European Maritime Safety Agency

MAR-ICE Network 3rd Evaluation Report

Third review and evaluation of the MAR-ICE Network covering its operation from July 2013 to December 2015

Date: February 2016

EMSA

Summary

The MAR-ICE Network was created in 2008 through a 3-Party Memorandum of Understanding (MoU) between the European Chemical Industry Council (Cefic), the Centre of Documentation, Research and Experimentation on Accidental Water Pollution (Cedre) and the European Maritime Safety Agency (EMSA) and became operational in January 2009. The Network provides remotely upon request expert information and advice on chemicals in the event of a maritime emergency. This report provides the third review and evaluation of the Network and the service it provided in the period **from July 2013 to December 2015**.

The MAR-ICE Network was activated eleven times during the reporting period, as shown in the table below:

Real incident during which the MAR-ICE Network was activated (July 2013 - December 2015)		
Requesting entity & date of request	Substance(s) involved in incident	Request made to the MAR-ICE Network
Irish Coast Guard (13.01.2014)	15 000 tons of Sodium Hydroxyde 50% (UN 1824); No leak, nor any immediate threat of pollution	The Network was activated preventively, to request information on potential risks for the marine environment in case of the release of Sodium hydroxide 50%
Notification or table-top exercises during which the MAR-ICE Network was activated (July 2013 - December 2015)		
Requesting entity & date of request	Substance(s) involved in exercise scenario	Request made to the MAR-ICE Network
Finnish Environment Institute (SYKE) (23.9.2013)	The scenario involved the grounding of a chemical tanker which resulted in the release of six different products in the Baltic Sea: - Phosphoric acid (UN 1805); - Sodium hydroxide (UN 1824); - Ethanol / ethyl alcohol (UN 1170); - Phenol (UN 2312); - Vegetable oil; - Heavy fuel oil (HFO-380).	Request for information on: - Potential risks for sensitive resources close-by; - The behaviour of the released chemicals in the water (surface and water column); - Potential health & safety hazards for responders; - Risks from the substances mixing together. Request for fate and trajectory modelling.
MRCC Madrid, Spanish Maritime Safety Agency (SASEMAR) (15.11.2013)	CLEANPORT TAR 2013 exercise: The exercise scenario covered the release of 6.7 m^3 of Aniline (UN 1547) in the Tarragona port.	The information requested was about the product's behaviour in the marine environment, as well as its chemical and physical properties, potential risks and hazards, response measures and required personal protective equipment (PPE).
MRCC Barcelona, Spanish Maritime Safety Agency (SASEMAR) (14.1.2014	The scenario involved the release of 8m^3 of White spirit (UN 1300).	The information requested was about the product's composition, as it was a blend of chemicals.
EMSA, on behalf of participating experts to an HNS workshop (01.10.2014)	The table-top exercise covered two separate scenarios, one with chemicals carried in bulk and the second with chemicals in packaged form.	For both scenarios, the Network was activated requesting information regarding the risks to the marine environment and public health; the trajectory of floating chemicals and any gas clouds generated and recommendations for response options, including PPE specifications.

Norwegian Coastal Administration, under the Copenhagen Agreement (18.02.2015)	The exercise scenario included the loss of containers at sea, following a collision, involving the product Oleum (UN 1831) (proper shipping name: Sulphuric acid, fuming).	The product-specific information requested via the MAR-ICE contact form concerned the product's stability and reactivity, chemical and physical properties and composition.
EMSA (3-4.3.2015)	EMSA activated unannounced the MAR-ICE Network prior to a table-top HNS exercise conducted by ITOPF, to which EMSA was invited to contribute. In accordance with the scenario, some of the cargo tanks of a chemical tanker were punctured resulting to a fire on-board and the tanker drifting ablaze and without propulsion.	There was yet no spillage of the bulk liquid cargo, but as the situation was very unstable information was requested by the Network on three separate products: Acrylonitrile (UN 1093), Ammonia anhydrous (UN 1005) and Styrene monomer (UN 2055), regarding each product and their behaviour in the marine environment.
MRCC Rijeka, Croatia (25.3.2015)	Activation to test the procedures.	
Prefecture maritime de la Manche Mer du Nord, (AEM Cherbourg), France (27.5.2015)	The scenario involved the collision between a chemical tanker and an oil tanker which resulted in a leak in some of the chemical tanker's cargo of 4,180 m3 of Styrene monomer (UN 2055) and an increased temperature and pressure in the cargo's tanks.	Product-specific information and information on the Styrene's behaviour in the marine environment were requested by the Network.
Finnish Environment Institute (SYKE) (1.10.2015)	The scenario included the release of Acrylonitrile (UN 1093) and Phosphoric acid (UN 1805) from damaged containers on board a vessel (initial release on deck) and the reaction of the phosphoric acid with aluminium and other metals and the resulting formation of Hydrogen gas cloud.	Information on the two products, possible response measures, behaviour in the marine environment and in air and the resulting hazards and danger zones were requested by the Network.
Finnish Environment Institute (SYKE) (18.12.2015)	The scenario involved a LNG tanker which was at berth in the Port of Hamina. Following a collision with the pier LNG gas release was generated from a raptured 7000 m^3 tank.	Product specific information and plume drift estimation for safety and evacuation planning were requested.

