



JRC CONFERENCE AND WORKSHOP REPORTS

Proceedings of the workshop on External Emergency Response Planning

*First workshop organised
under the Virtual Centre of
Offshore Safety Expertise*

5th-7th April 2017 (Ravenna, Italy)



Edited by:

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2017



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We express profound appreciation to the Italian Coast Guard for the local organization of the event and for their warm hospitality in Ravenna. In particular, we would like to acknowledge the enthusiasm and cordiality of Captain Pietro Ruberto, Captain Franco Maltese and warrant officer Armando Di Somma of the Port Authority of Ravenna.

We have appreciated the organizational efforts of the Italian Coast Guard, ENI and Saipem which allowed the inclusion of the POLLEX 2017 emergency exercise in the workshop agenda. We thank all personnel involved in the preparation and execution of the emergency demonstration that gave all participants the opportunity to follow it closely.

Let us also thank all participants for sharing their experiences and expertise on external emergency response planning and strategies for intervention in case of a major accident in the offshore oil and gas sector during the workshop held in Ravenna, Italy, on April 5th-7th 2017.

Last but not least, we sincerely thank the experts who actively contributed to the event:

- Mr. Ezio Mesini (President of the Italian Committee for Safety of Offshore Operations);
- Capt. Vittorio Pagotto, Lcdr. Fabio Borriello, Lcdr. Tommaso Pisino (Italian Coast Guard);
- Mr. Vincent Claessens (State Supervision of Mines, The Netherlands);
- Mr. Johannes Kool (Rijkswaterstaat sea and Delta, The Netherlands);
- Mr. Hugh Shaw (Secretary of State's Representative, United Kingdom);
- Mr. Jonathan Milne (Dept. of Business, Energy and Industrial Strategy, UK);
- Mr. Bryn Aril Kalberg (Petroleum Safety Authority, Norway);
- Mrs. Melania Buffagni (ENI);
- Mr. Robert James (Oil Spill Response Limited);
- Mr. Jens Hoffmark (International Association of Drilling Contractors);
- Mrs. Wendy Kennedy (BEIS, United Kingdom);
- Mr. Paolo Allara, Ms. Raffaella Pantile, Mr. Sergio Bomben (Saipem);
- Mr. Paolo Russo (University of Ferrara);
- Mr. Roberto Nicolucci (Techno HSE)
- Mr. Giancarlo Mangiapane (CREA);
- Mr. Frédéric Hébert (European Maritime Safety Agency);
- Mr. Malek Smaoui (REMPEC);
- Mr. Yoav Ratner (Ministry of Environmental Protection, Israel).

Foreword

Ensuring high levels of safety in the European offshore oil and gas industry is of paramount importance to the European Commission and to the Member States. To this purpose, Directive 2013/30/EU (also known as Offshore Safety Directive) introduced new safety requirements, and imposed additional duties on both the offshore industry and EU regulators.

In particular, Article 29 of Directive 2013/30/EU requires Member States to prepare, in cooperation with the relevant operators or owners and, as appropriate, licensees and the competent authority, external emergency response plans covering all offshore oil and gas installations or connected infrastructure and potentially affected areas within their jurisdiction.

Effective response to emergency situations resulting from major accidents requires immediate action and systematic and planned cooperation between oil and gas operators and the Member States' emergency response organisations, and with neighbouring countries.

Effective and efficient cooperation shall be attained through measures for the achievement of high levels of compatibility and interoperability of emergency response assets, i.e. equipment and expertise, and the coordination of additional emergency response resources by Member States' response organisations as the situation evolves.

Emergency response and planning should also make use of the existing resources and assistance available from within the Union, in particular through the European Maritime Safety Agency (EMSA).

The workshop on External Emergency Response Planning – supported by the **European Commission's Directorate-General for Energy (DG ENER)** – was jointly organised by **DG Joint Research Centre (JRC)** and the **Italian Ministry of Economic Development** (Directorate General for Safety of Mining and Energy Activities – National Mining Office for Hydrocarbons and Geo-resources) in collaboration with the **Italian Coast Guard**.

The event was the first workshop to be held under the Virtual Centre of Offshore Safety Expertise, and it covered one of the topics of primary interest to the Member States to guarantee high levels of safety and environmental protection in the EU waters.

The workshop was held on April 5th-7th April, 2017 at the premises of the Italian Coast Guard in Ravenna, Italy.

Sixty-eight (68) members of the offshore oil and gas community participated to the event, in particular:

- Representatives from sixteen (16) EU Member States, Norway, and the Commission;
- Representatives from the offshore industry (ENI, Saipem , Total, OVM Petrom, EDINA, Inagip);
- Representatives from the Industrial Associations (IADC, IOGP) and the Unions (IndustriAll Europe);
- Representatives from international agencies (EMSA, REMPEC);
- Representatives from Italian Academia (Universities of Bologna and Ferrara).

Member State delegates were representative of all EU offshore waters, i.e. Atlantic Ocean, Adriatic Sea, Baltic Sea, Black Sea, and East Mediterranean area. The complete list of participants can be found in Annex I.

The workshop was organised with the purposes of:

- Facilitating information sharing on the current arrangements and practices followed by the Member States concerning External Emergency Response Planning (EERP), including their strategies for intervention and coordination of operations and resources between MS, neighbouring countries and the offshore industry;
- Helping MS Authorities understand the different aspects to be considered and the challenges encountered in the execution of EERPs, and to feed them with new ideas on the possible improvement of their plans;
- Strengthening MS collaboration to improve the level of emergency preparedness;
- Discussing the role of the European Maritime Safety Agency (EMSA) in assisting MS with the preparation and execution of their plans (as per Article 10 of Directive 2013/30/EU).

The workshop combined sets of presentations and group exercises, followed by a plenary discussion to stimulate exchange of ideas. The agenda of the workshop is provided in the following section.

The first day (April 5th) was dedicated to the approaches adopted in different Member States (Italy, the Netherlands, and United Kingdom) and Norway to address External Emergency Response Planning, including the definition of roles and responsibilities, arrangements for coordinating resources, and challenges encountered by regulators.

The role of the industry in emergency planning and response was also discussed, i.e. ENI's management system, OSRL collaboration with national authorities, and IADC guidelines and step-by-step description of the Elgin incident.

During the first group exercise (organised by UK BEIS), participants were asked to provide answers to a number of questions related to various aspects of EERPs, thus highlighting the most challenging aspects of EERPs, and discussing past experiences, difficulties encountered, lessons learned, and new ideas to improve the preparation of External Emergency Response Plans.

The second day (April 6th) opened with presentations on technological innovations for emergency scenarios developed by Academia (University of Ferrara) and the Industry (Saipem, CREA).

The following sessions focused on the strategies for intervention and coordination in case of a major accident among the Member States and neighbouring countries (Italy, Norway, United Kingdom, Israel), and the activities of the Regional Marine Pollution Emergency Centre for the Mediterranean Sea (REMPEC) and the European Maritime Safety Agency (EMSA).

For the second (and third) exercise, participants were grouped based on their regional provenance (i.e. Atlantic Ocean, Adriatic Sea, Baltic Sea, Black Sea and East Med). The exercise aimed at stimulating discussions on how to best address all aspects which need to be in place should an accident occur, starting from an event which took place in the UK. It also aimed at strengthening collaboration among the Member States and between Member States and neighbouring countries.

Participants discussed the most urgent and relevant aspects to be addressed in case of a major accident, in order to put in place an efficient and effective response – particularly in case of events which may potentially affect neighbouring countries.

The purpose of the final group exercise was to foster the preparation of national and regional offshore emergency response plans in countries and regions where these are not yet well-established. The exercise was held at the conclusion of the workshop in order to encourage application of the experience shared and knowledge gathered through the presentations and previous exercises, regarding the content and preparation of emergency response plans, as well as the relevant available tools, services and instruments.

On the morning of April 7th, the Italian Coast Guard – in collaboration with ENI and Saipem – offered a demonstration of the emergency response procedures adopted in Italy should an offshore accident occur.

The objectives of the workshop were fully achieved. The JRC launched a survey just after the event and the feedback received from participants was excellent.

Agenda of the workshop

1stDay: 5th April 2017

8:30 Transfer from Hotel Galletti Abbiosi to Porto Corsini (Coast Guard Premises)

09:00-09:20 Registration

Welcome and opening of the Workshop

09:20-09:25 Welcome by the European Commission (A. Papandreou, DG ENER)

09:25-09:35 Welcome by the Italian Coast Guard (P. Ruberto)

09:35-09:45 Opening speech by the President of the Committee for Safety of Offshore Operations - Italian Competent Authority (E.Mesini)

09:45-09:50 Objectives and structure of the workshop (Stefano Tarantola, DG JRC)

PART 1. SETTING UP AN EXTERNAL EMERGENCY RESPONSE PLAN

SESSION I – Setting up an External Emergency Response Plan: Requirements of Directive 2013/30/EU and approaches from National Authorities (Chair Wendy Kennedy, BEIS - UK)

9:50-10:05 The requirements of Directive 2013/30/EU (Anastasios Papandreou – DG ENER)

10:05-10:35 Italian planning - the response to marine pollution (Roberto Cianella - MISE and Tommaso Pisino -Italian Coast Guard)

10:35-11:05 EERP approach in the Netherlands (Vincent Claessens-SSM & Jan Kool - Maritime ER Unit)

11:05 -11:25 Coffee/Tea break

11:25-11:55 The UK National contingency plan (Hugh Shaw, MCGA UK and Jonathan Milne, BEIS UK)

11:55-12:35 Discussion

12:35- 13:50 Lunch break (buffet)

SESSION I (cont'd) –Setting up an External Emergency Response Plan: Requirements of Directive 2013/30/EU and approaches from National Authorities

13:50-14:20 Overview of the Norwegian Approach (Bryn Aril Kalberg, PSA-NO)

14:20-14:35 Discussion

SESSION II – The relationship between Internal and External Emergency Response Plans: the role of the Industry (Chair Antonino Caliri, MISE - IT)

14:35 – 14:55 ENI's Emergency Response Management System (M. Buffagni, A. Ligrone, ENI)

14:55 – 15:20 Industry and Government Working Together: The role of the industry in emergency response planning (Robert James, OSRL UK)

15:20 – 15:45 IADC Guidelines and Cooperation with the National Authorities and the Elgin Incident (Jens Hoffmark, IADC)

15:45 – 16:00 Discussion

SESSION III - Challenges for Regulators in the preparation and execution of their External ERPs

16:00-18:00 First group Exercise, followed by Plenary Discussion (Organizer MCGA and BEIS, UK)

(including Coffee/Tea break)

Conclusions

18:00-18:15 Wrap-up session and conclusions

18:15 – Transfer to Ravenna (Hotel Galletti Abbiosi)

20:15 – Gala Dinner (offered by JRC)

2ndDay: 6th April 2017

8:00 Transfer from Hotel Galletti Abbiosi to Porto Corsini (Coast Guard Premises)

PART 2. PRACTICAL CHALLENGES IN THE EXECUTION OF AN EXTERNAL ERP

SESSION IV – Technological innovation for emergency scenarios (Art.29.4) (Chair Stefano Tarantola, JRC)

08:30 – 08:50 Oil Spill Response: two feasibility studies for recovery and monitoring (P.Allara & S.Bomben, SAIPEM)

08:50- 09:05 The use of mini-unmanned air vehicles for offshore surveillance and monitoring (P. Russo –University of Ferrara, R. Nicolucci -Techno HSE)

09:05-09:25 Offshore emergency: Lessons learnt & State of the art (CREA – G. Mangiapane)

09:25 - 09:45 Discussion

SESSION V – The European Maritime Safety Agency (Chair Joerg Koehli, DG ENER)

09:45 -10:05 The activities of the European Maritime Safety Agency (Frédéric Hébert)

10:05-10:20 Questions and answers

10:20-10:40 *Coffee/Tea break*

SESSION VI - Strategies for intervention and coordination in case of a major accident (Chair V. Claessens, SSM - NL)

10:40-11:00 Italian Strategies for intervention and coordination (V. Pagotto, F.Borriello – Italian Coast Guard)

11:00-11:30 Intervention and coordination in case of a major accident in the UK (Hugh Shaw - MCGA UK)

11:30-12:00 Emergency Preparedness offshore Norway (Bryn Aril Kalberg, PSA NO)

12:00-12:30 Discussion

12:30-13:30 *Lunch break (buffet)*

PART 3. COOPERATION BETWEEN MEMBER STATES AND NEIGHBOURING COUNTRIES

SESSION VII – Strengthening the collaboration in the EU and beyond (Anastasios Papandreou, DG ENER)

13:30 – 14:00 The activities of REMPEC (M. Smaoui, REMPEC)

14:00 – 14:30 Eastern Med Preparedness and Response for Marine Oil Pollution: current situation and future activities (Yoav Ratner- Israeli Ministry of Environmental Protection)

14:30 – 14:50 Discussion

SESSION VIII – EERP Implementation: Strengthening Collaboration

14:50 - 16:50 Second Group Exercise, followed by Plenary Discussion (Organizer BEIS and MCGA, UK)

(including Coffee/Tea break)

SESSION IX – EERP Preparation: Further developing region specific plans

16:50 - 18:20 Third group Exercise, followed by Plenary Discussion (Organizer DG ENER)

Conclusions

18:20-18:30 Wrap-up session and workshop conclusions

18:30 Transfer to Ravenna (Hotel Galletti Abbiosi)

3rdDay: 7th April 2017

8:00 Transfer from Hotel Galletti Abbiosi to Porto Corsini (Coast Guard Premises)

08:30-09:00 Briefing for the demonstration (Coast Guard personnel)

09:00-12:00 Offshore Demonstration on board of the vessel

12:00-12:45 *Light Lunch*

12:45 -13:15 De-briefing and conclusions

13:15 Transfer to Bologna Airport and/or Bologna Railway Station

Workshop presentations

All of the presentations provided at the workshop on External Emergency Response Planning are provided in the following sections.

Presentations are displayed below in compliance with the schedule of the event.

1 Objectives and structure of the workshop (S. Tarantola, DG JRC)



**The European Commission's
science and knowledge service**

Joint Research Centre

Workshop on External Emergency
Response Planning

Objectives and Structure

Stefano Tarantola

Ravenna, April 5^o, 2017



To share information and gathering knowledge about:

1. **practices** followed by States to set up, test and execute their plans;
2. **role of the industry** in emergency planning and response;
3. **coordination** between Member States and operators;
4. strategies for intervention in case of **transboundary effects**.

... with the goal of:

1. identifying the **challenges** of setting up, testing and executing the plans
2. highlighting the **possible gaps** in arrangements and resources
3. strengthening the collaboration among different States sharing the goal to **improve level of preparedness**

The agenda combines presentations, group exercises and plenary discussions and is composed by three thematic parts:

- ◆ Setting up an EERP (first day)
- ◆ Practical Challenges in the Execution of an EERP (second day)
- ◆ Cooperation between Member States and Neighbouring Countries (second day)

Demonstration of an emergency exercise by the Italian Coast Guard (third day).

Three group exercises with discussion on:

- ◆ past experiences, difficulties encountered, lessons learned, and ideas for improvement of plans preparation
- ◆ most urgent and relevant aspects to be addressed in case of accident.
- ◆ how knowledge gathered can assist plans preparation in countries and regions where these are not yet well-established.

Material available

- ◆ a leaflet with the program of the workshop,
- ◆ the list of participants
- ◆ a summary description of the emergency exercise and
- ◆ the relevant articles of the Offshore Safety Directive

2 The requirements of Directive 2013/30/EU (A. Papandreou, DG ENER)



Courtesy of Wintershall

European Commission

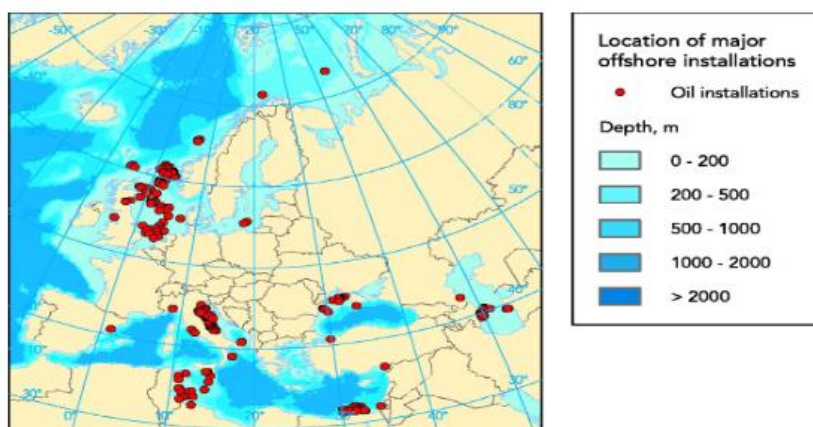
The Offshore Safety Directive – Preventing Accidents and Limiting Their Consequences

Directive of the European Parliament and Council on safety of offshore oil and gas operations and amending Directive 2004/35/EC (Text with EEA relevance)

European Commission
Directorate General for Energy

Energy 1

Offshore licensing in EU/EEA & adjoining states Different Regions – Different Conditions



Energy

2

Consequences Always Severe !



3

Major accident prevention by operators and owners

- **Ensure reliability and integrity of all safety and environmental relevant systems – set up inspection and maintenance systems**
- **Ensure no unplanned escape of hazardous substances from pipelines, vessels and systems for their confinement**
- **No single failure of a containment barrier may lead to a major accident**
- **Prepare an inventory of available equipment, its ownership, location, transport to and mode of deployment**
- **Take measures to ensure that equipment and procedures are maintained in operable conditions**
- **Ensure a suitable framework for monitoring the compliance with the corporate accident prevention policy**

Energy

4



Internal Emergency Response Plans

- **Prepared by the operator or owner pursuant to the requirements of this Directive**
- **Measures to prevent escalation or limit the consequences of a major accident relating to offshore oil and gas operations;**
- **Taking into account the major accident risk assessment undertaken during preparation of the most recent report on major hazards.**
- **The plan shall include an analysis of the oil spill response effectiveness.**
- **put into action without delay to respond to any major accident or a situation where there is an immediate risk of a major accident**

Energy

5



External Emergency Response Plans

- **Prepared by Member States**
- **local, national or regional strategy to prevent escalation or limit the consequences of a major accident**
- **Operator plus supplementary resources**
- **They shall cover all offshore oil and gas installations, connected infrastructure and potentially affected areas within their jurisdiction.**
- **Shall be made available to the Commission, other potentially affected Member States and the public.**

Energy

6



EU and cross-border level

- **Member States: achieve a high level of compatibility and interoperability of response equipment and expertise.**
- **Encourage industry to develop response equipment and contracted services that are compatible and interoperable throughout the geographical region.**
- **Develop cooperation scenarios for emergencies in case of trans-boundary effects, forward the relevant information to potentially further affected Member States.**
- Regularly test their preparedness
- **Notify the Commission for updates in Emergency Contact Info**
- **Adapt joint measures to prevent further damage.**

Energy

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Offshore Safety Directive – key requirements

Chapter III – Offshore Oil & Gas Operations

14. Internal Emergency Response Plans

Chapter IV – Prevention Policy

19. Major accident prevention by operators and owners

Chapter VI – Cooperation

27. Cooperation between Member States

Chapter VII – Emergency preparedness & response

28. Requirements for internal emergency response plans

29. External emergency response plans & emergency preparedness

30. Emergency response

Chapter VII – Emergency preparedness & response

31. Trans boundary emergency preparedness & response

32. Trans boundary response of Member States without operations

33. Coordinated approach to safety at international level

Energy

3 Italian planning - the response to marine pollution (R. Cianella, MISE - T. Pisino, Italian Coast Guard)



The Italian planning the response to marine pollution part 1

Ravenna 5th april 2017

Roberto Cianella

Ministry of Economic Development
DIRECTORATE GENERAL FOR SAFETY OF MINING AND ENERGY ACTIVITIES
NATIONAL MINING OFFICE FOR HYDROCARBONS AND GEORESOURCES

The Italian Competent Authority

The decree implementing Directive OS sets that the Presidency of the Italian Competent Authority is given to an independent expert with high level of expertise in safety of offshore operations and hydrocarbons.

The expert can come from private or public sectors, including universities, scientific and research institutes.

He has to be independent of everything is related to the economic management of the offshore natural resources.

The Italian Prime Minister has appointed the Professor Mesini as President of the CA



The Italian Competent Authority

Italian CA has been established in form of multi body structure, called “Committee for safety of offshore operations”.CA is composed of:

- ✓ the Director of National Mining Office for Hydrocarbons and Georesources
- ✓ the Director of Directorate General for the protection of the nature and the sea (Ministry of Environment)
- ✓ the Central Director for Prevention and Safety of National Fire Corp
- ✓ the General Commander of the Coast Guard.
- ✓ the Deputy Chief of Staff of the Italian Navy



The Italian Competent Authority

Benefit

more effective actions can be performed by combining all the expertise of the institutions, involved in the safety and environmental matter for the offshore upstream operations in Italy



The Italian Competent Authority

The multi-body structure allows to cover different areas with the common goal to avoid accident and limit possible consequences, e.g:

- ✓ workplace safety
- ✓ plant safety
- ✓ drilling matters
- ✓ mining police
- ✓ sea police
- ✓ prevention of sea pollution
- ✓ operation supervisory
- ✓ planning of emergency preparation, preparedness, response





~ ITALIAN COAST GUARD HEADQUARTERS ~

EXTERNAL EMERGENCY RESPONSE PLANNING

ITALIAN STRATEGIES FOR INTERVENTION AND
COORDINATION IN CASE OF A MAJOR ACCIDENT

RAVENNA, ITALY, 5TH – 7TH APRIL 2017



OFFICERS	1.281
PETTY OFFICERS	4.342
VOLUNTEERS	4.893
TOTAL	10.516

THE NATIONAL FRAMEWORK



INTEGRATION OF MISSIONS



THE NATIONAL FRAMEWORK



POLLUTION AT SEA

RESPONSE IN CASE OF MARITIME POLLUTION





POLLUTION AT SEA

1[^] LEVEL

THE 1° LEVEL POLLUTION AT SEA IS A POLLUTION THAT INTEREST ONLY:

- *PORT*
- *TERRITORIAL WATER*
- *ECOLOGICAL PROTECTION ZONE*
- *IT DOESN'T REPRESENT A DIRECT AND IMMEDIATE THREAT FOR COAST LINE.*

REPRESENT BY:

- *SMALL AND MEDIUM SIZED DISPERSIONS OF A SHIP/TERMINALS IN HARBOUR*
- *POLLUTION WITH LOW ENVIRONMENTAL IMPACT*
- *LOW POSSIBILITIES TO DEGENERATE*

FIGHT BY:

- *TIMELY RESPONSE*
- *ADEGUATE RESOURCES PRESENT ON SITE (FROM THE SHIP OR TERMINAL)*
- *EASILY CONFINED, RECOVERED, CLEARED AND DISPOSED*

7



POLLUTION AT SEA

MARITIME COMPARTMENT (C.G.) CONTINGENCY PLAN

LOCAL ANTI-POLLUTION PLAN



8



LOCAL EMERGENCY DECLARATION

DECLARED BY HEAD OF MARITIME COMPARTMENT
WHEN THE SITUATION DENOTES THAT THE LOCAL
AVAILABLE RESOURCES ARE INADEQUATE AND
MORE AND PARTICULAR RESOURCES ARE NEEDED.

9



2[^] LEVEL

THE 2° LEVEL POLLUTION AT SEA IS A POLLUTION THAT INTEREST:

- *COAST LINE*
- *ISLANDS*
- *IT REPRESENT A DIRECT AND SERIOUS THREAT FOR SEA.*

REPRESENT BY:

- *POLLUTION THAT NEEDS ADDITIONAL RESOURCES (REGIONAL, STATE OR INTERNATIONAL) TO BE FIGHT BECAUSE THE LOCAL RESOURCES ARE NOT ENOUGH*
- *POLLUTION WITH MEDIUM OR BIG ENVIRONMENTAL IMPACT*
- *HIGH POSSIBILITIES TO DEGENERATE AND TO AFFECT OTHER GIURISDICTION'S AREAS*

FIGHT BY:

- *LOCAL EMERGENCY DECLARATION*
- *OPERATIONAL PLAN FOR DEFENSE OF SEA AND COASTAL AREAS FROM ACCIDENTAL SPILL OF HYDROCARBONS AND OTHER NOXIOUS SUBSTANCE*

10



MINISTRY OF ENVIRONMENT CONTINGENCY PLAN

**THE OPERATIONAL PLAN FOR DEFENSE OF SEA AND
COASTAL AREAS FROM ACCIDENTAL SPILL OF
HYDROCARBONS AND OTHER NOXIOUS SUBSTANCE**

STRATEGIC DIRECTION	OPERATIONAL DIRECTION	TACTICAL DIRECTION
<i>MINISTRY OF ENVIRONMENT</i>	<i>HARBOUR MASTER / HEAD OF MARITIME COMPARTIMENT</i>	<i>HARBOUR MASTER / HEAD OF MARITIME COMPARTIMENT</i>

11



NATIONAL EMERGENCY DECLARATION

THE HARBOUR MASTER MAY SUGGEST TO MINISTRY OF ENVIRONMENT TO INCREASE THE LEVEL TO NATIONAL EMERGENCY, THAT SHOULD BE FORMALLY ADOPTED BY THE HEAD OF THE CIVIL PROTECTION DEPARTMENT, WHO ASSUMES THE COORDINATION OF THE OPERATION THAT SHALL BE CARRIED OUT FOLLOWING THE NATIONAL RESPONSE PLAN

12



POLLUTION AT SEA

3[^] LEVEL

THE 3^o LEVEL POLLUTION AT SEA IS A POLLUTION THAT INTEREST:

- *COAST LINE (LONG SIZE OR BIG AREAS)*
- *ISLANDS*
- *HIGH VALUE AREAS (LANDSCAPE, ENVIRONMENTAL, TURISTIC AND ECONOMIC)*
- *IT IS A DECLARATE SERIOUS POLLUTION AT SEA.*

REPRESENT BY:

- *POLLUTION THAT NEEDS ADDITIONAL RESOURCES (REGIONAL, STATE OR INTERNATIONAL) TO BE FIGHT BECAUSE THE LOCAL RESOURCES ARE NOT ENOUGH*
- *POLLUTION BIG OR CATASTROPHIC ENVIRONMENTAL IMPACT*
- *HIGH POSSIBILITIES TO AFFECT LARGE AREAS*

FIGHT BY:

- *NATIONAL EMERGENCY DECLARATION*
- *CIVIL PROTECTION CONTINGENCY PLAN*

13



POLLUTION AT SEA

CIVIL PROTECTION CONTINGENCY PLAN

**PROMP INTERVENTION IN CASE OF POLLUTION
CAUSED BY MARINE ACCIDENTS**

STRATEGIC DIRECTION	OPERATIONAL DIRECTION	TACTICAL DIRECTION
CIVIL PROTECTION DEPARTMENT	ITCG HEADQUARTERS	HARBOUR MASTER / HEAD OF MARITIME COMPARTIMENT

14



PROVINCIAL CONTINGENCY PLAN

PROVINCIAL CONTINGENCY PLANS FOR THE PROTECTION OF COASTAL AREAS

ALSO THE PROVINCIAL AUTHORITIES, AS A COMPONENT OF THE CIVIL PROTECTION ORGANIZATION, SHALL HAVE A CONTINGENCY PLAN FOR THE PROTECTION OF COASTAL AREAS.

15



CIVIL PROTECTION CONTINGENCY PLAN

and

MINISTRY OF ENVIRONMENT CONTINGENCY PLAN

and

HEAD OF MARITIME COMPARTMENT CONTINGENCY PLAN

and

PROVINCIAL CONTINGENCY PLAN

ARE BE DEVELOPED ENSURING MUTUAL CONSISTENCY

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 **OVERVIEW**

LIVEL	EMERGENCY	COMPETENT AUTHORITY	PLANNING	AUTHORITY INVOLVED
1^	LOCAL	HEAD OF MARITIME COMPARTIMENT	LOCAL OPERATING PLAN OF INTERVENTION	<ul style="list-style-type: none"> - HEAD OF MARITIME COMPARTIMENT - PROVINCIAL - Local sources
2^	LOCAL EMERGENCY	MINISTRY OF ENVIRONMENT	NATIONAL OPERATING PLAN OF INTERVENTION	<ul style="list-style-type: none"> - MINISTRY OF ENVIRONMENT - ITALIAN COAST GUARD HEADQUARTERS - PROVINCIAL
3^	NATIONAL EMERGENCY	CIVIL PROTECTION DEPARTMENT	NATIONAL OPERATING PLAN OF INTERVENTION IN CASE OF NATIONAL EMERGENCY DECLARARED	<ul style="list-style-type: none"> - CIVIL PROTECTION DEP. - ITALIAN COAST GUARD HEADQUARTERS - PROVINCIAL



THANK YOU FOR YOUR ATTENTION

For any blowout scenario, one or a combination of the following 7 ER activities could be necessary

- 1) rescuing people and bringing people to safety;
- 2) extinguishing fires;
- 3) cleaning-up oil in the sea, on beaches and/or in harbours;
- 4) securing the (offshore) installation;
- 5) well capping / killing;
- 6) well containment;
- 7) drilling a relief well.

Create clarity for who is responsible for what

R	who is responsible	the person who is <u>assigned</u> to do the work
A	who is accountable authority	the person who makes the <u>final decision</u> and has the <u>ultimate ownership</u>
C	who is consulted	the person who must be consulted <u>before</u> a decision or action is taken
I	who is informed	the person who must be informed that a decision or action <u>has</u> been taken

1. ER activity "rescue of people"

1.1 : serious incident reporting

1.2 : determine incident phase

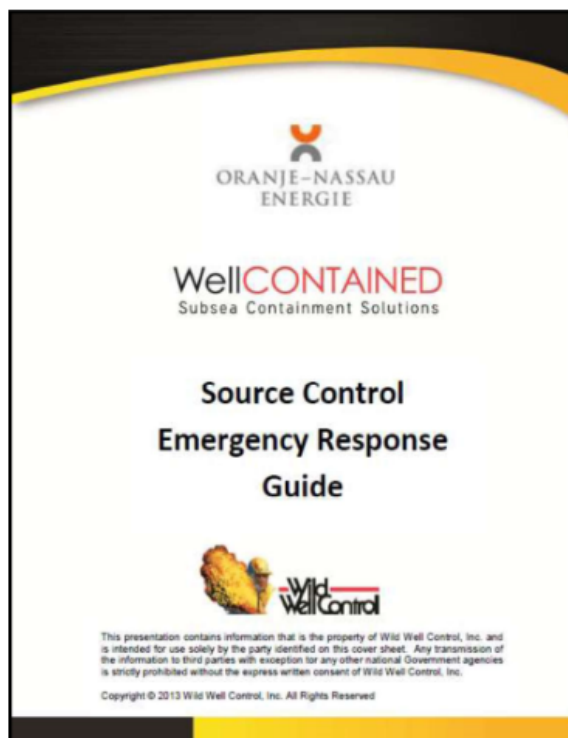
1.3 :

	Operator	Ministries					others
		Infrastructure & Environment		Economic Affairs			
		Coast-guard	Maritime depart.	Commun.	SSM	Commun.	
1.1	R	I			I₄		
1.2	I	R	C		I		

note 4: SSM informs regularly the Ministry of Economic Affairs

ER activities	subactivities	Operator	Organisations					others
			Ministries					
			Coast-guard	Maritime depart.	Commun.	SSM	Commun.	
1	rescue of people			A				
	competent government authority with final accountability							
	Operations							
	1.1 serious incident reporting	R	I		I₄			
	1.2 determine incident phase	I	R	C	I			
	1.3 monitoring the whereabouts of rig/platform personnel	C	R					
	1.4 dispatch SAR	I	R					
	1.5 dispatch KNRM	I	R					
	1.6 appoint on-scene commander (if required)	I	R					
	1.7 initial mobilization standby-boat (FRC)	R _s	I					
	1.8 mobilise other ships	I	R					
	1.9 check safety for rescue operations (see 5.4 / including establishing larger safety zone)	C	R		C			
	1.10 evacuation by helicopter	C	R					
	1.11 evacuation by lifeboat	R _s	I					
	1.12 rescue from sea by helicopter	I	R					
	1.13 rescue from sea by standby boat (FRC)	I	R					
	1.14 rescue from sea by other vessels	I	R					
	1.15 rescue from lifeboat by helicopter	I	R					
	1.16 rescue from lifeboat by standby boat (FRC)	I	R					
	1.17 control over airspace		R				C (LVNL)	
	1.18 determine VTS necessity	I	R					
	Communication							
	1.19 sitreps	I	R	I	I ₄	I ₄		
	1.20 informing next of kin	R				I		
	1.21 produce holding statement	R	I			I		
	1.22 produce press releases	C _s	R _s		R _s			
	1.23 organise press conferences	C _s	R _s		R _s			

ER activities	subactivities	organisations						
		Operator	authorities				commun.	
			Infrastruct. & Environm.		Economic Affairs			
Coast-guard	Maritime depart.	commun.	SSM	commun.				
5	well capping / killing	competent governm. author. with final accountability					A	
	operations							
	5.1	create well control task force incl. experts	R				I	
	5.2	prepare plan of attack	R	C10	C10		C	
	5.3	decide on plan of attack	R	I	I		A	
	5.4	organize/conduct onsite survey	R	I			A	
	5.5	source equipment & services	R				I	
	5.6	execute well capping activities	R	I			A	
	5.7	continued monitoring extent of pollution	I	I	R			
		communication						
	5.8	situation update	R	I	I		I	
	5.9	produce holding statement (if ap	R				I	
	5.10	produce press releases	C ₅				C	R ₆
	5.11	organise press conferences	C ₅				C	R ₆



Debris removal

Checklist

Completed / Task / Contractor / Notes

Generic procedure

Main equipment list

Activities & resources

KEY ACTIVITIES
Install rigging on conductor, cut and remove conductor sections
Clear all other debris that could impede well control operations
Set up horizontal and vertical cutting equipment for wedding cake cuts
Identify the chain of custody for any debris recovered
Identify and maintain a "wet store" area
Make wedding cuts to set up installation of well control device

REQUIRED RESOURCES
Dive Support vessel
Rough cut equipment
Smooth cut equipment
Rigging
Dive Crew with hand tools
Air Dive Support Equipment
Hydraulic power unit (HPU)

State Supervision of Mines_EUOAG_EERP workshop_5-7 april 2017_Ravenna

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Heat radiation hazards

Radiation Intensity (kW/m ²)	Effects
0.78-1.04	Intensity of solar radiation
1.58	Maximum level that personnel can stand for prolonged times with no protection
1.74	Time to pain threshold = 60 seconds
2.33	Time to pain threshold = 40 seconds
2.90	Time to pain threshold = 30 seconds
4.73	Personnel may work for several minutes without shielding but with

Heat Radiation Level kW/m ²	Distance from Blow-out Well (meters)		
	Gas 100 MMSCF/day	Gas 250 MMSCF/Day	Oil/Gas 28,000 BOPD or 22 MMSCF/day
1.6	133	146	100
5	35	48	41
10	12	22	32
Maximum Heat Radiation Level Expected	15.5 kW/m ²	22.1 kW/m ²	45.2 kW/m ²



Ministry of Infrastructure and the Environment

EERP approach in The Netherlands

Just one general plan



INTRODUCTION



- Organization
- Incident Management Plan North Sea (EERP)
- International cooperation
- Equipment



Organization

- Netherlands Coastguard (operational coordination)
- Ministry of Infrastructure and Environment (general coordination)
 - among which: **Rijkswaterstaat** (Directorate-General Public works and Water Management => resp. for EERP North Sea)
- Ministry of Defence
- Ministry of Security and Justice
- Ministry of Finance
- Ministry of Economic Affairs
 - among which: **State Supervision of Mines** (authority for approval of the IERP)

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Ministry of Infrastructure and the Environment
EERP approach in The Netherlands



EERP - framework

- part 0
 - General
 - Background and purpose
 - Assumptions
 - Establishment and management
 - Training and exercises
- part A
 - Coordination
 - Legal framework
 - Scope
 - Involved parties
 - Preconditions processes

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Ministry of Infrastructure and the Environment
EERP approach in The Netherlands



EERP - framework

- part B
 - Operations
 - Scenarios
- Attachments
 - Abbreviations
 - Terms
 - Maps
 - Legal Framework
 - Authorizations
 - Standard Schedules
 - Standard forms
 - Related Documents
 - Landing Places

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Ministry of Infrastructure and the Environment
EERP approach in The Netherlands



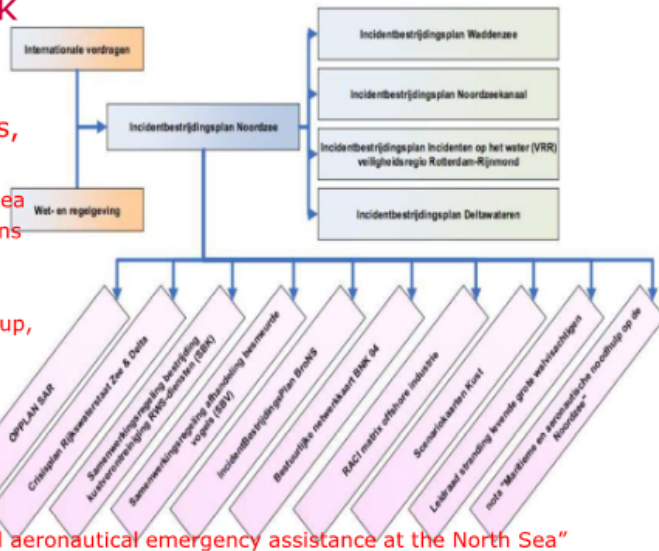
EERP - framework

various plans, based on International conventions, Law and regulations

- Incident response Plan North Sea
- Regional Incident response plans
- SAR

- Crisis plan Rijkswaterstaat
- Cooperation plan Beach Clean-up,
- Cooperation plan Oiled Birds,
- MIRG (firefighting)
- governance network
- RACI matrix
- Scenario card

- Guidance stranded whales
- policy document "maritime and aeronautical emergency assistance at the North Sea"

