

Technical Assistance *in support of the*

CoopP Project: TEST PROJECT ON COOPERATION IN EXECUTION OF VARIOUS MARITIME FUNCTIONALITIES AT SUB-REGIONAL OR SEA-BASIN LEVEL IN THE FIELD OF INTEGRATED MARITIME SURVEILLANCE

**PROJECT FILE: Appointment Letter N°258444
dated 11/07/2013**

DELIVERABLE OUT 5.1.3:

Review of Data Models and Semantic produced by WP5

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Ref.: BSC/JRC



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References

The present report is produced as a result of the activity specified by the Statement of Work 0001-13 Profile1 : Senior Expert dated July11, 2013, and implemented by the Appointment letter 258444 of the same date; and its amendment by mutual agreement on Oct 28, 2013

The present report materializes the third and final deliberable of the contract, namely:

OUT5.1.3 – Review of Data Models and Semantic

The review process of the Data Models and Semantic has been a continuous process between the CoopP WP5 team and the Experts over 6 months :

- the general formalism and initial shortlist of Core Data has been introduced and discussed in the Helsinki meeting in July 9-10, 2013
- a significant reassessment during the summer, conjugating top-down and bottom-up analyses, the last based upon the detailed Use cases activity OUT 5,1,1, produced a near-final short-list of 7 fundamental but relatively abstract « main entities » further detailed by 11 additional Core Data entities, more self-explanatory for the Maritime User Communities, as tabulated hereafter;
- a draft Data Model document has been built first in a graphic form, then as a text document; these drafts were thoroughly reviewed in a WP5 Meeting in Madrid on Sept. 4-5, 2013
- the global method, the formalism of description of the various Data models as well as the shortlist of Core Data entities, have been presented, discussed and agreed in a joint workshop with the CISE TAG in Ispra on Oct. 2-3, 2013, providing the go-ahead for the final editing;
- to adjust the parallel progress of the 2 sub-working groups of the CoopP WP5, each of them tasked of the production of the detailed Data Model and semantic of half of the Core Data Entities shortlist, and resolve the final details, a final WP5 meeting has been held in Bucharest on Nov 13-14, 2013.

At that stage, the very comprehensive review was principally conducted through living discussions, allowing to undertake the final Data Model and Semantic reports (one for each Core Data Entity) from fully ascertained material.

By essence, this major part of the Review process cannot be traced explicitly. Conversely, the final review traced hereafter only reflects the very final editing improvements process.

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1. Review of the Main Data Entities

The 7 Main Data Entities are following:

Agent

Document

Event

Location

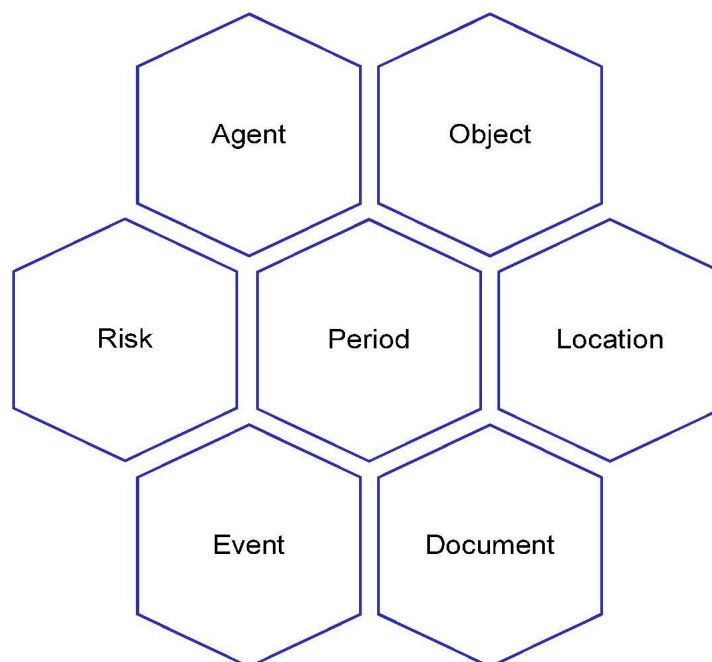
Object

Period

Risk

Because they come at a very high level of abstraction to categorize the essential nature of any information, the essence of these Main Data Entities is generally easy to capture, while conversely their pattern of associations with other Core Data Entities and the enumeration of most frequent instantiations as Maritime data reveal very numerous.

The review comments are highlighted in the original Data Model and Semantic reports from WP5, shortened where necessary (empty tables hereafter simply mean “no comment”).



1.1 CLASS AGENT

The Agent is one of the core entities of the overall data model of the information sharing environment. **By definition, an Agent is an operative entity that plays a role in any Event, owns, handles or operates Objects such as Cargo or Assets, creates and exploits Documents...**



It is an entity which holds information about individual persons or organizations which are involved as actors or targets in the various events and activities. Agent can have relationship with other agents, objects and locations. Agent can also be related to risks in different roles. Agent is an abstract entity which has two sub-entities Person and Organization.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Metadata	COOPP::Metadata			
BusinessCard	IETF::RFC6351::xCard			
Nationality	ISO3166-1::alpha-3			
UUID, TBC	IETF::RFC4122::UUID			
IsSuspect, TBC	Boolean			
IsOfInterest, TBC	Boolean			

ASSOCIATIONS

Name	With	Description
AgentInvolvementInEvent	Event	
AgentInvolvementInObject	Object	
AgentInvolvementInLocation	Location	
AgentInvolvementInAgent	Agent	
AgentInvolvementInRisk	Risk	
refersTo	Document	
IsCorrelatedWith	UniqueIdentifier	

INVARIANTS

Name	Description

CLASS AGENTINVOLVEMENTINEVENT

This class allows the association between Agent (or one of its sub-classes: person, organization) and Event (or one of its sub-classes: movement, incident, anomaly, action). It is not mandatory to associate an Agent with an Event but one Agent can be associated to multiple different Events. The association further describes the role of the Agent in the Event.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
AgentRole	AgentRoleInEvent			

ASSOCIATIONS

Name	With	Description

INVARIANTS

Name	Description

CLASS AGENTINVOLVEMENTINOBJECT

This class allows the association between Agent (or one of its sub-classes: person, organization) and Object (or one of its sub-classes: Vehicle (Vessel, Aircraft, Landvehicle), CargoPackage). It is not mandatory to associate an Agent with an Object but one Agent can be associated to multiple different Objects. The association further describes the role of the Agent in relation to the Object. The special relationship between Passangers and Craft is described by Boolean type attribute TransitPassanger which carries information about the status of the passanger (Transit passanger or not) and by two associations with class Location. Crew members have also a special relationship to Craft which is described by attribute Duty. This attribute carries information about the responsibilities and position of the person in the vessel. The duration of the relationship between the Agent and the Object is described by an association with class Period.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
AgentRole	AgentRoleInObject			
NSW:: Passengers:: TransitPassenger	Boolean			
Duty TBC	DutyType			
AgentRole	AgentRoleInEvent			

