EUROPEAN UNION'S ROLE CONCERNING OIL SPILL

Hussein Valizadeh
Private Law Department, Electronic Branch of the Islamic Azad University, Iran
E-mail: **Hussein.valizadeh1975@gmail.com**

ABSTRACT: *Oil pollution is by itself considered as one of the major reasons for water pollution. Deposition of oil and its byproducts leads to significant pollution. Due to being liquid, this matter disperses readily in water and land and imposes many injuries to the environment. Tapping underground resources such as mines and oil fields requires extreme accuracy and skill. If these operations are conducted without plan and monitoring and presence of experts, they will impose irreparable damages onto the environment. Thus, the European Union started to codify its preliminary regulations for the environment with the slogan of "the environment does not recognize boundaries". In its Sixth Action Environment Program (EAP), this union underlined the development of preservation and support of sea ecology with the final goal of "improving durable use of seas and marine ecosystems". According to this program, major damages that threaten seas and marine ecosystems, involve annihilation and destruction of a variety of different habitats, commercial fishery, and seafaring and also physical destruction of settlements due to dredging and proceedings conducted with the aim of removing sea oil pollutions. In general, different institutions of the European Union are trying by ratifying their bylaws, instructions, decisions, and recommendations to step forward toward stable development in specific time span.*

Keywords: *oil spill, European Union, Sixth Environment Action Program, Marine Strategies*

1. INTRODUCTION

If we consider water pollution as the change in soluble or suspending matters or as changing temperature or other physical, chemical, or biological properties of water, oil and its derivatives are considered one of the most important water-polluting factors that change water's physical and chemical properties and by entering the water, they render this vital liquid harmful or non-useful [1].

According to studies conducted by the American Academy of Sciences, it was determined that annually an average of 3 million and 100 thousand tons of oil enter world waters, and half of them are resulted from oil conveying pipes. When they arrive at beaches, oil pollutions impose more problems onto humans and the environment. In the vicinity of coasts, the amount and dangers of oil pollutions of the water is much higher [2,3].

Establishment of platforms in marine districts and drilling as well as extraction of oil by these platforms, oil leakage from conveying pipes passing across seas and damages that are exerted on oil tankers can be considered among the major reasons of oil pollution for waters. This type of pollution will have the effect of endangering the natural cycle of life for marine animals. This variation in biological cycle leads to change in human life. Thus, international-level players such as international organizations and some governments are trying to prevent dispersion of environmental pollutions by adopting specific policies and schemes. In this paper, oil pollutions caused in waters and role of the European Union against these pollutions are intended [4].

Given the importance of regional organizations in the world and their valuable role in advancing environmental goals, the EU can be mentioned as one international regional organization with the highest degree of coordination and possession of uniform environmental regulations. Thus, with an increasing and progressing trend, this organization has had considerable attempts to create balance between international rules and solve legal problems regarding the environment [5].

It has been attempted in this paper to consider marine methods and strategies of the EU against sea pollutions and especially oil pollution of seas. Thus, before investigating EU's role in dealing with oil pollutions, we discuss the major reasons of oil pollutions and the effects of this type of pollution on the environment and then consider EU's role in controlling oil pollutions in sea [6].

1 Status of oil waters oil pollution

Emergence of physical and chemical changes in water under the influence of oil leakage in water is called water oil pollution. Unfortunately in recent decades, world's seas have been used by man as a burial place for pollutants, especially oil ones. The issue of environment pollution has received special attention since the establishment of World Sailing Organization (one of the specialized organizations affiliated with the United Nations). Due to being observable, this type of pollution readily catches the attention of public media. Most people learn about the occurrence of incidents that lead to oil pollution in water with a short time difference either directly or through images broadcast on TV and in newspapers

Currently, world scale of oil pollutions is decreasing compared to past decades. In 1970s about 3 million barrels of oil used to pour into seas annually. But this value has almost decreased down to 2 million barrels in 1990. Results recorded from 1970 have addressed reports regarding over 100 thousand oil leakage cases. Data obtained over 1995-1999 show 500 incidental oil leakages with a total volume of some 14 million barrels of oil in the Persian Gulf. The pollution caused by this amount of oil materials in the Persian Gulf is estimated to be about 86% of the world's total oil pollution [5,6].

