Appendix Revisions

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**[x-###] - Appendix 0**

**References, Glossary of Terms, Abbreviations**

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Revisions to this Appendix are to be noted in the table prior to the issue of a revised document.

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Appendix 0 - References, Glossary of Terms, Abbreviations

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Appendix 0 -

**References, Glossary of Terms, Abbreviations**

This Annex contains all references, the complete glossary of terms and all abbreviations for the whole of this Recommendation, including Annexes.

# References

## [0.x] References to IALA documents

[0.1] IALA Recommendation eNAV-140[0101] on “*The e-Navigation architecture – the shore perspective”*

[0.2] IALA Recommendation eNAV-NN[0201] on *“The common shore-based e-Navigation system architecture”*

## [1.x] References to IMO documents

[1.x] relevant IMO documents

## [2.x] References to documents from other bodies

[2.x] maybe relevant international standards regarding the system architecture paradigm(s)

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# Glossary of Terms

This glossary is organized in a top-down approach, i.e. the most general terms are introduced in the beginning, while more specialized concepts are introduced later on. The list of abbreviations in the next chapter references this glossary of terms and complements it because it is organized alphabetically. This glossary of terms contains also relevant terms from the Annexes.

* **Technical e-Navigation service (or “service” for short):** --- summary definition intro sentence ---   
  A technical e-Navigation service is defined in terms of its functional capabilities and its data treatment by the sum of its External and Internal Basic Services. In most cases a technical e-Navigation service interacts with other technical e-Navigation services of the shore-based e-Navigation system architecture by being both requested service to at least one other technical e-Navigation service and requesting service to at least one another technical e-Navigation service.   
  The concept of the technical e-Navigation service is a *pre-requisite to fulfill the e-Navigation requirements of defined e-Navigation service levels and of a defined e-Navigation service portfolio* in a given geographical area, in technical regard.

**Note: For the purpose of this glossary of this generic engineering service model, the term “technical e-Navigation service” is abbreviated with “service”. Once a specific service is addressed, it is capitalized, e.g. in “Basic Service” or “AIS Service”.**

* **Basic Service (BS):** A *Basic Service (BS)* is a discrete service of a shore-based technical e-Navigation service and represents the functional delivery of a defined set of data objects or a defined set of functionality performed by that service. Basic implies that it is one consistent fundamental functionality of the service under consideration. The Basic Service also is the *smallest element (“atom”) to define technical e-Navigation service portfolios and associated technical e-Navigation service levels* in technical regard.
* **External Basic Service (E-BS):** An External Basic Service is a Basic Service of the technical e-Navigation service under consideration, which directly contributes capabilities to any so-called requesting service of the shore-based e-Navigation system, i.e. that contribution in terms of data and/or effects of some functionality cross the boundary of the service towards any requesting service of the shore-based e-Navigation system.
* **Requesting service:** A requesting service is a technical e-Navigation service of the shore-based e-Navigation system architecture, which requests certain functional capabilities and/or data delivery from another technical e-Navigation service of the shore-based e-Navigation system (the requested service), i.e. a requesting service employs at least one External Basic Service of another technical e-Navigation service. “Requesting service” is a role description for a given interaction between technical e-Navigation services, and the requesting service is in the role of the “client”.
* **Requested service:** A requested service is a technical e-Navigation service of the shore-based e-Navigation system architecture, which performs certain functional capabilities and/or delivers data upon request from another technical e-Navigation service of the shore-based e-Navigation system (the requesting service), i.e. a requested service supports another technical e-Navigation service by at least one External Basic Service. “Requested service” is a role description for a given interaction between technical e-Navigation services, and the requested service is in the role of the “server”.
* **Internal Basic Service (I-BS):** An Internal Basic Service is a Basic Service of a technical e-Navigation service, which don’t deliver data and/or provide capabilities to a requesting service, i.e. which, hence “internal”. Note: Data may be delivered and capabilities may be provided to the technical maintenance personnel by an appropriate Human Machine Interface, though.

For further details refer to the Annex 1.

* **Basic Service Category (BS Cat):** The Basic Service Categories of the common shore-based e-Navigation system architecture are a useful classification of Basic Services based on the net data flow mechanism within the technical e-Navigation service.

For further details refer to the Annex 1.

* **Minimum Set of Basic Services:** The Minimum Set of Basic Services is a comprehensive and normative definition of Basic Services generally required for each service of the common shore-based e-Navigation system.

For further details refer to the Annex 1.

