



UNEP-PNUE

**CENTRE REGIONAL MEDITERRANEEN POUR L'INTERVENTION
D'URGENCE CONTRE LA POLLUTION MARINE ACCIDENTELLE
(REMPEC)**

MEDITERRANEAN ACTION PLAN (MAP)

**Technical Study Meeting
on the National Dispersant Use Policy**

**26-28 October 2009,
Ankara, Turkey**

R E P O R T

NOVEMBER 2009

EXECUTIVE SUMMARY

The Turkish Ministry of Environment and Forestry addressed a specific request of assistance to the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC) in June 2009. With the assistance of *Cedre*, and with the in-kind assistance of the Oil Spill Preparedness Regional Initiative (OSPRI) who provided technical support to the Meeting through Mr. Alun Lewis' participation, REMPEC organised with the Ministry of Environment and Forestry, the "Technical Study meeting on National Dispersant Policy Use", held in Ankara, Turkey between 26 and 28 October 2009.

The Meeting was aimed at assist the Turkish Authorities in deciding upon a national policy on the use of dispersants.

Thirty-one participants from various Turkish Government ministries, departments and institutions as well as from the private sector attended the Meeting. The Meeting reviewed, with the technical support provided by REMPEC, Cedre and OSPRI, the first draft regulation on the national dispersant use policy proposed by the Turkish competent authority. The meeting was concluded with a general round-table to draw the Meeting conclusions.

Further national consultations on the reviewed document are expected to take place prior to its approval.

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1. INTRODUCTION

According to the following national legal instruments in place, the Ministry of Environment and Forestry is responsible for the preparation of regional and national emergency and response plans:

- The Law, 5312 “Law related to Compensation of Actions and Damages in Emergency Cases of Pollution of Sea Environmental with oil and Other Hazardous Substances”; and
- its by-law “Application Regulation Related to Compensation of Actions And Damages in Emergency Cases of Pollution Of Sea Environment With Oil and Other hazardous Substances”.

Turkish seas are considered as “sensitive area” in the framework of the “International Convention for the Prevention of Pollution from Ships (MARPOL 73/78)” due to its high productivity, economic value, and ecological and biological resources.

The marine environment is exposed to the risk of the important maritime transport of oil and Hazardous and Noxious Substances (HNS) and also to the risk generated by activities carried out in Turkish coastal facilities.

Turkey is in the accession period to the European Union and has to transpose and implement all EU regulations related to marine and coastal pollution. In this respect, the Turkish legislation regarding the use of dispersants in case of accidental oil spills from maritime sources in the marine environment and at ports; are currently being studied to satisfy the EU and other international conventions requirements.

The Turkish Ministry of Environment and Forestry addressed a specific request of assistance to the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC) in June 2009. With the assistance of CEDRE, and with the in-kind assistance of the Oil Spill Preparedness Regional Initiative (OSPRI) who provided technical support to the Meeting through Mr. Alun Lewis’ participation, REMPEC organised with the Ministry of Environment and Forestry, the “Technical Study meeting on National Dispersant Policy Use”, held in Ankara, Turkey between 26 and 28 October 2009.

The Meeting was organised in the framework of REMPEC programme of activities for the biennium 2008-2009 and followed a National Workshop on Use of Dispersant organised by the Oil Spill Preparedness Regional Initiative (OSPRI) (Caspian Sea – Black Sea – Central Eurasia) between 15 and 17 April 2008 in Ankara, Turkey

This meeting took place at the Ministry Of Environment And Forestry, Söğütözü Cad. No: 14/E - ANKARA, 22nd floor, in the Meeting room No:1

2. MEETING OBJECTIVES

The objective of the Meeting was to initiate the definition of a National Policy regarding the use of oil spill dispersants in Turkish waters.

3. MEETING PROGRAMME

The Meeting programme, attached in **Annex I**, consisted in general presentations provided by the experts on relevant topics related to the use of dispersants and subsequent discussions between the attendees to address the technical issues related to the implementation of the National Policy of use of oil spill dispersants.

Several topics were considered during the meeting, in particular, oil spills response methods, comparison between the three national policies in Europe regarding dispersion (France, Norway and United Kingdom), dispersant use limitation in coastal water, dispersants approval procedures, dispersants application technologies, decision making process and the place of dispersants in the contingency planning.

In addition, Turkish representatives provided presentations on the Turkish National Emergency Response Plan and on the environmental sensitivity of Turkish waters,

4. LIST OF PARTICIPANTS

The list of the participants is reported in the **Annex II**.

5. MEETING ORGANISATION

The meeting was officially open by Mr. Sedat KADIOGLU, Deputy Undersecretary, of the Ministry of Environment and Forestry, Republic of Turkey.

The Meeting was chaired by the Ministry Of Environment of Turkey with the assistance of Mr. Francois Xavier Merlin from CEDRE, Mr. Alun Lewis made available by OSPRI, and Mr. Gabino Gonzalez from REMPEC.

The Meeting language was English with a simultaneous translation English-Turkish-English.

The different topics of the programme have been covered through general presentations which are listed in **Annex III**. Two presentations on the national regulatory and environmental conditions were made by Turkish representatives. Following each presentations, a discussion took place to address all aspects of the use of dispersants in Turkish waters.

The draft regulation the use of dispersant in Turkey was prepared by the Ministry of Environment and Forestry in view of facilitating the discussions. This draft regulation reproduced in **Annex IV** was presented to the meeting and discussed.

In addition, a technical paper was prepared by CEDRE in cooperation with REMPEC to assist the Turkish government in defining the policy. The “proposed outlines for the National Policy for the use of dispersants in Turkish waters” is aimed at completing the information provided and is reproduced in **Annex V**.

Both documents will serve as basis for the development of the National Contingency Plan regarding the use of dispersant.

The Meeting ended with a round-table where the participants brought-up their personal conclusions.

