
SUCCESSFUL COMPLIANCE AND ENFORCEMENT APPROACHES

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SUMMARY

This paper reviews successful outcomes of enforcement actions. The US EPA seeks to secure compliance, deterrence, improved management and environmental benefits, including the transfer of innovative technologies across different industrial sectors and the “leveraging” of individual enforcement actions. The approaches highlighted include the use of lists for a universe of violators, targeted initiatives, “big” cases indicative of new and innovative directions in the enforcement program, and the “leveraging” of individual settlements to secure more comprehensive environmental benefits. (1)

1 INTRODUCTION

The primary goal of environmental enforcement is to ensure compliance in order to protect the environment and public health. At the most basic level, therefore, enforcement “success” can be measured by the extent to which the regulated community is, in fact, in compliance with all applicable environmental laws and regulations.

However, despite the central importance of compliance rates and the aggregate level of enforcement activity, they are not, by themselves, the only indicators of a healthy enforcement program. Other measures may indicate whether or not the overall environmental benefits of laws and regulations are being achieved. While a lot has been analyzed and written about the US environmental protection effort, we are still learning about the efficacy of our programs and our concept of environmental “success” continues to be both dynamic and evolving. As EPA’s environmental enforcement program has matured, the concept of “success” itself has also become more complex and multi-faceted. It encompasses not only the concept of high rates of compliance and aggregate numbers of enforcement actions, but also the important, albeit more difficult to measure, concept of environmental results and deterrence.

A historical review of EPA’s enforcement program shows that there is no single enforcement “model” or strategy which guarantees success. Rather, the enforcement process inevitably is influenced by and reflects a number of factors such as the Agency’s method of organization, relationship with States and the regulated community, its resource level and legal authorities, and the types of pollution problems facing the country, as well as the state of available technological and scientific knowledge, at a particular point in time.

Therefore, EPA’s approaches to enforcement have changed and, hopefully, become more sophisticated and successful over time. We still have not learned all the lessons, developed all the answers, nor solved all the problems. However, we have gradually and unmistakably moved from an emphasis solely on assessing penalties, to a “compliance plus” strategy which tries to “leverage” the impact of each individual enforcement action to secure additional deterrence and environmental results. The central features of this new approach are a commitment to risk reduction, pollution prevention and the diffusion and transfer of innovative technology within and across different industrial sectors.

2 EARLY ENFORCEMENT STRATEGY: THE "LIST" APPROACH

2.1 Major source enforcement effort

EPA's early enforcement strategies of the late 1970's and early 1980's involved identifying the total universe of specific sources that needed to be addressed. For example, the Major Source Enforcement Effort (MSEE) focused on a list of specific industries that were major violators of the Clean Air and Clean Water Acts. These industries then became the universe for both Federal and State enforcement action.

The MSEE, which took place from 1977-81, forced major facilities, primarily involving steel mills, power plants, refineries and chemical plants to install air and water pollution control equipment required for initial compliance. (2) Working methodically down the complete list of sources under the MSEE, EPA and the States took 609 enforcement actions involving CWA violations and initiated approximately 400 judicial referrals for CAA violations. When the MSEE was concluded, the "initial compliance" problems for these industries, focused on the installation of wastewater treatment for water sources and scrubbers for air sources, were generally under control. Obviously, this was only accomplished after a significant investment of time resources. (3)

2.2 Significant noncompliance

The "list" approach, with major refinements and adjustments, continued to serve as the Agency's primary enforcement strategy throughout most of the 1980's. The primary theoretical "retooling" took place in 1984 with the formal adaption of the Significant Noncomplier (SNC) concept by all of EPA's compliance programs. SNC lists do not generally single out specific industries. Rather, they are derived from the application of clearly defined national criteria and represent the most serious categories of high priority violations whose progress towards compliance is closely tracked by Agency-wide management systems. The Agency then analyzes the progress made by the Regions, programs, and States in undertaking "timely and appropriate" enforcement responses to the most significant violations, i.e., resolving the violations quickly and with an appropriate civil penalty.

