

## **FINAL REPORT ON THE IRA PROJECT MAR. WP 4 WORK PACKAGE.**

### **CHARACTERIZATION OF THE BEHAVIOUR OF TOXIC CLOUDS IN PORTS, ORIGINATING FROM SPILLS.**



## STRUCTURE OF THE REPORT.

1. Project summary
2. Structure of the exercises performed.
3. Typical exercise.
4. Closing event
5. gaps and conclusions
6. Lessons learned
7. Recommendations
8. The way forward

## 1.PROJECT SUMMARY.

The objective of the IRA MAR WP4 project was, in a broad sense, to locate weak points in the response to incidents in which SNPDs were involved and which could cause toxic clouds in the vicinity of the damaged vessel. During the exercises that were carried out, the areas for improving the response and the real problems encountered by the maritime, port and civil protection authorities and in collaboration with other health, industrial and order entities were revealed. audience. etc... they must face the event.

The need for a rapid reaction, coordination of actions within limited time frames and the need to increase the technical, material and training capacities of all actors involved at all levels was revealed. We understand that this is a positive step and in the right direction, but which must have continuity over time, in Spain has already started planning a program of exercises in other ports of general interest not covered by the IRA MAR project which will begin in March, as well as an evaluation of the different areas of improvement in the ports where the exercises have already been carried out.

In Spain, the project consisted of carrying out 13 simulations in as many ports to improve intervention systems in the event of possible emergencies caused by marine pollution generated by a toxic cloud of chemical origin. In these exercises, the structures of the different agents involved are implemented and it is verified that the operational procedures established to respond to cases of marine pollution work. The degree of coordination as well as the manner and time of response to the emergency are also evaluated.

In short, it is to examine the response capacity of the Spanish Maritime Administration in terms of direction, coordination and efficiency in cases of chemical pollution involving harmful liquid substances.

During the Workshop that have been developed in Madrid in January, deficiencies that could have been detected during the exercises will be highlighted, both at a technical, material and human level, and improvements to procedures will be proposed to ensure that if an incident of this type occurs, the best possible answer should be made.

## 2. STRUCTURE OF THE EXERCISES CARRIED OUT.

The structure of the 13 exercises carried out within the framework of WP4 of the IRA MAR project focused on the evaluation of all the factors which influence the response to an incident of contamination by HNS products with the consequence of the development of a toxic cloud .

In these, we have tried, in collaboration with those mainly responsible for the response, to locate the gaps or bad practices that make the response ineffective, either due to lack of resources, trained personnel, coordination, etc.

All have been discussed at length and in depth in each of the proposed scenarios and the conclusions have been developed in other parts of the report.

o Communication of the emergency, its channels, emission of the polrep and the products concerned.

o Procedures for communicating to other authorities

o The plans that need to be activated, who activates them and who directs them.

o emergency management.

o Evaluation of spilled products (we will define them soon with the maritime captain) using the Aloha application. Study of their behavior.

o Location of on-board documentation, loading plans, HNS in other warehouses, SOPEP, etc...

o Contacts with Feique and CECIS of DG ECHO.

o Response actions on board by the crew.

o Study of the structural condition of the vessel based on the characteristics of the spill, whether there was an explosion, grounding, etc. and whether the ship should be abandoned.

o Means on board to minimize risks and incidents.

o External actions, study of cloud drifts, towing, etc.

o Possibility of lowering the cloud with water in complete safety, ability of port tugs to do so in complete safety (PPE on board?).

o Means of response of the stakeholders involved. AA.PP, SASEMAR Maritime Captaincy, Chemical Industry, Navy, UME, Civil Guard; Civil Protection, Fire Brigade etc.... Check if there are any collaboration agreements with them.

o Realistic response times.

o ATEX and PPE resources of said establishments.

o Number and availability of personnel trained for these incidents and activation time.

o Equipment compatibility.

o Decontamination of participants.

o End of year, other questions related to the response, Gaps observed and lessons learned.

### 3. TYPICAL EXERCISE

## EMERGENCY DRILL WITH CHEMICAL TANK IN THE WATERS OF THE PORT OF HUELVA (IRA-MAR PROJECT)

Huelva, January 24 and 25, 2023



EMERGENCY EXERCISE WITH CHEMICAL SHIP IN THE  
WATERS OF THE PORT OF HUELVA  
(IRA-MAR PROJECT EXERCISE WP4)

## **A.- BACKGROUND, LEGAL FRAMEWORK, SCOPE OF APPLICATION.**

### **1. BACKGROUND.**

The International Convention on Cooperation, Preparedness and Fight against Hydrocarbon Pollution of 1990, known by the acronym OPRC 90, ratified by Spain on January 12, 1994, with entry into force generally and for Spain from May 13, 1995, have as their objective international cooperation and mutual assistance in major marine pollution incidents, and the development and maintenance in the States Parties of adequate preparedness and response capacity in the event of marine pollution emergencies caused by hydrocarbons. The OPRC 90 Convention determines in its article 6 the obligation for the States Parties to establish a “National System” to promptly and effectively deal with hydrocarbon pollution events. Likewise, this same article establishes an exercise program for organizations fighting against oil pollution and training relevant personnel. For its part, its Protocol on Cooperation, Preparedness and Fight against Pollution by Noxious and Potentially Hazardous Substances, 2000, known by the acronym OPRC-HNS 2000, ratified by Spain on January 27, 2005, with entry into force on January 14 of June 2007, in its article 4, it establishes these same obligations for pollution events due to harmful and potentially dangerous substances.

