

NEW NORWEGIAN POLICY ON USE OF DISPERSANTS

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ABSTRACT: *On the 1st of January 2002 the Norwegian Ministry of Environment introduced new regulations regarding the use of dispersants in oil spill response at sea. The Norwegian policy is to allow the use of dispersants when this means of response gives the best environmental results. Compared with former regulations this extends the possibilities of using a broader range of combat methods well suited for different spill scenarios. A thorough analysis has to be done in advance and the criteria for use must be documented in a contingency plan. Specific tests are required to make sure the dispersants are low toxic and effective (oil type specific). The regulations state that use of dispersants is prohibited unless well planned and documented. Whenever an oil company or other enterprises handling considerable amounts of oil, plans to use dispersants as a means of combat, the Norwegian Pollution Control Authority will consider the criteria for use described in their contingency plan. In oil spills where use of dispersants is not pre-planned the polluter or organization in charge of the operation at sea has to apply to the Norwegian Pollution Control Authority to get permission to disperse. This application has to include weather conditions, water depth, oil type, toxicity and effectiveness of the dispersant, and a Net Environmental Benefit Analyze. The large amount of documentation required compared with the short windows of opportunity means that in practice the use of dispersants has to be pre planned to be successful.*

Discussion

Background. For over 30 years the Norwegian Authorities has confined to mechanical recovery as the one and only method of combating oil spills at sea. The skepticism towards the use of chemicals has been obvious. The old regulations from 19801 clearly stated this point of view. Any use of dispersants exceeding 1000 liters had to be approved by the authorities, and it was not allowed to disperse the oil if mechanical recovery was possible. It was further not allowed to use dispersants in rivers, lakes or seashore.

Since 1980 large amounts of research has been done in finding less toxic dispersants and more suitable application equipment. We also know much more about fate and effects of the dispersed oil in the water column. This includes how quickly the dispersed oil dilutes to concentrations not considered toxic to marine life. In short: research shows that the possibility of biological effects of the dispersed oil/dispersants is limited in areas with rapid water replacement and few vulnerable resources present in the water column (e.g. spawning fish). For the Norwegian Environmental Authorities this increased knowledge has resulted in revised

regulations. New regulations relating to the composition and use of dispersants and beach-cleaning agents came in to force on the 1st of January 20022.

As mentioned above, the old regulations stated that mechanical recovery was to be the major combat method and that any use of dispersants exceeding 1000 liters had to be approved by the authorities. Anyone who is acquainted with the need for planning the use of dispersants and the logistics involved would know that these restrictions in fact excludes the possibility of a successful operation. This is mainly due to the limited time the different oils are dispersible. In addition, the time needed for the authorities to consider the application would steal valuable time from the actual operation.

The intention of the new regulations is to make dispersants a real alternative or supplement to mechanical recovery. This is done by permitting the planned and documented use of dispersants and beach-cleaning agents, and at the same time introducing stricter rules to prevent unregulated and unnecessary use. Those engaged in activities for which a contingency system for acute pollution is obligatory, will be able to use dispersants or beach-cleaning agents if the use of these preparations has been planned for as part of an approved contingency plan. All other use of these substances is prohibited unless given special permission by the Norwegian Pollution Control Authority.

Under the Pollution Control Act³ the environmental authorities may impose special requirements with regard to the use of different combat methods for oils spills (and other acute pollution) on those engaged in activities for which a contingency system is required. This may include a direct order to establish a contingency system based on dispersants if this is thought to reduce damage caused by an oil spill.

A key aspect of the regulations is the user's responsibility to get the best environmental result when an oil spill has taken place. The potential polluters are obligated to consider dispersants as a combat method in their contingency planning, but it is not meant to be a simple solution to be used in all kinds of situations. Therefore several requirements regarding planning and documentation has been laid down. These requirements will be further presented in the following.

Requirements. Any dispersant used or planned to be used has to fulfill requirements regarding maximum toxicity level and efficiency. The toxicity level is to be tested on the planktonic algae *Skeletonema costatum*, and use of the dispersant is prohibited if EC₅₀ < 10 mg/l. For a beach-cleaning agent this limit is raised to 100 mg/l.