As stated, the establishment of platforms situated in marine regions as well as drilling and extraction of oil by these platforms, leakage of the oil passing through conveyor

pipes down the sea, damages and overturn of tanker ships, washing of tankers' loading containers, and watering these containers to keep oil balance in the way back to oil field are among major causes of oil pollution of waters.

Other reasons of oil leakage in water is presence of maintenance ponds (places for periodical maintenance of oil tankers are intended), pollution caused in sea terminals by burnt and exuded oils, crash of oil tankers, crash of other drifting vehicles, and emission of fuel materials out of their fuel tanks and presence of coastal refineries.

There are various ways to remove oil pollution in sea waters including burning of the oil drifting on water, collecting the drifting oil albeit to a limited extent, collecting the oil deposited in shores and its natural way i.e. deposition and degradation by bacteria in different substrates of water. This needs a considerable time. However, presence of huge layers of oil deposited in water lead disorder in the lives of marine aquaculture as well as photosynthesis of sea plants.

2 Destructive effects of oil leakage in seas

As stated above, oil deposition in sea from ships, oil wells, coastal facilities, etc. lead to many environmental and economic losses. Results of studies regarding the fate of seas' oil pollution and the self-refining trend of seas show that evaporated light oil materials and aromatic materials transform, to some extent, into solutions and heavy combinations come to coasts as tar balls or deposit on seabed and other complexes are mixed with seawater as floating particles. A small fraction of these combinations are washed by bacteria and other creatures. Thus, toxicity of oil reduces gradually as the time pass and physical and chemical changes applied on it decrease but oil pollution of seas influence destructively plant/animal communities and ecosystem of seas. In this regard, major damages are imposed on fish of oil-polluted seas, thus affecting economy of region [7].

Many factors are effective in the amount of damages caused by oil. Such factors as oil leaked into water, type of oil that led to water pollution, climate conditions, and geographical coordinates of the incident location as well as time of incident (season and time range of the incident) have direct influence on the amount of damages exerted on water.

The evolution process of oil pollution in sea is as follows: when oil materials are poured into waters, under the effect of dominating winds, temperature, and water's turning direction, its physical and chemical properties change. Volatile materials are separated from oil at 30-40 degrees centigrade and the rest starts to move as a floating blot on water along its movement direction. Thus, when pollution is of light carbohydrates type, most of it will evaporate. Generally, the oil's fate when leaked out into the sea is as follows:

Evaporation of volatile materials: Until becoming a thin layer, its volatile materials are evaporated. Evaporation extent depends on temperature, wind, and pressure of vaporization. Oil composites boiling point of which is below 200 °C evaporate within a few hours and oil composites boiling point of which is below 270 °C take a couple of days to evaporate.

Solution of a fraction of oil composites in water: some oil composites which have small molecules, especially cyclic composites such as benzene and xylene are dissolved in water. Even a small fraction of these material, if solved, are very harmful to marine creatures and lead to the demise of sea organisms [8].

- Oxidization of a fraction by sun irradiation: radiation of sun's UV rays on oil materials, which are polarized, lead to their oxidization.
- Biological degradation of oil materials: presence of microorganisms in seawater has the result that some of these microorganisms use oil materials as food sources. Therefore, by secreting enzymes, they wash and absorb oil molecules and in parallel to this operation, the population of these microorganisms grow in seawater.
- Deposition: in some districts where dust is abundant and it settles on water surface, this dust mixes with oil materials under the influence of climate conditions and makes its specific weight heavier than water (1.024 g/mL) and settles with water flows on the seabed.
- Water emulsion in oil materials: when the amount of oil leakage is high, water drops infiltrate oil material and oil's viscosity becomes more than that of its pure mode and waves lead to fragmentation of this type of emulsion and big pieces of oil materials come to water surface.
- Natural dispersion: sea waves turn oil pieces into smaller pieces in sizes of 1-1000μm and these pieces come to water surface and with tide flows, these pieces go beneath water. The extent of natural dispersion big oil blots is between 0.5 and 2 percent per hour.
- Descent of different types of industrial sewages especially oil and its byproducts and leftover poisons, besides polluting seawater, have endangered the life of sea organisms. Presence of oil leftovers in water after natural dispersion persists for some 30 years, and this relatively long duration affects the lives of almost all biological variants associated with water such as seabirds and fish. It's here that a need is felt for presence of a solid and definite regulation and its enforcement in all countries.