6. CONCLUSION

During the round-table, the following arguments were brought-up by the participants:

- This Meeting was considered as a good follow-up of the previous Training Course organised by OSPRI, in April 2008;
- The discussion on the draft regulation was appreciated and judged appropriate;
- The participants from the industry were satisfied by the meeting as the Ministry of Environment answered to most of their questions;
- The participants reached an informal agreement, as a first approach, on the general criteria for the geographical limitation for the use of dispersants: 1 Nautical mile from the shore and 20 meter depth. However, one participant raised his reserve on the use of dispersants in certain coastal areas;

- In this respect, the meeting concurred that scientists should be encouraged to participate more in the implementation of the final document, especially on the definition of the geographical limits;
- The discussions pointed out the advantage for Turkey to accept the dispersants already approved in one (or two) countries known to be well advanced in the oil spill dispersant technology (e.g. France, United Kingdom...), rather than developing a new specific Turkish approval procedure;
- The meeting also coincided on the location of the emergency stockpiles of dispersants which should be centralised close to the application means (e.g. harbours for the ships and airports for the aircrafts);
- The participants agreed in majority that one single decision maker should be defined to initiate the treatment operations. The Secretary of Maritime Affairs (UMA) was referred as the potential decision maker;
- At last but not the least, it was recognised that sanctions against the illegal uses of dispersant should be integrated in the future regulation;
- It was unanimously agreed that there was a need for additional national meetings to follow-up the work initiated in this meeting. These additional meetings should be devoted to discuss the finalisation of the regulation and to the implementation phase;
- The representative of the Ministry of Environment and Forestry concluded the meeting by providing details on the following actions to be undertaken in order to complete the regulation. Prior to submitting the text to the Prime Minister for adoption, the draft regulation will be reviewed by the Ministry of Environment and Forestry and will be disseminated to other Government Departments/Ministries and stakeholders for final comments. Once comments will be consolidated the Ministry would convey the relevant stakeholder to finalise and agree upon the final version of the regulation prior to focusing on its implementation.

The discussions among the participants and their interests on the draft regulation for the use of dispersants in Turkish waters which will be used as a basis for the completion of the final National Policy, showed a clear evidence that the Turkish audience has taken the matter in hand, indicating that an official regulation on dispersant should be completed in the near future.

ANNEX I

**Technical Study Meeting
on the National Dispersant Use Policy**

**26-28 October 2009,
Ankara, Turkey**

FINAL PROGRAMME

Day 1: 26 October 2009

09:00 - 09:30	Registration	
09:30 - 10:00	Opening speech by (MoEF) Introductions of participants Introductions of international experts	
10:00 - 10:30	<i>Coffee Break</i>	
10:30 - 10:45	Oil spills at sea <i>Activities that pose a risk of oil spills, oils that might be spilled, how spilled oils behave, effects and eventual fate of oil spills</i>	A. Lewis
10:45 - 11:00	Oil spill response methods <i>Response objectives, putting the use oil spill dispersants into the context of achieving oil spill response objectives. Capabilities and limitations of response methods</i>	A. Lewis
11:00 - 11:15	Introduction to the dispersants	A. Lewis
11:15 - 11:30	Introduction to the English, French and Norwegian System	F. Merlin
11:30 - 11:45	Effects of dispersion observed on case studies	A. Lewis
11:45 - 12:15	Introduction to : The Turkish legislation, The studies on the draft regulation The draft regulation	A. Sever E. Barış
12:15 - 13:15	<i>Lunch</i>	
13:15 - 15:00	Discussion on the dispersant use objectives	
15:00 - 15:15	<i>Coffee Break</i>	
15:15 - 15:30	Rational for limitations in coastal waters	F. Merlin
15:30 - 17:30	Discussion on the rational and criteria for implementing Turkish rules on dispersant	
17:30	End of Day 1	

Day 2: 27 October 2009

09:30-10:00	Introduction to the Turkish National Emergency Response Plan & Sensitivity of the Turkish waters	L. Tolun D. Ediger
10:00-10:15	Introduction to approval procedures (real measurement – laboratory measurement)	A. Lewis
10:15 - 10:30	<i>Coffee Break</i>	
10:30 - 12:00	Discussion on dispersant pre-approval procedure	
12:00 - 12:15	Introduction to application technologies and operational procedures	F. Merlin
12:15-13:15	<i>Lunch</i>	
13:30 - 15:15	Discussion on : Technologies for the use of oil dispersants Monitoring of dispersant effectiveness Stocking, maintenance and transportation of dispersants	
15:15 - 15:30	<i>Coffee Break</i>	
15:30 - 15:45	Introduction on Tiered approach, and Mutual Assistance	G. Gonzalez
15:45 - 17:30	Discussion on Planning of dispersant usage, Tier 1, 2, 3, Mutual Assistance	
17:30	End of Day 2	

Day 3: 28 October 2009

09:30 - 09:45	Introduction to the decision making process	F. Merlin
09:45 - 10:45	Discussion on Decision making on the use of dispersants	
10:45 - 11:00	<i>Coffee Break</i>	
11:00-12:30	Final discussions	
12:30 - 13:00	Conclusions and recommendations	
13:00	End of the Meeting	

