

# Integrating Pollution Prevention (P2) Into the Inspection Process

## Auto Service and Repair/Solvent Usage Industry

### *Background*

Auto service and other industry groups that use solvents for parts washing, often use a variety of processes and chemicals that generate wastes ranging from ignitable and toxic solvents to excess metal parts for recycling. There are many small shops with four or fewer technicians on staff as well as larger operations that manage huge fleets for large companies or municipalities. The type of services offered includes everything from basic oil changes to antifreeze flushing to complex mechanical work that involves solvent parts washing.

### *Regulatory Issues*

This service industry can generate significant quantities of recyclable wastes as well as hazardous and solid wastes. For this reason, their processes are usually associated with hazardous and solid waste regulations.



Hazardous waste issues and violations include problems with proper generator registration, keeping containers closed at all times, failure to determine if a waste is hazardous, and mishandling of solvent-contaminated rags. Wastes generated from parts washing can be the most problematic waste stream for this group as common parts-washing solvent waste is generally considered hazardous due to ignitability and toxicity. Even aqueous or water-based solvent parts-washer waste may still be hazardous due to the metals (cadmium, chromium, and lead) it picks up after being in contact with the parts.

Solid waste issues include failure to abide by the used oil regulations, and problems related to tire and salvage parts management.

Water-related issues include pretreatment, oil spill prevention, and non-point source. Pretreatment issues are related to the types of wastes that may be disposed of through the floor drain or mud trap system. Waste antifreeze or aqueous parts-washing solutions often contain regulated metals. In some cases, even if the aqueous parts washer passes the TCLP, metal levels may still be too elevated to meet pretreatment discharge limits. The Spill Prevention, Control and Countermeasure regulation impacts businesses that store large quantities of oil on their property. Illegal dumping, poor property drainage, and vehicles that leak auto fluids in parking lots can all contribute to non-point source pollution problems.

Air emissions generated from solvent parts washing are generally below levels regulated under the Clean Air Act. Parts-washing solvents contain a variety of

VOC's and HAPs identified in the regulations; for this reason, very large operations may approach the regulatory levels if emissions from the fleet or parts-washing center are combined with emissions from other sources (such as painting) at the facility. In some areas of the country, local air emission regulations restrict the use of solvent parts washing for facilities of all sizes.

### ***Where is the P2 Potential?***

Just as parts' washing is the most problematic waste for this industry, it is also an area of great P2 potential. Fortunately, changes to the material, process or technology which reduce health hazards and hazardous waste disposal costs from parts cleaning are readily available. Utilizing P2 can mean decreases in hazardous waste costs, but it can also decrease liabilities and regulatory burden.

### **Change the Process**

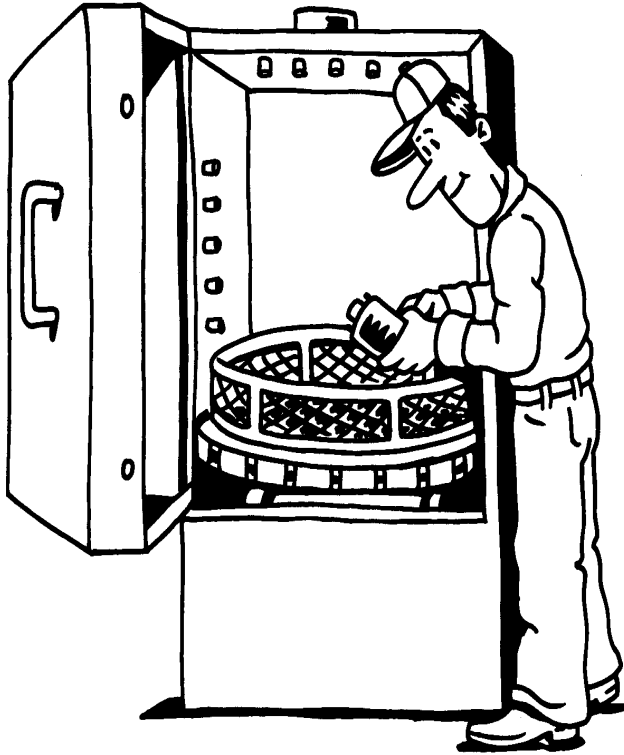
Solvent maintenance is very important to extending the life of alternative cleaning solutions and offers considerable savings in raw material use, and solution change out and disposal costs. When possible -

- Always preclean parts with a wire brush or jet washer to extend solvent life.
- Use a filter on the parts-washer system to remove contaminants and extend the parts-washer life.
- Change the solvent out only when it loses cleaning power, not on a schedule. How clean is clean for the shops purposes?
- Self-managed solvent parts washing can be very economical and efficient for some small shops. One shop in Kansas uses a low flash solvent (105°F flash point) with a filtration system; the solvent hasn't been changed in two years, only replenished as needed. The solution looks dirty but maintains its cleaning power.
- Recycle solvent on site. If mechanics feel a solvent must be used for cleaning, use a solvent still to recover mineral spirits for reuse. This option will reduce raw material purchases and hazardous waste disposal costs, but monthly hazardous waste generation status, and health or fire hazards *will not necessarily be reduced*.

