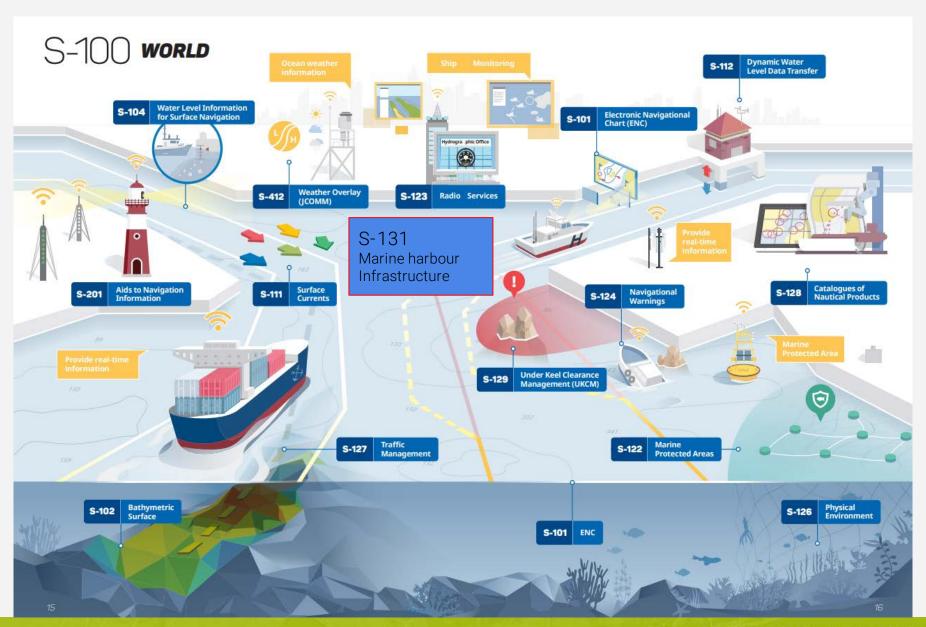


S-131 Marine Harbour Infrastructure

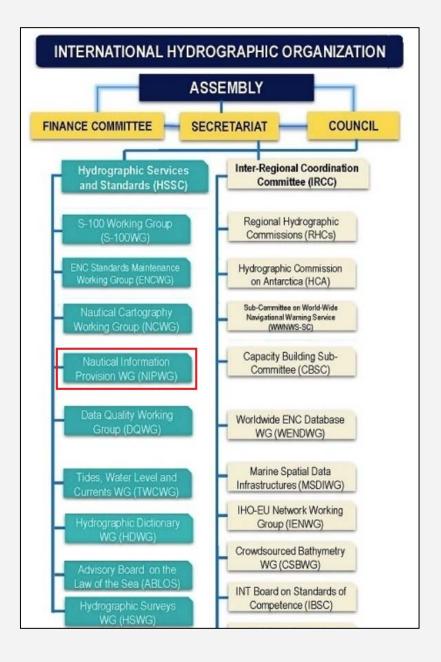


The world of S-100



Background

- Ongoing discussions since 2005 (IHO SNPWG/NIPWG).
 - International PORTCDM Council.
 - Port Manual information (2019) IHMA.
- NIPWG work on S-131 started 2020 (Commissioned by HSSC).
- WG participants:
 - IHO Member States
 - Industry (Port of Rotterdam)
 - Academia (UNH)



Abstract and Scope

Abstract:

- Intended use is to raise situational awareness before approaching a harbour.
- Layout of the berths as well as the services offered for berthing procedure.
- Berth-to-berth route planning process for an efficient harbour call.
- Presented in a way that is compact, organised and easily accessible.
- This information is also useful for shipping companies, brokers and other in the industry to optimize their planning.

