

## Rudder Bearing Lubrication Discharge Summary

### Description of Discharge

**How is this discharge generated?** This discharge is the oil or grease released by the erosion or dissolution from lubricated bearings that support the rudder and allow it to turn freely. Armed Forces' vessels generally use two types of rudder bearings, and two lubricating methods for each type of rudder bearing: 1) grease-lubricated roller bearings; 2) oil-lubricated roller bearings; 3) grease-lubricated stave bearings; and 4) water-lubricated stave bearings. Only oil-lubricated roller bearings and grease-lubricated stave bearings generate a discharge.

**Which vessels generate this discharge?** Approximately 220 Navy vessels, 50 Coast Guard vessels, and eight MSC vessels use a type of rudder bearing that generates this discharge.

**How often and where is this discharge generated?** The discharge occurs intermittently, primarily when a vessel is underway or its rudder is in use, although some discharges from oil-lubricated roller bearings could potentially occur pierside even when the rudder is not being used because the oil lubricant is slightly pressurized.

### Analysis

**Nature of Discharge:** This discharge consists of oil leakage and the washout of grease from rudder bearings. EPA and DOD developed an upper bound estimate of the fleetwide release of oil and grease based on allowable leakage/washout rates and the amount of time each vessel spends within 12 n.m. from shore. The maximum allowable oil leak rate for oil-lubricated roller bearings is one gallon/day when the vessel is underway and one pint/day while in port. In practice, these leakage rates are not reached under normal conditions. The grease washout rate for grease-lubricated stave bearings is based on Navy specifications limiting grease washout to 5 percent. Grease washout estimates for this rule are based on releasing 5 percent of the grease over a two-week period, which corresponds to the time between grease applications.

EPA and DOD calculated the expected receiving water concentrations of oil and grease from this discharge to evaluate the potential for the discharge to cause adverse impacts. The underway receiving water volume was determined using an average size vessel and estimating the volume of water displaced by the vessel while transiting from port to a distance of 12 n.m. from shore. In port, discharges are not expected since the lower bearing seals are designed to prevent leakage and, as noted above, the oil to the bearings is kept at a low pressure while in port. The resulting estimated pollutant concentrations do not exceed acute Federal criteria or State acute water quality criteria.

### Discussion and Discharge Determination

**Discussion:** The rudder bearing lubrication discharge has a low potential for causing adverse environmental impacts. EPA and DOD determined that it is not reasonable and practicable to require a MPCD to mitigate adverse impacts on the marine environment for this discharge.

**Determination:** A marine pollution control device is not required.