



Global Initiative for West and Central Africa

Regional Workshop on Dispersant Use Policies in West and Central Africa

Science and Technology Policy Research Institute (STEPRI, CSIR), Accra, Ghana

22nd to 24th June 2011



Hosted by Interim Guinea Current Commission and the Guinea Current Large Marine Ecosystem Project (IGCC/GCLME)

NOTE

This document has been prepared within the framework of the Global Initiative for West and Central Africa as a contribution to the implementation of the biennial action envisaged for this Initiative. The designations employed and the presentation of the material in this document do not imply the expression of any opinion whatsoever on the part of the IMO or IPIECA concerning the legal status of any State, Territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

This document can be downloaded from www.giwacaf.org and for bibliographic purposes should be cited as follows:

IMO/IPIECA. 2011. Report on Regional Workshop on Dispersant Use policies in West and Central Africa. 24 pages.

Executive summary

Date: Accra, Ghana 22nd to 24th June 2011

Type: Regional

Organised by:

- Interim Guinea Current Commission and the Guinea Current Large Marine Ecosystem Project (IGCC/GCLME)
- International Maritime Organization (IMO)
- International Petroleum Industry Environmental Conservation Association (IPIECA)

Number of participants: 40

The principal objectives of the Workshop were to:

1. To present and discuss recent developments in dispersant use;
2. To present and discuss the results from specific dispersant-related research projects addressing the use of dispersant within the context of national policies; and
3. To examine the possibility of developing a regional policy for dispersants use and ways of harmonizing national policies to support it.

The participants of the meeting agreed on the following points:

1. **Rationale.** Delegates agree on the rationale behind the use of dispersants in the context of oil spill response which should account for the following considerations: NET ENVIRONMENTAL BENEFIT ANALYSIS (NEBA), Geographical location and timeliness;
2. **National Policy.** All countries should have a clear national policy describing the conditions of utilization of dispersants and also pre determine list of approved dispersants.
3. **Regional cooperation (1).** On international, regional and sub regional co-operation, information regarding national policies, stockpiles of dispersants and equipment availability shall be in the GI WACAF website for the use of member countries.
4. **Regional cooperation (2).** It is also being proposed that we (GI WACAF focal points) create a correspondent group (focal points, consultants) in order to explore the possibilities of having a Regional Approach particularly with regard to oil spill and approved dispersants.
5. **Regional cooperation (3).** Effort should be done toward the harmonization of the list of approved dispersants within the territorial waters of the region.

Table of Contents

INTRODUCTION	4
OBJECTIVES OF THE WORKSHOP.....	4
PROGRAMME OF THE WORKSHOP	5
LOCATION, DATES, ROLES AND PARTICIPANTS	5
OPENING CEREMONIE.....	6
SUMMARY OF PRESENTATION	ERROR! BOOKMARK NOT DEFINED.
<p><i>Marine Biodiversity Assessment and Outlook: West, Central and Southern Africa Region</i></p> <p><i>IGCC/GCLME project implementation report</i></p> <p><i>Introduction to oil spill response options & strategies</i></p> <p><i>Introduction to dispersant chemistry</i></p> <p><i>Capabilities and limitations of dispersants</i></p> <p><i>Behaviour and effects of dispersant & oil mixture in the environment</i></p> <p><i>Considerations for dispersant use (NEBA)</i></p> <p><i>Application and monitoring techniques</i></p> <p><i>Equipment and stockpiles available</i></p> <p><i>Deepwater Nigeria Oil Spill Mitigation/Response Plan & Capability</i></p> <p><i>Tabletop exercises</i></p> <p><i>Status of National Policy Planning in the Region</i></p> <p><i>National Approaches</i></p> <p><i>Examples of regional policies/guidelines on dispersant use</i></p>	
SUMMARY OF WORKING GROUPS	11
SUMMARY OF THE CLOSING CEREMONY	ERROR! BOOKMARK NOT DEFINED.
RECOMMENDATIONS OF THE WORKSHOP.....	12
CONCLUSIONS	12
ANNEX 1. PROGRAMME	13
ANNEX 2. LIST OF PARTICIPANTS.....	16
ANNEX 3. OPENING SPEECH OMI/IPIECA	21
ANNEX 4. OPENING SPEECH.....	ERROR! BOOKMARK NOT DEFINED.
ANNEX 5. SUPPORT DOCUMENT FOR THE WORKING GROUPS FOR THE NATIONAL ACTION PLAN.....	ERROR! BOOKMARK NOT DEFINED.
ANNEX 6. ASSESSMENT FORM	ERROR! BOOKMARK NOT DEFINED.
ANNEX 7. PICTURE	25

Introduction

The Global Initiative for West and Central Africa (GI WACAF) is a partnership between the International Maritime Organisation (IMO) and the International Petroleum Industry Environment Conservation Association (IPIECA) to enhance the capacity of countries to prepare for and respond to marine oil spills. A key innovative feature is emphasis the promotion of public/private partnership for effective oil spill response making use of existing industry expertise and resources.

The mission is to strengthen the national oil spill response capability in twenty two countries in West and Central Africa through the establishment of local partnership between the oil industries and the national authorities in charge of oil spill preparedness and response at national level.

This program is jointly funded by the International Maritime Organization (IMO) eight Oil Companies members (BP, Chevron, ENI, ExxonMobil, Marathon, PERENCO, Shell and Total) through the International Petroleum Environment Conservation Association (IPIECA).

The scope is to organise workshops, training, seminars and deployment exercises with national authorities in charge of oil spill response, in partnership with local business units.

The GI WACAF is based on an effective management system established six goals of preparedness and key performance indicators to enhance the capacity of countries to prepare for and respond to marine oil spills. These goals cover the requirements of the OPRC 90 convention:

Goal 1: Legislation: Promote the ratification of the relevant international Convention

Goal 2: Contingency plan: Have contingency plan for all the countries of the region

Goal 3: Designation of authority: Get clarity in roles and responsibilities for oil spill response

Goal 4: Regional agreement: promote exchange and mutual assistance for oil spill response

Goal 5: Training: Ensure that training and exercise are developed in each countries on a regular basis

Goal 6: National capabilities: support countries in developing their own national response system

Objectives of the workshop

The focus of the Workshop was on the use of dispersants in the context of oil spill response in the different countries. It provided an opportunity for those participating to gain a better understanding of the chemistry and effects of dispersants, methods of application, environmental considerations and how dispersants should be considered in relation to other response strategies. The workshop had the following specific objectives:

4. To present and discuss recent developments in dispersant use;
5. To present and discuss the results from specific dispersant-related research projects addressing the use of dispersant within the context of national policies; and
6. To examine the possibility of developing a regional policy for dispersants use and ways of harmonizing national policies to support it.

