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**GUIDELINES FOR HARMONIZED COMMUNICATION AND ELECTRONIC EXCHANGE
OF OPERATIONAL DATA FOR PORT CALLS**

- 1 The Facilitation Committee, at its forty-seventh session (13 to 17 March 2023), approved the annexed *Guidelines for harmonized communication and electronic exchange of operational data for port calls*.
- 2 Member States and international organizations are invited to bring the Guidelines to the attention of all parties concerned.
- 3 Member States and international organizations are also invited to bring to the attention of the Committee, at the earliest opportunity, the results of the experience gained from the use of the Guidelines for consideration of action to be taken.

ANNEX

**GUIDELINES FOR HARMONIZED COMMUNICATION AND ELECTRONIC EXCHANGE
OF OPERATIONAL DATA FOR PORT CALLS**

Table of contents

1	Preamble	2
2	Abbreviations	3
3	Terminology/definitions	4
4	Logical diagram of a port call process	5
	4.1 The steps in the port call process	7
	4.2 The port call actors	7
	4.3 Data to be exchanged	8
5	Standards	9
	5.1 General	9
	5.2 Standards for timestamps	10
	5.3 Standards for geo references	12
	5.4 Passage planning	13
	5.5 Berth planning arrival, including VTS/pilotage area planning	13
	5.6 Port planning arrival, including VTS/pilotage area planning	14
	5.7 Berth/Port arrival	15
	5.8 Vessel service planning – Terminal	15
	5.9 Port planning departure, including VTS/pilotage area planning	16
	5.10 Berth/Port departure	17
6	Standard Interface	18
7	Cyberspace considerations	19
8	Summary	19
9	References	19

1 Preamble

1.1 These guidelines are intended to provide guidance to the implementation of an electronic and, automated exchange of operational data between a ship and a port. As part of this guidance, the guidelines will also provide definitions of the general port and ship related parties.

1.2 These guidelines will make references to the IMO Compendium, IMO Reference Data Model and other specifications where relevant but will not specify any specific protocol or information exchange standard.

1.3 To facilitate a uniform way for implementation of, for example, the Just In Time (JIT) from port to port, this document can be used as a port agnostic implementation guide, on which local processes and circumstances can be developed.

1.4 These guidelines are port and trade agnostic. Benefits of Just In Time Arrival concepts are not limited to only the shipping industry, in particular to vessel traffic service centres, to ensure safe and efficient traffic flows, but will also assist the port industry to better plan and organize port operations, and eventually the complete logistic chain.

1.5 These guidelines encompass international standards¹ that are non-technical only: data element definitions are based on the IMO Compendium and a logical diagram for the port call process. The relevant technical standards (API specifications, technical and business performance requirements) are in process of being developed within ISO TC 8.

1.6 With the definition of a logical information exchange diagram, the guidelines can be implemented on a variety of platforms and protocols to support different types and sizes of ships and ports.

1.7 The logical parties involved are defined in a way recognizing that any party can be represented by different organizations or persons and that one-person or organization can represent several parties.

1.8 These guidelines contain definitions of the different work processes or events related to a ship's port call and its planning. This includes at what times electronic messages need to be exchanged and between which parties.

1.9 The definition of information requirements related to the different work processes is decoupled from the electronic messages, as information exchanges may not contain this information, if the information is already available for the relevant party.

1.10 These guidelines contain reference to relevant data standards, including sections in the IMO Compendium

1.11 These guidelines contain other information processes related to port calls, as well as other requirements related to the implementation of these guidelines.

¹ In these Guidelines, any reference to standards means international standards.

