Office of Technical Assistance
Executive Office of Environmental Affairs
Commonwealth of Massachusetts

Toxics Use Reduction Case Study

MONOMER STORAGE AND HANDLING IMPROVEMENTS AT NOVACOR CHEMICALS INC.

SUMMARY

The U.S.-based polystyrene division of Novacor Chemicals, Inc. updated the equipment of their monomer storage and handling facility in order to demonstrate the company's environmental awareness and to reduce overall potential liability. This project eliminated the volatile hydrocarbon emissions that previously emanated from the monomer storage tanks, spelling a 50% reduction in the facility's overall emissions. The change also reduced the risks of fire and groundwater contamination, while eliminating the potential liability associated with collapse of the aged tanks previously in use.

BACKGROUND

Novacor is a Canadian corporation whose polystyrene division is based in Leominster, MA, with plants in Springfield, MA, Decatur, AL and Montreal, Quebec, Canada. The 55-employee facility at Indian Orchard in Springfield manufactures plastic pellets which are used to produce molded plastic parts for a wide variety of applications.

TOXICS USE REDUCTION PLANNING

Before 1990, the firm stored monomer - a raw material used in the manufacture of certain plastics - in three 100,000 gallon tanks that had been designed and constructed in 1946. These tanks were not fitted with up-to-date equipment for spill containment and fire protection. The lines into which a flame-retardant foam could be injected in the event of fire were positioned over the top of each tank and had become clogged with polymer formed from hydrocarbon vapors. They had also begun to show signs of declining structural integrity. Earthen dikes protected against gross surface contamination by funneling spills into the soil and groundwater. Lacking the ability to recapture fumes displaced by tank refilling, the tanks emitted approximately 8,800 pounds per year of volatile hydrocarbons. This was more than 50% of the facility's total hydrocarbon emissions.

TOXICS USE REDUCTION MODIFICATIONS

Novacor's insurance company had recommended that the firm update its monomer storage and handling system in order to tighten control over fire and groundwater contamination risks. The firm was further motivated to update these storage tanks because managers believed that such action was consistent with membership in the Chemical Manufacturers Association's Responsible Care Program. As part of the program's codes, pollution prevention is stressed as a means of improving the environment and public health. Managers state that the success of the program has created enthusiasm at corporate headquarters for similar projects which employ equipment

upgrades as a compliance strategy, instead of traditional pollution control.

Novacor's managers considered three alternatives. The first, continuing with the status quo, was rejected because managers concluded that this option was "contrary to corporate environmental and risk management standards." The second option, upgrading the existing storage facility, would have resulted in only marginal improvements in fire protection and spill containment capabilities at a cost of $700,000. The managers elected to replace all three existing tanks with a single 375,000 gallon tank fitted with up-to-date safeguards against fires and spills and with modern equipment for recovering hydrocarbon vapors. Novacor decided that this $995,000 investment was justified because it fit the corporation's environmental policy and risk management standards and because it promised to reduce the firm's potential liability for groundwater and soil contamination.

The new facility has a cooling system which condenses vapors. These vapors are returned to the tank through a vapor recovery return line. Additionally, there is a nitrogen gas blanket which protects the tank and fills the head space of the tank, preventing the monomer from volatilizing.

RESULTS

Reductions Achieved: By providing for the recovery of hydrocarbon vapors in the tank's headspace, the project eliminated hydrocarbon emissions from Novacor's monomer storage system. Novacor now emits 8,800 pounds less per year of hydrocarbon vapors, a reduction of 50% of the facility's total annual hydrocarbon emissions.

Economics: The new system represents a $995,000 capital investment. This investment will not lead to direct and quantifiable reductions in operating costs. However, Novacor's management judged the project worthwhile in part because of other economic effects that are difficult to quantify. In particular, the project promises to reduce Novacor's exposure to liability for soil and groundwater contamination. Moreover, the project anticipates regulatory requirements by taking into account the emissions reduction goals of the Massachusetts Toxics Use Reduction Act.

Advantages: The new storage and handling facility has four major advantages over the old system. Most importantly, hydrocarbon emissions are eliminated. Second, the new tanks offer improved fire and spill protection. The foam injection system is located at the tank bottom and is thus protected from clogging. A concrete dike contains spills while still protecting against soil and groundwater contamination. A false bottom and collection pit in the sub-floor further reduce leak risks. Third, replacing the old tanks has greatly reduced the threat of tank collapse due to lack of structural integrity. And finally, these upgrades place Novacor in a better position to meet future air regulations.

*The **Office of Technical Assistance** (OTA) in the Massachusetts Executive Office of Environmental Affairs facilitates the reduction of toxic chemical use and hazardous waste generation. the Office evaluates statewide needs for toxic use reduction and provides technical information and assistance to users of toxic materials. For further information on this case study and toxics use reduction in general, contact:* ***Office of Technical Assistance, Suite 1904, 100 Cambridge Street, Boston, Massachusetts 02202, (617) 727-3260.***