": "array",
        "items": {
          "$ref": "#/definitions/ConfigurationReference"
        }
      }
    }
  },
  "TimeSpan": {
    "type": "object",
    "required": [
      "Start",
      "End"
    ],
    "properties": {
      "Start": {
        "type": "string",
        "format": "date-time"
      },
      "End": {
        "type": "string",
        "format": "date-time"
      }
    },
    "additionalProperties": false
  },
  "ConfigurationReference": {
    "type": "object",
    "required": [
      "ID",
      "TimeStamp"
    ],
    "properties": {
      "ID": {
        "type": "string"
      }
    }
  },

```

```

        "TimeStamp": {
            "type": "string",
            "format": "date-time"
        }
    },
    "additionalProperties": false
},
"TimeSeriesData": {
    "type": "object",
    "required": [],
    "properties": {
        "DataConfiguration": {
            "$ref": "#/definitions/ConfigurationReference"
        },
        "TabularData": {
            "type": "array",
            "items": {
                "$ref": "#/definitions/TabularData"
            }
        },
        "EventData": {
            "$ref": "#/definitions/EventData"
        }
    }
},
"TabularData": {
    "type": "object",
    "required": [],
    "properties": {
        "NumberOfDataSet": {
            "type": "integer",
            "minimum": 0
        },
        "NumberOfDataChannel": {
            "type": "integer",
            "minimum": 0
        },
        "DataChannelID": {
            "type": "array",
            "items": {
                "type": "string"
            }
        },
        "DataSet": {
            "type": "array",
            "items": {
                "$ref": "#/definitions/DataSet_Tabular"
            }
        }
    }
},
"additionalProperties": false
},
"EventData": {
    "type": "object",
    "required": [],
    "properties": {
        "NumberOfDataSet": {
            "type": "integer",
            "minimum": 0
        },
        "DataSet": {
            "type": "array",
            "items": {
                "$ref": "#/definitions/DataSet_Event"
            }
        }
    }
},
"additionalProperties": false
},
"DataSet_Tabular": {
    "type": "object",
    "required": [

```

```

        "TimeStamp",
        "Value"
    ],
    "properties": {
        "TimeStamp": {
            "type": "string",
            "format": "date-time"
        },
        "Value": {
            "type": "array",
            "items": {
                "type": "string"
            }
        },
        "Quality": {
            "type": "array",
            "items": {
                "type": "string"
            }
        }
    },
    "additionalProperties": false
},
"DataSet_Event": {
    "type": "object",
    "required": [
        "TimeStamp",
        "DataChannelID",
        "Value"
    ],
    "properties": {
        "TimeStamp": {
            "type": "string",
            "format": "date-time"
        },
        "DataChannelID": {
            "type": "string"
        },
        "Value": {
            "type": "string"
        },
        "Quality": {
            "type": "string"
        }
    },
    "additionalProperties": false
}
}
}

```

b) JSON representation

An example of a JSON representation is as follows.

```

{
  "Package": {
    "Header": {
      "ShipID": "IMO1234567",
      "TimeSpan": {
        "Start": "2016-01-01T12:00:00Z",
        "End": "2016-01-03T12:00:00Z"
      },
      "DateCreated": "2016-01-03T12:00:00Z",
      "DateModified": "2016-01-03T12:00:00Z",
      "Author": "Shipboard data server",
      "SystemConfiguration": [{
        "ID": "SystemConfiguration.xml",
        "TimeStamp": "2016-01-01T00:00:00Z"
      }, {
        "ID": "SystemConfiguration.xml",
        "TimeStamp": "2016-01-03T00:00:00Z"
      }
    ]
  }
}

```

```

    ]]
  },
  "TimeSeriesData": [{
    "DataConfiguration": {
      "ID": "DataChannelList.xml",
      "TimeStamp": "2016-01-01T00:00:00Z"
    },
    "TabularData": [{
      "NumberOfDataSet": 2,
      "NumberOfDataChannel": 2,
      "DataChannelID": ["0010", "0020"],
      "DataSet": [{
        "TimeStamp": "2016-01-01T12:00:00Z",
        "Value": [ "100.0", "200.0" ],
        "Quality": ["0", "0"]
      }, {
        "TimeStamp": "2016-01-02T12:00:00Z",
        "Value": [ "100.5", "205.0" ],
        "Quality": ["0", "0"]
      }
    ]
  }, {
    "NumberOfDataSet": 3,
    "NumberOfDataChannel": 1,
    "DataChannelID": ["0110"],
    "DataSet": [{
      "TimeStamp": "2016-01-01T12:00:00Z",
      "Value": [ "100.0" ],
      "Quality": ["0"]
    }, {
      "TimeStamp": "2016-01-02T00:00:00Z",
      "Value": [ "100.2" ],
      "Quality": ["0"]
    }, {
      "TimeStamp": "2016-01-02T12:00:00Z",
      "Value": [ "100.3" ],
      "Quality": ["0"]
    }
  ]
}],
  "EventData": {
    "NumberOfDataSet": 3,
    "DataSet": [{
      "TimeStamp": "2016-01-01T12:00:01Z",
      "DataChannelID": "0011",
      "Value": "HIGH",
      "Quality": "0"
    }, {
      "TimeStamp": "2016-01-01T12:00:01Z",
      "DataChannelID": "0021",
      "Value": "HIGH",
      "Quality": "0"
    }, {
      "TimeStamp": "2016-01-01T12:00:23Z",
      "DataChannelID": "0011",
      "Value": "NORMAL",
      "Quality": "0"
    }
  ]
}, {
  "DataConfiguration": {
    "ID": "DataChannelList.xml",
    "TimeStamp": "2016-01-03T00:00:00Z"
  },
  "TabularData": [{
    "NumberOfDataSet": 1,
    "NumberOfDataChannel": 2,
    "DataChannelID": ["0010", "0020"],
    "DataSet": [{
      "TimeStamp": "2016-01-03T12:00:00Z",
      "Value": [ "101.0", "210.0" ],
      "Quality": ["0", "0"]
    }
  ]
}, {

```

```

    "NumberOfDataSet": 2,
    "NumberOfDataChannel": 1,
    "DataChannelID": ["0110"],
    "DataSet": [{
      "TimeStamp": "2016-01-03T00:00:00Z",
      "Value": ["100.8"],
      "Quality": ["0"]
    }, {
      "TimeStamp": "2016-01-03T12:00:00Z",
      "Value": [ "101.0" ],
      "Quality": ["0"]
    }]
  }]
}

```

NOTE Same as XML implementation, this example shows that both system configuration and Data Channel List are modified at 2016-01-03T00:00:00Z. Therefore, this example has two Time Series Data elements. Further, Data Channel 0010, 0020 have 24 h update intervals and 0110 have 12 h update intervals. Therefore, this example has two TabularData elements for each TimeSeriesData element.

A.4 CSV implementation

A.4.1 General

This clause defines the way to describe the data by using CSV.

CSV is only available for Time Series Data and shall be used in combination with the Data Channel List described in XML/JSON.

CSV shall be implemented in accordance with the following requirements and guidance.

- CSV shall be described in accordance with RFC 4180.
- Extension of the file shall be “csv”.
- Tabular Data and Event Data shall be described separately.
- CSV shall have the same number of columns in all rows.
- The Header row (1st row) may be omitted when Data Channel in the data can be clearly identified. For example, if the order of Data Channel in CSV is the same order as the Alias List described in accordance with ISO 19847:2024, 6.4, the header row may be omitted.

A.4.2 Tabular Data

CSV describes Tabular Data as follows:

TimeStamp,	DataChannelID_1,	DataChannelID_2,	...	DataChannelID_N
TimeStamp_1,	Value_1-1,	Value-1-2,	...	...
...	...	...	...	...
TimeStamp_M,	...	...	...	Value_M-N

where

- | | |
|-----------------|--|
| TimeStamp_M | is the measurement date and time; |
| DataChannelID_N | is the one of the following: Universal ID, Local ID, Short ID; and |
| Value_M-N | is the measurement value of DataChannelID_N at TimeStamp_M. |

Example of CSV for Tabular Data by using Short ID is as follows:

TimeStamp,	0010,	0020
2016-01-01T12:00:00Z,	100,	200
2016-01-02T12:00:00Z,	100,	205
2016-01-03T12:00:00Z,	101,	210

where 0010, 0020 is the Short ID of some Data Channel.

A.4.3 Event Data

CSV describes Event Data as follows:

TimeStamp,	DataChannelID,	Value
TimeStamp_1,	DataChannelID_1,	Value_1-1
...	...	...
TimeStamp_M,	DataChannelID_N,	Value_M-N

where

TimeStamp_M is the measurement date and time;

DataChannelID_N is the one of the following: Universal ID, Local ID, Short ID; and

Value_M-N is the measurement value of DataChannelID_N at TimeStamp_M.

Example of CSV for Event Data by using Short ID is as follows:

TimeStamp, DataChannelID,	Value
2016-01-01T12:00:01Z, 0011,	HIGH
2016-01-01T12:00:01Z, 0021,	HIGH
2016-01-01T12:01:23Z, 0011,	NORMAL

where 0011, 0021 is the Short ID of some Data Channel.

Annex B (informative)

Examples of Local ID definitions — jsmea_codebook

B.1 Codebook

B.1.1 General

Local ID is constructed by a combination of standardized terms listed in a dictionary called a Codebook.

The jsmea_codebook is composed of seven kinds of codebooks:

- jsmea_mac: codebook for engine and machinery
- jsmea_nav: codebook for navigational equipment
- jsmea_oil: codebook for oil properties
- jsmea_mot: codebook for ship's motion
- jsmea_voy: codebook for voyage report
- jsmea_wea: codebook for weather around the ship
- jsmea_com: codebook for terms commonly used for the above codebooks

Terms in the codebooks are combined in accordance with common naming scheme, described in [B.1.2](#), for constructing Local IDs.

B.1.2 Naming scheme

A Local ID should be named in accordance with guidelines that are unified respectively in each naming scheme.

As an example of jsmea_mac naming scheme, a method for naming a Local ID by dividing the term of a sensor name into five levels and combining these terms is introduced.

These levels are common for each Codebook but the meaning of Category and SubCategory is different.

Details of the various levels are shown in [Table B.1](#).

Table B.1 — List of levels

Level	Description	Example
T1: Category	Rough category of target name Typically used to describe discrete equipment, systems, phenomena, and materials that are measured.	MainEngine, DieselGeneratorSet CoolingSeaWaterSystem
T2: SubCategory	A part of the above category. Component, or parts which compose the above systems or measurement devices/methods for the above phenomena, and materials.	Cylinder TurboCharger FuelOilLine
T3: Content	Materials or phenomena in the above Category / SubCategory; e.g. oil or gas that flows through a pipeline.	HeavyFuelOil CoolingFreshWater ExhaustGas
T4: Position	Relative positions of measuring devices in the target equipment.	Inlet Outlet Port
T5: Item	Indicates temperatures, pressures and other measured objects.	Temperature Pressure Speed
Suffix (Optional)	Only if the Data Channel cannot be specified with the elements shown above (from “System” to “Item”), a suffix may be added after Local ID to identify the Data Channel. Suffixes may consist of a modifier and DataChannelType as shown below. Suffix: ../<modifier>/<DataChannelType>	A modifier is typically used to describe a correction parameter such as temperature for fuel oil viscosity, like “at15degC” . In case of Event/Alert data, a modifier is used for identifying Event/Alert cause, such as “HIGH”, “RUN”, “ABNORMALSTOP”.

According to the categorizing and naming scheme defined by “jsmea_mac”, [Table B.2](#) shows an example of “Main Engine #3 Air Cooler Cooling Fresh Water Outlet Temperature” for the ship whose IMO number is “IMO1234567”.

Table B.2 — Example of Universal ID

ShipID	Naming Rule	Local Data Name				
		Category	SubCategory	Content	Position	Item
IMO1234567	jsmea_mac	MainEngine	AirCooler3	CoolingFreshWater	Outlet	Temperature

In this case, the < Universal ID > and < Local ID > of the analogue data are as follows.

< Universal ID > = http://IMO1234567/jsmea_mac/MainEngine/AirCooler3/CoolingFreshWater/Outlet/Temp//Inst

< Local ID > = /jsmea_mac/MainEngine/AirCooler3/CoolingFreshWater/Outlet/Temp//Inst

If there are high alerts regarding above DataChannel, the < Universal ID > and < Local ID > are as follows.

< Universal ID > = http://IMO1234567/jsmea_mac/MainEngine/AirCooler3/CoolingFreshWater/Outlet/Temp/High/Alert

< Local ID > = /jsmea_mac/MainEngine/AirCooler3/CoolingFreshWater/Outlet/Temp/High/Alert

This case value could be 1 or 0.

The below IDs are also acceptable.

< Universal ID > = http://IMO1234567/jsmea_mac/MainEngine/AirCooler3/CoolingFreshWater/Outlet/Temp/State/Alert

< Local ID > = /jsmea_mac/MainEngine/AirCooler3/CoolingFreshWater/Outlet/Temp/State /Alert

This case value could be "High", "Normal", "Low", etc.

B.1.3 Name Object

When writing the Local ID structure in a Data Channel List, the Name Object, projection of the levels described in [B.1.1](#), is added under the Data Channel element.

[Figure B.1](#) shows an example of adding the Name Object in "jsmea_mac", drawn by UML. For more information on UML notation, refer to ISO/IEC 19505-1 and ISO/IEC 19505-2. In this example, three attributes — ID, Code and Name — are added under Name Object to describe details.

STANDARDSISO.COM : Click to view the full PDF of ISO 19848:2024

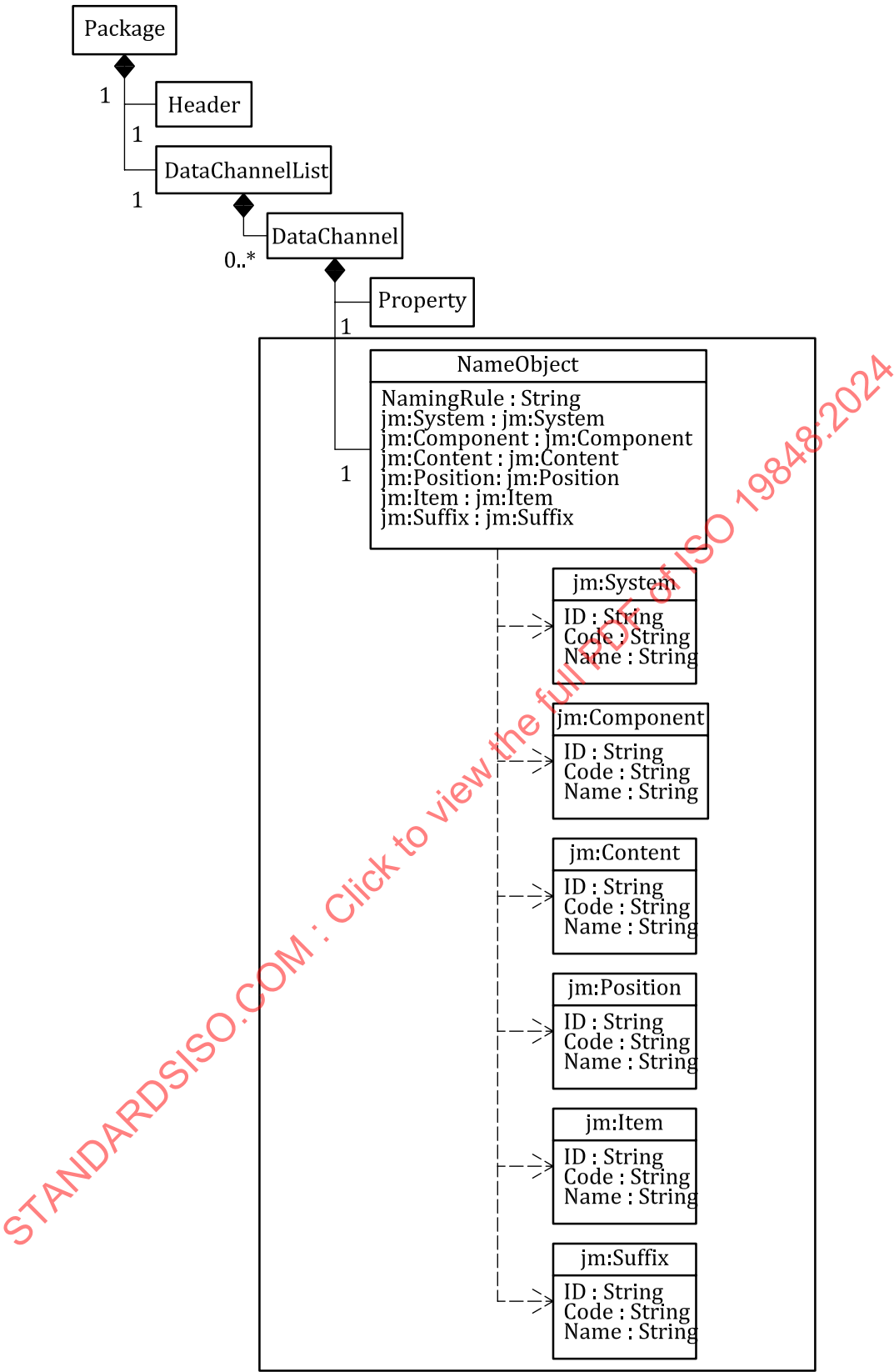


Figure B.1 — Logical structure of Data Channel List to which Name Object is added

B.1.4 Structure of codebook

The codebook is a list of standard names that corresponds to the Name Object, and created for each Name Object as shown in the example in [Table B.3](#).

In the codebook, the following are described:

- ID, which is part of Local ID;
- Code, machine-friendly name that corresponds to the ID;
- Name, that is for human readability; and
- its description.

Table B.3 — Example of Codebook entry

ID	Code	Name	Description
MainEngine	1ME01	No.1 Main Engine	No. 1 Diesel engine for propulsion

B.2 Example of codebook

B.2.1 Overview

[Tables B.4](#) to [B.18](#) show descriptions of the examples of the JSMEA codebook series.

Some of the rows in the "description" column in [Tables B.4](#) to [B.18](#) are left blank as their meaning is clear from the "name" column.

Descriptions of the abbreviated terms used in [Tables B.4](#) to [B.18](#) are provided in [Table B.25](#).

The master version of the codebook, as well as change histories and other resources, can be found in Reference [\[14\]](#).

Although the codebooks in [Tables B.4](#) to [B.18](#) are examples, the terms described here are guaranteed to be identical to those of the master version, even if there are typographical errors. This also applies to any future versions.

If the use of the name is deprecated for any reason, the Deprecated flag is given.

B.2.2 jsmea_mac — engine and machinery codebook

B.2.2.1 General

The codebook called "jsmea_mac" is intended to describe the name of sensor data related to a ship's machinery equipment and systems, such as the main propulsion system and power generation system.

B.2.2.2 T1: Category

Table B.4 — T1: Category of jsmea_mac

Code	Name	Description
MacT1001	AirConditioner	A system for heating, ventilation, and air conditioning, consisting of air conditioners, fans, dampers, etc. It is mainly for accomodation areas and does not include the engine room/ cargo ventilation system.
MacT1040	AlarmMonitoringSystem	Alarm system for main engine and other machineries required by the class societies.
MacT1002	AUXBoiler	Steam generation/supply system that is not used for propulsion and power generation and whose heat source is not exhaust gas, but includes auxiliary equipment (FeedWater-Pump, etc.) that is unique to the boiler.

Table B.4 (continued)

Code	Name	Description
MacT1003	BallastSystem	A system consisting of tanks, valves, pumps, etc., for ballast control. This includes equipment for ballast water treatment system (BWTS)/heel control.
MacT1004	BilgeSludgeSystem	Treatment system for waste oil, sludge, oily water, etc.
MacT1005	BoilerWaterSystem	Condensing and water supply system for boilers, which is composed of condensers, cascade tanks, etc. Auxiliary equipment installed in individual boilers are not included.
MacT1006	CargoPumpSystem	A pump used for transferring cargo liquid and its driving devices (steam, electric, hydraulic), which includes motor/turbine, but does not include generators/boilers.
MacT1007	CompressionAirSystem	A system for supplying compressed air for control and drive, consisting of compressors, valves, reservoirs, etc., which includes control air, but does not include noncompressed air such as air conditioning.
MacT1008	CoolingFreshWaterSystem	A system for cooling and supplying fresh water for cooling machinery, consisting of pumps, valves and heat exchangers.
MacT1009	CoolingSeaWaterSystem	A system for supplying seawater for cooling, consisting of pumps, valves, heat exchangers, etc.
MacT1010	DieselGeneratorSet	Generators, diesel engines, auxiliary equipment and piping systems for each GenSet used for supplying electric power.
MacT1011	DrinkWaterSystem	A system to supply fresh drinking water, consisting of pumps, valves and distillation equipment.
MacT1012	EmergencyGeneratorSystem	Emergency power generation/feeding equipment consisting of emergency generators, batteries, emergency switchboards, etc.
MacT1013	EngineRoom	Engine room itself.
MacT1014	ExhaustGasBoiler	Steam generation/supply system that uses exhaust gas as a heat source installed independently of the equipment. The source of the exhaust gas is not limited.
MacT1015	ExhaustGasRecirculationSystem	Low pressure EGR system (return from the turbo charger (T/C) turbine outlet to the compressor inlet), which includes valves, scrubbers, coolers and blowers.
MacT1016	FinStabilizerSystem	A roll reducing system with movable fins, which includes fins and its drive and control devices.
MacT1017	FireFightingSystem	Fire extinguishing equipment excluding the seawater system shared with other uses. The method is not limited to steam, CO ₂ , etc.
MacT1018	FreshWaterSystem	Fresh water that is not used for cooling and drinking, which includes warm water. Drinking water is distinguished separately (DrinkWaterSystem).
MacT1019	FuelGasSystem	A system for storing and supplying fuel gas used in various equipment such as main engines, generators, and boilers. Auxiliary equipment for each device are not included.
MacT1020	FuelOilSystem	A system for storing and supplying fuel oil used in various equipment such as main engines, generators and boilers. Auxiliary equipment for each device are not included.
MacT1021	HydraulicSystem	A system for controlling and driving equipment by hydraulic pressure. The equipment itself is not included.
MacT1022	Incinerator	Incinerator for garbage, waste oil, etc.
MacT1023	InertGasSystem	A system for generating, cleaning and supplying inert gas (cleaned and cooled exhaust gas or N ₂).
MacT1024	LubOilSystem	A system for storing and supplying lubricants used in various equipment such as main engines, generators and boilers.

Table B.4 (continued)

Code	Name	Description
MacT1025	MainEngine	A prime mover used mainly for propulsion of ships, which includes dual fuel, gas engines, propulsion generator engines. But does not include turbines.
MacT1041	MainSteamTurbine	Steam turbine for propulsion.
MacT1026	MainSwitchBoardRoom	Switchboard room itself.
MacT1027	NOxSCRSystem	A low-pressure NO _x selective catalytic reduction (SCR) system installed downstream of the T/C turbine, which is installed independently from the prime mover.
MacT1028	PowerElectricSystem	Equipment for supplying and distributing power, such as switchboards and power electronic devices, which does not include generators/drive devices (drive inverters, etc.) .