Programme of the workshop

The programme of this workshop was composed of a series of technical presentations, several tabletop exercises and roundtable discussions to examine the possibility of developing a regional policy for dispersants use and ways of harmonizing national policies to support it.

Cf. Annex 1 for the complete program.

Location, Dates, Roles and Participants

The workshop was organised under the auspices of the Global Initiative for West, Central and Southern Africa by the Interim Guinea Current Commission and the Guinea Current Large Marine Ecosystem Project (IGCC/GCLME) with the support of the International Maritime Organization (IMO), the United Nations Industrial Development Organization (UNIDO) and with the technical and financial support of IPIECA.

The experts in charge of the workshop were:

- Thomas Coolbaugh, GI WACAF Chairman, ExxonMobil
- François-Xavier Merlin, Consultant IMO/IPIECA
- Alun Lewis, Consultant IMO/IPIECA
- Andy Nicoll, Oil Spill Response
- Romain Chancerel, GI WACAF Project Manager

The Interim Guinea Current Commission and the Guinea Current Large Marine Ecosystem Project (IGCC/GCLME) took care of the general organisation and the host of delegates.

The workshop took place at the Science and Technology Policy Research Institute (STEPRI, CSIR)].

The total number of participants is 40, representing 16 countries in the GI WACAF region. The participant list is in Annex 2.

Opening Ceremony

Mr G. K. Scott, Chief Director, Ministry of Environment, Science and Technology opened the meeting and there was a welcome address by Dr Stephen Maxwell Donkor, Executive Secretary / Regional Coordinator, IGCC / GCLME. Opening addresses were made by Mr Romain Chancerel on behalf of IMO and by Mr. Thomas Coolbaugh and Mr. Andrew Nicoll, on behalf of IPIECA.

Cf. Annex 3: "Opening speeches"

Technical Sessions

Below is a summary of the presentations given during this workshop.

Marine Biodiversity Assessment and Outlook: West, Central and Southern Africa Region

Abou Bamba, Secretariat of the Abidjan Convention

The pressures, states, responses and outlook for the state of marine biodiversity in the sea areas of the region were described. Pressures include; nutrient loading, fisheries, port activities, an increasing sea surface temperature and offshore oil and gas E&P (exploration and production) activities. The Marine Trophic Index (MTI) is an indicator of the state of marine biodiversity and is low indicating that the fisheries are over-exploited, but could be rebuilding. The coastal areas are suffering erosion and retreat and there is physical destruction of some habitats. Minor oil pollution of the of Gulf of Guinea coasts, and partly along the Nigerian, Gabonese, Congolese and Angolan coasts, is frequently observed.

IGCC/GCLME Project implementation report

Steven Maxwell Donkor, Executive Secretary / Regional Coordinator IGCC

The key milestones of the IGCC / GCLME Project were described together with the objectives and strategy of the project. The five areas of the IGCC / GCLME Project are; Recovery of depleted fisheries, restoration of degraded habitats, reduction of land- and ship-based pollution, creation of an ecosystem-wide assessment and management framework and the establishment of viable regional consultative and coordination mechanisms. Progress on these individual topics was presented and Demonstration Projects described. The IGCC / GCLME Project has made great strides in implementing the planned activities.

Introduction to oil spill response options & strategies

Alun Lewis, Consultant IMO/IPIECA

Oil spills at sea can be the result of a variety of causes; incidents involving oil tankers have been the most frequent cause of oil spills in the past. The aim of any oil spill response strategy is to prevent or minimize the contact between a resource and the spilled oil. The behavior of spilled oil (spreading, drifting and "weathering" of spilled oil) and the prevailing conditions can limit the capabilities of the response strategies employed; (i) monitor and evaluate, (ii) containment and recovery, (iii) the use of dispersants, (iv) *in-situ* burning and (v) shoreline cleanup. The presentation concluded that damage caused by spilled oil can be most effectively minimized if spilled oil is responded to while still at sea.

Introduction to dispersant chemistry

Alun Lewis, Consultant IMO/IPIECA

Oil spill dispersants are one of the limited number of oil spill response strategies that have proved to be effective. The successful use of dispersants disperses the spilled oil as very small droplets into the upper layers of the water column. These droplets are then diluted to very low concentrations in the water column by the prevailing turbulence of the sea and the majority of the oil is subsequently biodegraded by naturally occurring micro-organisms. Dispersants greatly enhance the rate of natural dispersion and, if used rapidly enough, prevent the formation of water-in-oil emulsions that are persistent. The active ingredients in dispersants are surfactants that reduce the oil/ water interfacial tension that exists between oil and seawater.

Capabilities and limitations of dispersants

François-Xavier Merlin, Consultant IMO/IPIECA

Oil spill dispersants can disperse freshly spilled oils of low viscosity with a Pour Point below sea temperature, but are less effective on high viscosity oils or oils with a Pour Point that is higher than the sea temperature. As spilled oil “weathers”, the viscosity and Pour Point of the oil increases. Oils with a viscosity (at sea temperature) of below 5,000 cSt are generally easily dispersible, while oils with a viscosity above 10,000 cSt are unlikely to be successfully dispersed. There is a finite time period that begins when the oil is spilled onto the sea in which dispersant use is likely to be effective. This “time window” of dispersant use varies with oil type and prevailing seas conditions.

Behaviour and effects of dispersant & oil mixture in the environment

François-Xavier Merlin, Consultant IMO/IPIECA

Spilled oil on the sea surface drifts under the combined effects of wind and currents while oil dispersed into the sea moves with the current alone and is rapidly diluted into the water column. Dispersed oil in the water column has the potential to cause negative effects to marine organisms, but these are most pronounced when the dispersed oil is at relatively high concentration in the water. Recent experiments (the Discobiol project) have shown that various marine organisms (shrimp, sea bass, turbot and mullet) have shown that exposure to 50 and 70 ppm of dispersed oil in water for 24 hours can cause sub-lethal toxic effects, but the duration of exposure is much longer than that encountered during dispersant use at real oil spill incidents where dispersants have been used in a conventional way (i.e. sprayed onto spilled oil on the sea surface). The use of dispersants by sub-sea injection into escaping oil and gas, as was used at the *Deepwater Horizon* incident in the Gulf of Mexico was described.

Considerations for dispersant use (NEBA)

François-Xavier Merlin, Consultant IMO/IPIECA

The aim of using any oil spill response strategy is to reduce the amount of damage that would be caused by the spilled oil. The decision to use (or not use) dispersants needs to be taken on the basis of the sensitivity of resources to spilled oil on the sea surface or as dispersed oil in the water column. The use of dispersants is an appropriate response if the potential negative effects of dispersed oil on marine organisms are less than the potential benefit for a positive outcome on other resources by dispersing the spilled oil. NEBA (Net Environmental Benefit Analysis) is the process that is used to make decisions about dispersant use. The various resources at risk from the spilled oil need to be identified. The risks posed to marine organisms by dispersed oil in the water are greatest in shallow water; dispersion of oil in deeper water presents only a transient and localized risk. NEBA can therefore be considered on the basis of water depth and distance from particular resources.