ASSOCIATIONS

Name	With	Description
PortOfEmbarkation	Location	
PortOfDisembarkation	Location	
involvedDuring	Period	

INVARIANTS

Name	Description

CLASS AGENTINVOLVEMENTINLOCATION

This class allows the association between Agent (or one of its sub-classes: person, organization) and Location. It is not mandatory to associate an Agent with a Location but one Agent can be associated to multiple different Locations. The association further describes the role of the Agent in relation to the Location. The duration of the relationship between the Agent and the Location is described by an association with class Period.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
AgentRole	AgentRoleInLocation			

ASSOCIATIONS

Name	With	Description
involvedDuring	Period	

INVARIANTS

Name	Description

CLASS AGENTINVOLVEMENTINAGENT

This class allows the association between two Agents (or one of their sub-classes: person, organization). It is not mandatory to associate an Agent with another Agent but one Agent can be associated to multiple other Agents. The association further describes the role of the Agent in relation to the other Agent. Crew members have also a special relationship with the Organization inside the vessel company which is described by attribute Duty. This attribute carries information about the responsibilities and position of the person in the vessel. The duration of the relationship between the Agents is described by an association with class Period.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
AgentRole	AgentRoleInAgent			
Duty TBC	DutyType			

ASSOCIATIONS

Name	With	Description
involvedDuring	Period	

INVARIANTS

Name	Description

CLASS AGENTINVOLVEMENTINRISK

This class allows the association between Agent (or one of its sub-classes) and Risk. It is not mandatory to associate an Agent with a Risk but one Agent can be associated to multiple different Risks. The association further describes the role of the Agent in relation to the Risk.

ATTRIBUTES

(cf comment made in « Risks » on the risk reduction rôle missing)

Name	Data type	Description	Mandatory	Example
AgentRole	AgentRoleInRisk	Enumerated. Describes the relationship between Agent and Risk.	No	e.g. person who is the cause of the risk: <AgentRole>01</AgentRole>

ASSOCIATIONS

Name	With	Description

INVARIANTS

Name	Description

Enumeration AgentRoleInEvent

This enumeration presents the possible roles that an Agent can have in relation to Event.

Enumeration AgentRoleInObject

This enumeration presents the relationship between Agent and Object.

Enumeration AgentRoleInLocation


This enumeration presents the relationship between Agent and Location.

Enumeration AgentRoleInAgent

This enumeration presents the relationship between two Agents.

Enumeration AgentRoleInRisk

This enumeration presents the role of Agent in relation to Risk.

Literal (value) name	Description
01 Cause	Agent is the cause of the risk
02 Involved	Agent is somehow involved in the risk
03 Reports	Agent is reportin of the risk
To create if OK	Agent is preventing, mitigating and/or reducing the risk 
98 Other	Any other relation not mentioned above
99 Non-specified	Relation not specified

Enumeration DutyType (TBD)

This enumeration presents the role of Agent in relation to Risk.

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

1.2 CLASS DOCUMENT

The Document is one of the fundamental entities of the overall data model of the information sharing environment. A Document allows tracing and exchanging information in a persistent manner in almost any possible electronic format; this information is expected to provide details on and express specific associations between other Entity Classes such as Agents, Objects, Events, Risks, Locations etc.



ATTRIBUTES

Name	Data type	Description	Mandatory	Example
DC::Elements.Title	String			
DC::Terms.Subject	String			
Version	String			
content	base64			
hash	hex			
ReferenceURI	String			

ASSOCIATIONS

Name	With	Description
refersTo	Location	
accompaniedBy	Metadata	

INVARIANTS

Name	Description

CLASS VESSELDOCUMENT

This sub-class allows the identification and exchange of Vessel related documents and material in electronic format.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
DocumentType	VesselDocumentType			

ASSOCIATIONS

Name	With	Description

INVARIANTS

Name	Description

CLASS EVENTDOCUMENT

This sub-class allows the identification and exchange of Event related documents and material in electronic format.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
DocumentType	EventDocumentType			

ASSOCIATIONS

Name	With	Description

INVARIANTS

Name	Description

CLASS ORGANIZATIONDOCUMENT

This sub-class allows the identification and exchange of Organization related documents and material in electronic format.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
DocumentType	OrganizationDocumentType			

ASSOCIATIONS

Name	With	Description

INVARIANTS

Name	Description

CLASS PERSONDOCUMENT

This sub-class allows the identification and exchange of Person related documents and material in electronic format.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
DocumentType	PersonDocumentType			

ASSOCIATIONS

Name	With	Description

INVARIANTS

Name	Description

CLASS CARGODOCUMENT

This sub-class allows the identification and exchange of Cargo related documents and material in electronic format.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
DocumentType	CargoDocumentType			

ASSOCIATIONS

Name	With	Description

INVARIANTS

Name	Description

CLASS LOCATIONDOCUMENT

This sub-class allows the identification and exchange of Location related documents and material in electronic format.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
DocumentType	LocationDocumentType			

ASSOCIATIONS

Name	With	Description

INVARIANTS

Name	Description

CLASS RISKDOCUMENT

This sub-class allows the identification and exchange of Risk related documents and material in electronic format.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
DocumentType	RiskDocumentType			

ASSOCIATIONS

Name	With	Description

INVARIANTS

Name	Description

Enumeration VesselDocumentType

This enumeration presents the possible types of electronic material that can be related to individual vessels.

Enumeration EventDocumentType

This enumeration presents the possible types of documents related to different events (movements, actions, anomalies, incidents).

Enumeration OrganizationDocumentType

This enumeration presents the possible types of documents that can be related to organizations.

Enumeration PersonDocumentType

This enumeration presents the possible types of documents that can be related to individual persons.

Enumeration CargoDocumentType

This enumeration presents the possible types of documents related to cargo.

Enumeration LocationDocumentType

This enumeration presents the possible types of documents related to a location.

Enumeration RiskDocumentType

This enumeration presents the possible types of documents related to risks.