The countries that activated the Network have expressed their high appreciation of the rapid and professional information service provided. Generally, the EU Member States, coastal EFTA/EEA States and coastal EU Candidate countries acknowledge the importance and benefit of having rapid access to professional product and incident-specific information on chemical substances and their associated hazards and risks, as well as receiving timely expert advice when dealing with maritime chemical emergencies. This also depends on the type of specialised expertise and support they already have access to from other institutions at national or regional level. Some countries activate the Network to receive more operational and incident specific advice whereas others look for more detailed product-specific information on chemical substances. Feedback received from the Network's users has been duly considered and addressed by the MAR-ICE partners during this third evaluation of the Network. This resulted in concrete follow-up actions for each of the MAR-ICE partners, including the revision of the Network's Contact Form, relevant documents and procedures.

Cedre has to date performed its tasks as the MAR-ICE Contact Point to provide information on chemicals involved in maritime incidents very well and always timely. In addition to the product specific information, Cedre provided additional operational relevant information and expert advice in almost all cases, including several modelling results. Cefic's crucial role as a partner of the MAR-ICE Network in communicating with the ICE Network, maintaining the ICE Database and updating the ICE members on the MAR-ICE Network's developments is greatly appreciated. The Network currently runs through October 2017. All three parties made a positive assessment of MAR-ICE and have expressed their willingness to continue the Network beyond 2017.

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1. Introduction

In accordance with the Memorandum of Understanding (MoU) signed between Cefic, Cedre and EMSA on 17 October 2008, as amended in 2011 and 2014, the MAR-ICE Network became operational on 1 January 2009 and currently runs through to 16 October 2017. As agreed among the parties of the MoU, Cedre serves as the MAR-ICE Contact Point, receiving all requests for assistance to the Network and coordinating the information and advice provided. EMSA maintains, coordinates, reviews and evaluates the MAR-ICE Network.

The Network provides remotely and upon request expert information and advice on chemicals in the event of a maritime emergency. The tasks and activation procedures of the MAR-ICE Network are described in the MAR-ICE Implementation Plan, which has been distributed to the relevant administrations of the EU Member States, coastal EFTA/EEA States and coastal EU Candidate Countries. In addition to the response to marine HNS spills/releases, or the threat thereof, the MAR-ICE can also be used during pollution response drills and exercises. A leaflet describing the Network's scope and the expert information service it provides has been distributed to the relevant administrations. Information on the MAR-ICE Network is also published on Cefic's, Cedre's and EMSA's websites.

In accordance with the MAR-ICE MoU, EMSA, in close cooperation with its partners, reviews and evaluates the Network's operation and the service it provides in regular intervals. To this effect, an evaluation report is drafted and a dedicated meeting of the MAR-ICE partners is held at EMSA every two years. To date, two evaluation reports have been published:

- First evaluation report of the MAR-ICE Network and the service it provides, covering its operation from January 2009 to December 2010;
- Second evaluation report of the MAR-ICE Network and the service it provides, covering its operation from January 2011 to June 2013.
- This is the third evaluation report of the MAR-ICE Network and the service it provides, covering its operation from July 2013 to December 2015.

This report was drafted by EMSA and reviewed by its MAR-ICE partners, Cefic and Cedre during the third MAR-ICE Network evaluation meeting held on 3 December 2015 in Lisbon and was finalised shortly thereafter.

2. Relevant developments

Four developments relevant to the MAR-ICE Network took place within the period covered by this report:

- As identified in the second evaluation report of the MAR-ICE Network, EMSA, Cefic and Cedre considered the possibility and options for the Network to also provide upon request, expert advice on site of a maritime incident. Following extensive discussions with Cefic and the ICE partners, such an option cannot be supported at this stage by the chemical industry, primarily due to liability concerns. However, EMSA, Cefic and Cedre are open to consider other options for further developing the service.
- Since February 2014, the MAR-ICE Network (Cedre) also has access to EMSA's MAR-CIS (Marine chemical information sheets) database, which currently includes 213 substances with concise information and data pertinent during the initial stages of the response to a maritime incident. Whenever there is a MAR-ICE activation, the relevant MAR-CIS datasheet (when available) is also provided to the requester via the MAR-ICE Network, as part of the initial product-specific documentation.
- An important change in the ICE database took place in 2015 in order to always provide access to up-to-date data. The company data and links to companies and substances belonging to the following 13 countries were deleted from the ICE database, as these countries maintain and update similar local or national databases: Austria, Czech Republic, Denmark, Germany, Hungary, Italy, Norway, Poland, Slovak Republic, Spain, Sweden and UK. Only the company data and links to companies and substances belonging to the following four countries were kept in the ICE database: Belgium, France,

the Netherlands and Switzerland. When a company belonging to the first group of countries is contacted by the MAR-ICE Contact Point, via the MAR-ICE Network, the corresponding ICE Centres are contacted and they utilise their local databases to provide the requested information to the MAR-ICE Contact Point. In 2015 Gert van Bortel (BASF) replaced Rolf Haselhorst (BASF) as chairman of the ICE Group.