ANNEX II

**Technical Study Meeting
on the National Dispersant Use Policy**

**26-28 October 2009,
Ankara, Turkey**

LIST OF PARTICIPANTS

Name	Title	Ministry / Dept. / Institution	Address	Tel	Fax	Email
Damla BAYKAL	Environmental Engineer	EPASA	Alparslan Türkes Cd. 31 Sk. 10 nolu bina Beştepe / ANKARA	+90 312 222 12 43 / 335	+90 312 222 16 61	damlabaykal@hotmail.com
Ayşe Esin BAŞKAN	Environmental Engineer	Turkish Coast Guard Command Plan & Principle Department	Sahil Güvenlik Komutanlığı Dikmen Cd. Merasim Sk. No:10 Bakanlıklar / ANKARA	+90 312 416 47 67		aebaskan@hotmail.com abaskan@sgk.tsk.tr
Hilal Burcu ÇALIŞIR	Chief Engineer of Marine Pollution Technologies	Directorate General of Coastal Safety	Meclisi Mebusan Cd. No:18 Kat:4 34433 Salıpazarı / İSTANBUL	+90 212 252 22 94 +90 532 577 10 68	+90 212 292 52 97	bcalisir@kegm.gov.tr burcu.calisir@kegm.gov.tr
Gönül SU	Chemical Engineer	Pro.Dir. of MOEF – İstanbul	Fatih Ormanı Kampüsü Maslak / İSTANBUL	+90 216 339 63 00 +90 533 427 01 86	+90 216 327 00 67	gsu@cevreorman.gov.tr
Leman YILMAZ	Industry Engineer	BOTAŞ	Botaş Petrol İşletmeleri Bölge Müdürlüğü Ceyhan / ADANA	+90 505 759 67 81	+90 322 639 24 80	lemanyilmaz@botas.gov.tr
Emin BARIŞ	Environment and Forestry Deputy Expert	MOEF / GDEM	T.C. Çevre ve Orman Bakanlığı Söğütözü Cd. No: 14/E 06560 Söğütözü / ANKARA	+90 312 207 66 34	+90 312 207 66 95	eminbaris@cevreorman.gov.tr eminbarismoef@gmail.com
Dr. Aydın YILDIRIM	Deputy General Director	MOEF /GDEM	T.C. Çevre ve Orman Bakanlığı Söğütözü Cd. No: 14/E 06560 Söğütözü / ANKARA	+90 312 207 65 34	+90 312 207 66 95	ayildirim@cevreorman.gov.tr
Veysel ASLAN	Head of Department	MOEF / GDEM	T.C. Çevre ve Orman Bakanlığı Söğütözü Cd. No: 14/E 06560 Söğütözü / ANKARA	+90 312 207 66 48	+90 312 207 66 95	vaslan@cevreorman.gov.tr
Afire SEVER	Deputy Section Manager	MOEF / GDEM	T.C. Çevre ve Orman Bakanlığı Söğütözü Cd. No: 14/E 06560 Söğütözü / ANKARA	+90 312 207 66 40	+90 312 207 66 95	afiresever@yahoo.com
Leyla TOLUN	Senior Researcher	TÜBİTAK - MAM	TÜBİTAK MAM Çevre Enstitüsü - Gebze	+90 262 677 29 44		leyla.tolun@mam.gov.tr
Aytaç ÇAM	Chemist	Pro. Dir. Of MoEF - Hatay	Hatay İl Çevre ve Orman Müdürlüğü Atatürk Cd. Stadyum Karşısı - HATAY	+90 326 225 16 44 +90 533 357 13 76		Kim.aytaccam@hotmail.com
Dilek EDİGER	Senior Researcher	TÜBİTAK MAM	TÜBİTAK MAM Çevre Enstitüsü - Gebze	+90 262 677 29 75 +90 539 202 04 34		Dilek.ediger@mam.gov.tr
Elif KÜÇÜK	Head Engineer	Turkish Petroleum Co.	2. Cad Söğütözü Mah. No:86	+90 312 207 25 79	+90 312 286 90 60	ekucuk@tpao.gov.tr
Abdulgafur BELİKTAY	Biologist	UMA	Denizcilik Müsteşarlığı GMK Bulvarı N.128/A Maltepe, Ankara / TURKEY	+90 532 715 91 80 +90 312 232 38 50 / 2529	+90 232 498 55 35	beliktay@gmail.com a.beliktay@denizcilik.gov.tr

Technical Study Meeting on the National Dispersant Use Policy, Ankara, Turkey, 26-28 October 2009

ANNEX II – Participants list

Page 2

Name	Title	Ministry / Dept. / Institution	Address	Tel	Fax	Email
Burcu Göknel KİYAN	Environmental Engineer	TÜPRAŞ İzmir Refinery	Tüpraş İzmir Rafinerisi Atatürk Mah. 35800 Aliağa – İzmir / TURKEY	+90 232 498 55 20 +90 505 525 10 93	+90 232 498 55 35	burcu.goknelkiyane@tupras.com.tr b_goknel@yahoo.com
K. Murat ONAT	Technical Safety Chief	TÜPRAŞ İzmit Refinery	Tüpraş İzmit Rafinerisi Körfez – Kocaeli / TURKEY	+90 262 316 35 36 +90 506 862 46 49		murat@tupras.com.tr
İbrahim Server SEVİL	HSE Superintendant	TÜPRAŞ General Management	Tüpraş Genel Merkez Körfez – Kocaeli / TURKEY	+90 262 316 37 96 +90 532 578 24 52		ibrahimserver.sevil@tupras.com.tr
Ahmet DAŞKIN	Deputy Expert	MoEF / GDEM	T.C. Çevre ve Orman Bakanlığı Söğütözü Cd. No: 14/E 06560 Söğütözü / ANKARA	+90 312 207 66 64	+90 312 207 66 95	adaskin@cevreorman.gov.tr daskinahmet@gmail.com
Ahu ÇEKİM	Deputy Expert	MoEF / Chemicals	T.C. Çevre ve Orman Bakanlığı Söğütözü Cd. No: 14/E 06560 Söğütözü / ANKARA	+90 312 207 52 77		acekim@cob.gov.tr
Eylem Özlem NALBANTOĞ LU	Deputy Expert	MoEF / Chemicals	T.C. Çevre ve Orman Bakanlığı Söğütözü Cd. No: 14/E 06560 Söğütözü / ANKARA	+90 312 207 52 51		eonalbantoglu@cob.gov.tr
Bernard CORNUT	Adviser at international relations	MoEF / DIAB	T.C. Çevre ve Orman Bakanlığı Söğütözü Cd. No: 14/E 06560 Söğütözü / ANKARA	+90 312 207 54 40		bernard.cornut@ademe.fr
Neslihan KİREMİTÇİ	Biologist	MoEF / GDEM	T.C. Çevre ve Orman Bakanlığı Söğütözü Cd. No: 14/E 06560 Söğütözü / ANKARA	+90 312 207 66 52		neslihankiramitci@yahoo.com
Alev PİRCİ	Food Engineer	MoEF / GDEM	T.C. Çevre ve Orman Bakanlığı Söğütözü Cd. No: 14/E 06560 Söğütözü / ANKARA	+90 312 207 66 44	+90 312 207 66 95	alevpirci@yahoo.com
Fatma Göçer KARAASLAN	Env. Engineer	MoEF / GDEM	T.C. Çevre ve Orman Bakanlığı Söğütözü Cd. No: 14/E 06560 Söğütözü / ANKARA	+90 312 207 66 43	+90 312 207 66 95	fatmakaraaslan@yahoo.com
Çiğdem Çep AĞIR	Env. Engineer	MoEF / GDEM	T.C. Çevre ve Orman Bakanlığı Söğütözü Cd. No: 14/E 06560 Söğütözü / ANKARA	+90 312 207 66 35	+90 312 207 66 95	ccep2000@yahoo.com
Banu Behram KURAN	Chemical Engineer	MoEF / GDEM	T.C. Çevre ve Orman Bakanlığı Söğütözü Cd. No: 14/E 06560 Söğütözü / ANKARA	+90 312 207 66 38	+90 312 207 66 95	behrambanu@yahoo.com
Serpil DURAK	Meteorological Engineer	MoEF / GDEM	T.C. Çevre ve Orman Bakanlığı Söğütözü Cd. No: 14/E 06560 Söğütözü / ANKARA	+90 312 207 61 91	+90 312 207 66 95	serpild@cevreorman.gov.tr
Fatma Telli KARAKOÇ	Senior Researcher	TUBİTAK MAM	Gebze – Kocaeli / TURKEY	+90 262 677 29 47	+90 262 641 23 09	fatmatellikarakoc@mam.gov.tr

