

LOWER COLORADO RIVER AUTHORITY CASE STUDIES

Pollution Prevention Project Name: Solvent Distillation
Waste Minimization

Project Identification:

This project involves the recycling of citrus solvent using a process distillation unit. The need for solvent distillation was recognized after exhausting possible source reduction efforts. The substitution of Agitine with a citrus solvent initially indicated a true source reduction of hazardous waste; however, the non-hazardous citrus solvent became characteristically hazardous prior to disposal. Laboratory analysis identified various heavy metals above regulatory levels. Facility teams investigated segregation but found that contamination was random and that in some cases the citrus solvent was identified as being hazardous due to ignitability. FPP generates an average of 949 gallons of waste solvent each year. The waste coordinator estimated that in 1994 FPP will generate 1343 gallons (4.6 tons). Last year the citrus solvent cost FPP \$9,975 to purchase and \$8,132 to dispose. To date FPP has spent approximately \$25,597 in aerosol spray paint purchases and disposals.

Project Classification: Source Reduction/Waste Minimization

Project Prioritization: High

Explanation:

FPP generates an average of 14 pounds of hazardous paint related waste per day. The reported annual volume of hazardous paint related waste generated in 1993 was 2.65 tons. The volumes were reported as 1.66 tons of liquid paint waste and 0.92 tons of waste paint containers. The aerosol paint cans were estimated to make up approximately 275 lbs or 15% of the waste paint containers.

The first step of the project is to control inventory and remove broken or discarded aerosols from the work areas by setting up an exchange program. The program would require employees to return an empty or damaged aerosol paint cans before being issued new ones. This procedure would first encourage employees to use available spray cans in paint

lockers first and also encourage employees not to leave aerosol cans laying around. The empty or damaged aerosol cans should initially be collected by the Stores personnel. The used aerosols could be stored in a 55-gallon drum or other suitable container adjacent to the new aerosol paints. When the waste containers get full, the waste coordinator should be notified so that they can be taken to the waste storage building for depressurizing and recycling.

The waste coordinator has purchased a depressurizing device to render the aerosol containers non-hazardous. The contents of the aerosols will be collected and disposed as a hazardous waste and the containers will be recycled as scrap metal.

This first phase of the project will allow the waste coordinator to purge all empty or broken cans from the facility and the paint lockers efficiently. It will also allow FPP Stores to place some well needed inventory controls on the product. As the employees adjust to the procedure of returning empty aerosol spray paint cans, the second phase of the project should be introduced.

The second phase involves the setting up of depressurizing stations at satellites near areas of high aerosol spray paint usage. Following set-up, employees who use the paint should be trained how to use the device. The employees can then depressure the paint aerosol cans before exchanging. Once exchanged, the depressurized spray cans can be placed directly into the scrap metal recycling bin without transferring to the waste storage building.

Technical Considerations:

Space is available to set up a bin opposite the current storage area for new aerosol paint cans inside the main storage area. Space is also available to set up depressurizing units near several satellite areas where spray paint usage is high. No new construction is required for this project.

This project primarily involves procedural changes and will not require the installation of utilities.

As the project does involve new procedures some training and education will be required.

This project should improve the overall quality of work at FPP. The house cleaning exercise associated with phase I will create a neater and more efficient work environment. The quality of work should be maintained because method of paint application has not been changed.

The implementation of this project should not stop or slow production. The optimum time to implement this process would be before the next outage or other maintenance activity that may require aerosol spray paints.

Training will be required for all employees which use aerosol paints in their activities. For most employees, the training in the first phase will require more of an explanation. FPP Stores personnel will require some training regarding the exchange procedures and storage of spray cans. The second phase will require employees to be instructed how to operate the depressurizing device. The device is relatively easy to use and will require minimal training. A sign above the unit showing operating procedures should be used to reinforce the initial training and procedures. Aside from this, no new training will be required.

There are no regulatory barriers to the implementation of this project. The implementation of this project will not require any additional permits.