- In December 2014, a revised and updated set of MAR-ICE documentation, including the revised MAR-ICE brochure, the MAR-ICE Implementation Plan and Activation procedure and the revised MAR-ICE Contact Form, were prepared and sent by EMSA to the relevant maritime administrations of the EU Member States, coastal EFTA/EEA countries and coastal EU Candidate countries, in order to raise awareness of the Network.

3. MAR-ICE activations

During the period covered by this report, the MAR-ICE Network was activated eleven times:

- Once during a real incident, without actual release of chemicals, and
- Ten times during marine pollution response exercises (table-top exercises).

A brief summary of all the MAR-ICE activations and the main conclusions ('lessons learned') from these are presented below.

3.1 MAR-ICE Network activation by Ireland, 13.01.2014

The Irish Coast Guard (MRCC Dublin) activated the MAR-ICE Network on 13 January 2014, regarding a real incident involving a chemical carrier, without any actual product being released. The vessel, which due to mechanical failure was under tow around 100 nm west of Ireland, had 15,000 tonnes of Sodium Hydroxide 50% (UN 1824) on board, but there was no leak, nor immediate threat or danger of a release.

The Irish Coast Guard activated the MAR-ICE Network preventively, to ask what could have happened if there would be a release of the Sodium hydroxide 50% (UN 1824), with regard to potential risks for the marine environment. The MAR-ICE Network Contact Point (Cedre) provided within one hour to the requester a copy of the Cedre chemical response guide on Sodium Hydroxide 50% solution in English, noting that it also includes relevant spill scenarios. Following communication with the requester, the information provided was deemed sufficient for the specific incident and as there was no release involved, there was no request to contact a chemical company or the product's manufacturer for more information. The activation was concluded by the Irish Coast Guard shortly thereafter.

The activation procedure and overall communication between the MAR-ICE Contact Point and the requester was very smooth. The MAR-ICE contact form was filled in (hand-written) and faxed to Cedre. Ireland has activated the Network several times in the past, for both real incidents and exercises and is well acquainted with the Network's activation and service.

It is interesting to note here the use of the MAR-ICE Network for 'preventive' purposes, even when there was no product release or real threat of pollution or release in the marine environment.

3.2 MAR-ICE Network activations for drills and exercises

3.2.1 MAR-ICE Network activation by Finland, 23.09.2013

The Finnish Environment Institute (SYKE) activated the MAR-ICE Network on 23 September 2013 during an unannounced alert exercise with a very detailed and relatively complex scenario involving the release of several chemicals. The aim of the exercise was for SYKE to become familiar with the MAR-ICE activation procedures and to find out what type of information is available through the Network, in order to evaluate if and what other additional information sources would be required.

The scenario involved the grounding of a chemical tanker which resulted in the release of six different products in the Baltic Sea about 15 nm from the Finnish mainland. The spill area was close to floating type fish farms and a water intake system for a nuclear power plant. The six substances released where: Phosphoric acid (UN 1805); Sodium hydroxide (UN 1824); Ethanol / ethyl alcohol (UN 1170); Phenol (UN 2312); Vegetable oil; Heavy fuel oil (HFO-380).

The information requested by SYKE included fate and trajectory modelling in order to evaluate the potential risks for sensitive resources located close-by (fish farms and water intake system of nuclear power plant); the behaviour of the released chemicals in the water (surface and water column); the potential health and safety hazards for responders; and any additional risks from these substances mixing together.

The MAR-ICE Network provided initially (< 1 h) the Material Safety Data Sheets (MSDS) corresponding to the five substances and the fuel oil. This was shortly followed-up with additional information regarding the principal behaviour in the marine environment and main risks for responders and the aquatic life for each of the released substances. Within 2 ½ hours after the Network's activation, the results of 3D modelling (CHEMMAP software) for Phenol's behaviour and drifting were also provided by Cedre, as this substance was considered the most hazardous for the responders in vicinity to the vessel.

The requester also received additional information from national sources (Finnish institute of occupational health) with regard primarily the consequences and effects of mixing the released chemicals together, which was not covered by the MAR-ICE Network in its response.

The activation procedure and overall communication between the MAR-ICE Contact Point and the requester was very good. The MAR-ICE contact form was filled in (electronically) and sent to the Network by email, although an Annex explaining in more detail the scenario and the requested information for each of the substances was also required and attached to the form. The requester was very satisfied with the outcome of this exercise, appreciating in particular the rapid response and professional information received from the Network. It was also noted by this exercise that readily available additional information sources, especially regarding health and safety issues, was deemed necessary at national level.