MacT1029	PropulsionDriveSystem	Propulsion device and its transmission system, which includes controllable pitch propeller (CPP), contra-rotating propeller (CRP) gear, clutch, shaft, etc. In case of electric propulsion, this includes motors and inverters.
MacT1030	ProvisionRefrigerator	Refrigerator for food storage.
MacT1031	ReLiquefiedSystem	Equipment for reliquefying LNG/LPG boil-off gas (BOG), composed of compressors, heat exchangers, etc.
MacT1032	SeaWaterSystem	Seawater systems that are not used for cooling, which include fire and bilge pump, fire and general service pump, etc.
MacT1033	ShaftGeneratorMotorSystem	A generator connected to the propulsion shaft by some means, which includes reduction gear inverters, etc.
MacT1034	SOxScrubberSystem	SO _x scrubber equipped independently of the prime mover.
MacT1035	SteamSystem	Steam supply system, which does not include steam generators and consumer equipment.
MacT1036	SteeringGear	Equipment used for driving rudder, such as actuators, gears, pumps, motors and control devices.
MacT1042	ThermalOilHeater	
MacT1037	Thruster	Propulsion units used for dynamic positioning and transverse directioning such as side thrusters and azimuth thrusters, etc.
MacT1038	TurbineGeneratorSet	A generator driven by a steam turbine, which does not include generators using gas turbine. The source of steam is not limited.
MacT1039	VentilationFan	Ventilation system for engine room and cargo hold, which includes a damper. Ventilation system for accommodation is not included.

B.2.2.3 T2: Sub Category

Table B.5 — T2: Sub Category of jsmea_mac

Code	Name	Description
MacT2001	AirCooler	Air cooling device for the equipment specified in T1. This does not include air conditioner for accommodation areas.
MacT2002	AirCoolerCommon	Air cooling device commonly used by the equipment specified in T1. This does not include air conditioner for accommodation areas.
MacT2003	AirHornAirLine	Air line for air horn
MacT2172	AirReservoirEmergencyGenerator	Air reservoir for emergency generator
MacT2173	AirReservoirEmergencyShutOffValve	Air reservoir for emergency shut off valve

Table B.5 (continued)

Code	Name	Description
MacT2004	AUXAirCompressor	
MacT2174	AUXAirReservoir	
MacT2005	AUXBlower	Blower for supplying air to main engine
MacT2006	AzimuthThruster	Thrusters can be rotated to any horizontal angle.
MacT2007	AzimuthThrusterPropeller	Propeller for azimuth thruster
MacT2008	BallastPump	
MacT2175	BallastWaterManagementSystem	Ballast water management system or ballast water treatment system
MacT2009	BilgePump	
MacT2176	BilgeSeparatorOilContentMonitor	
MacT2010	BilgeSeparatorServicePump	
MacT2177	BilgeWell	
MacT2011	BoilerWaterCirculatingPumpMainEngine	Boiler water circulating pump for exhaust gas economizer (EGE) system fitted to main engine
MacT2012	BoilerWaterCirculatingPumpDieselGeneratorSet	Boiler water circulating pump for EGE fitted to diesel generator
MacT2013	BoilerWaterFeedLine	Water supply line to the boiler unit
MacT2014	BowThruster	Side thrusters equipped on the bow
MacT2015	BowThrusterMotor	Electric motor for driving BowThruster
MacT2016	BowThrusterPropeller	Screw Propeller equipped in BowThruster
MacT2017	Burner	Burners used in boilers, incinerators, etc.
MacT2018	BurnerFuelOilLine	Fuel supply line to boiler burners
MacT2019	BypassSideDamperMainEngine	Damper for bypassing T1 equipment for Main Engine (economizer, etc.)
MacT2020	BypassSideDamperDieselGeneratorSet	Damper for bypassing T1 equipment for Diesel Generator (economizer, etc.)
MacT2178	CamShaft	
MacT2021	CascadeTank	Feed water filter tank, which filters oil and iron contents, etc.
MacT2022	CascadeTankFillingLine	Water filling line to Cascade tank
MacT2023	Compressor	Air compressor
MacT2024	Condenser	A condenser for boilers, which does not include capacitors (electrical device)
MacT2025	CondenserCoolingFreshWaterPump	Fresh water pump for cooling condenser
MacT2179	ControllablePitchPropeller	
MacT2180	ControllablePitchPropellerHydraulicOilTank	Hydraulic oil tank for controllable pitch propeller
MacT2181	ControllablePitchPropellerLubOilSumpTank	Lubricating oil sump tank for controllable pitch propeller
MacT2026	ControlAirLine	Compressed air line for pneumatic control device
MacT2182	ControlAirReservoir	
MacT2027	CoolingSeaWaterLine	
MacT2028	CoolingSeaWaterPump	
MacT2029	Crankcase	
MacT2183	CrankcaseOilMistDetector	
MacT2030	CrossheadBearing	Bearing for crosshead of slider-crank linkage
MacT2031	Cylinder	

Table B.5 (continued)

Code	Name	Description
MacT2032	CylinderCommon	
MacT2033	CylinderLiner	
MacT2034	CylinderOilLine	
MacT2184	CylinderOilMeasuringTank	
MacT2035	DieselOilBunkerLine	Pipeline for bunkering diesel oil
MacT2036	DieselOilPurifier	
MacT2037	DieselOilServicePumpMainEngine	
MacT2038	DieselOilServicePumpDieselGeneratorSet	
MacT2185	DieselOilSettlingTank	
MacT2039	DieselOilServiceTank	
MacT2040	DieselOilTransferPump	
MacT2041	DistilledWaterLine	
MacT2042	DrinkWaterPump	
MacT2043	DrivingShaft	
MacT2044	Drum	Boiler steam drum
MacT2045	Engine	Recipocating engine of internal combustion engine
MacT2186	ElectroStaticDischargeProtection	
MacT2187	EmergencySwitchboard	
MacT2188	EngineInterfaceControlUnit	
MacT2046	EngineRoomExhaustFan	
MacT2047	EngineRoomSupplyFan	
MacT2048	ExcessSteamDumpValve	
MacT2049	ExhaustGasEconomizerMainEngine	Steam generation part of boiler using exhaust gas from main engine as a heat source
MacT2050	ExhaustGasEconomizerDieselGeneratorSet	Steam generation part of boiler using exhaust gas from diesel generator as a heat source
MacT2051	ExhaustGasLine	Flue for exhausting gas overboard
MacT2052	ExhaustValve	Exhaust valve of diesel engine
MacT2053	ExhaustValveActuator	Actuator for exhaust gas valve
MacT2054	ExhaustValveSpringAir	Compressed air of pneumatic valve springs for exhaust gas valve
MacT2055	ExpansionTank	
MacT2189	ExpansionTankDieselGeneratorSet	
MacT2190	ExpansionTankMainEngine	
MacT2191	FeedWaterLine	Water feed line for a boiler
MacT2056	FeedWaterPump	
MacT2057	FeedWaterRegulator	
MacT2058	FireBilgePump	
MacT2059	FireGeneralServiceWaterPump	
MacT2060	FireMainLine	
MacT2061	ForcedDraftFan	
MacT2062	FreshWaterGenerator	
MacT2063	FreshWaterPump	
MacT2064	FuelCommand	Command for changing fuel oil supply rate
MacT2065	FuelOilBunkerLine	Pipline for bunkering residual fuel oil

Table B.5 (continued)

Code	Name	Description
MacT2066	FuelOilBurningPump	
MacT2067	FuelOilCirculatingPumpMainEngine	
MacT2068	FuelOilCirculatingPumpDieselGeneratorSet	
MacT2069	FuelOilHeaterMainEngine	
MacT2070	FuelOilHeaterDieselGeneratorSet	
MacT2071	FuelOilInjectionSystem	
MacT2072	FuelOilInjector	
MacT2192	FuelOilDrainTank	
MacT2073	FuelOilLeakLine	
MacT2193	FuelOilLeakTank	
MacT2074	FuelOilLine	
MacT2075	FuelOilLineCommon	
MacT2194	FuelOilOverFlowTank	
MacT2076	FuelOilPump	
MacT2077	FuelOilPumpActuator	
MacT2078	FuelOilPurifier	Purifier for residual oil
MacT2195	FuelOilPurifierHeater	
MacT2079	FuelOilPurifierSupplyPump	
MacT2080	FuelOilSecondaryFilterCommon	
MacT2081	FuelOilSecondaryFilterMainEngine	
MacT2082	FuelOilSecondaryFilterDieselGeneratorSet	
MacT2083	FuelOilServiceTank	
MacT2196	FuelOilServiceTankAUXBoiler	
MacT2084	FuelOilSettlingTank	
MacT2085	FuelOilShifterHeater	
MacT2086	FuelOilShifterPump	
MacT2197	FuelOilSludgeTank	
MacT2087	FuelOilSupplyPumpMainEngine	
MacT2088	FuelOilSupplyPumpDieselGeneratorSet	
MacT2089	FuelOilTransferPump	
MacT2090	FuelRail	
MacT2091	FuelRailPressureSensor	
MacT2092	GeneralAirLine	
MacT2093	Generator	Electric power generator (excludes prime mover)
MacT2198	GeneratorACB	
MacT2094	GeneratorBearing	
MacT2095	GlandSeal	Steam turbine gland seal
MacT2199	Governor	A device used to regulate the speed of a machine
MacT2096	GovernorEndBearing	
MacT2097	HeelingPump	Pump for filling and discharging water into the tank for ship heel control
MacT2098	HighPressureDrum	
MacT2200	HighPressureTurbine	High pressure turbine for steam turbine
MacT2099	HighTempCoolingFreshWaterLine	High temperature fresh water system for jacket cooling of diesel engines

Table B.5 (continued)

Code	Name	Description
MacT2100	HighTempCoolingFreshWaterPump	
MacT2101	HighTempCoolingFreshWaterTempControlValve	
MacT2102	HighVoltageMainSwtichboard	Switchboard with AC1 000V or higher
MacT2103	HotWaterCirculatingPump	
MacT2201	HydraulicOilTank	
MacT2104	IntermediateShaftBearing	
MacT2105	LowPressureDrum	
MacT2202	LowPressureTurbine	Low pressure turbine for steam turbine
MacT2106	LowSulfurHeavyFuelOilServiceTank	
MacT2107	LowSulfurHeavyFuelOilSettlingTank	
MacT2108	LowTempCoolingFreshWaterLine	
MacT2109	LowTempCoolingFreshWaterPump	
MacT2110	LowTempCoolingFreshWaterTempControlValve	
MacT2111	LowVoltageMainSwitchboard	Switchboard less than AC1 000V
MacT2112	LowVoltageSwitchboard	
MacT2203	LubOilDrainTank	
MacT2113	LubOilFilter	
MacT2114	LubOilLine	
MacT2115	LubOilOverFlowTankMainEngine	
MacT2116	LubOilOverFlowTankDieselGeneratorSet	
MacT2117	LubOilPrimingPump	
MacT2118	LubOilPrimingPumpDieselGeneratorSet	
MacT2119	LubOilPrimingPumpTurbineGeneratorSet	
MacT2120	LubOilPumpMainEngine	
MacT2121	LubOilPumpDieselGeneratorSet	
MacT2204	LubOilPurifier	
MacT2122	LubOilPurifierMainEngine	
MacT2123	LubOilPurifierDieselGeneratorSet	
MacT2124	LubOilPurifierFeedPumpMainEngine	
MacT2125	LubOilPurifierFeedPumpDieselGeneratorSet	
MacT2205	LubOilPurifierHeaterMainEngine	
MacT2206	LubOilPurifierHeaterDieselGeneratorSet	
MacT2207	LubOilSecondaryFilterMainEngine	
MacT2208	LubOilSecondaryFilterDieselGeneratorSet	
MacT2209	LubOilSludgeTank	
MacT2126	LubOilSumpTank	
MacT2127	LubOilTransferPump	
MacT2128	MainAirCompressor	
MacT2129	MainAirReservoir	Air reservoir for starting main engine
MacT2210	MainBearing	The bearing that holds the crankshaft in position and allows it to rotate in the engine block
MacT2130	MainTransformer	Transformer for step-down from high voltage (1 000V~) to low voltage (~1 000V)
MacT2211	MarineGasOilServiceTank	
MacT2131	PinionGeneratorSideBearing	Reducer pinion generator side bearing

Table B.5 (continued)

Code	Name	Description
MacT2132	PinionTurbineSideBearing	Reducer pinion turbine side bearing
MacT2133	PistonCooling	
MacT2134	PressureReducingValve	
MacT2135	Propeller	Screw Propeller
MacT2136	PurifierRoomExhaustFan	
MacT2212	ReductionGearLubOilTank	
MacT2213	RemoteControlSystem	A system for controlling machinery from a remote location on board
MacT2137	RoomSpace	Atmosphere in the room
MacT2138	SafetyAirLine	Compressed air line for driving emergency shut-down system
MacT2214	SafetySystem	
MacT2139	ScavAirSpace	
MacT2140	ScavAirSpaceCommon	Scavenging air space commonly used for each cylinder
MacT2141	ServoOilPump	
MacT2142	ServoOilRail	
MacT2143	ServoOilRailPressureSensor	
MacT2144	ShaftSpaceSupplyFan	Ventilation fan for main shaft space
MacT2145	SideDamperMainEngine	Damper that changes line to the main engine side
MacT2146	SideDamperDieselGeneratorSet	Damper that changes line to diesel generator side
MacT2147	SludgePump	
MacT2148	SootBlowerMainEngine	
MacT2149	StartAirLine	Compressed air line for starting diesel engine
MacT2215	StartAirValve	
MacT2150	SteamLine	
MacT2216	SteeringGearControlCircuit	Control circuit for steering gear
MacT2151	SteeringGearMotor	Motor used to drive steering gear
MacT2152	SternThruster	Side thrusters equipped on the stern
MacT2153	SternThrusterMotor	Electric motor for driving stern thruster
MacT2154	SternThrusterPropeller	Screw propeller equipped in stern thruster
MacT2155	SternTube	
MacT2156	SternTubeAirSeal	Air seal that isolates sea and ship at the stern tube
MacT2157	SternTubeBearing	Bearing that holds the main shaft in the stern tube
MacT2158	SternTubeForwardSealLubOilPump	Lubricating oil pump for stern tube forward seal
MacT2159	SternTubeLubOilPump	Lubricating oil pump for stern tube
MacT2217	SternTubeLubOilSumpTank	Lubricating oil sump tank for stern tube
MacT2160	SternTubeLubOilTank	Lubricating oil tank for stern tube
MacT2218	SternTubeSealOilGravityTank	
MacT2219	SternTubeSealOilTank	
MacT2220	System	System described in the category itself
MacT2221	ThermalOilLine	
MacT2161	ThrustBearing	
MacT2162	TotalElectric	Total available electric power on a ship
MacT2163	Turbine	Turbine such as steam turbines and turbochargers

Table B.5 (continued)

Code	Name	Description
MacT2164	TurboCharger	
MacT2165	TurboChargerLubOilPumpMainEngine	Lubricating oil pump for turbo charger of main engine
MacT2222	TurboChargerLubOilTankMainEngine	
MacT2166	TurboChargerLubOilPumpDieselGeneratorSet	Lubricating oil pump for turbo charger of diesel generator set
MacT2223	TurboChargerLubOilTankDieselGeneratorSet	
MacT2167	UnderPassageFan	
MacT2168	WasteOilTank	
MacT2169	WasteOilTankExhaustFan	
MacT2170	WheelGeneratorSideBearing	Reducer wheel generator side bearing
MacT2171	WheelTurbineSideBearing	Reducer wheel turbine side bearing

B.2.3 jsmea_nav — navigational equipment codebook

B.2.3.1 General

The codebook called “jsmea_nav” is intended to describe names of sensor data related to the ship’s navigational equipment and systems, such as ship position and ship speed. [Tables B.6](#) and [B.7](#) show the contents of the codebook called “jsmea_nav”.

B.2.3.2 T1: Category

Table B.6 — T1: Category of jsmea_nav

Code	Name	Description
NavT1001	DepthMeasurementSystem	Water depth measurement system
NavT1002	HeadingMeasurementSystem	Ship's heading direction measurement system
NavT1003	ManeuveringSystem	A system for controlling ship's movement for berthing
NavT1004	MeteorologicalObservationSystem	Weather observation equipment
NavT1005	PositioningSystem	Ship's position measurement system
NavT1006	ShipCondition	Dynamic condition of the ship herself; condition of onboard equipment is not included.
NavT1007	ShipInformation	Ship's static information
NavT1008	SpeedAndDistanceMeasurementSystem	Speed distance meter

B.2.3.3 T2: Sub Category

Table B.7 — T2: Sub Category of jsmea_nav

Code	Name	Description
NavT2001	CCRS	Consistent Common Reference System
NavT2002	DopplerLOG	Sonar based speed measuring device
NavT2003	DraftGauge	Sensor for measuring ship's draft
NavT2004	EchoSounder	Sensor which measures ocean depth
NavT2005	EMLOG	Speed measuring device using electromagnetic induction

Table B.7 (continued)

Code	Name	Description
NavT2006	GNSS	Global Navigation Satellite System (ship position at each antenna position).
NavT2007	GyroCompass	Compass using gyro effect
NavT2008	Hygrometer	Any humidity measurement device
NavT2009	MagnetCompass	Compass which measures direction by the earth's magnetic field
NavT2010	MasterClock	Clock that manages the ship's clock
NavT2011	Rudder	
NavT2012	SatelliteLOG	Satellite based speed measuring device
NavT2013	TemperatureGauge	Temperature measurement device
NavT2014	WaveSensor	Sensor for measuring wave conditions, such as height and frequency.
NavT2015	WindIndicator	Anemometer

B.2.4 jsmea_oil — oil properties codebook

B.2.4.1 General

The codebook called “jsmea_oil” is intended to describe name of oil properties, such as sulfur content and flash point. [Tables B.8](#) and [B.9](#) show the contents of this codebook.

B.2.4.2 T1: Category

Table B.8 — T1: Category of jsmea_oil

Code	Name	Description
OilT1001	DieselOil	Distillate marine B (DMB) as defined in ISO 8217
OilT1002	HeavyFuelOil	Residual oil
OilT1003	LowSulfurHeavyFuelOil	Low sulfur residual oil, sulfur content less than global limit
OilT1004	LubOil	Lubricating oil, includes cylinder oil
OilT1005	MarineGasOil	Distillate marine A (DMA) as defined in ISO 8217

B.2.4.3 T2: Sub Category

Table B.9 — T2: Sub Category of jsmea_oil

Code	Name	Description
OilT2001	AnalysisProperty	Properties of the T1 substance obtained by analysis
OilT2002	PhysicalProperty	Properties of the T1 substance obtained by measurement
OilT2003	AnalysisPropertyMainEngine	Properties of the T1 substance for main engine obtained by analysis
OilT2004	AnalysisPropertyDieselGeneratorSet	Properties of the T1 substance for diesel generator obtained by analysis
OilT2005	AnalysisPropertyStorageTank	Properties of the T1 substance in storage tank obtained by analysis

B.2.5 jsmea_mot — ship motion codebook

B.2.5.1 General

The codebook called “jsmea_mot” is intended to describe the names of ship motion, such as roll and pitch. [Tables B.10](#) and [B.11](#) show descriptions of this codebook.

B.2.5.2 T1: Category

Table B.10 — T1: Category of jsmea_mot

Code	Name	Description
MotT1001	ShipMotion	Movement of a ship by forces from outside of the ship.

B.2.5.3 T2: Sub Category

Table B.11 — T2: Sub Category of jsmea_mot

Code	Name	Description
MotT2001	InertialMeasurementUnit	Inertial measurement unit measures acceleration and angle/angular velocity

B.2.6 jsmea_voy — voyage report codebook

B.2.6.1 General

The codebook called “jsmea_voy” is intended to describe the names related to the voyage report, such as fuel consumption and port information. [Tables B.12](#) and [B.13](#) show the contents of this codebook.

B.2.6.2 T1: Category

Table B.12 — T1: Category of jsmea_voy

Code	Name	Description
VoyT1001	Bunkered	Information of bunkered fuel observed by the crew
VoyT1002	CargoLoading	Information about loading cargo on board
VoyT1003	Consumption	Amount of consumption of expendables observed by the crew
VoyT1004	DateAndTime	Current date and time in the ship observed by crew
VoyT1005	DeadweightMeasurement	Result of deadweight measurement in a port observed by the crew
VoyT1006	DistanceAndTime	Sailing distance and time of the ship observed by the crew
VoyT1007	PortInformation	Information on the port where the ship departed or arrived
VoyT1008	RetentionOfOilOnBoard	Available fuel on board observed by the crew
VoyT1009	ShipPosition	Geographic coordinate of the ship observed by the crew
VoyT1010	ShipSpeed	Ship's speed, including ground speed and water speed, observed by the crew.
VoyT1011	VoyageInformation	Voyage information

B.2.6.3 T2: Sub Category

Table B.13 — T2: Sub Category of jsmea_voy

Code	Name	Description
VoyT2001	AuxBoiler	Report regarding auxiliary boiler
VoyT2002	CargoLoad	Report on the properties of a loaded cargo on board observed by the crew, such as mass, etc.
VoyT2003	CountryName	Report on country name
VoyT2004	Course	Report on direction of vessel movement, north up
VoyT2005	DestinationPortName	Report on destination port name
VoyT2006	DieselGeneratorSet	Report regarding generator driven by diesel engine
VoyT2007	Displacement	Report on ship's displacement
VoyT2008	DistanceRunByOG	Report on ground distance travelled
VoyT2009	DistanceRunByLOG	Report on distance a ship travelled through the water
VoyT2010	DraftAft	Report on draft at ship's aft part
VoyT2011	DraftFore	Report on draft at ship's fore part
VoyT2012	DraftMean	Report on mean draft at ship's aft, fore, port, starboard
VoyT2013	ETA	Report on estimate time of arrival
VoyT2014	LEG	Voyage leg
VoyT2015	MainEngine	Report on main propulsion engine
VoyT2016	MainEngineLoad	Report on main engine load factor, percent
VoyT2017	MainEngineOutput	Report on main engine output power
VoyT2018	OperationStatus	Report regarding ship's operating condition
VoyT2019	OverGround	Key word indicates a value measured against the ground
VoyT2020	PortName	Report on name of entered port name
VoyT2021	PropellerRPM	Report on propeller revolution per minute
VoyT2027	RetentionOnBoard	Retention or remainder of the content on board, ROB
VoyT2022	ReportCategory	
VoyT2023	Slip	Report on propeller slip
VoyT2024	SwellHeightScale	Scale for measuring swell height
VoyT2025	VoyageNumber	
VoyT2026	VoyageTime	Report on travel time from departed port to destination port

B.2.7 jsmea_wea — codebook for weather around the ship

B.2.7.1 General

The codebook called “jsmea_wea” is intended to describe the names related to oceanic and atmospheric phenomena, such as weather conditions and sea state. [Tables B.14](#) and [B.15](#) show the contents of this codebook.

B.2.7.2 T1: Category

Table B.14 — T1: Category of jsmea_wea

Code	Name	Description
WeaT1001	SeaState	State of the ocean
WeaT1001	WeatherCondition	Weather condition observed by the crew

B.2.7.3 T2: Sub Category**Table B.15 — T2: Sub Category of jsmea_wea**

Code	Name	Description
WeaT2001	AtmosphericPressure	
WeaT2002	CloudCover	Cloud coverage of the sky
WeaT2003	CloudType	Type of cloud covering the sky.