2 Abbreviations

Abbreviation	Description
AIS	Automatic Identification System
API	Application Programming Interface
ATA	Actual Time of Arrival
ATC	Actual Time of Completion
ATD	Actual Time of Departure
ATS	Actual Time of Start
DCSA	Digital Container Shipping Association
ECDIS	Electronic Chart Display Information System
ETA	Estimated Time of Arrival
ETC	Estimated Time of Completion
ETD	Estimated Time of Departure
ETS	Estimated Time of Start
IALA	International Association of Marine Aids to Navigation and Lighthouse Authorities
IAPH	International Association Ports and Harbours
IHO	International Hydrographic Organization
IMO GIA	International Maritime Organization Global Industry Alliance
IMO GISIS	IMO Global Integrated Shipping Information System
ISO	International Organization for Standardization
ITPCO	International Taskforce Port Call Optimization
JIT	Just In Time
MLC	Maritime Labour Convention
MSW	Maritime Single Window
PCS	Port Community System
PTA	Planned Time of Arrival
PTC	Planned Time of Completion
PTD	Planned Time of Departure
PTS	Planned Time of Start
RTA	Requested Time of Arrival
RTC	Requested Time of Completion
RTD	Requested Time of Departure
RTS	Requested Time of Start
SMDG	Ship Message Design Group
TOS	Terminal Operating System
VDES	VHF Data Exchange System
VHF	Very High Frequency
VTS	Vessel Traffic Services

3 Terminology/definitions

Authorities

Party that receives information related to the port call, provides clearance to the ship's arrival and departure. For example, but not limited to: harbour master, customs, immigration, port health, port VTS, coastguard.

Berth planner

Party that plans the berth call. Depending on the organization of the port, for example, but not limited to: terminal operator, berth operator, port authority, VTS.

Cargo services

Services related to the cargo, for example but not limited to: cargo handling, cargo survey, lashing.

Hydrographic service provider

Party that undertakes to arrange for the collection and compilation of hydrographic data and the publication, dissemination and keeping up to date of all nautical information necessary for safe navigation. For example, but not limited to: national hydrographic office, regional charting agency.

Nautical services

Services related to the safe passage and berthing of the vessel.

Nautical service providers

Party that provides nautical services to the ship. For example, but not limited to: pilots, tugs, linesmen, boatmen, VTS.

Port planner

Party that plans the port call. Depending on the organization of the port, for example, but not limited to: port authority, harbour master, terminal operator, VTS, pilots, coast guard.

Ship agent

The party representing the ship's owner and/or charterer (the Principal) in port. If so instructed, the agent is responsible to the Principal for arranging, together with the port, a berth, all relevant port and husbandry services, tending to the requirements of the master and crew, clearing the ship with the port and other authorities (including preparation and submission of appropriate documentation) along with releasing or receiving cargo on behalf of the Principal.

Ship charterer

Person or company who hires a ship from a shipowner for a period of time.

Ship manager

Party responsible for the day-to-day management, operation and maintenance of the ship. For example, but not limited to: shore side ship manager, or other party that acts on behalf of shore side ship manager, for example but not limited to: port captain, captain of the vessel or ship agent which handles for example, authorities' reporting requirements or some of the other information requested by any of the parties.

Ship operator

Party that decides how the ship is employed and where a vessel is to call. Depending on the commercial operation conditions, for example, but not limited to: charterer, shipowner, cargo owner/trader, ship manager, carrier, parties representing/acting on behalf of before mentioned parties.

Vessel or cargo service providers

Party that provides vessel services or cargo services to the ship. For example, but not limited to: bunkers, lube oil, potable water, provisions, stores, waste per IMO/MARPOL Class, repairs, cargo handling, cargo lashing, terminal operator, cargo survey.