Name	Title	Ministry / Dept. / Institution	Address	Tel	Fax	Email
Yrd. Doç. Dr. Nüket SİVRİ	Assist. Prof.	İstanbul Uni. Env. Engineering Department	İstanbul University – İstanbul / TURKEY	+90 212 473 70 70 / 17651 +90 532 486 75 66		sivrin@gmail.com nuket@istanbul.edu.tr
Alun LEWIS	Oil Spill Consultant			+441784469731		Alun.lewis4@btinternet.com
François Xavier MERLIN	Responsable Service Recherche Développement	CEDRE	CEDRE Rue Alain Colas B.P. 20 413 29604 - BREST CEDEX - (FRANCE)			francois.merlin@cedre.fr
Gabino GONZALEZ	Programme Officer	REMPEC	MARITIME HOUSE LASCARIS WHARF VALLETTA VLT 1921	+356 21 337 296 / 7 / 8	+356 21 339 951	ggonzalez@rempec.org

ANNEX III

**Technical Study Meeting
on the National Dispersant Use Policy**

**26-28 October 2009,
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LIST OF PRESENTATIONS DELIVERED DURING THE MEETING
(included in the CD-ROM)

1. Oil spills at sea.
2. Oil spill response method.
3. Introduction to dispersants.
4. Introduction to the English, French and Norwegian systems.
5. Effects of dispersion observed on cases studies.
6. Rational for limitations in coastal waters.
7. Introduction to approval procedures (real measurement – laboratory measurement).
8. Introduction to application technologies and operational procedures.
9. Introduction on tiered approach and mutual assistance.
10. Introduction to the decision making process.

ANNEX IV

**Technical Study Meeting
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**26-28 October 2009,
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**DRAFT REGULATION
REGARDING THE USE OF OIL SPILL DISPERSANTS IN TURKEY**

Articles	Proposed Regulations
<p>Amaç ve Kapsam, Dayanak, Tanımlar, Temel İlkeler, Genel Hükümler</p> <p>Scope, purpose, definitions, basic principles etc.</p>	<p>Purpose of this document is to regulate the dispersant usage as a response method during oil spills at sea. This regulation does not cover fresh waters.</p> <p>This regulation depends on Article 4/k of By-Law of 5312 Numbered “Law Pertaining to Principles of Emergency Response and Compensation for Damages in Pollution of Marine Environment by Oil and Other Harmful Substances” and Article 23/e of Water Pollution Control Regulation.</p>
<p>Dispersant Ön Onay Prosedürü</p> <p>Dispersant pre-approval procedure</p>	<p>Dispersants pre-approved all by England, France, Germany, Netherlands and Denmark can be used in Turkey without further testing.</p> <p>Or alternatively</p> <p>Efficiency, toxicity and biodegradability tests will be conducted by accredited labs. Limits not certain yet. Producers or distributors who apply for new product will have to provide those test results.</p> <p>Only dispersants pre-approved by The Ministry could be used in Turkey. Pre-approved dispersant list is given in annex-1. The Ministry replies the pre-approval applications by evaluating the results of accredited lab tests of new dispersants. Type 1 dispersants can't be pre-approved in Turkey.</p> <p>Criteria of pre approval for specific seas haven't been determined at the moment.</p>
<p>Dispersant Kullanımının Planlanması</p> <p>Planning of dispersant usage</p>	<p>Dispersant usage is a specific technique that is used for combating oil pollutions at sea. Deciding dispersant usage immediately or in emergency response plans requires a balanced strategy. Regional emergency response plans must include dispersant usage planning.</p> <p>The plans must include</p> <ul style="list-style-type: none">- evaluation of potential spill scenarios, risk and impacts,- Factors effecting oil behaviour (transported oil types, meteorological and oceanographic situation)- Significant ecosystem components and their sensitivity to oil pollution,- Physical and chemical properties of pre-approved dispersants,

	<ul style="list-style-type: none">- Results of Net Environmental Benefit Analysis (at planning stage) <p>Dispersibility of some known oil types must be listed. To prepare the list, some tests could be conducted and results collected in reports. These reports can include spraying suggestions, dispersant concentrations, quantity of treated oil and circumstances (salinity, temperature, etc.).</p> <p>Pre approved dispersants that could treat oil not more than %10 could be accepted for that specific oil type.</p> <p>Dispersant mapping must be added to emergency response system (plans).</p>
Dispersant Kullanım, şart ve sınırlamaları Dispersant usage requirements and limitations	<p>Coastal use prohibited Level 1 usage prohibited Usage forbidden except pre-approved products Distance from coast > 1 Nautical Mile Minimum depth > 20 meters Oil viscosity between 2000 – 5000 cSt Sea water temp > + 5°C Adequate and proper equipment required NEBA and authorised expert decision</p>
Önemli ekosistem bileşenleri ve bunların petrol kirliliğine karşı duyarlılıkları Significant ecosystem components and their sensitivity to oil pollution	<p>The dispersant maps must include</p> <ul style="list-style-type: none">- borders of depth of 20 meters and distance of 1 nm from shore,- significant ecosystem and economic components and their sensitivity to oil pollutions(for dispersed in water column and on surface).- Areas of allowance(after a NEBA) and prohibition (like fish hatcheries, facilities and water intakes)- Seasonal areas of allowance depending on tourism, bird passage and breeding periods.- Not only coastal, but also <p>More details and relative protection priorities of this components could be indicated by lists. This data could be used for NEBA and selecting response option.</p>
Net Çevresel Fayda Analizi Net environmental benefit analysis	<p>Decision of dispersant usage at polluted areas or areas under a risk of oil pollution could only be given by conducting a Net Environmental Benefit Analysis. If the result of NEBA indicates that not using dispersants will result in more serious biological and economical damage, dispersant usage decision can be given.</p>