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

1.3 CLASS EVENT

The Event is one of the core entities of the overall data model of the information sharing environment. It is an entity which holds information about **the occurrence of anything worth being reported in any type of general or Community-specific Maritime Situational Report such as** movements, anomalies, incidents or actions which occur in the maritime domain. Event can have relationships with other events, objects, agents, documents, periods and locations. Event can also be related to risks in different roles. Event is an abstract entity which has four sub-entities: Movement, Anomaly, Incident and Action.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Metadata	COOPP::Metadata			
NatureType	COOPP::NatureType			

ASSOCIATIONS

Name	With	Description
EventInvolvementInEvent	Event	
AgentInvolvementInEvent	Agent	
ObjectInvolvementInEvent	Object	
LocationInvolvementInEvent	Location	
describedBy	Document	
occursDuring	Period	
implies	Risk	

CLASS EVENTINVOLVEMENTINEVENT

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
EventRole	EventRoleInEvent			

ASSOCIATIONS

Name	With	Description
involvedDuring	Period	Defines the duration of the relationship between two Events

CLASS AGENTINVOLVEMENTINEVENT

Please see Agent CORE Vocabulary Specification.

CLASS OBJECTINVOLVEMENTINEVENT

This class allows the association between Object (or one of its sub-classes: vehicle, cargo) and Event (or one of its sub-classes: Movement, Anomaly, Incident, Action). It is not

mandatory to associate an Object with an Event but one Object can be associated to multiple different Events. The association further describes the role of the Object in relation to the Event.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
ObjectRole	ObjectRoleInEvent			

ASSOCIATIONS

Name	With	Description
involvedDuring	Period	

CLASS LOCATIONINVOLVEMENTINEVENT

This class allows the association between Location and Event (or one of its sub-classes: Movement, Anomaly, Incident and Action). It is not mandatory to associate a Location with an Event but one Location can be associated to multiple different Events. The association further describes the role of the Location in relation to the Event.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
LocationRole	LocationRoleInEvent			
DateTime	XSD::DateTime			
EventArea	EventAreaType			

Enumeration NatureType

This enumeration presents the different natures of an Event.

Enumeration EventRoleInEvent

This enumeration presents the role an Event can have in respect to another Event.

Enumeration ObjectRoleInEvent

This enumeration presents the possible roles that an Object can have in relation to an Event.

Enumeration LocationRoleInEvent

This enumeration presents the possible roles that a Location can have in relation to an Event.

Enumeration EventAreaType

In order to define the possible types a Location can have when in relation to an Event; we suggest reusing the work already done during the “tactical situation object” project. Among many artifacts, a list of area type has been defined.

During the scope of the Cooperation project, we chose to limit the enumeration list to the first level defined by the tactical situation object project. Sub-levels are also defined and their adoption could be considered in future developments of the data model (see “Disaster and emergency management - Shared situation awareness - Part 2: Codes for the message structure.”).

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

1.4 CLASS LOCATION

Locations can be described in three principal ways: by using a place name, geometry or an address. The specific context will determine which method of describing a location is most appropriate. ISO 19112 defines a location as "an identifiable geographic place". With this in mind, "Eiffel Tower", "Madrid" and "California" are all locations and this is a common way of representing locations in public sector data, i.e. simply by using a recognized name. Such identifiers are common although they can be highly ambiguous as many places share the same or similar names. These examples also reveal that a Location can reduce almost to a geo-referenced point (e.g. Lat/Longitude), or present a significant extent and include for example all points within a geo-referenced polygon (such as the boundaries of a Port, an EEZ etc.).

In addition to a simple (string) label or name for a Location, the identifier property allows defining a Location by a Uniform Resource Identifier (URI), such as a GeoNames or DBpedia URI.

No cardinality constraints are placed on any property of the Location class so as to maximize flexibility.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
GeographicName	ISA::CORE::Location.GeographicName: String			
GeographicIdentifier	ISA::CORE::Location.GeographicIdentifier: IETF::RFC3986::URI			
LocationCode	UN::LOCODE			
LocationType	Locationtype			
OperationalPurpose	OperationalPurposeType			
LocationQualitativeAccuracy	LocationQualitativeAccuracy			

ASSOCIATIONS

Name	With	Description
Prevails	MeteoOceanographicCondition	

INVARIANTS

Name	Description

CLASS METEOOCEANOGRAPHICCONDITION

This class allows the description of the meteorological oceanographic condition of a given Location.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Type	MetocType			
SSN::POLINF::WindDirection	double			
SSN::POLINF::WindSpeed	double			
SSN::POLINF::TideDirection	double			
SSN::POLINF::TideSpeed	double			
WaveDirection	double			
SSN::POLINF::WaveHeight	double			
SSN::POLINF::Visibility	double			
WeatherCondition [0..*]	WeatherCondition Type			
AirTemperature	double			
WasteTemperature	double			

ASSOCIATIONS

Name	With	Description

INVARIANTS

Name	Description

Enumeration LocationType

Enumeration OperationalPurposeType

Enumeration LocationQualitativeAccuracy

Enumeration metocType

Enumeration WeatherConditionType

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

1.5 CLASS OBJECT straightforward, nothing to add

The Object is one of the core entities of the overall data model of the information sharing environment. It is an entity which holds information about physical entities from the maritime domain like vehicles (vessels, aircrafts and land vehicles) and cargo packages.

Object has relationships with other classes Event, Agent, Document, Risk and Location. Furthermore Object can also be associated with other Object classes. The Object entity has two sub-entities: Vehicle and CargoPackage.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Metadata	COOPP::Metadata			
Nationality	ISO3166-1 ALPHA3::CountryCode			
Color	Array of String			
ExternalMarkings	FLUX::ACDR::ExternalMarkings (String)			
Name	NSW::Vessel::Name (String)			

ASSOCIATIONS

Name	With	Description
ObjectInvolvementInLocation	Location	
AgentInvolvementInObject	Agent	
involves	Risk	
refersTo	Document	
Involves	Event	
Contains	Object	

Enumeration PlacementProcessType

This enumeration defines how the placement of an object to a location has been determined. The location of an object can be observed, declared, estimated or simulated.

Enumeration PlacementPurposeType

This enumeration describes the reason of placement of an object to a location. An object can be at a location because it is in transit. A vessel (i.e. an object) can also be assigned to a location.

Enumeration SensorType

This enumeration presents the Sensor at the origin of an association between an Object and a Location.

Enumeration PlannedWorksType

This enumeration presents the possible planned works which can explain that an Object is at a Location.

Enumeration PlannedOperationsType

This enumeration presents the possible planned operations for which an Object is at a Location.