### **2. LEGAL FRAMEWORK.**

The National Response System (SNR) in the event of marine pollution, approved by Royal Decree 1695/2012, is applicable in all cases of accidental or deliberate marine pollution, regardless of its origin or nature, that affects or may affect the marine waters over which Spain exercises sovereignty, sovereign rights or jurisdiction, such as the Spanish coasts.

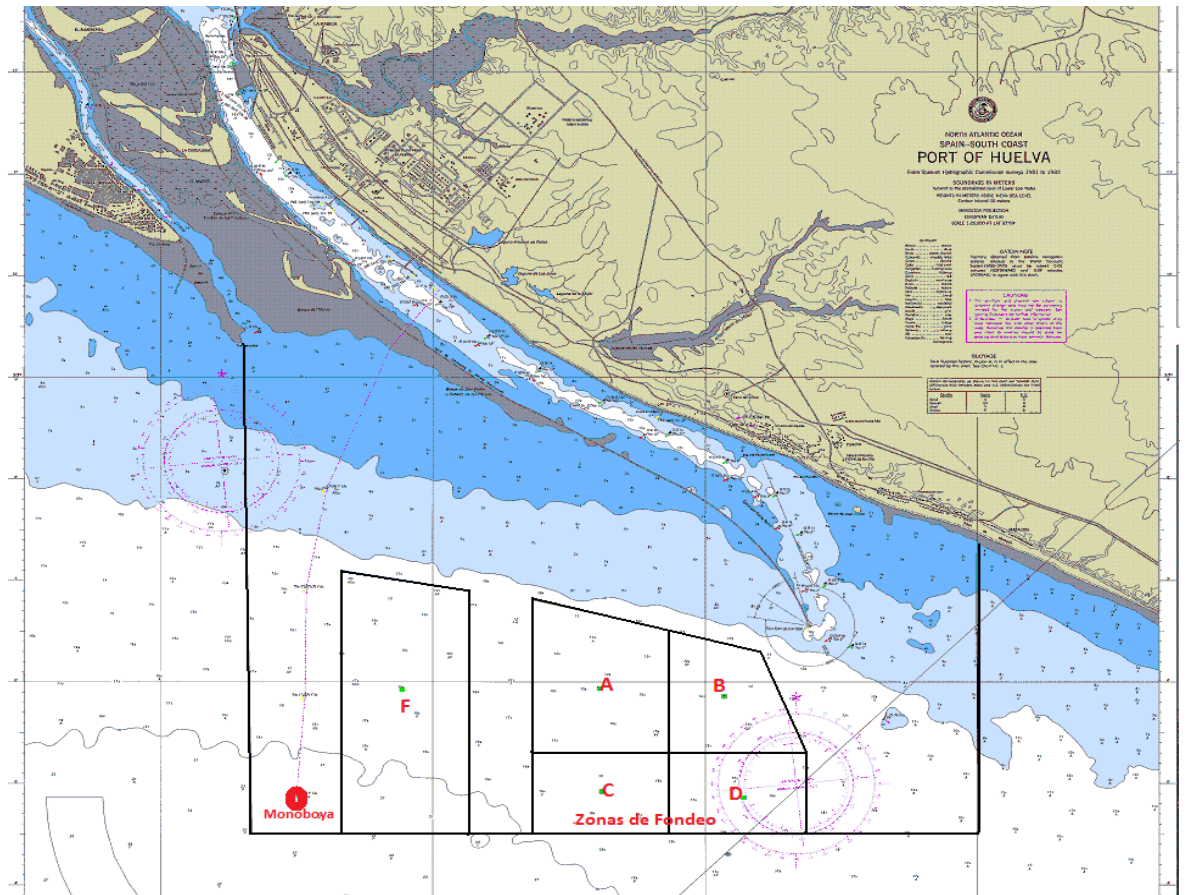
The National Response System contemplates two subsystems, which correspond to its areas of action, the maritime and the coastal. The maritime field includes the National Maritime Plan (PMN), approved by Order FOM/1793/2014, of September 22, 2014, along with lower-level internal maritime plans such as port and maritime terminal plans.

Said PMN will be activated when the pollution event affects maritime waters, and internal plans, in relation to ports, goods handling terminals, maritime resource exploitation platforms or any maritime facility located in Spanish waters. In addition, it establishes the response structures, operational procedures and the material and human means to respond to any type of marine pollution.

Likewise, the coastal area includes the State Plan for the Protection of the Seashore against Pollution, approved by Order AAA/702/2014, of April 28, together with the regional plans, in this case the Emergency Plan. against the risk of contamination of the coastline in Andalusia (PECLA), approved by Agreement of June 10, 2008, of the Ministry of the Interior of the Government of Andalusia, and with local and other plans.