Application and monitoring techniques

Andy Nicoll, OSR

The practical use of dispersants on spilled oil requires that certain pre-conditions are fulfilled; it must be likely that the use of dispersants will work (application of dispersant will take place within the “time window” of dispersant use and that appropriate approvals have been sought and granted. Dispersant can be sprayed from aircraft (fixed-wing and helicopters) and ships and each have advantages and disadvantages. There is a need to identify the areas of thickest oil to be sprayed, use a spray system that delivers the required amount of dispersant onto the spilled oil and a method of monitoring the effectiveness of dispersant use. Each of these factors requires specialist equipment and experience. Examples of dispersant use at the *Tasman Spirit*, *West Atlas* and *Deepwater Horizon* incidents were described and discussed.

Equipment and stockpiles available

Thomas Coolbaugh, GI WACAF Chairman, ExxonMobil

In order to mount an effective dispersant-spraying operation there must be sufficient dispersant and spraying equipment available that can be used within the “time window” of dispersant use. Stockpiles of dispersant are available in various locations throughout the world and these were described. Dispersants are available in various stockpiles held by oil companies in the WACAF area.

Deepwater Nigeria Oil Spill Mitigation/Response Plan & Capability

Mr. Adegboyega Olufemi Ogunkayode, Chevron Nigeria

The oil spill mitigation and response plan for the Agbami development were described. There are several potential vulnerable areas where risks must be minimised; the FPSO, the drilling and completion operations, the sub-sea wells, the export operations plus the associated utility and support vessels. Chevron Nigeria uses the tier concept to classify the response efforts that would be required to oil spill incidents of different sizes. The oil spill response structure was described and the equipment available for different aspects of response was presented.

Tabletop exercises

Alun Lewis, Consultant IMO/IPIECA

A series of tabletop exercises were presented for delegate participation. The exercises were simplified oil spill scenarios that illustrated the decisions that would need to be made about the use of dispersants as a response strategy. The aim of the tabletop was to stimulate discussion of the relevant issues amongst the delegates.

The delegates formed groups so that fruitful discussions on different aspects could be undertaken, Facilitators circulated amongst the groups, answering technical enquiries.

The slides supporting these exercises are available on request to the GI WACAF Project coordinator, Mr. Romain Chancerel: Romain.chancerel@ipieca.org.

Roundtable Discussions

Status of National Policy Planning in the Region

Mr François-Xavier Merlin presented a summary of the Criteria for Dispersant Policy Planning that highlighted topics presented in previous presentations, including:

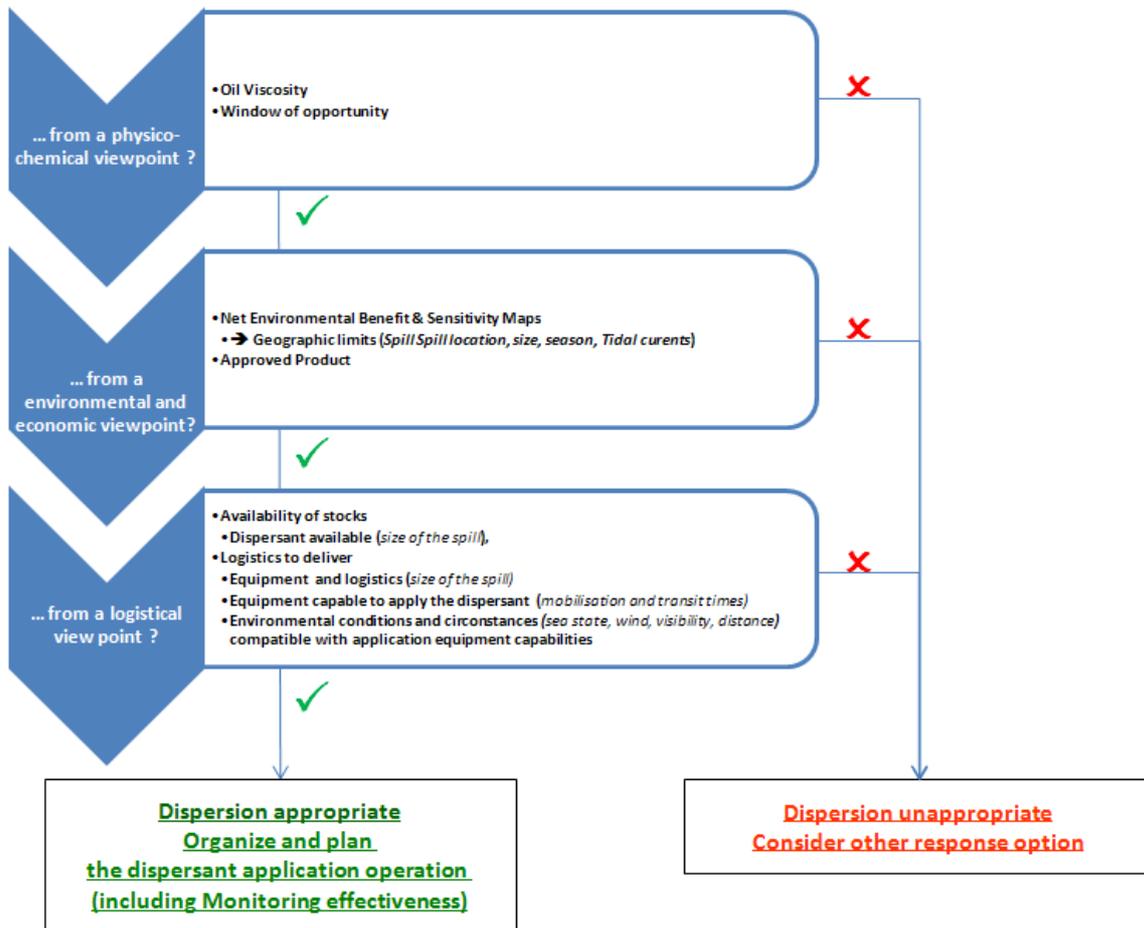
- Advantages and disadvantages of the use of dispersants
- NEBA for different ecosystems
- Significance of water depth
- Government approvals
- Decision checklist

Mr François-Xavier Merlin also presented on the decision-making process that should be used when considering dispersant use. The main questions are:

- Is dispersant use possible?
- Is dispersant use acceptable?
- Is dispersant use feasible?

A logical way of addressing these questions was presented in the following schematic form:

Dispersion feasible ...



National Approaches

A PowerPoint template to form the basis for further discussions had been sent to the representatives of 16 countries prior to the Workshop. Because of time constraints, it would not have been possible to have all of the 16 presentations of this topic presented at the Workshop and representatives from 4 countries; DR Congo, Nigeria, Angola and Ghana, were invited to present the approach to dispersant use in their countries at the Workshop.