CLASS OBJECTINVOLVEMENTINLOCATION

This class allows the association between Object (or one of its sub-classes: Vehicle, CargoPackage) and Location. It is not mandatory to associate an Object with a Location but one or many Object can be associated to a Location through this class. The association further describes the role of the Object in relation to the Location and other useful data.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Metadata	COOPP::Metadata			
PeriodOfTime	Period			
Process	PlacementProcessType			
SensorType	SensorType			
Heading	ITU-R M::DirectionOfMovement			
Speed	Double			
COG	ITU-R M::DirectionOfMovement			
SOG	Double			
Purpose	PlacementPurposeType			
PlannedOperation	Array of PlannedOperationsType			
PlannedWorks	Array of PlannedWorksType			
SpecialSecurityMeasures	String			

CLASS AGENTINVOLVEMENTINOBJECT

Please see Agent CORE Vocabulary Specification (Relevant text copied hereafter to facilitate the reading)

This class allows the association between Agent (or one of its sub-classes: Person, Organization) and Object (or one of its sub-classes: Vehicle (Vessel, Aircraft, LandVehicle), CargoPackage). It is not mandatory to associate an Agent with an Object but one Agent can be associated to multiple different Objects. The association further describes the role of the Agent in relation to the Object. The special relationship between Passengers and Craft is described by Boolean type attribute TransitPassenger which carries information about the status of the passenger (Transit passenger or not) and by two associations with class Location. Crew members have also a special relationship to Craft which is described by attribute Duty. This attribute carries information about the responsibilities and position of the person in the vessel. The duration of the relationship between the Agent and the Object is described by an association with class Period.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
AgentRole	AgentRoleInObject			
NSW:: Passengers:: TransitPassenger	Boolean			
Duty	DutyType			
AgentRole	AgentRoleInEvent			

ASSOCIATIONS

Name	With	Description
PortOfEmbarkation	Location	
PortOfDisembarkation	Location	
involvedDuring	Period	

CLASS VEHICLE

The Vehicle class is a sub-class of Object and is used to determine types of physical moving objects related to maritime.

The class Vehicle inherits the attributes and relationships of its super-class Object.

Vehicle has three sub-classes: Vessel, Aircraft and LandVehicle.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
TotalPersonsOnBoard	int			
MaximumSpeed	Double			
Cargo	Cargo			

ASSOCIATIONS

Name	With	Description
correspondsTo	OperationalAsset	

CLASS CARGOPACKAGE

Please see Cargo CORE Vocabulary Specification for a definition of the CargoPackage class.

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

1.6 CLASS PERIOD straightforward, nothing to add

The class Period is used to define a time interval which can be expressed by:

- only a duration (i.e. one month),
- a duration and a start (resp. end) date [ex.: a period of ten days starting (resp. ending) on December 10th, 2002], in this case the period is assumed to start (resp. end) on December 10th at 0:00 (resp. 23:59).
- a duration and a start (resp. end) time [ex.: a period of ten days starting (resp. ending) at 10am],
- a duration and start (resp. end) date and time (ex.: a period of ten days starting (resp. ending) on December 10th, 2002, 10am),
- a start Date and an end Date (ex.: December 3rd, 2002 & January 24th 2010),
- a start Time and an end Time (ex.: 9am and 10pm),
- a start date and start time following by an end date and end time (ex.: December 3rd, 2002 at 10pm and January 24th, 2010 at 9am).

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
StartDate	XSD:Date			
StartTime	XSD:Time			
EndDate	XSD:Date			
EndTime	XSD:Time			
Duration	XSD:Duration			

ASSOCIATIONS

See the Core Vocabulary Specification for class Period.

Name	With	Description

INVARIANTS

See the Core Vocabulary Specification for class Period.

Name	Description
Earlier EndDate	
Earlier EndTime	
Coherent Duration	

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

1.7 CLASS RISK

The class Risk is used to represent a more or less probable situation involving exposure to danger concerning the maritime domain. The notion of risk is usually very subjective and, in a first step, we decided to keep the definition of the class simple in order to ease its adoption.

Further work could be used to detail the risk definition and introduce metrics regarding probability and severity.



ATTRIBUTES

Name	Data type	Description	Mandatory	Example
RiskType	RiskType			
Level	RiskLevel			
Probability	RiskProbability			
Severity	RiskSeverity			

ASSOCIATIONS

Name	With	Description
LocateAt	Location	
describedBy	Document	
describedBy	Metadata	
occursDuring	Period	
Involves	Object	
Implies	Event	
AgentinvolvementinRisk	Agent	

INVARIANTS

Name	Description
Coherent Level	

Enumeration RISKTYPE

This enumeration presents the possible types of Risks.

Enumeration RISKPROBABILITY

This enumeration presents the possible probabilities of a risk.

Literal (value) name	Description
01 Frequent	The risk occurs frequently
02 Probable	The risk is probable
03 Occasional	The risk could occur on some occasions
04 Rare	The occurrence of the risk is rare

05 Improbable	The risk is improbable
98 Other	Risk Probability not included above
99 Non-specified	Risk Probability non-specified

In future activities, metrics should be added to each probability in order to foster semantic interoperability.

Enumeration RISKSEVERITY

This enumeration presents the different severities which can be assigned to a risk.

Literal (value) name	Description
01 Catastrophic	A major catastrophic event is the consequence of the risk (death of people, major pollution...)
02 Critical	The occurrence of the risk leads to major consequences affecting maritime activities (maritime traffic blocked...)
03 Marginal	The risk's consequences are marginal. The risk as no impact on maritime activities, people or cargo.
04 Negligible	The risk's consequences are negligible.
98 Other	Risk severity not included above
99 Non-specified	Risk severity non-specified

In future activities, metrics should be added to each severity in order to foster semantic interoperability.

Enumeration RISKLEVEL

The risk level is defined regarding the impact of the risk's occurrence. It is a combination of the two previous data: risk probability and risk severity.

A risk which occurs frequently and has a critical severity will have a high risk level. Respectively, a low probability risk with negligible severity will have a low risk level.

This enumeration presents the possible risk levels.

CLASS AGENTINVOLVEMENTINRISK

This class allows the association between Agent (or one of its sub-classes) and Risk. It is not mandatory to associate an Agent with a Risk but one or many Agent can be associated to multiple different Risks. The association further describes the role of the Agent in relation to the Risk.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
AgentRole	AgentRoleInRisk			

ASSOCIATIONS


Name	With	Description

INVARIANTS

Name	Description

Enumeration AgentRoleInRisk

This enumeration presents the role of Agent in relation to Risk.