In contrast to the MSEE approach, which, when concluded, signaled an overall drop in EPA enforcement, SNCs represent a dynamic enforcement management tool. (4) As with other list approaches, knowing that they are on the SNC list and that formal enforcement action will be taken against them, sources have gradually become more likely to resolve disputes more quickly.

2.3 The National Municipal Policy

A major application of the refined list approach was the National Municipal Policy (NMP) of the late 1980's. The NMP was designed to secure compliance with specific National Pollution Discharge Elimination System (NPDES) effluent limitations for municipal wastewater treatment plants. Previously, POTWs had been hesitant to install secondary treatment standards without federal funding support. EPA had compounded the problem by continuing to extend the timelines for compliance without taking formal enforcement actions.

Under the NMP, the noncomplying facilities became the object of both State and federal enforcement efforts. By 1987, almost 80% of all NMPs were under an administrative or judicial enforcement action. The results of the NMP were high successful. As the table below indicates, about 70% of the 1,478 subject facilities came into compliance by the July 1988 deadline for achieving required treatment. As of that date, as a result of the initiative, NMP facilities were removing an estimated 2.32 million more pounds/day of conventional pollutants and 15,000 more pounds/day of toxic pollutants. The NMP was ultimately successful because the Agency established a fixed universe of facilities to target and track them on a case-by-case basis until compliance was achieved. (5)

Compliance Status of NMP Facilities (as of July 1988)

	Number	Percentage
Total Major POTWs	3,731	
Not in compliance by 1984	1,478	100%
In compliance by 1988	1,055	71%
On enforceable schedule by 1988	235	16%
Judicial	195	
Administrative	40	
Not on enforceable schedule by 1988	188	13%
Judicial - filed	60	
Judicial - referral, not filed	38	

3 THE NEW APPROACH: MAXIMIZING ENVIRONMENTAL IMPACT

The SNC concept continues to be a major management tool for addressing violations on a single media or programmatic basis. In addition, since 1991, the Agency has used both single and multi-media inspection targeting and case screening procedures designed to identify violations which involve the most significant environmental and health risks, to choose the most appropriate response among administrative, civil judicial and criminal authorities, to assess the opportunity for incorporating innovative auditing and technological approaches as part of the case settlement process, and to publicize these enforcement actions for maximum deterrent impact across the regulated community. (6) These targeting, screening, and case development and management procedures are yielding an expanding universe of enforcement actions for which the Agency attempts to include pollution prevention/waste minimization conditions as part of the final case resolution.

3.1 National enforcement initiatives

As part of its multi-media, risk-based strategy, EPA began conducting annual national "targeted" enforcement initiatives in the late 1980's. As distinguished from the "list" approach discussed above, initiatives usually target a specific subset of a regulatory class or environmental problem which the Agency wants to emphasize both for its environmental and deterrence impact. The broader coverage provided by the multi-media enforcement strategy is more effective in addressing noncompliance and deterring future violations. The object of these initiatives have included specific pollutants, industries and sensitive geographic zones which present national risks to human health and the environment. (7)

For example, in 1992, the Agency filed nine benzene cases, prosecuted 24 lead cases, and filed 64 cases against the primary metals, pulp and paper and industrial organic chemical industries. EPA chose these three industries from among more than twenty industries both because of their history of significant noncompliance across several environmental laws and high ranking in terms of total and average pounds of toxic material released per facility have been major emitters of toxic pollutants. (8)

EPA also has implemented program-specific national initiatives, whose focus often is maintaining the integrity of its regulatory structure. In one example, the Agency successfully launched an "illegal operators" initiative which targeted hazardous waste handlers who, by virtue of their failure to identify themselves under the Resource Conservation and Recovery Act (RCRA), did not lawfully handle, store, or dispose of hazardous wastes. (9) Similarly, the Agency has conducted Data Integrity/Data Quality initiatives focused principally on non-reporters and false reports of data that are required under national and delegated programs. The goal of these initiatives is to send a positive,

consistent message to the regulated community to the importance to EPA and the states of obtaining accurate and complete data to determine compliance and to assess environmental progress.