	<p>NEBA at planning stage: To speed up decision making at an actual oil pollution, potential oil spill scenarios must be analysed and a pre-NEBA must be prepared for regions about possible response options.</p> <p>A NEBA must also be conducted during in case of an oil spill accident to decide whether to use dispersants as a response option or not.</p>
<p><i>Dispersant Kullanımına karar verme</i></p> <p>Decision making on the use of dispersants</p>	<p>It is better to aim collection or treatment of oil before coming to shore or sensitive areas to minimize environmental damage and reduce the costs of response operations. Primarily mechanical recovery will be chosen as a response option, provided that meteorological and oceanographic situation allows. As experiences show that 20% - 30% of spilled oil could be collected from sea surface by mechanical equipment, for big spillages, using mechanical recovery and dispersants at the same time but different places can be evaluated. NEBA must be conducted for this situation as well.</p> <p>An effective response option should be selected considering environmental factors, behaviour of spilled oil on surface, physical and chemical structure of oil, meteorological and oceanographic conditions (wind speed, sea and weather temperature).</p> <p>The decision maker must be an authorized personnel who works for Regional Emergency Response Centre and had been given “dispersant usage decision making education” to provide a quick and accurate decision.</p>
<p><i>Dispersant uygulama teknikleri</i></p> <p>Technologies for the use of oil dispersants</p>	<p>Dispersants must be sprayed by sea vessels, planes or helicopters which are installed with adequate equipment. Some standards of these equipments must be determined to provide spraying of uniform droplets to oil at surface.</p> <p>Usages of equipments out of these standards (like fire hose) are forbidden, to prevent low efficiency or even not working dispersants.</p> <p>Also guidelines should be prepared to explaining spraying techniques from ships or air vehicles.</p>
<p><i>Dispersant etkinliğinin izlenmesi</i></p> <p>Monitoring of dispersant effectiveness</p>	<p>Monitoring is necessary to determine the effectiveness dispersant application. Monitoring process includes both measuring sub-surface oil concentration and surface oil/emulsion properties.</p>

	<p>Monitoring can be limited to aerial observation in the initial stage of dispersant applications. This will be often enough, because successfully dispersed oil forms a easy to see orange-brown smoke under the sea surface. Sometimes this smoke may not be seen for successful dispersion and sub surface oil concentrations must also be measured.</p> <p>Dispersant application must be stopped when no smoke is formed and sub-surface sampling indicates that oil no longer respond to dispersants. Formation of white clouds under surface indicates ineffective dispersant application.</p>
<p>Dispersantın bulundurulması, saklanması ve taşınması</p> <p>Stocking, maintenance and transportation of dispersants</p>	<p>Coastal facilities have to declare quality and quantity of dispersants in stock or to be purchased to the Regional Emergency Response Centre. The RERC will keep inventory of all stocks of dispersants that coastal facilities have in the related region. It is prohibited to keep dispersants without the information of RERC.</p> <p>The dispersants must be kept in barrels or IBC containers as provided by producers. Dispersants are usually chemically stabile; they must be stored indoors protected from high temperature. Dispersants must not be stored in tanks with air vents, because that causes difficulties for spraying due to oxidation.</p> <p>Every three years, dispersant stocks must be checked for dispersion capability and against any other problems.</p> <p>Dispersants mustn't be mixed even if they are from the same manufacturer during transportation.</p>
<p>Diğer Hükümler</p> <p>Other provisions</p>	<p>-</p>
<p>Yaptırımlar</p> <p>Sanctions</p>	<p>Related sanctions of The Environmental Law numbered 2872 will be applied in case of violation of this regulation.</p>
<p>EKLER</p> <p>Annexes</p>	<ul style="list-style-type: none">- Pre-approved dispersants to be used in Turkey- Dispersion capacities of some known oil types- Using sea or aerial means of dispersant application

ANNEX V

**Technical Study Meeting
on the National Dispersant Use Policy**

**26-28 October 2009,
Ankara, Turkey**

**REFERENCE DOCUMENTS AND
USEFUL ADDRESSES AND CONTACTS**

A very large amount of literature has been published on all aspects of oil spill dispersants over the past 40 years. Several reviews and publications on specific aspects of oil spill dispersants have been written, including:

- 2009 - Marine and fisheries agency. Oil Spill Treatments Products Approved For Use in the United Kingdom, 12 August 2009.¹
- 2009 - Marine and fisheries agency. The approval and use of oil spill treatment products in the United Kingdom, Website Oil Spill Treatment Products Booklet revised August 2009.¹
- 2007 - Appendix A to WSL – Report LR 488 (OP) - Specification for oil spill dispersants.¹
- 2007 – ARPEL. Guideline for Use of Dispersant on Oil Spills.¹
- 2007 – EMSA. Inventory of national policies regarding the use of oil spill dispersants in the EU Member States.¹
- 2007 - ExxonMobil Research and Engineering and OSRL/EARL, Steen A., Findlay A. Frequency of Dispersant Use Worldwide.¹
- 2007 - U.S. Environmental Protection Agency. US Product approved in NCP.¹
- 2006 - Paper to Black Sea Commission AG ESAS. Briefing Paper and Questionnaire on Dispersant Use in the Black Sea region.¹
- 2006 – CEDRE. Using dispersants to treat oil slicks at sea, Response manual.¹
- 2006 – EMSA. Applicability of Oil Spill Dispersants.¹
- 2005 - Aurand, D. and G. Coelho (Editors). Cooperative Aquatic Toxicity Testing of Dispersed Oil and the “Chemical Response to Oil Spills: Ecological Effects Research Forum (CROSERF).” Ecosystem Management & Associates, Inc. Lusby, MD. Technical Report 07-03, 105 pages + Appendices Copies of this report can be obtained from: Ecosystem Management & Associates, Inc. website at: www.ecosystem-management.net
- 2005 – CEDRE. Using dispersant to treat oil slicks at sea Airborne and shipborne treatment response manual.
- 2005 – Abbasova A. and al. Evaluation of Dispersants for use in the Azerbaijan region of the Caspian Sea.¹
- 2005 - ITOPF (International Owners Oil Pollution Federation). The use of chemical dispersants to treat oil spills technical information paper No. 4.¹
- 2005 - National Research Council. Understanding Oil Spill Dispersants: Efficacy and Effects. Committee on Understanding Oil Spill Dispersants: Efficacy and Effects. ISBN: 0-309-09562-X, 396 pages, 6 x 9, paperback.¹
- 2004 – CCA. 20 Years NEBA TROPICS: NEBA of dispersed oil versus non-dispersed oil on coastal ecosystems & wildlife utilizing data derived from the 20-year tropics study.¹

¹ The pdf version of this document is available on the CD ROM.