3 Approaches to fighting oil pollution

In current circumstances, preventing oil pollution of waters is one of the most important environmental issues and the most important concern of countries. Since 100 years ago many attempts have been made to take effective steps by ratifying different conventions to protect the environment. Each of them, however, have had weaknesses, as shown obviously later on. Also, formation of such organizations as International Marine Organization (IMO) and damage

compensation committees on sea have tried to preserve sea environments. Among major such conventions the convention of United Nations 1982, London Convention to prevent oil pollution on sea surface 1954, London Convention to prevent pollution caused by ships and MARPOL International Convention to prevent pollution of seas and rivers could be mentioned [6 - 8].

Besides MARPOL Convention, Kuwait Regional Convention was established in 1978 for cooperation regarding support and development of marine environment and Persian Gulf shores against pollution in which seven countries took part and it became known with acronym ROPME. In our country, the bill for protecting seas and border rivers from oil pollution was ratified on February 7, 2008 under number No. 31856 by state cabinet and sent to respective authorities. In this bill, fines have been considered for those who pollute waters.

Regarding solid waste materials, according to the Environment Protection Organization, waste material management regulations ratified on May 11, 2004 must be abided by. Regarding hygienic sewages of ports, these sewages must be treated before entering the sea in urban treatment plants in order to achieve the standard extent recommended by the Iranian Environment Protection Organization in order to be discharged in surface waters. Ships' hygienic sewages must also be treated aboard and then be disposed of into the sea. Regarding oil pollution, according to MARPOL Convention, oil tanker ships must have International Oil Pollution Prevention Certificate and also at some seaports, Oil Spillage Contingency Plan (OSCP) has to be present.

In MARPOL Convention the goals for oil spillage contingency plan have been mentioned as follows:

- To minimize environmental pollution
- To minimize human injuries in coastal residential areas
- To preserve sensitive environmental regions such as mangrove forests and coral coasts and spawning areas for aquatic creatures.
- To preserve economic districts such as fishery and commercial ports
- To preserve industrial areas such as water-sweetening facilities, oil facilities and power plants

In fighting pollution, presence of a competent team equipped with instruments and facilities of fighting pollution is necessary. Thus, by holding planned maneuvers, this team keeps its preparation against emergency conditions.

OSCP plan must include importance of type 1 to 3, and given the amount of oil leakage, this is determined to be 3 degrees. Popular methods of removing oil pollution from seas is as follows:

Recycling oil products mechanically:

It is believed that using mechanical tools to recycle oil blots from sea surface is very useful but this method involves certain constrains and it is that using floating buoys during wind and wave flows loses its efficiency and typically a small fraction of oil blots can be recycled so that if the speed of blots' movement is beyond 0.5 m/s, collection of oil blots is minimized. Employing skimmers with different types have practices in mechanical recycling and sometimes using a simple pump can be effective. The amount of recycling done by skimmers and the amount of reserve tanker storage for recycled materials are major restrictions for this method. The efficiency of mechanical recycling depends on the situation of oil blots [9].