3.2 THE TSCA Compliance Audit Program

A notable example of a successful program-specific data quality/data integrity initiative is the Toxic Substances Control Act (TSCA) Section 8(e) Compliance Audit Program (CAP). (10) That Act gives EPA the responsibility of performing chemical risk assessments, for which the Agency needs accurate, comprehensive, and up-to-date hazard and exposure data to meet that task. In the past, however, the Agency believed that many companies had been slow to report chemical data concerning potentially serious health effects. This was undermining the "early warning" system which TSCA section 8(e) was meant to create.

To address this concern, EPA launched a TSCA section 8(e) Outreach and Enforcement Initiative in late 1989. The EPA began by issuing over 700 letters to corporations stressing the importance of data reporting, followed quickly by the filing of several administrative complaints and notices of noncompliance against individual companies. After getting the industry's "attention," Agency representatives met with industry leaders to discuss TSCA section 8(e) issues and potential releases from liability. The CAP program developed from these meetings.

The CAP consisted of a one-time voluntary audit program which gave industry a "window" to comply with the data requirements of TSCA section 8(e). A two-phased reporting schedule was established: most health effects and aquatic toxicity information was received by the end of FY 1992 and information on the release of chemical substances to and detection of chemicals in the environment will likely begin to be submitted to the Agency later in 1994. The Agency identified "up front" its enforcement response and allowed companies to assess their liability prior to electing to participate. Stipulated penalties are assessed for each study submitted under the CAP with an overall penalty ceiling of one million dollars per company. Non-participants were warned that EPA would actively peruse violations through enforcement efforts.

While the CAP program is not complete, the Agency views it preliminarily as an enforcement and compliance success. More than 120 companies with more than 1,000 facilities have participated in the CAP to date. They range from large and small chemical companies to petroleum, aerospace and electronics firms. Industry's awareness of section 8(e) reporting requirements has been heightened, and overall compliance improved. Over 10,000 health effects and/or aquatic toxicity studies have been submitted under the CAP, and total stipulated penalty could range from \$10-20 Million.

The CAP program is a good example of how the government can use corporate auditing to leverage its compliance efforts across several industries at once. The information gained under the CAP also is currently being used for EPA risk assessment and priority setting activities. Given its success, it may provide a good model for other EPA programs interested in innovative compliance promotion and enforcement strategies to enhance their own data quality requirements.

3.3 Innovative injunctive relief

Occasionally, a single enforcement action provides an important opportunity to suggest new directions. In the 1970's, EPA's actions against the Reserve Mining Company offered such an opportunity to demonstrate the Agency's enforcement resolve. (11) It involved complex environmental contamination of Lake Superior over a number of years. Millions of dollars were at stake and Agency staff were pitted against highly skilled private counsel. The Agency saw this as a landmark case it could not afford to lose. It focused a substantial portion of its limited resources to show that the government meant business and would see it through to resolution.

More recently, we have been able to use several "big cases" to promote innovative technologies and management practices to maximize environmental benefits.

3.3.1 Louisiana Pacific: Innovative pollution prevention

The Agency looks for opportunities to secure pollution prevention as injunctive relief, especially when this approach could best eliminate recurring patterns of violations which are unlikely to be corrected by additional "add on" controls or improved operations and maintenance, and where elimination or substitution offers the best prospects for the permanent return to compliance.

In another case settled as part of the pulp and paper initiative, Louisiana Pacific, a manufacturer of bleached kraft pulp, settled violations of Clean Water Act NPDES effluent limits by totally eliminating the use of chlorine in pulp bleaching [U.S. v. Louisiana Pacific Corporation, 78-0567 MHP (N.D. CA)]. The mill will eliminate the use of both elemental chlorine and chlorine dioxide through a new process which bleaches pulp with hydrogen peroxide and oxygen. (12) As part of the conversion process, bleach plant wastewater also will be recycled with the organic materials (BOD) in the bleach plant effluent recovered from the wastewater stream and burned for energy in the recovery boiler. Under the terms of the consent decree, the project must be completed by September 1995. This settlement stands as a major example of true innovation, i.e., the first time we will see "100%" commercial use of a new technology within a specific industry.