* **Data Model of a technical e-Navigation service:** The Data Model of a technical e-Navigation service provides the well-structured and abstract (functional) description of the data objects, that the service under consideration exchanges with requesting services of the common shore-based e-Navigation system, [*and* of the data objects the service under consideration uses for internal purposes].

For further details refer to the Data Model, Annex 2.

* **Distribution Model:** The Distribution Model describes the layout of the technical e-Navigation service from a geographical distribution point of view, i.e. it discusses the geographical topology of the service.

For further details refer to the Distribution Model, Annex 3.

* **Functional site:** Functional sites are sites where components of the shore-based system are deployed. There are five functional site definitions introduced, which are abstractions from specific physical sites: User site, Node site, Remote site, Technical Operation Personnel site, Technical Development site. These abstractions encapsulate the complexity of physical site considerations and thereby effectively support advanced life cycle management concepts and higher management decisions regarding the shore-based system. There may be more than one functional site of different kind on the same premises. Eventually, when considering implementation of the functional sites the specifics of physical site objects like premises, buildings, rooms, cases etc will reappear.
* **User site:** The User site is a functional site. A User site is where the data between the shore-based e-Navigation system and the operational end user is presented by means of a Human Machine Interface (HMI). VTS Centres are examples of User sites. To determine the User sites’ precise location for a shore-based e-Navigation system of an administration is a “user requirement”.   
  For further details refer to the Distribution Model, Annex 3.
* **Node site:** The Node site is a functional site. The idea of a Node is to bundle all functionality (and thereby also the physical components carrying that functionality) in a *minimum number of Nodes* of one administration’s deployment of the service under consideration. This is a strong requirement *from a shore-based system management perspective (operation and maintenance costs!)*. All functionality which is *not* rigidly necessary at the Remote Site from a *topology* point of view *may* be concentrated at the Node. There is the option not to bundle all of this kind of functionality, if good reasons are opposed to it. But from a system optimization point of view, the *default is concentration of geographically volatile functionality* *at the Node.*For further details refer to the Distribution Model, Annex 3.
* **Remote site:** The Remote Site is where a Remote Shore Station (RSS) of *any* of the services of the shore-based system is set up physically. Remote Sites are *only* populated by services with a Physical Layer. For further details refer to the Distribution Model, Annex 3.
* **Technical Operation Personnel (TOP):** The Technical Operation Personnel is that part of the technical staff that keeps the service components running, does their run-time configuration and repairs defective on-site components. It has ***not*** got the license to change structure and / or functionality of the service, though.
* **Technical Operation Personnel (TOP) site:** The Technical Operation Personnel site is a functional site. At this site the Human Machine Interfaces (HMI) are provided to the Technical Operation Personnel *at their workplaces* as defined by the management of the organization. (Human Machine Interfaces at other functional sites provided by machines to the Technical Operation Personnel for only short-time/quick interaction with the machines don’t qualify for TOP sites.)  
  For further details refer to the Distribution Model, Annex 3.
* **Technical Development Personnel (TDP):** The Technical Operation Personnel is that part of the technical staff that further develops and progresses the functionality and / or structure of the shore-based system and the services and that releases and deploys new soft- or firmware versions. Hence, the Technical Development Personnel has the license to change structure and / or functionality of the service under consideration.
* **Technical Development Personnel (TDP) site:** The Technical Development Personnel site is a functional site. At this site the Human Machine Interfaces (HMI) are provided to the Technical Development Personnel *at their workplaces* as defined by the management of the organization. (Human Machine Interfaces at other functional sites provided by machines to the Technical Operation Personnel for only short-time/quick interaction with the machines don’t qualify for TDP sites.)  
  For further details refer to the Distribution Model, Annex 3.
* **Service Distribution Configuration:** A Service Distribution Configuration is the precise description and/or depiction of the Distribution Model for a technical e-Navigation service under consideration in terms of functional sites populated (User sites, Remote site, Node site etc.), their respective geographical topology, and the intended set of WAN feeder links and WAN backbone links. There are three generic Service Distribution Configurations which can be used when defining the Distribution Model of the service under consideration.   
  For further details refer to the Distribution Model, Annex 3.
* **Multiple-Node Service Distribution Configuration:** This Service Distribution Configuration is characterized by populating *more than one* *Node site* for the service under consideration. This in turn requires (1) *WAN Feeder links* from the populated Node sites to all populated Remote site(s), Technical Operation Personnel and Technical Development Personnel sites and potentially User site(s) (not every service has a user-oriented Human Machine Interface as well as (2) *WAN Backbone links* between the Node sites.  
  For further details refer to the Distribution Model, Annex 3.
* **One-Node Service Distribution Configuration:** This Service Distribution Configuration is characterized by populating *just one* *Node* *site* for the service under consideration. This in turn requires *WAN Feeder links* from the one populated Node site to all Remote site(s), Technical Operation Personnel and Technical Development Personnel sites and potentially User site(s) (not every service has a user-oriented Human Machine Interface.  
  For further details refer to the Distribution Model, Annex 3.
* **One-Spot Service Distribution Configuration:** This Service Distribution Configuration is characterized by populating *just one* *site* for the service under consideration. Since all functional sites (Remote site(s), Node site, potentially User site(s) etc.) are on the same one premise, all data transfer is local and no WAN Feeder links are required.  
  For further details refer to the Distribution Model, Annex 3.
* **Structure Model of a technical e-Navigation service:** --- TBD ---
* **Physical Layer:** --- TBD ---
* **Physical Link:** --- TBD ---
* **Remote Shore Station (RSS):** --- TBD ---
* **Physical Shore Station (PSS) Layer:** --- TBD ---
* **Physical Link Terminal Equipment (PLTE) Layer:** The middle sub-layer of the Physical Layer. It contains all devices and/or functionality needed to – regarding “receiving“ - transform a signal received from the Physical Link Couplers Layer into a data object as appropriate for the specific technology of the service under consideration. The data object is forwarded to the Physical Shore Station (PSS) Layer. Regarding “transmission”, a data object received from the Physical Shore Station is transformed into an appropriate signal which is forwarded to the Physical Link Couplers Layer for eventual transmission on the Physical Link. Examples of PLTE are radio transceiver devices in the case of radio based services or light generating/receiving devices in the case of visual services.
* **Physical Link Couplers (PLC) Layer:** The lowest sub-layer of the Physical Layer. Regarding “transmission”, it contains all devices and/or functionality needed to effectively couple a signal generated by the Physical Link Terminal Equipment Layer into the appropriate Physical Link and/or – regarding “receiving” – to extract a signal present in the Physical Link and forward it to the Physical Link Terminal Equipment Layer. Examples of Physical Link Couplers are radio antennas for radio wave signals or optical lenses for light signals.
* **Sector:** A sector is a “vertical” subdivision of parts of the Physical Layer motivated by und used for coverage planning consideration regarding the Physical Link(s) of a service. A sector specifically allows for space/direction diversity regarding the physical range of a RSS. A sector always comprises the lowest two layers of the Physical Layer, namely a combination of Physical Link Terminal Equipment (PLTE) with Physical Link Couplers (PLC) both dedicated to a specific direction in space. All sectors of a RSS are co-ordinated by the PSS concurrently and all data delivered to/from all sectors are processed by the PSS concurrently. Hence, the PSS is not subject to the sectorization. Also, the Service Management does interact directly with the PSS alone, and not with any component within a sector. Conceptually wise, omnidirectional coverage ranges can be construed as a One-Sector RSS.