Leaving oil blots until they arrive at the shore:

Leaving oil blots along water movement direction until it arrives at the shore and then cleaning shores off oil pollutions are monitored, and they are prevented from entering sensitive areas. Using satellites to monitor oil blots has now become very common. This method is not efficient for oil ports because limitations of port area does not allow this. If oil spillages are caused far from shore and due to the damages exerted on oil conveying pipes or collision of oil tankers, this method can be used, and it would be possible to practice according to the direction of oil blots. Furthermore, movement direction must be directed toward shores that are uninhabited and no economic and industrial usages are made and after oil blot's reaching to shores, cleaning could be conducted. Cleaning shores requires many human resources, materials and equipment. Also, oil materials collected also have to be disposed of appropriately.

Abandoning oil blots so that they are destroyed naturally:

This method is used in marine pipelines or upon collision of floating tankers in the middle of sea. In this approach, the movement of oil blots is monitored frequently and the approach is conducted using pre-determined models. Upon deviation from the supposed model, using other methods oil blots are prevented from entering sensitive areas.

Using chemicals

Today, using chemicals in fighting against oil pollution of waters has become very popular. The role of these materials in removing pollution is in the way that such a chemical breaks up oil blots on water surface and turns them into smaller particles. These particles infiltrate down the water and become diluted and then are consumed by microorganisms present within the water and degraded and finally destroyed. Thus, environmental and economic damages are prevented. In using dispersants more care must be taken because these materials themselves cause toxicity for aquatic creatures. Concentration of these materials and also the type used must have already been studied. Also, using these materials requires permission from respective organizations must be acquired. For instance, in the Persian Gulf region or ROPME, those dispersants must be used that are authorized on permission list for this area [10].

Therefore, making decision regarding whether to use these materials or not requires specific expertise and such experts must justify this topic to the pollution-fighting team in the OSCP plan.

4-**European Union and oil pollution**

Having been introduced to issues related to waters oil pollution, effects of this type of pollution and approaches for removing them, we consider how EU deals with this issue.

Over the last 30 years, the environmental policies of the Europe was promoted from limited technical proceedings to a complete set of broad environmental practices. These proceedings have noticed different environmental issues, be it climate changes or sustainable development or oil pollutions of waters and believe that environmental standards cause innovation in this regard. In fact, as part of the world, the EU has progressed in concert with global changes in terms of environmental evolutions. Since seventies, i.e. when European community, which is now known as the European Union, started to originate its preliminary environmental regulations, "the environment does not recognize boundaries" was Europe's motto. Clear goals of this union regarding environmental issues shows political convergence between members.

So far, this union has codified over 200 practicable regulatory texts regarding legal topics of the environment. In the Sixth European Action Program, development, preservation, and support of marine environment with the final aim of promoting sustainable consumption of seas and marine ecosystems have been explicitly confirmed by this organization [8].

According to this program, the main damages that threaten seas and marine ecosystems, annihilation and destruction of different varieties of habitats, commercial fishing, and sailing as well as physical destruction of habitats are due to dredging and practices that are performed with the aim of removing water's oil pollutions.

This program includes all environmental and essential goals based on evaluating environmental evolutions, which lead to promotion of environmental approaches in all commission policies. Marine strategies of the Commission for Europe are moving toward sustainable development. This pervasive goal is practiced by conducting those goals that have a certain time range for achieving a desirable outcome. Achieving this goal requires access to an integrated approach where all threats and evaluations are considered accurately and by considering the amount of their negative effects on the environment, more serious threats are determined.

To achieve this goal, the EU considers regional variety in ecological practices of sea and its subareas, their quality, pressures and threats exerted on seas, political, social, and economic position in different regions and international organization arrangements active in connection with seas. Aims in EU policies are propounded and ratified according to specific treaties and regulations along with regional marine conventions. These aims have, in many cases, political value and are intensely considered as the infrastructure of subsequent aims. Their practice is toward needs fulfilment and reduction of negative effects on the environment. For instance, the Commission for Europe has defined its goal for stopping dangerous materials from entering the nature and environment as follows: "reducing emission, dispersion and of damage exerted on the environment by concentrating dangerous materials in those parts of the environment that have weaker values compared to other parts of the sea and minimizing the emission of synthetic and manmade materials to the environment." They expressed their final goal as halting the entry of any kind of harmful material to marine environment.