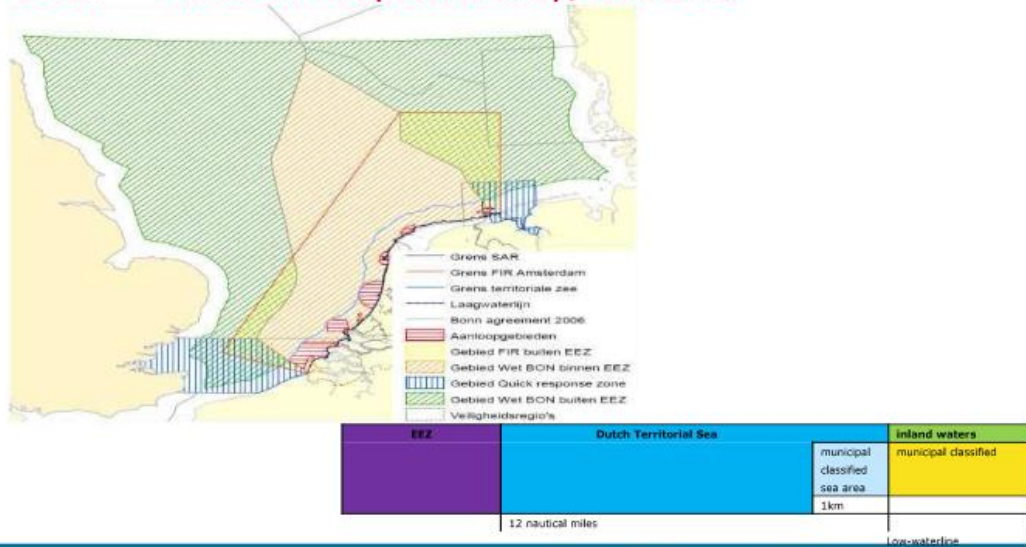


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EERP approach in The Netherlands



EERP - Area of responsibility/interest



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EERP approach in The Netherlands



EERP – Kind of emergencies

- Collision ships
- Lost cargo
- Collision oil and gas platforms
- Explosion / leakage oil and gas platform
- Collision windfarms
- Crash plane
- Fire / evacuation cruise ship
- Water and coastal pollution
- Nuclear accidents (submarine / transport)

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Ministry of Infrastructure and the Environment
EERP approach in The Netherlands



EERP – Teams / upscaling

	National	Ministry Infrastructure and Environment
Level 4 strategic	Inter Departmental Committee / Ministerial Commission on Crisis Management Chairperson: ICCm: DG National Coordinator for Counterterrorism and Security vz MCCm: Minister Security and Justice, or Prime Minister	Inter Departmental Committee / Ministerial Commission on Crisis Management Chairperson: ICCm: DG National Coordinator for Counterterrorism and Security vz MCCm: Minister Security and Justice, or Prime Minister
Level 3 Strategic	Regional Management Team North Sea Disasters Chairperson: Managing Director of Rijkswaterstaat Sea and Delta (Public Works)	Corporate Crisis Team Ministry Infrastructure and Environment Chairperson: board member
Level 2 Tactical	Operational team Coast Guard Chairperson: Operations Team Leader	Regional Crisis Team Rijkswaterstaat Sea and Delta Chairperson: Director of Rijkswaterstaat
Level 1 Operational	Communication and Coordination Center of the Coast Guard Chairperson: duty officer	(maritime) Emergency Response Team Chairperson: nautical advisor
Level 0 Routine	Netherlands Coast Guard	Rijkswaterstaat Sea and Delta

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EERP approach in The Netherlands



EERP – Scenarios cards

- Humans and animals in distress;
- Pollution sea and coast;
- Accident with hazardous substances;
- Fire and / or explosion
- Case of disorder
- Ecological incident
- Collision and / or ship adrift, object or cargo
- **Mining Installations**

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Ministry of Infrastructure and the Environment
EERP approach in The Netherlands



EERP – Scenario card - subjects

- Scenario Description
- Purpose
- Working area
- Imaging
- Network Card
- Laws and regulations
- Underlying plans / schemes
- Drawing working

Scenario card 8, Mining Installations

General description

Under this type of incident includes all accidents on and around a mining installation from which it is responsible. During drilling, production or construction may arise in different scenarios on mobile or fixed mining installations as a result of e.g. a collision, an explosion or blowout, etc. The scenario "mining installations" may occur due to various incidents. This scenario is divided into seven sub-scenarios include:

8.1 saving people / 8.2 fire fighting / 8.3 cleaning up oil at sea, on beaches or in ports / 8.4 securing the installation / 8.5 well capping / killing / 8.6, the containment and / redirection of oil or gas from spurting wells (well containment) / 8.7, the drilling of a relief well

Preconditions processes

leadership and coordination	1 Mining installations (primary process 1, the source and emission control)				
	Sub-scenario	Area	accountable	responsible	underlying scheme
	8.1 saving people	Dutch TZ and EEZ	Primary: Company Then: CG	Company	Regulation SAR
	8.2 fire fighting		Primary: Company Then:RWS	Company	Water Act
	8.3 cleaning up oil at sea, on beaches or		Primary: Company	Company	Water Act

	8.4 securing the installation	Primary: Company Then: min EA	Company	Mining and Labour regulation
	8.5 well capping	Primary: Company Then: min EA	Company	Mining and Labour regulation
	8.6, well containment	Primary: Company Then: min EA	Company	Mining and Labour regulation
	8.7, the drilling of a relief well	Primary: Company Then: min EA	Company	Mining and Labour regulation

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notification and alerting	Sub-scenarios 1 t / m3 is the prime responsibility of the company to report / report on a serious incident or a person, fire or oil spills to the Coast Guard Sub-scenarios 4 t / m 7 is the prime responsibility of the company to report / notify the Coast Guard and SSM
----------------------------------	--

upscaling and downscaling	Scaling up Subscenario 8.1: level 1 level 2 consider the case of multiple victims Subscenario 8.2: level 1 level 2 consider if there are effects of the fire water, fire not under control subscenario 8.3: level 1 level 3 consider if there is not to stop outflow Subscenarios 8.4 t / m 8.7: level 1, level 2, or consider higher if there are direct effects on the marine environment downscaling: When sub-scenarios 8.1 t / m 8.3 at the initiative of the KWC Sub-scenarios 8.4 t / m 8.7 on the initiative of SSM (RBN)
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Information and resource management	Information management			
	Situation and assessment	The supplier of information	Peculiarities, issues	Sharing information with
		Company
	Situation reports (Sitreps)	Coast guard Center

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Multidisciplinary issues			
Proces	The supplier of information	What (special issues regarding North Sea	Sharing information with
Source and emission control	within this process are 5 sub scenarios		
	<i>Sub scenario 8.2: extinguish fires</i>		
	Company RWS Sea and Delta	...	Coast Guard Center State Supervision of Mines
	<i>Sub scenario 8.4: secure installation</i>		
	Company RWS Sea and Delta	...	Coast Guard Center State Supervision of Mines
	Sub scenario 8.5: well capping/killing		
	Company Ministry Economic Affairs	...	Coast Guard Center State Supervision of Mines

Multidisciplinary issues			
	Sub scenario 8.6: put containment		
	Company Ministry Economic Affairs	...	Coast Guard Center State Supervision of Mines RWS Sea and Delta
	Sub scenario 8.7: drilling relief well		
	Company Ministry Economic Affairs	...	Coast Guard Center State Supervision of Mines RWS Sea and Delta
2. Rescue		Link scenario card 1: humans and animals in distress	
4. Medivac		Link scenario card 1: humans and animals in distress	
5. Public health		Link to scenario card 2:	

Multidisciplinary issues			
6. Psychosocial care		Link scenario card 1: humans and animals in distress	
14. Communication	Company Coast Guard Center		Coast Guard Center State Supervision of Mines Media
15. Public care		Link scenario card 1: humans and animals in distress	
18 Search and rescue	<i>Subscenario: 8.1 bringing people to safety</i>		
	Company Coast Guard Center	For more information: link to scenario 1: humans and animals in distress	Coast Guard Center State Supervision of Mines
20 Quality of the water	<i>Subscenario: 8.3 oil clean up at sea</i>		
	Company Coast Guard	For more information: link to scenario 2: pollution of Sea	Company Coast Guard

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Multidisciplinary issues			
20 Quality of the water	<i>Subscenario: 8.3 oil clean up at sea</i>		
	Company Coast Guard Center Rijkswaterstaat Sea and Delta	For more information: link to scenario 2: pollution of Sea and Coastline	Company Coast Guard Center State Supervision of Mines

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International cooperation

- Bonn Agreement
 - Sub agreements
 - Denmark Germany and The Netherlands
 - Belgium, France, UK and The Netherlands
- EU
 - EMSA
 - SafeSeaNet and
 - CleansSeaNet
 - DGECHO
 - (CESIS)
- IMO



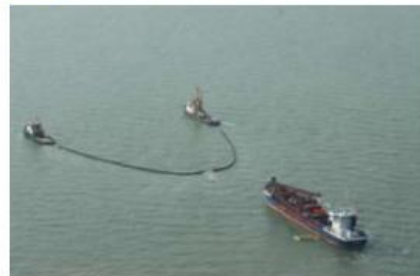
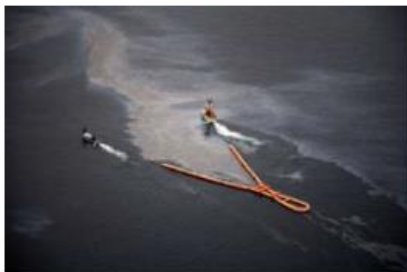
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Ministry of Infrastructure and the Environment
EERP approach in The Netherlands



Equipment and tools

- Mechanical recovery for
 - Sweeping arms
 - Current Buster(2) type 4 including 6 Boomvane(2)
 - Offshore Booms (2000meter, 10 reel a 2x100mtr)



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Ministry of Infrastructure and the Environment
EERP approach in The Netherlands



Equipment and tools

- Beach cleaners, containers etc.



- Dispersants, relying on other member states and companies

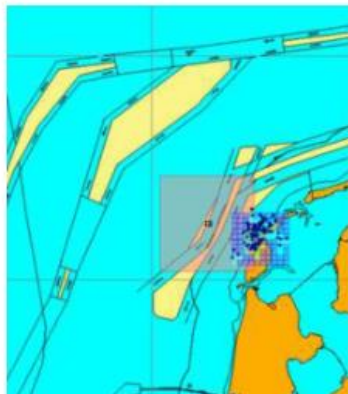
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Ministry of Infrastructure and the Environment
EERP approach in The Netherlands



Equipment and tools

- CleanSeaNet (Satellite images via EMSA)
- Oil/chem/SAR map (real-time data of weather, current, tide etcetera)



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EERP approach in The Netherlands



2x aerial surveillance



25 Ministry of Infrastructure and the Environment
EERP approach in The Netherlands



Governmental vessels



26 Ministry of Infrastructure and the Environment
EERP approach in The Netherlands



Contracted vessels (15);

Vessels via EMSA
(This region 2x)



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Ministry of Infrastructure and the Environment
EERP approach in The Netherlands



Challenges

- Overlap between IERP (company) and EERP (Authorities)
- Coordination between various authorities, so coordination is progressing well
- User friendly / readable
- Recognizable by all parties
- Communication during emergency handling (1 communication system between all authorities)
- Media and social media
- Identification scenarios (standard format)
- Waste management

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Ministry of Infrastructure and the Environment
EERP approach in The Netherlands

5 The UK National contingency plan (H. Shaw, MCGA - J. Milne, BEIS)

OPRED

Offshore Petroleum Regulator for Environment and Decommissioning

UK National Contingency Plan



Offshore Petroleum Regulator
for Environment & Decommissioning

External Emergency Response Plan (EERP)

- Offshore Petroleum Regulator for Environment & Decommissioning (OPRED)– UK Regulator for the environmental aspects of Offshore Oil and Gas Industry
- In the UK the EERP is delivered by the National Contingency Plan (NCP) – A strategic overview for responses to marine pollution from shipping & offshore installations and MCA SAR guidelines.
- The Maritime & Coastguard Agency (MCA) are the custodians of the NCP.
- Latest version published in 2014
- Following legal review the NCP was identified to contain all of the requirements of the EERP

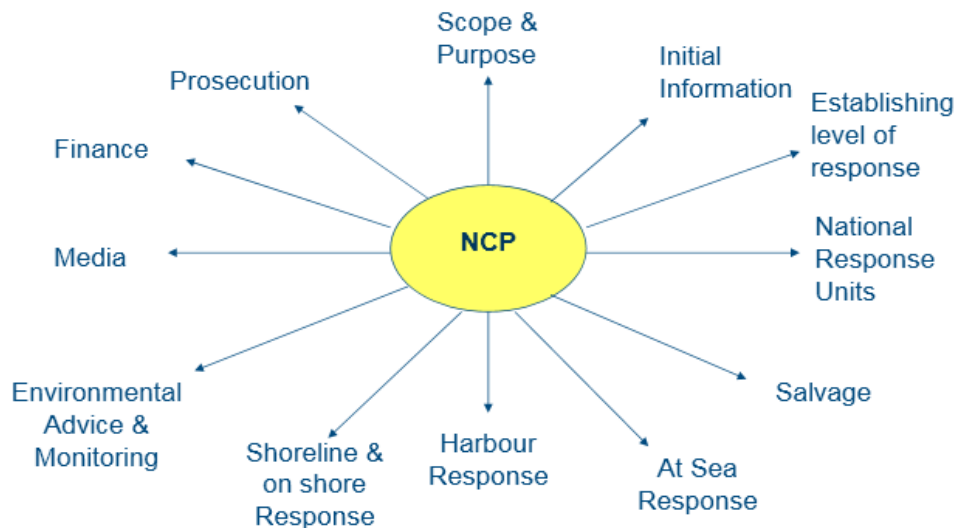


Offshore Petroleum Regulator
for Environment & Decommissioning

Purpose/Implementation

- To ensure that there is a timely, measured and effective response to marine pollution incidents.
- Harbour authorities, Responsible Persons for offshore installations, owners and masters of ships bear the primary responsibility for ensuring they do not pollute the sea.
- MCA may need to deploy National assets in response to Marine Pollution/ incidents to supplement the expertise of operators/response authorities.
- Sets out the circumstances in which the MCA deploys the UK's National assets to respond to a marine pollution incident to protect the overriding public interest.

Framework



Response Cells

- Marine Response Centre – MRC
 - Consider and implement most appropriate means of containing, dispersing and removing pollutants at sea
- Operations Control Unit – OCU
 - Support SOSREP by considering information on source control progress, interacting with Responsible Person
- Strategic Coordinating Group – SCG
 - Local authority can discharge their responsibilities for preventing & mitigating pollution on the shoreline
- Environment Group – EG
 - Provide advice to minimise the impact of the incident on the environment in the widest sense.

Relationship between EERP and IERP

- NCP requires that Responsible Persons have Oil Pollution Emergency Plans (OPEP) that are compatible with the NCP
- In the UK the IERP is delivered by OPEP and PFEER emergency response arrangements.
- It is mandatory for the operator to implement their OPEP for an oil spill incident.

IERP Legislative Background

- The International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC Convention) as adopted by the International Maritime Organisation (IMO) in 1990 entered into force in the United Kingdom in 1997 and was implemented for offshore oil and gas operations by the OPRC Regulations
- The OPRC Regulations apply to all UK waters and state that every Responsible Person must ensure that all offshore oil and gas operations for which they are responsible are subject to an OPEP approved by OPRED

Offshore Safety Directive

- Offshore Safety Directive implemented into UK law through Safety Case Regulations 2015 and Amendments to the OPRC Regulations
- OPRED along with the Health and Safety Executive (HSE) form the Competent Authority – Offshore Safety Directive Regulator (OSDR)
- Installation and Well Operators and Non Production Installation Owners (Responsible Persons) are required to hold an approved Oil Pollution Emergency Plan (OPEP) for any operation that presents a risk of oil pollution

OPEP Requirements

- In the event of any oil release to sea the Responsible Person is required to implement the OPEP
- OPRED specify 34 areas of OPEP content which include:
 - Response Initiation / Direction
 - Contractor Mobilisation and deployment timings of oil spill response equipment
 - Oil Characteristics
 - Training & Exercise requirements
 - Worst Case Release
 - Oil Spill Modelling
 - Well Cap / Relief Well Strategies
- OPRED approve OPEPs in consultation with the Maritime and Coastguard Agency

Oil Spill Response Effectiveness

- New requirement of the Directive is to include an estimate of the oil spill response effectiveness of available response techniques, including consideration of the following environmental conditions in the OPEP:
 - (i) weather, including wind, visibility, precipitation and temperature;
 - (ii) sea states, tides and currents;
 - (iii) presence of ice and debris;
 - (iv) hours of daylight; and
 - (v) other known environmental conditions that might influence the efficiency of the response equipment or the overall effectiveness of a response effort;
- To achieve this OPRED liaise Oil and Gas UK who produced guidelines which detail response effectiveness based on regional weather data and oil type for seven common response systems
- Metocean data specific to operating location and information regarding ITOPF oil type is used by Responsible Persons to extract the particular oil spill response effectiveness from the guidance document.

Oil Spill Response Effectiveness



Oil Spill Response Effectiveness

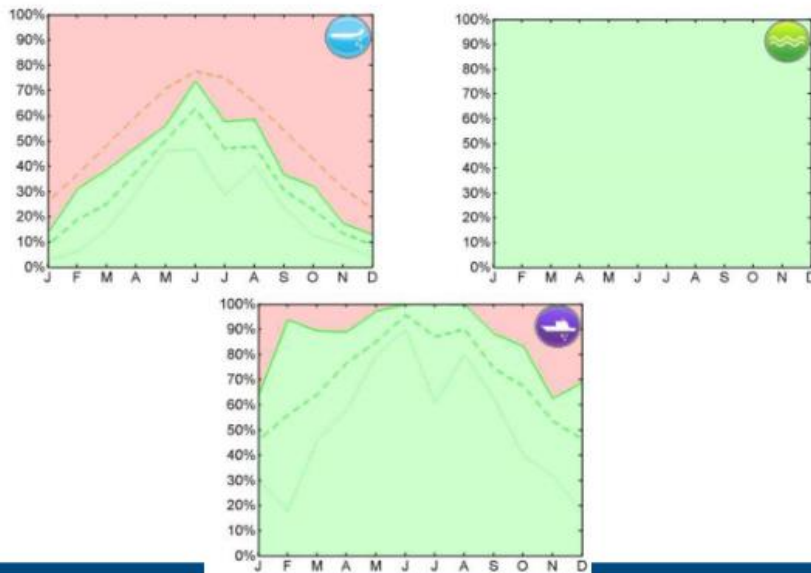
Oil spill response systems were identified in consultation with OGUK Members and OPRED:

1. Aerial Dispersant
2. In-situ Burn
3. Monitor & Evaluate
4. Natural Dispersion
5. Contain and Recover
6. Shoreline Cleanup
7. Vessel Dispersant

Oil Spill Response Effectiveness

	Aerial Dispersant	Contain and Recover	Natural Dispersion
Wind Speed	Between 6 kts & 27 kts	Less than 20 kts	All wind speeds
Visibility	More than 3 nm	More than 1 nm	Does not affect response
Precipitation	Does not affect response	Does not affect response	Does not affect response
Temperature	Does not affect response	Does not affect response	Does not affect response
Tidal State	Does not affect response	Does not affect response	Does not affect response
Current Speed	Does not affect response	Does not affect response	Does not affect response
Ice & Debris	N/A in UK Climate	N/A in UK Climate	N/A in UK Climate
Daylight	Dawn to 30 mins before Dusk	Dawn to 30 mins before Dusk	Does not affect response
Wave Height	Between 0 m & 4 m	Between 0 m and 2.5 m	All wave heights

Oil Spill Response Effectiveness



Inventory of available response equipment

- Second new requirement of the Directive that was implemented through the amended regulatory regime
- Each OPEP must fully describe the inventory of available oil spill response equipment available
- Achieved by Responsible Persons in UKCS through reference to internet based register of equipment held by contracted Oil Spill Response service providers.
- Supplemented by any additional equipment available not in the register - Installation/field specific

Inventory of available response equipment

- For any equipment not detailed in the response providers capability statement the Responsible Person must confirm the following in the OPEP:
 - i. Details of ownership;
 - ii. Storage locations;
 - iii. Transport arrangements to deployment site;
 - iv. Mode of deployment; and
 - v. Measures in place to ensure equipment and procedures are maintained in an operable condition.

Communication Channels

- The Responsible Person is required by regulation and permit conditions to report any release of oil or offshore chemicals to OPRED
- Web based oil & gas portal hosts the PON1 reporting tool
 - All releases must be reported online within 6hrs of the incident
 - A release of 1 tonne or more (oil or offshore chemicals) must be reported by telephone to OPRED on call inspector within 1 hour
- All releases also reported to Local Coastguard Operation Centre
 - Additional reporting requirements to environmental bodies if within or approaching environmentally sensitive area
- OPRED on call inspector remains in contact with Maritime and Coastguard Agency Counter Pollution and Salvage Officer (CPSO) and both remain in contact with Responsible Person while incident ongoing

Oil Spill Response Exercises

- Each Responsible Person required to undertake a 'SOSREP' Exercise every three years
- SOSREP Exercises involve all relevant oil spill response contractors and government bodies
- The responsible person must demonstrate OPEP implementation and SOSREP interface during the exercise.
- SOSREP exercises are evaluated by OPRED and feedback is given to the Responsible Person.
- In addition to SOSREP exercises each Responsible Person must annually exercise all approved OPEPS and demonstrate that all persons with responsibilities for implementing the OPEP participate in at least one exercise per calendar year

6 Overview of the Norwegian Approach (B. A. Kalberg, PSA)

External Emergency Response Planning Ravenna, 5. – 7. April 2017

Overview of the Norwegian Approach

Bryn Aril Kalberg
Special Advisor
Petroleum Safety Authority Norway



PTILIPSA



PETROLEUM SAFETY AUTHORITY
NORWAY

- Safety regulator since 1973
- First as part of the Norwegian Petroleum Directorate
- Petroleum Safety Authority Norway from 1.1.2004
- Regulatory responsibility for safety, the working environment and emergency preparedness in Norway's petroleum sector
- Reports to the Ministry of Labour and Social Affairs
- About 170 employees

PTILIPSA



Overall goal

“The Petroleum Safety Authority Norway will set the terms for health, safety, the environment and emergency preparedness in the petroleum sector, follow up to ensure that industry players maintain high standards in this area, and thereby contribute to creating maximum value for society.”

Authority has been delegated to the PSA:

- issue regulations for the petroleum sector as authorised by legislation
- undertake overall safety assessments
- take decisions on consents, sanctions and exemptions from regulatory requirements.

PSA also:

- advising the responsible ministry
- serve as a source of expertise for the industry, other government agencies and the general public



PTIL/PSA

Petroleum act, section 9-2 Emergency preparedness

- The licensee – the operator - and other participants in the petroleum activities shall at all times maintain efficient emergency preparedness with a view to dealing with accidents and emergencies which may lead to loss of lives or personal injuries, pollution or major damage to property.
- The licensee shall see to that necessary measures are taken to prevent or reduce harmful effects, including the measures required in order, to the extent possible, to return the environment to the condition it had before the accident occurred.
- The Ministry may issue rules about such emergency preparedness and such measures, and may in this connection order co-operation between several licensees in matters of emergency preparedness.



PTU/PSA

Framework HSE regulations

Section 20 Coordination of offshore emergency preparedness

- The operator shall ensure that emergency preparedness is coordinated when more than one facility or vessel are used simultaneously.
- The operator's emergency preparedness measures shall be designed for coordination with public emergency preparedness resources.
- The operator shall lead and coordinate the use of emergency preparedness resources in the event of hazard and accident situations, until a public authority assumes this responsibility, if applicable.



PTU/PSA

Framework HSE regulations

Section 21 Offshore emergency preparedness cooperation

- The operator shall cooperate with operators of other production licenses to ensure necessary emergency preparedness in the areas of health, safety and the environment.



PTIL/PSA

Activities Regulations

“The operator shall”

- Establishing emergency preparedness, § 73
- Shared use of emergency preparedness resources, § 74
- Emergency preparedness organisation, § 75
- Emergency preparedness plans, § 76
- Handling of situations of hazard and accident, § 77
- Regional preparedness for acute pollution, § 78
- Action against acute pollution § 79



PTIL/PSA

The Management Regulations

Section 29 Notification and reporting of hazard and accident situations to the supervisory authorities

The operator shall ensure coordinated and immediate notification via telephone to the Petroleum Safety Authority Norway in the event of hazard and accident situations that have led to, or under slightly altered circumstances could have led to

- a) death,
- b) serious and acute injury,
- c) acute life-threatening illness,
- d) serious impairment or discontinuance of safety related functions or barriers, so that the integrity of the offshore or onshore facility is threatened,
- e) acute pollution.



PTIL/PSA

The Management Regulations

Section 30 Information on follow-up of hazard and accident situations

Until situations as mentioned in Section 29, first and third subsections regarding notification of serious or acute hazard and accident situations are normalised, the operator shall keep the supervisory authorities continuously updated on the development, and of the measures it plans to implement.

Before the normalisation is concluded following serious or acute hazard and accident situations, the supervisory authorities shall be notified.

The supervisory authorities shall be notified if, after the normalisation, information comes to light that shows that the hazard and accident situation was more serious than previously reported.

In the event of action against acute pollution from facilities and offshore vessels, the operator shall ensure that the action plan as is submitted to the Norwegian Coastal Administration as soon as possible.

Reports of environmental surveys following acute pollution shall be submitted to the Norwegian Environment Agency and the Norwegian Coastal Administration as soon as they are available.



PTIL/PSA

Conclusion requirements

- The operator is responsible for establishment of emergency preparedness
- The emergency preparedness shall be established on the basis of results from risk analyses and emergency preparedness analyses.
- The dimensioning of the emergency preparedness shall be done for a representative selection of defined situations of hazard and accident (from the risk analyses)
- Performance requirements to emergency preparedness to be specified. This mean primarily, necessary capacity and response time for relevant emergency preparedness measures.
- ISO 15544 should be used for health and safety-related emergency preparedness
- Industry standard NORSOK Z-13 Risk and emergency preparedness assessment



PTL/PSA

Emergency Preparedness - Norway

- Authorities
- Roles and responsibility



PTL/PSA

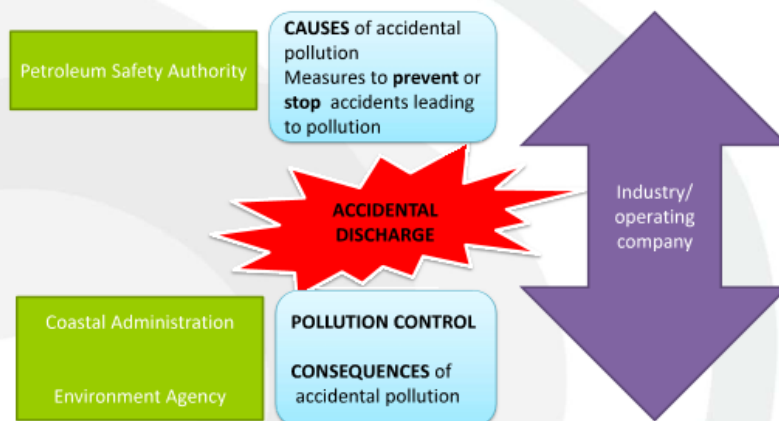
Norwegian Coastal Administration

- The main objective of the NCA is to ensure safe and efficient navigation in the fairways along the coast and into ports, as well as national preparedness for acute pollution.
- Emergency Preparedness Unit for Acute Pollution
 - Horten
 - Tromsø
 - Bergen
 - Ålesund (lawyers)



PTIL/PSA

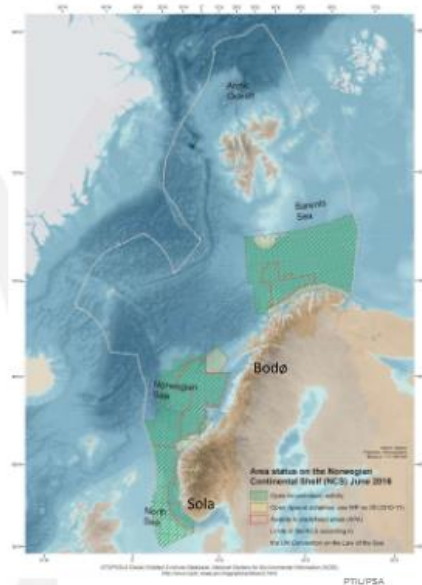
Roles and responsibility



PTIL/PSA

Joint Rescue Coordination Centres - JRCC

- Norwegian rescue services are carried out through cooperation between resources appropriate for rescue services
 - government agencies
 - voluntary organizations
 - private companies
- The Joint Rescue Coordination Centres have the overall operational responsibility during search and rescue operations.
 - JRCC Northern Norway / Bodø
 - JRCC Southern Norway / Sola
 - The border is 65 degrees north



Thank you for your attention

Bryn Aril Kalberg
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Petroleum Safety Authority Norway

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PTIL/PSA

7 ENI's Emergency Response Management System (M. Buffagni, A. Ligrone, ENI)



Eni's Emergency Response Management System

Eni Upstream, M. Buffagni, A. Ligrone

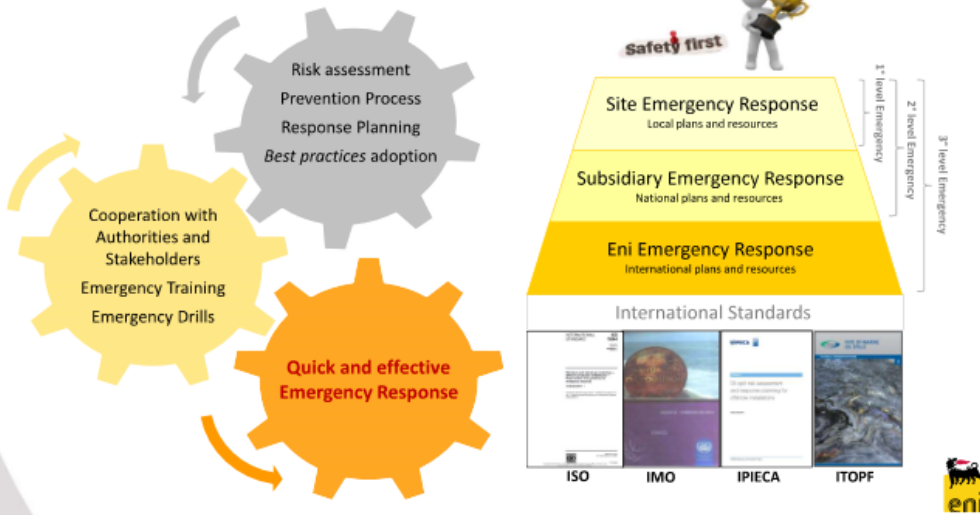
*JRC 1st Workshop under the Virtual Centre of Offshore Safety Expertise
External Emergency Response Planning
Ravenna, Italy, 5th – 7th April 2017*

INDEX

- *Emergency Management System*
- *Emergency Drills*
- *Capabilities to deal with major emergencies*
- *Continuous improvement initiatives*

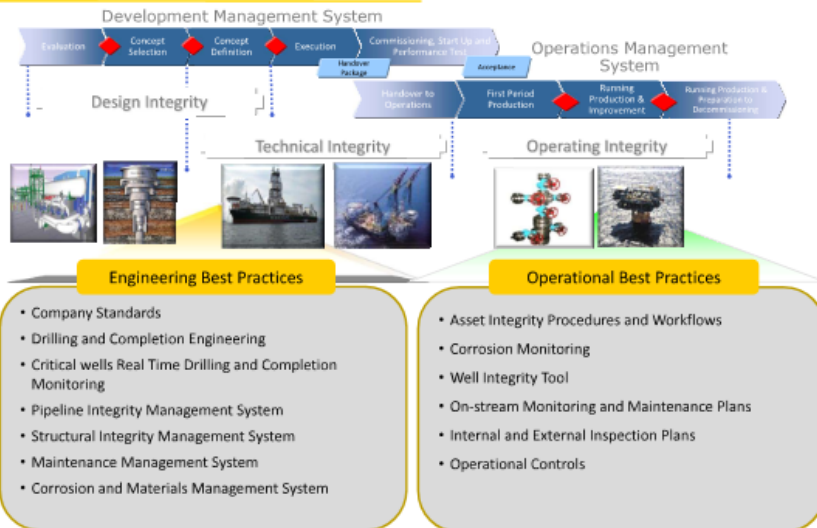


Emergency Management System Overview



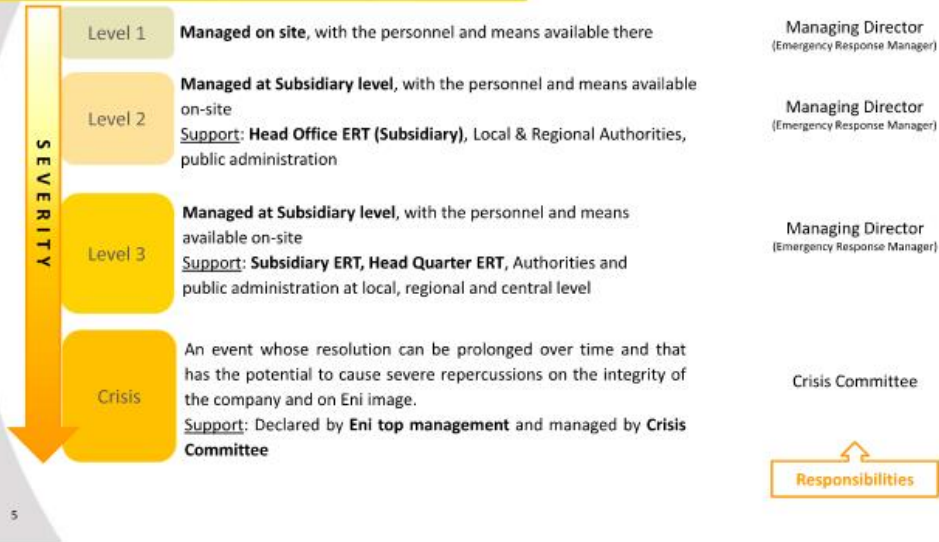
3

Risks Prevention and Mitigation



4

Emergency Response Tiered Approach



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- *Emergency Management System*
- *Emergency Drills*
- *Capabilities to deal with major emergencies*
- *Continuous improvement initiatives*

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Eni Upstream Emergency Drills

Coordinated 3rd Level
Emergency Drills performed in
the last 3 years

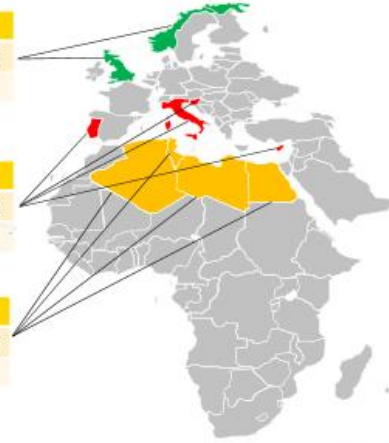
EMERGENCY DRILLS PARTICIPANTS:

- Eni Head Quarter and Subsidiary Emergency Response Teams
- Specialized Contractors: OSRL; NOFO; WWC; Saipem;
- Public Authorities: Environmental Authority, Coast Guard, Fire Brigade, Civil Protection, ...

North Europe			
Level	2014	2015	2016
3 rd	3	5	8

South Europe			
Level	2014	2015	2016
3 rd	5	8	6

North Africa			
Level	2014	2015	2016
3 rd	7	3	6

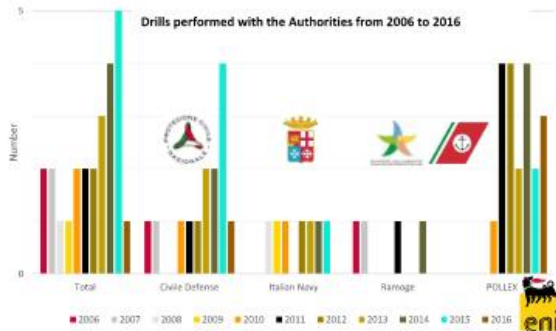


7

Coordinated Emergency Drills – focus on Italy

The Crisis Unit is the reference for:

- **Operative coordination with Central Authorities during national emergencies and drills;**
- **expertise in the working group with Civil Defence on natural disasters risk prevention and national drills.**



8

INDEX

- *Emergency Management System*
- *Emergency Drills*
- *Capabilities to deal with major emergencies*
- *Continuous improvement initiatives*

9



Emergency Response for blowout events

Following 2010 Gulf of Mexico blowout, industry and regulators focused on the upgrade of response capability on subsea offshore blowout.

Eni approach was to join international consortiums for main equipment and to develop in-house technologies to improve the intervention capability.

Eni Emergency Response Kit consists of:

Outsourced equipment contracted by Eni Head Quarter

- Access Agreement to Subsea Capping Equipment consortium
- Access Agreement to Global Dispersant Stockpile consortium

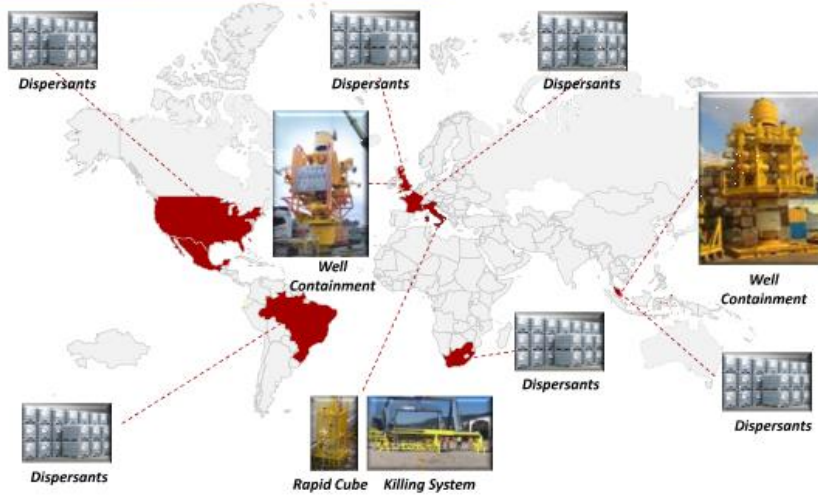
Eni Head Quarter proprietary equipment

- Rapid Cube
- Killing System

10



Eni Emergency Response Kit for blowout events - locations



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Subsea Capping Equipment Service

Access Agreement to «Subsea Capping Equipment»

«WellCONTAINED» system includes:

- Subsea Capping Stack
- Subsea Dispersant Application Kit
- Subsea Debris Removal equipment



Two set of equipment available in UK and Singapore



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Global Dispersant Stockpile Service

Access Agreement to «Global Dispersant Stockpile»

Agreement grants the access to 5000 cubic meters dispersant stockpile stored in strategic locations around the world.