- 2004 – UK Environment Agency - A guide to practices, procedures and methodologies following oil spill contamination incidents, UK. ¹
- 2004 – Law R.J. and Kelly C., The impact of the “Sea Empress” oil spill, in *Aquat. Living Resour.* 17, 389-394. ⁽²⁾
- 2001 – SINTEF and Lewis A. Oil Spill Dispersants. ¹
- 2001 - IPIECA International Petroleum Industry Environmental Conservation Association. Dispersants and their role in oil spill response, *2nd edition, November 2001.* ¹
- 2001 - American Petroleum Institute. Effects of Oil and Chemically Dispersed Oil in the Environment. Health and Environmental Sciences Department. API Publication Number 4693. Prepared under contract by: J.N. Boyd, J.H. Kucklick, D.K. Scholz, A.H. Walker, R.G. Pond and A. Bostrom. Scientific and Environmental Associates, Inc. Cape Charles, Virginia USA. ¹
- 2000 - IPIECA (International Petroleum Industry Environmental Conservation Association). Choosing spill response options to minimize damage. *E Net Environmental Benefit Analysis* available from <http://www.ipieca.org>.
- 1999 - American Petroleum Institute, Health and Environmental Sciences Department. A Decision-Maker's Guide to Dispersants, a Review of the Theory and Operational Requirements. API Publication Number 4692. Prepared under contract by: D.K. Scholz, J.H. Kucklick, R. Pond, A.H. Walker, A. Bostrom and D P. Fischbeck Scientific and Environmental Associates, Inc. Cape Charles, Virginia USA. ¹
- 1999 - American Petroleum Institute, Health and Environmental Sciences Department. Fate of Spilled Oil In Marine Waters: Where Does It Go? What Does It Do? How Do Dispersants Affect It? An Information Booklet for Decision-Makers. API Publication Number 4691. Prepared under contract by: D.K. Scholz, J.H. Kucklick, R. Pond, A.H. Walker, A. Bostrom and D P. Fischbeck Scientific and Environmental Associates, Inc. Cape Charles, Virginia USA. ¹
- 1998 – REMPEC. Guidelines for the use of dispersants for combating oil pollution at sea in the Mediterranean region. ¹
- 1997- American Petroleum Institute, Alun Lewis and Don Aurand. Putting Dispersants to Work: Overcoming Obstacles An Issue Paper Prepared for the 1997 International Oil Spill Conference.
- 1996 - Directorate of Fisheries Research, Kirby M.F., Matthiessen P. and Rycroft R.J. Procedures for the approval of oil spill treatments products, Fisheries Research Technical Report No. 102, Lowestoft. ¹
- 1995 – [IMO/UNEP Guidelines on Oil Spill Dispersant Application including Environmental Considerations.](#)
- 1989 - National Research Council, Marine Board. Using Oil Spill Dispersants on the Sea. Committee on Effectiveness of Oil Spill Dispersants, ISBN: 0-309-03889-8, 352 pages, 6 x 9, hardback.

The publications listed above contain many references;

Hundreds off scientific papers have been written concerning all aspects of oil spill dispersants have been published in proceedings of conferences, notably:

- The International Oil Spill Conferences held in North America every 2 years from 1969 until 2005 and then in 2008. A searchable database is available: <http://www.iosc.org/papers/search1.asp>. This has over 2,800 papers, abstracts, and proceedings in the archive. Papers accepted for publication by IOSC for conferences in 1995, 1997, 1999, 2001, 2003 and 2005 are included. Abstracts since 1969 are included as are the full texts of proceedings since IOSC 1995.
- The Arctic and Marine Oilspill Program (AMOP) Technical Seminars held in Canada annually from 1977 until the present.
- The Interspill conferences held in Europe every 3 years since 2000
- The SPILLCON conferences held in Australia in 2000, 2002, 2004 and 2007.

Papers on dispersants have been published in many journals including:

- Marine Pollution Bulletin
- Environmental Science & Technology
- Environmental Toxicology & Chemistry
- Ecotoxicology & Environmental Safety
- Journal of Environmental Engineering
- Spill Science and Technology Bulletin (published from 1998 until 2002)

The Louisiana Universities Marine Consortium (LUMCON) has established a searchable database of references specifically on oil spill dispersants. This database is on line at <http://www.lumcon.edu/library/dispersants> and consists of nearly 2,000 citations found in the journals and conference proceedings listed above, plus government reports and 'grey' literature on research related to oil spill dispersants from 1960 to June 2008.

ANNEX VI

**Technical Study Meeting
on the National Dispersant Use Policy**

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**PROPOSED OUTLINES FOR
THE NATIONAL POLICY FOR THE USE OF DISPERSANT
IN TURKISH WATERS**

1- Preamble

Chemical dispersion is one of the response options to combat the oil spillage. This technique is designed for the offshore situations and not for coastal situations. This technique has clear operational advantages however it requests some precautions; these points are developed in this document.

2 – Objectives of chemical dispersion

Chemical dispersion aims at minimize the impact of oil pollution

The use of dispersants at sea aims at reducing the amount of oil which would reach the coast, or environmentally or economically sensitive areas

The use of dispersant generate the scattering of the oil as dispersed form into the marine environment which is favourable to degradation processes (particularly biodegradation)

3- The dispersion process

Applied onto oil slicks, dispersants tend to reduce the interfacial tension between the water and the oil and allow the natural mixing generated by the waves to split the oil into a myriad of tiny droplets suspended in the water column: the oil is dispersed. Then turbulences and streams disseminate this dispersed oil into the marine environment

4- Role of the dispersant response option in the combating strategy

At sea there are different response options: recovery possibly associated with confining, chemical dispersion, in situ burning (applicable mainly in Arctic region), monitor and wait for action –ref: IMO manual).