### 3.- SCOPE OF ACTION.

This exercise of the IRA-MAR Project. WP4 is a local level exercise to combat marine pollution of chemical origin, which will develop between January 24 and 25, 2023 in the service areas I of the Port of Huelva, originating in the navigation channel accessing the port considering a situation of leakage of a dangerous and toxic chemical product such as ammonia (NH<sub>3</sub>), with two action scenarios Scenario 1: waters of the navigation channel of the Port of Huelva, in front of the South Pier; Scenario 2: South Pier terminals and facilities



This exercise is integrated into the IRA-MAR Project. WP4 is also incorporated into the training and periodic simulation exercises for activation of the National Maritime Plan, defined in article 30 of Order FOM/1793/2014. The activity will consist of a simulation with figurative means, without deployment of real means against marine pollution by SNL. A table exercise will be carried out with the main actors in the response to an incident in which SNNP are involved.

## **B.- DESCRIPTION AND OBJECTIVES OF THE EXERCISE.**

### **1.- DESCRIPTION.**

In this exercise, the Maritime Captaincy of Huelva, personnel from the Pollution Area of the General Directorate of the Merchant Navy (DGMM), belonging to the Ministry of Transport, Mobility and Urban Agenda, and the Maritime Rescue and Safety Society (SASEMAR), The Port Authority of Huelva, and Emergencies 112 Andalucía, in collaboration with other entities and companies, will carry out a simulated leak of a chemical product, originating in a scenario in which a chemical tanker sailing out of the Port of Huelva would be involved. , loaded with ammonia from the Factory involved in the incident terminal



The exercise will be carried out in 2 days, the first of which will be dedicated to the assessment of the procedures to determine the calculation of the dispersion of a toxic cloud, together with the CCS SASEMAR in Huelva

On the second day, an exercise to combat chemical pollution will be carried out without the deployment of real means to counteract the effects of a possible fictitious leak of ammonia from a leak caused on the deck of the ship VENTURE XXII due to human error during a maintenance operation in one of the lines on deck.

The confusion generated by the leak causes the ship to fall to starboard, specifically touching the sandy bottom, although without becoming stranded.

Unaware of the extent of the damage, as well as the impact on the integrity of the hull due to contact with the bottom, the captain decides to anchor where he is in order to assess the situation and assist any possible injured on deck.

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As a result of the ammonia leak on deck, the following events are triggered that require the activation of the different emergency plans with their response teams:

- Due to the ammonia leak, two crew members affected by inhalation of toxic gases (ammonia) need medical attention. evacuation required
- Contact with the bottom forces the captain to anchor the ship in the same channel as he does not know the extent of the damage that the hull could suffer: probing of the side ballast



tanks is required to see if they are affected and to what extent and the external inspection of the hull by divers.

Additionally, although the initial leak has been small and is considered resolved (it is considered that it has been dispersed naturally), there is a risk of a second, larger ammonia leak occurring, since the affected line on the deck has It is full of product (approx. 2000 liters) and it is not possible to reduce it without knowing the status of the rest of the line and valves after the breakdown. This situation poses a threat to nearby land areas and will require coordinated measures with emergency services on land to protect the population (confinement and/or evacuation).

The contingency plans that will be activated will be the following:

- PAU (Self-Protection Plan of the Port of Huelva) in category 3
- PMN (National Maritime Plan for response to pollution of the marine environment), situation 2.
- PTEAND (Territorial Emergency Plan of Andalusia. Emergencies 112 Andalusia)

## 2.- OBJECTIVES.

### 2.1. Goals

- Test the constitution of the response structures and check the established operating procedures, as well as use the material (simulated) and human means available to respond to the contamination scenario contemplated.
- Evaluate the degree of coordination between the different Administrations, Organizations, Institutions and companies involved in a marine pollution event and in its response, in accordance with the provisions of the National Marine Pollution Response System.
- Location of the response groups in the management of LCC and chemical risk equipment, means and techniques, their response times, availability and human and material resources that would be available in a similar case.
- Proposal for the review of the PMN with possible amendments based on the conclusions derived from the exercise.
- Evaluate the capacity of the Spanish Administration in the direction, coordination and response to a chemical contamination event in events in which harmful liquid substances are involved.

### 2.2. Specific objectives:

#### 2.2.1. Coordination.

Establish the phases and situations of the emergency and the use of response means in the event of chemical marine pollution, taking into account the possible risks and vulnerable areas.

- Evaluation of the possible damage that the event may cause to people, property and the marine environment.
- Improve coordination between the different activated plans
- Strengthen and promote cooperation between the General Directorate of the Merchant Navy, Emergencies 112 Andalusia, SASEMAR, the Port Authority and companies related to the response and fight against pollution.
- Improve response coordination mechanisms in the event of chemical contamination between maritime entities and companies (private sector) and the Maritime Port Administration.
- Improve the training of personnel involved in the response, clarify their roles and responsibilities in the event of a marine pollution event.

▪ Evaluate the shortcomings when dealing with an accident with HNS in this specific port.  
2.2.2. Operational.

- Determine the correct monitoring of the established operational procedures, as well as the response and action times with the different means, and their possible optimization.
- Strengthen cooperation and understanding between the different operational groups.
- Check the security standards that should be achieved in the response.
- Check the status and adequacy of the LCC and chemical risk equipment deployed during the exercise and the potential combination of equipment from different agencies or organizations, as well as their coordination.
- Evaluate the possible trajectories of the toxic cloud in different scenarios through the ALOHA program.

