

SafeSeaNet Group meeting no. 21
Agenda item IV
8 May 2014

SSN 21/4/6 (v.1.00)
Lisbon, 8 April 2014

SAFESEANET TECHNICAL ASPECTS

XML enhancements - Ship voyage data distribution

Submitted by EMSA

<i>Executive summary</i>	This document presents the concept and an associated technical proposal for the automatic distribution of ship voyage data using XML.
<i>Action to be taken</i>	As per paragraph 5
<i>Related documents</i>	a. SSN HLSG 6 agenda item 3.5: "Facilitation of XML enhancements" b. SSN HLSG 7 agenda item 3.5 "Enhancement of the SSN XML functionalities" c. SSN HLSG 9 agenda item 3.1 "SSN XML enhancements" d. SSN 15/6/3 SSN proxy pilot project

1. BACKGROUND INFORMATION

SSN, in its present implementation, is a "passive" system enabling Member States to access SSN information, through XML, only "on request"¹. A user is not aware that specific information is in SSN before requesting it. To address this shortfall, the implementation of an automatic XML-based mechanism would allow the proactive forwarding/pushing of information to the Member States' authorised users.

At SSN HLSG 6 (13 December 2011), Ireland submitted a document on the "enhancement of SSN XML functionalities" proposing an automatic XML based mechanism to provide information held in the central SSN to the Member States' own information systems.

The SSN HLSG 9 in 19 June 2012 agreed to continue the work on the technical specifications for the implementation of the voyage "push mechanism" and invited EMSA to report on the progress.

¹ Except for the incident reports

2. CONCEPT FOR THE SHIP VOYAGE DATA AUTOMATIC DISTRIBUTION

The concept paper presented at the SSN HLSG included the following two scenarios:

- Scenario (A): Proactive forwarding to a MS of relevant voyage information upon the receipt at SSN central of a notification concerning a voyage. The data to be “pushed” would contain the Hazmat data provided by the departing port and the ATD from that port.
- Scenario (B): Pushing voyage information to an MS upon ship entry into an area of responsibility defined by the MS (e.g. polygons). The data to be “pushed” in this case would be the full set of information that is available at the moment of entering the area of interest (e.g. the available pre-arrival notifications 72h/24h and Hazmat).

Both scenarios A and B were based on the idea that the full details of the messages will be automatically pushed to the Member States’ authorised users.

Despite the obvious benefits of such a proposal, it presents serious technical limitations to the proper functioning of the system. If such a solution would be implemented it will cause huge data flow which is doubtful if both the central and national systems will be able to cope. Though technically feasible to upgrade the systems to cope with the increased data flow, at this stage EMSA is not at the position to proceed with such a serious upgrade of its systems neither to propose to the Member States to do the same.

To reduce the impact to the central and national SSN systems, EMSA proposes to amend the initial concept and instead of the full details to distribute (“push”) only the information available at central level. An indicative structure of the Ship Voyage Message (SVM) is provided in appendix A. In addition EMSA proposes an additional option which is the distribution of the enriched AIS data streaming via the SSN streaming interface presented as Scenario C.

Considering the above the proposed scenarios are:

2.1 Scenario (A): Voyage data distribution based on the destination port

The SSN NCA administrator will subscribe to the service by selecting one or several destination port(s). When the two conditions described below are met the voyage data will be distributed to the service subscriber:

- SSN central system must receive a notification with a selected port as the next port of call;
- The associated ship has been confirmed as leaving the last port (through an ATD from a PortPlus notification or detected departure using the AIS position).

2.2 Scenario (B): Voyage data distribution based on destination port and geographical area

The SSN NCA administrator will subscribe to the service by selecting the destination port/or ports within Member State (as per Scenario A) and define a geographical area (polygon). To initiate the voyage data distribution service, two criteria must be met:

- SSN Central system must receive a PortPlus notification containing the relevant port as next port of call; and
- The ship enters the “polygon” (e.g. as based on the position information).

2.3 Scenario (B variant): Voyage data distribution based on geographical area

This scenario is similar with Scenario B with the exception that there is no need to select a destination port. The service will be initiated when the ship will enter inside the defined polygon.