3.2.2 MAR-ICE Network activation by Spain, 15.11.2013

The MRCC Madrid, Spanish Maritime Safety Agency (SASEMAR) activated the MAR-ICE Network on 15 November 2013 for an exercise (CLEANPORT TAR 2013). The exercise scenario covered the release of 6.7 m^3 of Aniline (UN 1547) in the Tarragona port at 12 m depth. The information requested was both about the product's behaviour in the marine environment, as well as its chemical and physical properties, potential risks and hazards, response measures and required personal protective equipment (PPE) (all the 'boxes' regarding 'information requested' in the MAR-ICE contact form were ticked).

Within one hour from acknowledgment of receipt of the request, the MAR-ICE Network provided the MSDS corresponding to Aniline. This was followed by additional information sent shortly thereafter on the substance's behaviour in the marine environment, based on the GESAMP profile. The MRCC Madrid acknowledged receipt of the information and terminated the exercise.

Apart from some technical problems (fax not working) in the beginning and towards the end of the activation, communication between the requester and the Network was overall positive. The MAR-ICE contact form was filled-in and sent via email. While a large amount of information was requested by the requester via the contact form, neither were all the requests addressed nor was there any follow-up questions or clarifications asked by the requester. It is very important that the information needs of the requester are clearly defined, prioritised and followed-up on, and that they are all addressed by the Network. Feedback received by the requester indicated that information with more operational focus had been expected from the Network during this exercise.

3.2.3 MAR-ICE Network activation by Spain, 14.01.2014

The MRCC Barcelona, Spanish Maritime Safety Agency (SASEMAR) activated the MAR-ICE Network on 14 January 2014 during an exercise involving the release of 8 m^3 of White sprit (UN 1300) (indicated slick area by requester: 250 x 50 m). The MAR-ICE contact form was filled out and sent by fax. Information on the product's composition was requested. A copy of the corresponding MSDS was sent by the MAR-ICE Network shortly after

the request was made and, considering that the released substance was a blend of chemicals, the requester was advised to contact the manufacturer in order to get more data on the correct composition of the blend.

To this effect, the MAR-ICE Contact Point called the ICE Centre in Spain (Madrid); however it was not clear to the ICE focal point what action was expected from them. Efforts to contact another relevant chemical company in Spain were also unsuccessful, as the respective contact number in the ICE database seemed to be incorrect.

While there was no further concrete follow-up from the requester regarding this exercise, which was considered terminated thereafter, this activation, like the one described above, highlighted that the Network can and should be activated also for small spills, as a chemical's complexity or associated hazards are irrelevant of the volume of the spill. It is also very important that the ICE database and the ICE focal centres are kept up-to-date with regard to the MAR-ICE Network.

As also demonstrated in the previous activation, it is crucial that the information needs of the requester are clearly defined, prioritised and followed-up on, and that they are all addressed by the Network. The termination of the Network's activation should also be clearly stated by the requester. As per the feedback received by the requester, information with more operational focus had been expected from the Network during this exercise.

3.2.4 MAR-ICE Network activation by EMSA, 01.10.2014

On 1 October 2014, EMSA organised and hosted a workshop for Member States experts addressing the key challenges of chemical marine pollution response. This workshop included a table-top exercise for participating experts, covering two separate scenarios, one with chemicals carried in bulk and the second with chemicals in packaged form. During this exercise, and on behalf of the participating experts, EMSA activated the MAR-ICE Network twice, once for each scenario. The main aim of this activation was for the experts participating in the table-top exercise to:

- Familiarise themselves with utilising and activating existing information services at national and EU level (e.g. MAR-ICE Network, MAR-CIS datasheets) available to support the response operations to HNS pollution incidents; and
- Better understand and evaluate the type of HNS-specific information and expert advice they can receive from the Network, and become aware of its added value, strengths and limitations

Considering the large number of participants and the two relatively complex scenarios running in parallel, the large amount of information requested from the Network, as well as the time limitations of such table-top exercises, there was prior communication between EMSA and the MAR-ICE Contact Point at Cedre and some of the information provided had been already pre-prepared by Cedre.

The type of information requested for both scenarios regarded the risks to the marine environment and public health; the trajectory of floating chemicals and any gas clouds generated and recommendations for response options, including PPE specifications.

For both scenarios, the communication with the Network was overall positive and rapid, within the limited timeline of the exercise. Through this exercise all the participants became familiarised with the MAR-ICE contact form and understood the type of information the Network can provide for bulk and packaged spills. This was the first time the MAR-ICE Network was activated during an EMSA workshop and EMSA intends to repeat such type of (operational) chemical table-top exercises in the future.

3.2.5 MAR-ICE Network activation by Norway, 18.02.2015

The Norwegian Coastal Administration (NCA) activated the MAR-ICE Network on 18 February 2015 within the framework of an HNS table-top exercise conducted by the Copenhagen Agreement. The exercise scenario included the loss of containers at sea, following a collision, involving the product Oleum (UN 1831) (proper shipping name: Sulphuric acid, fuming). The product-specific information requested via the MAR-ICE contact form concerned the product's stability and reactivity, chemical and physical properties and composition.