Dispersant Type	Volume (m ³)	Location
Dasic Slickgone NS	500	OSRL Base UK Southampton
	350	OSRL Base Singapore
Finasol OSR 52	500	OSRL Base UK Southampton
	350	OSRL Base Singapore
	1,500	Vatry, France
Corexit EC9500A	800	OSRL Base South Africa
	500	Florida, USA
	500	Rio de Janeiro, Brazil



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Aerial Surveillance and Dispersant Spraying Service



Boeing 727 for wide area dispersant application



Boeing 727 jet-based aerial dispersant system



Piper PA-31 for aerial surveillance at the UK continental shelf

Aircraft Type	Base Location	Mobilization Time	Dispersant Capability
Boeing 727	Doncaster, UK (DSA)	4 hours	15,000 litres
Piper PA-31 Navajo	Doncaster, UK (DSA)	60 minutes	Aerial Surveillance

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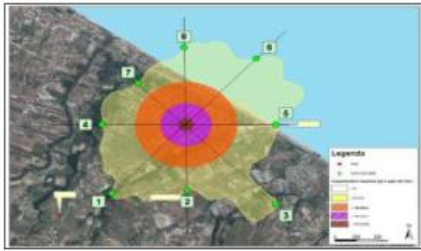


Emergency Tools – RAINBOW & OSCAR

RAINBOW

Risk Analysis **IN** BlowOut events and Wide impact scenarios

Consequences Analysis of wells blowouts and pipelines leaks from the HSE point of view.

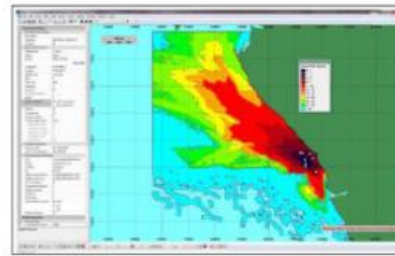


Eni proprietary tool (R&D, 2008)

OSCAR

Oil Spill Contingency And Response

Predict the fate and effects of an oil spill, either from a vessel, drilling activities, blowouts and other sources



Developed by SINTEF (Norway)

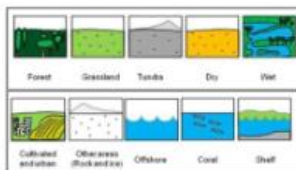


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Emergency Tools – Eni SMART-GIS & Eni 3-Ter Advanced

SMART-GIS

Tool for supporting decision making process in best option evaluation for response and remediation, considering local sensitivity maps.



3-TER Advanced

Web GIS platform developed for 3rd level emergency management. SMART habitat characterization and OSCAR outputs can be imported in 3-Ter.



Eni proprietary tools (R&D, 2013 - 2014)



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- *Emergency Management System*
- *Emergency Drills*
- *Capabilities to deal with major emergencies*
- *Continuous improvement initiatives*

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Eni R&D Continuous Improvement



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Proprietary equipment for the Emergency Response Kit

Eni Safety Competence Center – Gela Sicily



Emergency Response Kit:

- "Killing System"
- "Rapid Cube"



Killing System



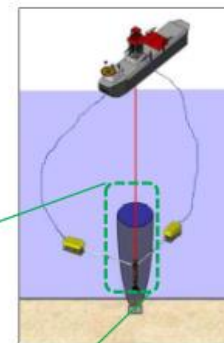
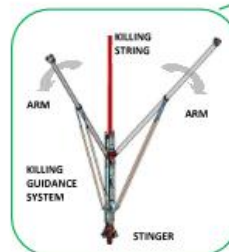
Rapid Cube



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Killing System

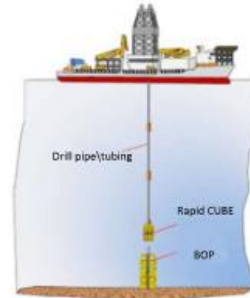
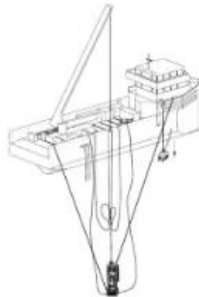
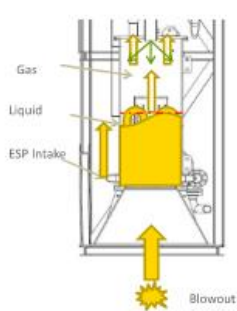
- Response tool devoted to assist and enhance vertical well re-entry on a deepwater well, during a blowout
- Intended to guide the re-entry of a killing string in a flowing well; operated by an acoustic sensing system and a combined control of 2 ROVs



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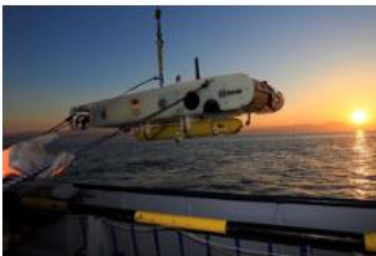
Rapid Cube System

- Subsea Oil Recovery System – no seal type
- Consist of a Subsea Separator and ESP pump to be deployed with dedicated vessel (currently Drilling Rig)
- Designed to be deployed with a Drilling Rig



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Clean Sea System



- Intended to be deployed for asset integrity inspection and environmental monitoring at the offshore installations
- Leak detection system, environmental parameters real – time measuring, water sampling, visual and acoustic inspections, pipelines tracking
- AUV or ROV operated, up to 1.200 meters of water-depth



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Thank you for your attention



8 Industry and Government Working Together: The role of the industry in emergency response planning (R. James, OSRL UK)



Agenda

- ▶ Guiding Principles in Emergency Response
- ▶ Good Practice in Government / Industry Collaboration
- ▶ Post Macondo Industry Initiatives



Guiding Principles in Emergency Response

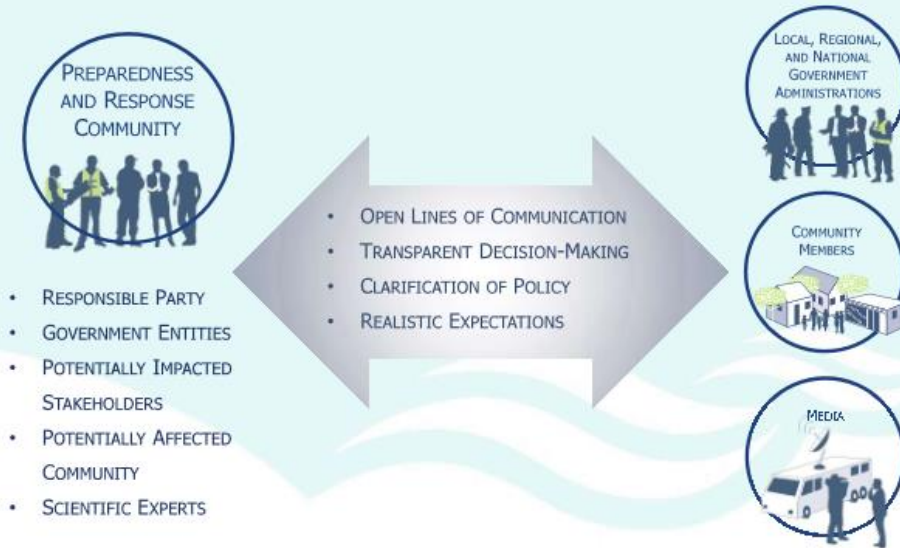
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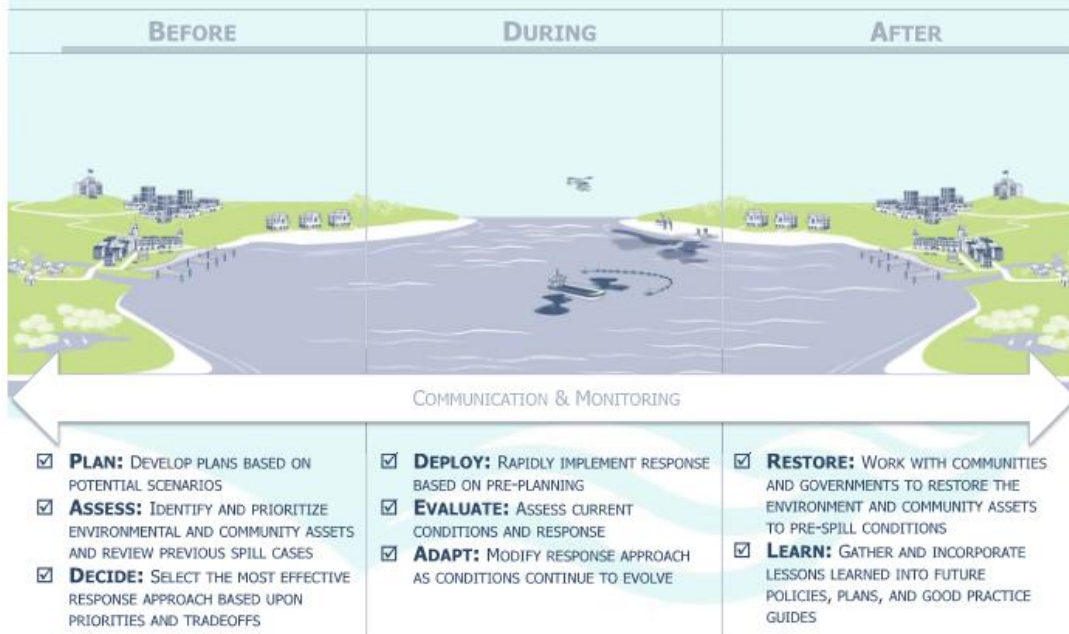
Working Together

- ▶ Industry and government have a shared interest in a unified, coordinated, and proactive approach, as this allows us to protect our shared values, which include:
 - Sensitive ecosystems,
 - The local business community and economy,
 - The health and safety of our citizens, and
 - The vitality and sustainability of tourism and other key community industries such as fishing.
- ▶ To achieve this well-managed response, there are several guiding principles that industry follows.

Multiple Stakeholder Engagement



Emergency Planning and Response Framework



Selecting the Right Response Tools



Good Practice in National Plans

- ▶ Clear roles and responsibilities
 - Quick decision-making key to effective response
- ▶ No artificial hierarchy of response techniques
 - Every spill is different, need to be able to use all the tools in the toolbox
- ▶ Well resourced and regularly exercised
 - Realistic, honest, real-time drills
 - Regular training for all actors



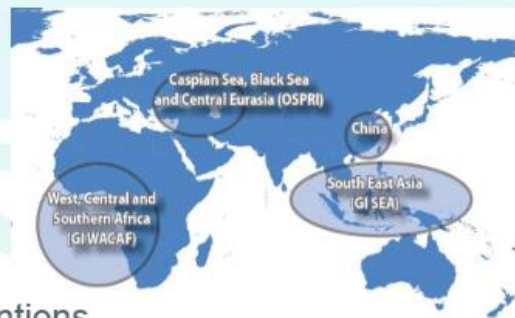
Good Practice in Government / Industry Collaboration

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The Global Initiative

- ▶ IPIECA and the IMO are working to enhance oil spill preparedness and response capacity for marine spills at priority locations around the world.
- ▶ This partnership aims to:
 - assist countries in preparing for major oil spills, and
 - encourage and enable ratification and implementation of oil spill related international conventions



GI Work Plan

- ▶ The GI has initiated regional / national workshops, training courses and exercises that have promoted and enabled:
 - the ratification and implementation of the relevant international conventions
 - the identification of responsible government agencies in charge of oil spill preparedness and response at national level
 - the approval of more national oil spill contingency plans (NOSCP) and regional plans
 - improved communications between government and industry at national and regional levels

UKCS Case Study

- ▶ Operators and the Regulators work very closely in the UKCS, they achieve this by
 - Assigning one OPRED Advisor to each Operator
 - OPRED invite Industry for consultation on any regulatory changes they are proposing
 - Operators use Oil and Gas UK as a single voice to engage with the regulators
 - EU Offshore Safety Regulations
 - Guidance Notes for Preparing Oil Pollution Emergency Response Plans
 - Oil Spill Response Effectiveness in UK Waters

Examples of Working Together

- ▶ Oil Pollution Emergency Plans
 - OPRED advisor assists with queries
 - Different formats developed for different facilities
- ▶ SOSRep exercises
 - Demonstrates operator can respond as per plan
 - Provide opportunity to practice responding together
- ▶ National Exercise
 - Test of the National Contingency Plan
 - Always 'hosted' by an operator
 - Provide opportunity to practice responding together



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Post-Macondo Industry Initiatives

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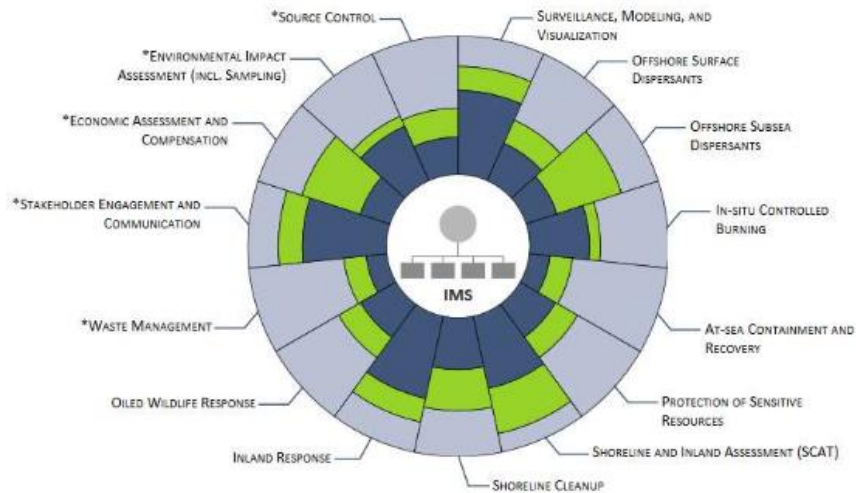
IOGP and IPIECA Global Industry Response Group



Good Practice Guides



- RESPONSE**
 - Aerial Surveillance of Oil Spills
 - Satellite Remote Sensing of oil Spills
 - In-water Surveillance
 - Dispersants: Sea surface
 - Dispersants: Subsurface
 - At Sea Containment and Recovery
 - In-Situ Controlled Burning
 - Shoreline Response Planning and SCAT
 - Shoreline Cleanup Techniques
 - Inland Responses
 - Waste Management
 - Oiled Wildlife Management
 - Economic Assessment & Compensation
 - Responder Health and Safety
- STRATEGY**
 - Oil Spill Preparedness & Response framework
 - Incident Management Strategies
 - Net Environmental Benefit Analysis (NEBA)
- PREPAREDNESS**
 - Contingency Planning
 - Sensitivity Mapping
 - Tiered Preparedness & Response
 - Training
 - Exercises
- IMPACTS**
 - Impacts on Marine Ecology
 - Impacts on Shorelines

Tiered Preparedness and Response




OSRL's Subject Matter Expert Programme

- The technical disciplines within OSRL's SME Programme align with the mainstream capabilities expected of Oil Spill Response Organisations, as outlined in the IPIECA-IOGP Tiered Preparedness and Response Framework.

Core Group	Scope of group
Dispersants	Surface dispersants Subsea dispersants
Surveillance, Modelling and Visualisation	Surveillance technologies from sky to the seabed Modelling and Visualisation
Shoreline	Shoreline protection Shoreline and Inland Assessment and Cleanup (SCAT) Shoreline cleanup
Offshore	Offshore containment and recovery In-situ burning
Inland	Inland waterways (static water, moving water) Inland substrates (impermeable, permeable)
Incident Management Systems	Incident Management Systems
Cold Weather	All planning and response scenarios in a cold weather environment

Direct links to industry experts from:



Wide Area Dispersant Capability

► C130 Hercules

- Senai, Malaysia
- 5hrs call to wheels-up
- Range 2,345nm unladen
- 300 kts
- Live tracking
- Dispersant System
 - 13m³ capacity
 - 170 – 1360 l/min flowrate
 - Swath width 150ft



Wide Area Dispersant Capability

► Boeing 727

- Doncaster, UK
- 4hrs call to wheels-up
- Range: 2,500nm unladen
- 480 kts
- Live tracking
- Dispersant System
 - 15m³ capacity
 - 800 – 1,200 l/min flowrate
 - Swath width 150ft
 - Data logging of spray volumes / locations



Global Oiled Wildlife Response System

Background

- Two-year JIP funded project
- Now OSRL funded in “beta testing” phase
- 10 international wildlife response groups
- Develop a robust Tier 3 response system
- Oversight via “Industry Advisory Group”



Deliverables

- **Governance**
 - How to work together
 - Who can be involved?
 - Models explored
 - How will this all be achieved? Roadmap
- **Standard Operating procedure (SOP)**
 - Coordination role explored
 - Notification/Assessment/Response/Demob process
- **Animal Care Standards**
 - Scientific literature update – where are we?
 - Common treatment protocols
- **Readiness**
 - Training modules
 - Exercises
 - Equipment & Tools

GOWRS: Next Steps

Programme

- Funded by OSRL (\$200k p.a.)
- Two year “beta” testing phase
- Sea Alarm = project manager
- Access still on “best endeavors”
- IAG activity
 - Widen membership
 - Build “Confident Ambassadors” in oil companies
 - Implement SOP exercising and feedback

Deliverables

- **Governance**
 - Establish chosen GOWRS model
 - Explore longer term plans (2019 onwards)
 - Continue to build coherence and collaborative spirit
- **Education and Outreach**
 - Develop communication materials
 - Conduct advocacy activity to message
 - Engage OSRL Membership and wider
- **Standard Operating Protocol (SOP)**
 - Test what has been built to date
 - Confirm contracting routes
- **Animal Care Standards**
 - Publish as Good Practice Guide (2017)
- **Readiness**
 - Standardize GOWRS personnel training
 - Industry OWR planning

Subsea Well Intervention Services



Capping Stack System

Brazil - 15k psi
Norway – 15k psi
Singapore – 10k psi
South Africa – 10kpsi

OSPRAG Cap for UK continental shelf only
Aberdeen – 15k psi

Subsea Incident Response Toolkit (SIRT)

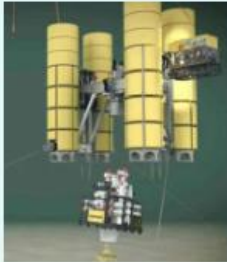
Stored in Brazil and Norway



Generic Containment Toolkit

- Adequate capture capacity for most subsea well incident scenarios
- Suitable for international deployment

Subsea Well Intervention Services



Offset Installation Equipment (OIE)

Allowing responding personnel to remove or install a capping stack, containment or relative equipment from a safe offset distance from an incident site



Global Dispersant Stockpile (GDS)

5,000 m³ of dispersant

(Based upon amount required for 30 days of ongoing response for a large incident, such as a subsea well blowout.)

Questions?

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Staying in touch

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robjames@oilspillresponse.com

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9 IADC Guidelines and Cooperation with the National Authorities and the Elgin Incident (J. Hoffmark, IADC)

IADC Guidelines and Cooperation with the
National Authorities and The Elgin Incident

Ravenna 5th-7th April 2017



Who is IADC?

Catalyzing improved performance for the drilling industry

Advocacy

Championing better regulation

Accreditation & Credentialing

Enhancing workforce competence

Technical Resources

Providing print, electronic and multimedia tools

Conferences

Networking and sharing best practices

Committees

Collaborating and shaping the industry

Chapters

Connecting the global industry

Industry News

Communicating critical information

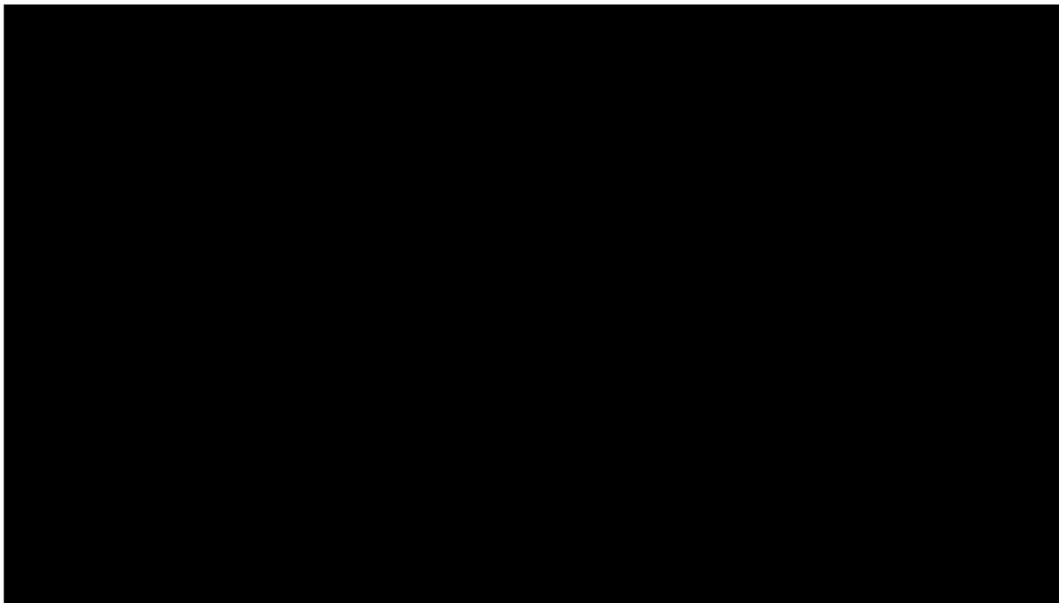


Regulatory Advocacy – IADC Goals

As governed by our bylaws, IADC strives to:

- Secure policies that enhance efficiency and effectiveness of IADC in supporting the drilling industry
- Secure positive outcomes through advocacy with government policy makers, representation with regulators and leadership of drilling space
- Prepare, safeguard and disseminate accurate information and pertinent analysis
- Facilitate exchange of ideas pertaining to policy making, regulatory matters, and improved industry performance affecting IADC members

And to do so in the most effective manner possible for each situation.



Task Given By Organizers for My Presentation

- *IADC should describe its guidelines (including cooperation with the national authorities) for intervention in case of accidents were to occur with consequences for both personnel, environment and assets..*



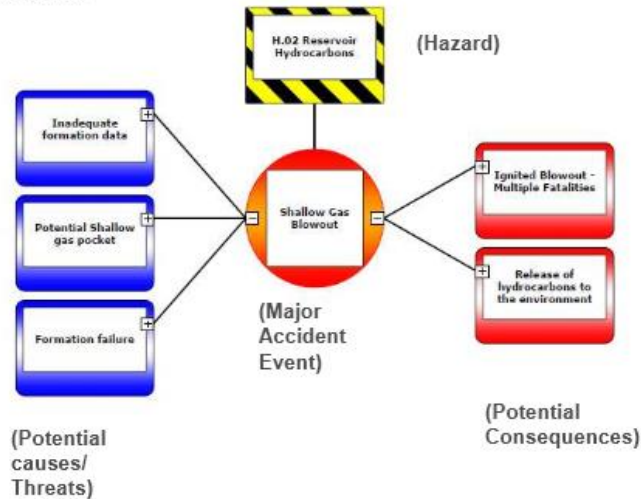
IADC Provisional Comments

- In our Safety Case guidelines we address the need for companies to completely address the “right hand side of the bowtie” and respond to mitigate or ameliorate incidents should they occur, but IADC offer no specifics. The specifics will largely, though not exclusively, be dictated by the terms of the contract and/or local custom regarding response by public authorities.
- In my next slide I offer you the right hand side of the bowtie!



Bowtie Example

A “bowtie diagram” is simply a pictorial representation of a Major Accident.



IADC Member Reference materials for Emergency Response Methodology

- IADC HSE Guidelines for Mobile Offshore Units
- IADC HSE Guideline for Land Drilling Units
- IADC Offshore Competency Training Programme
- IADC Emergency Response Plan
- IADC NorthWest European HSE Case Guidelines for MODU's

All these information is ready available on IADC.ORG free of charge and is used by our members for drawing up their individual Safety Cases



IADC HSE Guidelines for Mobile Offshore Units

IADC HSE Guideline for Land Drilling Units

- Assist in providing a demonstration to other stakeholders that their internal assurance process ensures that the management systems risk reducing controls related to HSE aspects of their operations meets their senior managements expectations
- Assist in providing a demonstration to external stakeholders where applicable, that the management systems risk reducing measures meet agreed upon stakeholders expectations



IADC Offshore Competency Training Programme

- The IADC European Working Group at the request of the North Sea Offshore Authorities Forum (NSOAF), Training Workgroup, developed this new Offshore Competency Training Programme. Discussions between NSOAF and IADC created the environment to develop this programme.
- The foundation of this programme is a common North West European standard for personal offshore competency. This will enable marine and rig crews to undertake specific courses, based on the training matrix, which are acceptable to all nations. Additionally, credit is given for marine and other personnel who have undertaken IMO STCW (International Convention on Standard of Training, Certification and Watchkeeping) training. The ability to move freely across national borders, demonstrating the right degree of competency, is the aim of this programme.
- The NSOAF envisages that this programme will contribute to greater efficiency and cost reduction both for industry and regulators, by reducing unnecessary duplication of effort. The NSOAF also expects that this programme will contribute to the enhancement of personal competency in health, safety and environment because of a more practical approach to training.
- The contents of this handbook reflect the extensive co-operation and hard work of Drilling Contractors throughout Europe and globally as well as the efforts of IADC, the British, Danish and Norwegian Ship Owners Associations



IADC Safety Case – Emergency Response Plan

- Ensuring that all the MODU crew members who may be involved in the command and control of an emergency are fully aware of: - the content and relevance of the plan - their specific roles and responsibilities What should be in the Case? Confirmation that the Emergency Response Plan contains relevant information from the analysis
- Description of the process for revising and updating the emergency response plan. Details of the involvement of MODU personnel in the maintenance and development of the emergency response plan. Details or reference to the H2S emergency procedures.



IADC HSE Guidelines – Emergency Response Plan

- Emergency Response Plan Objective
- To demonstrate that: - relevant information from the analysis is included in the emergency response plan - information contained within the plan is readily available to assist with decision making during a major accident. How can this be achieved? Identifying the information in the analysis that is directly relevant to the command and control of an emergency. Presenting the information in such a way that it can be easily referenced during an emergency. Ensuring that MODU crews are fully involved in the development and revision of emergency response plans.



IADC NorthWest European HSE Case Guidelines for MODU's

- Assist Drilling Contractors in preparing HSE Cases that will enable the Mobile Offshore Drilling Units (MODUs) to move between North West European (NWE) Coastal Areas without having to amend existing generic HSE Case documentation.
- Establish a harmonised foundation and framework to enable mutual acceptance of HSE Cases by NWE Coastal States. Demonstrate compliance with the International Safety Management (ISM) Code requirements. Capture the good practices and experience from ten years of operating within HSE Case regimes. The Guidelines are not compulsory. While they are intended to provide an example of good practice, Drilling Contractors should select the format and content for their HSE Case that suits their organisational and operational needs.
- IADC trust that the user will find the Guidelines useful and easy to follow. If errors, or inconsistencies are identified, or there are suggestions for improvement, then please submit relevant information to the IADC. (See details at end of this introduction – “Guideline Updates”).



Elgin Incident in the UK Sector of the North Sea

Ravenna 5th-7th 2017



Background Information for Presentation

- IADC have collected information from various sources such as , Rowan Drilling, HSE, Mr. Russel Breen and UK Coast Guard, Mr Simon Day.
- Both gentlemen were involved in the Emergency Response. Mr. Day was on watch in the Maritime Rescue Coordination Center at the time of the incident and today he uses the incident as a case study for training and thus had a deep knowledge to the incident which he kindly shared with me.



Background Information

- Case study in Offshore Emergency Evacuation – UK Sector North Sea
- Nature of the Incident – Gas Release at the Elgin Wellhead Platform
- Contracted Jack-Up unit – “Rowan Viking”
- Although, the incident occurred in March 2012, some aspects are still under legal review/litigation. Therefore, all information here was gathered from the public domain.



Background Information



- The Elgin Platform is located 149 miles east of Aberdeen in a water depth of 305 feet –
- The Field was discovered in 1991 and the production started in 2001
- Staff on the rig/platform 238
- Emergency Equipment:
 - 4 x 43 + 5 x 24 persons lifeboats

The incident occurred during work to plug and abandon the well, which was no longer producing gas.



Factual Information

- Total discovered a gas leak on 25th March 2012 12:15 hours
- 13:00 hours Total arranges a helicopters, which evacuates 200 non essential personel
- At Midnight the Elgin platform was abandoned and the remaining 19 onboard disembarked
- Emergency staff sees the sea bubbling!
- Coast Guard impose a 2 mile exclusion zone around ELGIN and a 3 mile no fly zone
- Shell announces on the 26th March they are closing down their Shearwater platform due to the risk of gas leaks and subsequent explosions



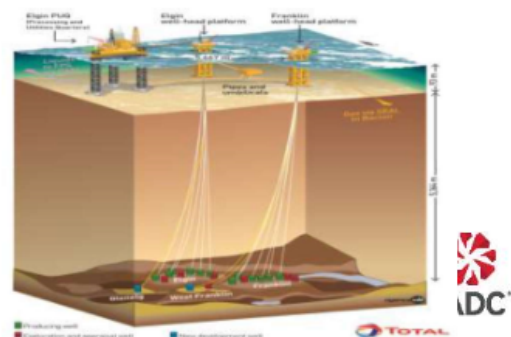
Emergency Response

- Two firefighting vessels are chartered and sail on location within the exclusion zone
- Hercules aircraft is on standby at East Midland Airport carrying dispersants
- The priority now is to plan an appropriate response to contain the leak and minimise the impact to the environment. Total have established their Emergency Response Centre (ERC) and have activated their Oil Pollution Emergency Plan.



Emergency Response

- A DECC Offshore Environmental Inspector has been present in the ERC and DECC continues to monitoring the ongoing response. The Secretary of State's Representative for Maritime Salvage and Intervention (SOSREP) is aware of the incident and is closely monitoring Total's response



Dynamic Kill Operation

- **Actions taken to tackle the leak**
- With respect to stopping the leak, Total is preparing two main actions which are progressing in parallel:
- Drilling relief wells – to that end, Total has suspended operations on two of its drilling rigs in order to make them available for work on the relief wells.
- Blocking the well with “heavy mud” – using a mixture containing mineral compounds to be pumped into the well to suppress the flow of gas.



Dynamic Kill Operation

- The Department of Energy and Climate Change has granted TOTAL environmental permits to undertake a dynamic kill operation to try to stop the gas release from the Elgin well.
- The operation will use heavy drilling mud pumped into the G4 well from the wellhead to stop the gas release. DECC has carried out full environmental assessment of the operation and the Health and Safety Executive has confirmed it has no objections to this intended activity.
- The well intervention operation will use the “West Phoenix” drilling rig as the pumping vessel, which will be located alongside the Elgin complex.



Dynamic Kill Operation

- A DECC spokesman said: “The Government and TOTAL have been working hard to ensure the Elgin gas release is dealt with as quickly and as safely as possible with minimal impact on the environment.
- “The dynamic kill operation is a major step for TOTAL and offers the quickest way to stop the release from the well. In parallel, work is underway to drill a relief well as an alternative solution. We continue to monitor the situation closely.”



Gas Release Stopped

- 16th May 2012 TOTAL has announced the gas release from the Elgin platform in the North Sea has been stopped.
- A dynamic kill operation has successfully used heavy mud to stem the flow of gas from the G4 well.
- This is the first stage in the process to permanently seal the well. Monitoring will now take place over the next few days to assess the complete success of the operation. After that, work can begin to permanently plug and abandon the well.



Lessons learned

- A couple of the learning points:
- The classification of the emergency phase at an early stage was important for the response to the incident. Because a Distress was declared, the Norwegian SAR aircraft was able to take more personnel on board than they had seats for. As the situation stabilised slightly, the Elgin was evacuated using a mixture of SAR aircraft and Commercial Air Transport (CAT) helicopters - though lengthy discussion were taken place regarding their use.
- Restricted airspace was established during the incident, which was there to protect the SAR (and CAT) helicopters operating in the area. However, the restriction was established based on gas release, which meant it wasn't easily collapsed and meant complications for Total getting engineers in to deal with the leak. Neither the Aeronautical Rescue Coordination Centre, the Coastguard or Total wanted to have responsibility for managing and policing the area.



Lessons learned

- There was excellent feedback on the importance of the Aircraft Coordinator Role and this proved invaluable during this incident. This is something the Industry and Regulators should look to use for in any subsequent incident of a similar nature, using multiple air assets.

After the gas leak appeared a clear Emergency plan was swiftly established

A close and professional cooperation was swiftly established between all stakeholders that is Regulators, Operator, Drilling Contractors, HSE, DECC, UK Coast Guard and they all acted in the most prudent and professional fashion



Conclusive Remarks

- Yves-Louis Darricarrere, president of Total Upstream, said: "Managing this industrial incident securely for our personnel and with limited impact on the environment was our priority.
- "The causes of the incident are now known and all necessary measures have been taken to enable us to resume production and carry out future exploitation of the fields from the Elgin/Franklin area in the best safety conditions.
- "Lessons learnt have been shared with the UK authorities and will also be shared with the wider industry. We now focus on continuing our development plans to bring back the full potential from these fields."
- Total fined record £1.125m for Elgin platform gas leak
- elgin.total.com/elgin/images.aspx (movies) May 21 2012 - Straight from the Expert - Following 5 days of close monitoring, the success of the intervention conducted on the leaking Elgin G4 well is confirmed



BATTLE TO PLUG THE LEAK

305ft

50 miles

Norway

ELGIN GAS FIELD

Aberdeen

North Sea

There are fears a flare on the rig could ignite the gas cloud

THE POSSIBLE CAUSE
Engineers working on pipes to an old gas reservoir caused it to rupture

HOW THEY COULD FIX IT
A Pump mud into the well to suppress the flow of gas

B Drill a relief well from another platform

Old reservoir

4 miles

Current gas reservoir

ELGIN PLATFORM

- Location: 149 miles east of Aberdeen, the oil capital of Europe
- Depth of water: 305ft
- Field discovered: 1991
- Production started: 2001

ON STANDBY

- Two firefighting vessels, Sea Bear and Skandia Saigon
- Unmanned submarine to scan seabed for signs of leaks
- Hercules aircraft carrying pollution dispersants



NORTH SEA EMERGENCY

1 SUNDAY MARCH 25, 12:15PM
Total discover a leak on the Elgin production platform

2 SUNDAY 1PM
Helicopters rescue more than 200 non-essential staff

3 SUNDAY, MIDNIGHT
Elgin abandoned and final 19 staff aboard removed. Emerging staff report seeing the sea 'boiling and bubbling'

4 MONDAY AT NOON
Coastguards impose a two-mile exclusion zone around the Elgin platform and a three-mile no-fly zone

5 YESTERDAY AT 1PM
Shell announces it is 'shutting down' the 19m rig, Shearwater, four miles away because of fears over the gas leak

ELGIN PLATFORM
 ■ Location: 149 miles east of Aberdeen, the oil capital of Europe
 ■ Well: Triangular, 337m on each side
 ■ Depth of water: 305 ft
 ■ Platform: Multiple use for production, utilities and quarters with a 3000 ft-ridge connecting to wellhead platform
 ■ Field discovered: 1991, production started 2001
 ■ Staff: 238
 ■ Emergency equipment: Four 43-man and five 24-man lifeboats

ON STANDBY
 ■ **Inside the exclusion zone:** Two freighting vessels, Sea Bear and Skandia Siggen
 ■ **Sea Bear:** Offshore supply ship which is 73.5metres long with 14 cabins and 24 beds for crew. It can travel at a maximum speed of 15 knots. Equipped with a hospital and freighting equipment
 ■ **Highland Fortress:** Carrying a remotely operated vehicle (ROV) to scan the seabed for signs of a subsided leak
 ■ **Heracles:** Aircraft carrying dispersant is on standby at East Midlands airport

FIXING THE LEAK
 Big Ben at 316ft to scale
 THE OPTIONS
 A Carry out a 'dynamic kill' pumping heavy mud into the well to suppress the flow of gas
 B Drill a relief well from another platform

Oil Fields in Area of Detail: Elgin, Shearwater, Glenelg, Franklin, West Franklin

Gas Pipelines: Oil pipeline to Cruden Bay, Gas pipeline to Bacton, Norfolk

Other Platforms: Highland Fortness, Sea Bear

Graphic: Geoffrey Stone



Questions?