### 3.- PLANNING AND DEVELOPMENT OF THE EXERCISE.

#### 3.1. Location.

The contemplated event will take place in port waters of service areas I of the Port of Huelva, within the navigation channel, in front of the South Pier. Coordinates 37° 8.8' N, 6° 52.9' W



The meteorological conditions of the prevailing wind during the development of the exercise will be simulated to ensure the impact of the areas that allow verifying the operation of the desired protocols and equipment, so in this case a SW wind with force 3 will be used.

The state of the tides will be the real one for the days and times in which the exercises take place. The times referred to in the document are Local Time, unless otherwise indicated.

#### 3.2. EVENT: CHEMICAL CONTAMINATION, ANHYDROUS AMMONICA LEAK

##### 3.2.1. Description of the event

Chemical tanker VENTURE XXII, IMO No. 9999999, with pilot on board, in full load departure maneuver from the FERTIBERIA terminal located in zone I (interior of Huelva estuary), with a cargo of 82% anhydrous ammonia and phenol, both products considered SNL of Annex II of the MARPOL Convention, suffers a failure on deck due to a small fire caused by maintenance operations that produces an ammonia leak when the starboard cargo tank line 3 is affected.

As a consequence of the breakdown, a first small ammonia leak occurs. As a result, two crew members were injured for having breathed the toxic gas; Likewise, the event generates a situation of confusion on the bridge that causes the ship to momentarily lose its course, causing contact between the ship and the bottom on the right bank of the Ría de Huelva, in front of the South Dock in the sandy shallows of the breakwater. Juan Carlos Primero.

The captain at that moment decides to anchor in the same place until the damage is assessed and the injured are treated. The side ballast tanks are probed and it is observed that they are suffering from damage, so fears that the integrity of one or more SNL cargo tanks may be affected. Given this situation, it was decided to subject it, when safety conditions permit, to an underwater inspection.

Once the ship is anchored, the captain requests evacuation and medical attention for the injured and informs that they are proceeding to review the damage suffered on deck. The crew members have appropriate protective clothing.

Additionally, and since the load line affected by the breakdown remains full and the status of it and the adjacent valves is unknown, there is a well-founded risk of a second, larger leak occurring

(the pipe remains full with approximately 2000 lts). This causes emergency services on the ground to be contacted so that they can organize preventive and response measures in the affected area or at risk of being affected due to weather conditions.



The exercise will end once the integrity of the damage in the line on deck has been reviewed, it can be emptied into one of the cargo tanks and new leaks are ruled out.

At that time, it is already possible to carry out an underwater inspection by which the feasibility of docking the ship at the terminal with the assistance of tugboats is determined, to proceed with its unloading, tank cleaning and degassing.

### 3.2.1.1. Characteristics of the vessel involved:


Nombre: VENTURE XXII  
 IMO: 9999999  
 Bandera: Turquía  
 Tipo buque: Chemical Product/tankers  
 Arqueo GT: 3.726 GT  
 Peso Muerto: 5.890 DWT  
 Eslora: 100,0 metros  
 Manga: 16,5 metros  
 Calado max: 6,8 metros  
 Año constr.: 1998

Current load: ANHYDROUS AMMONIA (4,000 tn), Class 2.3 / PHENOL (1,700 tn), Class 6.1  
 Both products classified in MARPOL Annex II / IBC Code for transport in bulk maritime.

### 3.2.1.2. Product characteristics:

In this event, a leak of the following product occurs:

ANHYDROUS AMMONIA 82%. UN number: 1005; Quantity: approx (?) m<sup>3</sup>

Amoniaco Anhidro							
<b>1 Identificación de la sustancia/mezcla y de la sociedad/empresa</b>							
<b>1.1 Identificador del producto</b>							
Nombre comercial del producto	Amoniaco anhidro 82%; Amoniaco grado metalúrgico						
Nombre químico	Amoniaco						
Sinónimos	Amoniaco Líquido, Amoniaco Licuado, Amoniaco Anhidro.						
Formula química	NH <sub>3</sub>						
Número de índice EU (Anexo 1)	007-001-00-5						
CE No	231-635-3						
CAS No.	7664-41-7						
REACH o Número nacional de registro del producto	01-2119488976-14-0038						
<b>1.2 Usos pertinentes identificados de la sustancia o de la mezcla y usos desaconsejados</b>							
Usos identificados	Distribución y formulación, como sustancia intermedia en diversos procesos industriales, aditivo de proceso como agente auxiliar, producto químico de laboratorio, producto de limpieza, regulador de pH, fertilizante.						
Usos desaconsejados							
<b>1.3 Datos del proveedor de la ficha de datos de seguridad</b>							
Nombre de la compañía	FERTIBERIA, S.A..						
Dirección de la compañía	Paseo de la Castellana, 259 D. Plantas 47 y 48 - 28046 Madrid						
Teléfono de la compañía	Central: 91.586.62.00; Fábrica de Avilés: 985.57.78.50; Fábrica de Huelva: 959.28.12.11; Fábrica de Palos: 959.49.24.00; Fábrica de Puertolano: 926.44.93.00; Fábrica de Sagunto: 962.69.90.04						
e-mail de la compañía para FDS	<a href="mailto:reachferti@ferti.es">reachferti@ferti.es</a>						
1.4 Teléfono de urgencias	Fábrica de Avilés: 985.57.78.50; Fábrica de Huelva: 959.28.12.11; Fábrica de Palos: 959.49.24.00; Fábrica de Puertolano: 926.44.93.00; Fábrica de Sagunto: 962.69.90.04						
<b>2 Identificación de los peligros</b>							
De acuerdo con la Directiva 548/67/CEE R10; T/R23; C/R34; N/R50							
De acuerdo con el Reglamento CE 1272/2008 [CLP]							
2.1 Clasificación*	Gas inflamable, Cat.2.: H221. Gas a Presión (Gas licuado): H280. Corrosión Cutánea, Cat.1B.: H314. Toxicidad Aguda por Inhalación, Cat.3.: H331. Peligrosa para el medio ambiente acuático, Cat.1.: H400.						
2.2 Elementos de la etiqueta		Pictogramas	Palabra de advertencia	Indicaciones de peligro	Consejos de Prudencia		
			Peligro	H221 H280 H314 H331 H400 EUH071	P210 P260 P280 P303+P361+P353 P305+P351+P338+P310 P403+P233		
2.3 Otros peligros							
No cumple con los criterios de sustancia PBT ni mPmB							
* Para conocer el significado completo de las frases R y/o indicaciones de peligro (H): ver sección 16							
<b>3 Composición/información sobre los componentes</b>							
3.1 Nombre	N° CE	N° CAS	%(p/p)	Nombre IUPAC	Clasificación D. 67/548/CEE	Clasificación Rgto. 1272/2008	Límites de concentración específicos
Amoniaco anhidro	231-635-3	7664-41-7	>=99,5%	ammonia	T/R23 C/R34 N/R50 R10	Flam Gas2 Press Gas Skin Corr.1B Acute Tox. Inha3 Aquatic Acute1	

