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Governor's Pollution Prevention Award, 1997 Recipient **Navistar International Transportation Springfield Assembly Plant**

***Navistar is being recognized for:******reducing toxics in raw materials, which reduced air pollutants by 25% since 1993, saving over \$600,000 a year,******upgrading the plant's cooling system, using non-ozone depleting material and increasing efficiency,******designing engines that already meet 2004 emission standards,******working with suppliers to design reusable containers saving over \$700,000 per year, and******starting a "hardware auction" where employees find uses for obsolete parts in other areas of production.***

The Governor's Awards for Outstanding Achievement in Pollution Prevention have been presented since 1986. Navistar International Transportation, Springfield Assembly Plant (Navistar) was one of seven recipients to receive the award in 1997. These awards recognize outstanding commitments to improve Ohio's environment through pollution prevention. Evaluation criteria for the awards include: the reduction of waste at the source, recycling or recovery of materials, cost-effectiveness, ability of the program to serve as a model for others, and effectiveness in promoting pollution prevention as the preferred long-term approach.

Navistar International Transportation

Navistar International Transportation Corporation manufactures and markets International brand medium and heavy duty trucks, school bus chassis and mid-range diesel engines. The Springfield Assembly Plant includes the finish paint facility and is the main truck manufacturing plant. The finishing plant supplies painted cabs to the Springfield Assembly Plant, the Chatham Assembly Plant in Ontario, Canada, Trailers De Monterrey in Mexico and Severe Service Trucks in Garland, Texas. The Springfield Assembly employs approximately 4,500 Ohioans.

Pollution Prevention Activities

Navistar expanded on existing pollution prevention efforts which had earned them a 1994 Governor's Award for Outstanding Achievement in Pollution Prevention. Air pollutants of all types are down 25% since 1993 and almost 90% since 1989 by reducing or eliminating the toxic constituents from paint, solvent and raw materials. Navistar's efforts included changes in production processes, changes in product design, and employee and community involvement.

Reduction of Hazardous Air Pollutants and Volatile Organic Compounds



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Navistar worked with its primary vendors to reduce Hazardous Air Pollutants (HAPs) and Volatile Organic Compounds (VOCs) by changing the materials used for basecoats, clearcoat and solvents.

Paint Process Improvements

Large paint totes typically left 4 to 5 gallons of residue. Making it possible to tilt the totes allowed more paint to be emptied, saving over 1900 gallons of paint per year. Special cabovers are now painted with side skirts attached. This reduced overspray which is the largest source of wasted paint in the process. This change led to the entire paint process being moved and a more efficient painting system being created.

Spray guns and lines need to be cleaned to change colors. The cleaning wasted paint and solvent during flushing due to differing line lengths. The lines were reconfigured to similar lengths which saved 16,000 gallons of paint and 12,500 gallons of solvent annually.

Employees suggested changes in the use of masking paper, plastic, and tape, decreasing the amount of trash generated. Customers and dealers indicated that the inside of the luggage doors did not need to be painted.

Low-Lead E-Coat

Before 1996, the electrodeposition primer (E-coat) required large

amounts of lead, generating hazardous waste and requiring large amounts of waste water treatment chemicals. A low-lead E-coat was developed jointly by Navistar and their main supplier.

Solvent Replacements

Mineral spirits have been the solvent of choice since elimination of 1,1,1-trichloroethane in 1992. Air permitting requirements, employee attention to safety and the expectation of future restrictions on the use of mineral spirits prompted a search for a new material. This led to the introduction of vegetable oil based cleaner in the engine and axle departments. Concerns over the combustibility of the new material led to the introduction of a water based material that is nonhazardous and retains the cleaning ability of mineral spirits.

The painting process also requires cleaning solvents, many of which were listed hazardous wastes. By December 1996, all solvents with these materials, except one, had been eliminated.

Hardware Auction

When parts in the process or vendors are changed, many parts on hand may become obsolete. They would often be stored, then eventually thrown away. A program was started for "orphan" parts to be auctioned off to departments that could use them.

Diesel Engine Advances

In 1994, Navistar introduced the

electro-hydraulic fuel injection system. Recent innovations include a new fuel injector system called the Slip-Shot. This system burns cleaner and runs quieter. Other innovations include recirculation of exhaust gas and special blended fuels.

Chiller Replacement

In 1994, Navistar's cooling system, including chillers and some of the air handling systems needed to be replaced. The new system cools 50% more efficiently and does not contain an ozone-depleting refrigerant.

Reuse and Recycling

Navistar expanded a program to use returnable containers. Parts which had been delivered in disposable cardboard and wood packaging are now delivered in reusable metal or plastic containers. For parts required in high volumes, Navistar works with vendors to design containers which maximize shipping and storage space while giving rapid access to parts.