10 Challenges for Regulators in the preparation and execution of their External ERPs (Group Exercise organised by BEIS UK)

OPRED

Offshore Petroleum Regulator for Environment and Decommissioning

Challenges for Regulators in Preparation and Execution of EERPs



 Offshore Petroleum Regulator
for Environment & Decommissioning

Challenges for regulators in the preparation and execution of EERPs

- Article 29 - External emergency response plans and emergency preparedness
 - Annex VII – Information to be provided in EERPs pursuant to Article 29
 - Annex VIII – Particulars to be included in the preparation of EERPs pursuant to Article 29

 Offshore Petroleum Regulator
for Environment & Decommissioning

Challenges for regulators in the preparation and execution of EERPs

- 2 hour group exercise facilitated by OPRED. The exercise is focussed on the challenges in relation to an ongoing offshore pollution incident.
- 8 groups selected by the Commission.
- Please get into the following groups now:



Challenges for regulators in the preparation and execution of EERPs

Group 1	Group 2	Group 3	Group 4
Hugh Shaw (UK)	Wendy Kennedy (UK)	Jonathan Milne (UK)	Vincent Claessens (NL)
Youssoupha Diop (FR)	Yuliyana Gospodinov (BG)	Roisin Cullinan (IE)	Anna Grabowska (PL)
Ben Browne (IE)	Jurga Lazauskiene (LT)	Themistoclis Kyriacou (CY)	Fabio Borriello (IT)
Salvatore Carbone (IT)	Antonino Calliri (IT)	Yoav Ratner (IL)	Jens Hoffmark (IADC)
Christian Schwarck (IOGP)	Mihaela Berghia (OVM Petrom)	Ilaria Antoncechi (IT)	Luca Falcone (EDINA)
Raffaella Pantile (Saipem)	Paolo Allara (Saipem)	Melania Buffagni (ENI)	Ketil Karlsen (Industrial Europe)
Paolo Russo (University of Ferrara)	Maria Corradi (Industrial Europe)	Hrvoje Goreta (INAgip)	Paolo Macini (University of Bologna)
Francesca Polla Mattiot (ENI)	Cristoforo Romanelli (ALTEC)	Malek Smaoui (REMPEC)	Andrea Rossotti
Group 5	Group 6	Group 7	Group 8
Jan Kool (NL)	Roberto Cianella (IT)	Bryn Aril Kalberg (NO)	Janni Rose Christensen (DK)
Kurt Machetanz (DE)	David Dobrinic (HR)	Gabriel Boulesteix (FR)	Vlatka Vanicek (HR)
Ojars Gerke (LV)	Constantin Gheorghe (gsp offshore)	Rocco Bruno (IT)	Frederic Hébert (EMSA)
Pietro Ruberto (IT)	Monica Mazzaresse (IT)	Rob James (OSRL)	Pietro Cavanna (Assomineraria)
Bruce Lawson (TOTAL)	Angelo Ligrone (ENI)	Damir Mlinaric (INAgip)	Ivan Mijic (INAgip)
Franco Nanni (ROCA)	Jako Krizan (EDINA)	Ignazio Frisone (Saipem)	Roberto Nicolucci (TECHNO HSE)
Anastasios Papandreou (COM)	Tommaso Pisino (IT)	Giancarlo Mangiapane (CREA)	Myrto Konstantinidou (JRC)
Ezio Mesini (University of Bologna)	Shlomo Wald (JRC)	Vittorio Pagotto (IT)	Sergio Bomben (Saipem)



Challenges for regulators in the preparation and execution of EERPs

- Each group has 30 minutes to discuss the allocated EERP challenges
- Each group should document discussion points and elect a spokesperson to present a summary of the discussion
- Take a 20 minute tea/coffee break after the group discussion
- After the break each group will have 5-10 minutes to present the summary of their discussions.



Challenges for regulators in the preparation and execution of EERPs

- Group 1 - EERP preparation/activation
 - Who should prepare the EERP?
 - How could an incident be notified to the organisation responsible to be implementing the EERP?
 - How should the EERP be activated?
 - What steps should a MS take to ensure the implementation of the EERP in the event of an incident?
 - How should a MS ensure the EERP remains current and applicable to operations?



Challenges for regulators in the preparation and execution of EERPs

- Group 2 – EERP structure :
 - How could the EERP be structured to ensure appropriate level of response is established?
 - How could a “tiered” approach to incident response assist the implementation of the EERP?
 - What decision making cells could be established for a national incident?
 - How should inter agency liaison be detailed in the EERP?
 - How could operational communications be specified in the EERP?



Challenges for regulators in the preparation and execution of EERPs

- Group 3 – Co-ordination of EERP response cells:
 - What response cells are mobilised in the event of EERP activation?
 - How should the EERP response cells be structured and their roles/specialities identified?
 - How should the communication flow between the response cells be managed?
 - How should operators identify and communicate with the EERP response cells?



Challenges for regulators in the preparation and execution of EERPs

- Group 4 – Relationship between IERP and EERP
 - What steps should a MS take to ensure the EERP is consistent with the IERPs?
 - How should a MS ensure the Operator has the financial capability to implement the IERP?
 - How could a MS ensure the capacity of licensees to demonstrate capability to meet their financial obligations – in particular how could a MS ensure the company liable for potential environmental damage has adequate financial resources to cover potential liabilities?
 - Should a MS be able to recover costs for EERP implementation from the Operator and how would this be managed?



Challenges for regulators in the preparation and execution of EERPs

- Group 5 – EERP exercises:
 - How often should a MS exercise the EERP?
 - What format could be used to exercise EERP?
 - Who should plan the MS EERP exercises?
 - How could MS EERP exercises be evaluated?
 - What does 'success' look like?
 - How could potential transboundary impacts be included in MS EERP exercises?
 - How could the interoperability or response resources between MS be included in the exercise regime?
 - How often should a MS review and update the EERP?



Challenges for regulators in the preparation and execution of EERPs

- Group 6 – EERP Resources:
 - How should a MS identify suitable emergency response resources (safety & environmental) to be detailed in the EERP and ensure the resources are available for use?
 - How should industry owned resources supplement the MS resources?
 - How should industry and MS resources be coordinated?
 - How could the arrangements for MS and industry resource storage, maintenance, transportation and deployment be captured in the EERP/IERP?
 - How should well capping/containment measures be included in the EERP/IERP arrangements?
 - How would the use of oil spill treatment products (dispersant) be authorised?



Challenges for regulators in the preparation and execution of EERPs

- Group 7 – EERP Information sharing:
 - What factors should a MS consider when making the EERP publically available?
 - Should the published EERP be a full version of the document?
 - What factors should determine the sharing of EERPs with neighbouring MS?
 - What communication channels should be established between a MS and neighbouring countries?
 - What factors should determine response primacy for transboundary incidents?



Challenges for regulators in the preparation and execution of EERPs

- Group 8 – EERP Media/communications
 - Which media teams may be established in a significant offshore incident?
 - What factors should be detailed in the EERP regarding media engagement?
 - How could the cooperation between various media teams be detailed in the EERP?
 - What practical working arrangements for media teams could be detailed in the EERP such as:
 - Procedures for avoiding conflicting media statements
 - A mechanism for clearing statements, responding to media enquires & social media and the arrangements for press conferences etc
 - Measures to avoid speculation

11 Oil Spill Response: two feasibility studies for recovery and monitoring (P.Allara, S.Bomben, R. Pantile, SAIPEM)



**Offshore Safety Directive (2013/30/EU)
1st Workshop on External Emergency
Response Planning**

**Oil Spill Response: two feasibility
studies for recovery and monitoring**

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Saipem Background

Just a flavour...



Congo - Kitina

20' Container c/w
offshore booms and
skimmer



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Saipem Background

Just a flavour...



Education and Training - as OPRC Training Provider

Costa Concordia - Controlled Ship Demolition



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V.I.T.O.
Virtuous Intervention Tool for Oil Spills

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V.I.T.O. - Virtuous Intervention Tool for Oil Spills

Typical oil spillage events and effects

Excluding exceptional events, the oil spills occurrences are in terms of weight on the average of 7-8 tons.

The contaminated water volume is observed to be about 3-4 times the oil volume spilled, with the result of a total volume to be treated generally equivalent to 25-30 m³.

Sea water oil concentration reaches generally values of 1000-1500 ppm.

MARPOL 73-78 limits to be respected are instead equivalent to 15 ppm.



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V.I.T.O. - Virtuous Intervention Tool for Oil Spills

Response and clean-up service

The response service can generally count on the technologies nowadays available that are mainly based on the contaminated water containment, the oil particles breaking-up by use of chemicals and the shipment of the recovered oil to shore for dedicated treatment.



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V.I.T.O. - Virtuous Intervention Tool for Oil Spills

V.I.T.O. unit concept

The aim of V.I.T.O. is to have a worldwide availability of “plug and play” units, modular and containerized, for an easy transport and lifting/installation on off-shore vessels.



V.I.T.O. - Virtuous Intervention Tool for Oil Spills

V.I.T.O. unit concept

The contaminated water is sucked from water surface by use of skimmers and pumped in to the container unit where will be subjected to the following sequence of different treatment phases:

- **First Filtration phase:** intended to remove by the use of gross and fine mesh screens the parts eventually present in to the water.
- **Filtration Unit:** intended to finally reduce the oil concentration to values < 15 ppm.
- **Storage:** use of pillow tank intended for oil disposal and gas vent.

V.I.T.O. - Virtuous Intervention Tool for Oil Spills

V.I.T.O. unit concept

The filtering concept at the base of the project is designed to remove oily contaminants, free oil and suspended solids from the contaminated water volume by a simplified system able to guarantee:

- Plug & play unit
- Easy to transport and operate/no-maintenance in operation
- No moving parts
- Lowest operating costs
- High flow rate and treatment efficiency
- No use of additives and no external residuals
- Simple design unit and no-maintenance concept in operation



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V.I.T.O. - Virtuous Intervention Tool for Oil Spills

Lab test report

January 2016

La Coruña - Spain

Tests have been conducted under Saipem and Vendor's representatives on oil/water mixtures at very high concentrations of different oil typologies - light and heavy - with the aim to verify the efficiency of coalescent plates technology in removing oily particles and contaminants from sea water, considering that an oil concentration of 1500-2000 ppm represents a typical real case intervention where high volumes of seawater have to be quickly treated.



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V.I.T.O. - Virtuous Intervention Tool for Oil Spills

Lab test report

During the lab test, as worst case scenario, an extremely high viscosity of water/oil mixture has been considered using heavy oil in concentration up to 70.000 ppm, with the aim to verify the capacity of the treatment system to be in accordance with MARPOL regulation where the oil content of an effluent without dilution cannot exceed 15 parts per million.

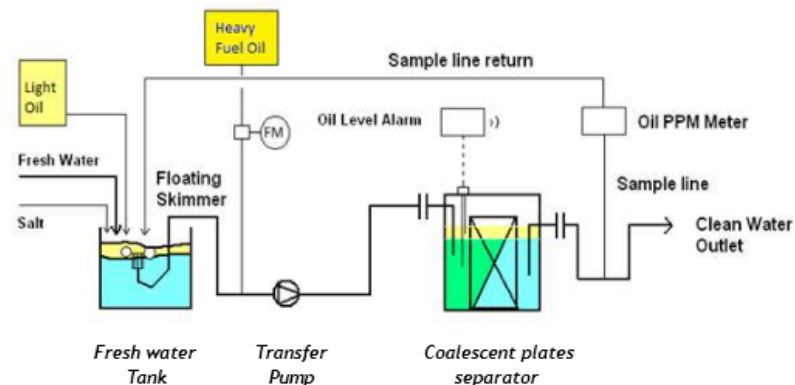
The test is intended to process the water in a single treatment process without recirculation, by the use of a water tank, floating oil skimmer, gentle positive displacement pump, inlet pipes, oil tank, oil ppm meter and oil level alarm.



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V.I.T.O. - Virtuous Intervention Tool for Oil Spills

Lab test report



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V.I.T.O. - Virtuous Intervention Tool for Oil Spills

Lab test report



Mixture preparation



Separator



Outlet / Inlet



PPM meter

V.I.T.O. - Virtuous Intervention Tool for Oil Spills

Lab test report



V.I.T.O. - Virtuous Intervention Tool for Oil Spills

Lab test report



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V.I.T.O. - Virtuous Intervention Tool for Oil Spills

Lab test report

RESULTS OF THE TEST

FLUID "A": Light Oil

Separator internal size: 800mm x 1000 x 1000 mm

Total salt water pumped during the test : 1000 lt /1h

Total light fuel oil in the test : 48lt

Inlet light oil concentration during the test: $48\text{lt}/1000\text{lt} = 4.8\%$
(48000 ppm)

Maximum light oil outlet concentration reading at oil ppm
device: 30 ppm



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V.I.T.O. - Virtuous Intervention Tool for Oil Spills

Lab test report

RESULTS OF THE TEST

FLUID "B": Heavy Fuel Oil

Separator internal size: 800mm x 1000 x 1000 mm

Total salt water pumped during the test: 1000 lt/ 64' = 1067 lt

Total heavy fuel oil in the test: 71 lt

Inlet heavy oil concentration during the test: 71lt/1067lt =
6.7% (67000 ppm)

Maximum heavy oil outlet concentration reading at oil ppm
device: 24 ppm



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V.I.T.O. - Virtuous Intervention Tool for Oil Spills

Lab test report

CONCLUSIONS

The technology tested is verified able to handle and remove light and heavy fuel oil from seawater, even at high inlet concentrations levels far above the average observed during common oil spillage events, giving outlet values lower than 30 ppm (with no recirculation).

The possibility to contain the pollution by use of floating barriers and the water recirculation at the basis of V.I.T.O. design, confirms the reliability of this technology and its treatment capacity in accordance with MARPOL regulation.



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Offshore Safety Directive (2013/30/EU)
1st Workshop on External Emergency Response Planning

Feasibility Project: EWIS

« Early Warning Integrated System »

A new Decision Support Tool

Ravenna, 5th – 7th April - 2017

EWIS - Early Warning Integrated System

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EWIS



The Context

The **EWIS** R&D Project, promoted by Saipem, is an "Integrated Decision Support System" (IDSS), dedicated to the management support of oil spill emergencies

- through the use of various types of equipment and sensors, both autonomous (satellites), either specifically installed on ships and aircraft, all connected to a central electronic system,
- able to collect different data type and format, relating to pollution in place and its evolution,
- to make them available of Emergency Management Centers, on GIS format, in real time or after predetermined time intervals;
- comparable with the various Predicting Trajectory Models of evolution of the oil spill used by Customers.

EWIS - Early Warning Integrated System

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EWIS



The Sinergy 1/2

Saipem, to develop the **EWIS** project, needed to join forces with a competent partner of the aviation and aerospace industry.

A suitable partner was subsequently identified in **ALTEC S.p.A.** a high-level reality, which operates in the specific field.

- **ALTEC – Aerospace Logistics Technology Engineering Company** - is the Italian center of excellence for engineering and logistics services to support the operations and utilization of the International Space Station and implementation of planetary exploration missions
- **ALTEC** is a public-private company owned by Thales Alenia Space, one of the most important European space industry, and the Italian Space Agency - ASI.
- **ALTEC** is a European key player in the development and operations of Mission Control Centers, Ground Segment and Data Processing applications.

EWIS - Early Warning Integrated System

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EWIS



The Sinergy 2/2

ALTEC background focuses on design, implementation and operations of:

- Mission control centers (space related projects and exoplanet exploration activities);
- Data processing systems (for satellite mission with huge amount of data generated);
- Supervision and coordination centers (for the management and distribution of data related to the environmental monitoring activities)

This know-how and experience will be used and exploited for the **EWIS** design and implementation.



EWIS - Early Warning Integrated System

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EWIS



EWIS Philosophy

Taken into account possible competitors, the target is set as a flexible and multitask system, to be made available, initially, but not exclusively, to customers of the Oil & Gas sector in the Mediterranean, as a “turnkey” solution, inserted and fitted into the actual operations of the Customers themselves, capable of:

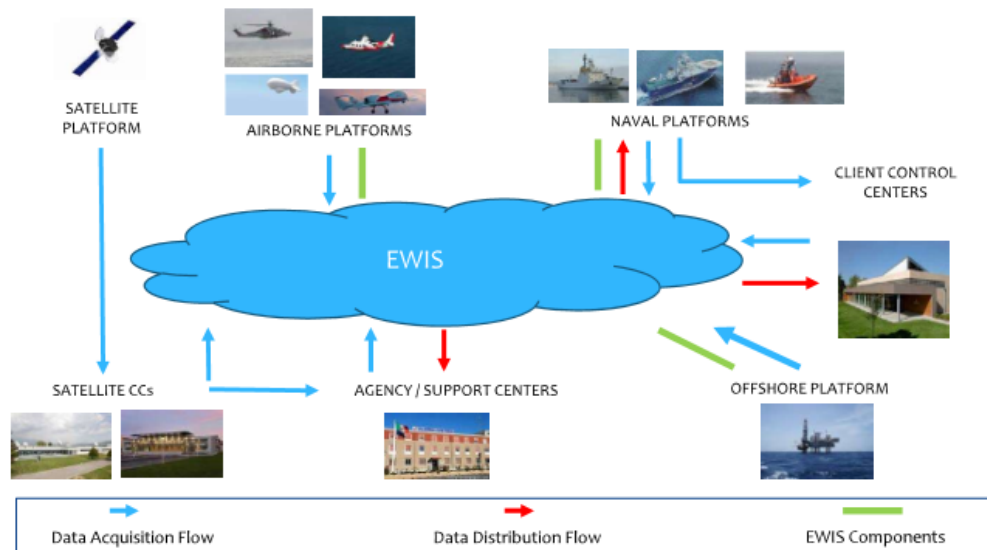
- Providing a technological network of sensors and always operational communication systems, on board the Customers’ offshore facilities and vessels, monitored in situ and remotely;
- Arranging tested sensors in kit ready-to-be-installed on Customers’ aircraft (upon verification of necessary certifications subsistence), and/or proposing alternative solutions such as pre-certified platforms and related sensor kit;
- Employing system - packages to be loaded on Customers’ vessels as a radio-link centers for data/images transmission from the area of operations; tethered balloons operated from the vessel will assure immediate control of the slick;
- Ensuring regular satellite surveillance, through agreements with several providers when needed, according to customer requirements;
- Integrating data from different acquisition sources into one system able to manage, processes and then display the data on a GIS Platform, through an already existing main control and supervision centre.



EWIS



The Project





EWIS



The Strategy (1/2)

- Achieve a highly reliable product through a prototype and relative trials sound engineering;
- Guarantee **a high quality service with cost minimization**, in the specific Mediterranean area characterized by few Operators and limited production rates;
- **Involve the public Administration** in future developments.
- **Develop the trial phase also in West Africa Countries**, already showing interest in the project;
- **Provide a 3-levels Service**, including the satellite imagery acquisition on request and the data collection, transmission, processing and visualization through 3 different suites...



EWIS



The Strategy 2/2

Identified Sensor Suites

Level	Available Sensors	Strength	Weakness
Basic	<ul style="list-style-type: none"> • Passive Visible (VIS) • Passive Ultraviolet (UV) • Passive Thermal Infrared (TIR) 	<ul style="list-style-type: none"> • Low Cost • Easy on-board installation • Easy data management 	<ul style="list-style-type: none"> • Sensor utilization constrained by light conditions (TIR is the only usable sensor at night time) • Sensor utilization constrained by atmospheric condition • False positive only partially removed using combined data • Limited oil spill characterization capabilities
Medium	<ul style="list-style-type: none"> • Passive VIS • Passive UV • Passive TIR • Active Radar (SAR o SLAR depending on the platform) 	<ul style="list-style-type: none"> • Good performances in almost every light condition (Thanks to radar sensor) • False positive limited through multi-sensor data combination (Particularly Radar + TIR) • Possibility to extract auxiliary information (i.e. meteo-marine information from Radar) 	<ul style="list-style-type: none"> • Complex installation of SAR sensor on certain kind of platforms • Complexity of Radar data processing • Average system price due to RADAR sensor cost • Limited oil spill characterization capabilities
Advanced	<ul style="list-style-type: none"> • Passive VIS • Passive UV • Passive TIR • Active Radar (SAR o SLAR depending on the platform) • Laser fluorosensor and/or Microwave Radiometer 	<ul style="list-style-type: none"> • Maximum performances, limited only by platform operations scenarios constraints (extremely rough sea and/or heavy atmospheric condition) • Most performant solution technologically available at the moment. 	<ul style="list-style-type: none"> • Complexity of data processing and fusion • Complex installation of advanced sensors on different platforms. • Price of the system (Sensor + Platforms usage cost)



EWIS



Conclusions (1/3)

EWIS is designed to manage multi-source data, i.e.:

➤ **DATA ACQUISITION PLATFORMS:**

1. Airplanes and helicopters
2. Ships
3. Offshore structures
4. Satellites
5. UAV (under evaluation)
6. Underwater ROVs

➤ **SENSORS:**

1. VIS/UV/IR Camera
2. SAR/SLAR Radar
3. Oil Spill detection System (naval radar)
4. Laser Fluorosensor
5. Microwave radiometer



EWIS



Conclusions (2/3)

- Few fully validated and operating system/products are already available on the market, using complex technology at high costs.
- EWIS must therefore offer a valid option with higher performances, more flexibility, interesting technological, operational and economical alternatives.
- The synergy between Saipem expertise in the oil spill field and ALTEC competence in complex data management and remote control represent a fundamental added value to the project.



EWIS



Conclusions (3/3)

In this framework, due to its innovative philosophy, EWIS represents a system able to:

- **Compete with other products currently available, due to its completeness, functionality and integration with support systems and infrastructures already existing;**
- **Collect data through a sensors network deployed on Customers' offshore structures and both naval and aerial assets, normally involved in routine activities, and in case of an emergency, through ready-to-go sensor kits, previously assembled and ready to be embarked on ships or fitted airplanes/helicopters.**

12 The use of mini-unmanned air vehicles for offshore surveillance and monitoring (P. Russo, University of Ferrara - R. Nicolucci, Techno HSE)



The use of mini-unmanned air vehicles for offshore surveillance and monitoring

Paolo Russo – University of Ferrara,
Roberto Nicolucci -Techno HSE



External Emergency Response Planning

Ravenna, Italy, 5th – 7th April 2017

Topics of the presentation

- MUAVs : GENERAL CONCEPTS
- CURRENT APPLICATIONS (Land and offshore)
- OUR EXPERIENCE
- RESEARCH AND PERSPECTIVES

MUAV's ?.... we commonly talk about "drones"

International terminology:

- Remotely Piloted Aircraft Systems (RPAS)
- Unmanned Aircraft Systems (UAS)
- Unmanned Aerial Vehicle (UAV)
- Remotely Piloted Vehicle (RPV)
- Remotely Operated Aircraft (ROA)
- Micro Aerial Vehicles (MAV)

Italian terminology

- Sistemi Aeromobili a Pilotaggio Remoto (SAPR)
- Areomobili a Pilotaggio Remoto (APR)



The smallest ones



The biggest ones



Altitude max: 14000 m
Endurance : 24 - 48 h
Payload: 1500 Kg

https://en.wikipedia.org/wiki/General_Atomics_MQ-1_Predator

CLASSIFICATION OF UAS

CATEGORY	Acronym	RANGE km	ALTITUDE m	ENDURANCE hours	PAYLOAD Kg
Nano	n	<1	100	<1	<0,025
Micro	m	<10	250	1	<5
Mini	Mini	<10	da 150 a 300	<2	<30
Close Range	CR	da 10 a 30	3000	da 2 a 4	150
Short Range	SR	da 30 a 70	3000	da 3 a 6	200
Medium Range	MR	da 70 a 200	5000	da 6 a 10	1250
Medium Range Endurance	MRE	>500	8000	da 10 a 18	1250
Low Altitude Deep Penetration	LADP	>250	da 50 a 9000	da 0,5 a 1	350
Low Altitude Long Endurance	LALE	>500	3000	>24	<30
Medium Altitude Long Endurance	MALE	>500	14000	da 24 a 48	1500
STRATEGICI					
High Altitude Long Endurance	HALE	>2000	20000	da 24 a 48	2000
SCOPI SPECIALI					
Unmanned Combat Aerial Vehicle	UCAV	1500	10000	circa 2	10000
Lethal	LETH	300	4000	da 3 a 4	250
Decoy	DEC	da 0 a 500	5000	<4	250
Stratospheric	STRATO	>2000	>20000 e <30000	>48	da stabilire

(MUAVs)

Mini Unmanned Aerial Vehicles (MUAVs) are becoming popular research platform during the last decade due to their multi-dimensional applications in almost every walk of life.



FLIGHT HEIGHT: UP TO 300 m
AUTONOMY: < 1 h
PAYLOAD: 200 gr ---- 10 kg

(MUAVs)

HELICOPTERS



Helicam



Autocopter



SYMA

S301G



Edmonton



SurveyCopter



Aeroscout

From «Ricerca e applicazioni geomatiche nel settore degli APR», Lo Brutto, ASITA ottobre 2014

(MUAVs)

FIXED WINGS



From: «Ricerca e applicazioni geomatiche nel settore degli APR», Lo Brutto, ASITA ottobre 2014

(MUAVs)

MULTICOPTERS



**THE UAV SYSTEM
COMPONENTS
FOR SURVEYING
APPLICATIONS**

AIRCRAFT



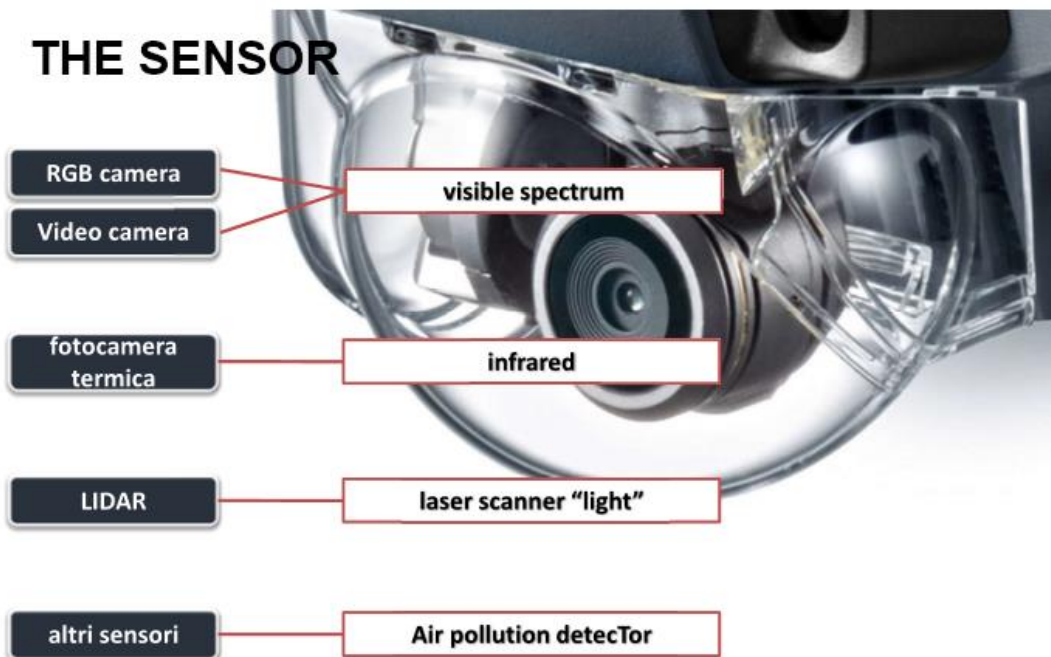
**THE GROUND
CONTROL STATION**



**SENSORS FOR THE
ACQUISITION OF DATA**



THE SENSOR



SOME CURRENT NON MILITARY APPLICATIONS

The most widespread applications

GEOMATICS

Digital photogrammetric or lidar survey of:

- Territory (mapping 2d and 3D)
- Buildings
- Infrastructures
- Cultural heritage

Photogrammetric survey of the territory



Aerial photographic image acquired by the drone

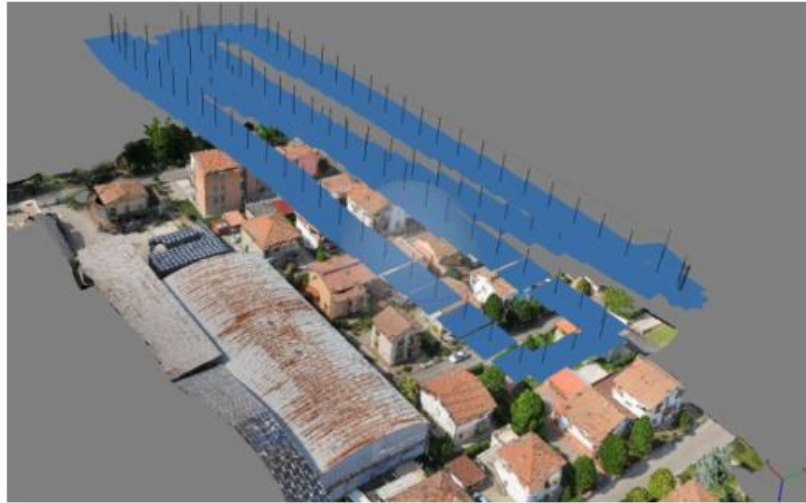
Photogrammetric survey of the territory : flight planning



Mission: WAYPOINTS



Photogrammetric survey of the territory :
flight path and images



Photogrammetric survey of the territory : the 3D model o
buildings and ground

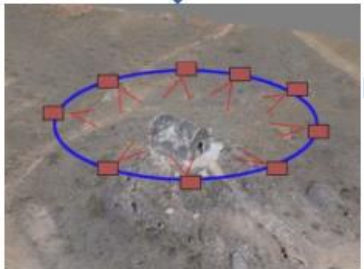
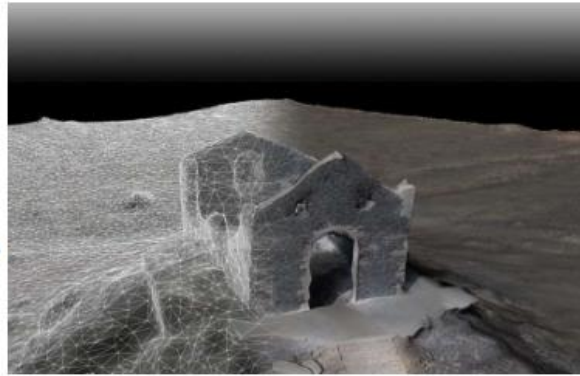


Photogrammetric survey and modelling of cultural heritage

THE OBJECT

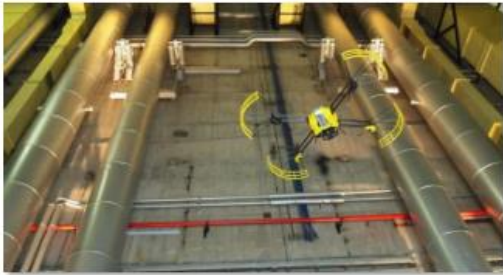


IMAGE PROCESSING :THE 3D MODEL



THE DRONE FLYES AROUND TAKING IMAGES

Other applications



INFRASTRUCURES INSPECTION
(plants and confined spaces)



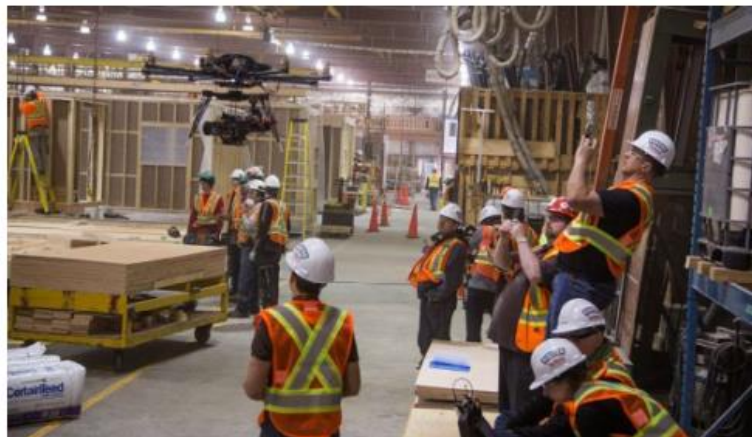
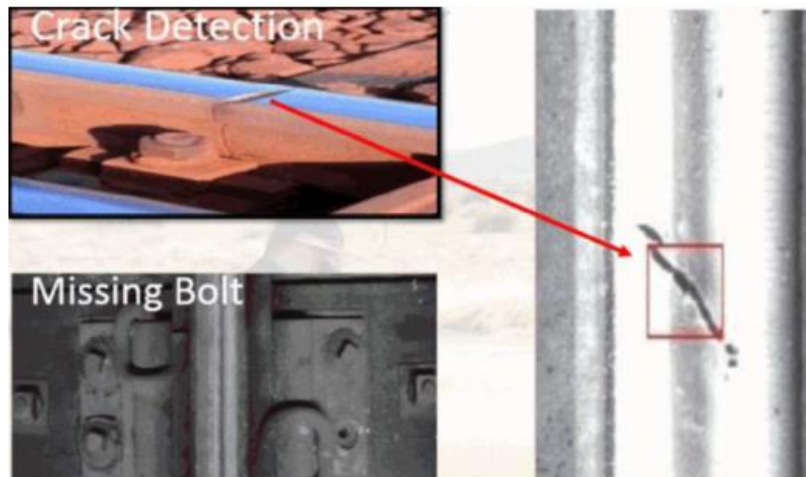
Fonte: www.aibotixitalia.it



CLOSE RANGE VIDEOINSPECTION
OF STRUCTURES



CLOSE RANGE VIDEOINSPECTION
OF RAILWAYS



INDOOR FLIGHT FOR INDUSTRIAL
PLANTS INSPECTION

www.flyability.it



Pipeline Monitoring

MONITORING OIL & GAS PLANTS AND INFRASTRUCTURES

<http://vestnergy.com/das-uav-pipeline-monitoring/>



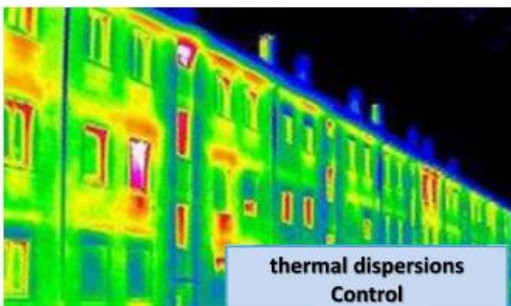
<https://pix4d.com/large-scale-industrial-surveying-drone-photogrammetry/>



www.dronezine.it

Checking presence hazardous substances

THERMOGRAPHIC APPLICATIONS



thermal dispersions Control

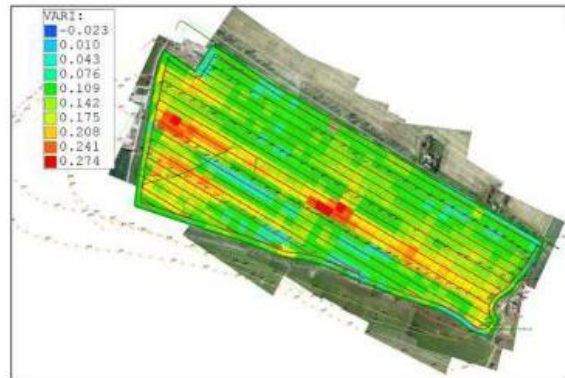
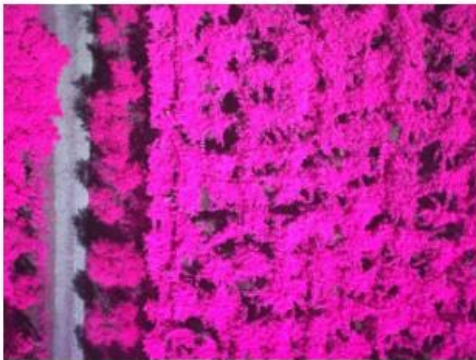


photovoltaic panels Control

www.fotovoltaiconorditalia.it



Precision farming: MULTISPECTRAL IMAGES AND DETERMINATION OF NDVI INDEX



EMERGENCY SITUATIONS



Fonte: www.dronemagazine.it

Monitoring of the territory in emergency situations



Fonte: www.ilsecoloxix.it



FORENSIC ENGINEERING





<http://www.dailytelegraph.com.au/news/nsw/police-drones-take-off-secret-weapons-in-the-fight-against-crime-and-terror-attacks/news-story/026a4a5eb8e97c83cba2eaaba424b591>

road accidents survey



<https://it.pinterest.com/pin/175288610469923999/>

www.dronezine.it



<http://www.customstoday.com.pk/doctor-drone-as-first-aid-server/>

FIRST AID: ADDRESS FAST
MEDICAL EQUIPMENTS IN
PLACES WHERE ARE NOT
AVAILABLE



<http://techtrends24h.blogspot.it/2013/08/defi-copter-first-aid-drone-made-in.html>

OFFSHORE PLATFORMS INSPECTION AND SURVEY



The drone and the ground station



<http://www.asctec.de/en/uav-uas-drone-applications/aerial-inspection-aerial-monitoring/>

inspection



<http://www.asctec.de/en/uav-uas-drone-applications/aerial-inspection-aerial-monitoring/>

Very close range inspection: corrosion monitoring



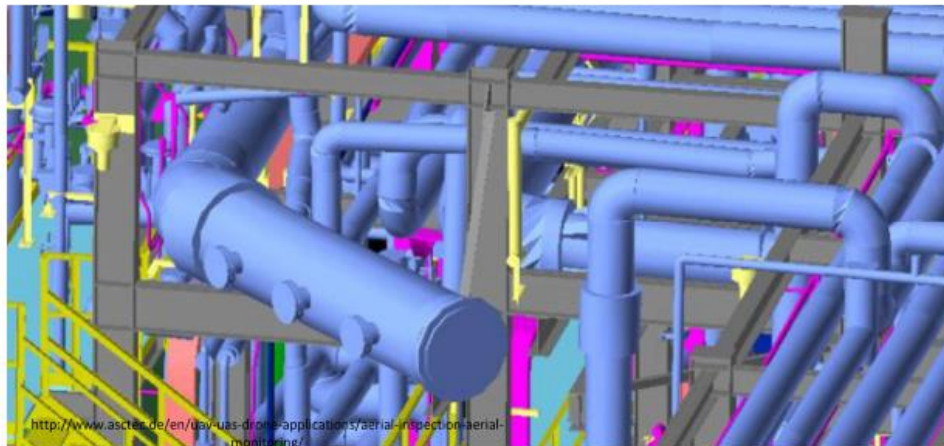
<http://www.asctec.de/en/uav-uas-drone-applications/aerial-inspection-aerial-monitoring/>

inspection of construction elements which are hardly accessible



<http://www.asctec.de/en/uav-uas-drone-applications/aerial-inspection-aerial-monitoring/>

The 3D virtual model of the plant from digital photogrammetry or 3d laser scanning

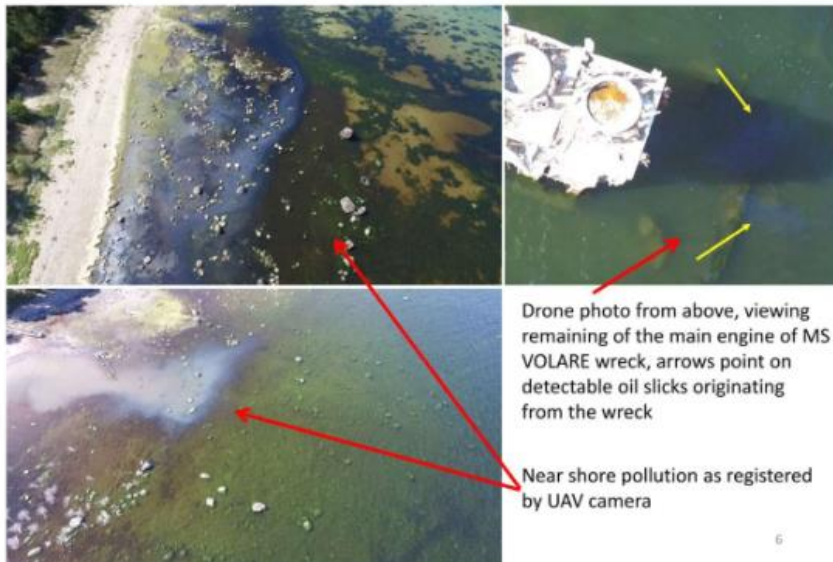


UAV applications for oil spill detection and suspended matter distribution



<http://extremevisiontechnology.com/blog/uav-drone-solution-for-gas-oil-refinery>

Oil spill detection



From: UAV applications for oil spill detection, suspended matter distribution and ice monitoring –first tests and trials in Estonia 2015/2016, Sander Rikka, Marine Systems Institute at TUT 1.11.2016

oil spill detection



https://www.youtube.com/watch?v=IN_NihsphY

TS Taipei Shipwreck and Oil Spill in Taiwan. Drone footage.