ANHYDROUS AMMONIA 82%. UN number: 1005; Quantity: approx (?) m3 Product classified in Annex II of the MARPOL 73/78 Convention for maritime transport in bulk, category Y

### 3.2.2. Scenarios and response actions

Given this situation, it is determined necessary to carry out various corrective actions aimed firstly at assessing the scope and associated risks, protecting the population from a possible second escape and caring for the injured, and finally reversing the state of the ship. to a security situation.

These actions will take place in two different scenarios.

#### **Scenario 1: ship and navigation channel.**

In the navigation channel, with the ship at anchor, the following will be carried out:

- Isolate the vessel and suspend traffic. A risk area will be established.
- The evacuation of the injured will be attempted with the assistance of the Port of Huelva firefighters, equipped with chemical suits and self-contained breathing apparatus, in coordination with the health services on land.
- The extent of the structural damage to the hull will be assessed with the assistance of the crew and, when conditions permit, the underwater inspection will be carried out.
- Measures will be adopted to reduce the risk of a new leak by checking the cargo line on deck and subsequently emptying it.

#### **Scenario 2: Facilities and terminals at the South Pier**

Considering the risk of a possible second toxic cloud, its extent and danger, as well as the meteorological conditions, we will proceed to:

- Establish a risk and exclusion zone by cutting roads, transferring population, confinement,...
- Evacuation of facilities, public buildings, establishment of evacuation routes

### 3.3. DEVELOPMENT OF THE EXERCISE.

#### 3.3.1. Sequence of events and required information contributions:

The LCC exercise will begin at 09:00 HL with the notification of the first leak and contact with the bottom of the damaged vessel, and its estimated completion is at 12:30 with the elimination of the risk of new leaks.

Hora L	Description	Information contributions / observations	Entity
09:00	Ship suffers a leak on deck during the departure maneuver.	-	-
	Officer on deck confirms two crew members injured	-	-
	Momentary contact with the sandy bottom	-	-
09:30	Incident communication from the ship to Huelva Port Control (HPC).	Notice of leak, contact with the bottom and injuries	Ship Captain / Pilot
09:45	• Incident communication to competent authorities: o Huelva Port Authority o Maritime Captaincy o Emergency 112	-	Huelva Port Control
10:00	Activation of the Port PAU	Response groups alert	APH Director
	PMN alert statement by Harbour Master Office.	-	Harbour Master
	PTAND pre-emergency declaration by DGJA	-	Government Delegate
10:30	PAU technical advisory committee meeting	Ex-officio members plus CM security coordinator; 1 <sup>st</sup> Chief SIX; company involved in the incident	Technician PAU Director
		<ul style="list-style-type: none"> <li>Traffic suspension</li> <li>SEIS mobilization for evacuation of wounded/serv coordination.</li> <li>sanitary and afloat services (ERAs provision)</li> <li>PMN activation; ship instructions to ensure safety</li> <li>Determination of possible land area affected</li> </ul>	
11:00	Activation of PTAND	South Pier Evacuation; La Rábida, ...; establishment of road closures (External Emergency Plan procedure)	Urgences 112-JA
11:30	Check loading and emptying line. Eliminated leak danger		Harbour Master
	Underwater inspection and emptying of the line	SEIS or UME Firefighters	
12:30	Vessel transferred to mooring point. End emergency		

### 3.3.2. Deployment of maritime/land resources:

This is a communications exercise without media mobilization.

#### 4.- COMMUNICATIONS: PROCEDURES AND MEANS

Written communications via email will have “Exercise-” visibly included in the subject line. Communications through written mobile phone applications will begin with the word “EXERCISE- EXERCISE- EXERCISE” or “SIMULACRE” in capital letters.