DR Congo	Mr. Jean-Paul Mwamba Nyembo, Ministry of Environment
Nigeria	Mr. Idris Olubola MUSA, Director/ Head, Oil Spill Detection Dept. National Oil Spill Detection and Response Agency (NOSDRA)
Angola	Mrs Lia Francisco Dos Prazeres Neto Sousa, Instituto Nacional de Investigacao Pesqueira
Ghana	Mr. Ebenezer Fiahagbe Environmental Protection Agency

A national policy on dispersant use should include two major parts, with supporting regulations:

1. Dispersant use regulations

Defining where and when dispersants can be used and the level of prior permission required for their use. This is most commonly achieved by defining a water depth (for example, 10 or 20 metres) and a specified distance from the shore (for example, 1 nautical mile). Dispersant use on spilled oil in the deeper water and further from shore may be pre-approved (i.e. does not require specific permission from the relevant national authority), while dispersant use on spilled oil in the shallow water within the defined zone may require specific permission (which may not be granted on the basis of NEBA considerations) or be restricted.

2. Dispersant product approval regulations

A second set of regulations may define which dispersants will be approved for use in national waters. This may be on the basis of specific tests, or on the basis of inclusion on the approved dispersants lists of other countries such as France, the UK or the USA that conduct tests for relative toxicity and relative effectiveness of commercially-available dispersants.

The presentations from DR Congo, Nigeria, Angola and Ghana contained these essential elements and discussions showed that these are common themes in all the national policies that are being developed, or have been developed.

Examples of regional policies/guidelines on dispersant use

Alun Lewis, Consultant IMO/IPIECA

A regional approach to oil spill response where individual countries, initially through bilateral and trilateral agreements, but also extending to multi-country agreements, exists in several parts of the world. These regional approaches cover many aspects of oil spill response and sometimes include a harmonized approach to dispersant use regulations (based on water depth and distance from shore) and dispersant product approval regulations (defining which dispersants are approved for use). Examples described and discussed included the Bonn Agreement (between 10 countries around the North Sea), REMPEC (the countries around the Mediterranean Sea) and ROPME (Regional Organization for the Protection of the Marine Environment) representing countries around the Persian Gulf.

Summary of discussions

Group Discussion: Possibilities for harmonization of dispersant policies and regulations in the WACAF region

The tabletop exercises had generated a good discussion on the aspects of oil spill response in general and on the potential use of dispersants in particular. The characteristics of the coastal region are similar in several countries in the GI WACAF region and the resources at risk from the effects of oil pollution are also similar. Although the different countries have different stages of development of their individual National Oil Spill Contingency Plans (NOSCPs), with some countries having fully developed plans (including regulations regarding dispersants), other countries currently have less developed policies. It was agreed that producing divergent policies or regulations would hinder cooperation in the event of a major oil spill incident that could have trans-boundary implications.

Recommendations of the Workshop

At the conclusion of the Workshop, the participants agreed upon the following points:

1. **Rationale.** Delegates agree on the rationale behind the use of dispersants in the context of oil spill response which should account for the following considerations: NET ENVIRONMENTAL BENEFIT ANALYSIS (NEBA), Geographical location and timeliness;
2. **National Policy.** All countries should have a clear national policy describing the conditions of utilization of dispersants and also pre determine list of approved dispersants.
3. **Regional cooperation (1).** On international, regional and sub regional co-operation, information regarding national policies, stockpiles of dispersants and equipment availability shall be in the GI WACAF website for the use of member countries.
4. **Regional cooperation (2).** It is also being proposed that we (GI WACAF focal points) create a correspondent group (focal points, consultants) in order to explore the possibilities of having a Regional Approach particularly with regard to oil spill and approved dispersants.
5. **Regional cooperation (3).** Effort should be done toward the harmonization of the list of approved dispersants within the territorial waters of the region.

Conclusions

This workshop benefited from the participation of delegates from various Governmental departments from 16 countries and from the local oil industry. The use of oil spill dispersants was discussed in the context of it being just one of several oil spill response strategies having - like all oil spill response strategies - certain capabilities and limitations. Recognizing that all oil spill response strategies should be maintained and used where appropriate, the Workshop concluded that the use of dispersants has a place in oil spill response and those policies and regulations regarding dispersants could usefully be harmonized in the GI WACAF region.

Annex 1. Programme

DAY 1 - 22 June 2011	
08h00	Registration
Opening Ceremony	
08h30	Opening Ceremony : <ul style="list-style-type: none"> - Opening speech (IMO, IPIECA, GCLME) - Introduction to GI WACAF - Introduction to GCLME, BCLME and CCLME - Introduction to the purpose of the workshop
Technical Sessions	
09h30	Aspects of the marine environment in the region Abou Bamba
09h45	Risks of major oil spill incidents GCLME
10h00	Introduction to oil spill response options & strategies Alun Lewis, Consultant IMO/IPIECA
10h30	Introduction to dispersant chemistry Alun Lewis, Consultant IMO/IPIECA
11h15	Coffee Break
Technical Sessions (continued)	
11h30	Capabilities and limitations of dispersants François-Xavier Merlin, Consultant IMO/IPIECA
12h15	Behaviour and effects of dispersant & oil mixture in the environment François-Xavier Merlin, Consultant IMO/IPIECA
13h00	Lunch Break
Pre-use Considerations	
14h30	Considerations for dispersant use (NEBA) François-Xavier Merlin, Consultant IMO/IPIECA
15h15	Application and monitoring techniques Andy Nicoll, OSR
16h00	End of Day 1

DAY 2 - 23 June 2011

08h45 **Summary of Day 1**
Alun Lewis, Consultant IMO/IPIECA

Criteria for Policy Planning

09h00 **Criteria for National Policy Planning**
to be announced

09h45 **Equipment and stockpiles available**
Thomas Coolbaugh, GI WACAF Chairman, ExxonMobil

Case Study

10h30 **Case Studies**
To be announced

11h00 **Coffee Break**

11h15 **Case Studies (continued)**
To be announced

Tabletop Exercise

12h15 **Objectives of the exercise and set up**
Alun Lewis, Consultant IMO/IPIECA

13h00 **Lunch**

Tabletop Exercise (continued)

