

OIL SPILL AND ECOLOGICAL CONSEQUENCES EVALUATION DURING SHIPWRECK OF TORREY CANYON

A.V. Fedorov, F.A. Gasanov, F.R. Abduragimov

Scientific advisors assistant B.R. Soktoev, senior lecturer I.E. Rymanova
National Research Tomsk Polytechnic University, Tomsk, Russia

An oil spill is a serious hazard for a natural ecosystem. For the period from 1970 to 2015 the largest oil spills occurred in the world, among them Fergana Valley, 1992 (Uzbekistan), Gulf War, 1991 (Kuwait), Atlantic Empress 1979 (Trinidad and Tobago) Deep-water Horizon 2010 (USA). In article we consider the Torrey Canyon oil spill.

The Torrey Canyon oil spill on the southwest coast of the United Kingdom in the spring of 1967 is one of the world's most serious oil spills. It is estimated about 32 million gallons of spilled crude oil

The wreck ship of the SS Torrey Canyon affected hundreds of miles of coastline in the United Kingdom, France, Guernsey, and Spain [1].

At the time it was the biggest oil spill ever, and the first one involving a new generation of supertankers. And no one knew what to do. But the Torrey Canyon disaster is not just a history lesson; it is evident (living) proof that big oil spills effect ecosystems for decades. Forty-three years on, the crude oil from the Torrey Canyon is still killing flora and fauna in the sea.

About 50 miles (80 km) of French and 120 miles (190 km) of Cornish coast were polluted. Around 15,000 sea birds were killed, along with huge numbers of marine organisms, before the 270 square miles (700 km²) of slick was removed. Much more damage was caused by harmful detergents to break up the slick, which were first-generation variants of products originally prepared to clean surfaces in ships' engine-rooms, without taking into account the toxicity of their components.

The disaster led to many changes in international regulations, such as the International Convention on Civil Liability for Oil Pollution Damage (CLC) of 1969, which imposed strict liability on ship owners without the need to prove negligence, and the 1973 International Convention for the Prevention of Pollution from Ships [2].

In Guernsey, in 2010, the authorities are also now trying to remove the last of the Torrey Canyon oil in an environmentally friendly way. Last month, they began to pump micro-organisms into the oily water, which is operated by a small generator running 24 hours a day. This process of "bioaugmentation" uses naturally occurring bacteria for which oil is a food source to break down the oil [3].

The accident is attributed to errors made by the ship's master and two noted flaws in the design of the steering control:

1. The steering lever was designed to switch the steering to a "Control mode", intended for use in maintenance only, which disconnected the rudder from the steering wheel.
2. The design of the steering selector unit did not provide an indication of the peculiar mode at the helm.

The British government was strongly criticized for its handling of the incident, which was at that time the costliest shipping disaster ever. The RAF and the Royal Navy also came in for ridicule, as 25% of the 42 bombs dropped missed the enormous stationary target.

Claims were made by the British and French governments against the owners of the vessel, and the subsequent settlement was the largest ever in marine history for an oil claim. The British government was able to serve its writ against the owners only by

arresting the Torrey Canyon's sister ship, the Lake Palourde, when she put in for provisions at Singapore, four months after the oil spill. A young British lawyer, Anthony O'Connor, from a Singaporean law firm, Drew & Napier, was deputised to arrest the ship on behalf of the British government by attaching a writ to its mast. O'Connor was able to board the ship and serve the writ as the ship's crew thought he was a whisky salesman. The French government, alerted to the Lake Palourde's presence, pursued the ship with motor boats, but crew were unable to board and serve their writ.

The disaster led to many changes in international regulations, such as the International Convention on Civil Liability for Oil Pollution Damage (CLC) of 1969, which imposed strict liability on ship owners without the need to prove negligence, and the 1973 International Convention for the Prevention of Pollution from Ships[1].

References

1. Torrey Canyon oil spill. – Access mode: [https://en.wikipedia.org/wiki/Torrey_Canyon_oil_spill] free. Caption of title screen (date of review 20.10.2015)
2. Torrey Canyon seabed returns to normal after oil spill. BBC News. – Access mode: [<http://www.bbc.com/news/science-environment-13280507>] free. Caption of title screen (date of review 20.10.2015)
3. Oil spills: Legacy of the Torrey Canyon. – Access mode: [<http://www.theguardian.com/environment/2010/jun/24/torrey-canyon-oil-spill-deepwater-bp>] free. Caption of title screen (date of review 20.10.2015)

AEROSOL POLLUTION AS A CHALLENGING ENVIRONMENTAL PROBLEM OF THE MODERN WORLD

S.I. Gamzatova

Scientific advisor associate professor E.V. Shvagrucova
National Research Tomsk Polytechnic University, Tomsk, Russia

At all the stages of evolution a human was closely connected with environment. With the appearance of a highly industrial society dangerous human intervention into the nature has harshly increased, the size of this intervention has become varied, and now it threatens to become a global danger for the mankind.

Let's start with the review of the factors that lead to deterioration of a state, one of the most important biosphere's constituents. People have been polluting the atmosphere for millennia. Firstly, it was the fire use in order to heat the cave and to cook a meal. It was necessary to reconcile with the smoke, which disturbed breath and laid down by a black cover on a ceiling and walls of the dwelling. The received heat was more important for people than clean air and incomplete walls of a cave. Then more serious types of pollution have come on stage.

There are several kinds of pollution such as air pollution, water pollution, etc. In general, three main resources of atmosphere pollution can be enumerated: industry, household boiler rooms, transport. The share of each of these sources in general air pollution is very different, and it depends on the place. Industrial production is looking for solutions in the sphere of air pollution. The sources of pollution are as follows: thermal power plants, which throw out sulphurous and carbon dioxide together with the smoke into the air; metallurgical enterprises, especially, nonferrous metallurgy, which throws out