Verbal communications will indicate in one way or another that it is an “EXERCISE” or “SIMULACRE.”

The working channel for radio communications will be VHF channel 6 of the marine band.

#### 5.- WEATHER FORECAST

The meteorological conditions considered in the exercise will be simulated:

SW wind Force 3 with slight waves

Notwithstanding the above, a table with a real forecast is provided as information of interest to the participants.

The king tide will be considered for the exercise.

#### 6.- EXERCISE ASSESSMENT

Subsequently, participants will be asked for their technical opinion on the exercise to draw conclusions regarding the functioning of communications and the achievement of objectives.



## Acronymes

APH	Port Authority of Huelva
BEC	Strategic Base to Fight Pollution - SASEMAR (Seville)
CCS-LCC	Rescue Coordination Center and Fight Against Pollution in Huelva
CMH	Harbour Master Office of Huelva
CNCS	National Maritime Rescue Coordination Center
CPCS	Port Services Control Center Port of Huelva
DGJA	Delegation of the Government of the Junta de Andalucía
DGMM	General Directorate of the Merchant Navy
DRACE	DRACE Infraestructuras S.A.
GC	Provincial Command of the Civil Guard in Huelva
GOPD	Drift Prediction Operational Group (SASEMAR)
HPC	Huelva Port Control.- Port of Huelva Maritime-Port Traffic Control Center
LCC	Fight Against Pollution
MITMA	Ministry of Transport, Mobility and Urban Agenda
OPRC 90	International Convention on Cooperation, Preparedness and Combating Oil Pollution of 1990
PIM	Interior Maritime Plan against Marine Pollution
PMN	National Maritime Plan against Marine Pollution (Order FOM/1793/2014)
SASEMAR	Maritime Rescue and Safety Society
SEIS	Fire Fighting and Rescue Service (Port of Huelva)
SGSCIM	General Subdirectorate of Safety, Pollution and Maritime Inspection of DGMM
SNR	National Response System against Marine Pollution (R.D. 1695/2012)
SPCOSTAS	Provincial Coastal Service in Huelva (MAPAMA)
SUBGOB	Government Subdelegation in Huelva

## 4. CLOSING EVENT

IRA-MAR PROJECT  
WORK PACKAGE 4 WORKSHOP.  
Palacio de Zurbano. Madrid  
16-17 January 2024.



## Workshop on respond to Gas clouds from HNS in ports Work Package 4.

While the frequency of emblematic maritime incidents in Europe has fallen sharply, maritime transport is undergoing many changes that are altering the associated risk profiles. New concerns are emerging in the face of increasing maritime traffic and larger ships, new cargoes, innovative propulsion systems with new properties, the development of offshore wind farms, and meteorological risks reflecting the consequences of global warming. These changing risk profiles require us to adapt our emergency preparedness, both in terms of capacity and methodology.

The problems and demands to tackle with incidents where HNS are involved mainly if these products released could produce gas clouds are of great concern for the maritime, environmental and civil protection authorities ; A quick and coordinated response have been rehearsed during the last 18 months in 13 different exercises alongside different main ports in Spain, the objective of this Workshop is to share our experience to the other parties of the project as well as to exchange different point of view in dealing with this kind of accidents.

In addition, the most recent marine pollution preparedness and response exercises organised at national have shown the importance of better coordinating the actions of the various response services, strengthening the land-sea interface in maritime emergency response and identifying new port risks.

Finally, new technologies such as drones have enormous potential to improve the response to maritime emergencies involving the spillage of oil or other chemicals. These new technologies make it possible to improve the effectiveness of the response by more rapidly acquiring the information needed to understand an event and its extent, to have better quality information, and to rapidly define the best response strategies. That's why it's important to understand how they perform in the varied uses and situations presented by maritime emergencies.



## PROGRAMME

DAY 1 Tuesday 16 January:

9:00-12:30 – Workshop on respond on Gas chemical clouds in ports.

9:00-09:30: Welcoming remarks and round table of stakeholders

09.30 - 09.50: Introduction of the IRA MAR PROJECT.

09.50 - 10.20: The management of Incidents with HNS, Sea perspective. .

10.20 - 10.40: The management of Incidents with HNS, Shore perspective.

10.40 - 11.00: Examples of exercises carried out during the WP.4

**11:00-11:15: Coffee break**

11:20 -11:50: Presentation of SGMer WP.

11:50-12:10: Presentation of Sea Alarm WP.

12:10 -12:30: Presentation of CEDRE WP.

12:30 -12:50: Presentation of ISPRA WP.

13:00 -13:30: Main overview of the project from the Director General de la Marina Mercante.

**13:30 - 15:00 Buffet in Palacio de Zurbano Premises.**

16:00 – 18:00: tour and explanation of duties and capacities of the National Maritime Rescue and Coordination Centre MRCC from SASEMAR in Madrid.



DAY 2 Wednesday 17 January:

Workshop on respond on Gas chemical clouds in ports-

9:00-09:45: Specific Gaps and Findings in the management of HNS gas clouds incidents

09.45 - 10:30: Lessons learned from the exercises.

**10:30-11:15: Coffee break**

11.15 – 12:00: Recommendations.

12.00- 12: 40: The way forward, new technologies to cope with such incidents.