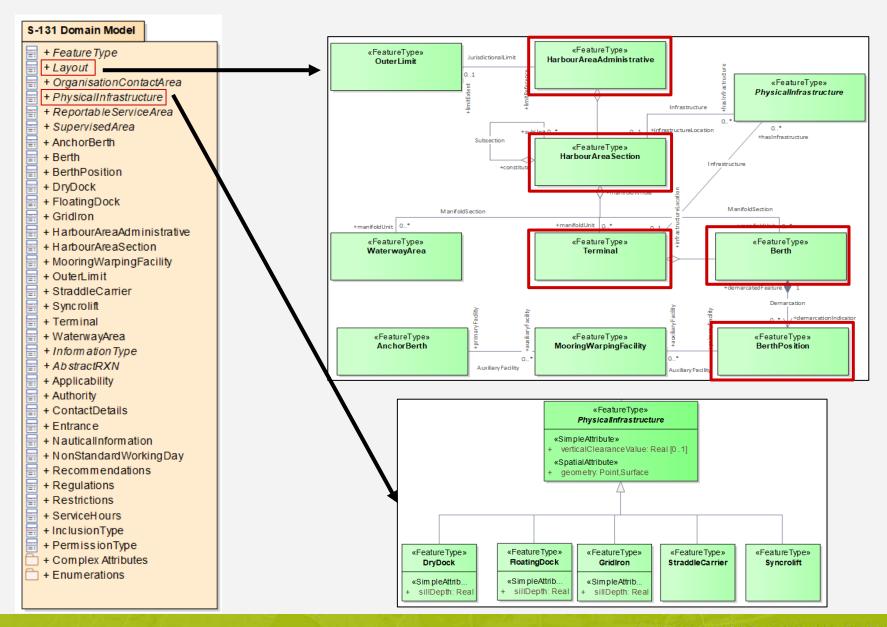
Scope:

 The Marine Harbour Infrastructure describes relevant data on harbour infrastructure, facilities and services in a harmonised form.

3 main categories

| Port/Harbour Layout Features | Port/Harbour Physical Infrastructure Features | Port/Harbour non-Physical Infrastructure_Features | |
|---|--|--|--|
| PortArea/HarbourArea | HarbourFacility (S- 101) | EmergencyCoordinationCentre | |
| SocialAndPolitical | Small craft facilities (S-101) | EnvironmentalEmergencyInformationCentre | |
| AnchorageArea (S-101) | PilotBoardingPlace | PortServicesBerthingAssistanceService | |
| AnchorBerth (S-101) | Waterway | PortServicesSupplyService | |
| PortSectionArea (PortLayoutArea, PortLayoutSection) | DryDock (S-101) | PortServicesWasteDisposal | |
| Terminal | FloatingDock (S-101) | PortServicesRepairService | |
| Berth (from S101) | Gridiron (S-101) | PortServicesTechnical | |
| BerthPosition | Syncrolift (S-101) | PortServiceMedicalService | |
| MooringFacilities (S- 101) | StraddleCarrier | PortServiceFireFighting | |
| | | PortServiceSecuritySafety | |

Domain Model



Services

Lavout «FeatureType» HarbourAreaAdministrative «simpleAttribute» uNLocationCode: text [0..1] countryCode: text [0..1] applicableLoadLineZone: text [0..1] iSPSLevel: iSPSLevel [0..1] categoryOfHarbourFacility: categoryOfHarbourFacility [0..*] availablePortServices: availablePortServices [0..1] generalHarbourInformation: generalHarbourInformation [0..1] «SpatialAttribue» geometry: Point, Surface

Icebreaker Linesman Mule Tractor Tower Police = 7 Rescue = 8

«enumeration» «enumeration» berthingAssistance firefighting Service Berthing information As hore fire brigade = 1 Fire-fighting boat = 2 Onboard trained fire brigade = 3 Mooring Boat «enumeration» shipSanitationControl Tug - deep sea Sanitation Measures Only = 1 Tug - Harbour SSCC = 2Tug - salvage SSCEC = 3 «enumeration» security Safety Emergency Service Coast Guard = 1 Customs = 2 Environmental Emergency Info Centre = 3 Emergency Coordination Centre = 4 Guard and/or Security Service = 5 Im migration = 6 «enumeration»

technicalPortService Compass Adjustment Degaussing Cargo Survey Vetting Service

Airport

Bicycle

Bus

Ferry

Boatm an

Highway

Launch

Railway

Road

Tunnel

Sea

«enumeration» m edical Service Ambulance = 1 De-ratting = 2 De-ratting Certificate = 3 De-ratting exemption certificate = 4 Fum igation = 5 doctor = 6 Quarantine = 7 Vaccination Centre = 8 «enumeration» wasteDisposalService transportationService

«enumeration» repairService Bridge = 1 Compass Adjustment = 2 Diver Services = 3 Engine and Engine Part = 4 Electronic equipment = 5 Navigational equipment = 7 Propellers = 8 Salvage gear = 9 Shafts = 10