2.4 Scenario (C): Voyage data distribution through SSN SI

According to Scenario C, the enriched AIS data streaming through the SSN Streaming Interface (SSN SI) provides an alternative technical solution of the ship voyage data distribution. The SSN SI streamed dataset will include information on the ship, its voyage and specific information (tag) on the availability of the detailed information in SSN central system.

The principle for initiating the service will be identical as for scenarios **A**, **B** and **B variant**. The indicative set of information which will be streamed through the SSN SI is available in the concept paper (Annex, paragraph 4) and the SSN SI interface document (appendix B).

3. IMPACT OF THE PROPOSALS

These services will be implemented by the Member States on a voluntary basis. The technical impact to the Member States national applications is listed below:

- The distribution of ship voyage data through XML requires the implementation of a new XML message (Ship Voyage Message – SVM). This allows the central SSN system to forward the voyage related data to MSs that have been identified as service subscribers (see par. 1 to 3 of the concept paper). The SVM will include information on the ship, voyage and the notifications available in SSN central system which will be provided automatically while the detailed information will remain available upon request. At national level, a dedicated mechanism can be implemented to request the details of the available information upon the receipt of the SVM message.
- The proposed SSN SI solution (see par. 4 of the concept paper) requires technical intervention at national level. For running this service, the software to visualize the received information and the SSN SI software has to be installed.
- Those services subscription require changes in the SSN central system management console to allow the SSN NCA Administrators to set up different services (e.g. "A" or "B" or "B variant" or "C") for different users. The SSN central system will have to process information to be submitted to Member States, and forward the data to those with a need to know.

The development of the options will have no impact to the Member States not participating in the new service (except that they should update the SSN XSD and SSN SI software). The revised concept with more detailed description of the proposed services is presented in Annex.

4. TIME PLAN

EMSA will report the progress on this topic at the next SSN HLSG meeting with a proposal for an implementation plan.

5. ACTION REQUIRED

Member States are invited to validate the concept and provide their feedback.

Annex

SHIP VOYAGE DATA AUTOMATIC DISTRIBUTION CONCEPT

Data distribution scenarios

The data distribution scenarios are described below:

1. Scenario A: Voyage data distribution based on the destination port

The SSN NCA Admin will select through the SSN management console the destination port/or ports (within their Member State) whereby the service will be triggered.

Whenever the SSN central system will receive a notification, for the voyage including as a destination port the one chosen by the MS service subscriber, a Ship Voyage Message (SVM) will be automatically compiled by the central SSN system and sent to the national SSN system of the service subscriber.

The SSN NCA Admin may select through the SSN management console to receive the following information (once it becomes available in SSN central system) as well as any possible updates:

- a. Voyage information from the departure and destination ports (PortPlus notifications):
 - ATD from departure port,
 - ETA to destination port,
 - Pre-arrival 72h, 24h,
 - Hazmat, waste and security information summary,
 - ATA at destination port,
 - detected arrival (SSN central system functionality based on AIS),
- b. Ship information:
 - Single hull tanker,
 - Banned ship,
- c. MRS reports (summary information).
- d. Incident reports (summary information).
- e. Ship positions (the closest position to the time of the SVM transmission).

An indicative structure of the SVM message is provided in appendix A. Updates will be automatically provided by the SSN central system in the form of further SVM messages whenever relevant notifications regarding the ship for that specific voyage have been received. Several services can be set up by the SSN NCA Administrator in parallel for different voyages to destination ports.

The SSN central application will stop sending information to the subscribed users as soon as SSN is informed that:

- the ship has arrived at the port of destination (by an ATA through a PortPlus notification or detected arrival), or
- the port of destination is changed (e.g. by update of the next port in the PortPlus notification or a new PortPlus notification for the current voyage with a different port of call), or
- the service has been cancelled by the service subscriber.

The benefit of this solution is that it can provide all the data that is available in SSN central system for the specific ship voyages, as soon as the ship departs from the port.

2 Scenario B: Voyage data distribution based on the destination port and/or geographical area

The SSN NCA Administrator will select the destination port/or ports within its Member State that will trigger the service (as per Scenario A). Moreover, the SSN NCA Administrator will define a geographical area (polygon). The list and coordinates of all polygons will be made available to all Member States.