For further details refer to the Distribution Model, Annex 3.

* **Service component:** --- TBD ---
* **Component of a service:** --- TBD ---
* **Service-owned infrastructure:** --- TBD ---
* **On-site infrastructure:** --- TBD ---

For further details refer to the Distribution Model, Annex 3, and to the Annex 12.

* **Logical Layer:** The Logical Layer of a technical e-Navigation service which contains *all* functionality of the service, which is not tied to a specific location at the waterway (as opposed to the Physical Layer) *and* which treats system-requested net data of the service (as opposed to e.g. management and/or maintenance data). Hence, by definition, the Logical Layer resides at a Node site (compare Distribution model). The Logical Layer comprises the functional component Logical Shore Station (LSS) and other supportive service-owned components.

For further details refer to the Distribution Model, Annex 3, and to the Annex 9.

* **Logical Shore Station (LSS):** The Logical Shore Station (LSS) is the functional service component of the Logical Layer, where the actual net data treatment is done. In most cases it is a software module residing in a computer (= service-owned infrastructure component).

For further details refer to the Distribution Model, Annex 3, and to the Annex 9.

* **Service Management (SM):** --- TBD --- The *Service Management* is – by its very nature – represented at all functional sites where the service under consideration is present, but special management functionality of the Service Management resides in the Node Site(s), too.

For further details refer to the Distribution Model, Annex 3, and to the Annex 11.

* **Service Management Master (SM-Master):** --- TBD --- the so-called *Service Management Master (SM-Master)* functionality resides in one Node Site out of many (at the Multi-Node Service configuration), only

For further details refer to the Distribution Model, Annex 3, and to the Annex 11.

* **Service Management Agent at the Node (SM-Node):** --- TBD ---

For further details refer to the Distribution Model, Annex 3, and to the Annex 11.