MARPOL I Dirty ballast water = 1 MARPOL II Category A = 2 MARPOL II Category B = 3 MARPOL II Category C = 4 MARPOL II Category D = 5 MARPOL IV Sewage = 6 MARPOL V Garbage = 7 MARPOL I Oily bilge water = 8 MARPOL I Oily mixtures containing chemicals = 9 MARPOL I Scale and Sludge from tanker cleaning = 10 Slop disposal = 11 MARPOL I Sludge from fuel oil purifier = 12 MARPOL I Tank Washing (Slops) = 13 MARPOL II Category X MARPOL II Category Y MARPOL II Category Z MARPOL II Category OS

«enum eration»

«ComplexAttributeType» availablePortServices

- + firefightingService: firefightingService [0..*]
- medicalService: medicalService [0..*]
- + repairService: repairService [0..*]
- technicalPortService: technicalPortService [0..*]
- shipSanitationControl: shipSanitationControl [0..*]
- transportationService: transportationService [0..*]
- berthingAssistance: berthingAssistance [0..*]
- securitySafetyEmergencyService: securitySafetyEmergencyService [0..*]
- wasteDisposalService: wasteDisposalService [0..*]

Enumerations and codelists

«S100 Codelist» «enumeration» «enumeration» categoryOfVessel categoryOfAuthority categoryOfDangerousOrHazardousCargo general cargo vessel = 1 customs = 1 IMDG Code Class 1 Div. 1.1 = 1 container carrier = 2 border control = 2 IMDG Code Class 1 Div. 1.2 = 2 + tanker = 3 police = 3 IMDG Code Class 1 Div. 1.3 = 3 bulk carrier = 4 port = 4 IMDG Code Class 1 Div. 1.4 = 4 passenger vessel = 5 immigration = 5 IMDG Code Class 1 Div. 1.5 = 5 roll-on roll-off = 6 health = 6 IMDG Code Class 1 Div. 1.6 = 6 refrigerated cargo vessel = 7 coast guard = 7 IMDG Code Class 2 Div. 2.1 = 7 + fishing vessel = 8 agricultural = 8 IMDG Code Class 2 Div. 2.2 = 8 military = 9 + service = 9 IMDG Code Class 2 Div. 2.3 = 9 warship = 10 private company = 10 IMDG Code Class 3 = 10 towed or pushed composite unit = 11 maritime police = 11 IMDG Code Class 4 Div. 4.1 = 11 + tug and tow = 12 environmental = 12 IMDG Code Class 4 Div. 4.2 = 12 + light recreational = 13 fishery = 13 IMDG Code Class 4 Div. 4.3 = 13 + semi-submersible offshore installation = 14 finance = 14 IMDG Code Class 5 Div. 5.1 = 14 jackup exploration or project installation = 15 maritime = 15 IMDG Code Class 5 Div. 5.2 = 15 livestock carrier = 16 IMDG Code Class 6 Div. 6.1 = 16 + sport fishing = 17 IMDG Code Class 6. Div. 6.2 = 17 IMDG Code Class 7 = 18 IMDG Code Class 8 = 19 codelistType = open enumeration IMDG Code Class 9 = 20 encoding = other: [something] Harmful Substances in packaged form = 21 «S100_Codelist» «S100_Codelist» «enumeration» categoryOf Schedule categoryOfRxN categoryOfCargo normal operation = 1 navigation = 1 bulk = 1closure = 2 communication = 2 container = 2 environmental protection = 3 unmanned operation = 3 general = 3 wildlife protection = 4 liquid = 4 s ecurity = 5 passenger = 5 codelistType = open enumeration customs = 6 livestock = 6 encoding = other: [something] cargo operation = 7 dangerous or hazardous = 7 refuge = 8 heavy lift = 8 health = 9 ballast = 9 «enumeration» categoryOfCommPref + port = 11 «enumeration» + finance = 12 preferred calling = 1 categoryOfHarbourFacility agriculture = 13 alternate calling = 2 RoRo Terminal = 1 preferred working = 3 ferry terminal = 3 alternate working = 4 codelistType = open enumeration fishing harbour = 4 encoding = other: [something] vacht harbour/marina = 5 «enumeration» naval base = 6 categoryOfVesselRegistry tanker terminal = 7

domestic = 1

foreign = 2

passenger terminal = 8

container terminal = 10

Service and Repair = 16

Quarantine Station = 17

bulk terminal = 11

straddle carrier = 13 Service harbour = 14 Pilotage Service = 15

shipyard = 9

Ship Lift = 12

+ natural resources or exploitation = 10

«enumeration» categoryOfText

abstract or summary = 1 extract = 2 full text = 3

«enumeration» Unused Domain Elements:: categoryOfMaritimeBroad cast New/Updated/\$131Specific:: categoryOfBerthLocation