To initiate the service, two criteria must be met:

- PortPlus notification containing the relevant port as port of destination shall be received by SSN central system; and
- The ship shall enter the "polygon" (e.g. based on the position information).

Whenever a ship will enter the polygon, a SVM message will be automatically compiled by the central SSN system and sent to the national SSN system of the MS service subscriber. The data to be "pushed" in this case will be the set of information that is available in SSN central system at the moment of entering the area of interest (e.g. the available pre-arrival notifications, Hazmat summary etc.).

Updates will be automatically provided by the central SSN system in the form of further SVM messages whenever relevant notifications regarding the ship for that specific voyage, within the polygon area, have been received.

Updated positions (within the polygon) may be provided by SVM messages in the pre-defined time periods (configurable, max. one per two hours, starting from the first SVM message).

The SSN central application will stop sending information to the subscribed users as soon as SSN is informed that:

- The ship has left the geographical area, or
- The ship has arrived at the port of destination (by an ATA through a PortPlus notification or detected arrival), or
- The port of destination is changed (e.g. by update of the next port in the PortPlus notification or a new PortPlus notification for the current voyage with a different port of call), or
- The service has been cancelled by the service subscriber.

The benefit of this solution is that it can provide all the information (notifications) that is available in SSN central system for the specific ship voyages, as soon as the ship enters and remains in the polygon.

3. Scenario B variant: Voyage data distribution based on geographical area

There might be also a small variation of scenario B whereby the MSs (service subscriber) will not define a destination port but only create the polygon. This polygon must be drawn by SSN NCA Admin within the Member State area of responsibility (SAR, EEZ or equivalent).

The service will start whenever a ship will enter the polygon (e.g. based on the position information) and will stop as soon as SSN is informed that the ship has crossed the "polygon" border and left the geographical area. Several services can be set up by NCA Admin in parallel for different polygons.

The added value of this Scenario "B variant" would be that it can provide all the information that is available in SSN for the specific ship voyage as soon as the ship enters the polygon. The service could be useful for coastal stations.