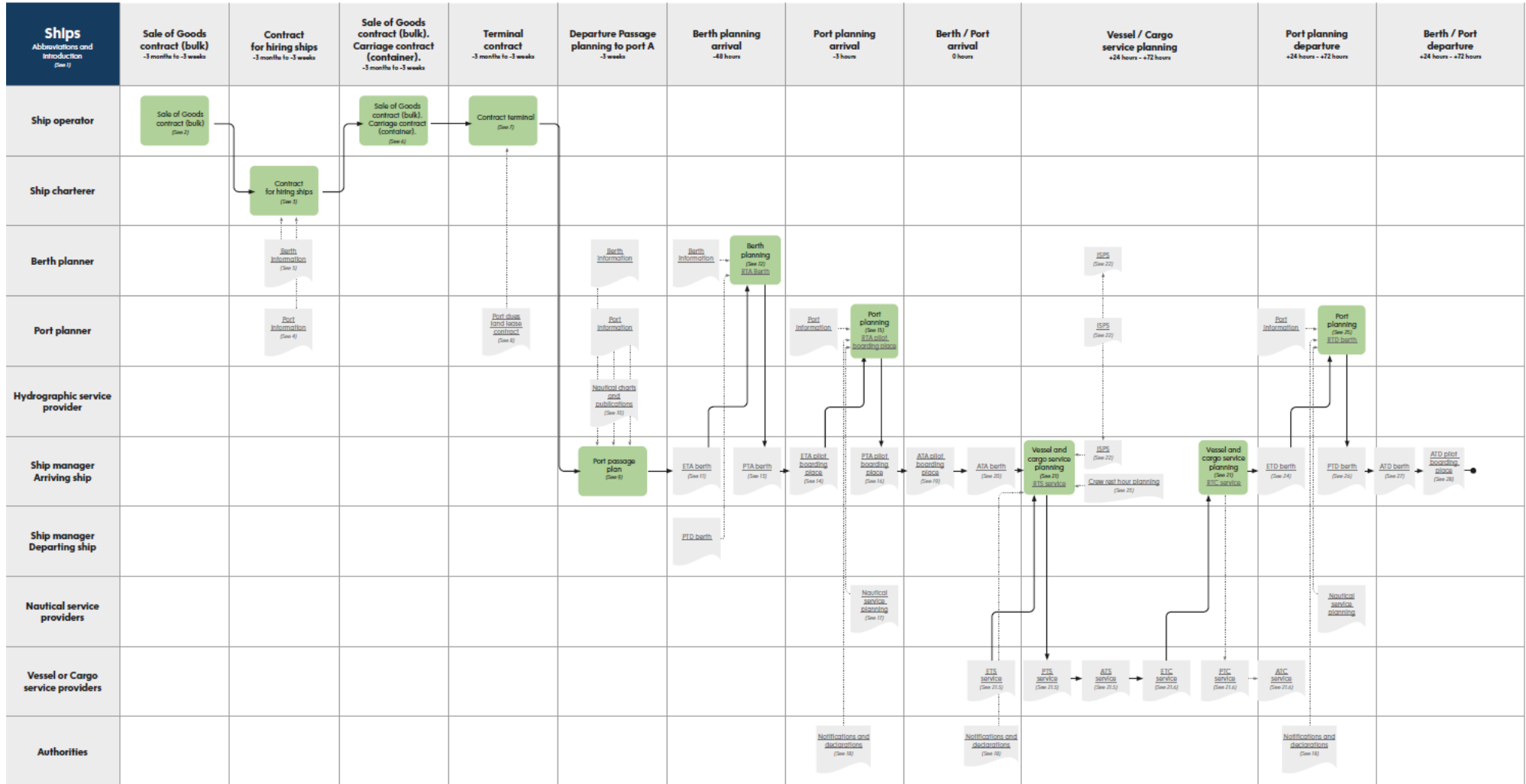
Vessel services

Services related to the vessel, for example but not limited to: bunkers, lube oil, potable water, provisions, stores, waste per IMO/MARPOL class, repairs, vetting, flag survey, periodic maintenance.

4 Logical diagram of a port call process

- .1 A generic diagram that does not prescribe any specific infrastructure components. It should be able to support in an interoperable manner, commonly used systems such as:
 - .1 Maritime Single Window;
 - .2 VTS and MRS services;
 - .3 Port Support Services;
 - .4 Port Community Systems;
 - .5 Terminal Operating Systems;
 - .6 Ship reporting software;
 - .7 Agent reporting software;
 - .8 Ship operator software;
 - .9 Data Service Providers; and etc.
- .2 The logical diagram (figure 1) is based on the high-level business process of port calls, which is based on IMO regulations, industry contracts, like BIMCO, requirements of port authorities and other stakeholders, making it a port and trade agnostic process. It has been created by the industry (a group of leading ports and shipping lines) and validated during Industry Roundtable sessions organized by the IMO Global Industry Alliance (GIA) to Support Low Carbon Shipping.