Oil spill detection

- Visual camera sensor not perfect for oil spill detection
 - Difficult to distinguish oil from the background
 - Sun glint
 - Wind sheen
 - Sea weeds
 - Cannot operate at night
 - No methods to ensure the positive detection
 - + Useful for documentation
 - + Cheap and widely available
 - + Easy to operate
 - The angle of the light
 - Seasonal differences
 - Reflections from waves and surface
 - Flight height
 - Wind, rain, snow etc

5

From: UAV applications for oil spill detection, suspended matter distribution and ice monitoring –first tests and trials in Estonia 2015/2016, Sander Rikka, Marine Systems Institute at TUT 1.11.2016

Oil spill in port



Photo 1



Photo 17

New drone to give MPA better view of oil spills

UAV being developed will be able to take off and land on water, operate at night

By ADRIAN LIM

THE Maritime and Port Authority of Singapore (MPA) expects to soon have an extra pair of "eyes" to assess oil spills at sea, in the form of a drone

which can be deployed from its patrol boats.

The authority is working with local engineering firm Hope Technik to develop an unmanned aerial vehicle (UAV) that is waterproof and capable of being deployed from its patrol boats.

"Using the UAV, we can have a comprehensive overview of the extent of the oil spill, and we can deploy our craft to a more efficient manner," said Captain Subhash Chavhan, port manager and deputy director of marine operations of the MPA. "From the surface, we have a limited line of sight, but we can see things we cannot see before."

Development of the drone, called the Water Spider, started last year and it will undergo trials at sea next. Hope Technik expects it to be ready by the third quarter of the year. The drone will cost at least \$10,000.

The firm's general director, Mr Ng Kiang Leng, said the Water Spider's flying algorithm allows it to fly in gusty winds of up to 20 knots, or 37 km/h. A typical drone can fly in winds up to only 15 knots.

Another key to launch it into and land on water is also important, Mr Ng said. "The drone has a vertical height and can adjust its take-off, and on most occasions, this is obstructed by obstacles and debris."

It will be equipped with two cameras - a regular one with a 10x zoom and another with thermal imaging, allowing it to operate like the night.

Singapore Oil and Singapore Customs general manager for Water said drones can be deployed quickly.

"Drones fly at low-wing (altitude) and helicopters sometimes are restricted because of air space control. Singapore is a small country and you need quite quickly into your neighbour's airspace. You may find themselves," he said.

MPA chief executive Andrew Tan said the UAV is a part of Singapore's push to be a leader in maritime safety.

The MPA has also started a more rapid reporting system. "The more incident that has happened, there could be several more incidents before the port... We want to understand if it's a risk relating to processing or business area," Mr Tan said.

'EYES IN THE SKY'

The Maritime and Port Authority of Singapore (MPA) is working with local firm Hope Technik on a prototype drone which can be used to assess oil spills and develop swifter clean-up responses.

SPECIFICATIONS

- Propeller: 10"
- Motor: 100W
- Flight controller: 100W
- Weight: 1.5kg
- Size (fully deployed): 1.5m x 1.5m x 1.2m
- Cost: More than \$10,000
- Can take off from and land on water

HOW IT WORKS

The drone is equipped for a variety of tasks up to 20 knots.

Power is supplied by a cable to the drone can fly continuously.

The "follow me" function allows the drone to follow the boat automatically.

Power cable is interfaced with a motor cable that is added strength.

In emergency, an off-switch is built.

A 10x zoom camera is used for oil spill detection.

A person can make an adjustment up to 1.5m x 1.5m x 1.2m.



Capable of Taking-off and Landing on Sea Surfaces



Water Spider in Flight

The Maritime and Port Authority of Singapore (MPA) is working with local firm Hope Technik on a prototype drone which can be used to assess oil spills and develop swifter clean-up responses.

River runoff monitoring

River runoff



17

Suspended matter distribution



15

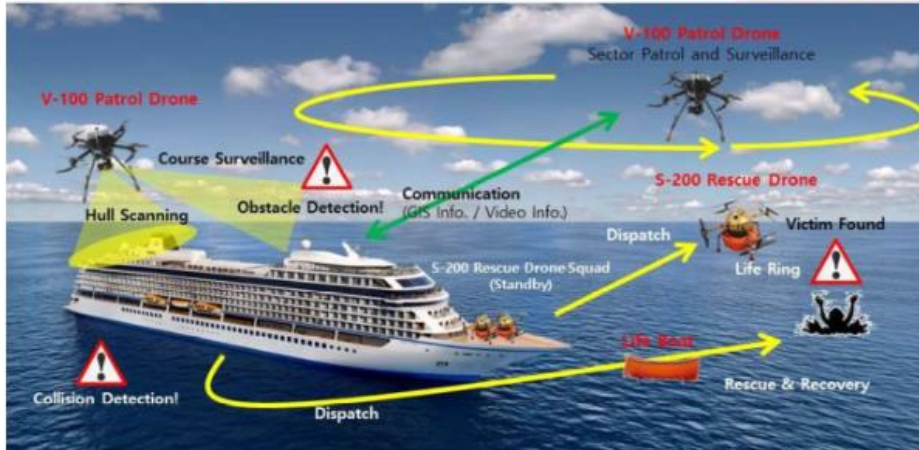
Search and rescue



<http://oceanhub.com/@oceanhub-as/maritime-drone-could-become-a-life-saver>

SOLUTION EXAMPLE #1 (Cruise Vessel Situation)

Marine Surveillance and Rescue System!



http://startup.buykorea.org/pav/BKKBPA032C.html?GOODS_SN=3054071&PAVLN_SN=3000619

SOLUTION EXAMPLE #2 (Beach Site Situation)



<http://startup.buykorea.org/>



images taken from video:http://startup.buykorea.org/pav/BKKBPA032C.html?GOODS_SN=3054071&PAVLN_SN=3000619



images taken from video:http://startup.buykorea.org/pav/BKKBPA032C.html?GOODS_SN=3054071&PAVLN_SN=3000619

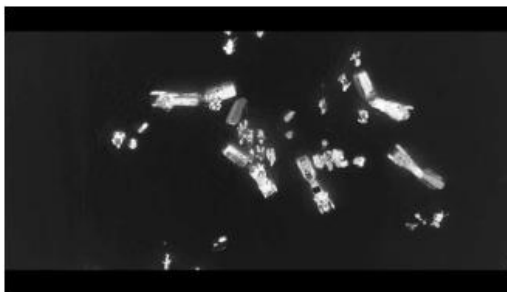
comparison of the rescue time



images taken from video:http://startup.buykorea.org/pav/BKKBPA032C.html?GOODS_SN=3054071&PAVLN_SN=3000619



SEARCH: INFRARED SENSOR



www.aerialtronics.com

Delivery of goods from vessel to vessel



<http://drone-atex.fr/index.php/fr/>
Drone-Atex Xamen Technologies



OUR EXPERIENCE and R&D PROGRAM

- HULL INSPECTION, SURVEY AND MODELLING
- DRY DOCK SURVEY
- SEA WATER SAMPLING (RESEARCH IN PROGRESS – PROJECT «**HYDRONE**»)
- GAS DETECTION (RESEARCH IN PROGRESS – PROJECT «**GASDRONE**»)
- X RAY DETECTION (RESEARCH TO BE STARTED)

GEOMETRIC SURVEY AND MODELLING OF A SHIP IN THE HARBOUR



PHOTOGRAMMETRIC FLIGHT

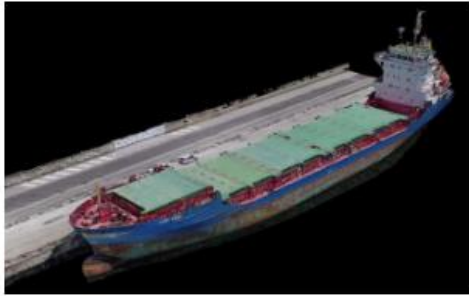
THE SURVEY



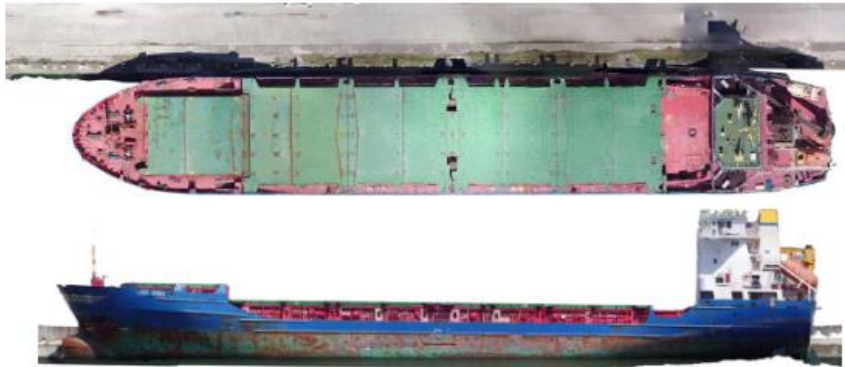
A DIGITAL IMAGE TAKEN FROM THE
UAV



TOTAL STATION SURVEY



DATA PROCESSING:
THE 3D MODEL OF
THE VESSEL AND
ORTHOIMAGES



DATA PROCESSING: 3D MODELLING OF A DAMAGE TO HULL



DIGITAL IMAGE



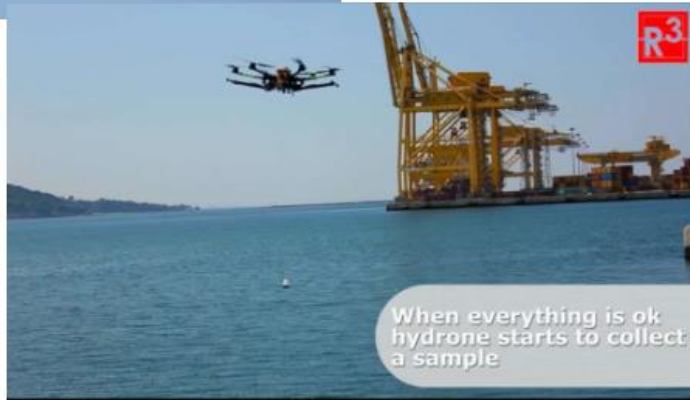
3D VIRTUAL MODEL

PROJECT «hydrone» FOR SEA WATER SAMPLING IN PORT

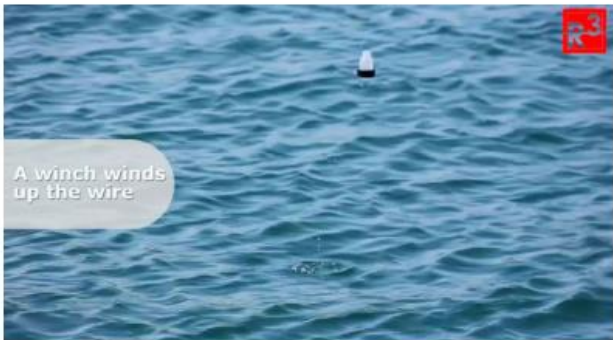




Retractable landing gears simplify operations and procedures



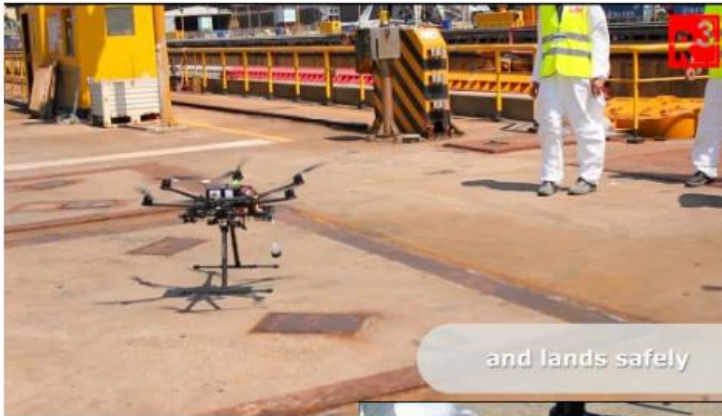
When everything is ok hydroner starts to collect a sample



A winch winds up the wire



A winch winds up the wire



THE USE OF MUAVs:
and

Advantages

Disadvantages

- ABSENCE OF THE PILOT**
- REACH PLACES otherwise unreachable**
- MANEUVERABILITY**
- rapidity of response to the emergency**
- Low cost**
- QUICK DATA COLLECTION**



- TECHNOLOGY STILL EVOLVING**
- PAYLOAD LIMITED**
- NEED TO WEATHER CONDITIONS FAVORABLE**
- AUTONOMY LIMITED**
- REGULATIONS AND LAWS THAT RESTRICT THE USE OF DRONES**

NORMATIVA ENAC (Ente Nazionale Aviazione Civile)



CORSO TEORICO e PRATICO

VISITA MEDICA AERONAUTICA

MANUALISTICA (manuale di volo, manuale delle operazioni, manuale di manutenzione, registro delle operazioni, analisi del rischio)

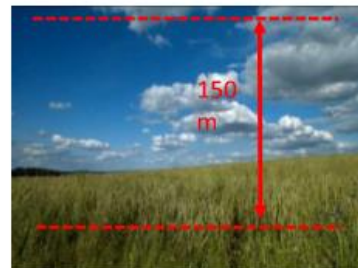
VIETATO SORVOLARE ASSEMBRAMENTI DI PERSONE



SOME REGULATIONS IN ITALY

LIMITS:

- MAXIMUM HEIGHT REACHED: 150 m
- MAXIMUM DISTANCE FROM THE TRANSMITTER: 500 m



future developments

- **On-water** launch and in-water recovery;
- **Pay load** Integration - video, still daylight and nighttime
- **IR imaging, image processing**, and hazardous material air plume sensing and mapping;
- **Command, Control and Communications** (data link to the Incident Command Post);
- **Platform Improvements** - greater reliability, minimized size and weight, portability, longer operational flight time and extended range, and improved power sources;
- **GPS positioning** -

Our group R&D program

Improvement of the sampling system, increasing the duration of the flight and the payload so as to take larger samples (HYDRONE)

Equipment of the drone with sensors for multiparameter analysis of sea water in situ (HYDRONE) (to be started)

Equipment of the drone with X ray detector (to be started)

Improvement of the sampling system and analysis of the atmosphere (GASDRONE) (

Project and development of an oil spill detection and mapping UAV System (to be started)

Improve the accuracy of GNSS positioning the drone (delivery medicines, goods on board boats of known position)

Development of system for indoor navigation (inspection of ship's hold)

Cooperation is welcome!!!

The first UAV.....?



(Julius Neubronne)
(1907)

thank you for your attention

13 Offshore emergency: Lessons learnt & State of the art (G. Mangiapane, CREA)

Offshore Emergency

Lesson Learnt & State of Art


crea
safety engineering


gruppogramma
igeam


Safety Environment Quality


Emergency Planning - Directive Focal Points

“(39) Information on major accidents in offshore oil and gas operations [...] can help in further understanding their potential causes, in promoting learning of key lessons and in further developing the regulatory framework.” Directive 2013/30/EU

Sharing of information and Cooperation with planning and emergency response purpose.

«...the environment is not compartmentalized and nor should environmental policies be.»
[ROPME 2013]


crea
safety engineering


gruppogramma
igeam

Safety Environment Quality

Global Situation

Puzzled situations followed the Macondo Incident

- *Lots of associations of industries and technical expert spread worldwide to develop new strategies and technologies to assure more and more efficient emergency response preparedness*
- *Need of Uniformity, Cooperation, Transparency and Development of more efficient prevention measures.*

But, what are the real Lesson to be learnt?



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Lesson Learnt

Prevention

- Failure to properly identify risks and address them in risk assessment
- Failure of well cementing job (Primary barrier)
- Failure of BOP (blowout preventer) (Secondary barrier)

Mitigation

- Failure to adequately use the diverter; too much reliance on human response under pressure
- Failure to avoid ignition of released hydrocarbons
- Failure to protect vulnerable areas (e.g. control room, workers' area, vulnerable compartments) from the impact of explosion



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Lesson Learnt

Preparedness and planning

- Failure to be adequately prepared to respond to the accident

Emergency response

- Failure to adequately respond to the accident

Lessons learning

- Failure to learn from accidents and from near-misses

Critical Points

Main Issues related to Operators:

- Minimize Human Error
- R&D of high level technology standards
- Reliability Risk assessment
- Installation of adequate BOP, diverter, gas detectors in appropriately defined hazardous areas
- Use of materials and designs that withstand increased overpressure.
- Be prepared and foresee the capacities needed to respond to the accident.
- Application of highly sophisticated emergency response technologies and application of efficient plans
- Put in place an appropriately designed system to investigate accidents, identify key lessons and learn lessons from accidents, incidents and near misses
- Communicate key lessons internally and externally, to the wider offshore risk management community

Critical Points

Main Issues related to Authorities :

- Appropriate oversight and performing of inspections and control of conformity,
- Reviewing risk assessment,
- Checking operator's/contractor's capacity,
- Reviewing and inspecting the emergency plans, confirming the existence of capacities, ensuring that other respond authorities are informed and managing transboundary effects
- External Emergency plan with the involvement of various authorities from affected Member States
- Collects data and forwards to the Commission for further analysis, in order to disseminate lessons

Critical Points

- need for pooling of data in order to have a complete picture of the offshore sector safety
- need for common formatting and transparency in order to facilitate data and experience sharing
- Inclusion of near misses in accident databases is necessary, because important lessons can be learned from them
- Lessons learnt from accidents and incidents should be available to all stakeholders
- Need to avoid double-reporting of accidents and incidents in different organizations (i.e. regulatory authorities, international associations)

Critical Points

Well control incidents:

- increasingly effective sharing of lessons learned amongst O&G Companies and Public Authorities
- formalizing a culture of learning, and embedding lessons learned from well control events in members' organizations
- using the learning to constantly monitor gaps and focus on the right prevention areas
- identifying opportunities to improve BOP reliability and efficiency
- promoting common industry solutions and identifying best practices



Safety Environment Quality

Critical Points

International standards, international collaboration and good coordination

- advocating for risk-based standards, pursuing the harmonization of key standards and influencing of new standard developments and their revisions
- avoiding different operational approaches foreseeing and proactively addressing the protocols and procedures for interactions and the interoperability: this applies particularly when myriad organizations of multiple types, composed of individuals from different backgrounds, training, and expertise, are responding to different hazards, operating in different geographical areas, and with different values, come together to respond to an emergency



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Critical Points

Human factors training, behaviors & competence

- providing a permanent improvement in the competence and behaviors of those people working in well control operations - a remit that includes operators, contractors and equipment manufacturers



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Emergency Planning - Directive Focal Points

Directive 2013/30/EU calls for:

- creation of **Databases** with information for Emergency Response and Emergency Prevention, regarding:
 - *Sharing of Best Practices*
 - *Incidental Experiences*
- **sharing of Contingency Plans** implemented in the individual Member States.
- make **every experience a "lessons learned"** for each Member State and / or active operator within the European Union.



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Safety Environment Quality

Sharing of Best Practices

Puzzled situation over Best Practice Databases

OSPRAG (Oil Spill Prevention and Response Advisory Group)

- operates in the North sea area
- review of industry practices, based on the findings of the Macondo accident
- technical support on protection of personnel,
- responses to emergencies and oil spills at sea,
- indemnity and insurance

Sharing of Best Practices

OSPAR

- operates on the north-East Atlantic security (born with the Oslo Convention of 1972 and the one in Paris in 1974, then unified and updated in the OSPAR Convention in 1992)

NSC (North Sea Conference)

- with the aim to achieve a comprehensive policy and a common structural framework for the protection of the North Sea.

NSOAF (North Sea Offshore Authorities Forum)

- a permanent forum with the aim of securing continuing monitoring and improving the safety of health policies and environmental protection in the North Sea.

Sharing of Best Practices

USA - Marine Well Containment Company (MWCC)

- *Founded in July 2010*
- *Shell, Chevron, ConocoPhillips and ExxonMobil*
- *New containment response capability for the U.S. Gulf of Mexico*
- *Built on a new Containment Systems starting from the company's previous system capabilities*
- *Today: 10 member companies*



Safety Environment Quality

Sharing of Best Practices

Global Industry Response Group (GIRG)

- *In response to the Gulf of Mexico oil spill incident (2010) and the preceding Montara incident in Australia (2009)*
- *Formed by the International Association of Oil and Gas Producers (IOGP)*
- *Identifying learning opportunities related to both incidents*
- *Nineteen recommendations, addressed via a Joint Industry Project:*
 - **Oil Spill Response JIP (OSR-JIP)** *funded by nineteen oil industry members*
 - *Managed by IPIECA on behalf of IOGP*
 - *Main scope: to improve the industry's well incident prevention, intervention and response capability to reduce materially the likelihood and impact of future well incidents*



Safety Environment Quality

Sharing of Best Practices

Subsea Well Response Project (SWRP)

- *Established in 2011 on the recommendation of the International Association of Oil & Gas Producers (IOGP)*
- *BP, Chevron, ConocoPhillips, ExxonMobil, Petrobras, Shell, Statoil and Total*
- *Further improve the prevention of, and response to, subsea well-control incidents.*
- *In 2013, SWRP delivered advanced capping and dispersant equipment for use by the international oil and gas industry*



Safety Environment Quality

Sharing of Best Practices

EPOL Emergency Preparedness Offshore Liaison Group

- *Formed in 1995 in the aftermath of the Piper Alpha disaster in July 1988, the subsequent Public Enquiry and the introduction of the Prevention of Fire and Explosion, and Emergency Response Regulations 1995*
- *Established to look at all aspects of offshore oil and gas industry emergency response where there was a risk to life in the UK Search & Rescue Region (UK SRR)*
- *EPOL is an industry led body chaired by Police Scotland and HM Coastguard is a permanent member.*
- *EPOL has spawned a number of sub-groups which cover aspects of emergency response*



Safety Environment Quality

Sharing of Best Practices

OERWG Offshore Emergency Response Working Group

- *established by EPOL in 2009 following two major offshore helicopter incidents in the Central North Sea.*
- *unique grouping that brings together the emergency services, regulators, and a cross section of the offshore oil and gas industry to review offshore Search and Rescue (SAR) procedures.*



Safety Environment Quality

What's Can Be Done?

Developing Unified Databases and Forum for sharing Best Practice

European Union Offshore Oil and Gas Authorities Group (EUOAG)

- Forum for the exchange of experiences and expertise on major accident prevention and response in offshore within the Union
- Established with Commission Decision C18/07 in 2012
- Formed by Member States' authorities covering safety and environmental protection aspects.
- Objectives: prioritization and supervision of the development of guidelines on best practices, and rapid exchange of information on incidents.



Safety Environment Quality

Incidental Databases

Puzzled situation over Incidental Databases:

- **UK – ORION Database** requires that all work-related accidents, diseases and dangerous occurrences in the UK and UK Continental Shelf are to be reported to the HSE.
- **UK – Hydrocarbon Release Database:** it contains information on all offshore releases of hydrocarbons reported to the HSE Offshore Division (OSD)
- **UK – Collision database:** vessel/platform collision incidents on the United Kingdom Continental Shelf (UKCS), data not available to the public.
- **UK – MAIB:** Marine Accident Investigation.

Incidental Databases

- **Norway – Petroleum Safety Authority (PSA):** according to the Management Regulations all accidents that result to death or injury should be reported to PSA through special forms.
- **Norway – SINTEF:** Offshore Blowout Database (BLOWOUT) is a comprehensive event database for blowout risk assessment.
- **Denmark – Danish Energy Agency:** accidents and near misses are reported to Danish Energy Agency (DEA) using the Electronic reporting system (EASY) or a special notification form.

Incidental Databases

- **IRF - Performance Measurement Project:** measure and compare offshore safety performance by collecting and comparing incident data. Data are provided from the members of the Forum
- **OGP – Well Control Incident Database:** Wells Committee of the International Association of Oil and Gas Producers
- **NSOAF – Common reporting format project:** the North Sea Offshore Authorities Forum; project of develop a common format for exchanging information about incidents, accidents and near-misses
- **DNV – WOAD:** one of the main sources for offshore accident information for public use includes accidents, incidents and near misses

What's Can Be Done?

Developing Unified Databases for record past and future near misses and incidents

- Information to be set in decided with respect of emergency planning scopes:
 - ageing of installations
 - statistical data grouped by type of installation and marine area regarding failure rates, causes of near misses and incidents
 - correlation between the incident magnitude and type of emergency response resources

In this way risk management decisions would be based on more objective and reliable data.

What's Can Be Done?

Developing Unified Databases for record past and future near misses and incidents

Joint Research Centre has developed

SyRIO

System for Reporting Incidents in Offshore Oil & Gas Operations

for reporting accidents and incidents from the operators to the Competent Authority of the individual Member States.



Safety Environment Quality

What Can Be Done?

Developing of Area Contingency Planning with the cooperation of different operators

- Long-standing close co-operation between Member States reduced the time required for emergency response to be activated.
- Area risk based assessments with focus on:
 - sea conditions,
 - number of installations,
 - type of fluids produced by installations,
 - ageing of installations
- Sharing maritime and airborne emergency response resources
- Prioritizing Areas for Additional Response Capacity



Safety Environment Quality

Area Contingency Planning

Three levels of Co-operation/assistance between States are currently available:

- Multilateral agreements (sub-regional level) between neighboring States
- Regional Agreements (regional level) between States adjoining the same sea area
- EMSA (Pan-European level) for all European Union Member States and European Neighborhood Policy (ENP) Countries



Safety Environment Quality

Area contingency planning Good Practice

Multilateral Contingency Planning Agreements

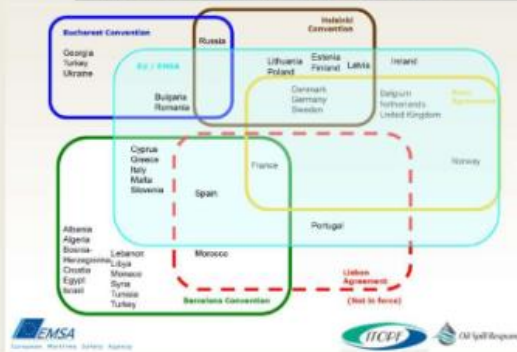
- **DENGERNETH Plan:** Joint Danish-German-Dutch Response Plan to maritime incidents involving Oil and other Harmful Substances and Co-operation in Aerial Surveillance, between Denmark, Germany and the Netherlands
- **MANCHEPLAN:** between France and the United Kingdom
- **NORBRITPLAN:** between Norway and the United Kingdom. The objectives of this plan are to establish procedures to be followed during any joint Norway/UK pollution response and salvage operations at sea. It clearly defines lines of communication as well as command and control procedures.
- **QUADRIPARTITE ZONE:** between Belgium, the Netherlands, France and the United Kingdom



Safety Environment Quality

Area contingency planning Good Practice

Regional Contingency Planning Agreements Regional Agreements in Europe



gruppo
igeam

Safety Environment Quality

Area contingency planning Good Practice

Regional Contingency Planning Agreements between STATES

- the Helsinki Convention on the protection of the marine environment for the Baltic Sea (www.helcom.fi)
- the Bonn Agreement for cooperation in terms of oil pollution response in the North Sea (www.bonnagreement.org)
- the Barcelona Convention for the protection of the Mediterranean Sea (www.rempec.org)
- the Bucharest Convention on the protection of the Black Sea against pollution (www.blacksea-commission.org)



gruppo
igeam

Safety Environment Quality

Area contingency planning Good Practice

Regional Contingency Planning Agreements between OPERATORS

Statoil, ExxonMobil, and Gassco have received consent from the Petroleum Safety Authority (PSA) to establish and participate in area contingency planning in the Sleipner Utsira area, off Norway (January 2017)



Safety Environment Quality

Area contingency planning Good Practice

EMSA (Pan-European level) for all European Union Member States and European Neighborhood Policy (ENP) Countries

the Agency provides technical assistance and support to the European Commission and Member States in the development and implementation of EU legislation on maritime safety, pollution by ships and maritime security. It has also been given operational tasks in the field of oil pollution response, vessel monitoring and in long range identification and tracking of vessels.



Safety Environment Quality

Area contingency planning Good Practice

Main goals achieved:

- *keeping each zone of responsibility under surveillance (including aerial and satellite), overcoming confusion or ambiguity over roles and responsibilities;*
- *obligation for States to inform the other States of their national organization for dealing with accidental pollution at sea and of new ways in which such pollution can be avoided;*
- *adopting common operational approaches;*
- *supporting each other (when asked to do so) in response operations;*
- *sharing research and development and carrying out joint exercises;*
- *Contracting Parties are required to notify each other of any casualty or of the presence of harmful substances in the North Sea. A standard notification format (POLREP) has been adopted.*

14 The activities of the European Maritime Safety Agency (F. Hébert, EMSA)



Frédéric HEBERT Head of Unit C1 « Pollution Response Services »/ Department C « Operations »

Ravenna 6 April 2017



EMSA is one of the (50) EU Agencies:

- Legal Entity** funded by a Regulation with a mandate,

- with an **Administrative Board** tasked with defining the work programme within the mandate

- **for Anti Pollution Measures a specific regulation on Multiannual Funding** (MAF Regulation) currently 2014-2020)



EMSA founding Regulation



In 2013 the Regulation 1406/2002 was amended in order to distinguish between:

-core tasks: funded by the ordinary Budget

-ancillary tasks: subject to agreement by the Board and provided that additional funding/resource is made available.



3

EMSA's mandate (Regulation 1406/2002)



« For the purpose of ensuring a high, uniform and effective level of maritime safety, **prevention of and response to, pollution caused by ships as well as response to marine pollution caused by oil and gas installations.**

To that end the Agency shall cooperate with the Member States and the Commission and provide them with technical, operational and scientific assistance. »



4

Art. 10 of the Offshore Safety Directive



2. Within the framework of its mandate, the Agency shall:

- (a) assist the Commission and the affected Member State, on its request, in detecting and monitoring the extent of an oil or gas spill;
- (b) assist Member States, at their request, with the preparation and execution of external emergency response plans, especially when there are transboundary impacts within and beyond offshore waters of Member States;
- (c) on the basis of the Member States' external and internal emergency response plans, develop with Member States and operators a catalogue of emergency equipment and services available.

3. The Agency may, if requested:

- (a) assist the Commission in assessing the external emergency response plans of Member States to check whether the plans are in conformity with this Directive;
- (b) review exercises that focus on testing transboundary and Union emergency mechanisms.



5

EMSA organisation



Agency based in Lisbon

2 main departments:

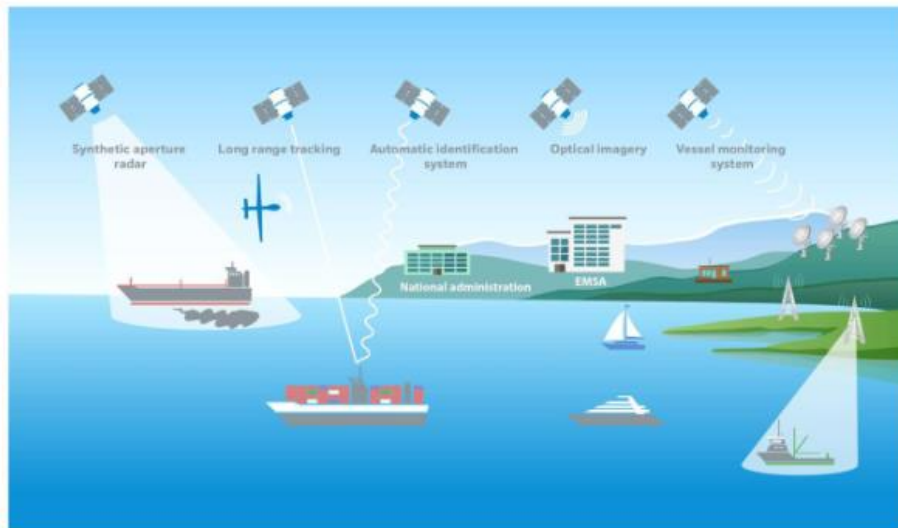
Implementation: assist the Member States in the implementation of international and European regulations (port state control, trainings, port reception facilities)

Operations: several services (reporting, earth observation, pollution response services..)



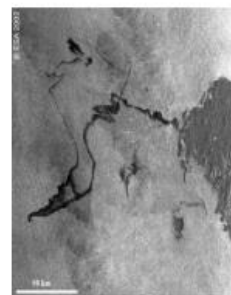
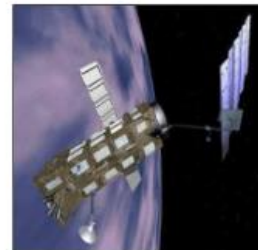
6

Operations: information



Operations: CleanSeaNet

- European Service for Satellite oil pollution detection and monitoring and Satellite vessel detection and monitoring
- Provides indication of possible oil spills and potential polluters
- Linked into national/regional response chain
- Service Results are delivered in Near Real Time (NRT); approx. 30 minutes after image acquisition



Operations: CleanSeaNet

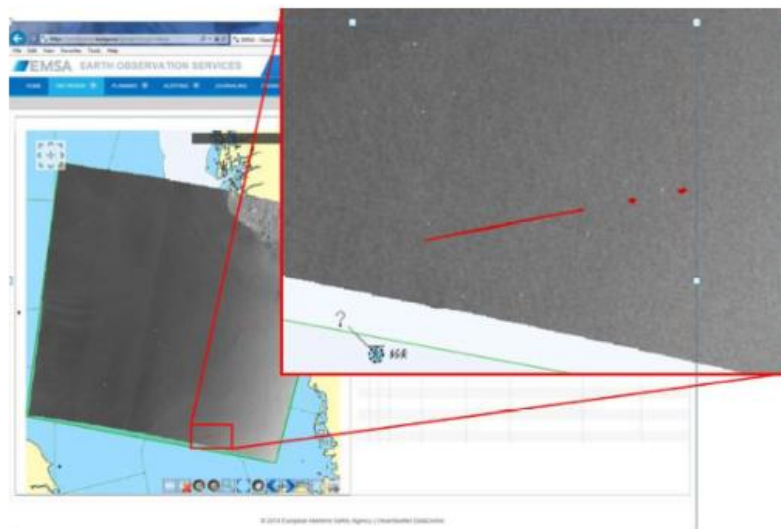


- **CleanSeaNet Routine Monitoring of Europe**
 - For 2016:
 - 3057 Satellite images have been delivered.
 - > 641 000 000 km² have been monitored.
 - 3168 possible oil spills have been detected.
- **Additional support in case of Emergencies**
 - Request to be addressed to the MSS 24/7 center at EMSA or through Emergency Response Coordination Centre (ERCC). of DG ECHO
- **Additional support for operations**
 - Ex: Tour D'Horizon operations



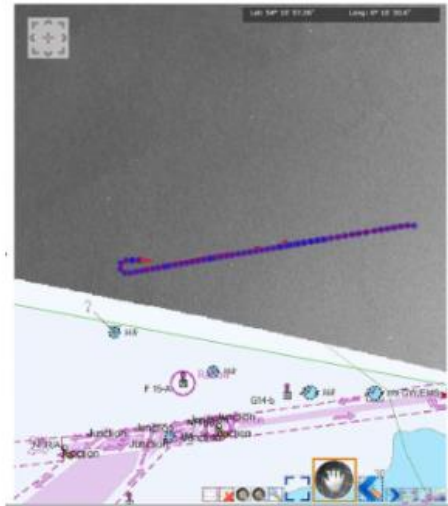
9

Operations: CleanSeaNet real case



10

Operations: CleanSeaNet real case



Operations: RPAS service

- RPAS operations to serve Member States, EU Agencies, and Commission
- Services “free of charge” subject to budget availability / number requests
- RPAS services only provided following a Member State request
- Member State authorities shall be the owner of the operations
- Operations will be adapted to user needs
- Member State authorities decide “what to do” (from operational & ATM point of view)
- User obligations
 - To provide/assist with the permit to fly
 - To provide the airstrip and logistics

Operations: RPAS



OP/06/2016: Marine Environment

- Anti-Pollution Measures: EUR 10 million over 4 years
- Marine Pollution Detection and Monitoring
- Ship Emission Monitoring
- 4 Contractors

OP/12/2016: Supporting Coast Guard Functions

- EU Border Package: EUR 67 million over 4 years
- Multi-purpose operations
- Supporting Member State Coast Guard Functions in cooperation with FRONTEX & EFCA
- 4 Contractors



13

Operations: pollution response services



Parameters

- Provide MS with additional means
- Taking into account the RA
- Maritime vs shoreline
- Ships sourced and oil and gas offshore installations
- Using the union Civil protection mechanism
- In a cost effective way (MAF regulation)

14

Pollution response services: users



Primarily:

- EU Member States and EFTA countries
- Acceding countries and candidate countries

2013 amendments:

- third countries sharing a regional sea basin with the Union

Administrative Board:

- Private entities that may cause a pollution but with the agreement of potentially affected States



15

Operations: network of oil spill response vessels



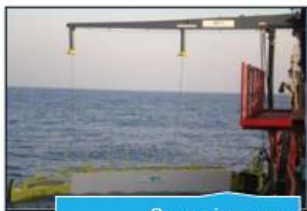
Network of oil spill response vessels:

- Vessels engaged in commercial operations within a dedicated area, adapted for oil spill response and ready to be mobilized under a maximum of 24H
- Minimum storage, pumping and heating capacity requirements
- All of them equipped for oil recovery with fixed sweeping arms and skimmers, and an alternative set of high sea boom and skimmer (High capacity).
- Some of them (4) equipped for dispersant spraying capacities and with associated dispersant stockpiles.
- Majority adapted to deal with substances with a flashpoint below 60°C



16

Oil spill response Vessels and Mechanical recovery equipment



Sweeping arms



Booms



Skimmers

Supported with Oil Slick Detection system

17

Operations: network of oil spill response vessels



18

Operations: network of oil spill response vessels



- Crew undergo IMO OPRC training and regular refresher courses
- Mandatory quarterly drills
- Participation in exercises with Member States (10 days/year)
- Regular maintenance and overhauling of equipment
- Requesting party chooses the equipment configuration needed and pay a daily operational fee plus fuel, port dues and cleaning costs
- Once activated, the vessels are under the command and control of the requesting State (if the requesting Party is a private entity its action has to be endorsed by the potentially affected State)
- EMSA supports the yearly availability fee and the cost of equipment



19

Operations: Equipment assistance service



Aim: to provide equipment to be used by non specialized vessels in response operations

- High sea standalone equipment, not frequently found in MS stockpiles
- Accessible through an EMSA contractor
- Fully containerised, ready to depart from the warehouse under 12 hours
- Technical staff able to provide quick handover
- Training programme for Member States 'operators



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Operations: Equipment assistance service



- Equipment provided at no cost but:
- Should be returned in full operational condition;
- Mobilisation lumpsum and transport costs to be born by the requesting State
- Requesting State to provide necessary unloading means

Status: currently 2 operational EAS, one in the North sea (Aberdeen) and one in the Baltic Sea (Gdansk), a 3rd one is under procurement for Southern Europe with a base within the Adriatic Sea.