In preparation of oil-pollution-reducing programs, EU always considers important topics, among major ones of which are considering coastal and integrated areas and management of water ponds and rivers, principle of precaution, principle of paying compensation (i.e. polluter has to pay), principle of clean production, quick prediction and reaction, evaluating environmental effects, environmental evaluation, special taxes, cost policies, and paying attention to agreements and pacts associated with the environment [11].

Strategy adopted by the European Union for protecting marine environment

Given threats that oceans and seas are facing, in this strategy the EU is seeking an equal method to protect marine environment.

In May 2002 the EU put forward a proposed plan and stressed that the strategy had to be executed by May 2005. Council for Europe ratified adoption of this method in Mars 2003 and accepted the outlines and important tips and goals that were propounded in this approach as an appropriate foundation for developing marine strategy of the future Europe. The commission had been asked to propose a final strategy by the end of 2005, and major emphasis of the Commission for Europe involved cooperation of all countries with the EU and mutual cooperation of all beneficiary groups. The commission became committed to keep on creating work groups and workshops with all beneficiaries. This practice is done in order for the Council of Europe to attract authorities' cooperation for improving environmental conditions of European seas so that it can, in this way, get the best benefit from their contributions. Based on the Council's decisions, solutions have been provided through the European parliament that involve creation of a uniform and integrated approach with long-term goals in terms of quality, quantity, timing, conducting specific activities, evaluation of negative impacts exerted on the environment as preliminary and valuable stages, subsidization and engaging beneficiary groups in planning affairs.

Operating pollution fighting schemes by the European Union

To make operative the plans, EU seeks to increase and facilitate cooperation with regional marine conventions with the purpose of preventing many of redundant actions and interventions, improvement and facilitation of cooperation with affiliated members, both national and international member states, countries that have joint this plan, neighbor countries, and beneficiary organizations and

groups. Since marine strategy has to be based on a process consistent with all European seas and to have potential for further development, some recommendations were propounded by the Commission for Europe, which are considered among the main elements of this process, including the following: having a set of coherent and clear goals, creating and conducting mechanisms for effective cooperation, instructions to improve management and having qualitative goals, obtaining an integrated approach for refinery and evaluation, creating at least two targeted sample projects in regional scale, having a complete set of indexes and scales, adjusting and balancing all subjects associated with protecting and supporting the environment. Here, we consider proceedings of the European Union as an example of EU in fighting seas' oil pollution [7].

EU practices regarding control of oil pollutions of the Mediterranean Sea

Pollution of the environment caused by land activities in the Mediterranean Sea is very serious. Some 30% of international marine trade is performed directly with 300 ports located at the Mediterranean Sea or passes across the Mediterranean Sea. Thus, marine pollutions caused by ships have increased due to the inefficiency of international requirements and standards. Discharge of oil leftovers, harmful liquid materials, ships' sewage and leftovers into seawater is one of critical sources of pollution in the Mediterranean Sea.

To reduce pollution in this sea some proceedings have been done in national scale such as design and implementation of projects associated with providing facilities for ships and helping member states in facing present issues in the way of ratifying and obligating international conventions associated with marine pollutions, but many of these countries are not capable of dealing with their environmental issues alone. Therefore, regional cooperation and mutual help seems quite necessary. So, to speed up and enforce these activities, mutual and multilateral cooperation and assistance have to be planned and organized. In 1972 Mediterranean countries devised a protocol entitled "legal framework for regional activities in order to prevent marine incidents" and they managed to create "Regional European Center for Preventing Marine Pollutions".

Among essential goals of this center are promoting regional and mutual national cooperation to prepare countries for facing marine oil pollutions through creation of organizational structures and planning for fighting occurrence of pollutions. This center has also embarked on training people and educating them with the purpose of pollution control, preparing instructions, and manuals.