Figure 1 – Port call process diagram



4.1 The steps in the port call process

Contractual phase

- .1 Sale of goods contract (bulk sector)
- .2 Contract for chartering ships
- .3 Sale of goods contract (bulk sector), carriage contract (container sector)
- .4 Terminal contract

Operational phase

- .1 Passage planning
- .2 Berth planning arrival, including VTS/pilotage area planning (if relevant)
- .3 Port planning arrival, including VTS/pilotage area planning (if relevant)
- .4 Vessel/Cargo service planning
- .5 Port/berth arrival
- .6 Vessel/Cargo service
- .7 Berth planning departure, including VTS/pilotage area planning (if relevant)
- .8 Port planning departure, including VTS/pilotage area planning (if relevant)
- .9 Berth/port departure

4.2 The port call actors

- .1 Most actors can be represented by any of several different real stakeholders, dependent on ship management organization, VTS/pilot organization, port and terminal organization, type of trade, etc.
- .2 In the description of message exchanges in these guidelines, these actors will be used as endpoints for communication.
- .3 The port call actors/logical parties involved in a port process include the following:
 - .1 Ship operator
 - .2 Ship charterer
 - .3 Berth planner
 - .4 Port planner
 - .5 Hydrographic service provider
 - .6 Ship manager
 - .7 Nautical service providers

- .8 Vessel or cargo service providers
- .9 Authorities
- .10 Ship agent

4.3 Data to be exchanged

- .1 The data to be exchanged as part of the port call process include the following:
 - .1 Nautical data
 - .1 Data that is provided by Hydrographic Offices in navigational charts, Nautical Publications or coast pilots, and tide tables. Refer to Guide for Nautical Data published by ITPCO (<https://portcalloptimization.org>).
 - .2 Administrative data
 - .1 Data that is submitted by ships or other non-authority parties to authorities in notifications and declarations.
 - .2 The data is based on legislation or regulations. This type of data can normally be shared between the authority parties covered by said legislation but can normally not be shared with non-authority users.
 - .3 For this purpose, IMO has developed standards for administrative data, the IMO Compendium. The IMO Compendium is a tool for software developers that design systems needed to support transmission, receipt, and response via electronic data exchange of information required for the arrival, stay, and departure of the ship, persons, and cargo to a port. By harmonizing the data elements required during a port call and by standardizing electronic messages, the IMO Compendium facilitates the exchange of information ship to shore and the interoperability of single windows, reducing the administrative burden of ships linked to formalities in ports. The IMO Compendium consists of IMO data sets and IMO Reference Data Model agreed by the main organizations involved in the development for the electronic exchange of information related to the FAL Convention. Details of the IMO Compendium can be found [here](#).
 - .4 For implementation of these standards, the IMO has developed *Guidelines for setting up a maritime single window*, as might be amended.

- .5 When referring to times in operational data exchange, the same references should be used as in administrative data. If the terminal plans/requests a vessel to come alongside at time A, that same time is equally important for both port authorities and port operational parties like pilots, bunker barges, etc.
- .6 To achieve interoperability between ship to shore and vice versa, there is a need for a global harmonized technical standard such as Application Programming Interface (API) and/or a common reporting interface for the electronic data exchange to/from the ship.
- .3 Operational data
 - .1 Data that is submitted to non-authority parties as part of planning or execution of certain operations.
 - .2 This data may normally not be shared to any other party (e.g. starting and completion times of services).
 - .3 For this purpose, the International Maritime Organization has developed standards for operational data, the IMO Compendium, aligning with existing time definitions for administrative data.
 - .4 The subsequent sections of this guideline will define the minimum set of operational data to be exchanged for port calls.

5 Standards

5.1 General

- .1 As shipping operates from port to port worldwide, the standards need to be accepted and respected by all ports globally (i.e. the standards need to be port agnostic). Additionally, the standards also need to be globally accepted by VTS and pilots.
- .2 As ports facilitate all types of trades (tanker, bulk, container, ro-ro, cruise etc.), the standards need to be accepted and respected by all trades (e.g. not only by container or tanker sector, i.e. the standards need to be trade agnostic).
- .3 As ports are all different from one another, the standards should be flexible enough to be implemented at each port. For example, the actors per port may be different, or some timestamps may not be available or required in one port but can be required in another port.
- .4 As shipping operates from port to port globally, the standards should be sufficiently rigid to facilitate port to port navigation.

- .5 As shipping is the most important component in the global supply chain, the connection to the global supply chain is very important.
- .6 As data owners face a lot of administrative burden to update parties in different formats, and the navigational safety, environment and security are best served by real time updates, efforts should be made for maximum compatibility between navigational, administrative and operational data.
- .7 The scope of the IMO Compendium has been expanded from administrative data to also include operational data and aligning the definitions of both in the IMO Compendium.
- .8 For the same reason, the definitions in the IMO Compendium will be harmonized with those in IHO S-131 for locations.
- .9 As most trades are facing ship-berth compatibility issues, efforts should be made for a robust data compatibility check between maximum sizes of both the ship and the berth by using the existing globally unique ship identification number (the IMO ship number) and UN/LOCODE with Facility Number as defined in IMO GISIS and/or the existing globally unique location identification number (ISO/IEC 6523).