«enumeration»

Wharf, Quay with reference location = TBD Wharf, Quay with meter marks = TBD Pier (Jettv) = TBD Multiple Buoy Mooring = TBD

New/Updated/\$131Specific: :categoryOfPortSection Port Fairway

Turning Basin Harbour Basin Berth Pocket Pilot Boarding Place Anchorage Area Dock Area Maneuvering Area Seaplane Area

«enumeration»

«enumeration» New/Updated/\$131Specific:: categoryOfMooringWarpingFacility

Dolphin = 1 Deviation Dolphin = 2 Bollard = 3 Tie-Up Wall = 4 Post or Pile = 5 Mooring Cable = 6 Mooring Buoy = 7 Ropes from Ashore = TBD

«enumeration» New/Updated/\$131Specific:: categoryOfAnchorage

unrestricted anchorage = 1 deep water anchorage = 2 tanker anchorage = 3 explosives anchorage = 4 quarantine anchorage = 5 Seaplane Anchorage = 6 small craft anchorage = 7 small craft mooring area = 8 anchorage for periods up to 24 hours = 9 an chorage for a limited period of time = 10 Anchorage for Dry Cargo Vessels = 12 Waiting Anchorage = 14

«enumeration» categoryOfRelationship

prohibited = 1 not recommended = 2 permitted = 3 recommended = 4 required = 5 not required = 6

«enumeration» New/Updated/\$131Specific: :categoryOfWaterwayArea

> Dredged Basin Turning Basin Channel Fairway Degaussing Range Safety Zone Seaplane Operating Area **Dumping Ground**

categoryOfPortSection & categoryOfWaterwayArea are candidates for merging

«enumeration» New/Updated/\$131Specific:: categoryOfDepthsDescription

Shoals General description Controlling depths

«enumeration» categoryOfPreference primary = 1

alternate = 2

«enumeration» categoryOfRadioMethods

Low Frequency (LF) voice traffic = 1

Equal features and attributes - different product specifications.

S-131

S-101

«enumeration» categoryOfHarbourFacility RoRo Terminal = 1 ferry terminal = 3 fishing harbour = 4 yacht harbour/marina = 5 naval base = 6 tanker terminal = 7 passenger terminal = 8 shipyard = 9 container terminal = 10 bulk terminal = 11 Ship Lift = 12 straddle carrier = 13 Service harbour = 14 Pilotage Service = 15 Service and Repair = 16 Quarantine Station = 17

| S-101 Attribute | S-57 Acronym | Allowable Encoding Value | Туре | Multiplicity |
|------------------------------|-----------------|---|------|--------------|
| category of harbour facility | (CATHAF) | 1 : RoRo-terminal 3 : ferry terminal 4 : fishing harbour 5 : yacht harbour/marina 6 : naval base 7 : tanker terminal 8 : passenger terminal 9 : shipyard 10 : container terminal 11 : bulk terminal 12 : ship lift 13 : straddle carrier 14 : service harbour 15 : pilotage service | EN | 1,* |

Enumerations and codelists

«enumeration» New/Updated/S131 Specific:: categoryOfAnchorage

unrestricted anchorage = 1
deep water anchorage = 2
tanker anchorage = 3
explosives anchorage = 4
quarantine anchorage = 5
Seaplane Anchorage = 6
small craft anchorage = 7
small craft mooring area = 8
anchorage for periods up to 24 hours = 9
anchorage for a limited period of time = 10
Anchorage for Dry Cargo Vessels = 12
Waiting Anchorage = 14

«enumeration» New/Updated/\$131\$pecific:: methodOfSecuring

Bows to seaward = TBD
Stern to wall (...to seaward?) = TBD
Mediterranean mooning
Baltic mooring
Running mooring
Standing mooring
Single point mooring
Conventional mooring
Ship to ship mooring
Spider buoy mooring

«enumeration» vesselsCharacteristicsUnit

metre = 1
foot = 2
metric ton = 3
ton = 4
short ton = 5
gross ton = 6
net ton = 7
Panama Canal/Universal Measurement System
net tonnage = 8
Suez Canal Net Tonnage = 9
none = 10
cubic metres = 11
Suez Canal Gross Tonnage = 12