WeaT2004	DryBulb	Dry bulb thermometer
WeaT2005	IceCover	Ice coverage of the sea.
WeaT2006	IceType	Type of ice covering the sea.
WeaT2007	IcingSpeed	Growing speed of ice on the ship's hull
WeaT2008	IcingThickness	Thickness of ice on the ship's hull
WeaT2009	IcingType	Type of ice on the ship's hull
WeaT2010	RelativeHumidity	
WeaT2011	SeaSurfaceTemp	Temperature on the sea surface
WeaT2012	StateOfSky	
WeaT2013	Swell1	Swell generated by wind in a different region from Swell2
WeaT2014	Swell2	Swell generated by wind in a different region from Swell1
WeaT2015	Visibility	Visiblility range
WeaT2016	Weather	
WeaT2017	WetBulb	Wet bulb thermometer
WeaT2018	Wind	
WeaT2019	WindWave	Waves generated by the wind blowing in the area where the ship is going

B.2.8 jsmea_com — common codebook**B.2.8.1 General**

The codebook called “jsmea_com” is intended to describe commonly used names for above codebooks, as shown in [Tables B.16](#) to [B.18](#).

B.2.8.2 T3: Content**Table B.16 — T3: Content of jsmea_com**

Code	Name	Description
T3055	AC100VBus	
T3056	AC200VBus	
T3001	AC440VBus	AC440V bus
T3002	AC6600VBus	AC6600V bus
T3003	CompressedAir	Compressed air not heated or cooled
T3004	Azimuth	
T3057	BilgeWater	
T3005	BoilerWater	Water adjusted for boilers
T3006	BoilOffGas	Naturally vaporized LNG
T3007	BoostAir	4-stroke diesel engine intake
T3008	Compression	Compression process
T3009	CoolingFreshWater	Cooling fresh water

Table B.16 (continued)

Code	Name	Description
T3010	CoolingSeaWater	Sea water for cooling
T3011	CylinderOil	
T3012	DieselOil	Distillate fuel oil
T3013	DistilledWater	Distilled water, which does not include water for drinking or cooling
T3014	DrainOil	
T3015	DrainWater	
T3016	DrinkWater	Distilled water treated for drinking
T3017	Electric	
T3018	ExhaustGas	
T3019	ExhaustSteam	
T3058	Flame	Flame of a burner
T3059	FreshWater	
T3020	FuelOil	General term for fuel oil
T3021	HeaderSteam	
T3022	Heave	Ship vertical movement
T3023	HeavyFuelOil	Residual fuel oil
T3060	HydraulicOil	
T3024	Longitudinal	Direction parallel to heading
T3025	LowSulfurGasOil	
T3026	LowSulfurHeavyFuelOil	Residual fuel oil with a sulfur content of 5 g/kg or less
T3027	LubOil	Oil for lubrication
T3028	MagneticBearing	Magnetic orientation reference
T3029	MaxCombustion	Combustion process
T3030	MeanIndication	
T3031	OilMist	
T3032	Output	
T3033	Air	Open air
T3034	Pitch	Propeller pitch
T3035	Relative	Heading reference
T3036	Revolution	
T3037	Roll	Rotational movement with reference to the longitudinal axis of the ship
T3038	ScavAir	2-stroke diesel engine ventilation
T3039	SeaWater	Seawater, not used for cooling
T3040	SecondaryCoil	Secondary coil of transformer (including winding)
T3041	Section	
T3042	Signal	
T3043	StatorCoil	Stator coil of rotating machine (including winding)
T3044	Steam	
T3045	Surge	Movement in the longitudinal directon (heading reference) of the ship

Table B.16 (continued)

Code	Name	Description
T3046	Sway	Movement in the left right direction (heading reference) of the ship
T3047	Theoretical	Heading reference (assuming the ship is stationary)
T3061	ThermalOil	
T3048	Total	
T3049	Transverse	Direction perpendicular to heading
T3050	TrueBearing	True orientation reference
T3051	Vibration	
T3052	WasteOil	
T3053	Wave	
T3054	Yaw	Rotational movement with reference to the vertical axis of the ship

B.2.8.3 T4: Position

Table B.17 — T4: Position of jsmea.com

Code	Name	Description
T4001	Aft	Rear part of the ship
T4002	AftPort	Rear left side of the ship towards the ship's heading
T4003	AftStarboard	Rear right side of the ship towards the ship's heading
T4004	Bow	Bow of the ship
T4005	CCRP	Consistent common reference point
T4006	Center	Centre part between ship's port side and starboard side
T4007	Close	Closed position/closed motion
T4008	DrivingEnd	Near side of prime mover/motor
T4009	Forward	Front part of the ship
T4010	ForwardPort	Front left side of the ship towards the ship's heading
T4011	ForwardStarboard	Front right side of the ship towards the ship's heading
T4012	FreeEnd	Far side of prime mover/motor
T4013	Inlet	
T4014	Line	Pipeline
T4015	Lower	Bottom part of the equipment
T4016	Middle	Centre of the ship in the longitudinal direction
T4017	MiddlePort	The port side of the centre of the ship in the longitudinal direction
T4018	MiddleStarboard	The starboard side of the centre of the ship in the longitudinal direction
T4019	Open	Open position/open motion
T4020	Outlet	
T4021	PhaseR	First phase, R phase, U phase in a three-phase AC system
T4022	PhaseS	Second phase S phase, V phase in a three-phase AC system
T4023	PhaseT	Third phase, T phase, W phase in a three-phase AC system
T4024	Port	Left side of the ship towards the ship's heading
T4025	Starboard	Right side of the ship towards the ship's heading

Table B.17 (continued)

Code	Name	Description
T4028	Start	Start position of something
T4026	Stern	Stern of the ship
T4027	Upper	Top part of the equipment

B.2.8.4 T5: Item

Table B.18 — T5: Item of jsmea_com

Code	Name	Description
T5089	Abnormal	Abnormal condition of equipment/sensor data
T5001	Acceleration	
T5002	ActivateNumber	Number of devices in operation
T5003	ActivePower	Active power, electric
T5004	AluminaSilicaContent	Content of SiO ₂ (silica)/Al ₂ O ₃ (alumina)
T5005	Amplitude	
T5006	Angle	Angle, which does not include correct valve opening
T5007	AngularVelocity	
T5008	ApparentPower	Apparent power, electric
T5009	AshContent	
T5090	AutoSlowDwon	
T5010	BeaufortScale	Beaufort wind force scale
T5011	CarbonResidue	
T5012	CCAI	Calculated carbon aromaticity index
T5013	CetaneIndex	Cetane index or cetane number
T5014	COG	Course over ground
T5015	Count	Accumulated value, number of times
T5016	Coverage	
T5017	Current	Electric current
T5091	CurrentSet	Direction of ocean current
T5092	CurrentSpeed	Speed of ocean current
T5018	DeadTime	The time when the equipment is not in operation
T5019	Density	
T5020	Depth	Water depth (depth below keel)
T5021	DeviationTemp	Deviation from the average of multiple tempreture measurements (mean, not time average)
T5022	DiffPress	Differential pressure between inlet and outlet
T5023	Direction	
T5024	Displacement	Positional variation, diplacement
T5025	Distance	Distance travelled
T5026	DouglasSeaScale	
T5027	Draft	Ship's draft
T5093	EmergencyStop	
T5028	FeAll	Total iron content
T5029	FeMagnetism	Magnetic iron powder
T5030	FlashPoint	Flash point temperature

Table B.18 (continued)

Code	Name	Description
T5031	Frequency	
T5032	FuelCommand	
T5094	FuelQualitySetting	
T5033	Heading	Heading of ship's bow
T5034	Heat	Calorie
T5035	Height	
T5036	HoursUnderway	Hours ship ongoing
T5037	Insoluble	Insoluble content
T5038	Insulation	Insulation resistance value
T5039	KinematicViscosity	Kinematic viscosity, absolute viscosity is not included
T5040	LAT	Latitude
T5041	Leak	Amount of leakage (liquid/gas) per unit time
T5042	Length	
T5043	Level	Liquid level height
T5044	Load	Load factor (percentage of rated output)
T5045	LoadIndex	
T5046	LocalTime	Ship time
T5047	LON	Longitude
T5048	LowCalorificValue	
T5049	Mass	
T5050	MassFlowCount	Accumulated quantity of mass flow
T5051	MassFlowRate	Mass flow per unit of time
T5052	MeanPress	Average value of some pressure in multiple devices
T5053	MeanTemp	Average value of some temperature of multiple devices
T5054	MinutesUnderway	Minutes ship ongoing
T5055	Notation	
T5056	OilContent	
T5057	Period	Duration of one cycle
T5058	PhaseDifference	Phase difference
T5059	Position	Valve opening, rack position
T5060	PotassiumContent	
T5061	Power	Heat, mechanical, electrical output
T5062	PowerFactor	
T5063	Press	
T5064	ReactivePower	Reactive power
T5065	RelativeHumidity	Relative humidity
T5066	ROR	Rudder order status
T5067	ROT	Rate of turn of the ship
T5068	RSA	Rudder sensor angle
T5069	RunHour	Total working time in operation
T5095	RunStop	Run/stop state of rotating machinery
T5070	Salinity	
T5071	SOG	Speed over ground
T5072	Speed	Speed of T1/T2 device

Table B.18 (continued)

Code	Name	Description
T5073	STW	Speed through the water
T5074	SulfurContent	
T5075	TBN	Base Number (Alkali value)
T5076	Temp	Temperature (Celsius)
T5077	Thickness	
T5078	Torque	Torque is the twisting moment of force with respect to the longitudinal axis of a beam or shaft
T5079	UTC	Coordinated Universal Time, the standard time used by the world to regulate clocks
T5080	VanadiumContent	
T5081	Vibration	
T5082	Voltage	Electric voltage
T5083	Volume	
T5084	VolumeFlowCount	Accumulated quantity of volume flow
T5085	VolumeFlowRate	Volume flow per unit of time
T5086	WaterContent	
T5087	WindDirection	
T5088	WindSpeed	

B.3 Examples of Local IDs

B.3.1 Overview

Tables B.19 to B.24 describe the examples of Local IDs in accordance with the JSMEA codebook series. The master version of the Local ID, as well as a complete set of Local IDs, change history and other resources, can be found in Reference [14].

Although the LocalIDs in Tables B.19 to B.24 are examples, the terms described here are guaranteed to be identical to those of the master version, even if there are typographical errors. This also applies to any future versions.

If the use of the name is deprecated for any reason, the deprecated flag is given.

Descriptions of the abbreviated terms used in Tables B.19 to B.24 are provided in Table B.25.

B.3.2 Local IDs for machinery system

Table B.19 shows examples of Local IDs for machinery systems.

Table B.19 — Examples of Local IDs for machinery systems

Channel Name (Unit)	LocalID
Air conditioner reefer compressor [n] ^a run hour (h)	/jsmea_mac/AirConditioner/Compressor[n] ^a ///RunHour/
^a [n] is read as a number of the first device. Omit [n] if there is only one device on board. ^b [m] is read as a number of the second device. Omit [m] if there is only one device on board. ^c 1 mm ² /s is equivalent to 1 cSt. ^d Parts per million. ^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min ⁻¹ .	

Table B.19 (continued)

Channel Name (Unit)	LocalID
Air conditioner reefer mach CFW pump run hour (h)	/jsmea_mac/AirConditioner/CondenserCoolingFreshWaterPump///RunHour/
AUX boiler feed water temp (°C)	/jsmea_mac/AUXBoiler/BoilerWaterFeedLine/BoilerWater/Inlet/Temp/
AUX boiler feed water flow rate (l/min)	/jsmea_mac/AUXBoiler/BoilerWaterFeedLine/BoilerWater/Inlet/VolumeFlowRate/
AUX boiler run hour (h)	/jsmea_mac/AUXBoiler/Burner///RunHour/
AUX boiler burner fuel oil in press (MPa)	/jsmea_mac/AUXBoiler/BurnerFuelOilLine/FuelOil/Inlet/Press/
AUX boiler burner fuel oil in temp (°C)	/jsmea_mac/AUXBoiler/BurnerFuelOilLine/FuelOil/Inlet/Temp/
AUX boiler fuel oil flow count (l)	/jsmea_mac/AUXBoiler/BurnerFuelOilLine/FuelOil/Inlet/VolumeFlowCount/
AUX boiler fuel oil flow rate (l/h)	/jsmea_mac/AUXBoiler/BurnerFuelOilLine/FuelOil/Inlet/VolumeFlowRate/
AUX boiler drum level (mm)	/jsmea_mac/AUXBoiler/Drum/BoilerWater//Level/
AUX boiler drum steam press (MPa)	/jsmea_mac/AUXBoiler/Drum/Steam//Press/
Excess steam dump valve opening (%)	/jsmea_mac/AUXBoiler/ExcessSteamDumpValve///Position/
AUX boiler exhaust gas out temp (°C)	/jsmea_mac/AUXBoiler/ExhaustGasLine/ExhaustGas/Outlet/Temp/
AUX boiler feed water pump [n] ^a run hour (h)	/jsmea_mac/AUXBoiler/FeedWaterPump[n] ^a ///RunHour/
AUX boiler feed water regulator valve opening (%)	/jsmea_mac/AUXBoiler/FeedWaterRegulator///Position/
AUX boiler fuel oil burning pump [n] ^a run hour (h)	/jsmea_mac/AUXBoiler/FuelOilBurningPump[n] ^a ///RunHour/
HPSS drum press (MPa)	/jsmea_mac/AUXBoiler/HighPressureDrum/Steam//Press/
LPSS drum press (MPa)	/jsmea_mac/AUXBoiler/LowPressureDrum/Steam//Press/
Steam reducing valve delivery press (MPa)	/jsmea_mac/AUXBoiler/PressureReducingValve/Steam/Outlet/Press/
Ballast pump [n] ^a run hour (h)	/jsmea_mac/BallastSystem/BallastPump[n] ^a ///RunHour/
Heeling pump [n] ^a run hour (h)	/jsmea_mac/BallastSystem/HeelingPump[n] ^a ///RunHour/
Bilge pump run hour (h)	/jsmea_mac/BilgeSludgeSystem/BilgePump///RunHour/
Bilge separator service pump run hour (h)	/jsmea_mac/BilgeSludgeSystem/BilgeSeparatorServicePump///RunHour/
Sludge pump run hour (h)	/jsmea_mac/BilgeSludgeSystem/SludgePump///RunHour/
Cascade tank level (mm)	/jsmea_mac/BoilerWaterSystem/CascadeTank/BoilerWater//Level/
Cascade tank filling water flow count (l)	/jsmea_mac/BoilerWaterSystem/CascadeTankFillingLine/BoilerWater//VolumeFlowCount/
General service air for air horn (MPa)	/jsmea_mac/CompressionAirSystem/AirHornAirLine/CompressedAir//Press/
AUX air compressor [n] ^a run hour (h)	/jsmea_mac/CompressionAirSystem/AUXAirCompressor[n] ^a ///RunHour/
Control air press (MPa)	/jsmea_mac/CompressionAirSystem/ControlAirLine/CompressedAir//Press/
^a [n] is read as a number of the first device. Omit [n] if there is only one device on board. ^b [m] is read as a number of the second device. Omit [m] if there is only one device on board. ^c 1 mm ² /s is equivalent to 1 cSt. ^d Parts per million. ^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min ⁻¹ .	

Table B.19 (continued)

Channel Name (Unit)	LocalID
Ship service air press (MPa)	/jsmea_mac/CompressionAirSystem/GeneralAirLine/CompressedAir//Press/
Main air compressor [n] ^a run hour (h)	/jsmea_mac/CompressionAirSystem/MainAirCompressor[n] ^a ///Run-Hour/
Main air reservoir [n] ^a press (MPa)	/jsmea_mac/CompressionAirSystem/MainAirReservoir[n] ^a /CompressedAir//Press/
Emergency shut off valve operating air press (MPa)	/jsmea_mac/CompressionAirSystem/SafetyAirLine/CompressedAir//Press/
CFW expansion tank level (m)	/jsmea_mac/CoolingFreshWaterSystem/ExpansionTank/CoolingFreshWater//Level/
Central CFW (HT) press (MPa)	/jsmea_mac/CoolingFreshWaterSystem/HighTempCoolingFreshWater-Line/CoolingFreshWater//Press/
Central CFW (HT) temp (°C)	/jsmea_mac/CoolingFreshWaterSystem/HighTempCoolingFreshWater-Line/CoolingFreshWater//Temp/
JCFW pump [n] ^a run hour (h)	/jsmea_mac/CoolingFreshWaterSystem/HighTempCoolingFreshWater-Pump[n] ^a ///RunHour/
Central CFW cooler temp cont valve (HT) opening (%)	/jsmea_mac/CoolingFreshWaterSystem/HighTempCoolingFreshWater-TempControlValve///Position/
Central CFW (LT) press (MPa)	/jsmea_mac/CoolingFreshWaterSystem/LowTempCoolingFreshWater-Line/CoolingFreshWater//Press/
Central CFW (LT) temp (°C)	/jsmea_mac/CoolingFreshWaterSystem/LowTempCoolingFreshWater-Line/CoolingFreshWater//Temp/
Central CFW pump [n] ^a run hour (h)	/jsmea_mac/CoolingFreshWaterSystem/LowTempCoolingFreshWater-Pump[n] ^a ///RunHour/
Central CFW pump [n] ^a revolution (min ⁻¹) ^e	/jsmea_mac/CoolingFreshWaterSystem/LowTempCoolingFreshWater-Pump[n] ^a /Revolution//Speed/
Central CFW cooler temp cont valve (LT) opening (%)	/jsmea_mac/CoolingFreshWaterSystem/LowTempCoolingFreshWater-TempControlValve///Position/
Main CSW press (MPa)	/jsmea_mac/CoolingSeaWaterSystem/CoolingSeaWaterLine/Cooling-SeaWater//Press/
Sea water temp (°C)	/jsmea_mac/CoolingSeaWaterSystem/CoolingSeaWaterLine/Cooling-SeaWater/Inlet/Temp/
Main CSW pump [n] ^a run hour (h)	/jsmea_mac/CoolingSeaWaterSystem/CoolingSeaWaterPump[n] ^a ///RunHour/
Main CSW pump [n] ^a revolution (min ⁻¹) ^e	/jsmea_mac/CoolingSeaWaterSystem/CoolingSeaWaterPump[n] ^a /Revolution//Speed/
G/E [n] ^a CFW(LT) in press (MPa)	/jsmea_mac/DieselGeneratorSet[n] ^a /AirCooler/CoolingFreshWater/Inlet/Press/
G/E [n] ^a sea water in press (MPa)	/jsmea_mac/DieselGeneratorSet[n] ^a /AirCooler/CoolingSeaWater/Inlet/Press/
G/E [n] ^a sea water in temp (°C)	/jsmea_mac/DieselGeneratorSet[n] ^a /AirCooler/CoolingSeaWater/Inlet/Temp/
G/E [n] ^a sea water out press (MPa)	/jsmea_mac/DieselGeneratorSet[n] ^a /AirCooler/CoolingSeaWater/Outlet/Press/

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
G/E CFW(LT) common in temp (°C)	/jsmea_mac/DieselGeneratorSet/AirCoolerCommon/CoolingFreshWater/Inlet/Temp/
G/E CFW(LT) common out temp (°C)	/jsmea_mac/DieselGeneratorSet/AirCoolerCommon/CoolingFreshWater/Outlet/Temp/
G/E [n] ^a CFW(HT) in press (MPa)	/jsmea_mac/DieselGeneratorSet[n] ^a /Cylinder/CoolingFreshWater/Inlet/Press/
G/E [n] ^a CFW(HT) out temp (°C)	/jsmea_mac/DieselGeneratorSet[n] ^a /Cylinder/CoolingFreshWater/Outlet/Temp/
G/E [n] ^a cylinder [m] ^b exhaust gas temp (°C)	/jsmea_mac/DieselGeneratorSet[n] ^a /Cylinder[m] ^b /ExhaustGas/Outlet/Temp/
G/E [n] ^a run hour (h)	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine///RunHour/
G/E [n] ^a boost air press (MPa)	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/BoostAir/Inlet/Press/
G/E [n] ^a boost air temp (°C)	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/BoostAir/Inlet/Temp/
G/E [n] ^a fuel oil in press (MPa)	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/FuelOil/Inlet/Press/
G/E [n] ^a fuel oil in temp (°C)	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/FuelOil/Inlet/Temp/
G/E [n] ^a lub oil in press (MPa)	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/LubOil/Inlet/Press/
G/E [n] ^a lub oil in temp (°C)	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/LubOil/Inlet/Temp/
G/E diesel oil viscosity (mm ² /s) ^{c, e}	/jsmea_mac/DieselGeneratorSet/FuelOilLine/DieselOil/Inlet/KinematicViscosity/
G/E diesel oil in temp (°C)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/DieselOil/Inlet/Temp/
G/E diesel oil flow count (l)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/DieselOil/Inlet/VolumeFlowCount/
G/E diesel oil flow rate (l/h)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/DieselOil/Inlet/VolumeFlowRate/
G/E diesel oil out temp (°C)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/DieselOil/Outlet/Temp/
G/E diesel oil out flow count (l)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/DieselOil/Outlet/VolumeFlowCount/
G/E diesel oil out flow rate (l/h)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/DieselOil/Outlet/VolumeFlowRate/
G/E fuel oil in temp (°C)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/FuelOil/Inlet/Temp/
G/E fuel oil in flow count (l)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/FuelOil/Inlet/VolumeFlowCount/
G/E fuel oil in flow rate (l/h)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/FuelOil/Inlet/VolumeFlowRate/
G/E fuel oil out temp (°C)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/FuelOil/Outlet/Temp/
G/E fuel oil out flow count (l)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/FuelOil/Outlet/VolumeFlowCount/
G/E fuel oil out flow rate (l/h)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/FuelOil/Outlet/VolumeFlowRate/
G/E heavy fuel oil viscosity (mm ² /s) ^{c, e}	/jsmea_mac/DieselGeneratorSet/FuelOilLine/HeavyFuelOil/Inlet/KinematicViscosity/
G/E heavy fuel oil in temp (°C)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/HeavyFuelOil/Inlet/Temp/
^a [n] is read as a number of the first device. Omit [n] if there is only one device on board. ^b [m] is read as a number of the second device. Omit [m] if there is only one device on board. ^c 1 mm²/s is equivalent to 1 cSt. ^d Parts per million. ^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.	

