Characterization of Facility Response Planning at Facilities that Handle, Store, or Transport Animal Fats or Vegetable Oils

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Overview

- U.S. Environmental Protection Agency (EPA) and U.S. Coast Guard (USCG) revised their Facility Response Planning regulations in June 2000.

- EPA’s regulation applies to non-transportation related facilities that:
  - Transfer oil over water and store more than 42,000 gallons of oil, or
  - Store more than 1 million gallons of oil and meet an additional criterion
Statutory Background

- Oil Pollution Act (OPA90) and Clean Water Act (CWA)
  - Oil spill prevention procedures in place since 1970.
  - OPA90 requires preparedness regulations for facilities.

- Edible Oil Regulatory Reform Act, 1995
  - Requires most Federal agencies to establish separate classes for animal fats, vegetable oils, and other types of oil, based on properties and environmental effects.
## Number of Oil Spills by Type

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Vegetable Oils</td>
<td>36</td>
<td>33</td>
<td>32</td>
<td>45</td>
<td>43</td>
<td>47</td>
</tr>
<tr>
<td>Animal Fats</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>8</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>36</td>
<td>34</td>
<td>53</td>
<td>49</td>
<td>47</td>
</tr>
</tbody>
</table>

* Annual average number of spills reported to National Response Center.

- Approximately 18,000 to 24,000 oil spills reported per year.
- Actual number of spills of animal fats and vegetable oils probably higher.
Similarities Between Animal Fats and Vegetable Oils and Petroleum Oils

- When spilled, can cause devastating physical effects such as:
  - Smothering
  - Coating birds’ feathers or fish scales and skin
  - Egg contamination
  - Destruction of food, breeding animals, and habitat
Similarities, continued

- Undergo similar reactions in the environment and can have toxic components, or form toxic degradation products.

- When spilled, can produce indirect effects, foul shorelines, and interfere with water treatment.

- When spilled, can persist in the environment or degrade rapidly.
Differences Between Animal Fats and Vegetable Oils and Petroleum Oils

- Volatile fraction is usually small in animal fats and vegetable oils, but may be large in some petroleum oils.
- Animal fats and vegetable oils can degrade rapidly or persist for decades; they may present a risk of oxygen depletion if degradation is rapid.
- Degradation of some animal fats and vegetable oils can create rancid odors.
EPA Requires “Substantial Harm” Facilities to Submit an FRP

- Approximately 465,000 facilities regulated under the Spill Prevention, Control, and Countermeasure (SPCC) regulation.

- Approximately 5,465 SPCC-regulated facilities also meet EPA’s “substantial harm” criteria.
  - About 87 store animal fats or vegetable oils.
  - About 63 store *primarily* animal fats and vegetable oils.
### EPA-Regulated Animal Fat and Vegetable Oil Facilities with FRPs

<table>
<thead>
<tr>
<th>Type of facility</th>
<th>Region 1 - 3</th>
<th>Region 4</th>
<th>Region 5</th>
<th>Region 6</th>
<th>Region 7</th>
<th>Region 8 - 10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybean mills</td>
<td>1</td>
<td>10</td>
<td>12</td>
<td>1</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>Other food manufacturers</td>
<td>6</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Other manufacturers</td>
<td>3</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Storage and water transportation</td>
<td>2</td>
<td>3</td>
<td>0</td>
<td>3</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Bulk stations and terminals</td>
<td>3</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>17</td>
<td>21</td>
<td>12</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
</table>
New FRP Rule Provisions for Animal Fats and Vegetable Oils

- Definitions added for animal fat and vegetable oil.

- Response planning levels in separate regulatory sections but kept three response planning scenarios.

- New oil groups (A, B, and C); use of persistence eliminated for these oils.
New Rule Provisions, Continued

- New methodology for determining response equipment requirements for a worst case discharge.
  
  - New tables for emulsification and recovery rates that are more appropriate for estimating on-water and onshore recovery resource needs for animal fats and vegetable oils.
Response Planning Scenarios – EPA and USCG Requirements

- EPA requires response planning for three scenarios (small, medium, and worst case discharges).

- USCG requires response planning for two scenarios (average most probable and worst case discharges).
Potential for Oil Discharges

Compared to USCG-regulated facilities, EPA-regulated facilities generally have a greater potential for larger discharges because they have:

- More transfers
- Greater diversity of structures and processes
- Wide range of activities and discharges that occur in different ways
- Worst case discharges that are larger by an order of magnitude or more
## Average Size of a Worst Case Discharge

<table>
<thead>
<tr>
<th></th>
<th>Worst Case Discharge (gallons)</th>
<th>Number of facilities with animal fats and vegetable oils</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
</tr>
<tr>
<td><strong>EPA</strong></td>
<td>2,000,000</td>
<td>1,200,000</td>
</tr>
<tr>
<td><strong>USCG</strong></td>
<td>23,000</td>
<td>10,000</td>
</tr>
</tbody>
</table>
Characteristics of Response Resources in FRPs

- Facilities report the type of response resources they plan to use for a small, medium, and worst case discharge.

- EPA analyzed 55 FRPs and found:
  - 13 reported different types or amounts of planned response resources for each of the three planning levels.
  - 19 reported different types or amounts of planned response resources for two of the three planning levels.
  - 23 reported the same planned response resources for each planning level.
Proximity to OSROs

- Oil Spill Removal Organizations (OSROs) may be included in FRPs as part of a facility’s planned response resources. First tier response resources must arrive at the spill within 6 or 12 hours, depending on the facility’s location.

- EPA estimated the distance from OSROs to facilities with these oils, and found that in every case resources could arrive within 6 or 12 hours.
Recovery Rates

- Recovery rates estimate percentage of spilled oil that can be removed.

- EPA estimated recovery rates based on natural degradation rates and field data showing the percent recovered from actual spills.

- USCG data for 1984 - 1999 show 39.9% of volume of these oils were recovered from water.
Recovery Rates, continued

- EPA’s new rule includes recovery rates of 15 to 65 percent.

- EPA’s recovery rates for the percent recovery for floating oil in nearshore/ inland/ Great Lakes is 20 percent for animal fats and vegetable oils, and 50 percent for petroleum oils.
Conclusions

- Animal fats and vegetable oils are regulated as oils under the Clean Water Act.

- These oils and petroleum oils share common physical properties and produce similar environmental effects.

- EPA has provided more specific methodology for facilities with animal fats and vegetable oils to plan for responding to a spill.

- EPA is continuing its efforts to publicize rule changes through outreach.