Literal (value) name	Description
01 Cause	Agent is the cause of the risk
02 Involved	Agent is somehow involved in the risk
03 Reports	Agent is reporting of the risk
To create if OK	Agent is preventing, mitigating and/or reducing the risk 
98 Other	Any other relation not mentioned above
99 Non-specified	Relation not specified

RDF AND XML SCHEMAS

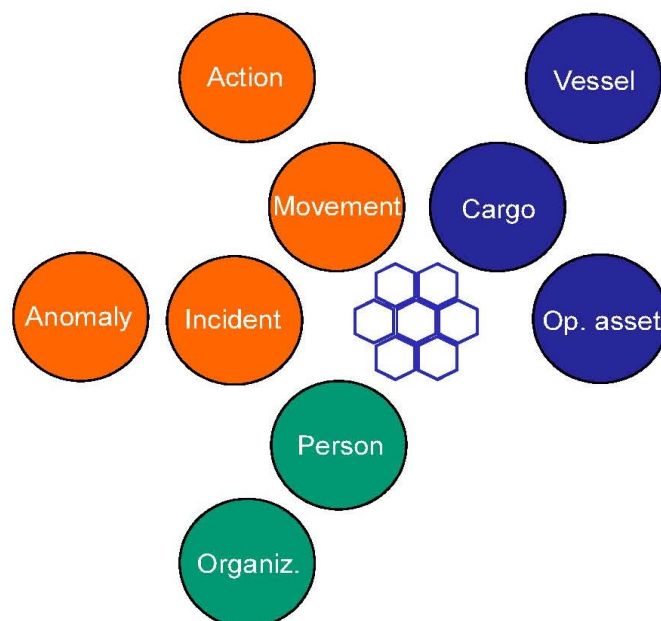
The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

2. Review of the other Core Data Entities

The 9 Main Maritime Data Entities retained at this stage are following:

Action
Anomaly
Cargo
Incident
Movement
Operational asset
Organization
Person
Vessel

Because these Data Entities are less abstract, they generally present a lower number of transverse associations to other Data Entities; and because they correspond to widely used data across maritime User Communities, most of them have already internationally recognized Enumerations (e.g. from Eurosur), not subject to discussion (as a consequence, detailed enumerations are not reproduced hereafter); still, the disparity of pre-existing Data Models, often incomplete, makes the WP5 Data Models and Semantic an essential contribution for the future development of CISE.



2.1 CLASS ACTION

It is a subclass of Event enclosing any formal process engaged by Maritime Authorities and surrogated actors to modify the course of an Event, and restore safety and security and/or contain the development of adverse effects. The Action entity may be linked to Incident, Anomaly and can also be expressed taking into account other entities as location, object, etc.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Type	ActionType			
Status	ActionStatus			
Mission	MissionType			
Priority	ActionPriority			

ASSOCIATIONS

See the Core Vocabulary Specification for class Event.

Name	With	Description

INVARIANTS

See the Core Vocabulary Specification for class Event.

Name	Description

Enumeration ACTIONTYPE

This enumeration presents the possible types of Actions.

Enumeration ACTIONSTATUS

In order to define the statuses associated to an action, we suggest reusing the work already done during the “tactical situation object” project. Among many artifacts, a list of action statuses has been defined.

This enumeration presents the possible statuses of an Action.

Enumeration MISSIONTYPE

In order to define the type of mission associated to an action. We suggest reusing the work already done during the “tactical situation object” project. Among many artifacts, a list of mission type has been defined.

During the scope of the Cooperation project, we chose to limit the enumeration list to the first level defined by the tactical situation object project. Sub-levels are also defined and their adoption could be considered in future developments of the data model (see “Disaster and

emergency management - Shared situation awareness - Part 2: Codes for the message structure.”).

Enumeration ACTIONPRIORITY

This enumeration presents the different priorities which can be assigned to an Action.

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

2.2 CLASS ANOMALY

The class Anomaly is a sub-class of the class Event. An anomaly is used to characterize a particular property of an ~~unusual~~ event considered as unusual for such type of event, which attracts observer's attention, appears possibly related to some risk, and deserves to be noted, reported and/or further investigated.



Anomaly has the same associations and relationships than its parent-class Event. Thus it can have relationship with Document, Risk, Event, Object, Period, Location, and Agent.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Type	AnomalyType			



As for Incident, a commonly agreed grading of **AnomalySeverity** could be introduced in the future (e.g. minor, notable, major).

ASSOCIATIONS

See the Core Vocabulary Specification for the Event class.

INVARIANTS

See the Core Vocabulary Specification for the Event class.

Enumeration AnomalyType

This enumeration presents the different types of anomalies. Many more types might be added by the various user communities at the various stages of sCISE deployment.

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

2.3 CLASS CARGO

The class Cargo is a sub-class of the class Object. A Cargo refers to a set of goods transported by a ship between two ports. Cargo is an abstract entity which has two sub-entities: CargoUnit and Catch, noting that Cargo is generally invariant from Port departure to next Port arrival while catch accrued from fishing activities during the ship voyage.



Cargo has the same associations and relationships than its parent-class Object. Thus it can have relationship with Document, Risk, Event, Location, and Agent.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
CargoType	COOPP::CargoType			
NatureType	COOPP::NatureType			

ASSOCIATIONS

Name	With	Description
Contains	CargoUnit	
Contains	Catch	

INVARIANTS

There must be at least one CargoUnit or, alternatively, one type of Catch to have a Cargo.

Enumeration CargoType

This enumeration presents the possible types of cargo (from UN-ECE-Recomendation 21, annex 2)

CLASS CATCH

The class Catch is a sub-class of the class Cargo. A Catch refers to a set of distinct species catch in the sea/ocean by a fishing vessel.

Catch has the same associations and relationships than its parent-class Object. Thus it can have relationship with Document, Risk, Event, Location, and Agent.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
UID	COOPP::UniqueIdentifier			
FLUX::ACDR::Species	ERS::SpeciesType			
ERS::CatchWeight	Double[0..1]			
ERS::FishNumber	Int[0..1]			
ERS::TotalWeight	Double[0..1]			

ERS::TotalNumber	Int[0..1]			
ERS::QuantityHeld	Double[0..1]			
ERS::NetHeld	Double[0..1]			
ERS::WeightMeans	Double[0..1]			
ERS::SizeDeclaration	Double[0..1]			

ASSOCIATIONS

Name	With	Description
ContainedCatch	Cargo	

Enumeration ERS:SpeciesType

This enumeration presents the possible types of species...

Enumeration Fishing Category

This enumeration presents the possible categories of fishing...