3.3.2 Louisiana Pacific: Transferring innovative technology across industries

Occasionally, an enforcement action can result in the transfer of "state of the art" technology from one industry to another. EPA secured this type of innovative relief in a second case involving the Louisiana Pacific company [U.S. v. Louisiana Pacific Corporation, NO 93-0869 (W.D. La)].

Here, the government uncovered evidence that Louisiana Pacific had failed to apply for required Clean Air Act permits and provided incomplete or low estimates on air emissions at 11 of its oriented strand board (ORB) and medium density fiberboard (MD) facilities located in nine states. As a result of the company's failure to report all its air emissions of VOC, PM and CO comprehensively, neither the Federal nor state governments would or could accurately know the level of air quality deterioration in the vicinity of the plants. In addition, Louisiana Pacific avoided installing pollution control equipment that would have been required to prevent the significant deterioration of air quality in an attainment area. (13)

In settling the case, Louisiana Pacific paid an \$11 million penalty, the largest Clean Air penalty in the Agency's history. In addition, the Company is implementing an extensive Clean Air Act compliance program, including obtaining all necessary air permits and complying with all necessary requirements and regulations. In a major, innovative aspect of the settlement, EPA and the Department of Justice (DOJ) convinced Louisiana Pacific to install a pollution control system based on regenerative thermal oxidation (RTO) technology to control VOC and particulate matter from oil heaters and boilers, dryers and presses. While RTO technology has been used in other manufacturing sectors—principally in the printing and graphics industries to control emissions from solvent-based inks—it had not been applied to the wood products industry. The Federal government believed that this technology was applicable to this sector. As part of the case resolution, we insisted that the company agree to install RTO at the appropriate facilities.

Under the terms of the consent decree, the RTO technology must achieve a removal efficiency of 90% of VOCs and 95% for particulate matter. The estimated cost of installing this technology at the 11 subject facilities is \$70 million. The RTO technology has been tried out on a pilot basis at several facilities and has exceeded expectations, reducing VOC emissions by 98% instead of the 90% required in the settlement. This results in additional benefits for the company, since reducing the extra amount of pollution enables a facility to increase production. In addition, some facilities might be able to operate in the future as "minor" sources which involve less state and federal regulation. Other American wood product manufacturers have taken note of the success of the RTO technology and are beginning to adapt it for use in their own OSB and MDF facilities, thereby accelerating its diffusion throughout the industry.

In addition to technology transfer, the Louisiana Pacific settlement also served the purpose of alerting the wood products industry about the obligation to completely and accurately report emissions data to EPA and the States. Once companies realized that the Federal government took these reporting violations seriously, they began to conduct their own internal audits and correct violations that they discovered. The deterrence impact of the case was substantial throughout the industry.

Overall, the settlement was a "win-win" success for both EPA and Louisiana Pacific—the government was able to transfer innovative technology into a new industrial sector and leveraged the deterrent impact throughout the wood products industry. Louisiana Pacific will be able to operate its facilities more efficiently and productively, while implementing a new technology which increases its prospects for remaining in compliance in the future.

3.3.3 United Technologies: Leveraging the impact of a Settlement through multi-facility environmental audits

EPA's general case settlement strategy involves looking for opportunities to maximize the "leverage" or impact of individual cases, either by securing "extra" reductions in overall emissions at a violating facility or to extend the provisions of the settlement to more than the single facility—or facilities—in violation.

One major tool used by EPA to secure additional environmental improvements is the multi-media, multi-facility environmental audit. This approach was successfully applied in the civil action against United Technologies Corporation (UTC). [U.S. v. United Technologies Corporation, No. H-90-715 (JAC)].

UTC, through its subsidiaries and divisions is a major government contractor of high technology products, including jet engines and environmental controls, and helicopters. EPA filed a civil suit charging the Company with over 150 RCRA violations, including: improper hazardous waste container management, storage of hazardous waste without a permit; inadequate groundwater monitoring and waste analysis plans). In addition, the State of Connecticut charged the Company with Clean Water Act (multiple discharges from its facilities into three different rivers in violation of NPDES effluent permit limits, as well as spills).