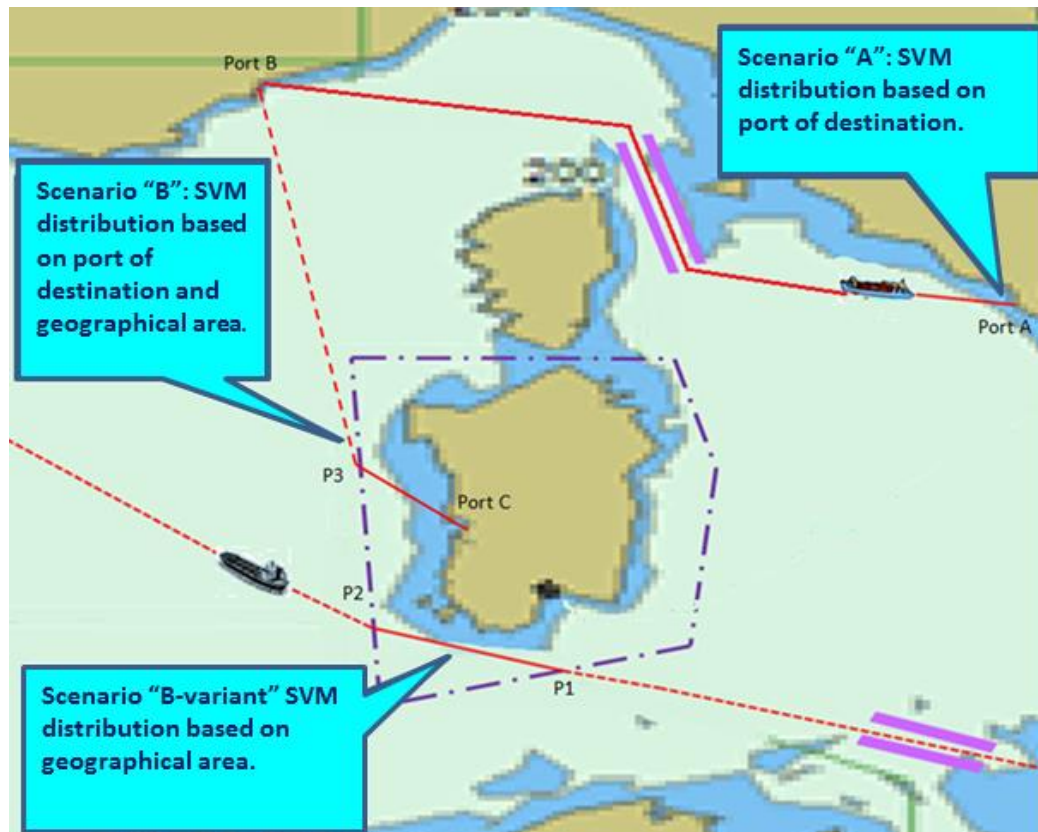


Figure 1: Proactive forwarding of voyage information – general concept

4. Scenario "C" Voyage data distribution through SSN SI

The enriched AIS data streaming through the SSN Streaming Interface (SSN SI) presents a simplified technical solution of the ship voyage data distribution. The SSN SI streamed dataset will include information on the ship, its voyage and specific information (tags) on the availability the detailed information in SSN central system (upon request).

The ship voyage data streaming service will start whenever the SSN central system will receive a notification for the voyage including as a destination port the one chosen by the MS service subscriber (as per scenario "A" above), or whenever the ship enters and remains in the polygon (as per scenario "B" or "B-variant" above).

The data will be streamed with the pre-defined intervals to the national SSN system of the service subscriber, and will include the ship latest position, accompanied with the following voyage information:

- Ship particulars (e.g. Name; Flag; IMO; MMSI; C/s);
- Destination port (it will also indicate that PortPlus message has been received by SSN Central system);
- "warning tags":
 - If Hazmat information is available in SSN;
 - If Waste information is available in SSN;
 - If Security information is available in SSN;
 - If Incident information is available in SSN;
- Ship status information:
 - Single hull tanker,
 - Banned ship,
- Source of the reported position data (e.g. MRS reported position will also be used to indicate that the MRS notification has been received by SSN central system)

An Indicative technical description of the streaming service is provided as appendix B. The SSN central application will stop streaming information as soon as SSN is informed that:

- The ship has left the geographical area (polygon), or
- The ship has arrived at the port of destination (by an ATA through a PortPlus notification or detected arrival), or
- The port of destination is changed (e.g. by update of the next port in the PortPlus notification or a new PortPlus notification for the current voyage with a different port of call), or
- The service has been cancelled by the service subscriber.

The SSN generated and streamed information (the "enrichment" tags) would be used by recipients to complement the already available information on their graphical presentation interfaces with the streamed SSN data (see appendix B).

The benefit of this solution is that the enriched AIS data streaming into the national applications can increase MSs operational capabilities, and in particular their monitoring and early warning capabilities. The figure below introduces voyage data distribution through the SSN streaming interface (SSN SI).