5.2 Standards for timestamps (aligned with IMO Compendium)

- .1 Estimated/Requested/Planned/Actual Time of Completion of Vessel or Cargo services
 - .1 Data numbers in IMO Compendium: IMO0301, IMO0302, IMO0303, IMO0304
 - .2 Definitions for these timestamps are as per IMO Compendium. For example, the date and time a service provider completes the cargo services
 - .3 Abbreviations: ETC, RTC, PTC, ATC
 - .4 Further fine-tuning of definition may be required for operations regarding completion of this specific service; whether the ship is ready for departure (can start unmooring, meaning the first line can be released) when other services may not be completed yet
 - .5 Geo reference: Berthing position of the ship (direct and indirect)
- .2 Estimated/Requested/Planned/Actual Time of Completion of Nautical services
 - .1 Data numbers in IMO Compendium: IMO0301, IMO0302, IMO0303, IMO0304
 - .2 Definitions for these timestamps are as per IMO Compendium. For example, the date and time a service provider completes the nautical services

- .3 Abbreviations: ETC, RTC, PTC, ATC at a certain location, e.g. terminal, where the terminal is the nautical service provider of the information
- .4 Further fine-tuning of definition for operations may be required regarding the start time of the unmooring service (first line released) and regarding completion time unmooring service (last line released)
- .5 Geo reference: Berthing position of the ship (direct and indirect)
- .3 Estimated/Requested/Planned/Actual Time of Departure Berth
 - .1 Data numbers in IMO Compendium: IMO0066, IMO0236, IMO0237, IMO0065
 - .2 Definitions for these timestamps are as per IMO Compendium. For example, the date and time the ship departs from berth
 - .3 Abbreviations: ETD, RTD, PTD, ATD Berth, where the Berth is the specific location
 - .4 Further fine-tuning of definition for operations may be required. For example, last line released
 - .5 Geo reference: Berthing position of the ship (direct and indirect)
- .4 Estimated/Requested/Planned/Actual Time of Arrival Berth
 - .1 Data numbers in IMO Compendium: IMO0064, IMO0234, IMO0235, IMO0063
 - .2 Definitions for these timestamps are as per IMO Compendium. For example, the date and time the ship arrives at berth
 - .3 Abbreviations: ETA, RTA, PTA, ATA Berth, where the Berth is the specific location
 - .4 Further fine-tuning of definition for operations may be required. For example, first line secured.
 - .5 Geo reference: Berthing position of the ship (direct and indirect)
- .5 Estimated/Requested/Planned/Actual Time of Arrival Pilot Boarding Place
 - .1 Data numbers in IMO Compendium: IMO0064, IMO0234, IMO0235, IMO0063
 - .2 Definitions for these timestamps are as per IMO Compendium. For example, the date and time the ship arrives at the pilot boarding place, where the pilot boarding place is the specific location
 - .3 Abbreviations: ETA, RTA, PTA, ATA Pilot Boarding Place
 - .4 Geo reference: Pilot boarding place

5.3 Standards for geo references

Indirect or direct references

There is a distinction between locations determined directly (geographical coordinates and names) and indirectly (via unique non-significant identifiers). Indirect references have the advantage over direct references as they do not change after updates of infrastructure or ownership. The disadvantage of indirect references is that humans often cannot "translate" these non-significant identifiers to direct references of name and location.

