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VISTA

September 16, 1991

Ms. Patty Dillion
Senior Research Analyst
Tufts University
Curtis Hall
475 Boston Avenue
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Dear Patty:

Below are my comments on the Corporate Environmental Management: Methods and Motivations Report. I've also attached an annotated copy of the report as most of my comments reference an underlined sentence on a particular page.

In general, I believe the report is a good one in terms of approach and data collection. The conclusions are consistent with my experience. I would add that in addition to corporate culture, individual locations within a company often have distinct cultures and leadership factors that influence environmental performance.

1. On Page 3, 1st paragraph, the description: "environmental manager" and "environmental director" are used. These words have varying significance in different companies. I'd suggest you stick with a description of the position or be consistent between "manager" and "director" word use.
2. I have some problem with your use of "good" and "bad" actor descriptions at the bottom of Page 5. This implies "character" versus the performance facts. This probably isn't fair or truly descriptive of the company.
3. The underlined statement on Page 17 adds nothing to the report, and I'd suggest deleting it.
4. On Page 18, it appears the underlined statement should be corrected to state ".... falsifying discharge reports, or amounts....", not permit requirements.
5. The underlined statement on Page 32 is, in my opinion, too strong and unfair. Depending on the time period of hire, location of the plant and other factors experienced, trained individuals are extremely difficult to recruit. This could be as much of a problem as commitment.

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Dillion Letter
September 16, 1991
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6. The underlined statement on Page 50 seems a little nonsensical. I'm not sure it adds anything to the report.
7. The significance of the underlined statement on Page 52 isn't clear to me. Does this mean the program wasn't functioning, wasn't in place long enough to have an impact, etc.?
8. Is the underlined statement on Page 58 a result of the research or the independent opinion of the researchers? As written, it appears to be an opinion. If so, it probably should be stated as such.
9. On Page 65, increased staffing levels are mentioned as a way to improve program. In general, increasing staff is a sensitive issue unless clearly indicated or justified on a case by case basis. I don't see much in the report that points to increased staffing, assuming some staff exists, improving environmental performance. You may want to consider rephrasing or restating this conclusion.
10. It is not clear to me what the 1st sentence before the bullet points on Page 65 means.
11. In regards to your conclusions under regulatory policy and economic considerations, I believe you must consider positive economic incentives as well as negative or deterrent type incentives. These could include tax breaks, etc. for performance above regulatory requirements, but positive incentives will motivate companies to perform.

When environmental expenditures can be shown to have direct positive dollar benefits, those beyond the societal and compliance issues, they are more likely to occur.

12. I suggest, based on your research, that you add another recommendation under education. Consistent with the need to integrate environmental issues into evening day business and operational practices, we must also begin to educate our future scientists and engineers early in the cycle, particularly college, to cause this to happen.
13. I believe the last research recommendation, a case study, is pretty unrealistic.

Please call me at 713-588-3445 if you have questions on my comments.

Sincerely,

Tom Grumbles

Thomas G. Grumbles, C.I.H.
Manager Environmental Affairs

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dlj

**DRAFT FINAL REPORT
DO NOT COPY, QUOTE, OR CIRCULATE**

**Environmental Management in Corporations:
Methods and Motivations**

by

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August 8, 1991

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Acknowledgements

This project, from conception to implementation, was a cooperative effort between the researchers at the Center for Environmental Management and Mr. James Hayes of the U.S. Environmental Protection Agency. The authors express their sincere thanks to Jim and his colleagues for their guidance throughout the project. We wish to thank the company representatives who generously provided their insights into the attitudes and operations of their companies and who devoted time to respond to our questionnaire and to participate in interviews. We would also like to acknowledge the contributions of the many Center staff members for their moral and substantive support for this project, including Anthony Cortese, William Moomaw, Margaret Fresher, Ann Rappaport, Betsy Ruffle, and Sarah Creighton. Graduate research assistants were vital to our efforts. We thank Linda Stein for her assistance in data collection and Mary Ellen Schloss for her thoughtful commentary on early drafts of the report. Finally, we thank _____ for their comments on the draft final report.

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The Center for Environmental Management

The Center for Environmental Management (CEM) at Tufts University was established in 1984 to develop an effective multidisciplinary approach to environmental problems through innovative health effects and technology research, policy analysis, education programs, and information transfer activities. CEM also acts as a neutral and independent forum center where citizens and representatives from government, academia, industry, and public interest/environmental groups can meet to discuss and resolve critical policy issues. The Center's activities are performed by a staff of scientists, engineers, policy analysts, and numerous faculty from the many schools and resource centers of Tufts University. The Center also sponsors research at other universities. Funding for the Center's projects is derived from state and federal grants, awards from foundations, and contributions from industry to the Center's Corporate Affiliates Program. Further information on the enclosed report or the activities and publications of the Center can be obtained by writing to The Center for Environmental Management, Tufts University, Curtis Hall, 474 Boston Avenue, Medford, Massachusetts 02155 or by calling the Center at 617/381-3486.