* **Service Management Agent at the Remote Shore Station (SM-RSS):** --- TBD ---

For further details refer to the Distribution Model, Annex 3, and to the Annex 11.

* **Configuration:** Configuration in the context of the common shore-based e-Navigation system architecture is used to designate the following configurable parameters of a service under consideration:
* **Configuration at planning time; examples:**
  + Distribution of components of a service over sites populated by this service, i.e. its geographical topology: compare Service Distribution Configuration
  + Number of instances of components of a service at any given site
* **Configuration at run-time; examples:**
  + technical tuning parameters of Basic Services, components and for the Physical Link(s) served by the service under consideration
  + address scheme(s) used for the functional connections of all services throughout the shore-based e-Navigation system

For further details refer to the Distribution Model, Annex 3, and to the Annex 13.

* **Functional connection:** A functional connection or link, sometimes also called a virtual connection or link, connects two components of the e-Navigation architecture for the purpose of data transfer. Depending on where the participating components are and how they move over time, there may be a variety of different functional connections or links. Functional connections need physical links for implementation. It should be noted, that functional/virtual connections also have properties like capacity, reliability, continuity, security, etc. (i.e. functional/virtual is not a synonym for “magic” ☺ ).

For further details refer to the Distribution Model, **Annex 3**.

* **WAN feeder link:** Wide Area Network feeder link is a term in the domain of the functional/virtual connections. The WAN feeder link connects any two functional sides of the shore-based system, other than two Nodes, which are situated on distinct premises. Local functional connections, i.e. functional connections on the same premises, are done by local area networking.

For further details refer to the Distribution Model, **Annex 3**.

* **WAN backbone link:** Wide Area Network backbone link is a term in the domain of the functional/virtual connections. The WAN backbone link connects any two Nodes of the shore-based system. Therefore, WAN backbone links require in most cases require higher quality regarding their properties than WAN feeder links, such as higher bandwidth, higher reliability etc.

For further details refer to the Distribution Model, **Annex 3**.

* **Nominal Coverage Area:** The Nominal Coverage Area is *an expressively defined geographical area designation associated with an entity* of the shore-based e-Navigation system architecture, *for which an expressively defined set of functionalities and/or data deliveries are performed with a expressively defined quality level being met.* The concept of the Nominal Coverage Area directly supports the e-Navigation aspects of defined service levels and of a defined service portfolio in a given geographical area.

For further details refer to the Distribution Model, **Annex 3**.

* **Receive Nominal Coverage Area:** Nominal Coverage Area defined for an entity for data flow direction “Receive”. For further details refer to the Distribution Model, **Annex 3**.
* **Transmit Nominal Coverage Area:** Nominal Coverage Area defined for an entity for data flow direction “Transmit”. For further details refer to the Distribution Model, **Annex 3**.
* **Service Coverage Area:** The Service Coverage Area is the Nominal Coverage Area of the whole of the service under consideration. In the case of a service with a Physical Layer the Service Coverage Area *always* is the inclusive overlay sum of all the PSS Coverage Areas (see below) of the service. In the case of a service without a Physical Layer, the Service Coverage Area is the area of responsibility of the administration setting up the service by default.

For further details refer to the Distribution Model, **Annex 3**.