21

Equipment systems



Integrated containment and recovery systems



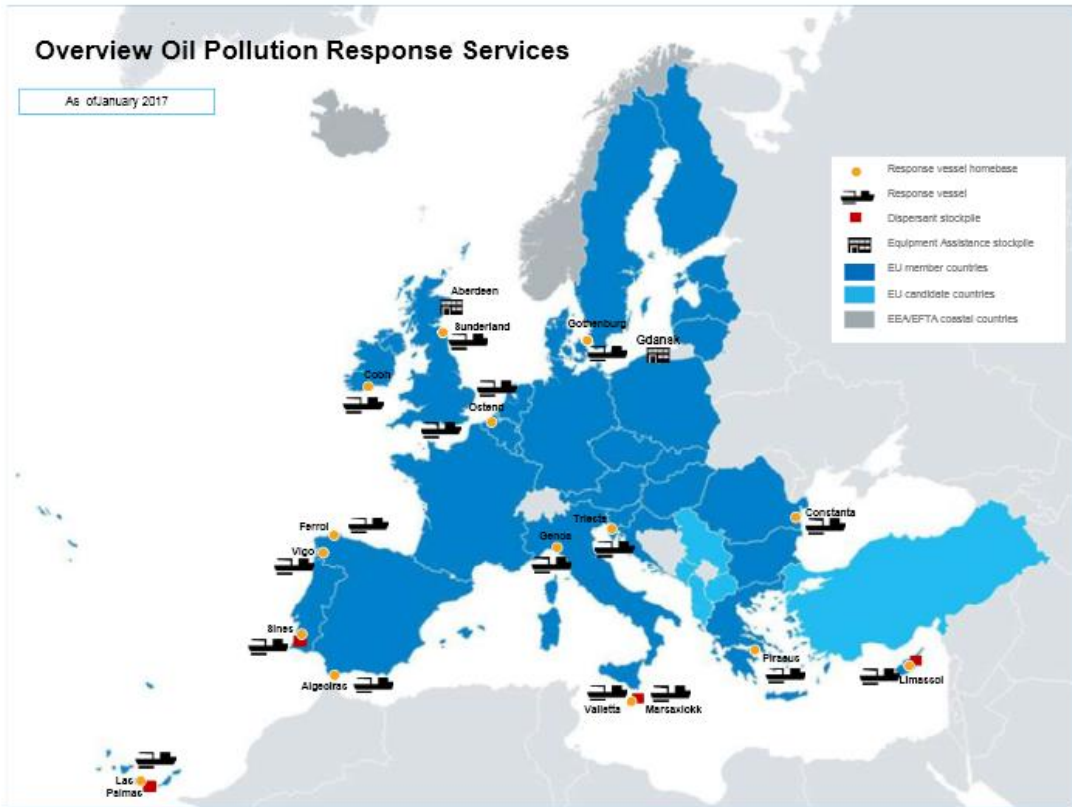
Fire booms



Trawl nets

Overview Oil Pollution Response Services

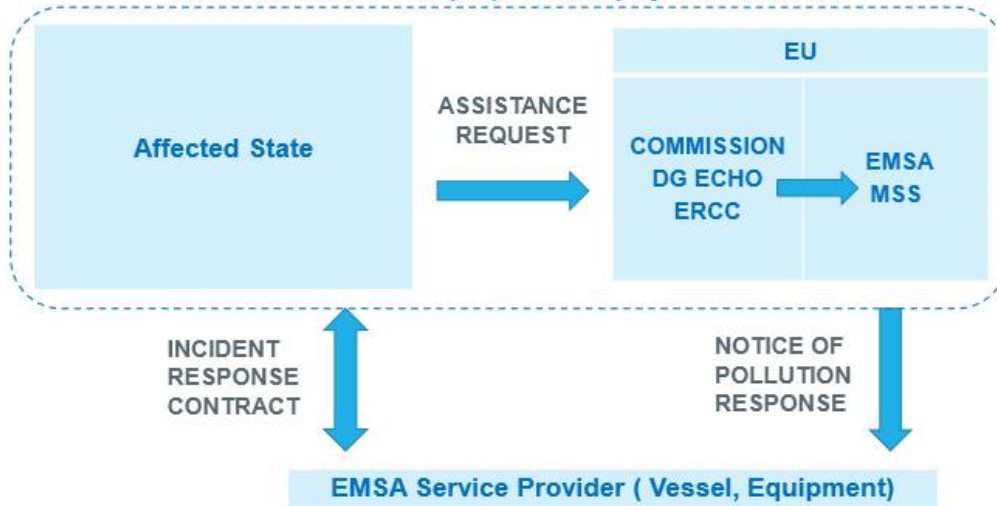
As of January 2017



Activation of EMSA services



CECIS Marine Pollution (MP) or Back-up system Fax/e-mail



CECIS MP: Common Emergency Communication and Information System
 ERCC 24/7: Echo-ercc@ec.europa.eu
 MSS 24/7: MaritimeSupportServices@emsa.europa.eu

EMSA pollution response services: costs and recovery policy



-Distinction between subsidiarity and solidarity and
The « Polluter pays principle »

- As regards EMSA's assets, a MoU has been
discussed with the IOPC Funds and the IG of P&I
associations for the hire rate of EMSA's assets, with
the technical assistance of ITOPF.



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EMSA's website





<http://emsa.europa.eu/operations/pollution-response-services.html>

26



THANK YOU

-  twitter.com/emsa_lisbon
-  facebook.com/emsa.lisbon



15 Italian Strategies for intervention and coordination (V. Pagotto, F.Borriello - Italian Coast Guard)

~ ITALIAN COAST GUARD HEADQUARTERS ~



JRC 1st Workshop under the
Virtual Centre of Offshore Safety Expertise
The Italian Coast Guard
operational strategies in case of
environmental accident

Ravenna 6th April 2017

Capt. Vittorio PAGOTTO
Lcdr. Fabio BORRIELLO



AGENDA

- NATIONAL POLLUTION RESPONSE FRAME
- ITCG STRATEGIES AND COMPREHENSIVE APPROACH
- INTER AGENCY COOPERATION
- INTERNATIONAL COOPERATION

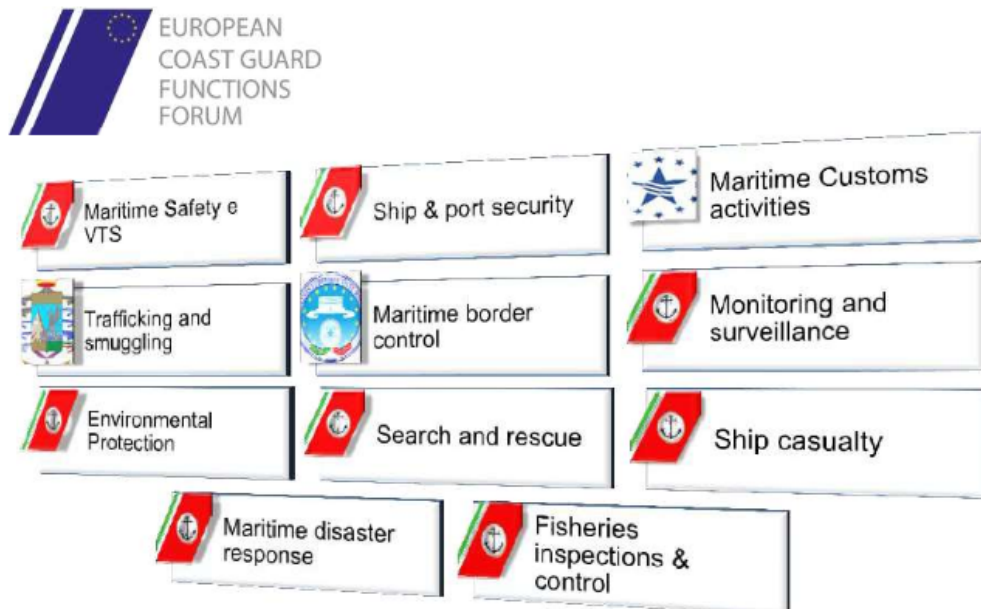


AGENDA

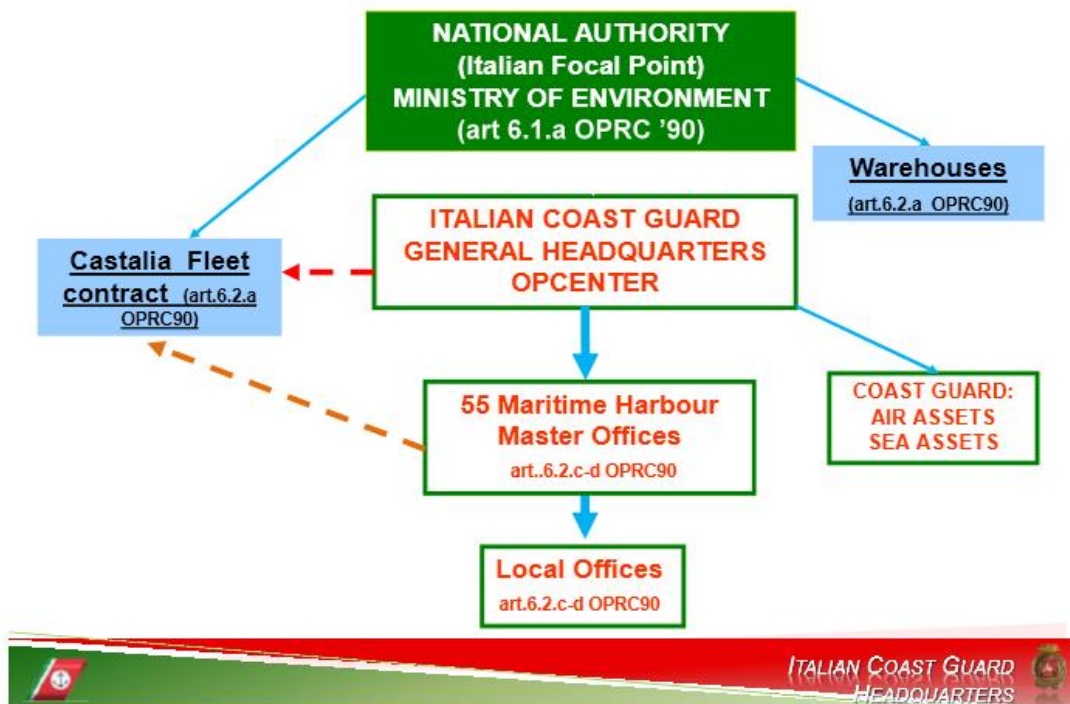
- NATIONAL POLLUTION RESPONSE FRAME
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COAST GUARD FUNCTIONS



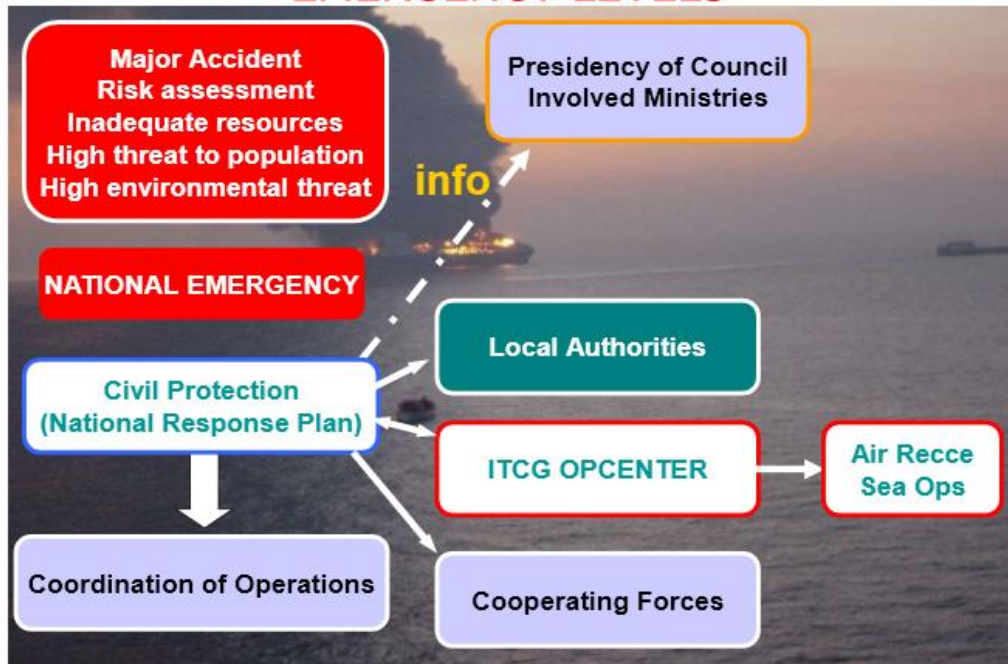
National Pollution Response Frame



EMERGENCY LEVELS



EMERGENCY LEVELS



ITALIAN COAST GUARD
HEADQUARTERS

RISK ASSESSMENT



VIEW OF THE TOP DECK FROM THE ACCOMMODATION

ITALIAN COAST GUARD
HEADQUARTERS

RISK ASSESSMENT

EVALUATION TEAM

PSCO
(structure, stability, equipment)

FIRE BRIGADE (CBRN)
(firefighting, chemical hazard)

HARBOUR CHEMIST
(chemical hazard, response)

TECHNICAL ADVISOR
(Classification society)

DIVING TEAM
(if necessary)



ITALIAN COAST GUARD
HEADQUARTERS



RISK ASSESSMENT

EVALUATION TEAM

TEAM SAFETY IS PARAMOUNT

- Fire risks assessment
- Environmental analysis
- Structural and equipment damages
- Dangerous goods – Hazardous Material
- Fuel/Cargo oil transfer arrangements
- Ballast and trimming
- Towing and mooring fittings
- Engine room, steering gears
- Sampling
- Underwater hull inspection



ITALIAN COAST GUARD
HEADQUARTERS



RISK ASSESSMENT

CRISIS UNIT

LOCAL LEVEL

Harbour Master
Fire Brigade
Port services
Harbour Chemist
Municipality
Prefecture
Public Health
Civil Protection
Advisors/Experts



ITALIAN COAST GUARD
HEADQUARTERS

RISK ASSESSMENT

Emergency Coordination Committee

CENTRAL LEVEL

Ministry of Environment

- General Directorate for nature and sea protection
- C.G. Marine Environment Department
- General Directorate for the safeguard of land and water
- General Directorate for environmental impact evaluation

Coast Guard Headquarters

- 3rd Dept. Plan and Operations

Civil Protection – Sea emergency Dept.

ISPRA

Advisors/Experts



ITALIAN COAST GUARD
HEADQUARTERS

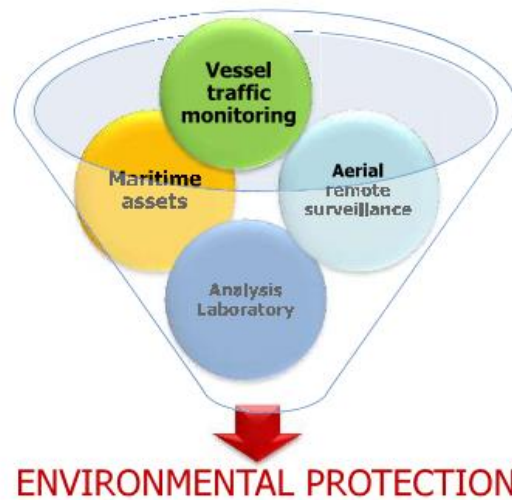
AGENDA

- NATIONAL POLLUTION RESPONSE FRAME
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ITCG Operational Strategy

COMPREHENSIVE APPROACH



ITCG VESSEL TRAFFIC MONITORING AND INFORMATION SYSTEM

A prevention activity....

Decree n. 196/2005 "Implementation of Directive 2002/59/EC establishing a Community monitoring and information system on maritime traffic"

A.I.S. Automatic Identification System

V.T.S. Vessel Traffic Service

V.M.S. Vessel Monitoring System

Cleanseanet v2

Safeseanet

E-GEOS Satellite



ITCG VESSEL TRAFFIC MONITORING AND INFORMATION SYSTEM

S. - VESSEL TRAFFIC SERVICE



PELAGUS



V.M.S. - VESSEL MONITORING SYSTEM

SAFESEANET

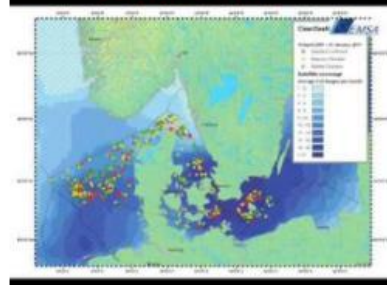


ITCG VESSEL TRAFFIC MONITORING AND INFORMATION SYSTEM

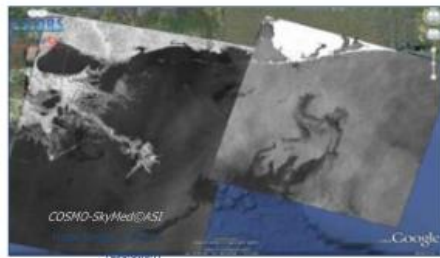
A.I.S. - AUTOMATIC IDENTIFICATION SYSTEM



CLEANSEANET



E-GEOS



ITCG VESSEL SPECIALIZED ASSETS & FACILITIES

SPECIALIZED ASSETS



N.3 ATR 42 MP

Aerial assets for Remote sensing (Detection, measurement and monitoring of polluted areas)



N.6 OPV

Off shore Patrol Vessels with antipollution capabilities (booms, oil skimmer, etc.)



N.2 MOBILE LABORATORY

Land vehicle specialized for chemical/physical/ biological analysis on site

SPECIALIZED FACILITIES

LABORATORY FOR ENVIRONMENTAL ANALYSIS

Opened 23rd of March 2017



INCREASED CHEMICAL ANALYSIS RANGE



AERIAL ASSETS

SLAR SYSTEM

Side Looking Airborne Radar



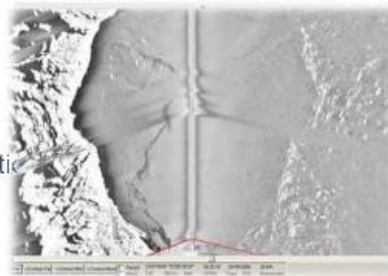
RADAR (X-RAY BAND) FOR LONG RANGE OIL SPILL DETECTION



ATR 42 "MANTA"



A.T.O.S. SYSTEM
Aerial Observational and Surveillance



ENVIRONMENTAL ANALYSIS LABORATORY



2011-2012: Initial Operating Capability

2013 QUALITY CERTIFICATION UNI EN ISO 9001:2008 by RINA Service

2014 Full Operating Capability

LAMs are fitted with technical equipment for collecting and analyzing water samples on site

Multiparameter probe, Fluorimeter, Spectrophotometer, Analysis kit

2017 Full Operating Capabilites



Gas chromatograph: for determination of Total Hydrocarbon in water samples



Ionized coupled plasma: for determination of metal trace in water samples



NAVAL ASSETS WITH ANTIPOLLUTION CAPABILITES

Radar SEADARQ
500 mts oceanic booms,
>1.000 mts absorbent booms,
Skimmer
Recoil tanks 500 cm.)
Disperdant spraying system;

250 mts oceanic booms,
Skimmer
Recoil tanks 500 cm.)
Disperdant spraying system;

100 mts floating booms,
>500 mts absorbent booms,
Skimmer (Discoil)
Disperdant spraying system



AGENDA

- NATIONAL POLLUTION RESPONSE FRAME
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- INTERNATIONAL COOPERATION



AGREEMENT BETWEEN ITCG AND OTHER ISTITUTION



Ministry of Environment

ITCG depends functionally from MoE

Specific Agreement for preventing activities and combating illegal activities at sea enhancing surveillance in Protected Sea areas and marine areas with offshore platforms oil.

According to the law Ministry for the Environment may use the Coast Guard for surveillance and management of marine reserves.

ITCG ACTIVITIES 2016

NAVAL ASSETS

Patrolling hours **4.423**

AIR ASSETS

Patrolling hours **380** for platform/rig monitoring
Patrolling hours **121** for Protected Sea Areas

SCUBA DIVERS

33 missions executed for Protected Sea Areas

MOBILE LABORATORY

5 missions executed for Protected Sea Areas



AGREEMENT BETWEEN ITCG AND OTHER ISTITUTION

Ministry of Economic Development

- intensify and improve cooperation and data exchange procedures
- connect, coordinate and promote any appropriate form of collaboration
- increase the effectiveness of the control and inspection activities conducted by ITCG in the field of offshore safety and environmental protection
- cooperation between personnel to optimize intervention procedures for the preservation of human life and environmental safety also in response to the objective of the DGS-UNMIG to increase the level of security activities at sea



ITCG ACTIVITIES 2016

NAVAL ASSETS

Patrolling hours **635**

AIR ASSETS

Patrolling hours **45** for platform/rig monitoring

SCUBA DIVERS

20 missions executed platform/rig monitoring

SINCE 2014
OFFSHORE PLATFORM DEDICATED
SURVEILLANCE

- PATROL BOATS
- AIRCRAFTS
- DIVERS TEAM



AGENDA

- NATIONAL POLLUTION RESPONSE FRAME
- ITCG STRATEGIES AND COMPREHENSIVE APPROACH
- INTER AGENCY COOPERATION
- **INTERNATIONAL COOPERATION**



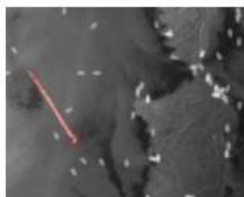
INTERNATIONAL COOPERATION AT EUROPEAN LEVEL..

OPERATIONAL COOPERATION BASED ON
INFORMATION SHARING

SAFESEANET



CLEANSEANET



MAREΣ



INTERNATIONAL COOPERATION Report Standardization



POLREP message transmission through the SafeSeaNet information about pollution, in order to:

- give prompt notice to all actors involved;
- inform on the actions taken and planned, taking into account new situations;
- request of assistance.

Divided into three parts:

1. **POLWARN** (Pollution Warning) providing a first information, or give the alarm about the pollution in place or its threat;
2. **POLINF** (Information Pollution) is aimed at giving all useful information concerning the pollution and can also be used, in the later stages, as SITREP (Situation Report);
3. **POLFAC** (Pollution Facilities) is used to request assistance to other countries and to define operational aspects regarding this aspect.



INTERNATIONAL COOPERATION

ADRIREP Adriatic Reporting System
Italy – Montenegro – Croatia – Slovenia
TO PREVENT MARITIME ACCIDENT BETWEEN
SHIPS CARRYING POLLUTANTS RESULTING
DANGER OF POLLUTION OF THE SEA AND
COASTLINE

- all oil tanker ships of 150 gross tonnage and above;
- all ships of 300 gross tonnage and above, carrying on board, as cargo, dangerous or polluting goods, in bulk or in packages.
- compilation of the report called ADRIREP and sending the same to the competent authority.



INTERNATIONAL COOPERATION

RAMOGE St Raphael-Monaco-Genova
France – Monaco - Italy

Agreement to enhance scientific, operational, technical, and judicial cooperation to prevent and fight against accidental marine pollution in the AREA of interest.



A REAL CASE...MISSION BAHAR Lebanon 2006



A REAL CASE...MISSION BAHAR Lebanon 2006



Figure 17: Manual Recovery Activities



A REAL CASE...COSTA CONCORDIA LAST TRIP



TRANSFER OF COSTA CONCORDIA FROM
«ISOLA DEL GIGLIO» to GENOVA



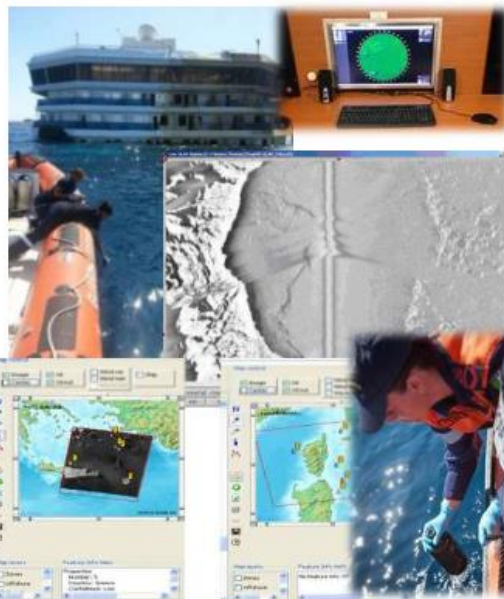
A REAL CASE...COSTA CONCORDIA LAST TRIP

COMMAND AND CONTROL ON BOARD
DICIOTTI OPV

CONSTANT SAMPLING AND ANALYSIS
OF SEAWATER ALONG THE ROUTE

CONSTANT AERIAL SURVEILLANCE
(SLAR) e SURFACE (SEADARQ);

SATELLITE MONITORING



16 Intervention and coordination in case of a major accident in the UK (H. Shaw, MCGA UK)

The Secretary of State's
Representative for Maritime
Salvage & Intervention

The role of the UK SOSREP in Offshore Sector Incidents

Hugh Shaw, The Secretary of State's Representative



Workshop on EERP, Ravenna, Italy
6 April, 2017

Overview

- ▶ UK Strategy for Intervention
- ▶ Agreements in place other Member States
- ▶ Case Studies / past experience EMSA



UK Government Strategic Overview

- ▶ Responsibility for environmental aspects of Offshore Oil and Gas Industry rests with Offshore Petroleum Regulator for Environment & Decommissioning (OPRED)
- ▶ SOSREP is co-located with UK Maritime and Coastguard Agency (MCA) in Southampton.
- ▶ The D/SOSREP is co-located with OPRED in Aberdeen.

So why was SOSREP introduced?

TORREY CANYON — Isles of Scilly 1967

- 119,000 tonnes oil spilled



TORREY CANYON

- ▶ Extreme measures taken in attempt to limit damage – including using military jets to bomb;
- ▶ Ministers deeply involved in the decision making process;
- ▶ Introduction of Intervention Convention.

BRAER — Shetland 1993
85,000 tonnes oil spilled



SEA EMPRESS — Milford Haven 1996
72,000 tonnes oil spilled



SEA EMPRESS

- ▶ Donaldson – *Salvage and Intervention and their Command and Control*;
- ▶ 1967 – 1996 creation statutory basis for Govt powers of intervention;
- ▶ Broad range enquiry into adequacy and most effective methods of employing intervention powers for shipping & oil and gas installations;
- ▶ No such review undertaken in the past and need for it underlined by public disquiet, whether justified or not, over handling SEA EMPRESS incident.

Donaldson Conclusions – 3 fundamental to Intervention Strategy

- ▶ Government response to the threat of significant pollution from or involving an offshore installation must be compatible with its response to such a threat from a shipping casualty.
- ▶ 2002 – The Offshore Installations (EPC) Regulations.

Donaldson Conclusions (2)

- ▶ Once an incident has developed to a point at which the government, in terms of its statutory powers and responsibilities, has become entitled to give directions as the "trigger" point has been reached, it has an inescapable and continuing responsibility to monitor and control the whole operation.

Donaldson Conclusions (3)

- ▶ Incidents that threaten to cause or actually cause marine pollution are so many and so varied in their initial severity and in the speed with which they become more serious or less serious, that the involvement of Ministers in operational decisions is not a practicable option. Whilst operations are in progress, they must stand aside, and be seen to stand aside, leaving operational control in the hands of the Secretary of State's Representative –

SOSREP

Role of the UK SOSREP

To represent the UK Government (and Devolved Administrations) by removing or reducing the risk to persons, property and the UK environment arising from accidents involving ships, fixed or floating platforms or sub-sea infrastructure within UK waters, within the remainder of the EEZ/UK Pollution Control Zone (UK PCZ) and on the UK Continental Shelf.

The SOSREP Function

- ▶ One person to act as representative of Secretary of State (s)
- ▶ Free to act without recourse to higher authority
- ▶ Ultimate & Decisive voice
- ▶ Can exercise Ultimate control
- ▶ Tacitly approves all actions
- ▶ Free from political interference
- ▶ Whilst operations are in progress "**Must be Backed or sacked**"

The Offshore Installations (EPC) Regulations 2002

- ▶ To prevent / reduce pollution and the risk of pollution following an accident involving an offshore installation;
- ▶ Covers all offshore installations and pipelines located in the Territorial Sea adjacent to the UK or any area designated under section 1(7) of the Continental Shelf Act 1964.

Trigger Situation & Directions

- ▶ Powers to intervene and issue Directions 'triggered' when:
 - ▶ An accident has occurred, and
 - ▶ In the opinion of the SOSREP the accident may or will cause significant pollution.
- ▶ Directions can be wide ranging and may be given to operator, manager, servant or agent of the offshore operation and may require the person to whom they are given to take or refrain from taking any kind of action.

Dealing with an Incident -



SHELL GANNET, North Sea, Aug 2011

Shell Gannet Incident [2011]

- ▶ Initial report oil on surface sea;
- ▶ Platform & sub sea infrastructure 113 miles (180km) off Aberdeen in water depth 300ft (91m);
- ▶ Leak discovered from pipeline – subsequently stopped but residual oil in line;
- ▶ Oil recovered to surface craft then transported to shore for safe disposal.

Main Theatres of Activity

- ◆ Search and rescue
- ◆ **'Salvage'** - control and containment of the cause of threat
- ◆ Clean up at sea
- ◆ Clean up of the shoreline
- ◆ **Dealing with the Media**

SOSREP Response Cell & Communications

Operations Control Unit

- ▶ Monitor operations & approve recovery plan
- ▶ Provide a forum for discussion between parties with interests and, if necessary provides an avenue for state intervention
- ▶ It is NOT a committee



Shell Gannet OCU

- ▶ OCU established within 24 hours of notification of accident;
- ▶ Located within Shell UK in close proximity to operator ERT;
- ▶ Forum for plan approval and review to ensure that incident dealt with as quickly and safely as possible and with minimum impact on environment.

Operations Control Unit Core Membership

- ▶ SOSREP
- ▶ Assistant to SOSREP (OPRED Inspector)
- ▶ Operator Emergency Operations Manager → OIM
- ▶ Operator Representative → CMT
- ▶ Environment Group Liaison Officer
- ▶ OPRED Strategic Advisor
- ▶ Neighbouring Coastal State Rep
- ▶ SOSREP Personal Specialist Advisors
- ▶ MCA Counter Pollution & Salvage Officer and/or
HM Coastguard Liaison Officer

SCU Communications & Media

- ▶ SOSREP Sitreps and Ministerial Briefings;
- ▶ Accurate record key decisions;
- ▶ Requirement for a Media Strategy Group with representatives from key parties;
- ▶ Openness, trust, transparency and good teamwork paramount for a successful operation.



Agreements in place with other Member States

NORBRIT

- ▶ Norway and the UK have developed the NORBRIT Agreement for joint counter pollution operations in the zone extending 50 miles either side of the median line separating the UK and Norwegian continental shelf.
- ▶ Provisional plan to test at next UK National Offshore exercise in February 2018.

Bonn Agreement

- ▶ All States bordering on the North Sea have entered into an agreement on mutual notification, assistance and environmental surveillance.
- ▶ UK MCA facilitate interface between BONN and the UK during incidents.

Past Experience with EMSA

- ▶ SOSREP personal experience drafting Guidelines and exercises;
- ▶ Offer of assistance from Maritime Support Services (MSS) centre Lisboa for Shell Gannet incident;
- ▶ Integrated Maritime Services – satellite monitoring / surveillance, etc.
- ▶ EMSA Equipment Assistance Service (EAS) + Response vessel(s)

EMSA AS North Sea

- ▶ EMSA Equipment Assistance Service (EAS North Sea) stand alone oil pollution response equipment stockpile in Aberdeen.



EAS North Sea (2)

- ▶ Capability quick mobilisation - 12 hours;
- ▶ Capability transportation equipment;
- ▶ Technical support personnel qualified and trained in maintenance and deployment of equipment;
- ▶ Fire Boom, Speed Sweep, Current Buster, Roboom-Roskim Integrated System and Trawl Net System.

EMSA Oil Spill Response Vessel

- ▶ Following request for assistance – max time for oil spill response vessel to be ready to sail is 24 hours.



Thank You for your time.....



Any Questions?

For further info contact: hugh.shaw@mcga.gov.uk

17 Emergency Preparedness offshore Norway (B. A. Kalberg, PSA)

External Emergency Response Planning Ravenna, 5. – 7. April 2017

Emergency Preparedness Offshore Norway

Bryn Aril Kalberg
Special Advisor
Petroleum Safety Authority Norway



PTIL/PSA

Emergency preparedness resources

National resources:

- SAR helicopters – 330 Squadron – 12 Sea King
- Oil recovery – close to shore
- Coastguard – Navy
- Hospitals

The petroleum fields are typical long distance from shore
National Resources will not give acceptable response

Industry resources

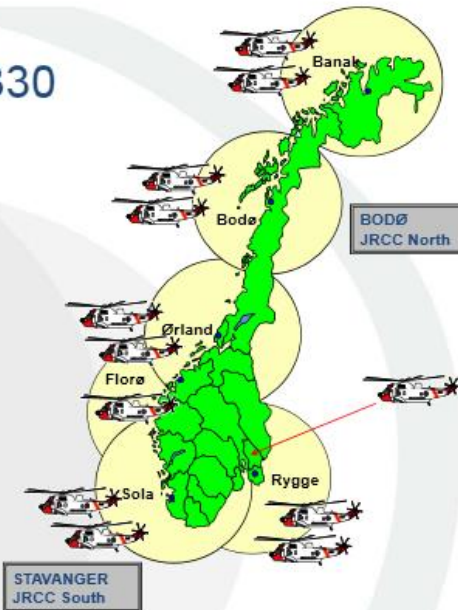
- Platform level – “Internal emergency preparedness”
- Field/areas level – “External emergency preparedness”



PTIL/PSA

SAR helicopters - 330 squadron

- **5 bases**
- **12 Sea King**
 - **AW101 (2017+)**



PTILPSA

Grane platform - Statoil

Evacuation resources and means



PTILPSA

Norwegian Oil and Gas Association Guidelines: 064 Recommended guidelines for area emergency preparedness

- The industry started this work around 1995
- PSA - in dialog, informed, given comments
- The project - The recommended guidelines define:
 - Defined situations of Hazard and Accident – DSHA
 - Performance requirements



PTU/PSA

DSHA and performance requirements

DSHA		Capacity	Efficiency requirement	Comments
1	Man over board	1	8 minutes	From alarm to pick up
2	Personnel in sea - helicopter accident	21	120 minutes	2 + 19
3	Personnel in sea – evacuation		120 minutes	Risk based – platform specific
4	Collision - Ship on collision course - Drifting object		- 50 minutes - 20/12 n.mil	
5	Acute pollution			Risk based – platform specific
6	Fire – need of external assistance			Platform specific
7	Personnel - injured - illness	2 1	- 3 hour	From decision to arrival hospital
8	Helicopter accident on helideck	1 – 3 – 4	Platform internal recourses	DSHA 7 relevant



PTU/PSA

Area emergency preparedness

Five areas + Barents/Hammerfest

- SAR helicopters
- Standby vessels – purpose build
- Sea surveillance centre Sandsli/Bergen and Ekofisk
- Oil recovery – The Norwegian Clean Seas Association for Operating Companies (NOFO)



PTI/PSA

Industry operated SAR-helicopters - NCS



- Barents/Hammerfest: S-92
- Halten Nordland/Heidrun: L1
- Tampen/Statfjord: S-92
- Troll/Oseberg/Oseberg: L1
- Johan Sverdrup/Sola: S-92
- South fields/Ekofisk: 2xS-92

PTI/PSA

Standby vessels



PTLIPSA

Sea surveillance centre

To detect ship on collision course or drifting objects

- Sandsli / Bergen
- Ekofisk
- To detect drifting objects and
- Radar coverage around all platforms are put together in one picture
- AIS
- Communication equipment
- 24/7
- Alert



PTLIPSA

The Norwegian Clean Seas Association for Operating Companies (NOFO)

Oil recovery preparedness for operating companies

- NOFO coordinate and take responsibility for tactical and operational management of oil recovery
- Head office at Forus/Sandnes and regional offices in Hammerfest
- Staff – 25 – management, operations and operational support
- Oil recovery equipment on vessels on permanent standby and bases onshore
- 11 vessels on permanent standby and 20 deployable vessels
- Training and exercises



PTIL/PSA

Barents Sea Exploration Collaboration - BaSEC

- Statoil, Eni Norge, Engie (GDF Suez), Lundin and OMV, in April 2015.
 - From summer 2015 all operators on the Norwegian Continental Shelf were invited to join the collaboration, and now includes 17 operating companies.
 - Build on existing knowledge and experience
 - Goal of high and cost effective HSE standards for exploration in Norwegian Barents Sea
- The companies shall aim to develop common solutions that can facilitate:
 - A joint operator approach to HSE in the Norwegian Barents Sea
 - Appropriate level of safety and emergency preparedness
 - Data sharing
 - Standardization



PTIL/PSA

PSA – Emergency Preparedness Organisation

- Emergency preparedness coordinator - On duty officer – 24/7
 - Receives notifications from the operators
 - Obtain more information from the operator
 - Information distribution and coordination
 - Internal
 - External
- Serious accident
 - Mobilize PSA Emergency Preparedness Organisation
 - Emergency Control Room



PTL/PSA

Exercises

- Platform
- Area
- Annual main exercise
- National exercises
- Cross boundary exercises
 - Dynamic Mercy



PTL/PSA

Floatel Superior – November 7th 2012

- Floatel Superior, with a total of 374 persons, was lying by the Njord A platform, connected by a bridge.
- The weather was heavy with strong wind and high waves.
- In the evening of 6th, the weather condition was so bad that they had to disconnect the bridge and move the flotel to an “stand off” position some 250 m from the Njord A platform.
- During the night Floatel Superior got a heel of 5,8 °, and in the morning the platform manager decided to evacuate all “non-essential” personnel.
- 336 persons was evacuated by helicopters in 1 hour and 22 minutes. Helicopter used was Norwegian State operated SAR helicopter and petroleum operated SAR helicopter.
- Later the Floatel Superior was moved to shore for repairs.