14h30 Alun Lewis, Consultant IMO/IPIECA

17h00 **End of Day 2**

DAY 3 - 24 June 2011	
08h45	Summary of Day 2 Alun Lewis, Consultant IMO/IPIECA
Roundtable – National Priorities	
09h00	Status of National Policy Planning in the Region François-Xavier Merlin, Consultant IMO/IPIECA
09h45	National Approaches <ul style="list-style-type: none"> - Objective: each delegates will be expected to give a short presentation on the national approach (5 slides max) - Discussion on the outcome of the presentations, to determine national needs and priorities
11h00	Coffee Break
Roundtable – National Priorities (continued)	
11h30	National Approaches (continued) <ul style="list-style-type: none"> - Discussion on the outcome of the presentations, determine national needs and priorities
13h00	Lunch Break
Roundtable – Regional Approach	
14h15	Examples of regional policies/guidelines on dispersant use Alun Lewis, Consultant IMO/IPIECA
14h45	Regional Approach Objective: discussion on a regional approach to possibly include elements such as: <ul style="list-style-type: none"> - common document/guidelines for the use of dispersant in the sub-region - common procedure to test the effect of dispersant on the environment - list of approved dispersants
15h30	Coffee Break
Closing of the Meeting	
15h45	Conclusion and Recommendations Alun Lewis and François-Xavier Merlin , Consultants IMO/IPIECA
16h30	Closing Ceremony GI WACAF, GCLME representatives
17h00	End of Day 3

Annex 2. List of participants

Title	Name	Job Title	Organization	Address	Country	Cell or telephone	e-mail
Mrs	Lia Francisco Dos Prazeres Neto Sousa	Research Assistant of Environmental Department	Instituto Nacional de Investigacao Pesqueira	Road Moitala Mohamed, Iha de Luanda Luanda	Angola	Tel: + 244 222 309731; Cell : + 244 923 608 610	liasousaneto@yahoo.com.br
Mr	Carvalho Constantino Alves De	Oil Spill Response Coordinator	Chevron - Cabgoc	77 Lenine Avenue - Luanda	Angola	Office : +224-222-692-600 ext 2019 Cell : +224-934-212-599	Acrv@chevron.com
Dr	GBAGUIDI A. N. Magloire	Researcher	Univ d'Abomey Calavy Benin, Ecole Polytechnique d'Abomey –	Calavi	Benin	Office: 00229 -941909 Tel : 00229 – 94241012	gbmag3@yahoo.fr
Mr	AOUDOU Joswa	Chef de Brigade des Inspections Environnementales	Ministère de l'Environnement et de la Protection de la Nature,	BP 320 Yaoundé Yaoundé,	Cameroun	Tel : 237 77263049 Fax : 237 2222 11 06	aoudoujoswa@yahoo.fr
Mr	Lucien Maloueki	Coordinateur PAN (GCLME)	Ministère de la Recherche Scientifique/DGRST	BP 1286 Centre de Recherche DGRST ex IRD Pointe-Noire,	Congo	242 066387870 Cell:24255344953	lumaloueki@yahoo.fr
Mr	Jean-Paul MWAMBA NYEMBO	National Director GCLME, Coordinator of PNU	Ministry of Environment	130 Av De La Gombe Kinshasa/Gombe B.P. 12348 KIN I	D.R. Congo	Office: +243997816451 cell : +24315161738	nyembordc@yahoo.fr
Mr	Patrick LAGRANGE	Health Safety & Environment Manager	PERENCO REP / MIOC	Nuanda,	DR Congo		plagrange@cd.perenco.com
Mr	Dzondo Bernard	Directeur General Adjoint	Soco Exploration et Production (Region Afrique)	BP 1790 Pointe – Noire,	Congo	Tel: 00242066567393 Cell: 00242066567393	bdzondo@soco-congo.com
Mr	Ange JVCS Akati Sembo	Manager	HSQ de la Société Pétrolière SOCIR	Immeuble BCDC 10eme bp 1478 kin Muanda,	RD Congo	el:+243995924461/+243819057173 Cell:+243819057173	ange.sakati@socir.com
Mr	TSHIMWANGA Kangulu Luc	Commissaire, Officer Marpol Nord Kivu	Office Congolais De Controle Nord Kivu MARPOL	18 jacaran das Cigoma Ville De Goma Nord – Kivu, DRC Kinshasa	DR Congo	Tel: 243 997542047	lutsumwanga@yahoo.fr

Regional Workshop on Dispersant Use Policies in West and Central Africa

Title	Name	Job Title	Organization	Address	Country	Cell or telephone	e-mail
Mr	NADONYAMO Sebutu Adrien	Point Focal Marpol OCC / RDC	Office congolais de Controle	AV. Bukavu 2535, Q. ville haute, C. Matadi (Bas Congo) Kinshasa	RD Congo	Tel : 00243-818469390 00243-998469390	nadosebad@yahoo.fr
Mr	Samuel Madragule Tanzi	Chef De Division /Environnement	Ministère Des Hydrocarbures/secrétariat General	Av. De La Justice, no. 239 Kinshasa-Gombe	D.R. Congo	Tel :243819071012 Cell: +243819077012	smaokm@yahoo.fr
Mr	Raymond Katambwe KABONGO	Marpol OCC- LAC Tanganyka	Office Congolais De contrôle	100. Av. Kivu, Uvira ,	RD Congo	Cell : +243998666777	katambweraymond@yahoo.fr
Mr	DIBI Niagne Martin	Assistant de Programme. Projet GEMCG	Ministère Environnement et du Developpement Durable	Abidjan- Cote D'Ivoire 20 B.P 650 Abidjan	Cote D'Ivoire	Tel : 225 20211183 Fax : 225 20211183 Cell : 225 02355846	dibmartino@yahoo.fr
Mr	Narcisse AMON	Resp. QSSE	Societe Ivoirienne De Raffinage	01 BP 1269 Abidjan 01 Abidjan-	Cote D'Ivoire	Tel:+225 21-23-73-36 Cell :+225 05-94-87-88	narcisse.amon@sir.ci
Mr	Nzang Nangue Juan De Dios	Jefe De Seccion De Aguas Y Costas	Ministerio De Pesca Y Medio Ambiente	C/Rosa Blanca S/N Malabo	Guinea Ecuatorial	Tel: +240222251896 Fax: + 240333094418	juandediosnzang@yahoo.es
Mr	Mamadu Abdulai-Saiku	Director of Academic Affairs	Regional Maritime University	P.O. Box GR 1115, Accra Home:No. 7 Bobo Stret, Tesano, Accra	Ghana	Tel: 0302712775 Fax: 0302712047 Cell: 0208179768	alsaiku@yahoo.com
Mr	Ebenezer Young Fiahagbe	Senior Programme Officer	E. P. A.	P. O. Box M 326 Accra	Ghana	Office : 030316469718	efiahagbe@epaghana.org
Mr	B. Alan Tackie	Safety Manager	Shell Ghana Limited	Shell House, P.O. Box 1097, Accra	Ghana	Tel:+233 21664636 ext 1113 Cell :+233 544330634	
Miss	Lilian Brew	Assistant Programme Officer	EPA	P. O. Box M 326 Accra	Ghana	Cell : 0244876954	nanaaba@yahoo.com
Captain	Catherine Haizel	Head of Department	Nautical Science Department Regional Maritime University	P. O Box 1115, Accra	Ghana	Office: 0302-712343 Fax: 0302- 712047	catherine.haizel@rmu.edu.gh
Mr	Ibrahima Ngaye CAMARA	Environnementaliste	M. Environnement Centre du Milieu Marin et des Zones Cotieres	BP 3118, Conakry	Republic of Guinée	Tel: 224-64209870 Cell: 224-62400398	ibrogaye@yahoo.fr
Mr	Octávio CABRAL	Direction Generale De L'Environnement		Avenida-Combatentes Da Liberdade De Patria; CAIXA POSTAL -399 Bissau	Guinee-Bissau	Tel:(00245) 673 22 89 / 528 86 76	Octavio_cabral@yahoo.com.br
Mr	Samuel W.D. WESLEY	Director. Department of Planning Focal Point for Oil Spill Contingency Planning in Liberia.	EPA	Monrovia	Liberia	Telephone:+ 231- 77037265	liberiaepagclme@yahoo.com swdw45@yahoo.com