Table B.19 (continued)

Channel Name (Unit)	LocalID
G/E heavy fuel oil in flow count (l)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/HeavyFuelOil/Inlet/VolumeFlowCount/
G/E heavy fuel oil in flow rate (l/h)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/HeavyFuelOil/Inlet/VolumeFlowRate/
G/E heavy fuel oil out temp (°C)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/HeavyFuelOil/Outlet/Temp/
G/E heavy fuel oil out flow count (l)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/HeavyFuelOil/Outlet/VolumeFlowCount/
G/E heavy fuel oil out flow rate (l/h)	/jsmea_mac/DieselGeneratorSet/FuelOilLine/HeavyFuelOil/Outlet/VolumeFlowRate/
G/E fuel oil common in temp (°C)	/jsmea_mac/DieselGeneratorSet/FuelOilLineCommon/FuelOil/Inlet/Temp/
Generator [n] ^a current (A)	/jsmea_mac/DieselGeneratorSet[n] ^a /Generator/Electric//Current/
Generator [n] ^a frequency (Hz)	/jsmea_mac/DieselGeneratorSet[n] ^a /Generator/Electric//Frequency/
Generator [n] ^a output (kW)	/jsmea_mac/DieselGeneratorSet[n] ^a /Generator/Electric//Power/
Generator [n] ^a voltage (V)	/jsmea_mac/DieselGeneratorSet[n] ^a /Generator/Electric//Voltage/
Generator [n] ^a stator (R) temp (°C)	/jsmea_mac/DieselGeneratorSet[n] ^a /Generator/StatorCoil/PhaseR/Temp/
Generator [n] ^a stator (S) temp (°C)	/jsmea_mac/DieselGeneratorSet[n] ^a /Generator/StatorCoil/PhaseS/Temp/
Generator [n] ^a stator (T) temp (°C)	/jsmea_mac/DieselGeneratorSet[n] ^a /Generator/StatorCoil/PhaseT/Temp/
Generator [n] ^a bearing temp (drive end) (°C)	/jsmea_mac/DieselGeneratorSet[n] ^a /GeneratorBearing//DrivingEnd/Temp/
Generator [n] ^a bearing temp (non-drive end) (°C)	/jsmea_mac/DieselGeneratorSet[n] ^a /GeneratorBearing//FreeEnd/Temp/
G/E [n] ^a starting air in press (MPa)	/jsmea_mac/DieselGeneratorSet[n] ^a /StartAirLine/CompressedAir/Inlet/Press/
G/E [n] ^a T/C [m] ^b exhaust gas in temp (°C)	/jsmea_mac/DieselGeneratorSet[n] ^a /TurboCharger[m] ^b /ExhaustGas/Inlet/Temp/
G/E [n] ^a T/C exhaust gas out temp (°C)	/jsmea_mac/DieselGeneratorSet[n] ^a /TurboCharger/ExhaustGas/Outlet/Temp/
G/E [n] ^a T/C lub oil in press (MPa)	/jsmea_mac/DieselGeneratorSet[n] ^a /TurboCharger/LubOil/Inlet/Press/
G/E [n] ^a T/C [m] ^b speed (min ⁻¹) ^e	/jsmea_mac/DieselGeneratorSet[n] ^a /TurboCharger[m] ^b /Revolution//Speed/
Drinking water pump [n] ^a run hour (h)	/jsmea_mac/DrinkWaterSystem/DrinkWaterPump[n] ^a ///RunHour/
Engine room air pressure (MPa)	/jsmea_mac/EngineRoom/RoomSpace/Air//Press/
Engine room air humidity (%)	/jsmea_mac/EngineRoom/RoomSpace/Air//RelativeHumidity/
Engine room temp (°C)	/jsmea_mac/EngineRoom/RoomSpace/Air//Temp/
G/E EGE boiler water circulation pump [n] ^a run hour (h)	/jsmea_mac/ExhaustGasBoiler/BoilerWaterCirculatingPumpDieselGeneratorSet[n] ^a ///RunHour/
^a [n] is read as a number of the first device. Omit [n] if there is only one device on board. ^b [m] is read as a number of the second device. Omit [m] if there is only one device on board. ^c 1 mm ² /s is equivalent to 1 cSt. ^d Parts per million. ^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min ⁻¹ .	

Table B.19 (continued)

Channel Name (Unit)	LocalID
M/E EGE boiler water circulation ump [n] ^a run hour (h)	/jsmea_mac/ExhaustGasBoiler/BoilerWaterCirculatingPump- MainEngine[n] ^a ///RunHour/
M/E EGE bypass side damper (-)	/jsmea_mac/ExhaustGasBoiler/BypassSideDamperMainEngine///Posi- tion/
G/E [n] ^a EGE exhaust gas in/out differen- tial press (MPa)	/jsmea_mac/ExhaustGasBoiler/ExhaustGasEconomizerDieselGenera- torSet[n] ^a /ExhaustGas//DiffPress/
M/E EGE exhaust gas in/out differential press (MPa)	/jsmea_mac/ExhaustGasBoiler/ExhaustGasEconomizerMainEngine/ ExhaustGas//DiffPress/
G/E [n] ^a EGE exhaust gas in temp (°C)	/jsmea_mac/ExhaustGasBoiler/ExhaustGasEconomizerDieselGenera- torSet[n] ^a /ExhaustGas/Inlet/Temp/
M/E EGE exhaust gas in temp (°C)	/jsmea_mac/ExhaustGasBoiler/ExhaustGasEconomizerMainEngine/ ExhaustGas/Inlet/Temp/
G/E [n] ^a EGE exhaust gas out temp (°C)	/jsmea_mac/ExhaustGasBoiler/ExhaustGasEconomizerDieselGenera- torSet[n] ^a /ExhaustGas/Outlet/Temp/
M/E EGE exhaust gas out temp (°C)	/jsmea_mac/ExhaustGasBoiler/ExhaustGasEconomizerMainEngine/ ExhaustGas/Outlet/Temp/
M/E EGE outlet header steam press (MPa)	/jsmea_mac/ExhaustGasBoiler/ExhaustGasEconomizerMainEngine/ HeaderSteam/Outlet/Press/
M/E EGE side damper (-)	/jsmea_mac/ExhaustGasBoiler/SideDamperMainEngine///Position/
M/E EGE soot blower operating air press (MPa)	/jsmea_mac/ExhaustGasBoiler/SootBlowerMainEngine/Compresse- dAir/Inlet/Press/
Fire main line press (MPa)	/jsmea_mac/FireFightingSystem/FireMainLine/CoolingSeaWater/ Line/Press/
Distilled water salinity (g/kg)	/jsmea_mac/FreshWaterSystem/DistilledWaterLine/DistilledWater// Salinity/
Distilled water flow count (l)	/jsmea_mac/FreshWaterSystem/DistilledWaterLine/DistilledWater// VolumeFlowCount/
Fresh water generator run hour (h)	/jsmea_mac/FreshWaterSystem/FreshWaterGenerator///RunHour/
Fresh water pump [n] ^a run hour (h)	/jsmea_mac/FreshWaterSystem/FreshWaterPump[n] ^a ///RunHour/
Hot water circulation pump [n] ^a run hour (h)	/jsmea_mac/FreshWaterSystem/HotWaterCirculatingPump[n] ^a /// RunHour/
Bunker diesel oil flow count (l)	/jsmea_mac/FuelOilSystem/DieselOilBunkerLine/DieselOil/Inlet/Vol- umeFlowCount/
Diesel oil purifier run hour (h)	/jsmea_mac/FuelOilSystem/DieselOilPurifier///RunHour/
Diesel oil purifier diesel oil in temp (°C)	/jsmea_mac/FuelOilSystem/DieselOilPurifier/DieselOil/Inlet/Temp/
G/E diesel oil service pump [n] ^a run hour (h)	/jsmea_mac/FuelOilSystem/DieselOilServicePumpDieselGenerator- Set[n] ^a ///RunHour/
G/E diesel oil service tank [n] ^a level (m)	/jsmea_mac/FuelOilSystem/DieselOilServiceTank[n] ^a /DieselOil// Level/
Diesel oil transfer pump run hour (h)	/jsmea_mac/FuelOilSystem/DieselOilTransferPump///RunHour/
Bunker fuel oil flow count (l)	/jsmea_mac/FuelOilSystem/FuelOilBunkerLine/FuelOil/Inlet/Volume- FlowCount/
G/E fuel oil circulation pump [n] ^a run hour (h)	/jsmea_mac/FuelOilSystem/FuelOilCirculatingPumpDieselGenerator- Set[n] ^a ///RunHour/

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
M/E fuel oil circulation pump [n] ^a run hour (h)	/jsmea_mac/FuelOilSystem/FuelOilCirculatingPumpMainEngine[n] ^a ///RunHour/
M/E fuel oil heater out temp (°C)	/jsmea_mac/FuelOilSystem/FuelOilHeaterMainEngine/FuelOil/Outlet/Temp/
M/E common fuel oil flow meter temp (°C)	/jsmea_mac/FuelOilSystem/FuelOilLine/FuelOil//Temp/
M/E common fuel oil flow (l)	/jsmea_mac/FuelOilSystem/FuelOilLine/FuelOil//VolumeFlowCount/
Heavy fuel oil purifier [n] ^a run hour(h)	/jsmea_mac/FuelOilSystem/FuelOilPurifier[n] ^a ///RunHour/
Heavy fuel oil purifier [n] ^a fuel oil in temp (°C)	/jsmea_mac/FuelOilSystem/FuelOilPurifier[n] ^a /FuelOil/Inlet/Temp/
Fuel oil purifier supply pump [n] ^a run hour (h)	/jsmea_mac/FuelOilSystem/FuelOilPurifierSupplyPump[n] ^a ///RunHour/
M/E G/E common fuel oil fine filter (2nd) DP (MPa)	/jsmea_mac/FuelOilSystem/FuelOilSecondaryFilterCommon/FuelOil//DiffPress/
M/E G/E common fuel oil back wash (l)	/jsmea_mac/FuelOilSystem/FuelOilSecondaryFilterCommon/FuelOil//VolumeFlowCount/
G/E fuel oil fine filter (2nd) DP (MPa)	/jsmea_mac/FuelOilSystem/FuelOilSecondaryFilterDieselGenerator-Set/FuelOil//DiffPress/
G/E fuel oil back wash (l)	/jsmea_mac/FuelOilSystem/FuelOilSecondaryFilterDieselGenerator-Set/FuelOil//VolumeFlowCount/
M/E fuel oil fine filter (2nd) DP (MPa)	/jsmea_mac/FuelOilSystem/FuelOilSecondaryFilterMainEngine/FuelOil//DiffPress/
M/E fuel oil back wash (l)	/jsmea_mac/FuelOilSystem/FuelOilSecondaryFilterMainEngine/FuelOil//VolumeFlowCount/
Fuel oil service tank level (m)	/jsmea_mac/FuelOilSystem/FuelOilServiceTank/FuelOil//Level/
Fuel oil service tank temp (°C)	/jsmea_mac/FuelOilSystem/FuelOilServiceTank/FuelOil//Temp/
Heavy fuel oil settling tank level (m)	/jsmea_mac/FuelOilSystem/FuelOilSettlingTank/HeavyFuelOil//Level/
Heavy fuel oil settling tank temp (°C)	/jsmea_mac/FuelOilSystem/FuelOilSettlingTank/HeavyFuelOil//Temp/
Fuel oil shifter heater out temp (°C)	/jsmea_mac/FuelOilSystem/FuelOilShifterHeater/FuelOil/Outlet/Temp/
Fuel oil shifter pump [n] ^a run hour (h)	/jsmea_mac/FuelOilSystem/FuelOilShifterPump[n] ^a ///RunHour/
G/E fuel oil supply pump [n] ^a run hour (h)	/jsmea_mac/FuelOilSystem/FuelOilSupplyPumpDieselGeneratorSet[n] ^a ///RunHour/
M/E fuel oil supply pump [n] ^a run hour (h)	/jsmea_mac/FuelOilSystem/FuelOilSupplyPumpMainEngine[n] ^a ///RunHour/
Fuel oil transfer pump run hour (h)	/jsmea_mac/FuelOilSystem/FuelOilTransferPump///RunHour/
Low sulfur fuel oil service tank level (m)	/jsmea_mac/FuelOilSystem/LowSulfurHeavyFuelOilServiceTank/LowSulfurHeavyFuelOil//Level/
Low sulfur fuel oil service tank temp (°C)	/jsmea_mac/FuelOilSystem/LowSulfurHeavyFuelOilServiceTank/LowSulfurHeavyFuelOil//Temp/
Low sulfur fuel oil settling tank level (m)	/jsmea_mac/FuelOilSystem/LowSulfurHeavyFuelOilSettlingTank/LowSulfurHeavyFuelOil//Level/
^a [n] is read as a number of the first device. Omit [n] if there is only one device on board. ^b [m] is read as a number of the second device. Omit [m] if there is only one device on board. ^c 1 mm ² /s is equivalent to 1 cSt. ^d Parts per million. ^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min ⁻¹ .	

Table B.19 (continued)

Channel Name (Unit)	LocalID
Low sulfur fuel oil settling tank temp (°C)	/jsmea_mac/FuelOilSystem/LowSulfurHeavyFuelOilSettlingTank/LowSulfurHeavyFuelOil//Temp/
Incinerator run hour (h)	/jsmea_mac/Incinerator/Burner///RunHour/
Waste oil tank [n] ^a level (m)	/jsmea_mac/Incinerator/WasteOilTank[n] ^a /WasteOil//Level/
Waste oil tank [n] ^a temp (°C)	/jsmea_mac/Incinerator/WasteOilTank[n] ^a /WasteOil//Temp/
G/E lub oil overflow tank level (m)	/jsmea_mac/LubOilSystem/LubOilOverFlowTankDieselGeneratorSet/LubOil//Level/
G/E [n] ^a lub oil priming pump run hour (h)	/jsmea_mac/LubOilSystem/LubOilPrimingPumpDieselGeneratorSet///RunHour/
T/G lub oil priming pump run hour (h)	/jsmea_mac/LubOilSystem/LubOilPrimingPumpTurbineGenerator-Set///RunHour/
Main lub oil pump [n] ^a run hour (h)	/jsmea_mac/LubOilSystem/LubOilPumpMainEngine[n] ^a ///RunHour/
G/E lub oil purifier run hour (h)	/jsmea_mac/LubOilSystem/LubOilPurifierDieselGeneratorSet///RunHour/
G/E lub oil purifier in temp (°C)	/jsmea_mac/LubOilSystem/LubOilPurifierDieselGeneratorSet/LubOil/Inlet/Temp/
G/E lub oil purifier supply pump [n] ^a run hour (h)	/jsmea_mac/LubOilSystem/LubOilPurifierFeedPumpDieselGenerator-Set[n] ^a ///RunHour/
M/E lub oil purifier supply pump [n] ^a run hour (h)	/jsmea_mac/LubOilSystem/LubOilPurifierFeedPumpMainEngine[n] ^a ///RunHour/
M/E lub oil purifier [n] ^a run hour (h)	/jsmea_mac/LubOilSystem/LubOilPurifierMainEngine[n] ^a ///RunHour/
M/E lub oil purifier [n] ^a lub oil in temp (°C)	/jsmea_mac/LubOilSystem/LubOilPurifierMainEngine[n] ^a /LubOil/Inlet/Temp/
Lub oil transfer pump run hour (h)	/jsmea_mac/LubOilSystem/LubOilTransferPump///RunHour/
Stern tube forward seal lub oil pump [n] ^a run hour (h)	/jsmea_mac/LubOilSystem/SternTubeForwardSealLubOilPump[n] ^a ///RunHour/
Stern tube lub oil pump [n] ^a run hour (h)	/jsmea_mac/LubOilSystem/SternTubeLubOilPump[n] ^a ///RunHour/
M/E [n] ^a T/C lub oil pump run hour (h)	/jsmea_mac/LubOilSystem/TurboChargerLubOilPumpMainEngine[n] ^a ///RunHour/
M/E air cooler CFW in press (MPa)	/jsmea_mac/MainEngine/AirCooler/CoolingFreshWater/Inlet/Press/
M/E air cooler CFW in temp (°C)	/jsmea_mac/MainEngine/AirCooler/CoolingFreshWater/Inlet/Temp/
M/E air cooler [n] ^a CFW out temp (°C)	/jsmea_mac/MainEngine/AirCooler[n] ^a /CoolingFreshWater/Outlet/Temp/
M/E air cooler sea water in press (MPa)	/jsmea_mac/MainEngine/AirCooler/CoolingSeaWater/Inlet/Press/
M/E air cooler sea water in temp (°C)	/jsmea_mac/MainEngine/AirCooler/CoolingSeaWater/Inlet/Temp/
M/E air cooler [n] ^a sea water out temp (°C)	/jsmea_mac/MainEngine/AirCooler[n] ^a /CoolingSeaWater/Outlet/Temp/
M/E air cooler [n] ^a air in temp (°C)	/jsmea_mac/MainEngine/AirCooler[n] ^a /ScavAir/Inlet/Temp/
M/E air cooler [n] ^a air out temp (°C)	/jsmea_mac/MainEngine/AirCooler[n] ^a /ScavAir/Outlet/Temp/
M/E AUX blower [n] ^a hour (h)	/jsmea_mac/MainEngine/AUXBlower[n] ^a ///RunHour/
M/E control air press (MPa)	/jsmea_mac/MainEngine/ControlAirLine/CompressedAir//Press/
^a [n] is read as a number of the first device. Omit [n] if there is only one device on board. ^b [m] is read as a number of the second device. Omit [m] if there is only one device on board. ^c 1 mm ² /s is equivalent to 1 cSt. ^d Parts per million. ^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min ⁻¹ .	

Table B.19 (continued)

Channel Name (Unit)	LocalID
M/E crankcase oil mist high (-)	/jsmea_mac/MainEngine/Crankcase/OilMist//OilContent/
M/E crosshead lub oil in press (MPa)	/jsmea_mac/MainEngine/CrossheadBearing/LubOil/Inlet/Press/
M/E cylinder [n] ^a compression press (MPa)	/jsmea_mac/MainEngine/Cylinder[n] ^a /Compression//Press/
M/E cylinder CFW in press (MPa)	/jsmea_mac/MainEngine/Cylinder/CoolingFreshWater/Inlet/Press/
M/E cylinder CFW in temp (°C)	/jsmea_mac/MainEngine/Cylinder/CoolingFreshWater/Inlet/Temp/
M/E cylinder [n] ^a CFW out temp (°C)	/jsmea_mac/MainEngine/Cylinder[n] ^a /CoolingFreshWater/Outlet/Temp/
M/E cylinder CFW common out temp (°C)	/jsmea_mac/MainEngine/CylinderCommon/CoolingFreshWater/Outlet/Temp/
M/E cylinder [n] ^a drain oil all iron (mg/kg)	/jsmea_mac/MainEngine/Cylinder[n] ^a /DrainOil//FeAll/
M/E cylinder [n] ^a drain oil magnetism iron (mg/kg)	/jsmea_mac/MainEngine/Cylinder[n] ^a /DrainOil//FeMagnetism/
M/E cylinder [n] ^a drain oil BN (mg/g)	/jsmea_mac/MainEngine/Cylinder[n] ^a /DrainOil//TBN/
M/E cylinder [n] ^a exhaust gas out temp (°C)	/jsmea_mac/MainEngine/Cylinder[n] ^a /ExhaustGas/Outlet/Temp/
M/E cylinder [n] ^a combustion press angle (°C)	/jsmea_mac/MainEngine/Cylinder[n] ^a /MaxCombustion//Angle/
M/E cylinder [n] ^a combustion press (MPa)	/jsmea_mac/MainEngine/Cylinder[n] ^a /MaxCombustion//Press/
M/E power production (indicated output) (kW)	/jsmea_mac/MainEngine/Cylinder/MeanIndication//Power/
M/E cylinder [n] ^a mean indicated pressure (MPa)	/jsmea_mac/MainEngine/Cylinder[n] ^a /MeanIndication//Press/
M/E cylinder [n] ^a liner temp after (°C)	/jsmea_mac/MainEngine/CylinderLiner[n] ^a //Aft/Temp/
M/E cylinder [n] ^a liner temp forward (°C)	/jsmea_mac/MainEngine/CylinderLiner[n] ^a //Forward/Temp/
M/E cylinder [n] ^a liner temp port (°C)	/jsmea_mac/MainEngine/CylinderLiner[n] ^a //Port/Temp/
M/E cylinder [n] ^a liner temp starboard (°C)	/jsmea_mac/MainEngine/CylinderLiner[n] ^a //Starboard/Temp/
M/E cylinder oil flow count (l)	/jsmea_mac/MainEngine/CylinderOilLine/CylinderOil//VolumeFlow-Count/
M/E cylinder oil main line press (MPa)	/jsmea_mac/MainEngine/CylinderOilLine/CylinderOil/Inlet/Press/
M/E cylinder oil main line temp (°C)	/jsmea_mac/MainEngine/CylinderOilLine/CylinderOil/Inlet/Temp/
Shaft horse power (kW)	/jsmea_mac/MainEngine/DrivingShaft/Output//Power/
Shaft torque (kNm)	/jsmea_mac/MainEngine/DrivingShaft/Output//Torque/
M/E run hour (h)	/jsmea_mac/MainEngine/Engine///RunHour/
M/E load (%)	/jsmea_mac/MainEngine/Engine/Output//Load/
M/E revolution counter (-)	/jsmea_mac/MainEngine/Engine/Revolution//Count/
M/E revolution speed (min ⁻¹) ^e	/jsmea_mac/MainEngine/Engine/Revolution//Speed/
M/E exhaust valve closing angle (°)	/jsmea_mac/MainEngine/ExhaustValve//Close/Angle/
M/E cylinder [n] ^a exhaust valve closing dead time (ms)	/jsmea_mac/MainEngine/ExhaustValve[n] ^a //Close/DeadTime/
M/E cylinder [n] ^a exhaust valve closed position (mA)	/jsmea_mac/MainEngine/ExhaustValve[n] ^a //Close/Position/

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
M/E exhaust valve opening angle (°)	/jsmea_mac/MainEngine/ExhaustValve//Open/Angle/
M/E cylinder [n] ^a exhaust valve opening dead time (ms)	/jsmea_mac/MainEngine/ExhaustValve[n] ^a //Open/DeadTime/
M/E cylinder [n] ^a exhaust valve open position (mA)	/jsmea_mac/MainEngine/ExhaustValve[n] ^a //Open/Position/
M/E exhaust valve actuator oil in press (MPa)	/jsmea_mac/MainEngine/ExhaustValveActuator/LubOil/Inlet/Press/
M/E exhaust valve spring air press (MPa)	/jsmea_mac/MainEngine/ExhaustValveSpringAir/CompressedAir/Inlet/Press/
M/E fuel command (%)	/jsmea_mac/MainEngine/FuelCommand///FuelCommand/
M/E cylinder [n] ^a inj time (ms)	/jsmea_mac/MainEngine/FuelOilInjectionSystem///Period/
M/E FQS (°)	/jsmea_mac/MainEngine/FuelOilInjectionSystem///FuelQualitySetting/SetPoint/
M/E injection begin (°)	/jsmea_mac/MainEngine/FuelOilInjectionSystem//Start/Angle/
M/E number of active inj nozzles (-)	/jsmea_mac/MainEngine/FuelOilInjector///ActivateNumber/
M/E fuel oil leak flow (l)	/jsmea_mac/MainEngine/FuelOilLeakLine/FuelOil//VolumeFlow-Count/
M/E fuel oil flow meter temp (°C)	/jsmea_mac/MainEngine/FuelOilLine/FuelOil//Temp/
M/E fuel oil viscosity (mm ² /s) ^{c, e}	/jsmea_mac/MainEngine/FuelOilLine/FuelOil/Inlet/KinematicViscosity/
M/E fuel oil in press (MPa)	/jsmea_mac/MainEngine/FuelOilLine/FuelOil/Inlet/Press/
M/E fuel oil in temp (°C)	/jsmea_mac/MainEngine/FuelOilLine/FuelOil/Inlet/Temp/
M/E fuel oil inlet flow (l)	/jsmea_mac/MainEngine/FuelOilLine/FuelOil/Inlet/VolumeFlow-Count/
M/E fuel oil outlet flow (l)	/jsmea_mac/MainEngine/FuelOilLine/FuelOil/Outlet/VolumeFlow-Count/
M/E fuel pump rack (-)	/jsmea_mac/MainEngine/FuelOilPump///Position/
M/E fuel pump position [n] ^a out temp (°C)	/jsmea_mac/MainEngine/FuelOilPump[n] ^a /FuelOil/Outlet/Temp/
M/E fuel pump actuator output (%)	/jsmea_mac/MainEngine/FuelOilPumpActuator///Position/
M/E fuel rail press set point (MPa)	/jsmea_mac/MainEngine/FuelRail/FuelOil//Press//SetPoint/
M/E fuel rail sensor [n] ^a press (MPa)	/jsmea_mac/MainEngine/FuelRail[n] ^a /FuelOil//Press//Inst/
M/E main lub oil in press (MPa)	/jsmea_mac/MainEngine/LubOilLine/LubOil/Inlet/Press/
M/E main lub oil in temp (°C)	/jsmea_mac/MainEngine/LubOilLine/LubOil/Inlet/Temp/
M/E lub oil sump tank level (m)	/jsmea_mac/MainEngine/LubOilSumpTank/LubOil//Level/
M/E cylinder [n] ^a piston cooling out temp (°C)	/jsmea_mac/MainEngine/PistonCooling[n] ^a /LubOil/Outlet/Temp/
M/E scavenging air common press (MPa)	/jsmea_mac/MainEngine/ScavAirSpaceCommon/ScavAir//Press/
M/E scavenging air [n] ^a temp (°C)	/jsmea_mac/MainEngine/ScavAirSpace[n] ^a /ScavAir//Temp/
M/E scavenging air common temp (°C)	/jsmea_mac/MainEngine/ScavAirSpaceCommon/ScavAir//Temp/
M/E servo oil pump inlet press (MPa)	/jsmea_mac/MainEngine/ServoOilPump/LubOil/Inlet/Press/
^a [n] is read as a number of the first device. Omit [n] if there is only one device on board. ^b [m] is read as a number of the second device. Omit [m] if there is only one device on board. ^c 1 mm ² /s is equivalent to 1 cSt. ^d Parts per million. ^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min ⁻¹ .	