PTLIPSA

Floatel Superior

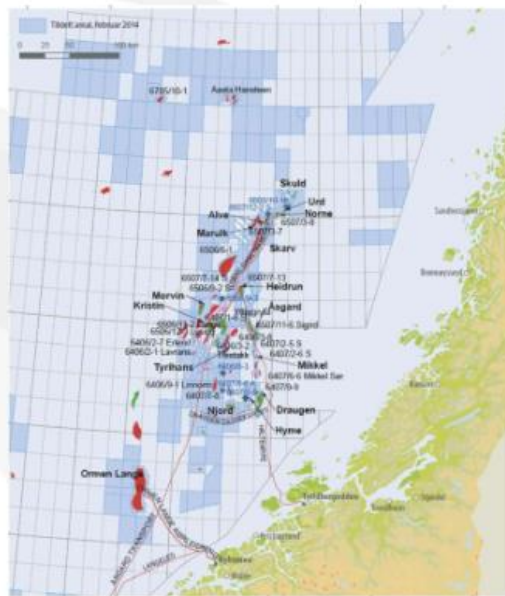


PTLIPSA

Njord A



PTLIPSA



PTLIPSA



Thank you for your attention

Bryn Aril Kalberg

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Petroleum Safety Authority Norway

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PTIL/PSA

18 The activities of REMPEC (M. Smaoui, REMPEC)




**REGIONAL MARINE POLLUTION EMERGENCY
RESPONSE CENTRE FOR THE MEDITERRANEAN SEA
REMPEC**

*JRC 1st Workshop
under the Virtual Centre of Offshore Safety Expertise*

“External Emergency Response Planning”
Strengthening the collaboration in the EU and beyond

**“Integrated Regional Emergency
Response Planning in the
Mediterranean”**



Malek SMAOUI, Programme Officer OPRC

Ravenna, Italy, 5th – 7th April 2017

1

Content

1. Legal and Institutional Framework
1. Recent developments
 - * The national contingency plan of Lebanon developed in view of the development of offshore activities in Lebanon and the possible preparation of another sub-regional agreement;
 - * The trilateral agreement (Cyprus, Greece and Israel), which has been initiated inter alia by offshore development in the region;
 - * The Mediterranean Guide on Cooperation and Mutual Assistance in responding to Marine Pollution Incidents, which is applicable in case of incident from offshore platform;
2. Programme of Work 2018-2019.

2

Legal and Institutional Framework

3

Institutional and Legal Framework

United Nations

International
Maritime Organisation
(IMO)

United Nations
Environment Programme
(UNEP/MAP)

IMO's Conventions

Barcelona Convention

Relevant issue
Pollution incidents

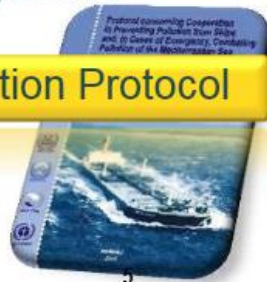
Relevant geographical area :
the Mediterranean region

REMPEC
























4

Barcelona Convention's Protocols

- Dumping Protocol
- Land-based Sources Protocol
- Specially Protected Areas Protocol
- Offshore Protocol
- Hazardous Wastes Protocol
- Integrated Coastal Zones Management Protocol
- Prevention and Emergency situation Protocol



Contracting Parties of both Protocols

Contracting Parties	1976 Emergency Protocol	2002 Emergency Protocol => 2004	1994 Offshore Protocol => 2011
	Entered into force	Entered into force	Entered into force
Albania	29.06.90	-	24.03.11 
Algeria	15.04.81	14.12.16 	-
Bosnia and Herzegovina	01.03.92	-	-
Croatia	08.10.91	17.03.04 	-
Cyprus	19.12.79	18.01.08 	24.03.11 
European Union	11.09.81	25.06.04 	29.03.13 
Egypt	23.09.78	-	-
France	10.04.78	17.03.04 	-
Greece	02.02.79	27.12.06 	-
Israel	02.04.78	10.10.14 	-
Italy	05.03.79	30.07.16 	-
Lebanon	12.02.78	-	-
Libya	02.03.79	-	24.03.11 
Malta	12.02.78	17.03.04 	-
Monaco	12.02.78	17.03.04 	-
Montenegro	-	19.12.07 	-
Morocco	15.02.80	26.05.11 	24.03.11 
Slovenia	15.03.94	17.03.04 	-
Spain	12.02.78	09.08.07 	-
Syria	25.01.79	11.05.08 	24.03.11 
Tunisia	12.02.78	-	24.03.11 
Turkey	06.05.81	17.03.04 	-

Offshore Protocol

- Article 5: requirements for authorizations

The contracting Party shall prescribe that **any application for authorization** of exploration or exploitation ... must include in particular:

The operator's contingency plan as specified in article 16

- Article 16: Contingency planning

Each Party shall require operators in charge of offshore installations **under its jurisdiction to have a marine pollution contingency plan** coordinated with national preparedness and response system of the contracting Party as requested by the Prevention and emergency Protocol

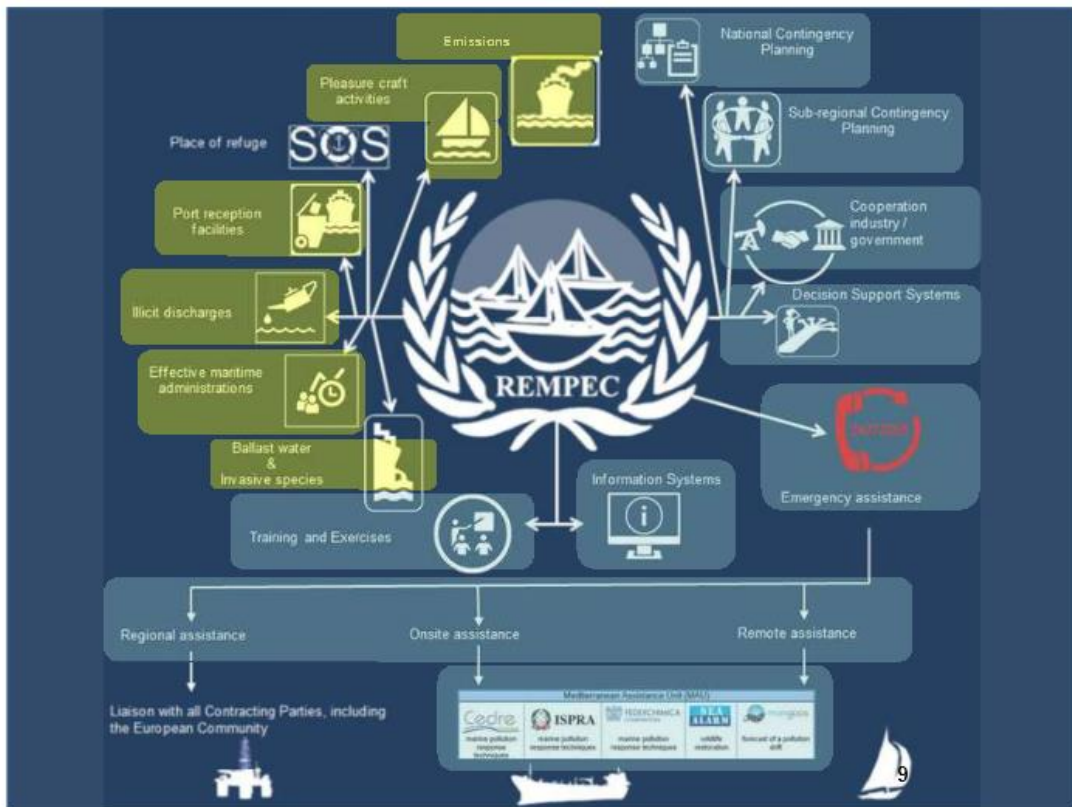
In cases of emergency the Contracting Parties shall **implement** *mutatis mutandis* the provisions of the "Prevention and Emergency Protocol, 2002"

7

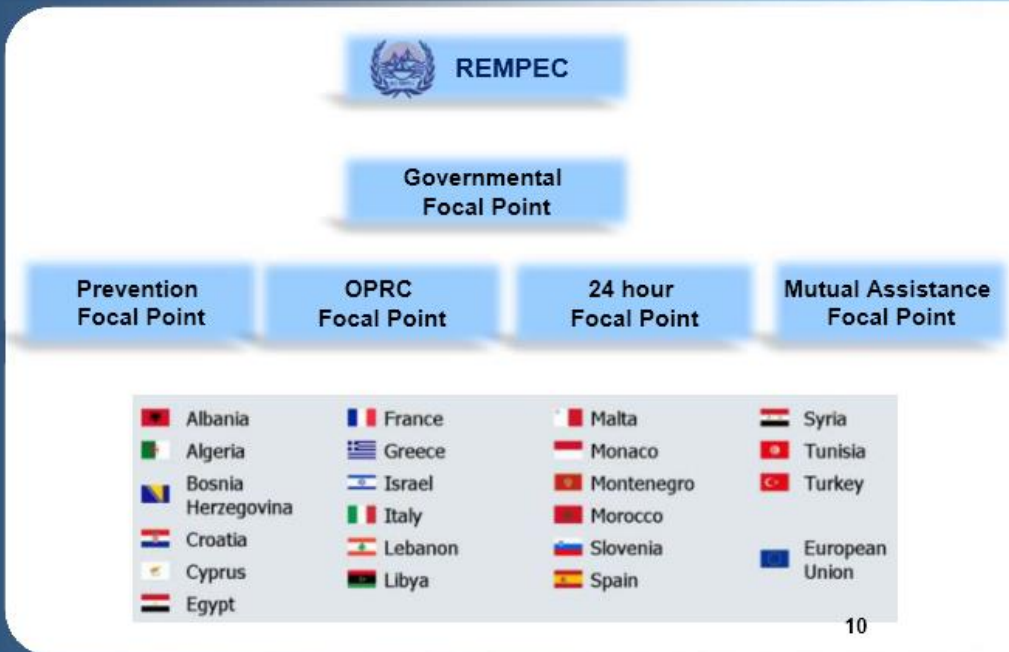
Prevention and Emergency Protocol

- The "**prevention and emergency protocol**" is modelled on the related IMO conventions in particular the **OPRC convention** and contains the same requirements than those of the OPRC.
- The main requirements relate to:
 - **contingency plans (article 4.):** The Parties shall endeavour to maintain and promote, either individually or through bilateral or multilateral cooperation, contingency plans and other means of preventing and combating pollution incidents. ...
 - **emergency measures on board ships, on offshore installations and in ports (article 11);**
 - 1. Each Party shall take the necessary steps to ensure that ships flying its flag have on board a pollution emergency plan as required by, and in accordance with, the relevant international regulations.
 - 4. Each Party shall require that authorities or operators in charge of sea ports and handling facilities under its jurisdiction as it deems appropriate have pollution emergency plans or similar arrangements that are coordinated with the national system.
 - 5. Each Party shall require operators in charge of offshore installations under its jurisdiction to have a contingency plan to combat any pollution incident, which is coordinated with the national system
 - pollution report and reporting procedures (articles 8 and 9);
 - assistance (article 12); and,
 - reimbursement of costs of assistance (article 13).

8



National Focal Points





Information System Decision Support tools



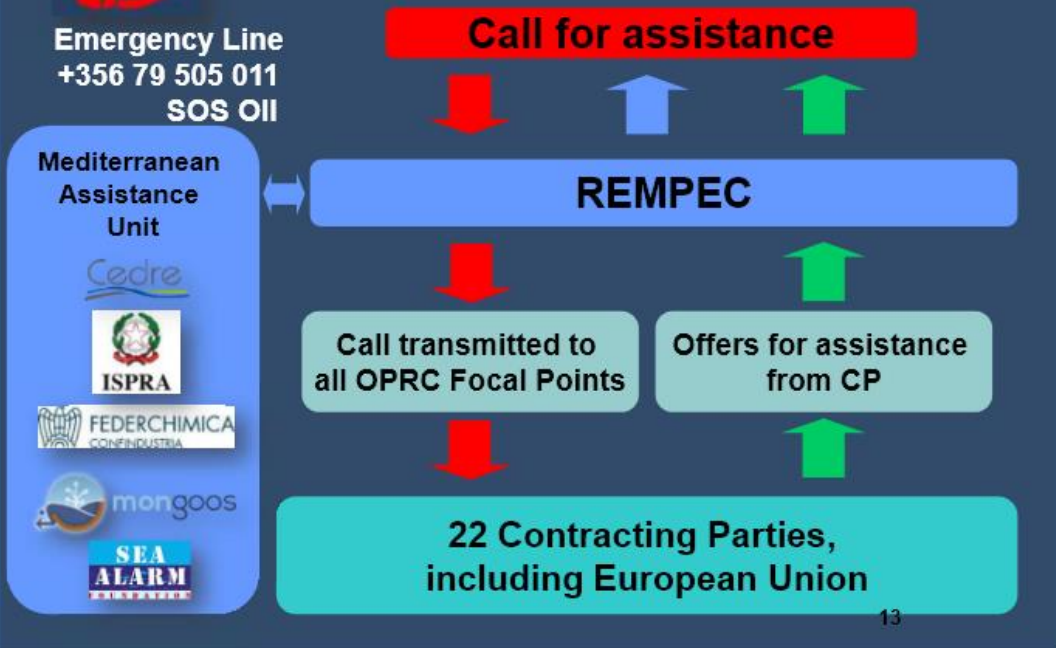
- Set of **Mediterranean Guidelines** for prevention of, preparedness for and response to oil and HNS spills
- Decision Support Tool
 - Waste Management
 - MIDSIS TROCS
 - MEDGIS-MAR
 - MEDESS-4MS





Emergency Assistance

Emergency Line
+356 79 505 011
SOS OIL



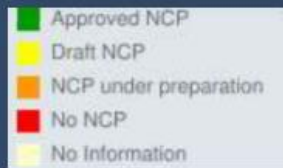
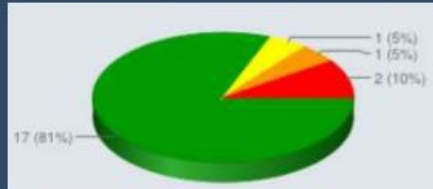
13

RECENT DEVELOPMENTS

14



National Contingency Planning



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NOSCP Context

- 2016 - Upon request of Lebanese authorities, REMPEC with technical support of the International Tanker Owners Pollution Federation Limited (ITOPF), provided to the development of the National Oil Spill Contingency Plan NOSCP within the Sustainable Oil and Gas Development in Lebanon (Minister of Energy and Water – UNDP SODEL Project)
 - Comments and guidance on the Draft of the National Contingency Plan of Lebanon produced by the consultant, July 2016
 - Comments on the drill and training organised to test the final draft version of NOSCP and on the way forward to implement the NOSCP once adopted, December 2016.
- REMPEC agreed during discussion held October 2016 with the United Nations Development Programme (UNDP) and Lebanese Petroleum Administration (LPA) to sustain the efforts taking **into account the approval of two offshore oil and gas decrees, allowing the country's offshore licensing round, stalled since 2013.**

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NOSCP and the emergencies related to Offshore activities

- With the approval of the bidding decree and launching of the licensing round which means that the oil and gas activities are expected soon (in 2018) in the Lebanese offshore.
- Accordingly, having Lebanon better prepared for oil spills is more of an urgency in 2017.
- Lebanon requested various support levels that REMPEC could assist with which will help Lebanon implement its NOSCP:
 - 1. Develop operational procedures (SOPs) in each entity depending on the role given to each party as per the NOSCP
 - 2. Develop the regional shoreline cleanup plans (at Mohafaza level)
 - 3. Provide OSP trainings (management and practical - IMO levels 1, 2 & 3 or ICS trainings or other specialized trainings)

17



Sub-regional Contingency Planning



Current development:



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SCP Cyprus Greece Israel

- The Ministers responsible for environment of Cyprus, Greece and Israel respectively met in Jerusalem April 2016 and signed the “Joint Declaration of Intent on Cooperation in the Field of Environmental Protection”.
- This Declaration identified inter alia the protection of marine and coastal environment and
“in particular preparedness and response to major marine pollution incidents in the Mediterranean, resulting from ships, offshore hydrocarbon (oil and gas) exploration and exploitation activities and hydrocarbon pipelines” as the first priority area in which the three countries intend to advance their cooperation.
- In accordance with its mandate REMPEC agreed, upon request, to assist Cyprus, Greece and Israel in the development of a joint Sub-regional Marine Pollution Contingency Plan.

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Way Forward

- **The Short term** phase 2016-2017 consisted on **the preparation** of the of the Sub-regional Marine Pollution Contingency Plan, as well as the Agreement concerning its implementation (**SCP CGI**).
- Already three meetings of the authorities of the three counties were held in Spain November 2016, Malta December 2016 and Cyprus February 2017. the final version of SCP CGI is expected to be finalised in July 2017 and to be signed during the 20th Meeting of the Contracting Parties to the Barcelona Convention, Albania December 2017.
- **Mid-term phase** was envisaged to focus on **reinforcing the capacities and strengthening cooperation arrangements between the Parties to the Plan**, with a view to completing the SCP and maintaining it operational. This is planned to be achieved through organizing specifically designed technical workshops and training courses.
- **The long term phase** would focus on testing the Plan through **full scale exercise at the level of the eastern Mediterranean region**.

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The draft Mediterranean Guide on Cooperation and Mutual Assistance in Responding to Marine Pollution Incidents



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Context

- One of the objectives of REMPEC is to develop regional co-operation and to facilitate co-operation among the Mediterranean coastal States in order to
- respond to pollution incidents which result or may result in a Oil or HNS Spills and
- which require emergency actions or other immediate response.

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Assistance Framework

- Obligations/responsibilities:

- Prevention and Emergency Protocol

Article 12: "Any Party requiring assistance to deal with a pollution incident may call for assistance from other Parties, either directly or through the Regional Centre ...";

- Offshore Protocol

Article 16: "In cases of emergency the Contracting Parties shall implement mutatis mutandis the Emergency Protocol".

Article 18 "In cases of emergency, a Party requiring assistance may request help from the other Parties, either directly or through the Regional Centre (REMPEC), which shall do their utmost to provide the assistance requested".

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Presentation

- The Mediterranean Guide is a tool developed by REMPEC to assist Contracting Parties in managing requests and offers of assistance from other countries and organisations when confronted with large, complex or significant marine pollution incidents.
- This Guide built on the existing manuals and guidelines is designed to provide the required background information and guidance to the national competent authorities in charge of managing and coordinating cooperation and international assistance when responding to marine pollution incidents.
- This Guide addresses the needs of countries with limited response capacities as well as those of countries with robust response and preparedness systems.

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Structure and Innovations

Draft Guide is divided into (2) parts:

one dedicated to background information (legal, institutional, relationships, etc.)

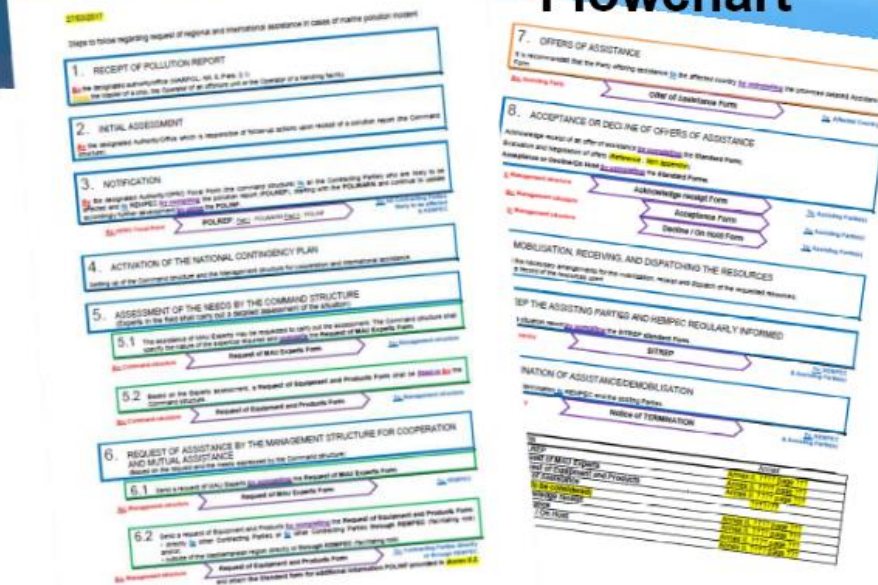
the second operational part addressing the management of regional and international assistance and the administrative, legal, and financial issues

In addition the Guide provides

- “Fiche” for each institution which may be involved in the coordination and/or mutual assistance in case of pollution incident
- Specific fiche presenting the relationship and the working procedures between REMPEC and these institutions
- Flowchart showing the step by step procedures related to cooperation and mutual assistance described in the Draft Guide;

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Flowchart



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FICHE

Mediterranean Guide on Cooperation and Mutual Assistance in Responding to Marine Pollution

Information regarding the following facilities according to responsibilities, involvement, and role in responding to marine pollution incidents, including information regarding the assistance which may be provided upon request.

Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC)

WHO

Role and responsibilities:

REMPEC is one of the components (Regional Activity Centres) of the Mediterranean Action Plan (UNEP/MAP). It is administered by the IMO and under the leadership of REMPEC, it is developing regional cooperation and to facilitate cooperation among the Mediterranean coastal States in order to respond to pollution incidents which result or may result in a discharge of oil or other hazardous and noxious substances and which require emergency actions or other immediate responses.

Who can request assistance:

REMPEC has been established by Resolution 7 adopted by the Conference of the Plenipotentiaries of the coastal States of the Mediterranean Region on the Protection of the Mediterranean Sea at Barcelona on 5 February 1976. In legal cases are the Prevention and Emergency Protocol and the OPRC Protocol regarding the response to marine pollution incidents. Its objectives and functions are defined by the Contracting Parties to the Barcelona Convention.

Who can provide assistance:

Contracting Parties to the Barcelona Convention (1976) may provide assistance in response to a pollution incident (oil or hazardous and noxious substances, other wastes) or through the Regional Centre, in order to facilitate the Centre engaged in an operation to combat pollution control agree on the organization of the operation, the Regional Centre may, with the approval of all the Parties involved, coordinate the activities of the facilities and help operations to those Parties.

Other Parties to the Convention:

In cases of emergency the Contracting Parties shall implement mutually mutually the Emergency Protocol (1976) or in cases of emergency, a Party requiring assistance may request help from other Parties, either directly or through the Regional Centre (REMPEC), which shall do their utmost to provide the assistance requested.

Functions of REMPEC:

1. To assist coastal States of the Mediterranean Region, which in cases of emergency to request, in obtaining assistance of the other Parties to the Convention and Emergency Protocol, in order to facilitate the possibilities for assistance to that extent within the region, in obtaining international assistance from outside the region.

2. To create and keep up to date operational arrangements and guidelines, aimed at facilitating co-operation between Mediterranean coastal States in cases of emergency.

3. To organize and activate the Mediterranean Assistance Unit for combating accidents marine pollution created by a decision of the Eighth Ordinary Meeting of the Contracting Parties (October 12-15 October 1983) in the conditions described in this section.

4. To collect and disseminate information regarding procedures and in cases of emergency regarding regional actions.

WHO

Role and responsibilities:

REMPEC has developed and maintains a Regional Information System (RIS) composed of electronic and traditional, operational guides and technical documents, and which is complemented by decision support system tools, including the Maritime Integrated Decision Support Information System (MIDSIS-PROD). The waste management decision support system, the Mediterranean Integrated Ship Oil Spill Response Plan (MISORP) and the Resource Allocation Decision Support System (RADSS).

REMPEC maintains regular contact with national competent authorities of the Contracting Parties in particular with the national designated OPRC, Mutual Assistance and 24-hour NOCs/MOCs.

Then, in cases of emergency, REMPEC will:

- Provide on-going operational assistance in operational, technical, administrative and legal aspects of pollution response;
- Coordinate and disseminate information of marine pollution events and on follow up actions;
- Facilitate obtaining assistance and if needed and requested coordinate the providing of international assistance (oiling, fire-fighting);
- As pollution response can occur in:
 - Assessing the emergency situation in the field to carrying out a detailed assessment of the situation;
 - Issuing the correct decision to request or offer international assistance and to specify, as precisely as possible, the type and quantity of equipment and products needed;
 - Having the management structure in charge of the response;
 - The coordination of offer of assistance;
 - The coordination of international assistance.

Cooperation and Mutual Assistance in Responding to Marine Pollution

Information regarding the following facilities according to responsibilities, involvement, and role in responding to marine pollution incidents, including information regarding the assistance which may be provided upon request.

European Union Agency for Maritime Safety (EMSA)

WHO

Role and responsibilities:

The European Union Agency for Maritime Safety (EMSA) aims to strengthen the role of its Member States in order to reduce the effectiveness of oil and non-oil spills, including marine pollution incidents, in the event of a spill operation out of the scope of the OPRC.

EMSA provides technical assistance to the European Union Member States in order to improve their capacity to respond to marine pollution incidents.

EMSA is one of the components of the European Union Agency for Maritime Safety, which also includes the European Union Agency for Maritime Safety and the European Union Agency for Maritime Safety.

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Cooperation and Mutual Assistance in Responding to Marine Pollution

Information regarding the following facilities according to responsibilities, involvement, and role in responding to marine pollution incidents, including information regarding the assistance which may be provided upon request.

International Maritime Organization (IMO)

WHO

Role and responsibilities:

The International Maritime Organization (IMO) is the specialized agency of the United Nations responsible for regulating shipping. It was founded in 1948 and is headquartered in London, United Kingdom.

IMO is also one of the components of the European Union Agency for Maritime Safety, which also includes the European Union Agency for Maritime Safety and the European Union Agency for Maritime Safety.

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IMO is also one of the components of the European Union Agency for Maritime Safety, which also includes the European Union Agency for Maritime Safety and the European Union Agency for Maritime Safety.

Diagram 1

This diagram relates to: cooperation and mutual assistance in cases of Tier 2 or Tier 3 situations when an affected contracting Party is requesting assistance to other contracting Party as well as to response providers or industry arrangements; and, when REMPEC will provide technical advices and assistance of experts (through the mobilisation of the MAU) and has mostly an advisory and facilitating role.

Type of situations: Tier 2 or Tier 3 situations relate to intermediate or large pollution when the mobilisation of the require response resources can be obtained from the Contracting Parties and the industry within the regional frame.

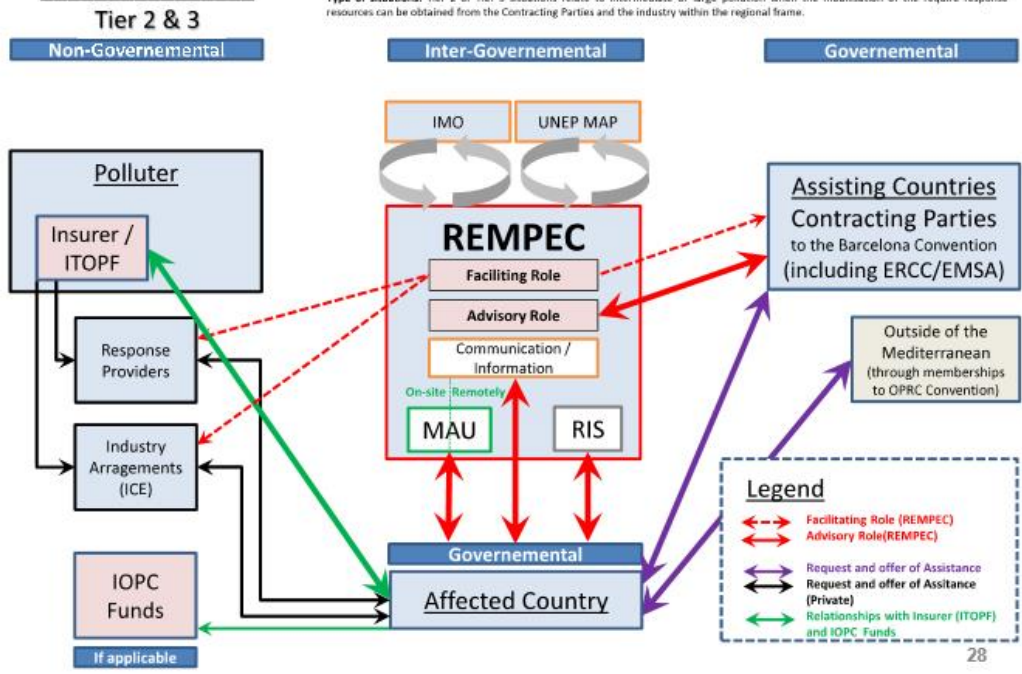
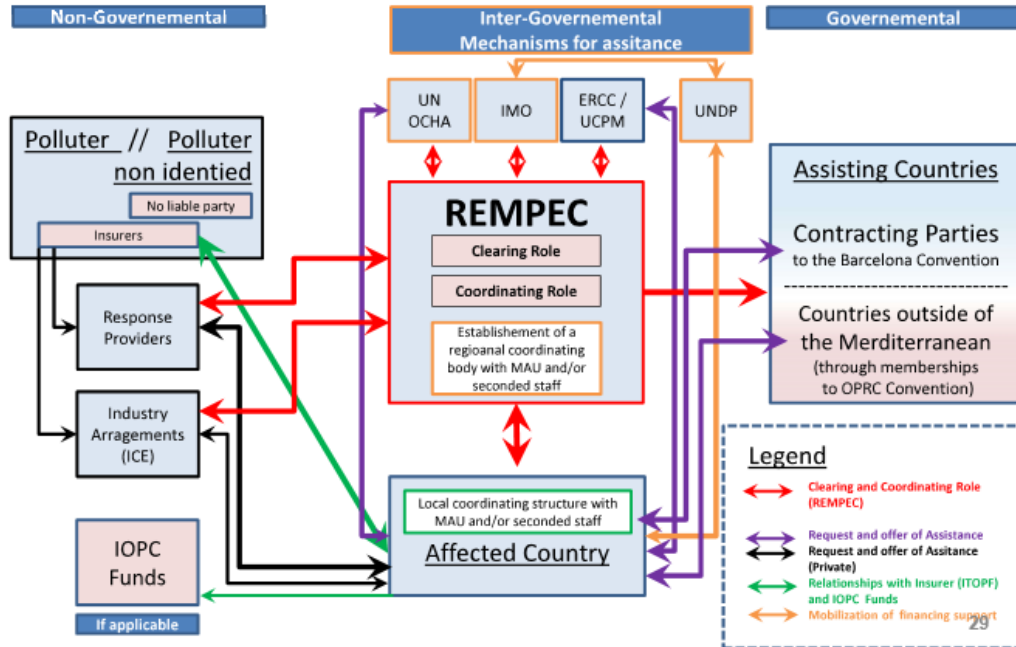


Diagram 2

Exceptional circumstances



PROGRAMME OF WORK 2018-2019

REMPEC POW 2018-2019

Excepted deliverables

- Technical support provided to CPs, which so request, **to assess, prepare, adopt, update as well as implement and test national contingency plans and sub-regional agreements/contingency plans** dealing with preparedness for and response to oil and HNS spills from ships, sea ports, oil handling facilities and offshore installations;
- **National and regional training courses/workshops** organised on response to spill incidents involving oil and/or HNS

Comments from DG ENER (Field: Safety and environmental protection for offshore oil and gas installations)

- Action 1: Stock taking on the legal and regulatory regimes in place at every Mediterranean country outside of the EU as well as transboundary coordination and emergency response.

Deliverables: Emergency response plans in place, both national and external

- Action 2: Bringing the authorities together for effective cooperation in emergency response to transboundary incidents.

Deliverables: Preparation of External emergency response plans - Preparation and execution of transboundary emergency exercises.