The MAR-ICE Network Contact Point provided rapidly the MSDS and ERICard of Sulphuric acid, fuming, and also the relevant MAR-CIS datasheet for Oleum, after it was provided by EMSA. The NCA then asked additional information by phone in terms of risk of explosion, based on real cases / past incidents. To this request, links to relevant websites (Rempec's MIDSIS database; and Cedre's accidents database) were provided to the NCA, corresponding to accidents involving Sulphuric acid (UN 1831).

There were no further follow-up questions from the requester and the activation was considered terminated by the MAR-ICE Contact Point. It is important that the termination of the activation is clearly stated by the requester.

3.2.6 MAR-ICE Network activation by EMSA, 3-4.03.2015

EMSA activated unannounced the MAR-ICE Network on 3 March 2015 prior to a table-top HNS exercise conducted by ITOPF on 6 March 2015, to which EMSA was invited to contribute. In accordance with the scenario, following a collision, some of the cargo tanks of a chemical tanker were punctured resulting to a fire on-board and the tanker drifting ablaze and without propulsion. There was yet no spillage of the bulk liquid cargo, but as the situation was very unstable information was requested by the Network on three separate products: Acrylonitrile (UN 1093), Ammonia anhydrous (UN 1005) and Styrene monomer (UN 2055), regarding each product and their behaviour in the marine environment (all the boxes in the contact from were ticked).

Within 1 hour of the request, the MAR-ICE Network Contact Point provided the MAR-CIS datasheets corresponding to the three products (UN numbers) defined in the scenario. EMSA asked for further information regarding the response to incidents involving these substances and for a ranking of the risks / immediate dangers for the environment and the safety of responders. The MAR-ICE Contact Point provided a link to the Cedre accidents database regarding the 2001 Ievoli Sun incident, which involved Styrene and also a table prioritising the three substances as per the request made. Following analysis of the information received, EMSA asked then for more information on the most hazardous substance (Acrylonitrile), with regard to its behaviour and trajectory if released in the marine environment and the associated hazards of the toxic cloud. The results of CHEMMAP 3D trajectory modelling simulations run for Acrylonitrile were provided to EMSA, covering both the trajectory of the spilled product at sea, as well as that of the toxic cloud in the atmosphere.

The information provided by the Network was considered sufficient and the activation was terminated by EMSA. Some technical issues identified during this exercise (the Cedre telephone switchboard was temporarily out of order and it was impossible to contact Cedre during a period of time) have since been resolved.

3.2.7 MAR-ICE Network activation by Croatia, 25.03.2015

The MRCC Rijeka (Croatia) activated the MAR-ICE Network on 25 March 2015, merely for notification purposes and in order to test the activation procedures; no specific maritime incident or chemical product were involved in this activation / exercise. This notification exercise highlighted the importance of maintaining a smooth and swift communication flow between the requester and the Network (via the MAR-ICE Contact Point at Cedre).

It is also important that all activation requests made by fax or email should be followed-up by phone by the requester, in order to confirm the activation and whenever data or information is transmitted among the Network by fax or email that this is followed-up by a phone call to inform that data has been exchanged. It is crucial that prompt and smooth communication is established and maintained between the Network and the requester throughout the activation.

3.2.8 MAR-ICE Network activation by France, 27.05.2015

The Prefecture maritime de la Manche Mer du Nord, AEM Cherbourg (France) activated the MAR-ICE Network on 27 May 2015 during an exercise. The scenario involved the collision between a chemical tanker and an oil tanker which resulted in a leak in some of the chemical tanker's cargo of 4,180 m^3 of Styrene monomer (UN 2055) and an increased temperature and pressure in the cargo's tanks. While Cedre was initially activated by the French authorities under the French national intervention agreement, during the exercise and as soon as the scenario reported the leak of Styrene in one or two tanks, Cedre proposed to the French authorities to activate the MAR-ICE Network.

The MAR-ICE contact form was then submitted by the French authorities by email, requesting product-specific information and information on the Styrene's behaviour in the marine environment. Initial information provided by the MAR-ICE Contact Point included the Cedre chemical response guide for Styrene and the corresponding MSDS. This was followed-up by the results of CHEMMAP 3D trajectory modelling simulations run for Styrene to assess the extent of the hazardous zones (Immediately Dangerous for Life and Health (IDLH) and concentrations in the water column). The results of the simulations and an analysis of these results were sent to the requester.

The MAR-ICE Network also contacted two manufacturers of Styrene via the ICE database, namely TOTAL PetroChemicals Gonfreville and Dow Chemicals, to get more information on the possible cause of the increase of temperature and pressure in the tanks reported in the scenario. Measures to control this situation and PPE that should be used were also discussed and advice on the use of an inhibitor together with the control of the oxygen amount in the tanks was provided to the French authorities by email. The MAR-ICE activation was then terminated.