Pilot Boarding Place

- .1 Data number in IMO Compendium: IMO0231
- .2 Definition is as per IMO Compendium. For example, the meeting place to which the pilot comes out at sea
- .3 Direct reference: In decimal degrees to a defined precision (minus to indicate South and West). Datum WGS84
- .4 Indirect reference for human exchange: Intuitive abbreviation of the name of the pilot boarding place as used by VTS Operators
- .5 Indirect reference for computer exchange: Marine Resource Number, MRN (IALA) or the Global Location Number, GLN (ISO/IEC 6523, 13 digits in text format with extension)

Berth Position

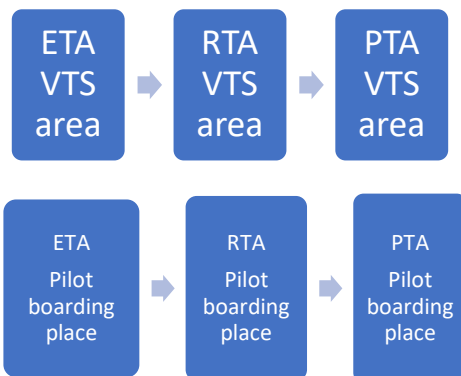
- .1 Data number in IMO Compendium: IMO0233
- .2 Definition is as per IMO Compendium that is, the position along the line of a berth, specified by one point (e.g. bollard, meter mark number, manifold, or ramp number), allowing the vessel to berth in the correct position along the berth
- .3 Direct reference: In decimal degrees to a defined precision (minus to indicate South and West). Datum WGS84
- .4 Indirect reference for human exchange: Intuitive abbreviation of the name of the terminal and berth as used already in SMDG or by VTS Operators with extension for example, manifold number or bollard number
- .5 Indirect reference for computer exchange: Global Location Number, GLN (ISO/IEC 6523, 13 digits in text format with extension) or Marine Resource Number, MRN (IALA)
- .6 UN/LOCODE with Facility Number as defined in IMO GISIS

Waiting area

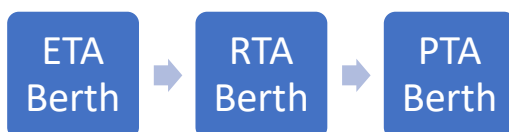
Locations or berths as designated by the relevant port authority for the purpose of becoming an "arrived ship" for tendering "Notice of Readiness" (bulk and tanker sector) or being in the queue to berth (container and other sectors).

5.4 Passage planning

The vessel's responsibilities are described in IMO resolution A.893(21): detailed planning of the entire voyage or passage from berth to berth.



5.5 Berth planning arrival, including VTS/pilotage area planning (if relevant)



ETA Berth

- .1 Process owner: Ship manager
- .2 Based on planning of the vessel
- .3 Availability: A year before in proforma schedules, a month before in long-term schedules, days before in company internal systems and hours before in PCS and ECDIS (in container sector)
- .4 Remark: Sometimes ETB is used, meaning Estimated Time Berth (however without indication if this is arrival or departure)

RTA Berth

- .1 Process owner: Berth planner
- .2 Based on planning of the berth
- .3 Availability: Normally only in internal berth planning systems
- .4 Remark: If there's a new RTA Berth, the previous PTA Berth is cancelled
- .5 Remark: The ETA Berth is often used until it becomes an ATA Berth

PTA Berth

- .1 Process owner: Ship manager
- .2 Based on confirming the RTA Berth
- .3 Availability: In PCS
- .4 Remark: If the captain or ship operator disagrees, then a new ETA Berth is sent triggering a new RTA Berth
- .5 Remark: The ETA Berth is often used until it becomes an ATA Berth

5.6 Port planning arrival, including VTS/pilotage area planning (if relevant)



ETA Pilot Boarding Place

- .1 Process owner: Ship manager
- .2 Based on PTA Berth
- .3 Availability: A year before in proforma schedules a month before in long-term schedules, days before in company internal systems and TOS and hours before in TOS, PCS, ECDIS (in container sector)
- .4 Remark: Ships without berth planning (e.g. proceeding to dry dock or public berth) may base the ETA Pilot Boarding Place not on the PTA Berth

RTA Pilot Boarding Place

- .1 Process owner: Port planner/Port Authority
- .2 Based on planning of the port/Port Authority
- .3 Availability: In PCS
- .4 Remark: This time is often not provided to ships, or only last minute at the first Calling In Point of the VTS sector; may also be relayed to ship by VTS when ship is at anchor
- .5 Remark: The ETA Pilot Boarding Place is often used until it becomes an ATA Pilot Boarding Place

PTA Pilot Boarding Place

- .1 Process owner: Ship manager
- .2 Based on confirming the RTA Pilot Boarding Place