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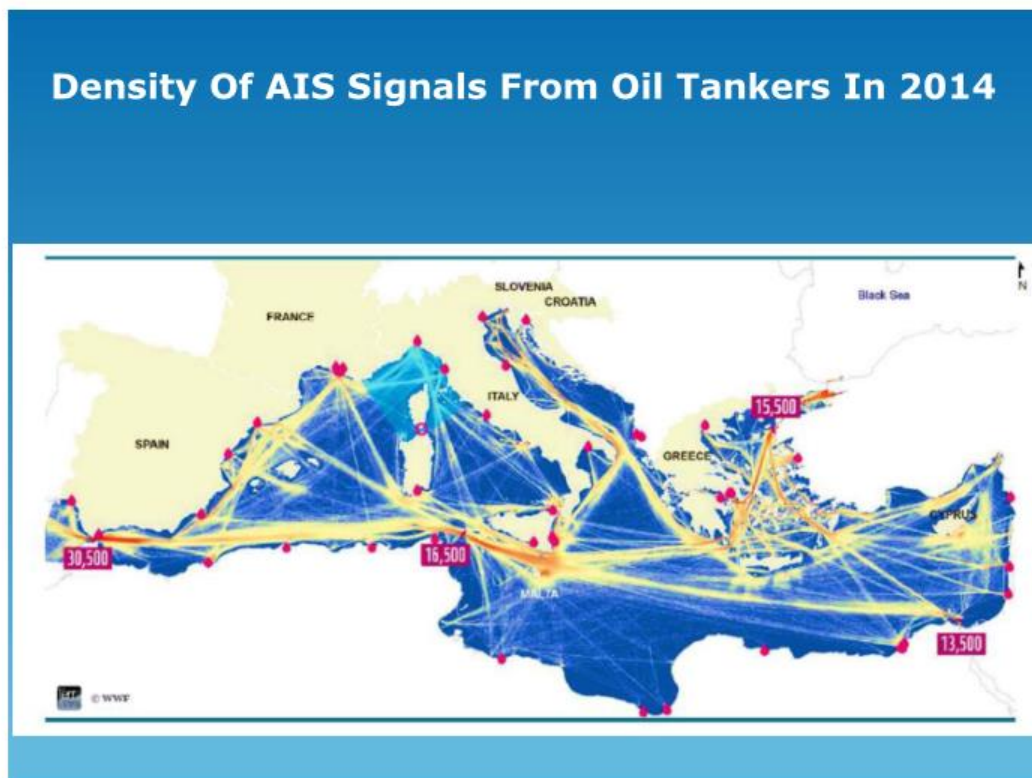
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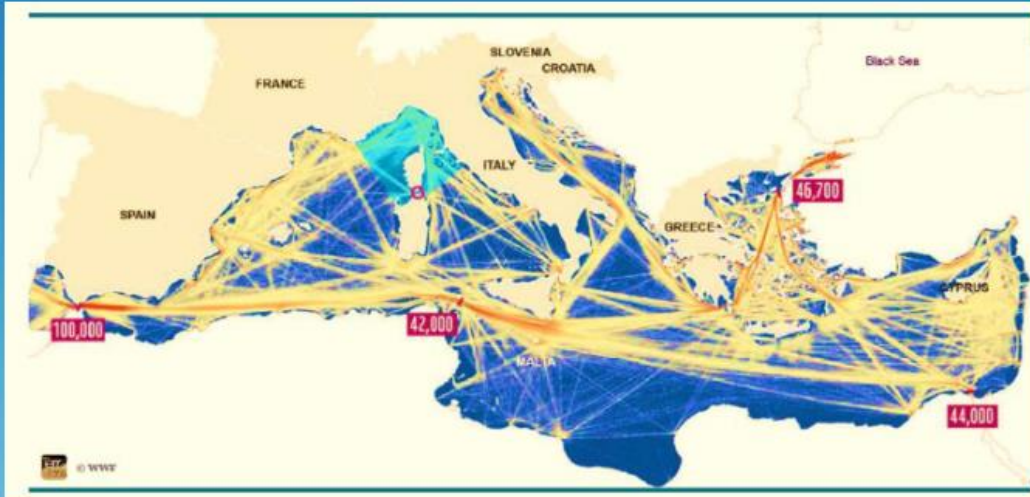
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19 Eastern Med Preparedness and Response for Marine Oil Pollution: current situation and future activities (Y. Ratner, Israeli Ministry of Environmental Protection)



Density Of AIS Signals From Cargos In 2014



ISRAEL

Land Area: 22,000 sq.km

Coastline Length: 185 km

Territorial waters: 4,060 sq.km

EEZ: 26,000 sq.km

Levantine Basin



Potential Sources Of Oil Pollution To Israel Marine And Coastal Environment

1. Shipping Accidents.
2. Loading And Unloading Of Oil.
3. Offshore Oil And Gas Exploration And Exploitation Activities.

Areas & Infrastructures With High Sensitivity To Oil Pollution

1. Marine & Coastal Nature Reserves
2. Desalination Plants
80% Of Israel's Drinking Water
3. Electric Power Stations
60% Of Electricity Production
4. Ports
99.9% Of Imported / exported Goods

Offshore Oil And Gas Exploration And Exploitation Activities

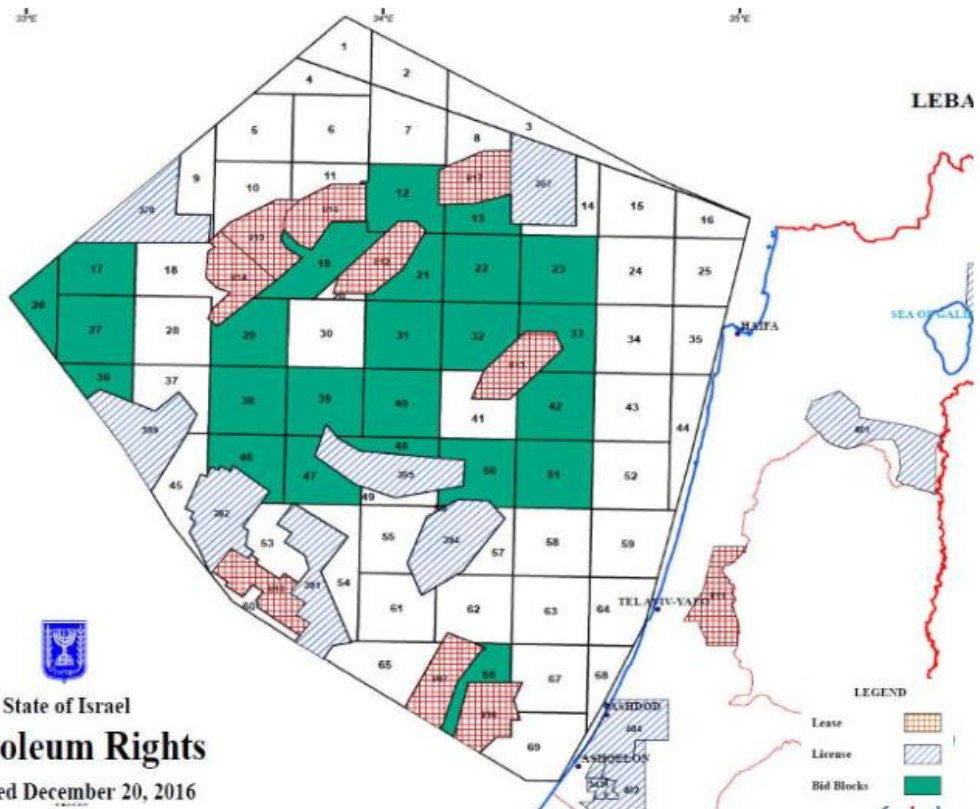


Deep Sea Exploration

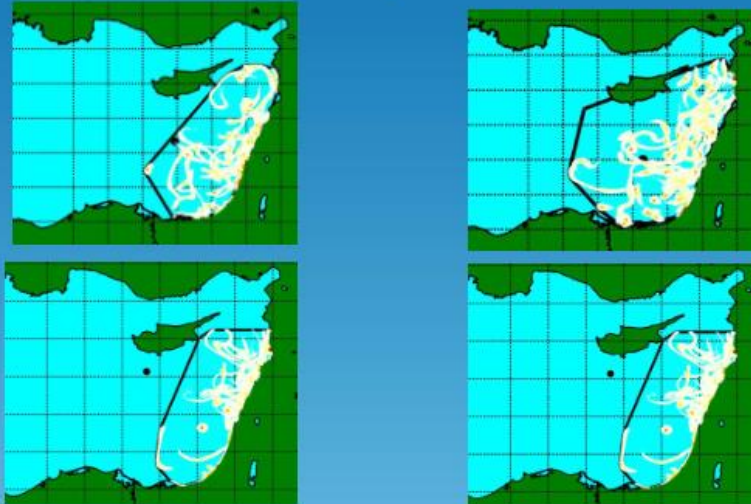




Ministry of National Infrastructure,
Energy and Water Resources
www.energy.gov.il



Examples Of Oil Spill Trajectories, From Certain Existing Wells, Offshore Platforms.



Dr. George Zodiatis





Eilat 23.11.2013



24.7.2011



International Conventions Concerning Marine Pollution Which Israel Is Committed To:

- **International Convention On Oil Pollution Preparedness Response And Cooperation (OPRC 1990).**
- **Convention For The Protection Of The Mediterranean Sea Against Pollution - Barcelona Convention**
- **International Convention For The Prevention Of Pollution From Ships (MARPOL)**
- **The International Oil Pollution Compensation Funds (IOPC Funds).**

Oil Spill National Contingency Plan (TALMAT)

- Derived From The OPRC & The Barcelona convention
- Adopted By A Government Decision, June 2008
- Preparedness And Response Is The Responsibility Of The Oil Transporters/Producers & Local Municipal Authorities. (Tier 1)
- The Government Is Responsible For Tier 3 Operations

NCP 3 Tier Response



National Tier 3 Capabilities

Tier 3 Response Is Based On Stockpiles Held By:

- **Private Sector/Oil & Gas Industry**
- **Oil Spill Response Contractors**
- **Navy**
- **Government**

Government Stockpile

Booms, Skimmers, Pumps, Dispersants, Sorbents

Operational Command- Situation Room

RCC Haifa (Haifa Radio, 4XO)

- 24/7 Rescue Coordination Center
- Tier 3 Operational Command
- Advanced Communication capabilities



Sub Regional Contingency Plans For Oil Spill Emergencies

- Cyprus, Egypt, Israel - 1995
- Upper Gulf of Aqaba -1995
- Cyprus, Greece, Israel - **First draft**

Cyprus, Egypt, Israel 1995

REMPEC Assisted The Parties With
Formulating And Implementing The
Plan And The Agreement



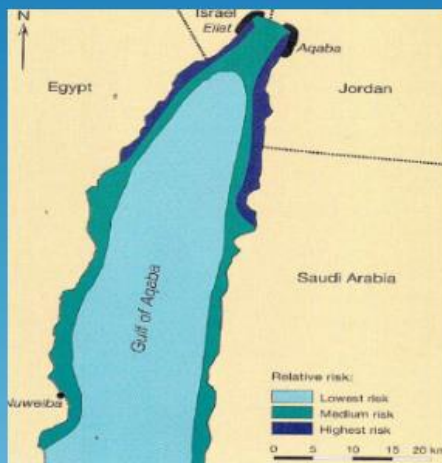
Construction of the SCP

- Core Issues For Coordination
 - Contingency Planning
 - Communications Procedures
 - Control And Clean-up Operations Strategies
 - Joint Training Courses And Exercises

Training Courses
Marine Pollution Preparedness and Response
During March 1995, Courses Were Held
Concurrently In Egypt, Cyprus & Israel

Sub regional Joint Response Exercises
Joint Exercises Were Conducted
Between 1995 And 1999

Upper Gulf of Aqaba -1995



Treaty Of Peace
Between The State Of Israel And The Hashemite Kingdom Of Jordan
October 26, 1994

"The Parties Will Co-operate In Matters Relating To The Environment..."

"The Gulf Of Aqaba..."

"The Marine Environment" ... "Marine Pollution"...

"Marine Sources:" .. Such As Oil Spills, ..."

"Emergency Response Actions"

Status as of today

- Training Exercises - Israel & Jordan
- Oil Spill Centers - Eilat & Aqaba
- Open Channels Of Communication - Israel & Jordan





A new initiative

Sub-regional Contingency Plan: Cyprus, Greece and Israel



The Ministers Declaration

On 6 April 2016 The Ministers Responsible For Environmental Matters Of The Parties, Met In Jerusalem And Signed The Joint Declaration Of Intent On Cooperation In The Field Of Environmental Protection



The Declaration

“This Declaration Identified *Inter Alia* The Protection Of Marine And Coastal Environment And In Particular Preparedness And Response To Major Marine Pollution Incidents In The Mediterranean, Resulting From Ships, Offshore Hydrocarbon (Oil And Gas) Exploration And Exploitation Activities And Hydrocarbon Pipelines”

Guidelines for establishing a SCP

IMO Manual on Oil Pollution, Section II: Contingency Planning (3rd edition)

▪ Information Which Government Should Provide When Developing An International CP:

1. **What** Is The Competent National Authority? & **Which** Is The National Operational Contact Point Responsible For Oil Spill Related Matters;
2. **What** Is The National Oil Spill Response Organization? **Is there** A National Contingency Plan?
3. **What** Are The Spill Response Resources? & **How** To Request Them In Case Of Need?
4. **What** Are The Available Logistic Support Facilities Within The Country?
5. **Where** Are The Storages For Recovered Oil? & **What** Are The Disposal Methods For Collected Oily Material?

Additional Issues To Take Into Consideration During The Preparation Of An International CP:

IMO Manual on Oil Pollution, Section II: Contingency Planning (4th edition)

1. **Scope Of Cooperation Between Participating Governments**
2. **Definition Of Geographical Area(s) And Division Of Responsibilities**
3. **Reporting, Alerting And Communications Procedures**
4. **Logistics, Administration And Funding**
5. **Review And Update Of An International Contingency Plan**

Key Points To Take Into Account:

- International CPs Should Be As Concise And Simple To Implement As Possible.

A Contingency Plan Is Not A Spill Response Manual!

- International CP Can Only Work If Based On The Provisions Of The Existing NCPs Of The Countries Concerned.



Israels Plans & Future Efforts

In The Next 2 Years, We Will Work To Accomplish Our Goals:

1. Addition Of Trained Personnel
2. Establishment Of Two Oil Pollution Response Bases Of Operation
3. Acquisition Of Oil Combating Equipment (OCV, Barges, Booms...)

Thank You Very Much

20 EERP Implementation: Strengthening Collaboration (Group Exercise organised by UK BEIS and MCGA)

OPRED

Offshore Petroleum Regulator for Environment and Decommissioning

EERP Implementation – Strengthening Collaboration



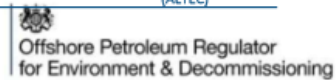
Strengthening collaboration

- 2 hour group exercise facilitated by OPRED. The exercise is focussed on an ongoing offshore pollution incident.
- 8 groups selected by the Commission (Use same groups as group exercise 1)
- Please get into the following groups now:



EERP implementation - Strengthening collaboration

ATLANTIC OCEAN	ADRIATIC SEA	BALTIC SEA	EAST MEDITERRANEAN	BLACK SEA
Ben Browne (IE)	Vlatka Vanicek (HR)	Kurt Machetanz (DE)	Themistoclis Kyriacou (CY)	Yuliyán Gospodinov (BG)
Roisin Cullinan (IE)	David Dobrinic (HR)	Anna Grabowska (PL)	Yoav Ratner (IL)	Janni Rose Christensen (DK)
Gabriel Boulesteix (FR)	Antonino Caliri (IT)	Jurga Lazauskiene (LT)	Vincent Claessens (NL)	Hugh Shaw (UK)
Youssoupha Diop (FR)	Salvatore Carbone (IT)	Ojars Gerke (LV)	Bryn Aril Karlberg (NO)	Constantin Gheorghe (gsp offshore)
Jonathan Milne (UK)	Jan Kool (NL)	Wendy Kennedy (UK)		
Raffaella Pantile (Saipem)	Luca Falcone (EDINA)	Bruce Lawson (TOTAL)	Melania Buffagni (ENI)	Mihaela Berghia (OVM Petrom)
Pietro Cavanna (Assomineraria)	Hrvoje Goreta (INAgip)	Ignazio Frisone (Saipem)	Paolo Allara (Saipem)	Sergio Bomben (Saipem)
Angelo Ligrone (ENI)	Ivan Mijic (INAgip)	Christian Schwarck (IOGP)	Damir Mlinaric (INAgip)	Francesca Polla Mattiot (ENI)
Jako Krizan (EDINA)	Roberto Nicolucci (TECHNO HSE)	Maria Corradi (Industrial Europe)	Rob James (OSRL)	Jens Hoffmark (IADC)
Frederic Hébert (EMSA)	Ilaria Antoncacci (IT)	Rocco Bruno (IT)	Malek Smaoui (REMPEC)	Ketil Karlsen (Industrial Europe)
Joerg Koehli (COM)	Fabio Borriello (IT)	Paolo Russo (University of Ferrara)	Monica Mazzarese (IT)	Vittorio Pagotto (IT)
Roberto Cianella (IT)		Pietro Ruberto (IT)	Franco Nanni (ROCA)	Tommaso Pisino (IT)
Giancarlo Mangiapane (CREA)			Paolo Macini (University of Bologna)	Ezio Mesini (University of Bologna) Cristoforo Romanelli (ALTEC)



EERP implementation - Strengthening collaboration

Objective:

Use a major oil pollution incident scenario in the North Sea to demonstrate:

- How an EERP could be implemented; and
- How collaboration between MS could occur for transboundary oil pollution incidents



EERP implementation - Strengthening collaboration

- A oil pollution incident scenario will be presented by OPRED and all groups will be challenged at various stages through the scenario to consider how an EERP could be implemented
- The session is intended to prompt MS to consider how the EERP could be implemented and what national arrangements should be in place to liaise with neighbouring countries who may be impacted by a transboundary oil pollution incident
- There will be insufficient time for all groups to feedback all matters discussed during the exercise
- Take time to have a tea/coffee break during the group sessions (no dedicated tea/coffee break)



UK EERP exercise regime

The UK EERP for marine pollution (NCP) is exercised for an offshore oil pollution incident every three years.

In addition each holder of an IERP (OPEP) must undertake:

- An offshore OPEP exercise once per shift per year;
- One onshore OPEP exercise per year; and
- Hold a SOSREP exercise every three years.



UK EERP exercises – Offshore oil & gas

UK EERP exercises undertaken concerning in relation to offshore:

- 2011 Exercise Sula – Deepwater loss of well control during well operations West of Shetland resulting to an ongoing uncontrolled oil release.
- 2014 – Exercise Dragon – Explosion on a floating oil storage unit in the East Irish Sea resulting in a release of oil inventory
- 2018 – tbc

The group exercise will use the scenario from Exercise Sula to challenge MS to consider EERP implantation.



Exercise Sula – Objectives:

- Exercise the UKs response to major oil spill from deep water drilling incident
- Test the National Contingency Plan for marine pollution from offshore installation (including media response and management)
- Demonstrate Oil and Gas Industry’s ability to respond to major deep water well control incident and resulting oil spill
- Exercise the Operators Well Control, Oil Spill Response and Tier 3 Emergency response plans
- Test liaison on National and International basis (Norway, Denmark, Faeroe Islands)

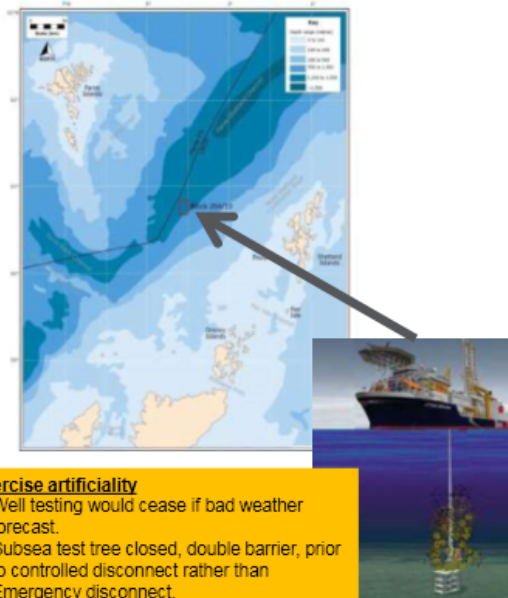
In addition:

- Physical demonstration of Industry Tier 2/3 oil spill response assets:
 - Surveillance and dispersant aircraft
 - Marine vessels – dispersant and oil skimming
 - Shoreline protection and counter pollution response



Incident:

- A Well Operator is drilling an appraisal well 162km West of Shetland, 170km East of Faroes and 8 km from the UK/Faroe Median Line.
- Water depth is 1090 metres and well flowing at 6,000 barrels of oil per day during well test.
- Emergency drill ship disconnect occurs after failure of marine riser tensioner system and an increasing sea state.
- Failure of subsea test tree and BOP system to fully close.
- Resultant uncontrolled release of oil to sea.
- All personnel on the drill ship are accounted for and there are no injuries.



Exercise artificiality

- Well testing would cease if bad weather forecast.
- Subsea test tree closed, double barrier, prior to controlled disconnect rather than Emergency disconnect.
- Routine testing of subsea BOP rams.

Group Exercise 1 – initial incident notification & immediate actions:

- How would the agency responsible for implementing the EERP be notified of an uncontrolled release of oil from a Well Operation in your jurisdiction?
- Should the notification be made in a specific time period?
- What are the initial actions the Well Operator should take?
- What action does the CA take on receipt of the notification?
- Who monitors the Well Operators response to the incident?
- What powers does the relevant agency have to monitor the Well Operator's response?

What happens in the UK:

- OPRED must be notified by telephone within 1 hour of the identification of an incident involving the release of more than 1tonne of oil (OPRED Environmental Inspectors are on call 24/7)
- Any release of oil must be reported on a PON1 via a bespoke on-line portal (UKOP) within 6 hours of identification.
- In this scenario it is expected that the Well Operator would:
 1. Ensure the safety of personnel on the Installation
 2. Implement the Oil Pollution Emergency Plan (OPEP) as approved by OPRED
 - Sets out arrangements in place to respond to a pollution incident
 - Details offshore and onshore response
 - Details reporting procedures for pollution incidents
 3. Establish their onshore Emergency Response Centre (ERC)
 - Recognised centre / team for managing the pollution incident
 - Provides communication contact point with the offshore installation and other agencies, e.g. OPRED/ MCA
 - Monitors the offshore incident and provides the mechanism for implementation of response strategies – as detailed in OPEP – such as aerial surveillance, oil containment and recovery measures
 - Implements Source Control measures – including use of the subsea capping stack
 - Manages the response strategies to mitigate and finally contain / stop the pollution incident
 - Liaises with the Well Operators other response teams - Crisis Management and Corporate Teams
- OPRED would notify the MCA and SOSREP and mobilise Environmental Inspector(s) to the ERC. Environmental inspectors have the regulatory authority to take any action (enter premises etc) to monitor the response to any oil release incident and ensure the OPEP is implemented.
- It is a criminal to obstruct an OPRED Environmental Inspector.



Incident update – OPRED Inspector at the ERC:

- The well continues to flow at a worst case of 6,000bbls per day
- EERV on scene reports a growing oil slick 3km x 0.5km tracking SW from a source point above the well
- The Well Operator has mobilised aerial surveillance due in field in 3hrs
- The Well Operator has mobilised at sea oil containment/recovery resources and shore line protection resources to Shetland
- The Well Operator has mobilised external well control specialists to the ERC
- Worst case to drill relief well as per OPEP is 79 days



Group Exercise 2 – MS response activation:

- Would your MS activate the EERP?
- How is the EERP activated?
- What MS Response Cells would be established?
- What roles do the MS Response Cells undertake? Is this documented in the EERP?
- Who has overall responsibility for directing the MS response to the incident?



UK regime:

- National Contingency Plan (NCP)
- 24/7 Nationwide Coastguard Operation Centres
- 24/7 MCA Counter Pollution Branch
- 24/7 OPRED Environmental Inspectorate
- SOSREP
- UK resources and stockpiles
- Independent technical experts
- Environmental experts
- NORBRIT
- Other International Agreements (UK/Faroe treaty, Mancheplan etc)



UK EERP Response cells:

OPERATOR INCIDENT RESPONSE	OPERATIONS CONTROL UNIT	MARINE RESPONSE CENTRE	SHORELINE RESPONSE CENTRE	ENVIRONMENT GROUP
<ul style="list-style-type: none"> Spill Mitigation Pollution source control Well Control Vessel salvage Support other Centres as necessary 	<ul style="list-style-type: none"> SOSREP monitors the Operators response to source control and eventual containment of the spill May intervene through the service of directions 	<ul style="list-style-type: none"> Strategic and tactical coordination of air-borne and sea-borne response activities for counter pollution 	<ul style="list-style-type: none"> Shoreline protection Beach preparation Beach clean-up Initial Waste Mgmt 	<ul style="list-style-type: none"> Comprises Environmental, Food, Fisheries and Public Health Agencies Advises all Response Centres on real and potential environmental or health matters



 Offshore Petroleum Regulator
 for Environment & Decommissioning

Incident update: SOSREP mobilisation/NCP activation

- SOSREP establishes OCU to monitor Well Operators Response
- MCA establish MRC and implements NCP - National resources mobilised
- Well control plan developed by Well Operator
- Modelling output received – next slide



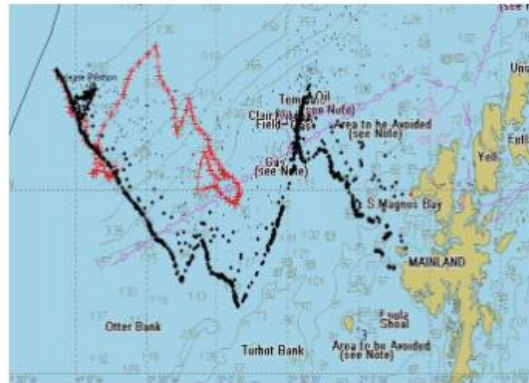


 Offshore Petroleum Regulator
 for Environment & Decommissioning

Incident update: SOSREP mobilisation/NCP activation

Modelling undertaken for 79 days (6,000bbls/day):

- First oil beaches in 12 days
- 83 tonnes will beach in Shetland
- 12 tonnes will beach in Norway



Exercise Artificiality

Weather simulated to drive oil towards Shetland.

Exercise Artificiality

- Models do not account for counter pollution measures.
- Assume ongoing release with no well intervention.



Offshore Petroleum Regulator
for Environment & Decommissioning

Group Exercise 3 – Resource mobilisation:

- Does your EERP consider national oil spill resource availability?
- How does your MS access national oil spill response resources?
- How quickly can oil spill response resources be mobilised and who sanctions their mobilisation?
- How would your MS assess/approve the large scale use of oil spill treatment products (dispersant)?
- How would your MS ensure source control measures (well capping/containment/well kill) considered/deployed?
- Who in the MS is responsible for the co-ordination of national oil spill resources with the operator mobilised resources?
- How would your neighbouring states be notified of the potential oil beaching? – What protocols/treaties would be implemented?



Offshore Petroleum Regulator
for Environment & Decommissioning

UK Regime:

MCA:

- Implement the most appropriate means of containing, dispersing and removing pollutants at sea.
- Deploy national resources (emergency towing vessels, aerial surveillance, equipment stockpiles etc) and coordinate with operator resources.
- Access duty MCA Scientific and Technical Officers plus a Duty Logistics Officer.
- Initiate call for the establishment of the Environment Group.
- Activate NORBRIT agreement



NORBRIT:

- The Plan is a MoU between the Maritime and Coastguard Agency and the Norwegian Coastal Administration.
- The MoU establishes the procedures to be followed during any joint Norway/UK pollution response and salvage operations at sea.
- The MoU clearly defines lines of communication as well as command and control procedures.
- In addition to the NORBRIT arrangements also exist under the Bonn Agreement and through EMSA to provide assistance and resources if deemed necessary.



UK Regime:

OPRED:

- Monitor on going well operator response;
 - Source control
 - Pollution remediation
 - OPEP implementation
- Sanction use of operator dispersant resources (following specialist environmental advice);
- Media Liaison;
- Ministerial submissions;
- Assistant to SOSREP;

SOSREP:

- One person to act as representative of the Secretaries of State - (BEIS for Offshore Installations)
- Free to act without recourse to higher authority
- Ultimate and Decisive voice
- Ultimate control
- Cannot choose to ignore a situation
- Tacitly approves all actions



Incident update: Escalation potential

- Well Operator develops plan to remove and replace BOP:
- If successful this will result:
 - Increase release rate to 88,000bbls/day for 2 days (total oil release 34,000 tonnes)
 - Release will then be halted
 - 114 tonnes of oil will beach in Shetland in 12 days
- If BOP replacement operation fails:
 - Increased release rate of 88,000bbls/day release for worst case of 79 days (total worst case oil release 926,000 tonnes gross release)
 - 800 tonnes of oil will beach in Shetland
 - 100 tonnes of oil will beach in Norway



Exercise Artificiality

- Models do not account for counter pollution measures.
- Assume ongoing release with no well intervention.
- Worst case exercise weather conditions.
- Maximum theoretical well flow condition.

Incident update: Alternative source control

In addition to the BOP remove/replace option the Well Operator has developed a source control programme which has been provided to OPRED, SOSREP & MCA

Timeframe	Activity
1- 4Hrs	Back-up acoustic communication with subsea BOP
2-72 hrs	ROV intervention on subsea BOP. Hydraulic "Hot-stab" to close BOP rams
1-5 days	Assess, mobilise and deploy necessary subsea debris removal equipment
6- 14 Days	Mobilise and deploy Subsea Capping stack
4-10 days	Mobilise and deploy subsea dispersant to allow safe on-scene work (if required)
10-14days	Mobilise and deploy Well kill equipment and vessels to kill well once capped
7- 90 days	Design, mobilise and construct relief well
7-90 days	Mobilise and deploy well containment "top-hat" to well test vessel and burn or contain liquid hydrocarbons, weather depending

Group Exercise 4 – Sanctioning BOP replacement:

- How would your MS consider the proposal to remove/replace the BOP?
- Who would have the ultimate decision on the proposal?
- How would you engage with neighbouring countries impacted by the remove/replace decision?
- How would you assess the potential environmental impacts of the remove/replace option? - How long would it take you to obtain this expertise?
- How would you assess the suitability of the proposed alternative well control options?
- Assuming the BOP remove/replace proposal is consented what would be your expectations as to the progression of the other well control options.



UK Regime

- SOSREP has authority to sanction BOP removal/replacement
- Environment Group would advise SOSREP on potential impacts of BOP remove/replace strategy
- MCA would liaise with Norwegian Coastal Administration to coordinate resources
- SOSREP/OPRED would monitor/assess further well control contingencies
- Well Operator would be required (by direction if necessary) to simultaneously progress and implement multiple well control strategies - This would include spudding a relief well.



End of Group Session

Objective was:

Use a major oil pollution incident scenario in the North Sea to demonstrate:

- How an EERP could be implemented; and
- How collaboration between MS could occur for transboundary oil pollution incidents

Hopefully the group sessions prompted useful discussions.

In addition to the operational EERP matters raised ensure you are prepared for media management...

21 EERP Preparation: Further developing region specific plans (Organiser DG ENER)

Workshop on Emergency Response – Ravenna IT, 5-7/4/2017 3rd Group Exercise

Objective:

The exercise aims at initiating the preparation of national and regional emergency response plans in participating countries and regions where these have not yet been established. The exercise will be held at the final stages of the workshop in order to encourage application of the knowledge and experience shared through the presentations and preceding exercises (content and preparation of emergency response plans, relevant available tools, services and instruments). Knowledge transfer from experienced authorities and experts will also be a core part of this exercise.

Methodology:

Participants will be separated into groups according to their regional representation, as follows:

- Adriatic Sea (Croatia, Italy, Greece),
- Atlantic Ocean (France, Ireland, Spain, Portugal, UK),
- Baltic Sea (Germany, Latvia, Lithuania, Poland, Estonia, Finland, Sweden)
- Black Sea (Bulgaria, Romania)
- East Mediterranean (Cyprus, Egypt, Israel).

The above groups will be assisted by experts from countries where emergency response plans exist and are regularly tested. The participation of these experts would contribute to the exercise by sharing their experience. It is important however that the number of participants in each group remains manageable, also because of the limited time available for this exercise.

Each group will also have a leader, who will be notified ahead of the workshop, and asked to prepare a scenario of an emergency situation (representative of a specific region) to be resolved during the exercise.

Execution:

Pre-workshop preparation:

- Leader prepares an emergency scenario, in as much as possible detail (location, water depth, incident characteristics, weather conditions, etc.). The scenario should be sent electronically to the organizers (JRC) so that it can be printed for the exercise.
- If can be easily prepared, leader sends to the workshop organizers (JRC) a regional map, preferably depicting location of infrastructure and sea delineation. This will be printed for the exercise.
- Leader may discuss this scenario with the other core members of the group ahead of time.

Exercise:

- First 10 minutes: Exercise Moderator sharply recaps on the relevant workshop material and introduces the objectives and structure of the exercise.
- Next 50 minutes: Participants in regional groups work through an emergency scenario relevant to their region (as prepared by the group leader and possibly fine-tuned by the co-members) and try to identify the necessary emergency response needs (e.g. personnel evacuation and rescue, fire-fighting, well containment, transboundary collaboration, shore mobilization, etc.), as well as the necessary response actions.
- Next 30 minutes: group leaders briefly explain to the workshop participants their reflection on the chosen scenario, reactions triggered and challenges faced.

Anastasios Papandreou – DG Energy, B4 – March 2017.

Examples of Emergency Scenarios

Example A

A Well Operator is drilling an appraisal well in location A (described in detail with map). Water depth is X metres and well flowing at F barrels of oil per day during well test (give as realistic figures as possible). Emergency drill ship disconnect occurs after failure of marine riser tensioner system and an increasing sea state. Failure of subsea test tree and BOP system to fully close. Resultant uncontrolled release of oil to sea occurs. All personnel on the drill ship are accounted for and there are no injuries.

Example B

A DP supply vessel is delivering high density mud to the drilling rig which is drilling an extra well at the platform (position provided). The DP vessel loses its positioning system and sails at considerable speed underneath the rig against the external conductor of the platform through which the rig is drilling the new well. The drilling bit has reached an over pressured gas reservoir. The well was closed-in awaiting the delivery of the high density mud. The external conductor and the internal casing strings are damaged below the waterline. The high pressure reservoir has as yet not been cased-off and the drilling assembly has been pulled of bottom. The damaged well is leaking oil based drilling mud below the waterline. After some time gas starts bubbling out of the well. It escalates further with the ensuing gas cloud exploding followed by a significant fire, weakening the platform structure. Also the rig and especially the derrick are being affected by the explosion and the ensuing fire. At the time of the incident there are 10 people on the platform and 90 people on the rig. Commercial helicopters and the SAR helicopter are scrambled to evacuate non-essential personnel. Also the SAR helicopter of the Authorities is called-out because also the crew of the DP supply vessel require rescue. 50 % of the people are evacuated with these helicopters, prior to gas starting to escape from the damaged well. The remaining people manage to leave the platform/rig using the free-fall boat of the platform and the lifeboats of the rig. Five people are missing and there are two casualties. There are questions about the integrity of the platform and the drilling rig. Priority one is rescuing people, determining threats to the environment and finally the status of the well, the derrick – rig and platform. Upon completion of the rescue operations, an aircraft and boat are dispatched to help getting a picture of the current situation and prepare the emergency combating plan. One of the points of attention is to try to pull the supply vessel away from under the rig. There is also a large slick from the oil based mud which drifts towards direction of coastline.

22 Emergency Demonstration: The POLLEX 2017 Exercise



JRC 1st Workshop under the
Virtual Centre of Offshore Safety Expertise

External Emergency Response Planning Emergency Demonstration: The POLLEX 2017 Exercise

Ravenna, Italy, 7th April 2017

Introduction

POLLEX 2017 is the name of the emergency demonstration which will be organized and carried out by the Italian Coast Guard/Ravenna Maritime Authority – in collaboration with ENI.

The demonstration will concern the execution of emergency response actions in case of incident on-board the Garibaldi C platform, with subsequent marine pollution (oil spill) and injury to one worker requiring medical evacuation (MEDEVAC).

Scenario

The simulated scenario will consist in a not-quantified oil spill to the sea, due to closing failure of hose used for loading the 6m³ storage tank situated on-board the **Garibaldi C** platform operated by ENI. Loading operations were carried out from a supply vessel.

One worker close to the storage tank slips on oil and injures himself (yellow code assigned).

Immediately after the incident, it is expected that the Offshore Installation Manager (OIM) will notify the event to the Italian Coast Guard/Ravenna Maritime Authority. The ENI operator's local headquarters in Marina di Ravenna (ENI DICS) will also be notified (in compliance with the company's internal emergency procedures). The emergency situation will be notified to local Government Territorial Office (UTG RAVENNA).

ENI procedures to face this type of events will be the first to be put in place by the OIM.

The Emergency Operations Centre of Italian Coast Guard/Ravenna Maritime Authority will be responsible for the management and execution of emergency response operations, including oil containment and recovery, through *"the local emergency response plan in case of marine pollution"*.



Emergency Operations Centre of Italian Coast Guard/Ravenna Maritime Authority will be also responsible for arrangements for MEDEVAC.

An Italian Coast Guard/Ravenna Maritime Authority helicopter will be employed for MEDEVAC and monitoring purposes during the emergency exercise.

Objectives of the demonstration

The objectives of the demonstration will be the following:

- To test the timely response of all key actors involved in oil containment and recovery – under the coordination of the Italian Coast Guard/Ravenna Maritime Authority;
- To train personnel responsible for management and coordination of response operations, and to train air and sea personnel involved in the management, execution and support to emergency response operations;
- To execute/implement the local strategy in case of marine pollution with the purpose of:
 - Testing the existing alert/warning system;
 - Test operational preparedness, timely intervention and efficiency of air and naval means;
 - Test communication systems;
 - Assess the Italian Coast Guard/Ravenna Maritime Authority's capability to coordinate equipment and personnel;
 - Test the level of preparedness of personnel involved in the Emergency Operations Centre's activities;
 - Test the time required for deployment and use of environmental response/oil recovery equipment.

Emergency operations to be performed

In order to coordinate the response operations to marine pollution and MEDEVAC operations, the Italian Coast Guard/Ravenna Maritime Authority will perform the following operations:

- Coordinate the intervention of the necessary Coast Guard patrol boats at the incident location;
- Coordinate the Coast Guard helicopter, which may be employed to monitor the extension of the oil spill and the efficiency of oil recovery operations and to carry out the MEDEVAC operation (personnel from the national health service will be on board the helicopter);
- Assess the level of emergency to be declared (local or national), based on the amount of the oil spill;



- Coordinate the environmental response means used by ENI (Saipem equipment for containment and recovery already on board) and the use of other equipment already available on board;
- The Ministry of the Environment will be informed (simulated phone call), who will authorize the use of SECOMAR depollution vessel (CASTALIA Soc. Consortile SPA) for oil containment and recovery;
- Thanks to the deployment of booms, skimmers, etc., the oil spill will be successfully contained and oil recovered;
- Issue a “formal notice” to ENI, as a result of the incident.

Platform

Garibaldi C is a fixed steel platform for natural gas extraction. Operated by ENI, it is bridge-linked to the Garibaldi K platform.

- Height above the sea level: 62 meters;
- Installation year: 1992
- Distance to shore: 8.5 nautical miles.



Garibaldi C and K offshore platforms

Actors involved

- Italian Coast Guard/Ravenna Maritime Authority;
- ENI (OIM and local ENI DICS headquarters);
- SAIPEM;
- CASTALIA Soc. Consortile SPA , with SECOMAR depollution vessel;



- National Health Service personnel;
- Local authorities/Government Territorial Office – *informed*.

Means involved

- Three Coast Guard patrol boat;
- Three SAIPEM/ENI vessels, i.e. two supply vessels and one crew boat;
- One SECOMAR depollution vessel for oil containment and recovery;
- One Coast Guard helicopter for pollution monitoring and MEDEVAC.



M/V CP 300 + AW139 in operation

Duration of the exercise

The emergency exercise is expected to last about four hours, starting at 08.00 am on April 7th, 2017.

Emergency Demonstration schedule

- 08.00 – Participants will be board on a crew boat, made available by ENI.
- 09.00 – Beginning of the exercise: simulation of the oil spill and injury to the worker.
- 11.00 – End of the exercise: oil spill successfully contained and recovered. Return to shore of involved air and sea means.
- 12.00 – Return to shore of workshop participants.
Conclusions

Note. The emergency exercise may be suspended or cancelled by the Italian Coast Guard/Ravenna Maritime Authority in case of occurrence of a real event, requiring the immediate intervention of all actors involved in the demonstration. In addition, the exercise may be interrupted if safety conditions cannot be ensured.

Sponsored by:



Annex I. Participants to the workshop on External Emergency Response Planning (Ravenna, 5th-7th April 2017)

First Name	Last Name	Organization
Paolo Mario	Allara	Saipem SpA
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Rocco	Bruno	Italian Coast Guard
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Maria	Corradi	Industrial Europe
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Yuliyán	Gospodinov	Maritime Administration Executive Agency
Anna	Grabowska	State Mining Authority
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Jens	Hoffmark	International Association of Drilling Contractors
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Ketil	Karlsen	Industrial Europe
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Joerg	Koehli	EU Commission – Directorate-General for Energy
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Johannes Cornelis	Kool	Rijkswaterstaat sea and Delta - Ministry of Infrastructure and Environment (The Netherlands)
Jako	Križan	EDINA
Themistoclis	Kyriacou	Department of Labour Inspection (Cyprus)
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Angelo	Ligrone	ENI
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Jonathan	Milne	Offshore Petroleum Regulator for Environment and Decommissioning (UK Department of Business, Energy and Industrial Strategy)
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Hugh	Shaw	Secretary of State Representative - Maritime and Coast Guard Agency
Malek	Smaoui	REMPEC
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