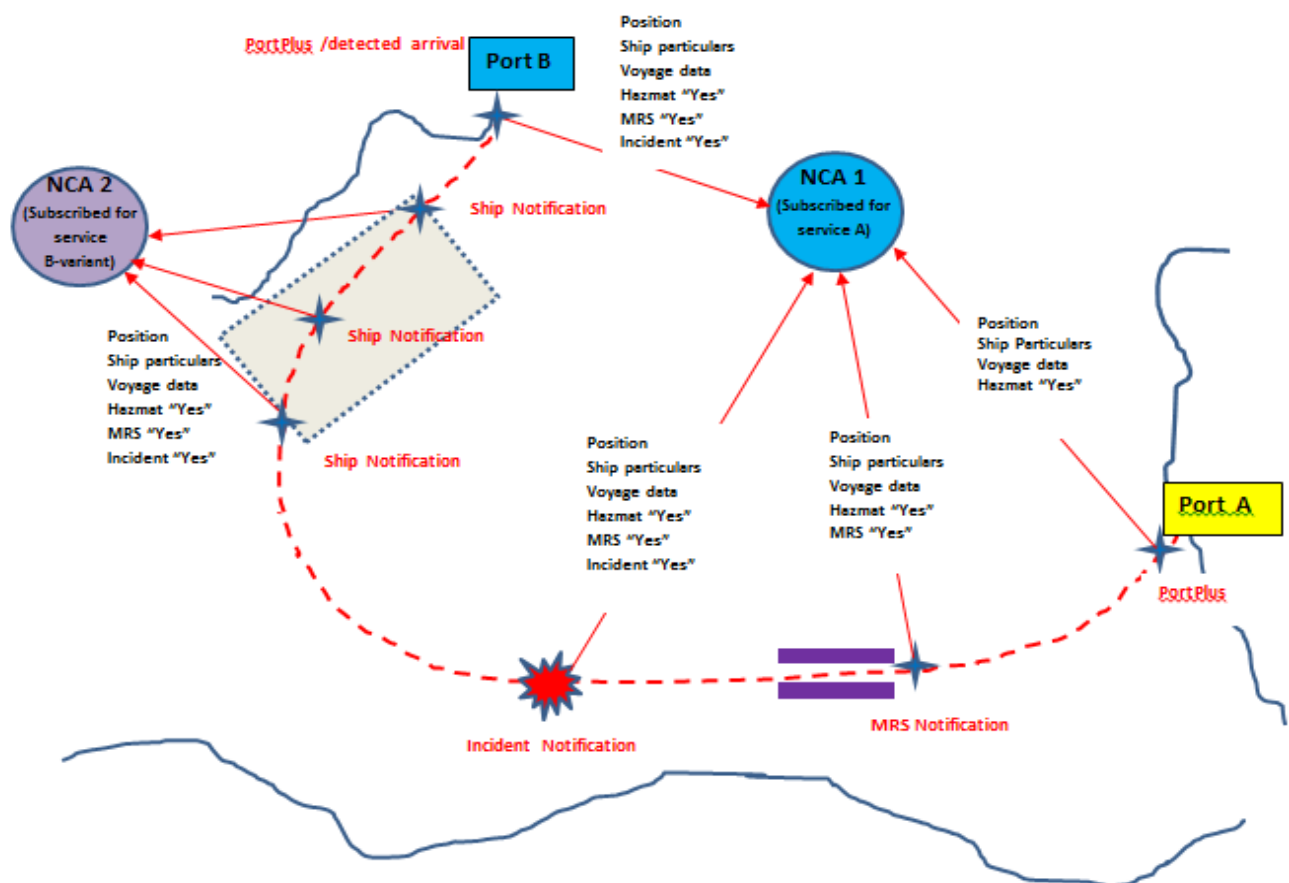


Figure 2 –Voyage data distribution through SSN SI

Appendix A to Annex: Indicative structure of the SVM message

Elements	Attributes	Occ
Header		1
	Version	1
	TestId	0-1
	SSNRefId	1
	SentAt	1
	From	1
	To	1
	StatusCode	1
	StatusMessage	1
Body		1
NotificationStatus		0-1
	ServiceID	1
	UpdateStatus	1
Notification		1
VesselIdentification		1
	IMONumber	0-1
	MMSINumber	0-1
	CallSign	0-1
	ShipName	0-1
	Flag	0-1
	IR_Number	0-1
	ER_Number	0-1
VesselStatus		0-1
	ServiceIndicator	0-1
	IsSHT	0-1
	IsBanned	0-1
	IsDetained	0-1
VoyageInformation		1
	SSNvoyageID	0-1
	ShipCallId	0-1
	LastPort	0-1
	PortOfCall	0-1
	PositionInPortOfCall	0-1
	ETDFromLastPort	0-1
	ETAToPortOfCall	0-1
	ETDFromPortOfCall	0-1
	NextPort	0-1
	ETAToNextPort	0-1
PurposeOfCall		0-9
	CallPurposeCode	1
VesselDetails		0-1
	GrossTonnage	0-1
	ShipType	0-1
InmarsatCallNumber		1
	Inmarsat	0-1
CertificateOfRegistry		0-1
	IssueDate	0-1
	CertificateNumber	0-1
PortOfRegistry		0-1
	LoCode	0-1
	LocationName	0-1
Company		0-1
	CompanyName	0-1
	IMOCompanyNr	0-1
PreArrival3DaysNotificationDetails		0-1
	PossibleAnchorage	0-1
	PlannedOperations	0-1
	PlannedWorks	0-1
	ShipConfiguration	0-1
	CargoVolumeNature	0-1
	ConditionCargoBallastTanks	0-1

