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Governor's Pollution Prevention Award, 1998 Recipient **BP Oil Company, Toledo Refinery**

BP Oil Company, Toledo Refinery is being recognized for installing flare flow meters to reduce hydrocarbon emissions and the associated air emissions while achieving economic benefits. BP Oil has reduced carbon dioxide and criteria air pollutant emissions by more than 5,500 tons per year, and has saved more than \$4,000 per day in reduced hydrocarbon emissions. BP Oil raised awareness of the importance of pollution prevention.

The Governor's Awards for Outstanding Achievement in Pollution Prevention have been presented since 1986. BP Oil Company was one of seven recipients to receive the Award in 1998. 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 for environmental management.

BP Oil Company, Toledo Refinery

The BP Oil Company, Toledo Refinery is a 160,000 barrel per day oil refinery located on 465 acres near Toledo, Ohio. The Toledo refinery produces motor gasoline, jet fuel, kerosene, aviation fuel, low sulfur diesel fuel, petroleum coke, asphalt, sulfur, LPG, propylene, and carbon dioxide. The refinery has 535 employees.

Pollution Prevention Activities

BP Oil's Toledo refinery was recognized for installing flare flow meters to reduce hydrocarbon emissions and the associated air emissions while achieving economic benefits. Flaring is a process in which excess hydrocarbon vapors are burned, significantly reducing the environmental impact. BP Oil has reduced carbon dioxide and criteria air pollutant emissions by more than 5,500 tons per year, and has saved



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more than \$4,000 per day in reduced hydrocarbon emissions. In addition, BP Oil has raised awareness throughout the refinery on the need to prevent pollution from being generated to reduce the need for flaring.

Flare Flow Meters

The refinery maintains a flare system which provides safety pressure relief for the various process units in the refinery. During start-ups, shutdowns, and routine operations, excess hydrocarbon gases are generated and diverted to the flare system. At the flare stack, the hydrocarbon gases are burned as a method of destruction. As a result, the flares are a major source of hydrocarbon losses. While minimizing flaring was a priority for both environmental and economic reasons, there was no mechanism in place for comprehensively and accurately measuring and identifying sources of hydrocarbon in the flare system prior to 1997.

In an effort to reduce hydrocarbon losses, BP Oil, Toledo Refinery installed flare flow meters on the East Flare and 16 flare feed lines in April 1997. The Refinery can now measure the actual quantity

and determine the source(s) of hydrocarbon being flared. This has enabled them to identify several sources that have remained undetected for some time. By monitoring these sources, refinery personnel are able to control the rate of gases entering the flare system by making operational changes to the source units. This allows the refinery to recover more usable product instead of burning valuable material as a waste at the flare stack. In addition to these benefits, presence of the meters has raised awareness among refinery personnel of the need to reduce flaring.

Environmental Benefits

BP's Chief Executive, John Brown, has committed BP to globally reduce greenhouse gas emissions in order to minimize the impact of their business on global warming. The flare flow meter system allows the refinery to control the amount of gas burned at the flare, thus minimizing the amount of greenhouse gases released. The system has also had a significant impact on reducing other air emissions such as sulfur dioxide, nitrogen oxides, and volatile organic compounds. Toledo

Refinery has realized a reduction of 60 tons of criteria air pollutants and a reduction of over 5,500 tons of carbon dioxide from this new system. In addition, the installation of the flare flow meters has assisted Toledo Refinery in preventing pollution well beyond their pledged 50 percent reduction in TRI releases under the Ohio Prevention First initiative.

Health and Safety Benefits

The entire Refinery flare system is designed to manage excess gases in a safe and environmentally sound manner. However, the most efficient way to manage hydrocarbons is to not flare them at all, but to convert as much as possible to usable product. The new flare flow meter system accomplishes this by identifying sources and measuring the amount of hydrocarbon entering the flare from different sources in the refinery, thus allowing better control and response to flaring events.

The flare flow meter system is designed to reduce the amount of hydrocarbon losses and minimize air emissions. Having the flare metering

BP Oil Company, Toledo Refinery

system in place allows for better control of these emissions, thus minimizing the risk, however small, of employee or community exposure. Additionally, since the visibility of the flares can occasionally cause concern in the community, when flaring is minimized, undue community concern over refinery operations is also reduced.

Ohio Prevention First

BP Oil Company, Toledo Refinery is an active participant in the Ohio Prevention First initiative, which provides an important opportunity for business and industry to take a leadership role in environmental protection without additional regulatory demands.

Management Commitment

Toledo Refinery management commitment to pollution prevention is demonstrated through their Environmental Policy and through active involvement in various programs. Refinery management has committed to achieving ISO 14001 Environmental Management System certification in 1998. Also, on January 1, 1996, BP Oil, Toledo

Refinery initiated the Variable Pay Program which provides incentive for improving financial performance while meeting tough targets on environmental compliance and safety performance, as well as other issues. Employees are financially rewarded based on the ability of the Refinery to meet these targets. Environmental targets for 1998 include NPDES permit compliance, Sulfur Recovery Unit compliance, and Fluid Catalytic Cracker opacity compliance.

The BP Oil, Toledo Refinery has demonstrated continuing outstanding achievement in pollution prevention. Toledo Refinery is a participant in the voluntary Ohio Prevention First initiative at the Industrial Leadership level. The Refinery pledged a 50 percent reduction in actual TRI chemical releases by the year 2000. Toledo Refinery has already significantly surpassed this goal by reducing TRI releases by 74 percent as of reporting year 1996. Also, Toledo Refinery has reduced emissions of volatile organic compounds by 92 percent since 1990.

BP Oil, Toledo Refinery participated in National

Pollution Prevention Week in 1997. To promote employee involvement, all Refinery employees received a letter offering awards for ideas which would reduce or eliminate waste in their work areas. Also, BP Toledo Refinery coordinated a meeting with the Sun Oil, Toledo Refinery and Marathon Oil Co. to share ideas and successes regarding pollution prevention activities. BP Oil also worked with the local media to inform the public of Pollution Prevention Week. The Refinery also highlighted previous successes and promoted future pollution prevention activities.

Transferability

The flare flow meter project has proved very successful. As a result, the Refinery is evaluating options for installing eight additional meters on flare feed lines in the refinery. This would further reduce flare emissions, and provide additional economic benefit. In this respect, the Refinery is meeting BP's commitment to protection of the environment through pollution prevention while maintaining economically justifiable results.

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Every facility that utilizes flare technology could potentially benefit from Toledo Refinery's innovative efforts. The Toledo Refinery shares pollution prevention information such as the flare meter project through active participation in Ohio Prevention First initiative, promoting the importance of pollution prevention and waste minimization during Pollution Prevention Week and throughout the year, and through meetings with other companies to discuss common pollution prevention opportunities.

Economic Benefits

The economic benefits of this project come from the increased ability of the refinery to reduce hydrocarbon losses so as to convert a larger percentage of the crude oil input into usable products. The flare flow meter installation project saves the Toledo Refinery approximately \$4,000 per day in reduced hydrocarbon losses. They have already more than recovered the \$450,000 installation cost.

For More Information

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This is one in a series of documents Ohio EPA has prepared to promote pollution prevention activities in Ohio and integrate pollution prevention into Ohio EPA programs. 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, as a second choice, environmentally sound recycling while avoiding cross media transfers. The Office develops information related to pollution prevention, increases awareness of pollution prevention opportunities, and can offer technical assistance to business, government, and the public.

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