The large number of violations across several media indicated that the Company lacked the senior management controls necessary to ensure that environmental requirements were being given priority attention. Therefore, in addition to a total federal civil penalty of \$4.25 million and another \$1.05 million State penalty, (14) the consent decree also requires UTC to implement an extensive multi-media environmental audit at all 26 of its facilities located in the Northeast portion of the United States. This is among the most extensive environmental audits ever agreed to in an EPA enforcement action.

The settlement requires both a management audit and a compliance audit. The first feature is an audit of UTC's environmental management systems and programs. UTC must hire a consultant to audit all of its business units in order to assess the company's ability to comply with all federal environmental laws. The consultant will then develop a set of recommendations concerning how UTC can improve its management systems in order to ensure environmental compliance and outline, for any existing systems for which no changes are recommended, how the current systems are adequate to ensure compliance. Based upon the consultant's recommendations, UTC must then submit a Management System Improvement Plan (MSIP) to EPA. The MSIP will describe all the actions the Company has taken or plans to take to address the recommendations made by the consultant. (15) UTC must implement the MSIP, and the consultant will visit each facility to determine if the recommendations are, indeed, being carried out.

The settlement also requires UTC to hire an audit firm to conduct multi-media environmental audits at the subject facilities, after the management audit is finished and the MSIP has been implemented. First, the audit firm will inspect each facility (which includes observing actual operations and sampling and testing waste or process streams as necessary) and review all facility records related to environmental compliance. Next, the audit firm will issue a compliance audit report for each facility, setting forth each potential violation of any environmental laws that may have occurred since the submission of

the MSIP. After the submission of the compliance audit reports, EPA and UTC will negotiate a penalty for the violations cited. If the parties are unable to reach an agreement on the penalties, the matter will be submitted to the Court. In addition, UTC will be required to correct all violations with a 60-day period (or longer, if both parties agree to an extended compliance schedule for particular violations). The audit firm will ensure that all violations are corrected.

UTC also will be required to conduct additional audits on an annual basis for three years. After each annual audit, UTC will submit to EPA a report addressing the specific violations discovered and explaining how the violations will be avoided in the future. While not explicitly covered in the consent decree, by implementing the requirements of the Court order, the Company will probably reduce the likelihood of future enforcement and assessment of subsequent penalties. Supplemental Environmental Projects (SEPs) incorporated in the judgement, in turn provide an additional opportunity for the government to improve environmental outcomes through the original action. (16)

3.3.4 Dexter Corporation: Combining civil and criminal liabilities

Occasionally, there may be an opportunity for bringing several enforcement tools and authorities to bear to achieve a comprehensive injunctive relief. One of the most significant settlements under the pulp and paper initiative involved the Dexter Corporation, a major specialty paper producer [U.S. and State of Connecticut v. Dexter Corporation, H-89-393 (AHN)]. A "global settlement" which encompassed both civil and criminal enforcement actions, Dexter agreed to pay more than \$13 million in criminal fines and civil penalties for violations of both the Clean Water Act and the Resource Conservation and Recovery Act. In addition, the consent decree requires the company to install equipment to treat both toxic and non-toxic pollutants, prepare a spill prevention plan, and to perform extra monitoring. The company also had to cleanup hazardous waste areas at the facility and perform a multi-facility environmental compliance audit.

4 SECURING "EXTRA" ENVIRONMENTAL RELIEF THROUGH SUPPLEMENTAL ENVIRONMENTAL PROJECTS (SEPs) IN ENFORCEMENT SETTLEMENTS

So far, this paper has tended to emphasize the success that can be developed through single, complex, resource intensive cases which involve significant injunctive relief or innovative technology. However, the aggregate environmental benefits that can be secured through the "leveraging" of many smaller cases also can be significant.

When settling a case, EPA policy requires the imposition of an appropriate civil penalty. EPA's penalty policies circumscribe the government's overall discretion, but provide some flexibility to reduce the amount of a civil penalty in exchange for the defendant's promise to clean up the environment beyond what the government could have forced it to do as injunctive relief. (17) EPA generally secures these "extra" environmental benefits as "Supplemental Environmental Projects" (SEPs). SEPs do not correct the violation itself (i.e., they are not injunctive relief) but are included in the consent order or decree because of the extra environmental benefits they provide beyond the return to compliance. When carefully crafted and implemented, SEPs improve the injured environment or reduce the total risk burden posed to the public health or environment and can also push the development of new pollution control technology applicable to other sources and source categories. (18)

4.1 Categories of SEPs

4.1.1 Pollution prevention

A pollution prevention project substantially reduces or prevents the generation or creation of pollutants through use reduction (i.e., by changing industrial processes, or by substituting different fuels or materials) or through application of closed-loop processes.

