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EP/0720/Circular

30 April 2015

Chairman NOSDCP Circular No: 02/2015

Subject: Net Environmental Benefit Analysis in Facility Contingency Plans

1. By a decision of Committee of Secretaries on 04 November 1993 and further, by amendment to Allocation of Business Rules, 1961 vide notification dated 12 December 2002, the Indian Coast Guard has been designated as the Central Coordinating Authority for combating of oil spills in Indian waters.
2. Selection of an appropriate response strategy to a marine oil pollution incident requires determination of the most environmentally and economically optimal oil spill response technique. Whereas dispersant would be considered for response to an oil spill in the open sea, offshore, and upstream of sensitive resources, to avoid oil reaching the shoreline or sensitive resources but avoided on or in the immediate vicinity of sensitive resources, coastal areas where several sensitive resources are of concern would require conduct of a Net Environmental Benefit Analysis (NEBA)¹ based on realistic scenarios.
3. NEBA is a comparison of *the impact of the spill following intervention with the response options as opposed to "no intervention"* based on the behavior of the oil according to the response options considered as well as the feasibility and the expected efficiency of the response options considered. The results of the NEBA determine the recommendations of which option is preferable, and which options should be prohibited.
4. It is necessary to perform NEBA, especially when using dispersants, because of the fact that dispersion does not completely remove oil from the environment, but transforms it into a state, which is safer for the environment and better for natural decomposition. Subjecting potential oil spill scenarios to NEBA of oil spill response techniques at the preparatory stage of oil spill contingency plans, before a spill occurs will maximize the window of opportunity for using dispersants, if that is the preferred choice.
5. With immediate effect, every facility contingency plan submitted for consideration of approval of the Coast Guard will include a NEBA for oil spill scenarios of 10 tons, and its exponential values up to and including the worst-case scenario. Each scenario will be supplemented with recommendations on practicability, from an ecological point of view, of dispersant usage or its prohibition. Approval for the use of dispersants as required by the national policy will be given based on positive results of NEBA. At the time of an actual spill, decisions will be made on the basis of the NEBA, with adjustment if the real spill situation differs significantly from the pre-studied scenarios.
6. The guidelines for conduct of NEBA in the development of facility contingency plans, which take into consideration the relevant IMO guidance² on the subject, are at Annexure.
7. This is issued with the approval of the Director General Indian Coast Guard.

(AA Hebbbar)
Dy Inspector General
Director (Environment)

¹ Other names include NEEBA (Net Environmental & Economic benefit Analysis) and NEDRA (Net Environmental Risk & Damage Assessment)

² See IMO. (2013, December 20). *Updating of IMO Dispersant Guidelines*. MEPC/OPRC-HNS/TG 16/3/2

Annexure to NOSDCP Circular No. 2/2015

Guidelines for Net Environmental Benefit Analysis

The NEBA for oil dispersants is an assessment of positive and negative consequences of dispersant use, as compared to the use of other response techniques, taking into consideration the biological resources and socio-economics of the region, such as the season, state of fisheries, economic and social values, and other biological resources.

The following documents are to be prepared before proceeding with the NEBA, in order to determine which resources may be damaged and which ones should be preserved:-

- (a) an inventory of the local sensitive resources;
- (b) the vulnerability¹ of the resources identified; and
- (c) the definition of the importance of the resources identified.

The NEBA may be performed as follows:

- (a) as a preliminary measure at the facility oil spill response plan development stage; or
- (b) in a specific situation during an oil spill.

A preliminary NEBA is preferred in order to reduce the time for decision-making.

The preliminary NEBA shall be performed for oil spill scenarios of 10 tons, and its exponential values up to and including the worst-case scenario. Each scenario will be supplemented with recommendations on practicability, from an ecological point of view, of dispersant usage or its prohibition.