Although the information in this document has been funded wholly or in part by the United States Environmental Protection Agency under assistance agreement CR813481 to the Center for Environmental Management at Tufts University, it may not necessarily reflect the views of the Agency and no official endorsement should be inferred.

ABSTRACT

Environmental Management in Corporations: Methods and Motivations

This project studies private sector environmental management. What distinguishes companies that comply with environmental regulations and go beyond to reduce environmental risks from companies that do not? What are the differences in their responses to environmental risks and regulations? Initiated and planned cooperatively by the Center's research staff and the Regulatory Innovations Staff, U.S. EPA, the report attempts to answer these basic questions by creating an understanding of the methods and motivations of private companies in regulatory compliance and environmental risk reduction. The research uses a case-study approach to analyze environmental management programs of 15 chemical manufacturers which vary in size, location, and environmental record and reputation. The audience for the report includes government, private business, and any others interested in how and why companies manage environmental risks.

The report contributes to environmental policy development in three ways:

- 1.) **Methods:** The researchers developed an index of environmental performance called Environmental Record and Reputation.
- 2.) **Findings:** The report delineates key elements of environmental management programs such as the importance of top management support and leadership, environmental policies, management controls, and communications; and analyzes attendant motivations such as considerations of costs, liabilities and survival, sense of social responsibility and consumer reputation, and company culture and values. The report presents a model that describes these methods and motivations as internal or external and abstract or concrete.
- 3.) **Conclusions and Recommendations:** The report makes recommendations in three areas: regulatory agencies could focus on a variety of pressure points or motivations that influence company behavior such as costs or incorporating management controls into regulatory strategies; promotion of educational programs for operating personnel and leaders or improving regulators' knowledge of business motivations and operations; the need for further research in refining the index of environmental performance, studying a larger number of companies in differing industries, and studying small companies and facilities.

Foreword

[to be written by Bill Moomaw]

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**What Motivates Companies
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CHAPTER 1

INTRODUCTION

Over the past twenty years, command-and-control regulations have been used as the principle tools by government for improving environmental quality. Industry has been the major focus of much of this regulation which has treated companies as monolithic entities motivated by short-term gains. Little attention has been paid to factors that influence an organization's behavior, how companies respond to environmental issues or deal with ever-changing regulations, or how such corporate actions affect environmental performance. Achieving society's goals of environmental quality will require an understanding of the forces which motivate corporations and the mechanisms through which they enact change. Equipped with this understanding, policy makers and regulators can better develop alternative strategies for achieving and exceeding compliance and encouraging environmentally responsible behavior.

Research on corporate environmental management systems or the motivations for company practices has been minimal. The pollution control regulations in the early 1970s prompted examination of companies' organizational response.¹ More recently, separate components of an environmental management effort such as environmental policies, planning, and audits have been analyzed.² Descriptions of individual company programs appear in the literature.³ In addition, trade associations such as the Chemical Manufacturers Association have surveyed their memberships.⁴ However, comprehensive studies of environmental management on the systems level and the factors that influence company programs have not been undertaken. Furthermore, little evidence exists to support the effectiveness of individual environmental management practices.

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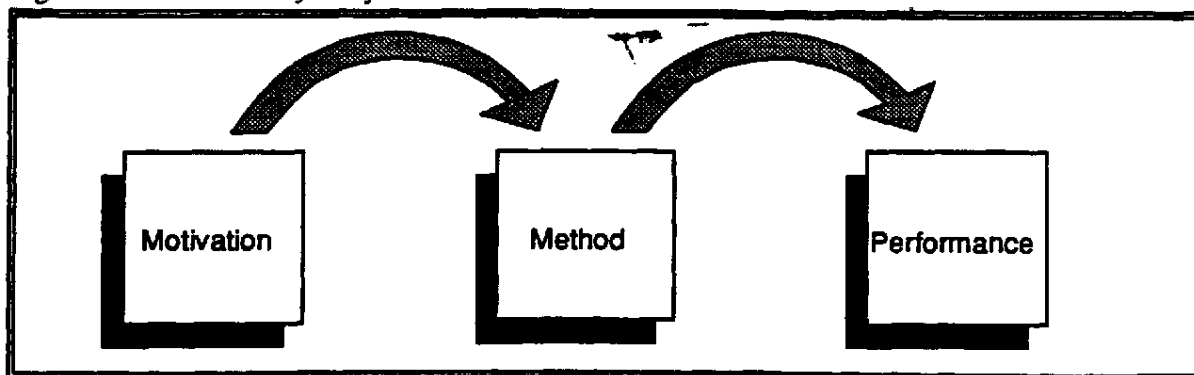
This study examines environmental management as a collection of programs and practices and integrates this analysis with an understanding of underlying motivations for these efforts. In addition, by comparing and contrasting companies that comply with regulations or go beyond regulations to those that do not, this study identifies characteristics of a successful environmental management program. The study results are based on an analysis of the practices of 15 chemical companies which vary in size, location, and environmental record and reputation.