- .3 Availability: In PCS
- .4 Remark: The Port Authority and/or Berth/Terminal Operator do not always receive confirmation that ship will be on time; it is the most important time for the ship to adjust speed or plan crew rest hours according to MLC requirements
- .5 Remark: The ETA Pilot Boarding Place is often used until it becomes an ATA Pilot Boarding Place

5.7 Berth/Port arrival



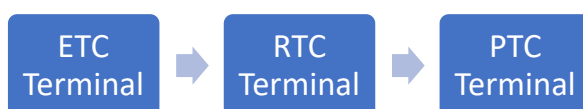
ATA Pilot Boarding Place

- .1 Process owner: Ship manager
- .2 Based on actual arrival at Pilot Boarding Place
- .3 Availability: In ship's logbook and in PCS

ATA Berth

- .1 Process owner: Ship manager
- .2 Based on actual arrival at Berth
- .3 Availability: In ship's logbook (as First Line Ashore) and in PCS
- .4 Remark: Many parties work with different definition for ATA Berth (e.g. Gangway Down, Gangway Down and Secured, First Line, All Fast etc.)

5.8 Vessel service planning – Terminal



ETC Vessel/Cargo service

- .1 Process owner: Berth planner
- .2 Based on planning of vessel/cargo services
- .3 Availability: In TOS and/or berth planning system
- .4 Remark: Often in the TOS only the "last move" is available, an add on is needed for handling time of e.g., Out of Gauge cargo, lashing, gear boxes; this add on is port call specific

RTC Vessel/Cargo service

- .1 Process owner: Ship manager
- .2 Based on planning of vessel
- .3 Availability: Often via verbal exchange
- .4 Remark: If the ETC is too late, carrier can ask for a cut and run (leave containers behind) or an improved crane intensity to get an earlier ETC; when the ETC is too early, carrier can ask for a reduced crane intensity, an extension or layby to be able to stay longer at the berth if so required. The ETC Terminal is often used until it becomes an ATC Terminal

PTC Vessel/Cargo service

- .1 Process owner: Vessel or Cargo service provider
- .2 Based on Berth Operator/Terminal to confirm the RTC Terminal
- .3 Availability: In PCS
- .4 Remark: The ETC Terminal is often used until it becomes an ATC Terminal

5.9 Port planning departure, including VTS/pilotage area planning (if relevant)



ETD Berth

- .1 Process owner: Ship manager
- .2 Based on PTC of all services, e.g. Terminal, Bunkers, but also ensure crew is back on board for safe manning of the ship
- .3 Availability: Hours before in PCS
- .4 Remark: Captain is not always informed about all completion times; often the Terminal planning is leading, but for example, bunker service may be completed later

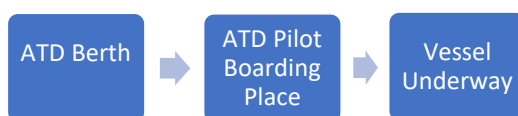
RTD Berth

- .1 Process owner: Port planner, Port Authority
- .2 Based on ETD
- .3 Availability: Normally only in internal port planning systems
- .4 Remark: This time is often not provided. The EDT Berth is often used until it becomes an ATD Berth

PTD Berth

- .1 Process owner: Ship manager
- .2 Based on confirming the RTD Berth
- .3 Availability: In PCS
- .4 Remark: It is not always made available to the ship; it is the most important time for the ship to plan crew rest hours according to MLC requirements
- .5 Remark: The ETD Berth is often used until it becomes an ATD Berth

5.10 Berth/Port departure



ATD Berth

- .1 Process owner: Ship manager
- .2 Based on actual departure from the berth
- .3 Availability: In ship's logbook and in PCS
- .4 Remark: This is often recorded as "started single up", "start unmooring" or "first line released"

