

OIL SPILL RESPONSE: RUSSIAN EXPERIENCE

K.V. Prismotrov

Scientific advisor associate A.B. Strelnikova
National Research Tomsk Polytechnic University, Tomsk, Russia

Currently, both governments and oil companies around the world are trying to reduce oil pollution and minimize negative environmental impact caused by oil and gas exploration and production. The present paper gives an overview of protective measures taken in Russia to prevent oil leaks and minimize oil spill consequences. It also aims at identifying general trends in national environmental protection policy.

An oil spill is the release of a liquid petroleum hydrocarbon into the environment in the result of to human activities and is a form of pollution. The term is usually applied to marine oil spills, where oil is released into the ocean or coastal waters, but spills may also occur on land. Oil spills may be due to releases of crude oil from tankers, offshore platforms, drilling rigs and wells, as well as spills of refined petroleum products and their by-products, heavier fuels used by large ships such as bunker fuel, or the spill of any oily refuse or waste oil.

Oil spills penetrate into the structure of the plumage of birds and the fur of mammals, reducing its insulating ability, and making them more vulnerable to temperature fluctuations and much less buoyant in the water. Cleanup and recovery from an oil spill is difficult and depends upon many factors, including the type of oil spilled, the temperature of the water (affecting evaporation and biodegradation), and the types of shorelines and beaches involved. Spills may take weeks, months or even years to clean up ^{[3],[6]}

Oil spills can have disastrous consequences for society – economical, environmental, and social. Despite substantial national and international policy improvements on preventing oil spills adopted in recent decades, large oil spills keep occurring. They can inflict an enormous damage to nature and become reason of ecocatastrophe in some region. Therefore, it is vitally important to liquidate the consequences of accident as soon as possible

Cleanup and recovery from an oil spill is difficult and depends upon many factors, including the type of oil spilled, the temperature of the water (affecting evaporation and biodegradation), and the types of shorelines and beaches involved [4].

Methods for cleaning up include:

- mechanical methods (coultisse of soils, collection of oil products);
- physical and chemical methods (washing, catchment, persorption);
- biological methods (bioremediation).

As a rule, the stages of oil spill liquidation can be determined as follows [1]:

- 1) Setting of protections impedimental to further distribution of contamination (especially topically for collection of oil products on water and prevention of spreading of oil spots).
- 2) Dispersion of sorbents (including biosorbents) by means of that natural dispersion of oil products is conducted, that allows to minimize the consequences of spreading of oil products till they will affect a clean zone ecologically;
- 3) Mechanical collection of oil products (for this purpose, skimmers are used).

In Russian Federation, about 50% of export oil are transported by seas, including arctic ones. Therefore, the greatest share of potential environmental risks is connected with sea transportation. Taking into account the fact that the amount of oil exported from the Murmansk, Archangelic and Sakhalin areas are supposed to increase, the risks rise proportionally. As a response, today, there are organizations in the territory of the RF,

which are to minimize the damage to the environment in case of oil spill (for example, Marine Emergency and Rescue- Coordinating service of Russia).

Currently, Russia is involved in the intense development of the Arctic shelf, therefore, it is very important to take all necessary measures to prevent petroleum overflows. The great number of rare types of animals and birds dwells on territory of Arctic, thus the Russian Federation must organize the reliable system of preventive measures against environmental pollution.

Being one of the world's largest producer of oil, Russia regularly experiences oil spills in different parts of the country. Some examples are represented in the table below:

Spill	Location	Date	Tons
Kerch Strait oil spill [2]	Russia, Strait of Kerch	November 11, 2007	more than 1600
Black Sea oil spill [7]	Russia, Tuapse, near Black Sea	December 24, 2014	about 7,4
Nefteyugansk oil spill [5]	Russia, Nefteyugansk	June 24, 2015	more than 40
Oil spill in Surgut area [8]	Russia, Surgut area	July 15, 2015	20

In conclusion, this study has shown that currently in the RF, there is a system of measures to minimize the negative environmental impacts caused by oil spills. However, the system of preventive measures is being developed today as well. There are scientific projects aimed at oil spill forecast and prevention. Environment protection laws and regulations are becoming tougher to make oil companies fully responsible for probable spills. These improvements are specifically connected with Arctic oil exploration, since it boosts the enhancements in environmental protection over the whole country.

References

1. Largest producer of equipment for liquidations of overflows of oil. URL: <http://larn.ru> (date of reference: 01.10.2015).
2. Lavrova O.Yu., Bocharova T.Yu., Mityagina M.I., Strochkov A.Ya. Satellite monitoring of the aftereffects of a catastrophic oil spill in the Kerch Strait // Current problems in remote sensing of the Earth from space. 2009. № 6. V. 1. P. 409–420.
3. Lingering Lessons of the Exxon Valdez Oil Spill. URL: <http://www.commondreams.org/views04/0322-04.htm>. (date of reference: 15.10.2015).
4. Magerromov A.M. Removal of oil thin films from a water surface // Young scientist. 2011. №7. T.1. P. 65–68.
5. Nefteyugansk oil spill URL: <http://www.ntv.ru/novosti/1434138> (date of reference: 01.10.2015).
6. Oil Spills and Disasters URL: <http://www.infoplease.com/ipa/A0001451.html> (date of reference: 08.10.2015).
7. Oil spills in Western Siberia URL: <http://www.oilru.com/news/469810> (date of reference: 01.10.2015).
8. Nazarov M.; Gorodyankin G. Oil spills into Black Sea near Russian port after pipeline leak. Reuters. December 24, 2014. URL: <http://www.reuters.com/article/2014/12/24/us-russia-oil-spill-idUSKBN0K20ND20141224> (date of reference: 15.10.2015).