The efficiency testing is somewhat more complicated and is divided into two categories. One category is dedicated to activities that involve the production or processing of oil. These

enterprises are required to customize their dispersants to the exact kinds of oils they are handling, i.e. choose the dispersant available that is most effective on their oils. If many types of oil are handled by the same enterprise that efficiency testing of all the oils will incur unreasonable high costs, testing shall be conducted on a selection of oil types most likely to be treated by dispersion. An IFP4 (Institute Francais du Petrol) test shall be used to compare relevant dispersants. For tests of dispersability of oil that has undergone varying degrees of weathering, the IFP test shall be used in combination with an MNS5 (Mackay, Nadeau and Steelmann) test.

The second category is dedicated to activities that do not involve the production or processing of oil. These enterprises, which are required to have a contingency system, must conduct a WSL6 (Warren Spring Laboratory) test to find a suitable dispersant. This standard test procedure includes a typical North Sea crude oil and a medium fuel oil.

The efficiency of dispersants and beach-cleaning agents will vary to a great extent depending on the kind of oil they are used to treat. That is why it would serve no purpose to set specific minimum limits for efficiency. It is the user's responsibility to use the most effective product for the specific oil types in question.

An evaluation of the potential environmental damage caused by the use of dispersant must be carried out before use. This includes an evaluation of the natural resources in the area that can be affected by the dispersed oil, compared to the potential damage of the oil when dispersants or beach-cleaning agents are not used. In other words a Net Environmental Benefit Analyses (NEBA) is required. Whereas the testing procedures are relatively simple, a NEBA can be a lot more complicated. Even though we know much about the effects of dispersed oil on biota and concentrations of dispersed oil under a treated oil slick there are always elements of uncertainty. One element is the dynamic property of an ecosystem. It is impossible to know exactly where the fish fry or seabirds are at the time of an oil spill. In planning you use the best data available and in case of an oil spill some verification is always necessary. And in the case of extreme bad luck, should we save the birds/beaches or the fish fry?

Another element of uncertainty is the area's ability of water replacement. This is well known at open sea, but not when we move towards the seashore and into bays, creeks and fjords with more shallow waters and irregular currents. In addition to uncertainties regarding sedimentation of dispersed oil, concentration levels and dilution rates, the ecosystems in these areas are far more complicated. The use of dispersants in rivers and lakes has been and still is controversial. This is mostly due to poor water replacement especially in the lakes, high degree of natural dispersion in rivers and the presence of vulnerable natural resources. There may be a range of use in rivers in times of high water flow. The regulations do not divide between marine and fresh water systems, but in most cases a NEBA will probably not recommend the use of dispersants.

Implementation. The authorities will always have a problem deciding the sufficient level of documentation needed to fulfil the requirements, whether considering contingency plans or "emergency" applications. Procedures and standards have not yet been laid down and both the authorities and the industry are in the middle of a maturing process finding ways to implement this method in their contingency systems. The oil industry is carrying out NEBAs for the different regions at the Norwegian Continental Shelf and has developed a helicopter bucket to be stationed offshore. The authorities are a few steps behind the industry, but will speed up the process if budget proposals are accepted. The

state shall provide for the necessary emergency response system to deal with major incidents of acute pollution that are not covered by municipal or private emergency response systems. In practice this means wrecked ships causing acute pollution. It is much more difficult to plan for a successful use of dispersants when the oil type and geographic position is unknown. And the oil type is often some sort of heavy bunker oil with reduced ability to disperse.

Conclusion

From an environmental point of view the Norwegian authorities can clearly see the advantages of having dispersants as an option to mechanical recovery. Especially in situations offshore, where there are vulnerable populations of sea birds present and/or where the probability of stranding oil is considerable. We acknowledge the need for more research to be able to make good NEBAs in coastal areas and where possible, use dispersants with confidence. A lot of work is being laid down at the moment implementing dispersants in contingency systems and hopefully in a few years this will be a fully accepted and valuable combat method to be used to reduce environmental damage.

Biography

Ann Mari Vik graduated from the Norwegian University of Science and Technology in 1998 with a Cand. Scient. in biology. She joined SFT in spring 1999 and has been working with development of regulations and requirements regarding emergency preparedness and environmental risk related to industry offshore and onshore.

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