Table B.19 (continued)

Channel Name (Unit)	LocalID
M/E servo oil pump [n] ^a PWM current (mA)	/jsmea_mac/MainEngine/ServoOilPump[n] ^a /Signal//Current/
Servo oil press set point (MPa)	/jsmea_mac/MainEngine/ServoOilRail///Press//SetPoint/
Servo oil press sensor [n] ^a (MPa)	/jsmea_mac/MainEngine/ServoOilRail[n] ^a ///Press//Inst/
M/E starting air press (MPa)	/jsmea_mac/MainEngine/StartAirLine/CompressedAir/Inlet/Press/
M/E thrust pad forward temp (°C)	/jsmea_mac/MainEngine/ThrustBearing/LubOil/Forward/Temp/
M/E thrust bearing lub oil out temp (°C)	/jsmea_mac/MainEngine/ThrustBearing/LubOil/Outlet/Temp/
M/E T/C [n] ^a exhaust gas out temp (°C)	/jsmea_mac/MainEngine/TurboCharger[n] ^a /ExhaustGas/Outlet/Temp/
M/E T/C [n] ^a exhaust gas in temp (°C)	/jsmea_mac/MainEngine/TurboCharger[n] ^a /ExhaustGas/Inlet/Temp/
M/E T/C [n] ^a lub oil in press (MPa)	/jsmea_mac/MainEngine/TurboCharger[n] ^a /LubOil/Inlet/Press/
M/E T/C [n] ^a lub oil out temp (°C)	/jsmea_mac/MainEngine/TurboCharger[n] ^a /LubOil/Outlet/Temp/
M/E T/C [n] ^a revolution speed (min ⁻¹) ^e	/jsmea_mac/MainEngine/TurboCharger[n] ^a /Revolution//Speed/
MSB room temp (°C)	/jsmea_mac/MainSwitchBoardRoom/RoomSpace/Air//Temp/
6 600 V HVMSB bus frequency (Hz)	/jsmea_mac/PowerElectricSystem/HighVoltageMainSwitchboard/AC6600VBus//Frequency/
6 600 V HVMSB bus voltage (V)	/jsmea_mac/PowerElectricSystem/HighVoltageMainSwitchboard/AC6600VBus//Voltage/
440 V LVMSB bus frequency (Hz)	/jsmea_mac/PowerElectricSystem/LowVoltageMainSwitchboard/AC440VBus//Frequency/
440 V LVMSB bus voltage (V)	/jsmea_mac/PowerElectricSystem/LowVoltageMainSwitchboard/AC440VBus//Voltage/
440 V LVSB [n] ^a bus current (A)	/jsmea_mac/PowerElectricSystem/LowVoltageSwitchboard[n] ^a /AC440VBus//Current/
440 V LVSB [n] ^a bus voltage (V)	/jsmea_mac/PowerElectricSystem/LowVoltageSwitchboard[n] ^a /AC440VBus//Voltage/
Main trans [n] ^a 2nd (R) temp (°C)	/jsmea_mac/PowerElectricSystem/MainTransformer[n] ^a /Secondary-Coil/PhaseR/Temp/
Main trans [n] ^a 2nd (S) temp (°C)	/jsmea_mac/PowerElectricSystem/MainTransformer[n] ^a /Secondary-Coil/PhaseS/Temp/
Main trans [n] ^a 2nd (T) temp (°C)	/jsmea_mac/PowerElectricSystem/MainTransformer[n] ^a /Secondary-Coil/PhaseT/Temp/
Total electric power (kW)	/jsmea_mac/PowerElectricSystem/TotalElectric/Electric//Power/
Interm shaft bearing temp (°C)	/jsmea_mac/PropulsionDriveSystem/IntermediateShaftBearing///Temp/
Interm shaft bearing temp (lower) (°C)	/jsmea_mac/PropulsionDriveSystem/IntermediateShaftBearing//Lower/Temp/
Interm shaft bearing temp (P) (°C)	/jsmea_mac/PropulsionDriveSystem/IntermediateShaftBearing//Port/Temp/
Interm shaft bearing temp (S) (°C)	/jsmea_mac/PropulsionDriveSystem/IntermediateShaftBearing//Starboard/Temp/
Interm shaft bearing temp (upper) (°C)	/jsmea_mac/PropulsionDriveSystem/IntermediateShaftBearing//Upper/Temp/
^a [n] is read as a number of the first device. Omit [n] if there is only one device on board. ^b [m] is read as a number of the second device. Omit [m] if there is only one device on board. ^c 1 mm²/s is equivalent to 1 cSt. ^d Parts per million. ^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.	

Table B.19 (continued)

Channel Name (Unit)	LocalID
Controllable pitch propeller [n] ^a lub oil temp (°C)	/jsmea_mac/PropulsionDriveSystem/Propeller[n] ^a /LubOil//Temp/
Controllable pitch propeller [n] ^a working press (MPa)	/jsmea_mac/PropulsionDriveSystem/Propeller[n] ^a /LubOil/Lower/Press/
Controllable pitch propeller [n] ^a propulsion pitches (°)	/jsmea_mac/PropulsionDriveSystem/Propeller[n] ^a /Pitch//Angle/
Controllable pitch propeller [n] ^a propeller speed (min ⁻¹) ^e	/jsmea_mac/PropulsionDriveSystem/Propeller[n] ^a /Revolution//Speed/
Stern tube lub oil inlet temp (°C)	/jsmea_mac/PropulsionDriveSystem/SternTube/LubOil/Inlet/Temp/
Stern tube lub oil outlet temp (°C)	/jsmea_mac/PropulsionDriveSystem/SternTube/LubOil/Outlet/Temp/
Stern tube seal air press (MPa)	/jsmea_mac/PropulsionDriveSystem/SternTubeAirSeal/CompressedAir//Press/
Stern tube bearing (aft) temp (°C)	/jsmea_mac/PropulsionDriveSystem/SternTubeBearing//Aft/Temp/
Stern tube bearing (forward) temp (°C)	/jsmea_mac/PropulsionDriveSystem/SternTubeBearing//Forward/Temp/
Stern tube bearing (lower) temp (°C)	/jsmea_mac/PropulsionDriveSystem/SternTubeBearing//Lower/Temp/
Stern tube bearing (P) temp (°C)	/jsmea_mac/PropulsionDriveSystem/SternTubeBearing//Port/Temp/
Stern tube bearing (S) temp (°C)	/jsmea_mac/PropulsionDriveSystem/SternTubeBearing//Starboard/Temp/
Stern tube bearing (upper) temp (°C)	/jsmea_mac/PropulsionDriveSystem/SternTubeBearing//Upper/Temp/
Stern tube lub oil tank press (MPa)	/jsmea_mac/PropulsionDriveSystem/SternTubeLubOilTank/LubOil//Press/
Provision reefer compressor [n] ^a run hour (h)	/jsmea_mac/ProvisionRefrigerator/Compressor[n] ^a ///RunHour/
Fire and bilge pump run hour (h)	/jsmea_mac/SeaWaterSystem/FireBilgePump///RunHour/
Fire and general service. pump run hour (h)	/jsmea_mac/SeaWaterSystem/FireGeneralServiceWaterPump///RunHour/
Steering gear electric current (A)	/jsmea_mac/ShaftGeneratorMotorSystem/Generator/Electric//Current/
Steering gear electric frequency (Hz)	/jsmea_mac/ShaftGeneratorMotorSystem/Generator/Electric//Frequency/
Steering gear electric power (kW)	/jsmea_mac/ShaftGeneratorMotorSystem/Generator/Electric//Power/
Steering gear electric voltage (V)	/jsmea_mac/ShaftGeneratorMotorSystem/Generator/Electric//Voltage/
Steer gear motor [n] ^a run hour (h)	/jsmea_mac/SteeringGear/SteeringGearMotor[n] ^a ///RunHour/
Thruster [n] ^a azimuth angle (°)	/jsmea_mac/Thruster/AzimuthThruster[n] ^a /Azimuth//Angle/
Thruster [n] ^a revolution (min ⁻¹) ^e	/jsmea_mac/Thruster/AzimuthThrusterPropeller[n] ^a /Revolution//Speed/
Bow thruster [n] ^a run hour (h)	/jsmea_mac/Thruster/BowThrusterMotor[n] ^a ///RunHour/
Bow thruster [n] ^a current (A)	/jsmea_mac/Thruster/BowThrusterMotor[n] ^a /Electric//Current/
^a [n] is read as a number of the first device. Omit [n] if there is only one device on board. ^b [m] is read as a number of the second device. Omit [m] if there is only one device on board. ^c 1 mm²/s is equivalent to 1 cSt. ^d Parts per million. ^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.	

Table B.19 (continued)

Channel Name (Unit)	LocalID
Bow thruster [n] ^a motor (R) temp (°C)	/jsmea_mac/Thruster/BowThrusterMotor[n] ^a /StatorCoil/PhaseR/Temp/
Bow thruster [n] ^a motor (S) temp (°C)	/jsmea_mac/Thruster/BowThrusterMotor[n] ^a /StatorCoil/PhaseS/Temp/
Bow thruster [n] ^a motor (T) temp (°C)	/jsmea_mac/Thruster/BowThrusterMotor[n] ^a /StatorCoil/PhaseT/Temp/
Bow thruster [n] ^a propeller pitch (°)	/jsmea_mac/Thruster/BowThrusterPropeller[n] ^a /Pitch//Angle/
Bow thruster [n] ^a propeller speed (min ⁻¹) ^e	/jsmea_mac/Thruster/BowThrusterPropeller[n] ^a /Revolution//Speed/
Bow thruster [n] ^a run hour (h)	/jsmea_mac/Thruster/SternThrusterMotor[n] ^a //RunHour/
Stern thruster [n] ^a current (A)	/jsmea_mac/Thruster/SternThrusterMotor[n] ^a /Electric//Current/
Stern thruster [n] ^a motor (R) temp (°C)	/jsmea_mac/Thruster/SternThrusterMotor[n] ^a /StatorCoil/PhaseR/Temp/
Stern thruster [n] ^a motor (S) temp (°C)	/jsmea_mac/Thruster/SternThrusterMotor[n] ^a /StatorCoil/PhaseS/Temp/
Stern thruster [n] ^a motor (T) temp (°C)	/jsmea_mac/Thruster/SternThrusterMotor[n] ^a /StatorCoil/PhaseT/Temp/
Stern thruster [n] ^a propeller pitch (°)	/jsmea_mac/Thruster/SternThrusterPropeller[n] ^a /Pitch//Angle/
Stern thruster [n] ^a propeller speed (min ⁻¹) ^e	/jsmea_mac/Thruster/SternThrusterPropeller[n] ^a /Revolution//Speed/
T/G condenser salinity (g/kg)	/jsmea_mac/TurbineGeneratorSet/Condenser/DrainWater//Salinity/
T/G condenser vacuum press (MPa)	/jsmea_mac/TurbineGeneratorSet/Condenser/ExhaustSteam//Press/
T/G current (A)	/jsmea_mac/TurbineGeneratorSet/Generator/Electric//Current/
T/G frequency (Hz)	/jsmea_mac/TurbineGeneratorSet/Generator/Electric//Frequency/
T/G electric power (kW)	/jsmea_mac/TurbineGeneratorSet/Generator/Electric//Power/
T/G voltage (V)	/jsmea_mac/TurbineGeneratorSet/Generator/Electric//Voltage/
T/G stator (R) temp (°C)	/jsmea_mac/TurbineGeneratorSet/Generator/StatorCoil/PhaseR/Temp/
T/G stator (S) temp (°C)	/jsmea_mac/TurbineGeneratorSet/Generator/StatorCoil/PhaseS/Temp/
T/G stator (T) temp (°C)	/jsmea_mac/TurbineGeneratorSet/Generator/StatorCoil/PhaseT/Temp/
T/G grand seal steam press (MPa)	/jsmea_mac/TurbineGeneratorSet/GlandSeal/Steam/Inlet/Temp/
T/G turbine governor end bearing temp (°C)	/jsmea_mac/TurbineGeneratorSet/GovernorEndBearing///Temp/
T/G R/G pinion bearing (generator) temp (°C)	/jsmea_mac/TurbineGeneratorSet/PinionGeneratorSideBearing///Temp/
T/G R/G pinion bearing (turbine) temp (°C)	/jsmea_mac/TurbineGeneratorSet/PinionTurbineSideBearing///Temp/
T/G main steam in press (MPa)	/jsmea_mac/TurbineGeneratorSet/SteamLine/Steam/Inlet/Press/
T/G main steam in temp (°C)	/jsmea_mac/TurbineGeneratorSet/SteamLine/Steam/Inlet/Temp/
T/G turbine thrust bearing temp (°C)	/jsmea_mac/TurbineGeneratorSet/ThrustBearing///Temp/
T/G run hour (h)	/jsmea_mac/TurbineGeneratorSet/Turbine///RunHour/
T/G turbine lub oil in press (MPa)	/jsmea_mac/TurbineGeneratorSet/Turbine/LubOil/Inlet/Press/

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
T/G turbine lub oil in temp (°C)	/jsmea_mac/TurbineGeneratorSet/Turbine/LubOil/Inlet/Temp/
T/G turbine vibration (-)	/jsmea_mac/TurbineGeneratorSet/Turbine/Vibration//Amplitude/
T/G wheel bearing (gen) temp (°C)	/jsmea_mac/TurbineGeneratorSet/WheelGeneratorSideBearing///Temp/
T/G wheel bearing (turbine) temp (°C)	/jsmea_mac/TurbineGeneratorSet/WheelTurbineSideBearing///Temp/
Engine room exhaust fan [n] ^a run hour (h)	/jsmea_mac/VentilationFan/EngineRoomExhaustFan[n] ^a ///RunHour/
Engine room supply fan [n] ^a run hour (h)	/jsmea_mac/VentilationFan/EngineRoomSupplyFan[n] ^a ///RunHour/
Purifier room exhaust fan run hour (h)	/jsmea_mac/VentilationFan/PurifierRoomExhaustFan///RunHour/
Shaft space supply fan run hour (h)	/jsmea_mac/VentilationFan/ShaftSpaceSupplyFan///RunHour/
Under passage fan [n] ^a run hour (h)	/jsmea_mac/VentilationFan/UnderPassageFan[n] ^a ///RunHour/
Waste oil tank exhaust fan [n] ^a run hour (h)	/jsmea_mac/VentilationFan/WasteOilTankExhaustFan[n] ^a ///Run-Hour/
AMS abnormal	/jsmea_mac/AlarmMonitoringSystem/System///Abnormal/Abnormal-Stop/Alert/
AUX boiler abnormal	/jsmea_mac/AUXBoiler/Burner///Abnormal/EmergencyStop/Alert/
AUX boiler flame eye	/jsmea_mac/AUXBoiler/Burner/Flame//Abnormal/AbnormalStop/Alert/
AUX boiler burner fuel oil in press low	/jsmea_mac/AUXBoiler/BurnerFuelOilLine/FuelOil/Inlet/Press/Low/Alert/
AUX boiler burner fuel oil in temp high	/jsmea_mac/AUXBoiler/BurnerFuelOilLine/FuelOil/Inlet/Temp/High/Alert/
AUX boiler burner fuel oil in temp low	/jsmea_mac/AUXBoiler/BurnerFuelOilLine/FuelOil/Inlet/Temp/Low/Alert/
AUX boiler burner fuel oil in temp abnormal	/jsmea_mac/AUXBoiler/BurnerFuelOilLine/FuelOil/Inlet/Temp/State/Alert/
AUX boiler drum level high	/jsmea_mac/AUXBoiler/Drum/BoilerWater//Level/High/Alert/
AUX boiler drum level low	/jsmea_mac/AUXBoiler/Drum/BoilerWater//Level/Low/Alert/
AUX boiler drum level very low	/jsmea_mac/AUXBoiler/Drum/BoilerWater//Level/LowLow/Alert/
AUX boiler drum steam press high	/jsmea_mac/AUXBoiler/Drum/Steam/Outlet/Press/High/Alert/
AUX boiler drum steam press low	/jsmea_mac/AUXBoiler/Drum/Steam/Outlet/Press/Low/Alert/
AUX boiler exhaust gas out temp high	/jsmea_mac/AUXBoiler/ExhaustGasLine/ExhaustGas/Outlet/Temp/High/Alert/
AUX boiler feed water salinity	/jsmea_mac/AUXBoiler/FeedWaterLine/BoilerWater//Salinity/High/Alert/
AUX boiler feed water pump [n] ^a run	/jsmea_mac/AUXBoiler/FeedWaterPump[n] ^a ///RunStop/Run/Status/
AUX boiler feed water pump [n] ^a	/jsmea_mac/AUXBoiler/FeedWaterPump[n] ^a ///RunStop/State/Status/
AUX boiler feed water pump [n] ^a stop	/jsmea_mac/AUXBoiler/FeedWaterPump[n] ^a ///RunStop/Stop/Status/
AUX boiler Feed water pump [n] ^a out press low	/jsmea_mac/AUXBoiler/FeedWaterPump[n] ^a /BoilerWater/Outlet/Press/Low/Alert/
AUX boiler forced draft fan run	/jsmea_mac/AUXBoiler/ForcedDraftFan///RunStop/Run/Status/
AUX boiler forced draft fan	/jsmea_mac/AUXBoiler/ForcedDraftFan///RunStop/State/Status/

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
AUX boiler forced draft fan stop	/jsmea_mac/AUXBoiler/ForcedDraftFan///RunStop/Stop/Status/
AUX boiler forced draft out air press low	/jsmea_mac/AUXBoiler/ForcedDraftFan/Air/Outlet/Press/Low/Alert
AUX boiler HP drum level high	/jsmea_mac/AUXBoiler/HighPressureDrum/BoilerWater//Level/High/Alert/
AUX boiler HP drum level low	/jsmea_mac/AUXBoiler/HighPressureDrum/BoilerWater//Level/Low/Alert/
AUX boiler HP out steam press high	/jsmea_mac/AUXBoiler/HighPressureDrum/Steam/Outlet/Press/High/Alert/
AUX boiler HP out steam press low	/jsmea_mac/AUXBoiler/HighPressureDrum/Steam/Outlet/Press/Low/Alert/
AUX boiler LP drum level high	/jsmea_mac/AUXBoiler/LowPressureDrum/BoilerWater//Level/High/Alert/
AUX boiler LP drum level low	/jsmea_mac/AUXBoiler/LowPressureDrum/BoilerWater//Level/Low/Alert/
AUX boiler LP out steam press high	/jsmea_mac/AUXBoiler/LowPressureDrum/Steam/Outlet/Press/High/Alert/
AUX boiler LP out steam press low	/jsmea_mac/AUXBoiler/LowPressureDrum/Steam/Outlet/Press/Low/Alert/
BWMS abnormal trip	/jsmea_mac/BallastSystem/BallastWaterManagementSystem///Abnormal/AbnormalStop/Alert/
BWMS abnormal	/jsmea_mac/BallastSystem/BallastWaterManagementSystem///Abnormal/State/Alert/
Bilge pump long run	/jsmea_mac/BilgeSludgeSystem/BilgePump///Abnormal/LongRun/Alert/
Bilge pump auto start	/jsmea_mac/BilgeSludgeSystem/BilgePump///RunStop/AutoStart/Status/
Bilge pump auto stop	/jsmea_mac/BilgeSludgeSystem/BilgePump///RunStop/AutoStop/Status/
Bilge pump	/jsmea_mac/BilgeSludgeSystem/BilgePump///RunStop/State/Status/
15 ppm ^d bilge separator oil content	/jsmea_mac/BilgeSludgeSystem/BilgeSeparatorOilContentMonitor///OilContent/15ppm/Alert/
Bilge separator oil content	/jsmea_mac/BilgeSludgeSystem/BilgeSeparatorOilContentMonitor///OilContent/State/Alert/
Bilge well [Location] level high	/jsmea_mac/BilgeSludgeSystem/BilgeWell[location]/BilgeWater//Level/High/Alert/
Fuel oil sludge tank level high	/jsmea_mac/BilgeSludgeSystem/FuelOilSludgeTank///Level/High/Alert
Fuel oil sludge tank level abnormal	/jsmea_mac/BilgeSludgeSystem/FuelOilSludgeTank///Level/State/Alert
Lub oil sludge tank level high	/jsmea_mac/BilgeSludgeSystem/LubOilSludgeTank///Level/High/Alert
Lub oil sludge tank level abnormal	/jsmea_mac/BilgeSludgeSystem/LubOilSludgeTank///Level/State/Alert
Cascade tank level low	/jsmea_mac/BoilerWaterSystem/CascadeTank/BoilerWater//Level/Low/Alert/

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
Cascade tank level abnormal	/jsmea_mac/BoilerWaterSystem/CascadeTank/BoilerWater//Level/State/Alert/
AUX air reservoir press low	/jsmea_mac/CompressionAirSystem/AUXAirReservoir/CompressedAir//Press/Low/Alert/
Control air reservoir press low	/jsmea_mac/CompressionAirSystem/ControlAirReservoir/CompressedAir//Press/Low/Alert/
Emergency generator start air reservoir press low	/jsmea_mac/CompressionAirSystem/AirReservoirEmergencyGenerator/CompressedAir//Press/Low/Alert/
Fuel oil valve emergency shutoff air reservoir press low	/jsmea_mac/CompressionAirSystem/AirReservoirEmergencyShutOffValve/CompressedAir//Press/Low/Alert/
Main air compressor [n] ^a auto stop	/jsmea_mac/CompressionAirSystem/MainAirCompressor[n] ^a //Run-Stop/AutoStop/Alert/
Main air compressor [n] ^a lub oil in press low	/jsmea_mac/CompressionAirSystem/MainAirCompressor[n] ^a /LubOil//Press/Low/Alert/
Main air reservoir press low	/jsmea_mac/CompressionAirSystem/MainAirReservoir/CompressedAir//Press/Low/Alert/
G/E CFW expansion tank level low	/jsmea_mac/CoolingFreshWaterSystem/ExpansionTankDieselGeneratorSet/CoolingFreshWater//Level/Low/Alert
G/E CFW expansion tank level abnormal	/jsmea_mac/CoolingFreshWaterSystem/ExpansionTankDieselGeneratorSet/CoolingFreshWater//Level/State/Alert
M/E CFW expansion tank level low	/jsmea_mac/CoolingFreshWaterSystem/ExpansionTankMainEngine/CoolingFreshWater//Level/Low/Alert
M/E CFW expansion tank level abnormal	/jsmea_mac/CoolingFreshWaterSystem/ExpansionTankMainEngine/CoolingFreshWater//Level/State/Alert
Central CFW (HT) temp high	/jsmea_mac/CoolingFreshWaterSystem/HighTempCoolingFreshWaterLine/CoolingFreshWater//Temp/High/Alert/
Central CFW (HT) temp low	/jsmea_mac/CoolingFreshWaterSystem/HighTempCoolingFreshWaterLine/CoolingFreshWater//Temp/Low/Alert/
Central CFW (HT) temp abnormal	/jsmea_mac/CoolingFreshWaterSystem/HighTempCoolingFreshWaterLine/CoolingFreshWater//Temp/State/Alert/
Central CFW (LT) temp high	/jsmea_mac/CoolingFreshWaterSystem/LowTempCoolingFreshWaterLine/CoolingFreshWater//Temp/High/Alert/
Central CFW (LT) temp low	/jsmea_mac/CoolingFreshWaterSystem/LowTempCoolingFreshWaterLine/CoolingFreshWater//Temp/Low/Alert/
Central CFW (LT) temp abnormal	/jsmea_mac/CoolingFreshWaterSystem/LowTempCoolingFreshWaterLine/CoolingFreshWater//Temp/State/Alert/
Sea water temp high	/jsmea_mac/CoolingSeaWaterSystem/CoolingSeaWaterLine/CoolingSeaWater//Temp/High/Alert/