ATD Pilot Boarding Place

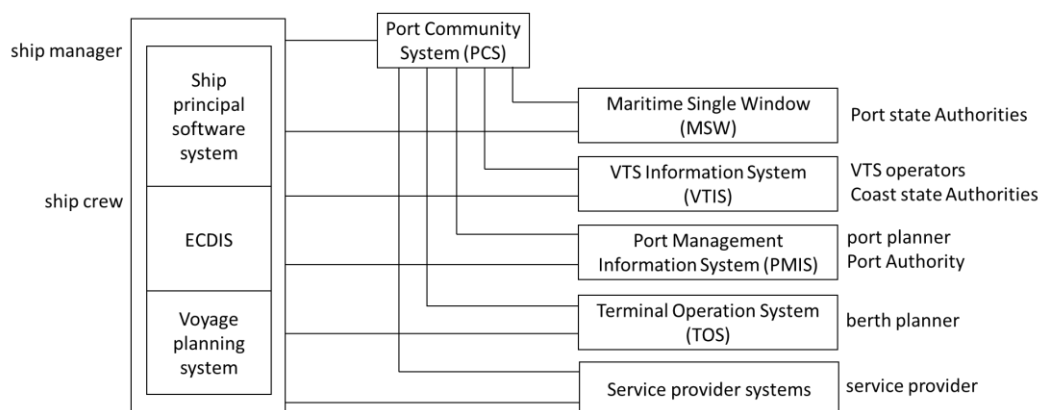
- .1 Process owner: Ship manager
- .2 Based on actual departure from pilot boarding place
- .3 Availability: In ship's logbook, normally not in PCS
- .4 Remark: It is usually not a defined area/location for departure, normally ATC Pilotage is used

Vessel Underway

- .1 Process owner: Ship manager
- .2 Based on actual departure from Berth
- .3 Availability: In ship's logbook, normally not in PCS but reported to VTS Operators
- .4 Remark: It is often recorded as "unmoored"

6 Standard Interface

- .1 In port, many timestamps are shared by one-to-one communication means, e.g. telephone or VHF radio. This makes the sharing of timestamps prone to error and very labour intensive. Facilitation to allow one to many data sharing, yet respecting business to business data access, will be a big step forward. In some ports the PCS is complemented by another system for handling timestamp sharing.
- .2 Systems that can play a vital role:
 - .1 Port Community Systems (PCS)
 - .2 Terminal Operating Systems (TOS)
 - .3 VTS systems
 - .4 Electronic Chart Display Information Systems (ECDIS)
 - .5 Port Management Information Systems
 - .6 Voyage Planning System
 - .7 Maritime Single Window
- .3 Systems that can play a vital role:



The way ICT systems in a port is connected together varies, but the figure shows some general principles:

- .1 Different systems can be used on the ship or in the ship principals' offices. Some examples are shown to the left. Systems on the ship will be operated by the crew. Systems on shore by various managers of the ship operations, including ship agents, ship managers, charterers or the ship owner. In these guidelines the term "ship manager" is used for these roles.
- .2 In some ports, a port community system (PCS) will be the interface between ship managers and some or all of the ICT systems in the port. In other ports, there may not be a PCS. In these guidelines the term "PCS" is used as a generic name for an ICT system in the port. The specific role, as indicated in the far right, determines what system should be used in an actual case.

- .3 The figure also gives the generic names for the ICT systems. However, names may vary between manufacturers and ports.

7 Cybersecurity Considerations

Refer to *IMO Guidelines on Maritime Cyber Risk Management* as might be amended including the "IAPH Cybersecurity Guidelines for Ports and Port Facilities".²

8 Summary

- .1 Overall, the most important is to keep it simple, flexible and with commonly agreed rules
- .2 Standardized data sets should be kept to a minimum, only covering the most necessary events which have an immediate impact during the operational phase, generalized for all trades
- .3 Complex data sets pose a risk to be implemented differently by different actors, breaking interoperability, and causing ambiguity and errors
- .4 Adding identification of the process owner to timestamps will help to understand where timestamp is coming from and who is responsible for it
- .5 Process owners can be different per port, each port needs a port specific implementation plan

9 References

- .1 IHO S-131 Marine Harbour Infrastructure
- .2 [IMO Compendium on Facilitation and Electronic Business](#)
- .3 IMO GIA Industry Round Table meetings and desk top exercises
- .4 [IMO GIA Just In Time Arrival Guide](#)
- .5 ISO TC 8 Development and maintenance of technical standards for administrative and operational data
- .6 ITPCO Port Information Manual
- .7 ITPCO Guide for Nautical Data
- .8 JIT Port Call definitions as proposed by DCSA
- .9 IALA S-211 Port Call Message
- .10 IAPH Cybersecurity Guidelines for Ports and Port Facilities

² https://sustainableworldports.org/wp-content/uploads/IAPH-Cybersecurity-Guidelines-version-1_0.pdf