In the decision making process, each of these options considered alone and/or combined should be examined in a comparative way.

Chemical dispersion is generally not compatible with the other responses options (especially the confining and recovery); however, in the same case of pollution, the suse of chemical dispersion simultaneously with other response options can be considered on different locations.

5- Advantages and disadvantages

5-1 Advantages

Dispersant can be generally used in more difficult situations (wind and sea state) than the other response options, (e.g.; confining and recovery)

Dispersion does not produce wastes to be disposed.

When dispersed the pollutant is no longer drifted by the wind, and then follow the stream; therefore, when carried out upwind sensitive areas, dispersion contributes to reduce the amount of pollutant which would drift towards these locations.

Dispersants help in reducing the contamination (oiling) of some resources sensitive to the floating oil (surface slick), e.g. mammals and birds

Dispersion enhances the (bio) degradation of the oil in the marine environment.

5-2 Disadvantages

Dispersed oil is more toxic than the undispersed oil and leads to a local increase of the pollutant toxicity for a lot of marine resources; in fact, dispersion enhances the contact (or the bio-availability) of the oil with these resources living in the upper layer of the sea (mainly the photic zone); therefore the chemical dispersion is not possible in any circumstances.

Dispersant are not efficient towards all oil pollutants, especially those which presents a high viscosity.

On significant pollution, chemical dispersion is not applicable in too calm sea state (sea state 0, 1 possibly 2 according to the situation).

Chemical pollution is not compatible with other responses options, e.g.; confining and recovery.

6- Recommendations for the use of dispersants

6-1 Recommendation for the use of dispersants

Taking into account that dispersants can be efficient only during the beginning of the oil release, it is of utmost importance that the decision to sue or not to use dispersant can be taken very quickly, without loose of time in assessment and discussions.

The speed of decision depends on a close preparation in which decision criteria will have been first studied from the physico-chemical, environmental and logistical viewpoints.

6-1-1 Oil dispersible and not dispersible

The effectiveness of chemical dispersion depends on the nature of the pollutant; the viscosity of the pollutant at ambient temperature constitutes one of the most important factors.

Chemical dispersion is usually possible for the pollutants not exceeding a viscosity of 5000 cSt; (with some exceptions, in particular in the case of hydrocarbons containing strong contents paraffin).

Beyond 5000 cSt the chances of success decrease quickly; dispersion is not adapted for the pollutants having a viscosity of 10.000 cSt and more.

The viscosity of an oil pollutant increase with the time in the environment, under the effect of ageing (evaporation, emulsification), its dispersibility decreases with time: in general, an oil pollutant is dispersible only during a certain time - we speak about "window opportunity for dispersion".

To have an idea of the viscosity of an oil pollutant, and/or its "window opportunity for dispersion", certain data-processing models designed to estimate the evolution of a pollutant according to its nature and the environmental conditions can be used (model of ageing).

When the pollutant has a significant viscosity, the more agitated is the environment (state of sea), the higher are the chances for dispersion.

Taking into account the specificities of the oils produced / transported in Turkish waters, the oil "X", "Y" etc...can be dispersed for X to Y hours; these products have been studied / modelised to define their window of opportunity for dispersion ... cf document : study X, Y, Z.....

6-1-2 Location where the chemical dispersion can be undertaken

The toxicity of the dispersed oil can affect marine fauna and flora, hence chemical dispersion is not applicable everywhere.

Chemical dispersion is not generally adapted on or in the immediate vicinity of the ecologically vulnerable or sensitive areas and in areas where the possibilities of renewal and mixing of water do not offer conditions for rapid dilution of the dispersed oil.

The definition of the areas where chemical dispersion can be reasonably undertaken is a relatively complex and long process since it must take into account different local environmental parameters and data (current, biological diversity...). Such task would be hardly carried out during a pollution. Areas where chemical dispersion can be reasonably undertaken from an environment point of view should be pre-established and geo-localised: geographical limits for the use of the dispersants.

The choice of these areas should be based on studies of scenarios which aim at comparing the evolutions and the environmental and socio-economic impacts of the pollutant of dispersed and non-dispersed oil (reference to the concept of “NEBA” Net environmental benefit analysis – IMO/UNEP Guidelines). These studies of scenarios would take into account all local specificities; type of ecological and socio-economic resources, national parks and the halieutics resources, currents, seasons - climate variations and migrations of the marine species of interest....

The geographical limits have been defined for increasing spill scenarios, corresponding to pollution situation of Tiers 1, Tiers 2 and Tiers 3 (ex : 1-10 t, 10-100 t, 100 – 1000 t or more)

The charts of the limits are integrated in the contingency plan. They assist persons in charge of the response to decide without delay to disperse or not, (to decide as long as the pollutant is still dispersible).

These charts are regularly updated by a working group made up of who is also in charge of defining and studying the scenarios.

6-1-3 Logistique for dispersant application

Logistics required for the application of dispersant include the spraying systems, the products, and other related items.

These products and means required are listed in the contingency plan (location, quantities, characteristics, compatibility, availability, operational limit conditions and deployment timeframe) such as:

- operational stocks of dispersant,
- ship spraying systems,
- Vessel-mounted spraying systems
- Aerial spraying aircraft
- Facilities from where means would be deployed (airports, ports...).
- And eventually:
- Aerial surveillance aircrafts aim at following, and guiding the operations,
- Communication mean,
- Transport means,....

The plan includes information (characteristic, performances, requirements, and conditions of availability) related to national means but also to regional or international mean which are likely to be mobilized.

The plan provides details on the persons in charge of the various means.

6-1-4 The decision making process

The decision at the time of the accident is led through 3 questions:

- Q1) is dispersion a priori possible or not from a physicochemical point of view? : is the viscosity of the pollutant compatible with dispersion? This question refers to the recommendations put forth in § 6-1-1.
- Q2) dispersion is it acceptable from an environmental point of view? Is the pollution located in an area where a priori dispersion is possible? This question refers to the recommendation mentioned in § 6-1-2.
- Q3) Is dispersion feasible from a logistic point of view? : are the means available (product and spraying equipment) a priori available and sufficiently mobile to conduct the operation within the time limit (period when chemical dispersion remains effective)?