Elements	Attributes	Occ
PreArrival24HoursNotificationDetails		0-1
	POBVoyageTowardsPortOfCall	1
ArrivalNotificationDetails		0-1
	ATAPortOfCall	1
	Anchorage	0-1
DepartureNotificationDetails		0-1
	ATDPortOfCall	1
	POBVoyageTowardsNextPort	0-1
HazmatNotificationInfoNonEUDepartures		0-1
HazmatCargoInformation		1
	HazmatOnBoardYorN	1
	INFSHIPClass	0-1
DG		0-99
	DGClassification	1
CargoManifest		0-1
UrlDetails		0-1
	Url	1
	DocType	1
ContactDetails		0-1
	LastName	0-1
	FirstName	0-1
	LoCode	1
	Phone	1
	Fax	1
	EMail	0-1
HazmatNotificationInfoEUDepartures		0-1
HazmatCargoPOBInformation		1
	HazmatOnBoardYorN	1
	INFSHIPClass	0-1
DG		0-99
	DGClassification	1
CargoManifest		0-1
UrlDetails		0-1
	Url	1
	DocType	1
ContactDetails		0-1
	LastName	0-1
	FirstName	0-1
	LoCode	1
	Phone	1
	Fax	1
	EMail	0-1
WasteNotification		0-1
	LastPortDelivered	0-1
	LastPortDeliveredDate	0-1
	WasteDeliveryStatus	1
SecurityNotification		0-1
	CurrentSecurityLevel	1
AgentInPortAtArrival		0-1
	AgentName	1
	Phone	0-1
	Fax	0-1
	EMail	0-1
MRS		0-1
MRSInformation		1
	MRSIdentification	1
	CSTIdentification	0-1
VoyageInformation		1
	NextPortOfCall	1
	ETA	0-1
	TotalPersonsOnBoard	1
	AnyDG	1
ShipPosition		1
	Longitude	1
	Latitude	1

Elements	Attributes	Occ
	ReportingDateAndTime	1
Incident		0-1
IncidentIdentification		1
	Type	1
	IncidentID	1
IRVesselIdentificationList		0-1
RVesselIdentification		1-99
ShipPositionAtTimeOfIncident		0-1
GeoCoordinates		1
	Longitude	1
	Latitude	1
ShipPositionAtTimeOfReporting		0-1
GeoCoordinates		1
	Longitude	1
	Latitude	1
AuthorityReportingIncident		1
IdentificationOfAuthority		0-1
	AuthorityName	1
	LoCode	1
	Phone	1
	Fax	1
	EMail	0-1
IncidentDetails		0-1
WasteIncidentInformation		0-1
NonComplianceInfo		1
	WasteDeliveryDuePort	1
	InspectionReason	1
InspectionInformation		0-1
	Deficiencies	1
	ActionTaken	1
SITREPIncidentInformation		0-1
SITREPIncidentInformation		1
C_Situation		1
	MessageType	1
	NotifiedAt	1
	Nature	1
POLREPIncidentInformation		0-1
POLREPIncidentInformation		1
POLWARN		0-1
P1_DateTime		1
POLINF		0-1
P40_DateTime		0-1
POLFAC		0-1
P80_DateTime		0-1
LostFoundObjectIncidentInformation		0-1
LostFoundObjectInformation		1
	DateTimeReportLostFoundObject	1
	P1_ReportType	1
ObjectInformation		1
Object		0-99
	Description	1
FailedNotificationIncidentInformation		0-1
Description		1
FailedNotificationIncidentInformation		0-1
Description		1
VTSRulesInfringementIncidentInformation		0-1
Description		1
BannedShipIncidentInformation		0-1
Description		1
InsuranceFailureIncidentInformation		0-1
Description		1
PilotOrPortReportIncidentInformation		0-1
Description		1
OtherIncidentInformation		0-1
Description		1

Elements	Attributes	Occ
Ship position		0-1
	SystemReportingPosition	0-1
	Longitude	1
	Latitude	1
	Timestamp	1
	Speed	1
	Course	1

**Appendix B to Annex: SafeSeaNet Streaming Interface (SSN_SI)
Control Document**
(attached hereafter)

Note: The current SSN SI ICD version (V.1.04) will be amended in accordance with the ship voyage data push concept specifications.