Enumeration FAO Area Code

This enumeration presents the codes of the FAO area...

CLASS CARGOUNIT

The class CargoUnit is a sub-class of the class Cargo. It is an entity which holds information about units of goods when transported by ships.

CargoUnit has the same associations and relationships than its parent-class Cargo. Thus it can have the same relationship as an Object namely with Document, Risk, Event, Location, and Agent.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
UID	COOPP::UniqueIdentifier			
PackageType	UN-ECE-RECOM21::PackageType			
PackagingMaterial	UN-ECE-RECOM21::PackagingMaterial[0..1]			
NSW::DPG::GrossQuantity	Double [0..1]			
UN-ECE-RECOM20::UnitsOfMeasure	UnitsOfMeasure[0..1]			
DangerousSubstancesCode	DangerousSubstancesType[0..1]			
SSN::CargoInformation::LocationOnBoardGoods	String [0..1]			
SSN::CargoInformation::LocationOnBoardContainer	String [0..1]			
NSW::DPG::ContactDetails	Agent [0..1]			
NSW::DPG::PortOfLoading	Location [0..1]			
NSW::DPG::PortOfDischarge	Location [0..1]			

NSW::ContainerMarksAndNumber	String [0..1]			
NSW::OtherMarksAndNumber	String [0..1]			
NSW::UNDG	UNDG [0..1]			
NSW::DPG::FlashPoint	Double [0..1]			
NSW::IMDG::PackingGroupCode	PackingGroupCode [0..1]			
NSW::DPG::MARPOL::PollutionCode	MARPOL::PollutionCode [0..1]			
NSW::DPG::NetQuantity	Double [0..1]			
CommunityStatusOfGoods	CommunityStatusType			

ASSOCIATIONS

Name	With	Description
isContainedBy	Cargo	Each CargoUnit is part of a Cargo
Contains	CargoUnit	A CargoUnit can contain other CargoUnits

Enumeration PackageType

This enumeration presents the possible types of package used in CargoUnits.

Enumeration PackagingMaterialType

This enumeration presents the possible types of packaging material used in CargoUnits.

Enumeration UnitsOfMeasure

This enumeration presents the considered units of measure for CargoUnits, according to the United Nations codes for units of measure used in international trade.

Enumeration DangerousSubstancesType

This enumeration presents the general categories of Hazardous cargo, according to the International Maritime Dangerous Goods (IMDG) code. For additional information about IBC, IGC and INF (IBC - Intermediate Bulk Container, IGC - International Gas Carrier and INF - Irradiated Nuclear Fuel) contact the International Maritime Organization (IMO).

Enumeration Agent::AgentRoleInObjectType

This enumeration defines the role of the agent, depending on the object type.

Enumeration Location::PlacementPurposeType

This enumeration defines the purpose of a place where an object is/will be/was located.

Enumeration UNDG

This enumeration defines United Nations Dangerous Goods list...

Enumeration PackingGroupCode

This enumeration defines the danger code, according to the level of danger from the IMDG (International Maritime Dangerous Goods).

Enumeration MARPOL::PollutionCode

This enumeration defines the pollution code, according to the MARPOL.

Enumeration CommunityStatusType

This enumeration reflects the different customs status of cargo units on board a ship.

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

2.4 CLASS INCIDENT

The class Incident is a sub-class of the abstract class Event. ~~An incident refers to a particular happening, sometimes criminal but always noteworthy~~ is an adverse event (accidental = safety issue or intentional / criminal = security issues) having occurred with negative consequences at any level of severity on goods, persons and/or maritime environment.

Incident can have the same associations and relationships than the parent-class Event. Thus it can have relationship with other agents, objects, documents and locations or it can be related to risks. An incident can also be associated with other(s) incident(s) (an incident can cause others for example).

Incident has four sub-classes: MaritimeSafetyIncident, IrregularMigrationIncident, LawInfringementIncident and CrisisIncident.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Metadata	COOPP::Metadata			
NatureType	COOPP::NatureType			
Severity	OASIS-CAP::SeverityType			
Certainty	OASIS-CAP::CertaintyType			
ResponseUrgency	OASIS-CAP::UrgencyType			
ResponseType	ResponseType			
Instructions	String			
DeathsOnBoard	Int			
DiseasesOnBoard	Boolean			
InfectionOnBoard	Boolean			
NumberOfIllPersons	Int			
SickAnimalOnBoard	Boolean			

ASSOCIATIONS

See the Core Vocabulary Specification for class Event.

INVARIANTS

See the Core Vocabulary Specification for class Event.

Enumeration SeverityType

This enumeration presents the severity of an incident as defined by the OASIS common alerting protocol.

Enumeration CertaintyType

This enumeration presents the certainty of an incident as defined by the OASIS common alerting protocol.

Enumeration UrgencyType

This enumeration presents the urgency of an incident response as defined by the OASIS common alerting protocol.

Enumeration ResponseType

This enumeration presents the incident's response types as defined by the OASIS common alerting protocol.

Note: <instruction> denotes the “instructions” attribute of the Incident class.

CLASS MARITIMESAFETYINCIDENT

The MaritimeSafetyIncident class is a sub-class of Incident and is used to determine types of incidents related to maritime safety as defined by the SafeSeaNet project.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Type	MaritimeSafetyIncidentType			

Enumeration MaritimeSafetyIncidentType

This enumeration presents the maritime safety incident types, mainly from SafeSeaNet.

CLASS IRREGULARMIGRATIONINCIDENT

The IrregularMigrationIncident class is a sub-class of Incident and is used to determine types of incidents related to irregular migration as defined by the EUROSUR project.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Type	IrregularMigrationIncidentType			

Enumeration IrregularMigrationIncidentType

This enumeration presents the irregular migration incident types, from EUROSUR.

CLASS LAWINFRINGEMENTINCIDENT

The LawInfringementIncident class is a sub-class of Incident and is used to determine types of incidents related to law infringement as defined by the EUROSUR project

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Type	LawInfringementIncidentType			

Enumeration LawInfringementIncidentType

This enumeration presents the law infringement incident types, mainly from EUROSUR.

CLASS CRISISINCIDENT

The CrisisIncident class is a sub-class of Incident and is used to determine types of incidents related to crisis situations as defined by the EUROSUR project

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Type	CrisisIncidentType	The type of crisis incident	Yes	“10” for a Natural disaster - Lightning strike

Enumeration CrisisIncidentType

This enumeration presents the incident types related to crisis situations.