Sea water temp low	/jsmea_mac/CoolingSeaWaterSystem/CoolingSeaWaterLine/CoolingSeaWater//Temp/Low/Alert/
G/E [n] ^a CFW (LT) in temp high	/jsmea_mac/DieselGeneratorSet[n] ^a /AirCooler/CoolingFreshWater/Inlet/Temp/High/Alert/
G/E [n] ^a sea water in temp high	/jsmea_mac/DieselGeneratorSet[n] ^a /AirCooler/CoolingSeaWater/Inlet/Temp/High/Alert/

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
G/E [n] ^a sea water in temp low	/jsmea_mac/DieselGeneratorSet[n] ^a /AirCooler/CoolingSeaWater/Inlet/Temp/Low/Alert/
G/E [n] ^a sea water in temp abnormal	/jsmea_mac/DieselGeneratorSet[n] ^a /AirCooler/CoolingSeaWater/Inlet/Temp/State/Alert/
G/E CFW (LT) Common out temp high	/jsmea_mac/DieselGeneratorSet/AirCoolerCommon/CoolingFreshWater/Outlet/Temp/High/Alert/
G/E [n] ^a CFW (HT) in temp high	/jsmea_mac/DieselGeneratorSet[n] ^a /Cylinder/CoolingFreshWater/Inlet/Temp/High/Alert/
G/E [n] ^a CFW (HT) in temp low	/jsmea_mac/DieselGeneratorSet[n] ^a /Cylinder/CoolingFreshWater/Inlet/Temp/Low/Alert/
G/E [n] ^a CFW (HT) in temp abnormal	/jsmea_mac/DieselGeneratorSet[n] ^a /Cylinder/CoolingFreshWater/Inlet/Temp/State/Alert/
G/E [n] ^a abnormal trip	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine///Abnormal/Abnormal-Stop/Alert/
G/E [n] ^a start fail	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine///Abnormal/StartFail/Alert/
G/E [n] ^a fuel oil in temp high	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/FuelOil/Inlet/Temp/High/Alert/
G/E [n] ^a fuel oil in temp low	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/FuelOil/Inlet/Temp/Low/Alert/
G/E [n] ^a fuel oil in temp abnormal	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/FuelOil/Inlet/Temp/State/Alert/
G/E [n] ^a lub oil in press low	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/LubOil/Inlet/Press/Low/Alert/
G/E [n] ^a lub oil in press low	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/LubOil/Inlet/Press/Low/Alert/
G/E [n] ^a lub oil in temp high	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/LubOil/Inlet/Temp/High/Alert/
G/E [n] ^a lub oil in temp low	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/LubOil/Inlet/Temp/Low/Alert/
G/E [n] ^a lub oil in temp abnormal	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/LubOil/Inlet/Temp/State/Alert/
G/E [n] ^a over speed	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/Revolution//Speed/High/Alert/
G/E [n] ^a revolution level	/jsmea_mac/DieselGeneratorSet[n] ^a /Engine/Revolution//Speed/Low/Alert/
G/E [n] ^a fuel oil leak high	/jsmea_mac/DieselGeneratorSet[n] ^a /FuelOilLeakTank/FuelOil//Level/High/Alert/
G/E fuel oil in temp high	/jsmea_mac/DieselGeneratorSet/FuelOilLine/FuelOil/Inlet/Temp/High/Alert/
G/E fuel oil in temp low	/jsmea_mac/DieselGeneratorSet/FuelOilLine/FuelOil/Inlet/Temp/Low/Alert/
G/E fuel oil in temp abnormal	/jsmea_mac/DieselGeneratorSet/FuelOilLine/FuelOil/Inlet/Temp/State/Alert/

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
Generator [n] ^a over current	/jsmea_mac/DieselGeneratorSet[n] ^a /Generator/Electric//Current/High/Alert/
Generator [n] ^a frequency high	/jsmea_mac/DieselGeneratorSet[n] ^a /Generator/Electric//Frequency/High/Alert/
Generator [n] ^a frequency low	/jsmea_mac/DieselGeneratorSet[n] ^a /Generator/Electric//Frequency/Low/Alert/
Generator [n] ^a voltage high	/jsmea_mac/DieselGeneratorSet[n] ^a /Generator/Electric//Voltage/High/Alert/
Generator [n] ^a voltage low	/jsmea_mac/DieselGeneratorSet[n] ^a /Generator/Electric//Voltage/Low/Alert/
Generator [n] ^a preferential trip	/jsmea_mac/DieselGeneratorSet[n] ^a /GeneratorACB///Abnormal/PreferentialTrip/Alert/
G/E [n] ^a lub oil sump tank level low	/jsmea_mac/DieselGeneratorSet[n] ^a /LubOilSumpTank/LubOil//Level/Low/Alert
G/E [n] ^a lub oil sump tank level	/jsmea_mac/DieselGeneratorSet[n] ^a /LubOilSumpTank/LubOil//Level/State/Alert
G/E [n] ^a T/C exhaust gas in temp high	/jsmea_mac/DieselGeneratorSet[n] ^a /TurboCharger/ExhaustGas/Inlet/Temp/High/Alert/
G/E [n] ^a T/C lub oil in temp low	/jsmea_mac/DieselGeneratorSet[n] ^a /TurboCharger/LubOil/Inlet/Temp/Low/Alert/
G/E [n] ^a T/C lub oil out temp high	/jsmea_mac/DieselGeneratorSet[n] ^a /TurboCharger/LubOil/Outlet/Temp/High/Alert/
G/E [n] ^a T/C over speed	/jsmea_mac/DieselGeneratorSet[n] ^a /TurboCharger/Revolution//Speed/High/Alert/
Emergency generator CFW out press low	/jsmea_mac/EmergencyGeneratorSystem/Engine/CoolingFreshWater/Outlet/Press/Low/Alert/
Emergency generator CFW out temp high	/jsmea_mac/EmergencyGeneratorSystem/Engine/CoolingFreshWater/Outlet/Temp/High/Alert/
Emergency generator lub oil in press low	/jsmea_mac/EmergencyGeneratorSystem/Engine/LubOil/Inlet/Press/Low/Alert
Emergency generator lub oil in temp high	/jsmea_mac/EmergencyGeneratorSystem/Engine/LubOil/Inlet/Temp/High/Alert
Emergency generator over speed	/jsmea_mac/EmergencyGeneratorSystem/Engine/Revolution//Speed/High/Alert/
Emergency generator fuel oil leak level high	/jsmea_mac/EmergencyGeneratorSystem/FuelOilLeakTank/FuelOil//Level/High/Alert/
Distilled water salinity abnormal	/jsmea_mac/FreshWaterSystem/DistilledWaterLine/DistilledWater//Salinity/State/Alert/
DO service tank [n] ^a level high	/jsmea_mac/FuelOilSystem/DieselOilServiceTank[n] ^a /DieselOil//Level/High/Alert/
DO service tank [n] ^a level low	/jsmea_mac/FuelOilSystem/DieselOilServiceTank[n] ^a /DieselOil//Level/Low/Alert/
DO service tank [n] ^a level abnormal	/jsmea_mac/FuelOilSystem/DieselOilServiceTank[n] ^a /DieselOil//Level/State/Alert/

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
DO settling tank [n] ^a level high	/jsmea_mac/FuelOilSystem/DieselOilSettlingTank[n] ^a /DieselOil//Level/High/Alert/
DO settling tank [n] ^a level low	/jsmea_mac/FuelOilSystem/DieselOilSettlingTank[n] ^a /DieselOil//Level/Low/Alert/
DO settling tank [n] ^a level abnormal	/jsmea_mac/FuelOilSystem/DieselOilSettlingTank[n] ^a /DieselOil//Level/State/Alert/
Heavy fuel oil drain tank level high	/jsmea_mac/FuelOilSystem/FuelOilDrainTank/HeavyFuelOil//Level/High/Alert/
Heavy fuel oil drain tank level low	/jsmea_mac/FuelOilSystem/FuelOilDrainTank/HeavyFuelOil//Level/Low/Alert/
Heavy fuel oil drain tank level abnormal	/jsmea_mac/FuelOilSystem/FuelOilDrainTank/HeavyFuelOil//Level/State/Alert/
Heavy fuel oil overflow tank level high	/jsmea_mac/FuelOilSystem/FuelOilOverFlowTank/HeavyFuelOil//Level/High/Alert/
Heavy fuel oil overflow tank level low	/jsmea_mac/FuelOilSystem/FuelOilOverFlowTank/HeavyFuelOil//Level/Low/Alert/
Heavy fuel oil overflow tank level abnormal	/jsmea_mac/FuelOilSystem/FuelOilOverFlowTank/HeavyFuelOil//Level/State/Alert/
Fuel oil purifier [n] ^a abnormal trip	/jsmea_mac/FuelOilSystem/FuelOilPurifier[n] ^a ///Abnormal/AbnormalStop/Alert/
Fuel oil purifier [n] ^a abnormal	/jsmea_mac/FuelOilSystem/FuelOilPurifier[n] ^a ///Abnormal/State/Alert/
Heavy fuel oil purifier [n] ^a heater fuel oil out temp high	/jsmea_mac/FuelOilSystem/FuelOilPurifierHeater[n] ^a /HeavyFuelOil/Outlet/Temp/High/Alert/
Heavy fuel oil purifier [n] ^a heater fuel oil out temp low	/jsmea_mac/FuelOilSystem/FuelOilPurifierHeater[n] ^a /HeavyFuelOil/Outlet/Temp/Low/Alert/
Heavy fuel oil purifier [n] ^a heater fuel oil out temp	/jsmea_mac/FuelOilSystem/FuelOilPurifierHeater[n] ^a /HeavyFuelOil/Outlet/Temp/State/Alert/
Heavy fuel oil service tank [n] ^a level high	/jsmea_mac/FuelOilSystem/FuelOilServiceTank[n] ^a /HeavyFuelOil//Level/High/Alert
Heavy fuel oil service tank [n] ^a level low	/jsmea_mac/FuelOilSystem/FuelOilServiceTank[n] ^a /HeavyFuelOil//Level/Low/Alert
Heavy fuel oil service tank [n] ^a level abnormal	/jsmea_mac/FuelOilSystem/FuelOilServiceTank[n] ^a /HeavyFuelOil//Level/State/Alert
Heavy fuel oil service tank [n] ^a temp high	/jsmea_mac/FuelOilSystem/FuelOilServiceTank[n] ^a /HeavyFuelOil//Temp/High/Alert/
Heavy fuel oil service tank [n] ^a temp low	/jsmea_mac/FuelOilSystem/FuelOilServiceTank[n] ^a /HeavyFuelOil//Temp/Low/Alert/
Heavy fuel oil service tank [n] ^a temp abnormal	/jsmea_mac/FuelOilSystem/FuelOilServiceTank[n] ^a /HeavyFuelOil//Temp/State/Alert/
AUX boiler heavy fuel oil service tank temp high	/jsmea_mac/FuelOilSystem/FuelOilServiceTankAUXBoiler/HeavyFuelOil//Temp/High/Alert/
AUX boiler heavy fuel oil service tank temp low	/jsmea_mac/FuelOilSystem/FuelOilServiceTankAUXBoiler/HeavyFuelOil//Temp/Low/Alert/

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
AUX boiler heavy fuel oil service tank temp abnormal	/jsmea_mac/FuelOilSystem/FuelOilServiceTankAUXBoiler/HeavyFuelOil//Temp/State/Alert/
Heavy fuel oil settling tank level high	/jsmea_mac/FuelOilSystem/FuelOilSettlingTank/HeavyFuelOil//Level/High/Alert/
Heavy fuel oil settling tank level low	/jsmea_mac/FuelOilSystem/FuelOilSettlingTank/HeavyFuelOil//Level/Low/Alert/
Heavy fuel oil settling tank level abnormal	/jsmea_mac/FuelOilSystem/FuelOilSettlingTank/HeavyFuelOil//Level/State/Alert/
Heavy fuel oil settling tank temp high	/jsmea_mac/FuelOilSystem/FuelOilSettlingTank/HeavyFuelOil//Temp/High/Alert/
Heavy fuel oil settling tank temp low	/jsmea_mac/FuelOilSystem/FuelOilSettlingTank/HeavyFuelOil//Temp/Low/Alert/
Heavy fuel oil settling tank temp abnormal	/jsmea_mac/FuelOilSystem/FuelOilSettlingTank/HeavyFuelOil//Temp/State/Alert/
Low sulfur heavy fuel oil service tank level high	/jsmea_mac/FuelOilSystem/LowSulfurHeavyFuelOilServiceTank/LowSulfurHeavyFuelOil//Level/High/Alert/
Low sulfur heavy fuel oil service tank level low	/jsmea_mac/FuelOilSystem/LowSulfurHeavyFuelOilServiceTank/LowSulfurHeavyFuelOil//Level/Low/Alert/
Low sulfur heavy fuel oil service tank level abnormal	/jsmea_mac/FuelOilSystem/LowSulfurHeavyFuelOilServiceTank/LowSulfurHeavyFuelOil//Level/State/Alert/
Low sulfur heavy fuel oil setting tank level high	/jsmea_mac/FuelOilSystem/LowSulfurHeavyFuelOilSettlingTank/LowSulfurHeavyFuelOil//Level/High/Alert/
Low sulfur heavy fuel oil setting tank level low	/jsmea_mac/FuelOilSystem/LowSulfurHeavyFuelOilSettlingTank/LowSulfurHeavyFuelOil//Level/Low/Alert/
Low sulfur heavy fuel oil setting tank level abnormal	/jsmea_mac/FuelOilSystem/LowSulfurHeavyFuelOilSettlingTank/LowSulfurHeavyFuelOil//Level/State/Alert/
Marine gas oil service tank level high	/jsmea_mac/FuelOilSystem/MarineGasOilServiceTank/MarineGasOil//Level/High/Alert/
Marine gas oil service tank level low	/jsmea_mac/FuelOilSystem/MarineGasOilServiceTank/MarineGasOil//Level/Low/Alert/
Marine gas oil service tank level abnormal	/jsmea_mac/FuelOilSystem/MarineGasOilServiceTank/MarineGasOil//Level/State/Alert/
Incinerator abnormal trip	/jsmea_mac/Incinerator/Burner///Abnormal/AbnormalStop/Alert/
Incinerator abnormal	/jsmea_mac/Incinerator/Burner///Abnormal/State/Alert/
Waste oil tank [n] ^a level high	/jsmea_mac/Incinerator/WasteOilTank[n] ^a /WasteOil//Level/High/Alert/
Waste oil tank [n] ^a level low	/jsmea_mac/Incinerator/WasteOilTank[n] ^a /WasteOil//Level/Low/Alert/
Waste oil tank [n] ^a level abnormal	/jsmea_mac/Incinerator/WasteOilTank[n] ^a /WasteOil//Level/State/Alert/
Cylinder oil measuring tank low low	/jsmea_mac/LubOilSystem/CylinderOilMeasuringTank/CylinderOil//Level/Low/Alert/
Cylinder oil measuring tank level	/jsmea_mac/LubOilSystem/CylinderOilMeasuringTank/CylinderOil//Level/State/Alert/
^a [n] is read as a number of the first device. Omit [n] if there is only one device on board. ^b [m] is read as a number of the second device. Omit [m] if there is only one device on board. ^c 1 mm ² /s is equivalent to 1 cSt. ^d Parts per million. ^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min ⁻¹ .	

Table B.19 (continued)

Channel Name (Unit)	LocalID
Lub oil drain tank level high	/jsmea_mac/LubOilSystem/LubOilDrainTank/LubOil//Level/High/Alert/
Lub oil drain tank level abnormal	/jsmea_mac/LubOilSystem/LubOilDrainTank/LubOil//Level/State/Alert/
Lub oil purifier Abnormal trip	/jsmea_mac/LubOilSystem/LubOilPurifier///Abnormal/AbnormalStop/Alert/
Lub oil purifier abnormal	/jsmea_mac/LubOilSystem/LubOilPurifier///Abnormal/State/Alert/
G/E lub oil purifier heater out temp high	/jsmea_mac/LubOilSystem/LubOilPurifierHeaterDieselGeneratorSet/LubOil/Outlet/Temp/High/Alert/
G/E lub oil purifier heater out temp low	/jsmea_mac/LubOilSystem/LubOilPurifierHeaterDieselGeneratorSet/LubOil/Outlet/Temp/Low/Alert/
G/E lub oil purifier heater out temp	/jsmea_mac/LubOilSystem/LubOilPurifierHeaterDieselGeneratorSet/LubOil/Outlet/Temp/State/Alert/
M/E lub oil purifier heater out temp high	/jsmea_mac/LubOilSystem/LubOilPurifierHeaterMainEngine/LubOil/Outlet/Temp/High/Alert/
M/E lub oil purifier heater out temp low	/jsmea_mac/LubOilSystem/LubOilPurifierHeaterMainEngine/LubOil/Outlet/Temp/Low/Alert/
M/E lub oil purifier heater out temp	/jsmea_mac/LubOilSystem/LubOilPurifierHeaterMainEngine/LubOil/Outlet/Temp/State/Alert/
G/E [n] ^a lub oil filter diff press	/jsmea_mac/LubOilSystem/LubOilSecondaryFilterDieselGeneratorSet/LubOil//DiffPress/State/Status
M/E lub oil filter diff press	/jsmea_mac/LubOilSystem/LubOilSecondaryFilterMainEngine/LubOil//DiffPress/State/Status
Reduction gear lub oil tank low low	/jsmea_mac/LubOilSystem/ReductionGearLubOilTank/LubOil//Level/Low/Alert
Reduction gear lub oil tank level	/jsmea_mac/LubOilSystem/ReductionGearLubOilTank/LubOil//Level/State/Alert
M/E T/C lub oil tank level low	/jsmea_mac/LubOilSystem/TurboChargerLubOilTankMainEngine/LubOil//Level/Low/Alert
M/E T/C lub oil tank level abnormal	/jsmea_mac/LubOilSystem/TurboChargerLubOilTankMainEngine/LubOil//Level/State/Alert
M/E remote control system power fail	/jsmea_mac/MainEngine/RemoteControlSystem///Abnormal/Power-Fail/Alert/
M/E safety system abnormal	/jsmea_mac/MainEngine/SafetySystem///Abnormal/AbnormalStop/Alert/
M/E safety system power fail	/jsmea_mac/MainEngine/SafetySystem///Abnormal/PowerFail/Alert
M/E safety system abnormal ESD circuit	/jsmea_mac/MainEngine/SafetySystem/ElectroStaticDischargeProtection//Abnormal/AbnormalStop/Alert
M/E air cooler CFW in press low	/jsmea_mac/MainEngine/AirCooler/CoolingFreshWater/Inlet/Press/Low/Alert
M/E air cooler [n] ^a CFW out temp high	/jsmea_mac/MainEngine/AirCooler[n] ^a /CoolingFreshWater/Outlet/Temp/High/Alert
M/E air cooler [n] ^a CFW out temp low	/jsmea_mac/MainEngine/AirCooler[n] ^a /CoolingFreshWater/Outlet/Temp/Low/Alert

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
M/E air cooler [n] ^a CFW out temp abnormal	/jsmea_mac/MainEngine/AirCooler[n] ^a /CoolingSeaWater/Inlet/Press/Low/Alert
M/E air cooler sea water in temp high	/jsmea_mac/MainEngine/AirCooler/CoolingSeaWater/Inlet/Temp/High/Alert/
M/E air cooler sea water in temp low	/jsmea_mac/MainEngine/AirCooler/CoolingSeaWater/Inlet/Temp/Low/Alert/
M/E air cooler sea water in temp abnormal	/jsmea_mac/MainEngine/AirCooler/CoolingSeaWater/Inlet/Temp/State/Alert/
M/E air cooler [n] ^a sea water out temp high	/jsmea_mac/MainEngine/AirCooler[n] ^a /CoolingSeaWater/Outlet/Temp/High/Alert
M/E air cooler [n] ^a sea water out temp low	/jsmea_mac/MainEngine/AirCooler[n] ^a /CoolingSeaWater/Outlet/Temp/Low/Alert
M/E air cooler [n] ^a air out temp high	/jsmea_mac/MainEngine/AirCooler[n] ^a /ScavAir/Outlet/Temp/High/Alert
M/E air cooler [n] ^a air out temp low	/jsmea_mac/MainEngine/AirCooler[n] ^a /ScavAir/Outlet/Temp/Low/Alert
M/E camshaft lub oil in press low	/jsmea_mac/MainEngine/CamShaft/LubOil/Inlet/Press/Low/Alert/
M/E camshaft lub oil in temp high	/jsmea_mac/MainEngine/CamShaft/LubOil/Inlet/Temp/High/Alert/
M/E camshaft lub oil in temp low	/jsmea_mac/MainEngine/CamShaft/LubOil/Inlet/Temp/Low/Alert/
M/E control air in press low	/jsmea_mac/MainEngine/ControlAirLine/CompressedAir/Inlet/Press/Low/Alert/
M/E crankcase oil mist (mg/l)	/jsmea_mac/MainEngine/Crankcase/OilMist//OilContent//Inst/
M/E crankcase oil mist high	/jsmea_mac/MainEngine/Crankcase/OilMist//OilContent/High/Alert/
M/E oil mist detection fail	/jsmea_mac/MainEngine/CrankcaseOilMistDetector///Abnormal/Fail/Alert/
M/E crosshead lub oil press low	/jsmea_mac/MainEngine/CrossheadBearing/LubOil/Inlet/Press/Low/Alert/
M/E crosshead lub oil temp high	/jsmea_mac/MainEngine/CrossheadBearing/LubOil/Inlet/Temp/High/Alert/
M/E air cooler CFW in press low	/jsmea_mac/MainEngine/Cylinder/CoolingFreshWater/Inlet/Press/Low/Alert/
M/E air cooler CFW in temp high	/jsmea_mac/MainEngine/Cylinder/CoolingFreshWater/Inlet/Temp/High/Alert/
M/E air cooler CFW in temp low	/jsmea_mac/MainEngine/Cylinder/CoolingFreshWater/Inlet/Temp/Low/Alert/
M/E air cooler CFW in temp abnormal	/jsmea_mac/MainEngine/Cylinder/CoolingFreshWater/Inlet/Temp/State/Alert/
M/E cylinder [n] ^a CFW out temp high	/jsmea_mac/MainEngine/Cylinder[n] ^a /CoolingFreshWater/Outlet/Temp/High/Alert/
M/E cylinder [n] ^a oil flow low	/jsmea_mac/MainEngine/Cylinder[n] ^a /CylinderOil//VolumeFlow-Count/Low/Alert/
M/E cylinder [n] ^a exhaust gas out temp deviation high	/jsmea_mac/MainEngine/Cylinder[n] ^a /ExhaustGas/Outlet/Deviation-Temp/High/Alert/
^a [n] is read as a number of the first device. Omit [n] if there is only one device on board. ^b [m] is read as a number of the second device. Omit [m] if there is only one device on board. ^c 1 mm ² /s is equivalent to 1 cSt. ^d Parts per million. ^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min ⁻¹ .	