12.40 - 13:00: Wrap up and finish of the workshop

## 5. Gaps and Findings in the management of HNS Gas clouds incidents

- Be sure what kind of plans need to be activated and in what scale.
- One of the most critical issues is the command of the emergency, who is who in the direction.
- What authority is in charge, sometimes it is not very clear for the different stakeholders.
- There are gaps identified in the coordination between the NCP ( PMN ) and their relation with the PAP ( Harbours Protection Plans) as well as with the territorial Plans.
- In some cases, we have identified lack of understanding of the procedures to deal with these incidents.
- The procedures need to be tested in exercises and modified if necessary.
- The Support from both the CEREMMP (Support from SASEMAR Headquarters) and MIR-ICE should be improved.
- In some cases, the information provided was released slowly and very basically
- Crews in almost all the cases have a lack of PPE (personnel protective equipment) for HNS.
- Neither have training in the use of them.
- Tugs and salvage boats do not have positive pressure to get close to a ship in distress but in one case (Tarragona port).
- The use of the manuals like CANUTEC ERG 2020 or WestMoPoCo HNS it is not widely known by many of the stakeholders.
- In some cases, we find out that the use of common documents like the *convenio entre Puertos del Estado and the DGMM in case of emergencias* was missed.
- We observed cases where some local stakeholder do not know the exact responsibility allocated to them in an incident like this .
- We have observed that sometimes information about the products carried on board is not available from the ship-need to clarify the ways to get this info.
- If the ship is not berthed in some cases it is not clear who is in charge of the emergency-Port authority or harbour master office.
- We have been aware that in many cases the information of the incident don't get to the main stakeholders in time.
- Not all the ships nearby have radio channel listening, therefore in case of an emergency, making difficult to contact them in cases like that.
- As these incidents have a high component of Civil protection response and measures, we observed that there are not contemplated in the Regional Civil Protection Plans, unless the ship is alongside - the situation is contemplated in the Port Authority plans.
- There are difficulties in allocated responsibilities to a terminal when the ship is no longer in operation- in some cases they said they are responsible just in operation otherwise it is not clear who is in charge, the ship or the terminal.

- There are not a proper plan of continuous training for the harbour master authorities.

## **6. Lessons learned from the exercises.**

- Having in mind that the response to these incidents involved many stakeholders it is of paramount importance carry out periodic exercises to be trained.
- To be aware of the chemical experts you could count is critical , the best one is the nearer.
- Sometimes the procedures to carried out operations are not well known by the responsible ones.
- A national list of technical experts in this field should be made with the cooperation of civil protection authorities.
- We find out that in some cases there is not a list of capacities , resources and assets to carried operations at regional or port level.
- All the decisions and assessment of the incident should be made with the safety first principle.
- We find out that in almost all the cases the Port, maritime as well as civil protection authorities do not have the proper PPE to go near the ship involved in a gas cloud incident.
- Furthermore the Salvage tugs owned to SASEMAR don't have the possibility to get near a ship with such a problem
- SASEMAR do not have this capacity so far and it could be developed.
- The use of other national capacities to response to the emergency have been put in evidence through practically all the exercises.
- Not a single Port have enough capacity by themselves to cope with an incident of this type to be extended on the time.
- Therefore the study of the means to response in the local areas should be a task made asap by the port and maritime entities.
- One of the positive lessons of the Project is that the constant change of experience, assistance to exercises with all the local and regional civil protection authorities allow to the future responders know procedures and capacities.
- The use of common documents like the convenio entre Puertos del Estado and the DGMM in case of emergencies should be encouraged.
- In order to take advantage of other stakeholders equipment's and supplies it is necessary to know the characteristics of the equipment to be sure the responders could use it in support of their own .
- And what kind of products you can use it.
- To know in advance the characteristics of the tugs and auxiliary vessels in port it is of great importance as well as their bollard power , also to know the water spraying capacity.
- We have identified that in some ports where there are operations with chemical tankers there are not provided with the quick release hooks ( QRH ), it could be a factor of risk in case of an incident when the ship is alongside.



- All the information regarding to the evaluation of the gas cloud should be submitted as soon as possible to all stakeholder and civil protection to take measures to inform the population and diminish the risk.
- The same applied with the currents, winds, State of the sea etc...
- Some information official should be appointed to inform about the current situation of the incident .
- Information should be send also to the police and Guardia civil in order to stablish an exclusion area at sea as well as in land, this areas should be stablish according with the indications of the ALOHA tool and other systems of measurement about the quality of air.
- The municipalities should be at all times be informed of the development of the emergency.
- Some legal advisor should be appointed to cope with liabilities and responsibilities
- All the steps taken in the management of the emergency should be logged.
- Attention should be made to sampling ( if possible ) and the chain of custody of the samples.
- In some cases we have identified that the ships do not have pendulous cables in operation in chemical terminals and therefore making an towing operation very difficult , it can be a good practice and make it compulsory .
- A quick activation of the response assets is of paramount importance