### **Change the Material/Technology**

Enzyme cleaners use active enzymes to actually digest oils and other soils from parts, allowing the solution to be used indefinitely; some shops have been using their systems for almost two years, adding only more enzyme and water with no loss of cleaning power. These systems are much gentler on the mechanics' hands, warm in winter, and are very safe to use. Some parts may take a little bit longer to clean, but most workers agree it's not significant and is worth the time to avoid the health

hazards associated with breathing solvent fumes. *Waste parts-washing fluid disposal virtually goes to zero with the use of these units.* One company actually offers to let companies use their unit for a trial period of time. The Good Year Tire facility in Omaha has switched over to these units and is very happy with them. Unit costs are comparable to other sink-on-a-drum style units equipped similarly (filters and heaters). Use of an aqueous enzyme -detergent system significantly reduces hazardous waste generation from the parts-washing process.



Aqueous or water-based parts washers offer shops the opportunity to reduce worker exposures and amount of hazardous wastes. But shops must keep in mind the fluids in these washers can become a hazardous waste when used for long periods of time, due to heavy metal accumulation. A study conducted in one air district of Los Angeles where VOC's in cleaning fluids were limited to 50gms/l shows all the shops involved in the feasibility study were able to convert to water-based cleaners as *viable alternatives to mineral spirits*. Use heated aqueous solution where possible. Use only a non-emulsifying detergent and an oil skimmer with aqueous parts washers. These allow oil and oil-bound soils to settle out when

the machine is not in use, promoting better removal from the solution, thus prolonging its cleaning life and decreasing disposal costs.

Hot soap parts washers offer big labor savings, but capital investment is higher. Solution can also become hazardous due to heavy metal accumulation.

### **Used Oil**

Used oil can be another area of great pollution prevention potential. Shops should -

- Purchase oils in bulk, if not already doing so.
- Fleet shops should consider going to a predictive maintenance schedule for fluid changes to reduce raw material purchases and waste oil generation. Many fleet operations have begun testing their equipments' motor fluids and change it only when needed, instead of scheduling changes by hours of operation or mileage.
- Consider burning used oil in used oil heaters to cut disposal cost and reduce energy costs for heating buildings and hot water. Some fleet facilities generate enough oil to install used oil burners in one or more of their buildings. As of late 1998, used oil burners can now take used oil from other *businesses* if the used oil is determined through proper testing to be "on-spec". In some cases shops may

consider using used oil heaters as supplements for all the shops; in 1999 one gallon of used oil could be purchased from commercial recyclers for \$ .20 to \$ .30 a gallon and would produce as much heat as \$0.80 of natural gas.

- Oil filters should always be hot drained for 24 hours and crushed to retrieve the maximum level of used oil recovery prior to being land filled.
- Oil filter crushers further recover used oil and reduce the volumes of waste sent to the landfill.

### **Used Antifreeze**

Antifreeze is another waste stream that can be minimized. Used antifreeze, if still clean, should be returned to the radiator rather than fully replaced whenever possible. Some services recycle used antifreeze on site and then use additives to bring the recycled material up to specifications. These services are very popular and cost effective. For example, the antifreeze recycling service may cost \$2 to \$2.75 per gallon, but new antifreeze is \$3 to \$4 per gallon. Large shops and fleet facilities can benefit by purchasing their own antifreeze recycling system and treating the antifreeze on-site themselves.

### **Parts and Batteries**

Old parts and auto batteries that are no longer usable can be recycled. Items should be properly stored so that they do not become damaged or contaminate the environment. Batteries that are cracked and leaking should be handled as hazardous waste. Use a secondary containment shelving system and store batteries off the floor to prevent accidental breakage. Fleet operations should consider the installation of solar pulse units on vehicles; battery life can be extended up to 10 years and longer.