Regional Workshop on Dispersant Use Policies in West and Central Africa

Title	Name	Job Title	Organization	Address	Country	Cell or telephone	e-mail
Mr	Idris Olubola MUSA	Director/ Head	Oil Spill Detection Dept. National Oil Spill Detection and Response Agency (NOSDRA)	5th Floor, NAIC House PMB 145 Garki, Abuja	Nigeria	Cell: 08033153547 Tel:+2344618693 Fax: +234 94618698	iomusa2003@yahoo.com
Mr.	Adegboyega (Olufemi Ogunkayode	Health Environment and Safety Supv. DW OFFSHORE- Agbami FPSO	Chevron Nigeria Limited	2, Chevron Drive, Off Lekki, Lagos	Nigeria	Office: 234-1-2772222/64276 Cell: 234-1-8055880774	ogad@chevron.com
Mr	Emmanuel Abayomi Olujonwo	Health, Environmental and Safety Manager	Chevron Nigeria LTD	2 Chevron Drive Lekki Lagos	Nigeria	Tel : 234 8039786003	oluj@chevron.com
Mr	Chibuzor Nnubia	General Manager	Clean Nigeria Associates Limited /Gte, of Nigeria.	Rooms 1 & 2, Fire Building, Kidney Island Shell Pet Dev. Co. LTD Porte-Harcourt	Nigeria	Tel:23484427883 Cell:2348033404705	chfnnubia@yahoo.com
Mr	Hussein Korede Olanrewaju	Asst. Manager, Spill Control & Pollution Prevention	Nig AGIP Oil Co. LTD,	P.O. Box 923, Mile 4, Ikwerre Road, Port- Harcourt,	Nigeria	Tel: 23484236400 Cell: 234 8037551316	olanrewaju.hussein@naoc.agip.it
Mr	Nnamdi Micheal Ahiamadu	Head, Environment Operations	Total Nigeria LTD.	Plot 25 Trans AMADI Industrial Layout, Port Harcourt	Nigeria	Tel: +2347034008901	nnamdi.ahiamadu@total.com
Miss	Maria Assumpta Ngozi Anabi	Environmental Officer	Total E & P DW-HSE (Total)	35 Kofo Abayomi Street, Victoria Island 4th Floor, Rm 418	Nigeria	Tel: +234 70602789036 Cell: 07062789036	assumngo@yahoo.com
Mrs	Ngozi Okeke	Director	KENDROS OIL	10, OKE-OLWOFBEOWO ST. Lagos Island Lagos	Nigeria	Tel : 2348034454113 Fax: 23418961160 Cell: 0803432977	kenrodsoilserv@yahoo.com
Mr	Olanrewaju Ajayi Oguntomole	Operations and Maintenance Manager	Clean Nigeria Associates Limited /Gte, of Nigeria.	Federal Lighter Terminal NPA Onne Port, Port Harcourt	Nigeria	Office: +234-7034574761 Cell: +234-07034574761	oguntla@yahoo.com, lanre.oguntomole@cnang.org
Mr	Manuel Fernandes De Ceita Vaz Do Rosario	(Pollution) Technique Da D.G. A Et Point Focal Projet GI-WACAF	Direction General de L'environnement	Aveni da Kuame Nkruma	Sao Tome	00239 99 11 266/9911266	manrosario2000@yahoo.com.br
Mr	KANU Abu Bakarr	Maritime safety supervisor	Sierra Leone Maritime Administration	Govt. Wharf Freetown	Sierra Leone	Office:+232-076-853-061 Cell: 00232 76 73 09 67	abubakarrkn@yahoo.com
Mr	SOULEMANE Abdel- Ganiou	Ingénieur Environnementaliste (point Focal GI-WAF)	Ministere de L'Environnement	247, rue des nimes, BP. 4025 Lome - Togo	Togo	Tel: +228 912 07 12/ 221 33 21 Fax:221 03 33/ 221 03 33	soule001@yahoo.fr

Regional Workshop on Dispersant Use Policies in West and Central Africa

Title	Name	Job Title	Organization	Address	Country	Cell or telephone	e-mail
Mr	Talbia Djotbayi	Expert Techniques Maritimes	SHELL	Route D'Aneho zone Industrielle BP 3283 Lome	Togo	Tel: +228-8135505/2237210 Cell: +228-8135505	Talbia.djotbayi@togosh.simis.com
Mr	Djeri Samari Essofa	Chef Section Lutte Contre la pollution	Port Autonome de Lome	BP 1225 Lome	Togo		essofadjerisamari@yahoo.fr
Dr	Moses Maurihungirire	Ecosystem Coordinator	BCLME	47 Feld Street, P.O. Box 40728- Windhoek	Namibia	Office:+264661246948 Fax: +26461246803 Cell:+264811293145	moses@benguelacc.org
Mr	Abou Bamba	Coordinator	UNEP/ Abidjan Convention	C/O UNDP, Ring Road			