## 7. Recomendations in the management of HNS Gas clouds incidents

- Main one , to be prepared.
- Customized what kind of training you need.
- According with the characteristics of the port and products loaded/unloaded.
- Knowledge and use of specific applications and tools.
- ALOHA, Chemap.....
- All the main stakeholders must have personal training in the use of such programs.
- All the main stakeholders should have knowledge of sources of information about HNS products.
- The knowledge of the manuals like CANUTEC ERG 2020 or WestMoPoCo HNS should be encouraged between the stakeholders.
- Identified strenghts.
- knowledge of behaviour of products in your ports.
- Technical assistance from factories and refineries nearby.
- Try to identified in advance the shortcomings in the management of these particulars incidents.
- It is very important carry out periodical exercises with all the stakeholders. To be sure all of them are aware of their respective responsibilities .
- The existence of specialised ground teams is an important asset, the experience, equipment and staff should be made available to the maritime domain , mainly through agreements between institutions.
- MIRG concept of teams of firefighters should be developed with the Support of Maritime experts and carried out joint exercises.
- Agreements between the Port authorities and local firefighters should be encouraged.
- In some cases we observed that not all the entities related to the response have the same information than others , a clear channel of work should be stablish from the beginning and written in the Contingency plans.
- Safeseanet is not available to all stakeholders, the information should be shared at the same time and stablished the protocols to do so.
- Not all the ships nearby have radio channel listening, therefore in case of an emergency, making difficult to contact them in cases like that, it should be compulsory to have some officer on stand by in these ports.
- DGMM as well as SASEMAR should have a more deep training in this specific field of emergencies as well on the use of the PPE , drone with sniffers, infrared technology and new equipment developed by the market.
- Their personal should participate in national and international exercises between agencies.
- ALOHA is a very Good tool , but it is necessary to know its limitations, we do recommend to make al least two evaluations with the data provided by the

POLREP in order to provide accurate assessment of the situation from different sources ( CP and SASEMAR )

- Propose to EMSA as well as OMI develop syllabus for courses and workshops in training in this specific matters. OMI have courses but without some practical part.
- And make compulsory for Ports and Maritime agents to have this courses –in different levels.
- Include in Civil Protection Regional Plans some chapter on how to deal with this situations.
- In some cases we have identified that the ships do not have pendulous cables in operation in chemical terminals and therefore making an towing operation very difficult .
- As the Response time in an occurrence like this in some cases are very short it is recommended that previous scenario based evaluations should be made through the ALOHA tool .
- Improvement of the linguistic skills ( Englis.)of firefighters and personal in terminals should be encouraged.
- The inspection of records of exercises on board should be made by PSC officers .
- Stablish a training programme in this class of occurrences for the Harbour masters.
- In every Watch in the MRCC should be a trained officer in the use of ALOHA as well as other tools .
- Take advantage of the sources of information that the CC.AA could provide ( environmental situation , socioeconomic and other.... ).

## 8. The way forward and new technologies to cope with HNS Incidents.

- All the procedures and tools to tackle these kind of incidents should be tested and improved if necessary.
- Setting up working groups with the main actors to assess the performance of the plans and procedures.
- A national list of capacities, and resources to give support in this incidents should be made.
- A national list of experts in chemical incident should be made if it does not exist or updated if we have one.
- The existing specialised ground teams to support the response should be encouraged developing agreements between institutions.
- MIRG concept of teams of firefighters should be developed with the support of maritime experts and carried out joint exercises.
- As there are some ports that don't have agreements between the Port authorities and local and regional firefighters it should be encouraged by the local maritime and civil protection authorities
- The same applied with main chemical factories and refineries that have specialized teams and equipment.
- Implement and develop some kind of evaluation tool for the performance of training exercises, in the Project Sea alarm is going to deliver one and it could be a Good practise to stick to it or some similar.
- The use of Telegram as well as Teams in the management of the incidents should be encouraged having in mind the number of different stakeholders and the necessity to stay updated of the develop of the incident.
- National chemical industry contacts should be created and updated periodically (with the help of C.P directorate).
- Agreements with UME and NBQR Units of the Army, both unit have technical experts in chemical incidents as well as material and the **capacity of projection** in a very short time.
- Agreements with Navy; In some ports of Spain there are naval bases, with very well trained staff that could give support to the civil authorities also in very short spam of time.
- Agreements with Civil Protection, the use of their logistics bases and special knowledge in chemical incidents, made Civil Protection authorities a first actor in the resolve of such incidents.
- Agreements with G.C, their regional NBQR units could be of assistance, an also other branches like the Maritime service as well as SEPRONA.
- The National Police Corps (CNP) could give as well Support from their NBQR units.
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- And also very important the collaboration with the Firefighters different corps should be encouraged and work on it.
- The Use of assets of these institutions, mainly should be made by their proper channels having in mind that they will be under their command and responsibility .
- Use of Drones with sniffers.
- We are going to propose a plan of continuous improvement through exercises, we have made thirteen exercises so far into the IRA MAR Project, the idea is that we are going to cover all the main Spanish ports with similar exercises by ourselves.
- It would be advisable to develop some procedures about how to deal with these incidents from the point of view of legal aspects. The use of international support should be tested in exercises to be sure of what kind of help can we ask for, the time of deployment of such support, and to be sure that we talk the same language and use the same procedures and manuals .
- We have a good deal of trained staff, equipment and knowledge to face an incident of chemical release at sea and to the air and we need to work together .
- Make exercises of how to approach to a ship in distress.
- Use of Toxic industrial Chemical RAPID for major applications include chemical reconnaissance, survey and monitoring; Emergency Responder operations, event security, Critical Infrastructure Protection and environmental monitoring of industrial facilities.
- The necessity to have exercises with other international partners to exchange experiences and lessons learned.