Table B.19 (continued)

Channel Name (Unit)	LocalID
M/E cylinder [n] ^a exhaust gas out temp high	/jsmea_mac/MainEngine/Cylinder[n] ^a /ExhaustGas/Outlet/Temp/High/Alert/
M/E cylinder oil flow low	/jsmea_mac/MainEngine/CylinderOilLine/CylinderOil//VolumeFlow-Count/Low/Alert/
M/E auto slow down	/jsmea_mac/MainEngine/Engine///Abnormal/AutoSlowDown/Alert/
M/E auto slow down request	/jsmea_mac/MainEngine/Engine///Abnormal/AutoSlowDownRequest/Alert/
M/E auto re-start fail	/jsmea_mac/MainEngine/Engine///Abnormal/AutoStartFail/Alert/
M/E emergency stop	/jsmea_mac/MainEngine/Engine///Abnormal/EmergencyStop/Alert/
M/E start fail	/jsmea_mac/MainEngine/Engine///Abnormal/StartFail/Alert/
M/E wrong way	/jsmea_mac/MainEngine/Engine///Abnormal/WrongWay/Alert/
M/E manual emergency stop	/jsmea_mac/MainEngine/Engine///Abnormal/ManualEmergencyStop/Alert/
M/E auto slow down override	/jsmea_mac/MainEngine/Engine///Abnormal/AutoSlowDownOver-ride/Alert/
M/E auto slow down prewarning	/jsmea_mac/MainEngine/Engine///Abnormal/AutoSlowDownPre-warning/Alert/
M/E critical speed	/jsmea_mac/MainEngine/Engine/Revolution//Speed/Critical/Alert
M/E over speed	/jsmea_mac/MainEngine/Engine/Revolution//Speed/High/Alert/
M/E EICU abnormal trip	/jsmea_mac/MainEngine/EngineInterfaceControlUnit///Abnormal/AbnormalStop/Alert/
M/E EICU abnormal	/jsmea_mac/MainEngine/EngineInterfaceControlUnit///Abnormal/State/Alert/
M/E exhaust valve actuator oil in press low	/jsmea_mac/MainEngine/ExhaustValveActuator/LubOil/Inlet/Press/Low/Alert/
M/E exhaust valve spring air press low	/jsmea_mac/MainEngine/ExhaustValveSpringAir/CompressedAir/Inlet/Press/Low/Alert/
M/E fuel oil leak	/jsmea_mac/MainEngine/FuelOilLeakTank/FuelOil//Level/State/Alert/
M/E fuel oil viscosity high	/jsmea_mac/MainEngine/FuelOilLine/FuelOil/Inlet/KinematicViscosity/High/Alert/
M/E fuel oil viscosity low	/jsmea_mac/MainEngine/FuelOilLine/FuelOil/Inlet/KinematicViscosity/Low/Alert/
M/E fuel oil in temp high	/jsmea_mac/MainEngine/FuelOilLine/FuelOil/Inlet/Temp/High/Alert/
M/E fuel oil in temp low	/jsmea_mac/MainEngine/FuelOilLine/FuelOil/Inlet/Temp/Low/Alert/
M/E fuel oil in temp abnormal	/jsmea_mac/MainEngine/FuelOilLine/FuelOil/Inlet/Temp/State/Alert/
M/E fuel pump [n] ^a in press high	/jsmea_mac/MainEngine/FuelOilPump[n] ^a /FuelOil/Inlet/Press/High/Alert/
M/E fuel pump [n] ^a in press low	/jsmea_mac/MainEngine/FuelOilPump[n] ^a /FuelOil/Inlet/Press/Low/Alert/
M/E fuel pump [n] ^a in temp low	/jsmea_mac/MainEngine/FuelOilPump[n] ^a /FuelOil/Inlet/Temp/High/Alert/

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
M/E fuel pump [n] ^a in temp high	/jsmea_mac/MainEngine/FuelOilPump[n] ^a /FuelOil/Inlet/Temp/Low/Alert/
M/E governor abnormal	/jsmea_mac/MainEngine/Governor///Abnormal/AbnormalStop/Alert
M/E main lub oil in press low	/jsmea_mac/MainEngine/LubOilLine/LubOil/Inlet/Press/Low/Alert/
M/E main lub oil in temp high	/jsmea_mac/MainEngine/LubOilLine/LubOil/Inlet/Temp/High/Alert/
M/E main lub oil in temp low	/jsmea_mac/MainEngine/LubOilLine/LubOil/Inlet/Temp/Low/Alert/
M/E main lub oil in temp abnormal	/jsmea_mac/MainEngine/LubOilLine/LubOil/Inlet/Temp/State/Alert/
M/E lub oil sump tank level low	/jsmea_mac/MainEngine/LubOilSumpTank/LubOil//Level/Low/Alert/
M/E lub oil sump tank level	/jsmea_mac/MainEngine/LubOilSumpTank/LubOil//Level/State/Alert/
M/E lub oil sump tank temp high	/jsmea_mac/MainEngine/LubOilSumpTank/LubOil//Temp/High/Alert/
M/E lub oil sump tank temp low	/jsmea_mac/MainEngine/LubOilSumpTank/LubOil//Temp/Low/Alert/
M/E lub oil sump tank temp	/jsmea_mac/MainEngine/LubOilSumpTank/LubOil//Temp/State/Alert/
M/E lub oil main bearing in press low	/jsmea_mac/MainEngine/MainBearing/LubOil/Inlet/Press/Low/Alert/
M/E cylinder [n] ^a PCO in press low	/jsmea_mac/MainEngine/PistonCooling[n] ^a /LubOil/Inlet/Press/Low/Alert/
M/E cylinder [n] ^a PCO in temp low	/jsmea_mac/MainEngine/PistonCooling[n] ^a /LubOil/Inlet/Temp/Low/Alert/
M/E cylinder [n] ^a PCO out deviation temp high	/jsmea_mac/MainEngine/PistonCooling[n] ^a /LubOil/Outlet/Deviation-Temp/High/Alert/
M/E cylinder [n] ^a PCO out temp high	/jsmea_mac/MainEngine/PistonCooling[n] ^a /LubOil/Outlet/Temp/High/Alert/
M/E cylinder [n] ^a PCO flow low	/jsmea_mac/MainEngine/PistonCooling[n] ^a /LubOil/Outlet/Volume-Flow Count/Low/Alert/
M/E remote control system abnormal stop	/jsmea_mac/MainEngine/RemoteControlSystem///Abnormal/AbnormalStop/Alert/
M/E remote control system abnormal	/jsmea_mac/MainEngine/RemoteControlSystem///Abnormal/State/Alert/
M/E scavenging air [n] ^a water drain level high	/jsmea_mac/MainEngine/ScavAirSpace[n] ^a /DrainWater//Level/High/Alert/
M/E scavenging air [n] ^a press low	/jsmea_mac/MainEngine/ScavAirSpace[n] ^a /ScavAir//Press/Low/Alert/
M/E scavenging air [n] ^a temp high	/jsmea_mac/MainEngine/ScavAirSpace[n] ^a /ScavAir//Temp/High/Alert/
M/E starting air press low	/jsmea_mac/MainEngine/StartAirLine/CompressedAir/Inlet/Press/Low/Alert/
M/E starting air valve position	/jsmea_mac/MainEngine/StartAirValve///Position//Inst/
M/E thrust pad forward temp high	/jsmea_mac/MainEngine/ThrustBearing//Forward/Temp/High/Alert/
M/E thrust bearing lub oil in press low	/jsmea_mac/MainEngine/ThrustBearing/LubOil/Inlet/Press/Low/Alert/

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
M/E thrust bearing lub oil out temp high	/jsmea_mac/MainEngine/ThrustBearing/LubOil/Outlet/Temp/High/Alert/
M/E T/C [n] ^a exhaust gas in temp high	/jsmea_mac/MainEngine/TurboCharger[n] ^a /ExhaustGas/Inlet/Temp/High/Alert/
M/E T/C [n] ^a exhaust gas out temp high	/jsmea_mac/MainEngine/TurboCharger[n] ^a /ExhaustGas/Outlet/Temp/High/Alert/
M/E T/C [n] ^a lub oil in press low	/jsmea_mac/MainEngine/TurboCharger[n] ^a /LubOil/Inlet/Press/Low/Alert/
M/E T/C [n] ^a lub oil in temp low	/jsmea_mac/MainEngine/TurboCharger[n] ^a /LubOil/Inlet/Temp/Low/Alert/
M/E T/C [n] ^a lub oil out temp high	/jsmea_mac/MainEngine/TurboCharger[n] ^a /LubOil/Outlet/Temp/High/Alert/
M/E T/C [n] ^a over speed	/jsmea_mac/MainEngine/TurboCharger[n] ^a /Revolution//Speed/High/Alert/
M/ST HP turbine steam in press low	/jsmea_mac/MainSteamTrubine/HighPressureTurbine/Steam/Inlet/Press/Low/Alert/
M/ST LP turbine steam out press high	/jsmea_mac/MainSteamTrubine/LowPressureTurbine/ExhaustSteam/Outlet/Press/High/Alert/
M/ST LP turbine steam in press low	/jsmea_mac/MainSteamTrubine/LowPressureTurbine/Steam/Inlet/Press/Low/Alert/
M/ST lub oil in press low	/jsmea_mac/MainSteamTrubine/LubOilLine/LubOil/Inlet/Press/Low/Alert/
M/ST lub oil in temp high	/jsmea_mac/MainSteamTrubine/LubOilLine/LubOil/Inlet/Temp/High/Alert/
100V emergency switchboard low insulation	/jsmea_mac/PowerElectricSystem/EmergencySwitchboard/AC100V-bus//Insulation/Low/Alert/
100V LVSB low insulation	/jsmea_mac/PowerElectricSystem/LowVoltageMainSwitchboard/AC100Vbus//Insulation/Low/Alert/
440V LVSB low insulation	/jsmea_mac/PowerElectricSystem/LowVoltageMainSwitchboard/AC440Vbus//Insulation/Low/Alert/
CPP hydraulic oil press low	/jsmea_mac/PropulsionDriveSystem/ControllablePitchPropeller/HydraulicOil//Press/Low/Alert/
CPP hydraulic oil tank level low	/jsmea_mac/PropulsionDriveSystem/ControllablePitchPropellerHydraulicOilTank/HydraulicOil//Level/Low/Alert/
CPP hydraulic oil sump tank level low	/jsmea_mac/PropulsionDriveSystem/ControllablePitchPropeller-LubOilSumpTank/LubOil//Level/Low/Alert/
CPP hydraulic oil sump tank level	/jsmea_mac/PropulsionDriveSystem/ControllablePitchPropeller-LubOilSumpTank/LubOil//Level/State/Alert/
Propeller [n] ^a speed (min ⁻¹) ^e	/jsmea_mac/PropulsionDriveSystem/Propeller[n] ^a /Revolution//Speed//Inst/
Stern tube seal air press high	/jsmea_mac/PropulsionDriveSystem/SternTubeAirSeal/CompressedAir//Press/High/Alert
Stern tube seal air press low	/jsmea_mac/PropulsionDriveSystem/SternTubeAirSeal/CompressedAir//Press/Low/Alert

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
Stern tube bearing [position] temp high	/jsmea_mac/PropulsionDriveSystem/SternTubeBearing//[position]/Temp/High/Alert/
Stern tube lub oil sump tank level low	/jsmea_mac/PropulsionDriveSystem/SternTubeLubOilSumpTank/LubOil//Level/Low/Alert/
Stern tube lub oil sump tank level	/jsmea_mac/PropulsionDriveSystem/SternTubeLubOilSumpTank/LubOil//Level/State/Alert/
Stern tube lub oil tank level low	/jsmea_mac/PropulsionDriveSystem/SternTubeLubOilTank/LubOil//Level/Low/Alert
Stern tube lub oil tank level	/jsmea_mac/PropulsionDriveSystem/SternTubeLubOilTank/LubOil//Level/State/Alert/
Stern tube lub oil tank press low	/jsmea_mac/PropulsionDriveSystem/SternTubeLubOilTank/LubOil//Press/Low/Alert
Stern tube [location] lub oil gravity tank level low	/jsmea_mac/PropulsionDriveSystem/SternTubeSealOilGravityTank[location]/LubOil//Level/Low/Alert/
Stern tube [location] lub oil tank level low	/jsmea_mac/PropulsionDriveSystem/SternTubeSealOilTank[location]/LubOil//Level/Low/Alert/
Steering gear [n] ^a hydraulic oil tank level low	/jsmea_mac/SteeringGear[n] ^a /HydraulicOilTank/HydraulicOil//Level/Low/Alert/
Steering gear [n] ^a hydrolock	/jsmea_mac/SteeringGear[n] ^a /SteeringGear///Abnormal/Hydrolock/Alert/
Steering gear control circuit power fail	/jsmea_mac/SteeringGear/SteeringGearControlCircuit/Electric//Voltage/NoVoltage/Alert/
Steering gear [n] ^a	/jsmea_mac/SteeringGear[n] ^a /SteeringGearMotor///RunStop/State/Status/
Steering gear [n] ^a overload	/jsmea_mac/SteeringGear[n] ^a /SteeringGearMotor///Abnormal/Overload/Alert/
Steering gear [n] ^a phase fail	/jsmea_mac/SteeringGear[n] ^a /SteeringGearMotor///Abnormal/Phase-Fail/Alert/
Steering gear [n] ^a power fail	/jsmea_mac/SteeringGear[n] ^a /SteeringGearMotor/Electric//Voltage/NoVoltage/Alert/
Thermal oil heater burner flame eye	/jsmea_mac/ThermalOilHeater/Burner/Flame//Abnormal/Abnormal-Stop/Alert/
Thermal oil heater fuel oil in press low	/jsmea_mac/ThermalOilHeater/BurnerFuelOilLine/FuelOil/Inlet/Press/Low/Alert/
Thermal oil heater fuel oil in temp low	/jsmea_mac/ThermalOilHeater/BurnerFuelOilLine/FuelOil/Inlet/Temp/Low/Alert/
Thermal oil heater thermal oil diff press low	/jsmea_mac/ThermalOilHeater/ThermalOilLine/ThermalOil//Diff-Press/Low/Alert/
Thermal oil heater thermal oil out temp high	/jsmea_mac/ThermalOilHeater/ThermalOilLine/ThermalOil/Outlet/Temp/High/Alert/
Thermal oil heater thermal oil flow low	/jsmea_mac/ThermalOilHeater/ThermalOilLine/ThermalOil/Outlet/VolumeFlowCount/Low/Alert/
T/G condenser vacuum press low	/jsmea_mac/TurbineGeneratorSet/Condenser/ExhaustSteam//Press/Low/Alert/

^a [n] is read as a number of the first device. Omit [n] if there is only one device on board.

^b [m] is read as a number of the second device. Omit [m] if there is only one device on board.

^c 1 mm²/s is equivalent to 1 cSt.

^d Parts per million.

^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.19 (continued)

Channel Name (Unit)	LocalID
T/G turbine abnormal trip	/jsmea_mac/TurbineGeneratorSet/Turbine///Abnormal/Abnormal-Stop/Alert
T/G steam out press high	/jsmea_mac/TurbineGeneratorSet/Turbine/ExhaustSteam//Press/High/Alert/
T/G turbine lub oil in press low	/jsmea_mac/TurbineGeneratorSet/Turbine/LubOil//Press/Low/Alert/
T/G turbine over speed	/jsmea_mac/TurbineGeneratorSet/Turbine/Revolution//Speed/High/Alert/
T/G turbine vibration high	/jsmea_mac/TurbineGeneratorSet/Turbine/Vibration//Amplitude/High/Alert/
^a [n] is read as a number of the first device. Omit [n] if there is only one device on board. ^b [m] is read as a number of the second device. Omit [m] if there is only one device on board. ^c 1 mm²/s is equivalent to 1 cSt. ^d Parts per million. ^e Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.	

B.3.3 Local IDs for navigation system

Table B.20 — Examples of Local IDs for navigation system

Channel Name (Unit)	LocalID
UTC (system use)	/jsmea_nav/PositioningSystem/CCRS///UTC/
Latitude (system use) (°)	/jsmea_nav/PositioningSystem/CCRS//CCRP/LAT/
Longitude (system use) (°)	/jsmea_nav/PositioningSystem/CCRS//CCRP/LON/
Course over the ground (system use) (°)	/jsmea_nav/PositioningSystem/CCRS///COG/
Speed over the ground (system use) (kn) ^a	/jsmea_nav/PositioningSystem/CCRS///SOG/
Speed over the ground (Longitudinal) (system use) (kn) ^a	/jsmea_nav/PositioningSystem/CCRS/Longitudinal//SOG/
Speed over the ground (Transverse) (system use) (kn) ^a	/jsmea_nav/PositioningSystem/CCRS/Transverse//SOG/
Total distance (system use) (NM) ^b	/jsmea_nav/PositioningSystem/CCRS/Total//Distance/
Section distance (system use) (NM) ^b	/jsmea_nav/PositioningSystem/CCRS/Section//Distance/
UTC	/jsmea_nav/PositioningSystem/GNSS///UTC/
Latitude (°)	/jsmea_nav/PositioningSystem/GNSS///LAT/
Longitude (°)	/jsmea_nav/PositioningSystem/GNSS///LON/
Course over the ground (°)	/jsmea_nav/PositioningSystem/GNSS///COG/
Speed over the ground (kn) ^a	/jsmea_nav/PositioningSystem/GNSS///SOG/
Speed over the ground (Longitudinal) (kn) ^a	/jsmea_nav/PositioningSystem/GNSS/Longitudinal//SOG/
Speed over the ground (Transverse) (kn) ^a	/jsmea_nav/PositioningSystem/GNSS/Transverse//SOG/
Total distance travelled (NM) ^b	/jsmea_nav/PositioningSystem/GNSS/Total//Distance/
Section distance travelled (NM) ^b	/jsmea_nav/PositioningSystem/GNSS/Section//Distance/
Ship's local time	/jsmea_nav/ShipInformation/MasterClock///LocalTime/
Speed through the water (kn) ^a	/jsmea_nav/SpeedandDistanceMeasurementSystem/Doppler-LOG///STW/
Speed through the water (Longitudinal) (kn)	/jsmea_nav/SpeedandDistanceMeasurementSystem/Doppler-LOG/Longitudinal//STW/
^a 1 kn = 1,852 km/h. ^b 1 NM = 1,852 km.	

Table B.20 (continued)

Channel Name (Unit)	LocalID
Speed through the water (Transverse) (kn) ^a	/jsmea_nav/SpeedandDistanceMeasurementSystem/Doppler-LOG/Transverse//STW/
Speed through the water (Transverse, Stern) (kn) ^a	/jsmea_nav/SpeedandDistanceMeasurementSystem/Doppler-LOG/Transverse/Stern/STW/
Speed over the ground (kn) ^a	/jsmea_nav/SpeedandDistanceMeasurementSystem/Doppler-LOG///SOG/
Speed over the ground (Longitudinal) (kn) ^a	/jsmea_nav/SpeedandDistanceMeasurementSystem/Doppler-LOG/Longitudinal//SOG/
Speed over the ground (Transverse) (kn) ^a	/jsmea_nav/SpeedandDistanceMeasurementSystem/Doppler-LOG/Transverse//SOG/
Speed over the ground (Transverse, Stern) (kn) ^a	/jsmea_nav/SpeedandDistanceMeasurementSystem/Doppler-LOG/Transverse/Stern/SOG/
Total ground distance travelled (NM) ^b	/jsmea_nav/SpeedandDistanceMeasurementSystem/SatelliteLOG/Total//Distance/
Section ground distance travelled (NM) ^b	/jsmea_nav/SpeedandDistanceMeasurementSystem/SatelliteLOG/Section//Distance/
Total water distance travelled (NM) ^b	/jsmea_nav/SpeedandDistanceMeasurementSystem/EMLOG/Total//Distance/
Section water distance travelled (NM) ^b	/jsmea_nav/SpeedandDistanceMeasurementSystem/EMLOG/Section//Distance/
Relative wind direction (°)	/jsmea_nav/MeteorologicalObservationSystem/WindIndicator/Relative//WindDirection/
Theoretical wind direction (head up) (°)	/jsmea_nav/MeteorologicalObservationSystem/WindIndicator/Theoretical//WindDirection/
True wind direction (North up) (°)	/jsmea_nav/MeteorologicalObservationSystem/WindIndicator/TrueBearing//WindDirection/
Relative wind speed (m/s)	/jsmea_nav/MeteorologicalObservationSystem/WindIndicator/Relative//WindSpeed/
Theoretical wind speed (head up) (m/s)	/jsmea_nav/MeteorologicalObservationSystem/WindIndicator/Theoretical//WindSpeed/
True wind speed (North up) (m/s)	/jsmea_nav/MeteorologicalObservationSystem/WindIndicator/TrueBearing//WindSpeed/
Water depth (m)	/jsmea_nav/DepthMeasurementSystem/EchoSounder///Depth/
Heading (system use) (°)	/jsmea_nav/HeadingMeasurementSystem/CCRS///Heading/
Rate of turn (system use) (°/s)	/jsmea_nav/HeadingMeasurementSystem/CCRS///ROT/
Heading (gyro compass) (°)	/jsmea_nav/HeadingMeasurementSystem/GyroCompass///Heading/
Rate of turn (gyro compass) (°/s)	/jsmea_nav/HeadingMeasurementSystem/GyroCompass///ROT/
Heading (magnet compass) (°)	/jsmea_nav/HeadingMeasurementSystem/MagnetCompass///Heading/
Rate of turn (magnet compass) (°/s)	/jsmea_nav/HeadingMeasurementSystem/MagnetCompass///ROT/
Sea water temperature (°C)	/jsmea_nav/MeteorologicalObservationSystem/Temperature-Gauge/SeaWater//Temp/
Atmosphere temperature (°C)	/jsmea_nav/MeteorologicalObservationSystem/Temperature-Gauge/Air//Temp/
Atmosphere humidity (%)	/jsmea_nav/MeteorologicalObservationSystem/Hygrometer/Air//RelativeHumidity/

^a 1 kn = 1,852 km/h.^b 1 NM = 1,852 km.