Each potential oil spill scenario must address the following:-

- (a) description of assets where oil spills are possible;
- (b) potential oil spill scenarios and spill volumes including worst case spill, physical and chemical properties of oil;
- (c) results of mathematical simulation of oil spill behavior on water (spreading, possible drift directions, quantitative changes of oil, when presented on the sea surface, which occur due to evaporation and dispersion under the influence of wave energy and currents; amount of oil stranded onshore, oil remaining on the sea surface and penetrating into water column);
- (d) list of ecosystem components that exist within the action zone of the facility contingency plan, depending on the priority of their protection in time of potential emergency scenarios, from the point of view of preserving natural resources, and taking into account their seasonal changes;
- (e) list of economically and socially valuable assets which require protection;
- (f) prioritization of the identified environmental and economic resources, decided with the local stakeholders;
- (g) advantages and disadvantages of various available, in-place oil spill response methods including dispersion and an in-principle, assessment of the expected results of each possible response technique: dispersion, containment and recovery, monitoring for action; and
- (h) impact of floating and dispersed oil on selected ecosystem components and state of the environment in general.

Both natural and economic resources should be considered. In general, endangered species, highly productive areas, sheltered habitats with poor flushing rates, and habitats which take a long time to recover should receive top protection priority. The list should take into account factors like possible

¹ Vulnerability takes into account sensibility to oil and the ability of the resources to recover/restore rapidly.

seasonal variations as well as the time needed by each impacted resource to recover (damage on a resource which can regenerate quickly is often more acceptable than damage to one which needs a very long restoration time). These factors will affect priorities.

Habitats and resources should be considered as a whole and not independently, as the decision to apply dispersant may benefit particular habitats or resources and at the same time affect adjacent ecosystems.²

In terms of priority, it is better to protect the habitat before the species themselves, as the species are dependent on the preservation of their habitat. In term of species, the objective must be to protect the reproductive potential.

The NEBA for the use of dispersant in particular, must take the following into consideration:-

- (a) consider the behavior (drift and weathering) of the treated oil (drift according to the current and speed of dilution of the plume) and of the untreated oil (drift according to the current and wind);
- (b) identify resources potentially affected by the treated oil or untreated surface oil;
- (c) assess possible vulnerability of these resources (vulnerability = sensitivity + restoration time);
- (d) rank these resources according to their vulnerability and/or importance and decide on the priorities (what must be preserved, what could be sacrificed);
- (e) predict the possible impacts for the different response options (e.g. chemical dispersion or not) and make a decision on the use of dispersants;
- (f) in case of conflicting conclusions,
 - (i) preserve the habitat before the species, and
 - (ii) preserve reproductive potential.
- (g) where local birds are concentrated, accord special concern for application of dispersants to ensure that direct contact between dispersants and feathers of seabirds is absolutely avoided.

The NEBA results must include mapping of areas where dispersants should not be used according to different criteria (e.g. seasonal or at any time of year, tides or current, weather conditions, or the size of the spill – tier 1, 2, 3).

The plot of valuable ecosystem components on environmental sensitivity maps and mathematical modeling of spilled oil behavior constitutes the basis for a NEBA. The results of preliminary NEBA are to be arranged in the form of a set of oil spill response scenarios. The scenarios are to be supplemented with recommendations on practicability, from an ecological point of view, of dispersant usage or its prohibition. The scenarios are to be then included in the relevant facility oil spill contingency plan.

Consequent to conduct of NEBA, consideration of certain response options may be immediately ruled out because of their ineffectiveness in the given conditions and, others ranked in terms of effectiveness and preference. The use of different techniques may be recommended for different parts of the slick. With respect to chemical dispersion, the recommendations must indicate whether it is possible or impossible to use dispersants in a given situation or which parts of the slick should be treated with dispersants.

At the time of an actual spill, approval for the use of dispersants will be given based on positive results of NEBA. Also, decisions will be made on the basis of the NEBA, with adjustment if the real spill situation differs significantly from the pre-studied scenarios.

² For example, if a spill occurs in shallow water above a submerged coral reef with current and wind conditions leading the slick toward a mangrove swamp, it is generally advisable to disperse the oil above the reef (although it may increase oil exposure of the corals) in order to avoid oil from becoming incorporated in the mangrove sediments from which it will constantly seep out over many years causing long term chronic pollution to both ecosystems.

The NEBA results must be documented in a report approved by the relevant pollution control board, or environment ministry.

NEBA is a time intensive process. It is required to be conducted on scientific basis by a team of stakeholders, which preferably includes specialists in several fields (e.g. ecology; bird, mammal, fish, and benthos biology; mathematical modeling of the behavior of spilled oil). Running the scenarios will require specialized models designed for impact assessment.