This activation highlighted the importance of the specialised product-specific information that can be provided by the chemical industry / product's manufacturer, and the added-value this provides to the more generic information sources available, when an incident requires a more precise and product-oriented analysis.

3.2.9 MAR-ICE Network activation by Finland, 01.10.2015

The Finnish Environment Institute (SYKE) activated the MAR-ICE Network on 1 October 2015, during a table-top exercise. The scenario included the release of Acrylonitrile (UN 1093) and Phosphoric acid (UN 1805) from damaged containers on board a vessel (initial release on deck) and the reaction of the phosphoric acid with aluminium and other metals and the resulting formation of Hydrogen gas cloud. Information on the two products, possible response measures, behaviour in the marine environment and in air and the resulting hazards and danger zones was requested (all the boxes in the contact form were ticked).

The MAR-CIS datasheets for Acrylonitrile and Phosphoric acid, as well as the Cedre chemical response guide for Phosphoric acid were the product-specific documents provided to the requester. SYKE was interested to know how the released chemicals would spread in air and how they will be spreading / drifting if (eventually) spilled into the water.

The MAR-ICE Contact Point provided the results of simulations conducted with the CHEMMAP and ALOHA models for Acrylonitrile (which was considered the most dangerous product, due to its high acute toxicity and to the volume potentially spilt). The data provided included the product's toxicity and explosivity, dangerous and flammable zones (via ALOHA) and the products behaviour in the marine / air environment (CHEMMAP). With regard to the request to model the formation of Hydrogen gas cloud (resulting from the reaction of Phosphoric acid with Aluminium), Cedre was not able to do this, so it contacted a French specialised centre (national centre for industrial safety and environmental protection (INERIS) for more information, which was then provided to SYKE. Following a review of all the information provided, the activation was then terminated by the requester.

The feedback provided by SYKE on the service received by the Network was that the information given was very relevant and useful; some of this information was already available to the requester, who was himself a chemical specialist. The information and advice offered by the Network assisted with the scenario and in particular the modelling results provided were very much appreciated in better assessing the situation.

3.2.10 MAR-ICE Network activation by Finland, 18.12.2015

The Finnish Environment Institute (SYKE) activated the MAR-ICE Network once again on 18 December 2015, during an exercise involving LNG. According to the scenario, a LNG tanker, which was at berth in the Port of Hamina, generated a LNG gas release from a raptured 7000 m^3 tank following collision with the pier.

During the initial stages of the activation, the MAR-ICE Contact Point provided the requester with CAMEO datasheets for LNG, with data on the released product's reactivity, firefighting measures and required personal protection measures; this information was followed with results of the ALOHA modelling simulating the released product's behaviour, toxicity and flammable zones. The model was used with a different product (Propane) assuming that its behaviour would be close to that of the LNG. Model calculations using propane seem to have

overestimated the plume drift. Following some clarifications required by the requester on the model results for the exposure limits, the exercise was concluded.

The requester was satisfied with the rapid and qualified response received from the MAR-ICE Contact Point. Three bodies were alerted during this exercise: two national organisations (the Finnish Institute of Occupational Health and the Finnish Meteorological Institute) and the MAR-ICE Network, with rapid responses and initial advice received from all three institutions.

4. Cedre's performance as the MAR-ICE Contact Point

4.1 Response to requests received

In all cases of the MAR-ICE Network's activations, Cedre has acted very efficiently in providing initial relevant product-specific documentation (e.g. MSDSs, MAR-CIS datasheets) and information within 1 hour. This is in most cases followed by the provision of additional information mostly on the substance's behaviour in the marine environment, or the substance's trajectory or risk evaluation and risk assessment of several substances. Cedre has in many cases acted proactively and made relevant proposals and suggestions and offered additional advice to the requested information. In all cases, Cedre has demonstrated professionalism and expertise in their response to the requests received. In particular the promptness, professionalism and expertise of the information provided by Cedre are very much appreciated by the service's users.

In most cases Cedre provided the requested information based on its own resources. In the period covered in this report, chemical companies (manufacturers) were only contacted in two occasions: during the Spanish exercise on 14.01.2014 (unsuccessfully) and during the French exercise on 27.05.2015, where two separate chemical companies were successfully contacted via phone and provided specialised information. The low number of contacts with the chemical companies was due to the fact that either there was no such request made by the requester; or it was not offered as an option by the MAR-ICE Network Contact Point or it was not required by the incident / exercise scenario. However, as the specialised information provided by the manufacturer is in most cases of added-value, it may be worth exploring how the Network's partners can make more often use of this specialised knowledge and offer it to the requester as a standing option during all the activations.

In some cases during exercises, it is not clear if all the information requested by the requester was provided. This applies in particular when all the relevant information boxes in the MAR-ICE Contact Form are ticked and/or when there is no specific additional description of the data needed, or follow-up from the requester on the initial request made. This will be addressed by a revision of the MAR-ICE Contact Form.

