

Aqueous Film-Forming Foam Discharge Summary

Description of Discharge

How is this discharge generated? This discharge consists of a mixture of seawater and firefighting foam discharged during training, testing, and maintenance operations. Aqueous film-forming foam (AFFF) is the primary firefighting agent used to extinguish flammable liquid fires on surface ships of the Armed Forces. AFFF is stored on vessels as a concentrated liquid that is mixed with seawater to create the diluted solution (3-6% AFFF) that is sprayed as a foam on the fire. The solution is applied with both fire hoses and fixed sprinkler devices. During planned maintenance of firefighting systems, system testing and inspections, and flight deck certifications, the seawater/foam solution is discharged either directly overboard from hoses, or onto flight decks and then subsequently washed overboard. These discharges are considered incidental to the normal operation of Armed Forces vessels. Discharges of AFFF that occur during firefighting or other shipboard emergency situations are not incidental to normal operations and are not subject to the requirements of the rule.

Which vessels generate this discharge? AFFF is discharged from all Navy ships, those MSC ships capable of supporting helicopter operations, and Coast Guard cutters, icebreakers, and tugs.

How often and where is this discharge generated? AFFF discharges generally occur at distances greater than 12 n.m. from shore, and in all cases more than 3 n.m. from shore due to existing Armed Forces operating instructions.

Analysis

Nature of Discharge: The constituents of AFFF include water, 2-(2-butoxyethoxy)-ethanol, urea, alkyl sulfate salts, amphoteric fluoroalkylamide derivative, perfluoroalkyl sulfonate salts, triethanolamine, and methyl-1H-benzotriazole. Because the water used to mix with the AFFF concentrate comes from the vessel's firemain, the discharge will also include bis(2-ethylhexyl)phthalate, nitrogen (measured as total Kjeldahl nitrogen), copper, nickel, and iron from the firemain piping.

Discussion and Discharge Determination

Discussion: The AFFF discharge produces an aqueous foam intended to cool and smother fires. Water quality criteria for some States include narrative requirements for waters to be free of floating materials attributable to domestic, industrial, or other controllable sources, or include narrative criteria prohibiting discharges of foam. AFFF discharges in State waters would be expected to result in violating such narrative criteria for foam or floating materials. At present, the Navy uses certain management practices to control these discharges, including a self-imposed prohibition on AFFF discharges in coastal waters by most Armed Forces vessels. These management practices to control discharges of AFFF demonstrate the availability of a MPCD to mitigate the potential adverse impacts that could result from the discharge of AFFF. Therefore, EPA and DOD have determined that it is reasonable and practical to require use of a MPCD for this discharge.

AFFF discharges occur beyond 3 n.m. but within 12 n.m. from shore infrequently and in relatively small volumes, and preliminary investigation indicates that the diluted (3-6%) AFFF solution does not exhibit significant toxic effects. Further, any discharges that do occur take place while the vessel is underway and will be dispersed in the turbulence of the vessel wake.

Determination: A marine pollution control device is required.