Table B.20 (continued)

Channel Name (Unit)	LocalID
Rudder angle (single) (°)	/jsmea_nav/ManeuveringSystem/Rudder///RSA/
Rudder angle (twin-port) (°)	/jsmea_nav/ManeuveringSystem/Rudder//Port/RSA/
Rudder angle (twin-starboard) (°)	/jsmea_nav/ManeuveringSystem/Rudder//Starboard/RSA/
Commanded rudder angle (single) (°)	/jsmea_nav/ManeuveringSystem/Rudder///ROR/
Commanded rudder angle (twin-port) (°)	/jsmea_nav/ManeuveringSystem/Rudder//Port/ROR/
Commanded rudder angle (twin-starboard) (°)	/jsmea_nav/ManeuveringSystem/Rudder//Starboard/ROR/
Draft (Fore) (m)	/jsmea_nav/ShipCondition/DraftGauge//Forward/Draft/
Draft (Mid) (m)	/jsmea_nav/ShipCondition/DraftGauge//Middle/Draft/
Draft (Aft) (m)	/jsmea_nav/ShipCondition/DraftGauge//Aft/Draft/
Wave direction (°)	/jsmea_nav/MeteorologicalObservationSystem/WaveSensor/ Wave//Direction/
Wave height (m)	/jsmea_nav/MeteorologicalObservationSystem/WaveSensor/ Wave//Height/
Wave period (s)	/jsmea_nav/MeteorologicalObservationSystem/WaveSensor/ Wave//Period/
^a 1 kn = 1,852 km/h. ^b 1 NM = 1,852 km.	

B.3.4 Local IDs for oil property

Table B.21 — Examples of Local IDs for oil property

Channel Name (Unit)	LocalID
Diesel oil alumina/silica content (mg/kg)	/jsmea_oil/DieselOil/AnalysisProperty///AluminaSilicaContent/
Diesel oil ash content (g/kg)	/jsmea_oil/DieselOil/AnalysisProperty///AshContent/
Diesel oil carbon residue (g/kg)	/jsmea_oil/DieselOil/AnalysisProperty///CarbonResidue/
Diesel oil cetane index (-)	/jsmea_oil/DieselOil/AnalysisProperty///CetaneIndex/
Diesel oil density at 15 (kg/m ³) ^a	/jsmea_oil/DieselOil/AnalysisProperty///Density/
Diesel oil flash point (°C)	/jsmea_oil/DieselOil/AnalysisProperty///FlashPoint/
Diesel oil viscosity at 40 (mm ² /s) ^a	/jsmea_oil/DieselOil/AnalysisProperty///KinematicViscosity/ At40degC/
Diesel oil viscosity at 50 (mm ² /s) ^a	/jsmea_oil/DieselOil/AnalysisProperty///KinematicViscosity/ At50degC/
Diesel oil low calorific value (kJ/kg)	/jsmea_oil/DieselOil/AnalysisProperty///LowCalorificValue/
Diesel oil potassium content (mg/kg)	/jsmea_oil/DieselOil/AnalysisProperty///PotassiumContent/
Diesel oil sulfur content (g/kg)	/jsmea_oil/DieselOil/AnalysisProperty///SulfurContent/
Diesel oil vanadium content (mg/kg)	/jsmea_oil/DieselOil/AnalysisProperty///VanadiumContent/
Diesel oil water content (ml/l)	/jsmea_oil/DieselOil/AnalysisProperty///WaterContent/
HFO alumina/silica content (mg/kg)	/jsmea_oil/HeavyFuelOil/AnalysisProperty///AluminaSilicaCon- tent/
HFO ash content (g/kg)	/jsmea_oil/HeavyFuelOil/AnalysisProperty///AshContent/
HFO carbon residue (g/kg)	/jsmea_oil/HeavyFuelOil/AnalysisProperty///CarbonResidue/
HFO CCAI (-)	/jsmea_oil/HeavyFuelOil/AnalysisProperty///CCAI/
HFO cetane index (-)	/jsmea_oil/HeavyFuelOil/AnalysisProperty///CetaneIndex/
HFO potassium content (mg/kg)	/jsmea_oil/HeavyFuelOil/AnalysisProperty///PotassiumCon- tent/
^a Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min ⁻¹ .	

Table B.21 (continued)

Channel Name (Unit)	LocalID
HFO sulfur content (g/kg)	/jsmea_oil/HeavyFuelOil/AnalysisProperty///SulfurContent/
HFO vanadium content (mg/kg)	/jsmea_oil/HeavyFuelOil/AnalysisProperty///VanadiumContent/
HFO water content (ml/l)	/jsmea_oil/HeavyFuelOil/AnalysisProperty///WaterContent/
HFO density at 15 (kg/m ³) ^a	/jsmea_oil/HeavyFuelOil/PhysicalProperty///Density/At15degC/
HFO flash point (°C)	/jsmea_oil/HeavyFuelOil/PhysicalProperty///FlashPoint/
HFO viscosity at 40 (mm ² /s) ^a	/jsmea_oil/HeavyFuelOil/PhysicalProperty///KinematicViscosity/At40degC/
HFO viscosity at 50 (mm ² /s) ^a	/jsmea_oil/HeavyFuelOil/PhysicalProperty///KinematicViscosity/At50degC/
HFO low calorific value (kJ/kg)	/jsmea_oil/HeavyFuelOil/AnalysisProperty///LowCalorificValue/
LSHFO alumina/silica content (mg/kg)	/jsmea_oil/LowSulfurHeavyfuelOil/AnalysisProperty///AluminaSilicaContent/
LSHFO ash content (g/kg)	/jsmea_oil/LowSulfurHeavyfuelOil/AnalysisProperty///AshContent/
LSHFO carbon residue (g/kg)	/jsmea_oil/LowSulfurHeavyfuelOil/AnalysisProperty///CarbonResidue/
LSHFO CCAI (-)	/jsmea_oil/LowSulfurHeavyfuelOil/AnalysisProperty///CCAI/
LSHFO cetane index (-)	/jsmea_oil/LowSulfurHeavyfuelOil/AnalysisProperty///CetaneIndex/
LSHFO density at 15 (kg/m ³) ^a	/jsmea_oil/LowSulfurHeavyfuelOil/AnalysisProperty///Density/
LSHFO flash point (°C)	/jsmea_oil/LowSulfurHeavyfuelOil/AnalysisProperty///FlashPoint/
LSHFO viscosity at 40 (mm ² /s) ^a	/jsmea_oil/LowSulfurHeavyfuelOil/AnalysisProperty///KinematicViscosity/At40degC/
LSHFO viscosity at 50 (mm ² /s) ^a	/jsmea_oil/LowSulfurHeavyfuelOil/AnalysisProperty///KinematicViscosity/At50degC/
LSHFO low calorific value (kJ/kg)	/jsmea_oil/LowSulfurHeavyfuelOil/AnalysisProperty///LowCalorificValue/
LSHFO potassium content (mg/kg)	/jsmea_oil/LowSulfurHeavyfuelOil/AnalysisProperty///PotassiumContent/
LSHFO sulfur content (g/kg)	/jsmea_oil/LowSulfurHeavyfuelOil/AnalysisProperty///SulfurContent/
LSHFO vanadium content (mg/kg)	/jsmea_oil/LowSulfurHeavyfuelOil/AnalysisProperty///VanadiumContent/
LSHFO water content (ml/l)	/jsmea_oil/LowSulfurHeavyfuelOil/AnalysisProperty///WaterContent/
Lub oil flash point (°C)	/jsmea_oil/LubOil/AnalysisPropertyDieselGeneratorSet///FlashPoint/
Lub oil Insolubles (B-method) (mg/g)	/jsmea_oil/LubOil/AnalysisPropertyDieselGeneratorSet///Insoluble/
Lub oil viscosity at 40 (mm ² /s) ^a	/jsmea_oil/LubOil/AnalysisPropertyDieselGeneratorSet///KinematicViscosity/At40degC/
Lub oil viscosity at 100 (mm ² /s) ^a	/jsmea_oil/LubOil/AnalysisPropertyDieselGeneratorSet///KinematicViscosity/At100degC/
Lub oil turbine (mg /g)	/jsmea_oil/LubOil/AnalysisPropertyDieselGeneratorSet///TBN/

^a Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.21 (continued)

Channel Name (Unit)	LocalID
Lub oil water content (mg/g)	/jsmea_oil/LubOil/AnalysisPropertyDieselGeneratorSet///WaterContent/
Lub oil flash point (°C)	/jsmea_oil/LubOil/AnalysisPropertyMainEngine///FlashPoint/
Lub oil insolubles (B-method) (mg/g)	/jsmea_oil/LubOil/AnalysisPropertyMainEngine///Insoluble/
Lub oil viscosity at 40 (mm ² /s) ^a	/jsmea_oil/LubOil/AnalysisPropertyMainEngine///KinematicViscosity/At40degC/
Lub oil viscosity at 100 (mm ² /s) ^a	/jsmea_oil/LubOil/AnalysisPropertyMainEngine///KinematicViscosity/At50degC/
Lub oil turbine (mg /g)	/jsmea_oil/LubOil/AnalysisPropertyMainEngine///TBN/
Lub oil water content (mg /g)	/jsmea_oil/LubOil/AnalysisPropertyMainEngine///WaterContent/
Lub oil flash point (°C)	/jsmea_oil/LubOil/AnalysisPropertyStorageTank///FlashPoint/
Lub oil insolubles (B-method) (mg/g)	/jsmea_oil/LubOil/AnalysisPropertyStorageTank///Insoluble/
Lub oil viscosity at 40 (mm ² /s) ^a	/jsmea_oil/LubOil/AnalysisPropertyStorageTank///KinematicViscosity/At40degC/
Lub oil viscosity at 100 (mm ² /s) ^a	/jsmea_oil/LubOil/AnalysisPropertyStorageTank///KinematicViscosity/At100degC/
Lub oil turbine (mg /g)	/jsmea_oil/LubOil/AnalysisPropertyStorageTank///TBN/
Lub oil water content (mg /g)	/jsmea_oil/LubOil/AnalysisPropertyStorageTank///WaterContent/
MGO cetane index (-)	/jsmea_oil/MarineGasOil/AnalysisProperty///CetaneIndex/
MGO density at 15 (kg/m ³) ^a	/jsmea_oil/MarineGasOil/AnalysisProperty///Density/
MGO flash point (°C)	/jsmea_oil/MarineGasOil/AnalysisProperty///FlashPoint/
MGO viscosity at 40 (mm ² /s) ^a	/jsmea_oil/MarineGasOil/AnalysisProperty///KinematicViscosity/At40degC/
MGO viscosity at 50 (mm ² /s) ^a	/jsmea_oil/MarineGasOil/AnalysisProperty///KinematicViscosity/At50degC/
MGO low calorific value (kJ/kg)	/jsmea_oil/MarineGasOil/AnalysisProperty///LowCalorificValue/
MGO sulfur content (g/kg)	/jsmea_oil/MarineGasOil/AnalysisProperty///SulfurContent/

^a Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

B.3.5 Local IDs for ship motion

Table B.22 — Examples of Local IDs for ship motion

Channel Name (Unit)	LocalID
Surge (m)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Surge//Displacement/
Sway (m)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Sway//Displacement/
Heave (m)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Heave//Displacement/
Roll (°)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Roll//Angle/
Pitch (°)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Pitch//Angle/
Yaw (°)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Yaw//Angle/

^a Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.22 (continued)

Channel Name (Unit)	LocalID
Surge period (s)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Surge//Period/
Sway period (s)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Sway//Period/
Heave period (s)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Heave//Period/
Roll period (s)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Roll//Period/
Pitch period (s)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Pitch//Period/
Yaw period (s)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Yaw//Period/
Surge acceleration (m/s ²) ^a	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Surge//Acceleration/
Sway Acceleration (m/s ²) ^a	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Sway//Acceleration/
Heave Acceleration (m/s ²) ^a	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Heave//Acceleration/
Roll rate (°/s)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Roll//AngularVelocity/
Pitch rate (°/s)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Pitch//AngularVelocity/
Yaw rate (°/s)	/jsmea_mot/ShipMotion/InertialMeasurementUnit/Yaw//AngularVelocity/
^a Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min ⁻¹ .	

B.3.6 Local IDs for voyage information

Table B.23 — Examples of Local IDs for voyage information

Channel Name (Unit)	LocalID
Fuel receiving diesel oil (MT) ^a	/jsmea_voy/Bunkered//DieselOil///
Fuel receiving HFO (MT) ^a	/jsmea_voy/Bunkered//HeavyFuelOil///
Fuel receiving LSGO (MT) ^a	/jsmea_voy/Bunkered//LowSulfurGasOil///
Fuel receiving LSFO (MT) ^a	/jsmea_voy/Bunkered//LowSulfurHeavyFuelOil///
Cargo on board MT (MT) ^a	/jsmea_voy/CargoLoading/CargoLoad///Mass/
Consumption boiler diesel oil at voyage (MT) ^a	/jsmea_voy/Consumption/AuxBoiler/DieselOil///
Consumption boiler HFO at voyage (MT) ^a	/jsmea_voy/Consumption/AuxBoiler/HeavyFuelOil///
Consumption boiler LSGO at voyage (MT) ^a	/jsmea_voy/Consumption/AuxBoiler/LowSulfurGasOil///
Consumption boiler LSFO at voyage (MT) ^a	/jsmea_voy/Consumption/AuxBoiler/LowSulfurHeavyFuelOil///
Consumption D/G BOG at voyage (MT) ^a	/jsmea_voy/Consumption/DieselGeneratorSet/BoilOffGas///
Consumption D/G diesel oil at voyage (MT) ^a	/jsmea_voy/Consumption/DieselGeneratorSet/DieselOil///
Consumption D/G HFO at voyage (MT) ^a	/jsmea_voy/Consumption/DieselGeneratorSet/HeavyFuelOil///
^a 1 MT = 1 t (1 metric ton or 1 tonne). ^b 1 NM = 1,852 km. ^c 1 kn = 1,852 km/h. ^d Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min ⁻¹ .	

Table B.23 (continued)

Channel Name (Unit)	LocalID
Consumption D/G LSGO at voyage (MT) ^a	/jsmea_voy/Consumption/DieselGeneratorSet/LowSulfurGasOil///
Consumption D/G LSFO at voyage (MT) ^a	/jsmea_voy/Consumption/DieselGeneratorSet/LowSulfurHeavyFuelOil///
Consumption M/E BOG at voyage (MT) ^a	/jsmea_voy/Consumption/MainEngine/BoilOffGas///
Consumption M/E cylinder oil at voyage (l)	/jsmea_voy/Consumption/MainEngine/CylinderOil///
Consumption M/E diesel oil at voyage (MT) ^a	/jsmea_voy/Consumption/MainEngine/DieselOil///
Consumption M/E HFO at voyage (MT) ^a	/jsmea_voy/Consumption/MainEngine/HeavyFuelOil///
Consumption M/E LSGO at voyage (MT) ^a	/jsmea_voy/Consumption/MainEngine/LowSulfurGasOil///
Consumption M/E LSFO at voyage (MT) ^a	/jsmea_voy/Consumption/MainEngine/LowSulfurHeavyFuelOil///
Date local time	/jsmea_voy/DateAndTime////LocalTime/
Date UTC	/jsmea_voy/DateAndTime////UTC/
Displacement at port (MT) ^a	/jsmea_voy/DeadweightMeasurement/Displacement///
Draft aft (m)	/jsmea_voy/DeadweightMeasurement/DraftAft///
Draft fore (m)	/jsmea_voy/DeadweightMeasurement/DraftFore///
Draft mean (m)	/jsmea_voy/DeadweightMeasurement/DraftMean///
Distance run by OG (NM) ^b	/jsmea_voy/DistanceAndTime/DistanceRunByOG///
Distance run by LOG (NM) ^b	/jsmea_voy/DistanceAndTime/DistanceRunByLOG///
Voyage hours (h)	/jsmea_voy/DistanceAndTime/VoyageTime///HoursUnderway/
Voyage hours (min)	/jsmea_voy/DistanceAndTime/VoyageTime///MinutesUnderway/
Country name	/jsmea_voy/PortInformation/CountryName///
ETA Destination	/jsmea_voy/PortInformation/DestinationPortName///
ETA Date/Time	/jsmea_voy/PortInformation/ETA///UTC/
Port name	/jsmea_voy/PortInformation/PortName///
Consumption daily ROB does; oil (MT) ^a	/jsmea_voy/RetentionOfOilOnBoard//DieselOil///
Consumption daily ROB HFO (MT) ^a	/jsmea_voy/RetentionOfOilOnBoard//HeavyFuelOil///
Consumption daily ROB LSGO (MT) ^a	/jsmea_voy/RetentionOfOilOnBoard//LowSulfurGasOil///
Consumption daily ROB LSFO (MT) ^a	/jsmea_voy/RetentionOfOilOnBoard//LowSulfurHeavyFuelOil///
Consumption daily ROB fresh water (MT) ^a	/jsmea_voy/RetentionOnBoard//FreshWater///
Position latitude (°)	/jsmea_voy/ShipPosition////LAT/
Position longitude (°)	/jsmea_voy/ShipPosition////LON/
Average speed BY OG (kn) ^c	/jsmea_voy/ShipSpeed/OverGround///Speed/
Course	/jsmea_voy/VoyageInformation/Course///
LEG	/jsmea_voy/VoyageInformation/LEG///
M/E load (%)	/jsmea_voy/VoyageInformation/MainEngineLoad///
M/E output (kW)	/jsmea_voy/VoyageInformation/MainEngineOutput///
Operation status	/jsmea_voy/VoyageInformation/OperationStatus///
Propeller RPM (min ⁻¹) ^d	/jsmea_voy/VoyageInformation/PropellerRPM///
Voyage report category	/jsmea_voy/VoyageInformation/ReportCategory///

^a 1 MT = 1 t (1 metric ton or 1 tonne).

^b 1 NM = 1,852 km.

^c 1 kn = 1,852 km/h.

^d Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min⁻¹.

Table B.23 (continued)

Channel Name (Unit)	LocalID
Slip (%)	/jsmea_voy/VoyageInformation/Slip////
Voyage number	/jsmea_voy/VoyageInformation/VoyageNumber////
Swell height scale	/jsmea_voy/WeatherCondition/SwellHeightScale////
Wind beaufort scale	/jsmea_voy/WeatherCondition/Wind///BeaufortScale/
Wind direction scale	/jsmea_voy/WeatherCondition/Wind///Direction/
^a 1 MT = 1 t (1 metric ton or 1 tonne). ^b 1 NM = 1,852 km. ^c 1 kn = 1,852 km/h. ^d Normal style character can be used instead of superscript and subscript, when the application cannot use these characters, i.e. min-1 instead of min ⁻¹ .	

B.3.7 Local IDs for weather information

Table B.24 — Examples of Local IDs for weather information

Channel Name (Unit)	LocalID
Current set (°)	/jsmea_wea/SeaState/Current//CurrentSet/
Current speed (kn) ^a	/jsmea_wea/SeaState/Current///CurrentSpeed/
Coverage of sea ice	/jsmea_wea/SeaState/IceCover///Coverage/
Type of sea ice	/jsmea_wea/SeaState/IceType///Notation/
Icing speed on the hull	/jsmea_wea/SeaState/IcingSpeed///Notation/
Thickness of ice on the hull (cm)	/jsmea_wea/SeaState/IcingThickness///Thickness/
Type of ice on the hull	/jsmea_wea/SeaState/IcingType///Notation/
Sea surface temperature (°)	/jsmea_wea/SeaState/SeaSurfaceTemp///Temp/
Swell 1 direction	/jsmea_wea/SeaState/Swell1///Direction/
Douglas sea scale of swell 1	/jsmea_wea/SeaState/Swell1///DouglasSeaScale/
Swell 2 direction	/jsmea_wea/SeaState/Swell2///Direction/
Douglas sea scale of swell 2	/jsmea_wea/SeaState/Swell2///DouglasSeaScale/
Windsea direction	/jsmea_wea/SeaState/WindWave///Direction/
Douglas sea scale of windsea	/jsmea_wea/SeaState/WindWave///DouglasSeaScale/
Windwave period (s)	/jsmea_wea/SeaState/WindWave///Period/
Atmospheric pressure (hPa)	/jsmea_wea/WeatherCondition/AtmosphericPressure////
Degree of cloudiness	/jsmea_wea/WeatherCondition/CloudCover///Coverage/
Cloud shape	/jsmea_wea/WeatherCondition/CloudType///Notation/
Temperature measured by dry bulb (°)	/jsmea_wea/WeatherCondition/DryBulb///Temp/
Relative humidity (%)	/jsmea_wea/WeatherCondition/RelativeHumidity////
State if sky	/jsmea_wea/WeatherCondition/StateOfSky///Notation/
Visibility	/jsmea_wea/WeatherCondition/Visibility///Notation/
Weather	/jsmea_wea/WeatherCondition/Weather///Notation/
Temperature measured by wet bulb (°)	/jsmea_wea/WeatherCondition/WetBulb///Temp/
Beaufortscale	/jsmea_wea/WeatherCondition/Wind///BeaufortScale/
Wind direction	/jsmea_wea/WeatherCondition/Wind///Direction/
^a 1 kn = 1,852 km/h.	

B.4 Abbreviations

Table B.25 lists the terms represented by the abbreviated terms used in Tables B.4 to B.24.

Table B.25 — Abbreviated terms for the example of Local ID

Abbreviated term	Complete term
AMS	Alarm and Monitoring System
AUX	Auxiliary
BN	Base Number
BOG	Boil Off Gas
BWMS	Ballast Water Management system
CCAI	Calculated Carbon Aromaticity Index
CFW	Cooling Fresh Water
CPP	Controllable Pitch Propeller
CRP	Contra Rotating Propeller
CSW	Cooling Sea Water
D/G	Diesel Generator
DMA	Distillate Marine A
DMB	Distillate Marine B
DO	Diesel Oil
DP	Differential Pressure
EGE	Exhaust Gas Economizer
EICU	Engine Interface Control Unit
ESD	Electro Static Discharge
ETA	Estimated Time of Arrival
FQS	Fuel Quality Setting
G/E	Generator Engine
HFO	Heavy Fuel Oil
HP	High Pressure
HPSS	High Pressure Steam System
HT	High Temp
HV	High Voltage
JCFW	Jacket Cooling Fresh Water
LNG	Liquefied Natural Gas
LP	Low Pressure
LPG	Liquefied Petroleum Gas
LPSS	Low Pressure Steam System
LSFO	Low Sulfur Fuel Oil
LSGO	Low Sulfur Gas Oil
LSHFO	Low Sulfur Heavy Fuel Oil
LT	Low Temp
LV	Low Voltage
LVSB	Low Voltage Switchboard
M/E	Main Engine
M/ST	Main Steam Turbine
MGO	Marine Gas Oil
MSB	Main Switch Board

Table B.25 (continued)

Abbreviated term	Complete term
O.G	Over Ground
P	Port
PCO	Piston Cooling Oil
PWM	Pulse Width Modulation
R/G	Redution Gear
ROB	Retention of Oil on Board
S	Starboard
SCR	Selective Catalytic Reduction
TBN	Total Base Number
T/C	Turbo Charger
T/G	Turbine Generator

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