4.1.2 Pollution reduction

A pollution reduction project is defined as a project which goes substantially beyond compliance with discharge limitations to further reduce the amount of pollution that would otherwise be discharged into the environment, e.g., one that reduces the discharge of pollutants through more effective end-of-pipe or stack removal technologies.

4.1.3 Environmental restoration

An environmental restoration project is defined as a project that not only repairs the damage done to the environment because of the violation, but which goes beyond repair to enhance the environment in the vicinity of the violating facility.

4.1.4 Environmental auditing

Environmental Auditing projects identify and correct existing management and/or environmental practices whose deficiencies appear to be contributing to recurring or potential violations. These other potential violations may exist not only at the violating facility, but at other facilities owned and operated by the defendant/respondent.

4.1.5 Public awareness projects

Public Awareness Projects are publications, broadcasts or seminars which underscore for the regulated community the importance of complying with environmental laws or disseminate technical information about the means of complying with environmental laws.

4.1.6 Aid to local emergency planning organizations

Defendants can give computers, hazardous material response equipment and other types of support to Local Emergency Planning Organizations, which are established under the Emergency Planning and Community Right to Know Act (EPCRA).

The table printed below provides summary information on SEPs negotiated by the Agency for FY 1992. Together, 80% of all SEPs negotiated involved Pollution Reduction and Pollution Prevention. The remaining 20% were distributed among Environmental Auditing, support for Local Emergency Planning Committees, and Environmental Restoration, and Public Awareness projects. Taken Together, Pollution Prevention and Pollution Reduction SEPs had an estimated dollar value of almost \$15.7M (31%) and Pollution Reduction SEPs had an estimated dollar value of over \$29.7M (59%).

Supplemental Environmental Projects by Type and Value

Type Sep	No.	(%)	\$ Value	(%)
Pollution reduction	115	(52%)	\$ 29.7M	(59%)
Pollution prevention	62	(28%)	\$ 15.7M	(31%)
Environmental audit	19	(09%)	\$ 3.0M	(06%)
Public awareness	12	(05%)	\$.5M	(01%)
Aid to LEPCs/SERCs	10	(04%)	\$.1M	(<1%)
Environmental restoration	4	(02%)	\$ 1.1M	(02%)
Total seps in FY 1992	222			

4.2 Pollution prevention: Most preferred type of SEP

The Executive Branch is limited in its authority to impose unilaterally in an enforcement action specific pollution prevention technologies or methodologies in the absence of an enforceable requirement which mandates such an approach. In many instances, the regulated facility is charged with choosing the method of compliance with environmental requirements, i.e., either an innovative source reduction methodology or a more traditional "end of pipe" approach. Meeting the performance standard articulated in the order, however, is non-negotiable. The burden clearly falls on the violator to meet the articulated goal, even if new unproven technology is chosen.

SEPs that contain pollution prevention conditions are the type most preferred by the Agency, because of the permanent environmental benefits of source reduction. We encourage federal government negotiators to incorporate pollution prevention conditions in both single and multi-media settlements when feasible. General examples of pollution prevention activities included in SEPs include: product change (e.g., manufacturing water-based inks instead of solvent-based ones); process change (e.g., using non-hazardous input chemicals, changing to mechanical stripping or cleaning devices to avoid solvent use); and improved operating practices (e.g., segregating waste streams to avoid cross-contaminating hazardous and non-hazardous materials).

The specific types of source reduction activities contained in the Pollution Prevention SEPs negotiated by EPA in FY 1992 were: Input Chemical Substitution (34%), Closed-Loop Recycling (22%), New Equipment (18%), and Process Change (25%), along with partial estimates of the environmental impact of the SEPs (e.g., the amount of high toxic solvents replaced with lower toxic solvents, the reduction pollutant loadings (either emissions or discharges, etc.)). The following table provides some information on the known reductions secured through pollution prevention SEPs.