Finally, after years of endeavor to protect the environment of European seas including the Mediterranean, the Commission for Europe managed in 2005 to offer an instruction entitled "an instruction for developing designed approaches to access appropriate environmental circumstances in marine environment until 2021". This instruction that comprises of 25 articles includes all European seas and the Mediterranean Sea.

As stated, one of the main elements to create a strategy to improve European seas is to create instructions for improving conditions of European seas. In parallel with the aims of this instruction, appropriate environmental conditions when considering the structure, performance and water-forming ecosystems, physiologic factors, geographic and climate factors, and also chemical and physical circumstances caused by human activities were specified.

This instruction is practicable for all European seawaters and it covers from origin line, where the amount of area waters is measured, to regions under dominance of member states and includes seabed and seabed soils and beneath seabed.

Sea regions, subject to the agency instruction, includes Baltic Sea, North-east Atlantic Ocean, and the Mediterranean Sea. The Mediterranean region covers western Mediterranean Sea, waters under authority of Spain, France, and Italy, Adriatic Sea, waters governed by Italy and Slovenia, Ionian Sea, seawaters governed by Greece, Italy and Malt and Levantine Sea governed by Greece and Cyprus. Audience for this instruction are EU member and European Parliament member countries, and in the Council for Europe, Council Presidency [12].

Arrangements considered for this instruction involve marine strategies, cooperation, specifying national custodies, specifying appropriate environmental conditions, specifying environmental goals, specifying monitoring plans and programs, specifying practical plans, securing information and updating them as well as mid-term reports, communication and general counseling, and finally commission reporting.

Each member state must prepare an appropriate strategy with respect to its marine region in accordance with practical plans offered in this instruction. The first step taken by member states is to do a preliminary evaluation on environmental conditions of intended waters as well as the effect of human activities on it. This has to be done until 4 years after obligating the instruction and appropriate environmental conditions for these waters must be defined and explained based on standards, measures, and qualitative standards [9 - 12].

According to the articles of the instruction, environmental goals must include criteria such as good coverage of forming principles of marine seas under governance of member states, specifying goals for creating desired conditions based on suitable environmental conditions, specifying measurable goals that are possible to control, practical goals associated with practical proceedings in order to prevent support their artifacts, specifying a set of environmental circumstances that have to be secured, performing the set of goals and lack of contradiction between them, specifying sources required to achieve goals, adjusting goals with a time scale for obtaining them, specifying intended indexes for controlling progress and making managerial decisions for securing aims.

In general, by studying performance of the European Union regarding water oil pollution, both in the Mediterranean Sea and other seas, it could be stated that European Union has a general view on environmental issues and water pollution. In fact, EU perspective regarding this topic is holistic. That is in EU, first different types of marine pollution is determined and then instructions, programs, and policies regarding each of these marine threats are expressed.

CONCLUSION

Oil products enter water through various sources and major pollution sources are related to oil wells and oil production rigs and platforms. Among important implications of water pollution due to oil or sewage sources, is environmental issues that are created for marine organisms. Since petroleum is not a pure material and there are hydrocarbons with physical and chemical differences, once it pollutes sea, it becomes crystallized into different shapes, which are often harmful to aquatic creatures.

Some of them that are lighter will rapidly evaporate and pollute the air. Another fraction remains floating on sea, which is sometimes eaten by fish, thus poisoning them. Fractions of petroleum is absorbed by the skin of aquatic creatures. Another fraction stays on sea surface and prevents sunlight infiltration. Finally, another fraction appear as masses that are directed to shores by water and wind flows, thus polluting them. In general, oil pollution exerts unrecoverable damages to the environment irrespective of cause. Thus, expansion of the scope of these damages is so that has made most countries and international organizations to react. In this paper, we considered EU's way of encountering oil pollution of seas.

By studying EU practice regarding fight with water oil pollution, it could be stated that EU subset member states are countries with an eclectic view on water oil pollution.