«enumeration» New/Updated/S131Specific: :status

permanent = 1 occasional = 2 not in use = 4 reserved = 6 tem porary = 7 private = 8 mandatory = 9 public = 14

«S100 Codelist»

actionOrActivity

navigating with a pilot = 1

entering port = 2

leaving port = 3

berthing = 4

anchoring = 6

transiting = 8

overtaking = 9

reporting = 10

landing = 12

diving = 13

fishing = 14

passing = 16

weighing anchor = 7

working cargo = 11

+ slipping = 5

«enumeration» sourceType

law or regulation = 1
official publication = 2
mariner report, confirmed = 7
mariner report, not confirmed = 8
indus try publications and reports = 9
rem otely sensed images = 10
photographs = 11
products issued by HO services = 12
news media = 13
traffic data = 14

«enumeration»

cardinalDirection

N = 1

NNE = 2

NE = 3

ENE = 4

ESE = 6

SE = 7

SSE = 8

SSW = 10

WSW = 12

WNW = 14

NNW = 16

NW = 15

SW = 11

W = 13

S = 9

E = 5

«enumeration» iSPSLevel

ISPS Level 1 = 1 ISPS Level 2 = 2 ISPS Level 3 = 3

«enumeration» membership

included = 1 excluded = 2

«S100_Codelist» onlineFunction

+ download = 1 + information = 2 + offlineAccess = 3

+ order = 4 + search = 5

+ completeMetadata = 6 + browseGraphic = 7

+ upload = 8 + emailService = 9

+ browsing = 10 + fileAccess = 11

«enumeration» operation largest value = 1

«enumeration»

logica |Connectives

logical conjunction = 1

logical disjunction = 2

smallest value = 1

«enumeration» condition

under construction = 1 under reclamation = 3 planned construction = 5

«enumeration» dayOfWeek

Sunday = 1 Monday = 2 Tuesday = 3 Wednesday = 4 Thursday = 5 Friday = 6 Saturday = 7

«enumeration» comparis onOperator

codelistType = open enumeration

encoding = other. [something]

discharging overboard = 15

greater than = 1 greater than or equal to = 2 less than = 3 less than or equal to = 4 equal to = 5 not equal to = 6

«enumeration» New/Updated/S131Specific:: dynamicResource

static = 1 mandatory external dynamic = 2 optional external dynamic = 3

«enumeration» vesselsCharacteristics

length overall = 1
length at waterline = 2
breadth = 3
draught = 4
height = 5
displacement tonnage = 6
displacement tonnage, light = 7
displacement tonnage, loaded = 8
deadweight tonnage = 9
gross tonnage = 10
net tonnage = 11
Panama Canal/Universal Measurement
System net tonnage = 12
Suez Canal net tonnage = 13
Suez Canal gross tonnage = 14

«S100_Codelist» telecommunicationService

+ voice = 1 + facsimile = 2

+ sms = 3

+ data = 4 + stream edData = 5 + telex = 6

telegraph = 7 email = 8

tags

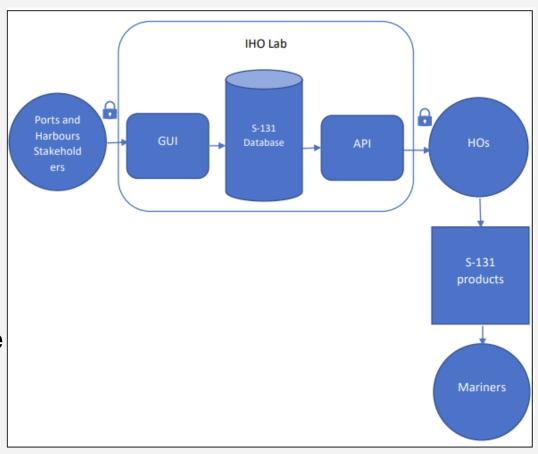
codelistType = open enumeration encoding = other: [something]

Progress

- Started 2020.
- February 2022 version 0.0.2.
- IHO contracted Portolan Sciences to finalize version 1.0.0
 - o Testing and implementation purposes
 - o Test phase
- Further process towards version 2.0.0 for operational use.

Marine Harbour Infrastructure Database

- Ports face difficulties when gathering data from all data owners in the port; as the port authority is not data owner of all port data (e.g, terminals may be the data owner of the soundings of the berthing pocket).
- Marine Harbour Infrastructure database will facilitate the information exchange between harbours and HOs.



Thank you!