This project should be pursued only after extensive discussion with all groups within the facility that would be affected, including production, maintenance and purchasing. **Maintenance especially should be consulted since it is they who generate most of the waste and it is they who must perform most of the work.**

Some additional labor may be required initially to remove and de-pressurize all waste aerosols in circulation; however, once phase two of the project is implemented a considerable amount of labor savings should be realized. Waste coordinators will not be managing and tracking as much waste.

A similar exchange program already exists at Sim Gideon; however, instead of paint, they exchange Nicad batteries. According to stores at SGP the exchange procedure has reduced their inventory and the amount of batteries requiring disposal. The paint depressuring devices have also been successfully used at the Smithville Railcar Facility.

Since this project involves primarily procedural changes the impact of failure is relatively small. If the project fails the old procedures can be used. The aerosols can continue to be managed and disposed of at a cost \$6.48/lb or they can be depressurized and recycled.

Economic Considerations:

The cost savings of this project relate to the savings in waste management and disposal costs. Additional costs will be realized from the inventory controls and the reduction of raw materials used. Basing calculations on an average of 885 spray cans used per year generating approximately 275 lbs of hazardous waste at a total cost of \$5,451.60 per year. The project will reduce the current hazardous waste generation by an estimated 220 lbs or 80%. The project will require the purchase of three depressurizing devices for a total cost of \$2,100. The annual net disposal and waste management cost savings is estimated at \$3,229.40 per year with a pay back of less than eight months. These figures are conservative and do not include an estimated 10% savings associated with inventory reductions and revenues from the recycling of scrap metal.

Assessment of Risk:

The implementation of this project alleviates several environmental problems such as reduced hazardous waste and reduction of a hazardous materials inventory. The project will also reduce the human health risks at the facility by reducing the circulating inventory of waste materials and the volume of flammable containers stored around the facility.

The new procedures do not pose any new safety problems at the facility. Current storage of full aerosol containers in the stores at FPP is probably more of a safety issue than storing empty aerosol containers prior to depressurization. Depressurization of aerosols at satellite waste storage areas should not be a problem if operated correctly. The units are self contained and can operate in class I areas.

Schedule of Implementation:

The project can be implemented immediately following management approval. One depressurizing unit has already been purchased and is being used at the waste storage building. Two additional units have been requisitioned.

Cases of Medium Transfer:

The proposed project does involve some media transfer during the depressurization phase of the project. During depressurization, VOCs are released through a vent and filter to the atmosphere and liquids are drained into a drum. The vapors from the aerosols are captured in a filter which must be eventually disposed of. The liquid paint waste collected will probably be a characteristically hazardous waste material.

Estimation of Reductions:

The first phase of the project will purge the facility of empty or broken aerosol paint cans which are widespread throughout the facility. The house cleaning activity may initially increase the volume of liquid paint waste generated. Overall reductions of hazardous waste generated from aerosol paint is expected to be 80 percent. Because spray paint aerosols contributes only to 15 percent of the total volume of waste paint containers, the 1993 reported quantity of hazardous waste at FPP will be reduced by approximately 1.5 percent or 0.11 tons.

Incremental Costs and revenues: \$ Per Year

Operating Costs/Revenue Item

Operating Costs:

Decrease (or Increase) in Disposal:	459.55
Decrease (or Increase) in Raw materials:	180.67
Decrease (or Increase) in Utility:	N/A
Decrease (or Increase) in Quality:	
Decrease (or Increase) in Labor:	722.50
Decrease (or Increase) in Supplies:	1745.00
Decrease (or Increase) in Insurance:	
Decrease (or Increase) in Overhead:	310.68

Total Decrease (Increase) in Operating Costs: \$3,417.85

Incremental Revenue:

Revenue from Increased (Decreased) productivity:	
Revenue from Marketable By-products: scrap metal	\$13.75
Total Incremental Revenue:	13.75

TOTALS: \$3,431.60

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