Feedback received from some countries indicates that the type of information and documentation provided by the Network could be improved to have a more operational focus, going beyond the more generic MSDS information and to include warnings, practical advice and health and safety information for the response operations. This has been noted by the three parties and the MAR-ICE Contact Form will also be revised accordingly, so as to specify more the initial information needs of the requester.

4.2 Internal training

Since the establishment of the MAR-ICE Network, Cedre has conducted regular training of its duty engineers on the MAR-ICE procedures and the service to be provided via the Network. This internal training consists of familiarisation with the ICE database and the MAR-CIS tool, consulting various other chemical databases, using HNS modelling software (such as CHEMMAP) and keeping up-to-date with the MAR-ICE activation procedures.

Information on the MAR-ICE Network is available in Cedre's website and when there is an activation of the Network, brief information on the activation is included in Cedre's monthly Newsletters.

4.3 Reporting to EMSA

Some communication issues regarding contacting the Network via Cedre and EMSA's notification of the MAR-ICE Network activations (phone number and email technical problems) have been identified during the reporting

period and have been addressed by the parties. It has been agreed to only maintain the Cedre switchboard number as the main telephone number for contacting the MAR-ICE Contact Point and the MAR-ICE Network. EMSA's Maritime Support Services (MSS) 24/7 accessible phone number will also be included in the MAR-ICE Contact Form as a back-up number, in order to support and guide the requester on how to contact the Network in case this may be needed (e.g. when the Cedre switchboard number is not reachable). The MAR-ICE Contact Form has been revised accordingly.

As several Cedre duty officers are responding to the MAR-ICE Network activations within Cedre's function as the MAR-ICE Contact Point, a more standardised approach in reporting the Network's activations to EMSA will be implemented by Cedre, following the dedicated MAR-ICE Activation Reporting template.

5. Cefic's performance as coordinator of the ICE scheme

Cefic plays a crucial role in the MAR-ICE Network as it maintains and manages the ICE database, which contains the contact information of all National ICE Centres of the ICE Network in Europe and for some countries, the chemical companies that can provide information and assistance for specific products (depending on the country). The ICE database is used by the MAR-ICE Network to contact when needed National ICE Centres or chemical companies / manufacturers to get more specialised product-specific information. Cefic also regularly informs and updates the ICE members of the MAR-ICE Network's activations.

Information on the MAR-ICE Network is published on Cefic's website and the MAR-ICE Network is a standing topic on the agenda of the annual ICE Integration Group meetings regarding the emergency response to road and rail incidents involving chemicals. Cefic guarantees the chemical industry's awareness of and involvement in the MAR-ICE Network.

Although Cefic's role is not as visible as Cedre's contribution to the functioning of the MAR-ICE Network, Cefic clearly has a critical role in representing the chemical industry and the ICE partners and is greatly appreciated as a partner of the MAR-ICE, in particular with regard to the discussions for further development of the service. In addition, Cefic is also aware of all the MAR-ICE Network's activations and coordinates and follows-up with any issues regarding the participation and contribution of the ICE centres and the ICE chemical companies in the MAR-ICE Network.

6. EMSA's role as coordinator of the MAR-ICE Network

EMSA's role is to maintain, review and evaluate the MAR-ICE Network, ensuring that the service is provided efficiently and without disruptions. While not visible during the Network's initial activation procedure and during the communication exchange between the requester and the MAR-ICE Contact Point, EMSA is part of the MAR-ICE Network and is aware of all the MAR-ICE activations in real time and receives an activation report by Cedre shortly after the termination of each activation.

EMSA was the initiator of the MAR-ICE Network and is responsible for monitoring and evaluating the MAR-ICE Network activations and the service it provides. EMSA is in close and regular contact with the other two MAR-ICE partners (Cefic and Cedre) and also contacts the requester/user of the MAR-ICE Network to provide feedback on the use of the Network shortly after each activation.

Based on the Network's regular evaluations and the constant review of the feedback provided by the Network's users, EMSA, in close cooperation with its partners, aims to enhance the Network of experts and further develop the service provided to support the EU Member States during the initial stage of maritime emergencies involving chemicals.

7. Evaluation of the MAR-ICE Network, lessons learnt and follow-up actions

The MAR-ICE Network and the expert information and advice service it provides, is highly appreciated by the EU Member States, coastal EFTA/EEA States and coastal EU Candidate countries and is considered as providing a real added value. The service is rapidly available to the marine pollution response authorities as an initial or additional information source for chemical spills (or the threat thereof) in case of maritime emergencies.

Two points are of interest to note:

1) Compared to past years, the annual use of the service during this reporting period has increased, especially for exercises. This shows an increased awareness of the Network and the wish of the Member States to familiarise themselves with the Network's activation procedures. It also demonstrates the willingness to find out what type of information and expert advice countries can expect to receive from the Network and how such information relates with the (nationally or regionally available) information sources at hand.