Facilitators							
Title	Name	Job Title	Organization	Address	Country	Cell or telephone	e-mail
Mr	Alun Lewis	Independent Oil Spill Consultant		121 Laleham Road Staines, Middx, TW18 2EG,	UK	Phone / Fax: +44 (0)1784 469731	alun.lewis4@btinternet.com
Mr	Andrew Nicoll	Advocacy Manager	Oil Spill Response LTD (IPIECA)	OSR Lower William Street Southampton	UK	Office: +44(0) 2320331551 Fax: +44(0) 2380331972 Cell: +44-7919566538	andrewnicoll@oilspillresponse.com
Mr	Romain Laurent Chancelerel	GI WACAF Project Manager	International Petroleum Industry Environmental Conservation Association (IPIECA)	5th Floor, 209-215 Blackfriars Road London SE1 8NL London,	UK	Office: 00447738993689	romain.chancelerel@ipieca.org
Mr	Aaron Christopher Montgomery	West Africa Regional Representative	Oil Spill Response	OSR Lower William Street Southampton	UK	Tel: +44 2380331551 Fax: +44 2380 331 972	aaronmontgomery@oilresponse.com
Mr	François-Xavier Merlin	Head of Research and Development Department	CEDRE	715, rue Alain Colas 29218 Brest Cedex 2	France	Tel : (0) 298336706	francois.merlin@cedre.fr
Mr	Sébastien MORVAN	QHSE Advisor	PERENCO	23-25, rue Dumont-d'Urville 75116, Paris	France	Office : +33153576600 Cell : +33650753480	smorvan@fr.perenco.com
Mr	Thomas Smith Coolbaugh	GI WACAF Chairman	ExxonMobil (ExxonMobil Research & Engineering)	3225 Gallows Road 22037 Fairfax	USA	Office: 7038463371 Cell:2155184417	thomas.s.coolbaugh@exxonmobil.com

Regional Workshop on Dispersant Use Policies in West and Central Africa

Title	Name	Job Title	Organization	Address	Country	Cell or telephone	e-mail
Interpreters							
	Paul – Romeo Essessi	Traducteur/interprète	Makdoe Consult	P.O. Box KW 337 Kwabanya, Accra,	Ghana	Tel:024923292 Cell:0278585587	Parokess@yahoo.com
	Kossi Amegah- wovof	Interprète				Tel:00228 904-0956	Didier.sunny@gmail.com
	Paul Kofi Koranteng	Interprète	J&P Transcomput LTD	P.O. Box LG 464, Legon-Accra,	Ghana	Tel:0249939555 Fax:0302254385 Cell:0208205179	Paulkoranteng@yahoo.com
	Theophilus Seddoh	Interprète	J&P Transcomput LTD				Theophilusk2006@yahoo.com

Title	Name	Job Title	Organization	Address	Country	Cell or telephone	e-mail
Press							
Mr	Mohammed Alhassan Abu	Associate Editor	The Al-Haji Newspaper		Ghana	Tel:0302230461 Cell:0277727992	enewsafrika99@gmail.com
Mr	Augustus Newlove Acquaye	Assistant News Editor	GBC Radio		Ghana	Tel: 0302223012 Cell: 0243571215	a2newlove@yahoo.com
Mr	Ismael Barfi Gyebi Boateng	Senior Reporter	The Independent		Ghana	Tel:0208458921	Email:leintgh@yahoo.com

Title	Name	Job Title	Organization	Address	Country	Cell or telephone	e-mail
SECRETARIAT GCLME RCU/IGCC							
Dr.	Stephen Maxwell K Donkor	Regional Coordinator & Executive Secretary, Regional Coordination Unit	IGCC/GCLME Project		Ghana	Tel:233-302-781225 Fax:233-302-781226 Mob: 233-20-5255570	s.donkor@gmail.com OR s.donkor@unido.org
Dr.	Jacques Abe	Environment Scientist	IGCC/GCLME Project		Ghana	Tel:233-302-781225 Fax:233-302-781226 Mobile: 024-3630649	jacquesabe@yahoo.com
Mr	John Napoleon Gbolonyo	Administrative Officer	IGCC/GCLME Project		Ghana	Mob: 024-4524298	
Mr	Olu Sarr	Communications adviser	IGCC/GCLME Project		Ghana	Cell: 026-5650849	
Miss	Sylvia Osei Nsenkyire	National Programme Assistant	IGCC/GCLME Project		Ghana	Cell:024-4642858	
Mr	Yao Modenou	ICT Officer	IGCC/GCLME Project		Ghana	Cell:024-3557055	
Miss	Nana Afia Y. Arthur	Intern for Admin & Travels	IGCC/GCLME Project		Ghana	Cell: 026-4677727	
Mr	Socrates Apetorgbor	Junior Fisheries Officer	IGCC/GCLME Project		Ghana	Cell: 0242 677184	
Miss	Sena Kufogbe	Intern for translation	IGCC/GCLME Project		Ghana	024-3644956	
Miss	Alberta Aryee	Biodiversity Intern	IGCC/GCLME Project		Ghana	Cell: 027-5112752/ 0543-864074	
Mrs	Yvonne Botwe	General Intern	IGCC/GCLME Project		Ghana	Cell: 026-2640627, 024-4640627	
Miss	Aishatu Yakubu Lea	Communications Intern	IGCC/GCLME Project		Ghana	Cell: 020 6666010	

Annex 3. Opening speech

IMO/IPIECA Opening Speech, Regional Dispersant Workshop, Accra, Ghana, 22-24 June 2011

Mr. Romain Chancerel, GI WACAF Project Manager – IMO/IPIECA representative

Mr. Chief Director, Ministry of Environment, Science and Technology
Mr. Executive Secretary of the Interim Guinean Current Commission,
Distinguished Delegates,
Ladies and Gentlemen,

It is an honour for me to deliver this opening address on behalf of the International Maritime Organization (IMO) and IPIECA, the global oil and gas industry association for environmental and social issues, at this Regional workshop for the review of national dispersant policies in West, Central and Southern Africa.

I would like to briefly remind the roles of these organizations. IPIECA is the global oil and gas industry association for environmental and social issues. It was formed in 1974 following the launch of the United Nations Environment Programme (UNEP). IPIECA is involved in both the upstream and downstream oil and gas industry on environmental and social issues and its membership covers over half of the world's oil production.

The International Maritime Organization (IMO) is a specialized agency of the United Nations with a global mandate. The mission of IMO is to promote safe, secure, efficient, environmentally sound and sustainable shipping. This is pursued by adopting the highest practicable standards of maritime safety and security, and of prevention and control of pollution from ships.

Following the Exxon Valdez incident off the Alaskan coast, in 1989, the IMO member states developed the International Convention on Oil Pollution Preparedness, Response and Co-operation. The OPRC Convention, as it became known, was adopted in 1990 and entered into force in 1995. The OPRC Convention provided a global framework to facilitate international co-operation and mutual assistance in preparing for and responding to major oil pollution. It encourages States to develop and maintain an adequate preparedness and response capability simultaneously recognizing the importance of co-operation with the oil and shipping industries to deal with such emergencies. Coupled to this is the provision for the reimbursement of costs sustained by victims impacted by oil pollution damage. In this regard IMO has put in place international liability and compensation regimes to address this issue.

To support the implementation of these international conventions, IMO and IPIECA launched in 1996 the Global Initiative (GI) with the objective to support countries in strengthening their oil spill response capability and ensure the full implementation of these above mentioned international convention. The GI is active at various degrees in four regions of the world: Caspian and Black sea, the Mediterranean Sea, the Caribbean and West, Central and Southern Africa.

