

4.2.1 Garment Cleaning: Dry Cleaning

Case Study #1

BUSINESS: Cottage Cleaners; Forest Lake, Minnesota
WASTE ORIGIN: Dry Cleaning Process
WASTE TYPES: Toxic Cleaning Solvents, Air Emissions of VOCs (Primarily Perchloroethylene), and Lint and Filter Wastes (Tainted with Perchloroethylene)

COMPANY BACKGROUND

Cottage Cleaners is a 10-employee shop providing dry cleaning services to commercial and industrial customers.

MOTIVATION

Growing evidence shows that the primary chemical used in dry cleaning — perchloroethylene, perc or PCE for short — can pose serious contamination risks to customers, workers, and property. Cottage Cleaners also needed to achieve compliance with OSHA and 1990 Clean Air Act Amendments requirements for perc emissions.

STRATEGIES

Reduce perc usage in the cleaning process by replacing older, less efficient dry cleaning equipment

ORIGINAL PROCESS

Cottage Cleaners was losing a large amount of perc from their transfer dry cleaning process. Significant perc loss occurred when clothes were manually transferred from a washing unit to a drying unit. Loss also occurred from leaking gaskets and seals in the older equipment.

NEW PROCESS

The old transfer dry cleaning machines were replaced with a new, more efficient dry-to-dry machine. Washing and drying are done in the same unit, eliminating perc lost from opening doors and moving clothes. The new machine also is entirely programmable for a variety of cleaning needs. No perc is lost through the new machine's seals and gaskets. The new machine's reclaiming unit also recovers more perc for reuse than the old machine.

RESULTS

Waste Reduction

Perchloroethylene use was reduced from 455 gallons/year in 1990, to 38 gallons/year in 1992.

Reduced hazardous waste generated from 750 gallons/year in 1990, to 480 gallons/year in 1992.

Economics

Capital Cost: \$49,000 purchase cost for new dry-to-dry machine.

Operating/Maintenance Cost:

Saved \$2,246 in perc purchase costs in 1992.

Saved \$593 in hazardous waste disposal costs in 1992.

Payback Period: Not available.

HEALTH & SAFETY BENEFITS

Perchloroethylene exposure to employees was greatly reduced while meeting regulatory compliance. Perc is a suspected carcinogen, is moderately toxic by inhalation, is an eye and severe skin irritant, and has shown experimental teratogenic and reproductive effects.

PROBLEMS

Perc releases still occur from the new machine when the lint screen is cleaned and the diatomaceous earth filter is replaced.

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Case Study #2

BUSINESS: Spic and Span, Inc.; Milwaukee, Wisconsin
WASTE ORIGIN: Dry Cleaning Process
WASTE TYPES: Spent Cleaning Chemicals, Petroleum-based Solvents, Volatile Organic Compounds (VOCs) Air Emissions, Lint and Filter Wastes, and Still Bottoms Tainted with VOCs)

COMPANY BACKGROUND

Spic and Span is a retail dry cleaning and commercial laundry service with an industrial uniform and towel rental service.

MOTIVATION

Spic and Span needed to comply with OSHA and 1990 Clean Air Act Amendments requirements for perc emissions.

STRATEGIES

Reduce perc usage in the cleaning process rather than being forced to manage them later. Reduce perc emissions by replacing older, less efficient dry cleaning equipment.

ORIGINAL PROCESS

Spic and Span was losing a large amount of perc from their transfer dry cleaning process. Significant perc loss occurred when damp, solvent-treated clothes were manually transferred from a washing unit to a drying unit. Harmful emissions were also generated from exhausted stack fumes and by leaking gaskets and seals in the older cleaning equipment. The company had to comply with a 120 ton/year emission limit outlined in its operation permit.

NEW PROCESS:

Old transfer dry cleaning machines were replaced with new, efficient self-contained and electronically-controlled machines. Washing and drying are done in the same unit, eliminating perc lost from opening doors and moving clothes. The new machine is fully programmable for various cleaning needs. No perc is lost through the new machine's seals and gaskets.

RESULTS

Waste Reduction

Reduced VOC emissions and still bottoms.

Economics

Capital Cost:

\$700,000 for new equipment and installation, part which was defrayed by selling its VOC credits to a nearby company (see "Problems Encountered" below).

Operating/Maintenance Savings:

\$56,000 annual savings from contracted still bottom disposal.

No significant new O&M costs.

Payback Period: Not available.

HEALTH & SAFETY BENEFITS

Perchloroethylene exposure to employees was greatly reduced, while meeting regulatory compliance. Perc is a suspected carcinogen, is moderately toxic by inhalation, is an eye and severe skin irritant, and has shown experimental teratogenic and reproductive effects.

TECHNOLOGY TRANSFER

The new system includes a built-in refrigerated solvent recovery system that condenses and recovers solvent that would otherwise be lost as stack emissions.

PROBLEMS

The expense was the only major obstacle. Fortunately, Spic and Span took advantage of an emissions credit trading program overseen by the State of Wisconsin. The program assigns a credit value to an emission reduction achieved by a company. A percentage of the credits can be sold to another company not in compliance, or wishes to expand its operations.