The decisional criteria related to these questions are specified in the contingency plan. This question refers to the recommendations mentioned in § 6-1

The decision falls within the competence of the authority XXX support by

6-2 Selection of dispersants products

The dispersant used in the area of competence of Turkey must exclusively products accepted (approved) by the authorities.

The Turkish authorities set up / refer to an evaluation and control procedure of the dispersant. This procedure is based initially on the test of the effectiveness, the toxicity and the intrinsic biodegradability of the dispersant. The products having satisfied the criteria of approval are registered on a list of approved products at the national level. This list is constantly revised.

In the event of pollution concerning the neighbouring countries, the decisions related to and the application of dispersant will take into account the existence of bilateral agreement with the neighbouring country(ies). These agreements would eventually refer to the dispersants approved by the related country(ies), the availability of means, the integration in the Turkish response system of response capacities of the related country(ies).

In the event of major pollution, requiring international means (Tier 3), dispersants can then be products which will have been examined at least from the point of view of their effectiveness and their intrinsic toxicity and which is accepted in two of the countries listed hereafter: EUA, GB, F, NR,

The diagram acceptance of the products is under the responsibility of

The approval procedure is under the responsibility off

The approval procedure is under the responsibility of

6-3 Choice of application equipment

The equipment used for the application of the dispersants is specialised material or material converted for this purpose.

The equipment ensures a regular spraying and distribution of the dispersant (diameter of the drops, rate of application).

The equipment is regularly maintenance and is tested periodically through exercises.

The choice of the application equipment is under the responsibility of

6-4 Logistic related to dispersion application

A dispersant operation requires a complete logistics; in addition to the spraying equipment, it is necessary to envisage the means carrying this equipment (ships, helicopters and planes), the required consumable (in particular fuel), adapted facilities (port, airport) as well as other related provisions (ex. means of transport of the material or products).

Reciprocal compatibilities of the equipment and materials deployed must be checked in order to guarantee the reliability of the whole logistic chain (e.g.: compatibility of the spraying systems with the ships, compatibility of planes or helicopters with the local facilities...).

Operational stocks of dispersant:

In order to ensure prompt dispersion application, dispersant stocks must be set up. These stocks should be quickly deployed or localised near to the spraying systems. They must be also dimensioned to enable a day of dispersion with the spraying system available. Regarding the Vessel-mounted spraying systems, stocks should be located preferentially in the ports where the vessels are located. Concerning the aerial spraying aircraft, stocks should preferably be available at the airport.

The dispersants of the operational stocks are checked periodically (physicochemical parameters, effectiveness....) to check their good conservation.

An inventory of stocks of dispersant and spraying system should be kept up-to-date by the authority in charge. The inventory takes into account stocks of the countries or entities with which bilateral agreements or agreements of assistance exist as well as the industry capacities.

At the national level, the dispersion stockpile and the application equipment are under the responsibility of.....

7- Application procedures

7-1 On location dispersion efficiency test and dispersion monitoring

The weathering degree of the oil is generally unknown; therefore the dispersibility of the pollutant remains uncertain when start the treatment and further;

For this reason, any treatment operation should begin with careful observation of the treatment effect (e.g.; visual observation to look for brown plume under the sea surface corresponding to dispersed oil). It is necessary to carry out start the treatment with a test praying run in order to decide whether to continue or to stop the dispersant application.

The decision to use dispersant is under the responsibility of ... , with the assistance of

7-2 Dispersion application procedure

Success of an operation is based on the respect of treatment procedures. The treatment should be conducted:

- On the thick parts of the slick (colour brown to black) without taking into consideration the thinnest parts (iridescence, shine...),
- In a systematic way, taking into account the wind

(Reference appendix 6 – operational procedures from IMO / UNEP recommendations on dispersant application).

As often as possible, treatment means (especially ships) are guided during the spraying operation by a spotter aircraft which indicates the slick zone where the dispersant application must be targeted. When necessary, these parts to be treated can be marked out with buoys or smoke canisters.

As often as possible, the treatment is monitored in order to assess its efficiency; such a monitoring can be carried out by taking water samples on the treated slick before and after treatment for oil concentrations measurement, or by aerial photographs or teledetection (e.g.; IR) to assess the amount of oil remaining on sea surface (reduction of the slicks due to the dispersion process). This monitoring can be useful to justify the decision to use dispersant and to claim for compensation.

The monitoring of the efficiency of dispersants is under the responsibility of

7-3 Involvements on fisheries activities

The dispersion of significant amount of oil can impact some environmental resources as fisheries (e.g. tainting of sea food following contact with oil droplets). For sanitary reason and to justify afterward claims for compensation it is useful to monitor water column quality which may have been in contact with oil as well as the quality of the sea food;

The monitoring of the effects of dispersant use is under the responsibility of

8 Precautions and operational recommendations

8-1 Drills

Drills are organized periodically to validate the combating procedures, to train the operators and to check the capability of the contingency plan and of the combating equipment to respond to a pollution situation.

Drills are managed byand involve the following partners.....

8-2 Training

Persons in charge of running the treatment equipment are specifically trained.

8-3 Protection of persons and equipment

Persons in charge of the spraying operations are protected against mist of dispersant (respiratory protection / mask, protective impermeable clothes, gloves...).

Solid surfaces (especially ship decks) which may receive sprays of dispersant are flushed with water to avoid being slippery for people.

Materials and equipment in contact with dispersant are flushed with water to avoid any deterioration (of paint, rubber seals...).

9- Role of the different stakeholders and objectives of the different working groups

Dispersant approval procedure
Definition of the geographical areas where dispersant can and cannot be used Definition and study of scenario
Decision for the use of dispersant
Equipment management
Dispersant stockpile management
In charge of the application
In charge of the environmental monitoring related the dispersant use
In case of large operation, who is in charge of the coordination with foreign actors (neighbouring countries, equipment cooperatives....)

10 Operational organisation

Spraying system:

Availability and time required for its deployment,

Compatibility (dimensions, fixations, certifications) with the transport means (vessel, helicopter, and aircraft).

Dispersants

Availability, quantity, characteristics, location of the products

Logistic and time required for the deployment onsite

Transport means

Availability, time required for their deployment

Feeding requirement in particular fuel (Type of fuel required)

Compatibility of facilities (ex length and resistance track...).