The Global Initiative for West, Central and Southern Africa, known as GI WACAF, was launched in April 2006. It is considered a flagship programme among the various GI regional initiatives put in place by IMO and IPIECA. The project is jointly funded by IMO and eight oil company members through IPIECA. Today, it covers 22 countries in West, Central and Southern Africa. Since its creation significant progress in improving oil spill response capability has been achieved.

For instance, from 2006 to 2011 more than 3,000 persons were trained through the delivery of some 55 workshops. From a results-based perspective the overall preparedness indicator has increased by 30% since 2006 and all six key performance indicators of preparedness have progressed. We celebrate this year the 15th Anniversary of the GI and the successful partnership between IMO and IPIECA.

GI WACAF Opening Speech, Regional Dispersant Workshop, Accra, Ghana, 22-24 June 2011

Opening address by Dr. Thomas Coolbaugh, Chairman of the GI WACAF Project

Honorable delegates
Ladies and Gentlemen,

As the past Chairman and a representative of the Global Initiative for West and Central Africa (GI WACAF Project), I would like to express my pleasure at being here today in Ghana.

I am extremely honoured and pleased to have the privilege to participate in this opening ceremony of the GI WACAF Regional Dispersant Workshop.

As you are aware, the GI WACAF Project is a partnership between the International Maritime Organization (IMO) and the International Petroleum Industry Environmental Conservation Association (IPIECA). The objective of this project is to enhance the oil spill response capability in west, central and South Africa through the development of public-private partnerships.

The GI WACAF Project is a part of a wider partnership between the IMO and the IPIECA called the "Global Initiative." Officially launched in Cape Town in 1996, the Global Initiative has the key innovative feature of promoting public-private partnerships for oil spill preparedness, response and cooperation and it is gratifying to see the progress that has been achieved over the last 15 years in different parts of the world.

It was based on this success that in April, 2006, the IMO and IPIECA launched the Global Initiative for West and Central Africa (GI WACAF) to highlight their efforts in the west and central African region and to strengthen their activities through a structured biennial project approach. Eight oil companies joined the project and continue to provide funding, together with the IMO.

This workshop is very important part of the GI WACAF project. Following the first years of the project, most countries in the region developed National Contingency Plans and strengthened their national capability for oil spill response. However, to be fully effective, these plans need to be regularly tested and evaluated to make sure they continue to meet the requirements of national policies. This workshop, with its focus on dispersants, will examine the possibility of developing a regional policy for their use and harmonizing national policies in support of it.

I have no doubt that the next few days will prove successful in providing each of you with the opportunity to gain an increased understanding of dispersants, especially with respect to their use and effects along with environmental considerations and how they may be viewed in relation to other oil spill response options. In fact, I am looking forward to taking part in the workshop as well and I look forward to having the chance to discuss the topic of dispersants with you.

Finally, I would like to take this opportunity to remind all participants that the next GI WACAF Regional Conference will be held this coming October in Lagos, Nigeria. The details are currently being finalized. I hope that it will provide an opportunity of a celebration for the 15 years of the Global Initiative.

Thank you for your kind attention.

PIECA Opening Speech, Regional Dispersant Workshop, Accra, Ghana, 22-24 June 2011

Mr. Andrew Nicoll – IPIECA representative

On behalf of the International Petroleum Industry Environmental Conservation Association (IPIECA) it gives me great pleasure to add my sincere thanks to our host- organisations and to welcome you all to this regional workshop on dispersant policy considerations.

The International Petroleum Industry Environmental Conservation Association (IPIECA) is, as you may be aware, the industry body which represents the environmental concerns of the international oil industry. IPIECA has working groups which deal with a wide range of issues including climate change, social responsibility, bio-diversity and oil spills and it is through the Oil Spill Working Group of IPIECA that the Global Initiative partnership with IMO has been established as the umbrella under which the GI-WACAF project properly sits. "GI" - the Global Initiative also stands for Government and Industry and a number of oil industry representatives are here this week in the spirit of "working together" which is the mantra which for 15 years has underpinned the ideals of the Global Initiative.

The Global Initiative for West and Central Africa (GI-WACAF) is underpinned by the "elements of preparedness" which are enshrined in the OPRC Convention. Having mechanisms and procedures in place to use (or not to use) a dispersant based response strategy is an important step towards building preparedness.

When considering the response to large oil spills, either from a maritime shipping accident or a loss of well control such as we witnessed in the Gulf of Mexico last year, then dispersants can be a most effective means to mitigate the worst environmental consequences of pollution, but perhaps more than any other response strategy, the need to have pre-planned for their use in advance of the accident is of critical importance. Time is of the essence when a spill happens and so if there are rational decisions about their use which we can take now then we will be better placed as a nation and as a region to respond appropriately and effectively should the time come to act.

This week we have an opportunity to consider both the implications of using dispersants but, just as importantly, the implications of NOT using them in respect of the prevailing circumstances, and to set the context for national and regional policy plans in this regard.

IPIECA members and their technical partners, including CEDRE, and Oil Spill Response will offer their experiences, objective views, advice and support to this process and I look forward to the forthcoming discussions over the coming three days.

My colleague Mr. Romain Chancerel and his associates within IMO and IPIECA have developed a comprehensive programme designed to maximise the opportunities of our time together. Today we have a number of technical sessions to set the context of dispersant use.

On Thursday we will learn of some case history uses of dispersant in the region and a scenario-based table-top exercise will help to further explore the rationale for use and for not using, according to the circumstances which prevail.

Regional Workshop on Dispersant Use Policies in West and Central Africa

Finally on Friday the focus is filling the gaps in our collective knowledge of dispersant pre-use considerations in each nation and, recognising that oil spills don't respect national boundaries, consider the opportunities which now exist to establish a regional approach to dispersant use.

We are fortunate indeed to have two of the world's most respected authorities experts in our midst, with considerable individual, and an enormous collective wealth of international experience in all aspects of dispersant response, practice and policy. I encourage you to make good use of them during our time together.

Finally, I wish us all well for a productive, informative and, I am sure enjoyable discussion which lie ahead.

Thank you

Pictures



Group picture on day 1 reassembling the delegates, experts and representatives from the industry



Delegates from the 16 countries as well as industry partners of the GCLME Region attended the workshop

Regional Workshop on Dispersant Use Policies in West and Central Africa



The experts for this meeting included (from left to right) Romain Chancerel (GI WACAF), François-Xavier Merlin, Andy Nicoll (Oil Spill Response), Jacques Abe (GCLME), Alun Lewis and Thomas Coolbaugh



Thomas Coolbaugh, Chairman of the GI WACAF delivered an opening address on day 1 on behalf of the GI WACAF and presented an industry perspective on the use of dispersants on day 3.



François-Xavier Merlin presented the effects of applying dispersants onto a sample of oil and water

More pictures available on:

www.facebook.com/pages/lgcc-gclme