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

2.5 CLASS MOVEMENT



It is a subclass of event. The Movement entity is linked to Voyage. Movement can be actual (e.g. current position, heading and speed), historical data or planned in the future and can also be expressed taking into account other entities as location, object, etc.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Type	MovementType			
Purpose	string			
NSW::Voyage::VoyageNumber	string			

ASSOCIATIONS

See the Core Vocabulary Specification for class Event.

Name	With	Description

INVARIANTS

See the Core Vocabulary Specification for class Event.

Name	Description

Enumeration MovementType

This enumeration presents the possible types of processes used to perform the objects correlation.

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

2.6 CLASS OPERATIONALASSET

An Operational Asset is an Object (in particular means of observation or transportation, but also including associated sensors, means of communication and means of intervention such as deterrence or neutralization of threats, fire fighting, pollution containment etc.) enabling operational Actions (most often at sea or on sea shores) of the Agents mandated by public Organizations in charge of Maritime Safety and Security.



ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Metadata	COOPP::Metadata			
AvailabilityPeriod	COOPP::Period			
ReadinessState	XSD::Time			
Capability	OperationalCapability			
Maxspeed	double			
Range	double			
MaxPassengers	int			
OperationalAssetType	OperationalAssetType			

ASSOCIATIONS

Name	With	Description
CorrespondsTo: Vehicle	Object::Vehicle	OperationalAsset is referred to a an Object, which is a vehicle

INVARIANTS

Name	Description

Enumeration OperationalCapability

This enumeration presents the possible types of operational capabilities.

Enumeration OperationalAssetType

This enumeration presents the possible types of operational assets.

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

2.7 CLASS ORGANIZATION

The class Organization is a sub-class of an abstract class Agent. Organization represents a structured and legally recognized association of humans and material resources for some common purpose or reason for existence which goes beyond the set of people belonging to it. An organization may itself be involved as actor or target in the various events and activities. Organization can have the same associations and relationships than the parent-class Agent. Thus it can have relationship with other agents, objects and locations or it can be related to risks in different roles. Organization has four sub-classes: OrganizationalUnit, PortOrganization, FormalOrganization and OrganizationalCollaboration.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
W3C::Organization.Purpose	OrganizationPurposeType			
W3C::Organization.Classification	OrganizationClassificationType			
SSN::OrganizationRole	OrganizationRoleType			
LegalName	String			
AlternativeName	String			
IdentificationNumber	String			

ASSOCIATIONS

See the Core Vocabulary Specification for class Agent.

Name	With	Description

INVARIANTS

See the Core Vocabulary Specification for class Agent.

Name	Description

CLASS ORGANIZATIONALUNIT

In some cases it is useful to refer to departments or organizational units such as the IT department which only have meaning within the context of the containing organization and would not be regarded as a legal entity in its own right. This situation is supported by a subclass of Organization called OrganizationalUnit.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
UnitIdentifier	String			

ASSOCIATIONS

See the Core Vocabulary Specification for class Agent.

Name	With	Description

INVARIANTS

See the Core Vocabulary Specification for class Agent.

Name	Description

CLASS PORTORGANIZATION

A particular sub-class of organization has been defined to be used when modelling IMO recognized ports. PortOrganization carries some additional attributes that carry information relevant only to ports.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
NSW::Port.PortFacility	string			
NSW::Vessel.IMOCompanyIdentificationNumber	string			
NSW::Voyage::PortSecurityLevel	ISPSS::PortSecurityLevel			

ASSOCIATIONS

See the Core Vocabulary Specification for class Agent.

Name	With	Description

INVARIANTS

See the Core Vocabulary Specification for class Agent.

Name	Description

CLASS FORMALORGANIZATION (TBC)

A particular sub-class of organization FormalOrganization can be used to indicate organizations that are recognized in the world at large, in particular in legal jurisdictions, with associated rights and responsibilities. Examples include a corporation, charity, government or church.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
FormalOrganizationName	string			

ASSOCIATIONS

See the Core Vocabulary Specification for class Agent.

Name	With	Description

INVARIANTS

See the Core Vocabulary Specification for class Agent.

Name	Description

CLASS ORGANIZATIONALCOLLABORATION

The sub-class OrganizationalCollaboration is defined to describe a collaboration between two or more Organizations such as a project. OrganizationalCollaboration meets the criteria for being an Organization in that it has an identity and defined purpose independent of its particular members but is neither a formally recognized legal entity nor a sub-unit within some larger organization. Might typically have a shorter lifetime than the Organizations within it, but not necessarily.

ATTRIBUTES

The OrganizationalCollaboration has only the same attributes than the parent class Organization.

Name	Data type	Description	Mandatory	Example

ASSOCIATIONS

The class OrganizationalCollaboration has one own association (described bellow) in addition to the associations inherited from class Agent (See the Core Vocabulary Specification for class Agent). OrganizationalCollaboration has to be associated at least to two Organizations by association "linkedTo" but there is no upper limit for the number of organizations associated to collaboration.

Name	With	Description
linkedTo	Organization	I

INVARIANTS

See the Core Vocabulary Specification for class Agent.

Name	Description

Enumeration OrganizationPurposeType

This enumeration presents the general purpose of the organization.

Enumeration OrganizationClassificationType

This enumeration presents the formal classification (status) of organization.

Enumeration OrganizationRoleType

This enumeration presents the role of organization as described by different roles defined in SafeSeaNet system.

Enumeration ISPSS::PortSecurityLevel

This enumeration presents the possible values for the security level of the port.

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

2.8 CLASS PERSON

The Person Class is a sub class of the more general 'Agent' class that encompasses organisations, legal entities, groups etc. - any entity that is able to carry out actions. **Person** has the common meaning of a human individual (Mr X), designated as such and not just from an organizational role (Master of Vessel Y).



The data type properties of the Person class do not have any cardinality restrictions and as such all are optional. However, guidance is provided for the usage of each property in the following sections..

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
ISA::CORE::Person:FullName	String			
ISA::CORE::Person:FamilyName	String			
ISA::CORE::Person:GivenName	String			
ISA::CORE::Person:PatronymicName	String			
ISA::CORE::Person:AlternativeName	String			
ISA::CORE::Person:Gender	GenderType			
ISA::CORE::Person:BirthName	String			
ISA::CORE::Person:BirthDate:	XSD::Date			
ISA::CORE::Person:DateOfDeath	XSD::DateTime			

ASSOCIATIONS

Name	With	Description
Identifiedby	PersonIdentifier	

INVARIANTS

Name	Description

CLASS PERSONIDENTIFIER

The PersonIdentifier class allows the identification of the Person by means of a document of given type and related id number, according to the different countries policy.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
IdentifierType	IdentificationType			
IdentifierValue	String			

ASSOCIATIONS

Name	With	Description

INVARIANTS

Name	Description

Enumeration GenderType

Enumeration IdentificationType

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

2.9 CLASS VESSEL

The class Vessel is a sub-class of the class Vehicle. A vessel refers to a ship or a boat.