Chemicals in Pollution Prevention SEPs:
Approximate Amount Reduced/Eliminated

1,1,1 TCE	186,400 lbs/yr
Toulene	87,300 lbs/yr
MEK	30,000 lbs/yr
Xylene	32,855 lbs/yr
Sulfuric acid	8,850 lbs/yr
Freon	8,730 gall/yr
Acetone	250,000 lbs/yr
VOCs	8,500 lbs/yr
Ammonia	1,500,000 lbs/yr

4.3 Diffusion of pollution prevention technology through SEPs: The metal finishing industry

SEPs can provide important environmental benefits within particular industries. For example, many of the processes used by metal products manufacturers can yield environmentally problematical residual by-products, (e.g., metal plating, painting and degreasing). As a result, they have been the object of significant regulation and enforcement by EPA. The industry profile is that of a large number of smaller facilities, rather than concentration within a few large firms. Therefore, the environmental benefits secured by pollution prevention efforts in this area often result less from technological innovation in a few "big" cases, than from the diffusion of technology—primarily the substitution of solvent-based cleaning systems by aqueous or mechanical cleaning systems—throughout many smaller cases.

In one recent case, the EPA and a company which manufactures engineered pump components from metal and ceramic materials using machining and lapping equipment, failed to file required data on phosphoric acid, 1,1,1, trichloroethane (TCE), xylene, and methyl ethyl ketone under EPCRA Section 313 (42 U.S. Code 11023). The company traditionally used TCE solvent immersion cleaning units for the majority of both in-process and final cleaning operations. As part of the case resolution, the company performed a SEP which consisted of changes to the company's parts cleaning system to retrofit a TCE degreaser used on non-metal lapped parts to reduce solvent use and emissions. This approach was designed to reduce the amount of TCE used by 130,000 lbs/year for that facility alone. The company also purchased, installed and tested equipment to switch from solvent to semi-aqueous-based cleaning of ferrous and non-ferrous metal parts. The company spent approximately \$201K on the SEP.

In another SEP, a company manufacturing solid cast brass nuts and bolts and chrome plated tubular plumbing supplies violated several RCRA requirements, including failure to close hazardous waste storage containers of oil and alkaline solutions and chromic acid, and failure to label hazardous waste containers of lead contaminated polishing dust, mixed oil and alkaline solutions, and chromic acid. The company proposed a multi-part SEP to modify the automatic plating line and to collect polishing dust more effectively. To reduce the polishing dust waste, the company replaced the existing nickel tank with a longer tank. The tank, along with a longer part cycle time, is designed to improve the surface finish of the part so that a larger percentage of parts do not need polishing to achieve satisfactory chrome plating. The reduction in polishing is designed to reduce the generation of dust by 65-85%. To reduce the generation of metal hydroxide sludge, the company proposed to convert the chrome bath from hexavalent chromium to less toxic trivalent chromium. It projected this change to reduce the proportion of solids in the waste stream by 33% and reduce metal hydroxide sludge generation by 5,500 gallons/year. The switch to trivalent chromium also eliminated approximately 330 gallons of chromic acid annually during the cleanup and disposal of the chrome plating tank. The estimated cost of the SEP is \$170K.

5 CONCLUSION

As the Agency's regulatory responsibilities grow, vigilant enforcement is essential to its success in protecting human health and the environment. The strategies, techniques, and approaches which we will use to achieve and evaluate success also will continue to change. (19) The Agency's increasing emphasis on risk based, multi-media targeting and the use of the enforcement process to promote innovative technologies will continue to present both a challenge and an opportunity. The challenge will be to maintain this high level of success in enforcement while enhancing the use of these technologies by the regulated community. The opportunity recognizes that these approaches are an integral component of the innovative, environmental results-based and multi-media oriented enforcement approach which the Agency will continue to use in the future.