* **LSS Coverage Area**: The LSS Coverage Area is the Nominal Coverage Area of one instance of the Logical Shore Station (LSS). This is the area for which the requesting service of the shore-based e-Navigation system configures the requested Basic Services, and this is the area for which the service delivers the Basic Services to that requesting service. For a given instance of the LSS, the LSS Coverage Area can comprise any subset of the Service Coverage Area or can be set equal to the Service Coverage Area.
* **PSS Coverage Area:** The PSS Coverage Area is the Nominal Coverage Area of one Remote Shore Station (RSS) of the service with a Physical Layer. Hence, it could also synonymously be called **RSS Coverage Area** although it is the PSS as the relevant component of the RSS, i.e. its highest layer, which determines the RSS Coverage Area assuming an equal or larger physical range of the Physical Link Couplers in that RSS.   
  For further details refer to the Distribution Model, Annex 3, and to the Annexes 10.1 and 10.2.
* **Sector Coverage Area:** The Sector Coverage Area is the Nominal Coverage Area for which the Physical Link Couplers (PLC) Layer of a Remote Shore Station (RSS) of the service with a Physical Layer has been planned for. For further details refer to the Distribution Model, Annex 3, and to the Annexes 10.1 and 10.4.
* **Interaction and Data Storage Model:** The Interaction and Data Storage Model addresses issues associated with the distributed data storages within a service under consideration and the associated data flow mechanisms within that service between the different data storages, taking into account the distributed geographical topology.   
  For further details refer to **Annex 4**, Interaction and Data Storage model.
* **Data Storage Section:** Data Storage Sections are entities in the abstract data object domain. They exist both as a class and as instances, each. The Data Storage Sections can be *considered an engineering answer to the general request for a* *user-requirement driven system design*: It is the Data Storage Sections which reflect the user-requirements regarding parameters associated with data storage, such as *age of data objects* and *data delivery latency*, in a *implementation independent* manner. There are defined the following Data Storage Sections (refer to the appropriate entry in this glossary): **--- TBD ---**For further details refer to **Annex 4**, Interaction and Data Storage model.
* **Data Storage Model:** The Data Storage Model is an important feature of a technical e-Navigation service. Its exclusive element is the definition and description of so-called *Data Storage Sections*, i.e. the Data Storage Model is exclusively build by using different Data Storage Sections. Like the Basic Services and the Data Model, the Data Storage Model with its Data Storage Sections can be *considered an engineering answer to the general request for a* *user-requirement driven system design*: It is the Data Storage Model with its Data Storage Sections which reflects the user-requirements regarding parameters associated with data storage, such as *age of data objects* and *data delivery latency*, in a *implementation independent* manner.  
  For further details refer to **Annex 4**, Interaction and Data Storage Models.
* **Internal Service-wide Data Storage (IDS):** The Internal Service-wide Data Storage (IDS) is a Data Storage Section and thus is one part of the Data Storage Model of a service. **--- TBD ---**For further details refer to **Annex 4**, Interaction and Data Storage model.
* **Centralized Data Storage (CDS):** The Centralized Data Storage (CDS) is a Data Storage Section and thus is one part of the Data Storage Model of a service. **--- TBD ---**For further details refer to **Annex 4**, Interaction and Data Storage model.
* **System-wide Data Storage (SDS):** The System-wide Data Storage (CDS) is a Data Storage Section and thus is one part of the Data Storage Model of a service. It comprises any and all data storage entities of the common shore-based e-Nav system architecture, which are directly accessible, hence “visible”, for any other technical e-Navigation service. While the SDS therefore is not a part of a single service alone, strictly speaking, every service of the shore-based e-Navigation system contributes to the SDS and benefits from the contributions of other services in turn. Hence, the SDS section describes the data exchange between the services of the shore-based e-Navigation system in abstract and data storage terms.  
  For further details refer to **Annex 4**, Interaction and Data Storage model.
* **Local Data Storage (LDS):** The Local Data Storage (LDS) is a Data Storage Section and thus is one part of the Data Storage Model of a service. **--- TBD ---**For further details refer to **Annex 4**, Interaction and Data Storage model.
* **Remote Data Storage (RDS):** The Remote Data Storage (CDS) is a Data Storage Section and thus is one part of the Data Storage Model of a service. **--- TBD ---**For further details refer to **Annex 4**, Interaction and Data Storage model.
* **Data sentence:** A data sentence is a data content which is exchanged *within* *or between* services of the shore-based e-Navigation system by Machine-to-Machine interfaces. To that end the data sentence is encoded in the format appropriate for the interface technology and protocols used. Note the difference to data contents exchanged by a signal or a message on a Physical Link.
* **Signal / Message:** A signal or a message is a data content *exchanged by using a specific Physical Link* and which is encoded in the physical format appropriate for the Physical Link under consideration to that end. Note the difference to the term “data sentence”.

# Abbreviations

This alphabetical list of abbreviations contains also relevant abbreviations from the Annexes.

BS - Basic Service

BS Cat - Basic Service Category

CDS - Centralized Data Storage

E-BS - External Basic Service

HMI - Human Machine Interface

I-BS - Internal Basic Service

IDS - Internal Service-wide Data Storage

LAN - Local Area Network

LDS - Local Data Storage

LSS - Logical Shore Station

M2M - Machine to Machine Interface

PLC - Physical Link Couplers

PLTE - Physical Link Terminal Equipment

PSS - Physical Shore Station

RDS - Remote Data Storage

RSS - Remote Shore Station

SBN - Shore-Based Wide Area Network Service

SDS - System-wide Data Storage

SM - Service Management Layer

SM-Master - Service Management Master

SM-Node - Service Management Agent at the Node site

SM-RSS - Service Management Agent at the Remote Shore Station

TDP - Technical Development Personnel

TOP - Technical Operation Personnel

WAN - Wide-area data transfer network