Vessel has the same associations and relationships than its parent-classes Vehicle and Object. Thus it can have relationship with Document, Risk, Event, Location, and Agent. It can also be associated with OperationalAsset.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
IMONumber	Long			
MMSI	Long			
Callsign	String			
NavigationalStatus	NavigationalStatus			
PortOfRegistry	Location			
RegistryDate	XSD::Date			
RegistryNumber	String			
INMARSATNumber	String			
GrossTonnage	Double			
NetTonnage	Double			
ShipType	VesselType			
LOA	Double			
VesselCompany	Organization			
Breadth	Double			
Depth	Double			
Draught	Double			
Deadweight	Double			
ContainerCapacity	Int			
DesignSpeed	Double			
Builder	Organization			
YearBuilt	Int			
LengthenedPlace	Location			
LengthenedYear	Int			
RegisteredOwner	Organization			
Charterer	Organization			
HullMaterial	HullMaterialType			
Arrangement	String			
SegregatedBallastVolume	Double			
IRNumber_FishingVessel	String			
IsFishing	Boolean			
IsBanned	Boolean			

Length	Double			
Beam	Double			
ShipConfiguration	ShipConfigurationType			
FishingGear	FishingGearType			
UVI	String			
RegionalIdentification	String			
ConditionOfTheCargoAndBallast	ConditionOfTheCargoAndBallastType			
INFShipClass	INFClass			
ISPSecuritylevel	ISPSecurityLevel			
UnderSanitaryMeasure	SanitaryMeasure			

ASSOCIATIONS

See the Core Vocabulary Specifications for classes Vehicle and Object.

INVARIANTS

See the Core Vocabulary Specifications for classes Vehicle and Object.

Enumeration NavigationalStatus

This enumeration presents the different types of navigational statuses in accordance with the inter VTS exchange format.

Enumeration VesselType

This enumeration presents the different types of Vessel. This list is limited to general type of vessel. It could be detailed in further modeling activities.

Enumeration HullMaterialType

This enumeration presents hull material types. This list will need to be enhanced during further modeling activities.

Enumeration ShipConfigurationType

This enumeration presents the list of ship configuration types.

Enumeration FishingGearType

This enumeration presents the list of fishing gears a vessel can be equipped with according to UN FAO rules.

Enumeration ConditionOfHullAndBallastType

This enumeration presents the vessel load's condition.

Enumeration INFClass

This enumeration presents the list of international codes for the Safe Carriage of Packaged

Irradiated Nuclear Fuel, Plutonium and High-Level Radioactive Wastes on Board Ships.

See <http://www.imo.org/OurWork/Safety/Cargoes/Pages/IrradiatedNuclearFuel.aspx> for further details.

Enumeration ISPSecurityLevel

This enumeration presents the three levels of the ISPS code.

See http://www.imo.org/blast/mainframe.asp?topic_id=583&doc_id=2689#code for further details.

Enumeration SanitaryMeasure

This enumeration presents the list of sanitary measure a vessel can be the object of. This list is taken from the National Single Window initiative.

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

3. Review of Meta_Data and Unique_Identifier

These two classes are distinct in essence : « Meta_data » and « Unique_Identifier » are elements of the messaging management component (the « envelope » of the letter to be mailed) while the previous Core Data Entities encode the maritime data itself (the « letter » to be mailed).

The Reviewer suggests to consider « Unique_Identifier » as a sub-class of Meta_Data instead of managing these two Data Entities distinctively.

3.1 CLASS METADATA

The class provides information about the **properties of the** data communicated through the system, **excluding the content of the data**.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
Designation	String			
Creator	String			
CreationDate	XSD: DateTime			
Publisher	String			
PublicationDate	XSD: DateTime			
InformationSensitivity	InformationSensitivityDegree			
InformationSecurityClassification	InformationSecurityClassificationType			
Purpose of access restrictions	Specific usage of data legally allowed/prohibited			
Language	ISO 639-2/T			
DC::Terms::Abstract	String			
DC::Terms::Description	String			
Comments	String			
FileURI	IETF::RFC3986::URI			
FileSchema	IETF::RFC3986::URI			
FileFormat	IETF::RFC2046::Content-Type::MediaType			



ASSOCIATIONS

Name	With	Description
hasValidity	Period	Metadata hasValidity for a specific Period of time

INVARIANTS

Name	Description

Enumeration InformationSensitivityDegree

This enumeration presents the possible values for information sensitivity degree. The Traffic Light Protocol (TLP) of US-CERT is applied (<http://www.us-cert.gov/tlp>).

Enumeration InformationSecurityClassificationType

This enumeration presents the possible values for information security classification. The enumeration is based in the security rules for protecting EU classified information (<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2011:141:0017:0065:EN:PDF>).

Enumeration InformationReliabilityLevel

This enumeration provides a quantitative evaluation of the reliability level of the information that is provided.

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

3.2 CLASS UNIQUE IDENTIFIER

The Unique Identifier is a fundamental entity of the overall data model of the information sharing environment, since it will allow, as its name implies, to **uniquely identify each and every single data object exchanged through the network**. With this identifier it will also be possible for the legacy systems to keep trace of the relationships between their data objects and those from the information sharing environment. It will be possible to understand who and when is publishing each and every data object in the network.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
UUID	IETF::RFC4122::UUID			
GeneratedIn	XSD::DateTime			

ASSOCIATIONS

Name	With	Description
GeneratedBy	Organization	

INVARIANTS

Name	Description
Uniqueness	There is only one object for each UniqueIdentifier

CLASS ISCORRELATEDWITH

This class allows the correlation among the different objects in the information sharing environment. This correlation will allow the identification and “merging” of duplicate objects in the network, thus making the information shared more understandable.

ATTRIBUTES

Name	Data type	Description	Mandatory	Example
CorrelatedIn	XSD::DateTime			
CorrelationType	CorrelationType			

ASSOCIATIONS

Name	With	Description
CorrelatedBy	Organization	Organization which made the correlation

INVARIANTS

Name	Description

Enumeration CorrelationType

This enumeration presents the possible types of processes used to perform the objects correlation.

RDF AND XML SCHEMAS

The production, validation and final review of the RDF and XML schemas is covered by the work of the other Experts and not included here.

End of the Document