REFERENCES/ENDNOTES

1. The authors would like to thank Amelia Katzen of EPA's Region I Office of Regional Council, and Julie Domike and Andrew Cherry of EPA Headquarters Office of Enforcement and Compliance Assurance for their contributions to this paper.
2. "Improving the Efficiency and Effectiveness of Compliance Monitoring and Enforcement of Environmental Policies," Cheryl Wasserman. Prepared for the Organization for Economic Cooperation and Development, 1987.
3. See Wasserman, VI-14

4. Wasserman, VI-16
5. See case study of the National Municipal Policy in the Principles of Environmental Enforcement, EPA/300-F-93-001
6. The Agency's enforcement targeting and case screening procedures are fully described in EPA's Enforcement Four-Year Strategic Plan, issued July, 1992, and Regional Enforcement Management: Enhanced Regional Case Screening, December 3, 1990.
7. Lynn Peterson's paper will describe in detail the geographic initiative targeting the Great Lakes. Bob Van Heuvelen's paper will discuss the mechanics of developing and implementing national enforcement initiatives.
8. EPA collects annual data on toxic chemical releases under section 313 of the Emergency Planning and Community-Right-to Know Act (EPCRA).
9. One of the goals of the "illegal operators" initiative was to create a public enforcement presence for deterrence. This goal appears to have been met. Subsequent reporting by the regulated community has been higher as a result of the initiative. And although there is no statistical data to indicate that these compliance rates rose specifically as a result of the initiative, the general perception on the part of the regulated community was that the Agency's publicizing of this initiative had an obvious deterrent impact.
10. TSCA section 8(e) (15 U.S. Code 2601) requirements apply to any person who manufactures, imports, processes or distributes a chemical substance or mixture and who obtains "new" information that supports a conclusion that such substances or mixtures present a substantial risk of injury to health or the environment. This information must be submitted promptly to EPA for further review.
11. EPA sued the Reserve Mining Company for dumping taconite iron ore tailings in Lake Superior, producing an asbestos fibers health hazard in the land and water.
12. This approach is known as totally chlorine free (TCF).
13. Under the Clean Air Act, companies located in attainment areas are limited in the amount of additional pollution they can emit.
14. \$3.7 Million of the total penalty is for federal RCRA violations, the largest RCRA civil penalty ever assessed by EPA.
15. The MISP must address each specific recommendation and provide a rationale and justification for the actions UTC will take to address any problems identified.
16. See section 4 for a more detailed discussion of SEPs.
17. See "General Framework for the Assessment of Civil Penalties," August 24, 1984. Penalties consist of 2 components: A "gravity-based" factor, which represents the seriousness of the violation, and the "economic benefit" factor, which represents the amount of money the violator saved as a result of his noncompliance. The size of the final penalty must, at a minimum, reflect the economic benefit of the violation.

18. "Policy on the Use of Supplemental Environmental Projects in Enforcement Settlements," February 12, 1991. Currently, the Agency negotiates six categories of SEPs: pollution prevention, pollution reduction, environmental restoration, environmental auditing, public awareness projects, and support to Local Emergency Planning Committees under the Emergency Planning and Community Right to Know Act (EPCRA). Pollution prevention SEPs are the Agency's most preferred category of SEPs.

The SEP Policy requires that the settlement include a cash penalty which captures the economic benefit of non-compliance plus a portion of the gravity component. SEPs may be negotiated in exchange for a reduction in the size of the assessed penalty, although the amount of that reduction will generally not fall below the economic benefit of noncompliance. Similarly, the Agency normally seeks at least a 2:1 penalty mitigation ratio (i.e., the defendant spends at least \$2 on the SEP for every \$1 the penalty is reduced).

19. Administrator Browner's recent reorganization of the new Office of Enforcement and Compliance Assurance will result in a more integrated enforcement program which will promote the expanded use of many of the approaches described in this paper.

The principles underlying the reorganization include measuring enforcement success through improvement in compliance rates and environmental results, rather than through an exclusive reliance on the "number" of enforcement actions, as well as instituting a "multi media," and "whole facility" compliance and enforcement approach organized around major sectors of the economy. This approach will result in more "particularized" sector expertise within the Agency, which will enhance the use of pollution prevention and other innovative techniques in the enforcement program.