In general, there are two types of legal environmental perspective. First, there are countries that set rules for achieving an efficient management on the environment and regulations affecting it, given the segregation of natural, human, and social environment, such as Western Europe countries. Second, there are countries that see the environment integrated and view all its components as a whole set, thus enforcing consistent laws, such as most Eastern Europe countries. In environment protection law, Iran's view is also integrated, but in certain cases, it has used terms such as pollution, etc. that represent natural environment. Thus, it could be stated that our country's rules are gradually transitioning from holistic view to detailed one.

In The European Union that includes the countries of Central and Eastern Europe and 15 other European countries in addition to Norway, Island, and Liechtenstein, there is a combination of these two views. However, general view is moving toward detailed view. Instructions and programs as well as policies of the EU to prevent marine pollution show that in this union, first different types of marine pollution is determined and then instructions, plans, and policies in relation to each of these marine threats are considered. If we want to have a categorization for bills of EU institutions, the following grouping is a good one:

- regulations
- directives
- decisions
- recommendations
- opinions

Of course, to those above, views and perspectives of the Court of Justice of the European Union must also be added. In general, in the regulations, instructions, decisions, recommendations, and opinions that the EU offers regarding water oil pollution, the principle of precaution, principle of compensation (polluter has to pay), principle of clean production, and quick reactions and attention to the implications of agreements and treaties associated with the environment are noticed.

REFERENCE

1. Jondollah, O. International legal problems of sea environment pollution caused by oil transport, Journal of attorney, No. 37 and 38. 2008.
2. Saheri, S. Comparative consideration of sea strategies of the European Union and the RAPMI regional organization to prevent sea environment pollution, http://www.ensani.ir/storage/Files/20120326120354-1153-44.pdf . 2012.
3. Kadkhodaii, A. European Union structure and law, Mizan Publishing, First printing. 2011.
4. Mehdinezhad, M. Methods of collecting and removing oil pollution off sea, the scientific journal of AJA University of Medical Sciences. 2012.
5. Helmut, V. and Alice, R. translated by Masoud Bonyanian, Monopoly: mystery of the European Union, Islamic Azad University Journal of International political studies-Shahre Reza Branch, First issue, spring. 2009.
6. Preparing For Oil Spills: Contingency Planning in http://www.epa.gov/oem/docs/oil/edu/oilspill_book/chap6.pdf
7. A status report Of Chronic oil pollution in Europe in http://www.ifaw.org/sites/default/files/Chronic%20oil%20pollution%20in%20Europe.pdf
8. EU ENVIRONMENTAL ISSUES AND POLICIES GUIDELINES in http://www.ueapme.com/businesssupport%20II/Training%20Tools/Confartigianato/Environment/EU%20Environmental%20Guide.pdf
9. John, W. Farrington, Oil Pollution in the Marine Environment I: Inputs, Big Spills, Small Spills, and Dribbles in the http:// www. environmentmagazine. org/Archives/Back %20 Issues /2013/ November-December % 202013/ oil- pollution-full. Html. 2013.

10. Oil Pollution Damage, http:// www. emsa. Europa .eu /main/enforcement-eu-legislation/topics-a-instruments / item/102-liability-and-compensation-intro-page.html
11. Policy Department Economic and Scientific Policy, Simplification of European Water Policies, (IP/A/ENVI/FWC/2006-172/Lot 1/C1/SC5) in http://www.europarl.europa.eu/RegData/etudes/note/join/2007/385630/IPOL-ENVI_NT%282007%29385630_EN.pdf
12. Action Plan For Oil Pollution Preparedness and Response,in the http://www.emsa.europa.eu/oil-recovery-vessels/opr-documents/action-plans/item/486-the-pollution-preparedness-a-response-activities-of-the-european-maritime-safety-agen

http://www.shana.ir/fa/newsagency/183166
http://www.water-pollution.org.uk/oilpollution.html
http://www.doe.ir/Portal/Home/?113848/%DA%A9%D9%86%D9%88%D
http://europa.eu/legislation_summaries/agriculture/environment/l28027_fr.htm
http://europa.eu/legislation_summaries/agriculture/environment/l28027_fr.htm