2) Countries and national administrations that have used the Network once, keep activating it again and again, with different exercise scenarios, in order to increase their understanding of the type of service and assistance they can receive from the Network during chemical spills. Also new users / countries activated the Network during this reporting period. It is EMSA's intend to enable all EU Member States to activate the MAR-ICE Network at least once.

The feedback received by the requesting parties on the use of the Network was mostly positive, in particular regarding the rapid and professional information and expert advice provided regarding the products involved. Some technical issues raised and other comments made by the service's users in improving practical aspects of the activation procedure and facilitating the communication and information exchange have been considered by EMSA in the review of the Network and will be addressed by the MAR-ICE partners. Furthermore, some user feedback pointed out that the information and documentation provided by the Network was expected to have a more operational focus. This also depends on the request made and the follow-up by the requester. It is very important that the specific type of information or advice requested is clearly indicated and is followed-up.

Lessons learned and follow-up actions to be implemented, based on the feedback received by the users and on the Network's evaluation by the three MAR-ICE parties include:

- Revising the MAR-ICE Contact Form for easier use by the requesting party, in particular regarding the addition of 'free text' entry space; the entry of information for multiple substances; the clearer and easier description and some type of prioritisation of the requested information (redrafting of parts E.1 and E.2); and the inclusion of the Network's information flow, indicating the steps to be taken by the requester.
- Revising the contact numbers for activating the Network.
- Depending on the incident, the option to contact a manufacturer or relevant chemical company via the Network should be more visible to the requester.
- Documentation (especially larger documents) provided by the Network, should always be accompanied by further explanation and description of the document provided, drawing attention to the key relevant points. Providing web-links should preferably be avoided.
- The termination of the MAR-ICE activation should always be clearly stated by the requester – brief information on this has been included in the MAR-ICE Contact Form.
- Feedback from the user of the service should always be requested by EMSA following an activation of the Network – a specialised feedback form has been developed for this reason.
- Modelling (e.g. CHEMMAP / Aloha) simulation results and risks assessments (e.g. simplified risk assessment table / chemicals' prioritisation lists) are very much appreciated by the users and seem to be requested more often. If justified by the incident or exercise scenario, the provision of modelling and risk assessment results will be provided by the MAR-ICE Contact Point in a more standardised way to the

requester, as per the dedicated forms developed for this purpose. The specific conditions used for the scenario simulations will always be mentioned in these forms.

- There is a need to increase awareness of the MAR-ICE Network among the ICE partners (ICE National Centres, ICE Focal Points and chemical companies).
- There is a need to facilitate and increase the accessibility to the MAR-ICE Network documentation (Contact Form) among EU Member States' relevant administrations.
- Alert exercises for testing the MAR-ICE Network will be introduced by the MAR-ICE partners as follows:
  - 'Alert tests': Between EMSA and the MAR-ICE Contact Point (Cedre), on a monthly basis and unannounced, to check that the MAR-ICE Network's contact numbers work correctly. EMSA proposed to involve EU countries (especially those that have never activated the Network before) once or twice a year in these alert tests, so that they activate the Network to test that all communication channels work well.
  - 'MAR-ICE Ring Tests': Between the MAR-ICE Contact Point (Cedre) and the 17 ICE National Centres (once or twice a year), similarly to the ICE Ring Tests, to check that the ICE database information is up-to-date and that the ICE National Centres are aware of their role within the MAR-ICE Network.

8. Concluding remarks

The MAR-ICE Network and its service of providing remotely and upon request expert information and advice to national maritime administrations in cases of maritime chemical emergencies is well received by the EU Member States, coastal EFTA/EEA States and coastal EU Candidate countries. The MAR-ICE Network was activated eleven times during the two and a half years from July 2013 to December 2015. This shows a small increase compared to the previous two reporting periods (the Network was activated six times during its first two years of operation from 2009 to 2010 and eight times during the following two and a half years of operation, from January 2011 to June 2013). In particular the number of MAR-ICE Network activations for table-top exercises has increased, as has the number of countries that activate the Network more than once.

Cedre has performed its tasks as the MAR-ICE Contact Point well and Cefic has supported the service among its members. The lessons learned and follow-up actions identified in this report will be implemented by the three parties and any changes to the MAR-ICE Contact Form or other MAR-ICE documentation will be communicated to the MAR-ICE users in due course. It is the aim of the Agency to support and enhance the use of this information service among the EU Member States.

All three parties (Cefic, Cedre and EMSA) strongly support the MAR-ICE Network and the service it provides. Based on the positive user feedback and the outcome of this third review, they wish to continue with the Network beyond 2017. Discussion on how to proceed after 2017 and how to further develop the service is expected to commence later in 2016 among the three parties. In support of the future direction of the MAR-ICE Network, a workshop may be held at EMSA in 2017 addressing the MAR-ICE activation procedures, the evaluation of the MAR-ICE information provided and the Network's future direction.

This report will be published on EMSA's website.

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