### **Shop Rags**

Use of solvent-contaminated shop rags should be minimized at these facilities. Whenever possible, encourage the use of less hazardous alternatives like water or alcohol, if the shop currently uses a non-F003 "listed" waste solvent such as methyl ethyl ketone or toluene.

## **Auto Service and Repair/Solvent Usage Industry P2 Checklist**

### ***Parts Washing***

Pre-clean parts by mechanical means such as wire brushes or rags. This will decrease the amount of sludge and soil loading on the system.

Clean only the parts that need to be cleaned for the repair.

Increase time between solvent change outs. Change solvent only when it loses its cleaning power, not on a preset schedule or because it looks dirty. Consider self-management of the parts washer.

Use a two-stage cleaning system, using dirty solvent for pre-cleaning, then finish cleaning with clean solvent to prolong clean solvent life.

Substitute less toxic or non-toxic solvent alternatives whenever possible.

Consult the MSDS before you buy a new product. Systems include the following: Enzyme cleaners use active enzymes to actually digest the oils and other soils from parts, allowing the solution to be used indefinitely; some shops have been using their systems for almost two years, adding only more enzyme and water with no loss of cleaning power.

Aqueous or water-based parts washers offer shops the opportunity to reduce worker exposures and amount of hazardous wastes. But remember, fluids in these washers can become a hazardous waste when used for long periods of time, due to heavy metal accumulation.

### ***Used Oil and Antifreeze***

Burn used oil on site for energy recovery. Provide a technical guidance document.

Oil filters should always be hot-drained at a minimum and crushed prior to disposal when possible.

Recycle used oil, antifreeze, and other engine fluids, as well as batteries and used parts.

Use pop-up level indicators on drums and other bulk receptacles to prevent overfilling.

### ***General***

Use catch pans to prevent leaks, drips, and spills from reaching the floor.

Control your inventory to prevent overuse or underuse of materials at your shop.

Don't allow your raw materials to become too old and unusable, creating hazardous wastes. Use a first-in, first-out policy.

Keep waste streams separate for reuse, recycling, or treatment. Keep non-hazardous materials from becoming contaminated. If you put hazardous waste into oil, the entire mixture can become hazardous.

Label all materials and wastes. Keep tight-fitting lids on containers except when adding or removing material or waste.

Keep a spill kit on site, and train employees yearly in spill prevention and response.

Contact the Kansas Small Business Environmental Assistance Program for individual on-site pollution prevention and compliance assistance at 800-578-8898.

***Case Study/Cost Benefit***  
**Enzyme / Traditional Solvent System**

Variable	Units	Yearly cost
<b>Current service provider costs</b>		
Yearly solvent service fees and parts washer rental	1 unit serviced every 6 weeks	\$1210
<b>Total solvent-related costs (current est.)</b>		<b>\$1210</b>
Cost of enzyme units parts washers (~\$1650)	\$1650	\$1650
Enzyme filters cost \$10/ea., change monthly in parts washers	\$10 x 1 x 12	\$120
Cleaning solution added as needed to replace drag-out (assume 5 gals every two months for parts washers)	\$90/ 5gal pail x1 units x 6 additions yearly	\$360
<b>Total Operating Cost (w/o equipment purchase)</b>		<b>\$480</b>
<b>Total Operational Savings</b>		<b>\$730</b>
<b>Total Cost with Equipment Purchases</b>		<b>\$2130</b>
Equipment Payback Period Cost of equipment ÷ total savings per year	$\$1650 \div \$730 = 2.3 \text{ years}$	<b>2.3 yrs.</b>

***Additional resources***

The Small Business Environmental Assistance Program, SBEAP, is a confidential non-regulatory program that assists small business with environmental concerns. A detailed P2 manual for Auto Service and Repair can be obtained by contacting the SBEAP at 800-578-8898 or <http://www.sbeap.org>.

The Coordinating Committee for Automotive Repair (CCAR) Information Center is a federally sponsored program that has a virtual garage featured on its Web site. Users may point and click on various items for information. Go to: <http://www.ccar-greenlink.org> for more information.

Downloadable fact sheets on a variety of P2 options for Auto Service is available at: [http://www.epa.gov/region09/cross\\_pr/p2/autofleet/factauto.html](http://www.epa.gov/region09/cross_pr/p2/autofleet/factauto.html)

This Web site, EnviroSense, allows you to search for solvent alternatives: <http://es.epa.gov/>

Regulatory compliance information related to solvent-contaminated rags and used oil and other waste handling issues can be viewed and downloaded from the KDHE Web site at <http://www.kdhe.state.ks.us>