Customers often request a specific antifreeze for their trucks. Navistar now changes these fluids before shipment, saving approximately 2000 gallons of antifreeze for reuse at the assembly plant.

Navistar's recycling efforts included 52,000 pounds of oil and anti-freeze, 1,650,000 of cardboard, 4,550,000 pounds of ferrous metals, and 21,500 pounds of plastic drums and caps. Approxi-

Navistar International Springfield Assembly Plant

mately 2400 pounds of aluminum cans were recycled with the proceeds benefiting area Shriner Burn Centers.

Environmental Benefits

In 1993, HAPs emissions totaled 119,222 pounds or 1.62 pounds per unit produced. By 1996, HAPs emissions were down to 40,547 pounds, or 0.55 per unit, a 66% reduction. Changes in clearcoat eliminated HAPs from this process. HAPs in selected basecoats dropped from 0.6 lbs/gallon to 0.01 lbs/gallon.

In 1993, VOC emissions totaled 194 tons or 5.28 pounds per unit. By 1996, emissions totaled 148.17 tons or 4.02 pounds per unit, a reduction of almost 24%. Material substitutions for Toxic Release Inventory chemicals resulted in a 32% reduction since 1993 (from 3.65 lbs/unit to 2.48 lbs/unit).

Development of the low-lead E-coat reduced total lead usage from 5400 pounds in 1995 to less than 5 pounds per year in 1996. 70,000 lbs of solids are now non-hazardous. Also, reusable containers reduced solid waste generation.

Navistar's newest engines meet 2004 emission standards today.

Navistar already has reduced the use of mineral spirits by over 200 gallons per year. Using water based cleaner may eliminate use of mineral spirits altogether.

Over 100,000 pounds of solvent waste is now nonhazardous.

36,000 pounds of hazardous solid waste were replaced by nonhazardous waste.

Reconfiguration of the paint and solvent lines reduced hazardous waste by 230,000 pounds.

Economic Benefits

Most projects were accomplished with little or no capital investment on the part of Navistar. Most were the result of examining materials used, procedures or work habits, and ways they could be changed to eliminate waste.

Improved efficiency in the painting process saved over \$100,000 in paint and labor in 1996. Recovery of residual paint from totes saved over \$50,000 annually.

Reconfiguring the paint and solvent lines saved more than \$500,000 per year. Savings in the use of masking materials were \$25,000. Navistar saved almost \$10,000 by not painting the inside of luggage doors.

Removing lead saved \$25,300 a year. The on-site water treatment plant saves over \$100,000 per year in treatment chemicals.

Advancements in the use of returnable containers have added \$235,000 in savings per year since 1993, and \$730,000 per year since the program's inception in 1989.

Replacement of mineral spirits has cost \$1,200 per year and could cost \$3,300 per year, but it would reduce the need for hazardous

waste permitting. Substitution of solvents that generate nonhazardous waste saved over \$30,000 annually.

The hardware auction saved over \$120,000 worth of inventory that would have been thrown away. Antifreeze recycling saved over \$20,000 per year.

Anticipating future mandates and preparing in advance gives Navistar a competitive advantage over companies that put off process changes.

Health and Safety Benefits

Lead reduction, mineral spirits elimination, and RCRA F-waste substitutions expose the environment, the community, and employees to less risk.

Management Commitment

Managers and employees are active participants in pollution prevention committees and projects. Weekly newsletters encourage employees to find new and novel ways to eliminate waste at the "front of the pipe."

Transferability

Navistar is involved in regional, state, and local pollution prevention outreach activities including:

- ◆ "Environment and You" public service announcements,
- ◆ Cosponsorship of the Clark

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County Earth Day Clean-up,

◆ Sponsorship and supply of technical support for a program for a local school to study the water quality in Ohio rivers, creeks, and streams, and

◆ Navistar employees have given presentations concerning pollution prevention locally and nationally.

Navistar has hosted several industry functions including;

◆ Ohio EPA Pollution Prevention training conference for local businesses,

◆ Truck Manufacturers Association Environmental Management Committee meeting, and

◆ Southwest Ohio Chapter of the Water Environment Federation with a tour of the Assembly Plant and Waste Water Treatment Plant.

For More Information

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This is one in a series of documents Ohio EPA has prepared on pollution prevention. For more information, call the Office of Pollution Prevention at (614) 644-3469.

The Office of Pollution Prevention was created to encourage multi-media pollution prevention activities in Ohio to reduce risk to public health, safety, welfare and the environment. Pollution prevention stresses source reduction and, secondarily, environmentally sound recycling while avoiding cross media transfers. The Office analyzes, develops, and publicizes information related to pollution prevention and increases awareness of pollution prevention opportunities via education, outreach, and technical assistance programs for business, government, and the public.

Office of Pollution Prevention WWW address: www.epa.state.oh.us/opp