The report is intended for regulators and companies as well as others interested in understanding corporate management of environmental issues. The report will help regulators to better understand why and how companies manage their environmental affairs. It is hoped that increased knowledge of existing systems and influences will help policy makers improve environmental protection through more effective environmental policies, laws, regulations, and other incentives for environmentally responsible behavior. While many of the principles and practices discussed in the report are applications of general business management, the nature and perception of environmental problems present corporations with unique challenges. Companies and their environmental managers may find ideas or data in this report to support their own programs and practices in the examples of successful environmental management systems that are provided.

Project Overview

One can theorize that external or internal factors may motivate corporate behavior in ways that precipitate new methods of environmental management. These methods may be the development of policies or practices that positively effect the outcome seen in improved compliance with regulations or voluntary initiatives to reduce risk. As depicted in Figure 1.1, the research described in this report represents an initial study that describes, analyzes, and links factors shaping company actions, elements of environmental management systems, and environmental record.

Figure 1.1: The Study Objective



The research used a case study approach, since it provides an excellent opportunity for open-ended examination and analysis of complex social phenomena. Case studies were developed using a questionnaire and interviews of corporate and facility personnel. The questionnaire, directed to the corporate environmental manager, provided the researchers with background information on the company and its environmental programs. The corporate interview was conducted with the corporate environmental director, or the senior-most individual responsible for environmental affairs. The facility interview was directed at the facility environmental manager or the individual most responsible for environmental compliance at the facility. In some cases, a variety of individuals at corporate headquarters and the facility participated in interviews. In addition, documents such as policy statements and manuals, provided by company representatives, were reviewed, annual reports were collected, and a limited literature search was conducted for each company.

Subject
selected
for
study

The researchers inquired about internal and external forces and events shaping company practices and explored company attitudes towards environmental regulations and societal concerns. Information was gathered on environmental policies, organizational structure, incentives and accountability for environmental performance, and intra-organizational relationships which effect the management of environmental issues.

Fifteen chemical manufacturers, both small and large companies, participated in the study.⁵ Data were collected between October 1987 and April 1988. Since companies were assured anonymity, cases are not presented in their entirety in this report. Rather, the data are aggregated by topic or theme with examples drawn from the case materials to illustrate key points.

Company Selection and Participation

The researchers limited their examination to one industry in order to control for variability in the need for and type of environmental management systems in place and, therefore, to increase the comparability of cases. The chemical industry (SIC code 28) was selected as the focus group for this study because of the potential impact of its activities and products on the environment, and, therefore, its interest to regulators and the general public.⁶ In addition, some chemical manufacturers are reported to have the most developed environmental management systems.

In order to select companies systematically within the chemical industry, the researchers used variables thought to influence companies' environmental management programs and practices. Application of variables also provided a tool for selecting companies with an array of characteristics and for controlling for some potentially influential factors. Data collection and analysis as well as budgetary constraints made it necessary to limit the number of variables in order to select a manageable number of cases. The following variables were used in case selection:

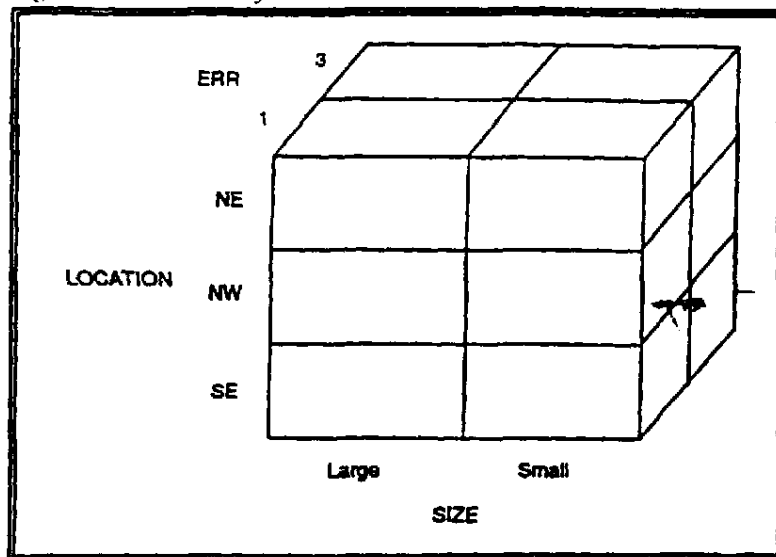
- size of the company measured by number of employees;

- location of the manufacturing facility; and
- the environmental record and reputation (ERR) of the facility.

Due in part to the availability and applicability of information, two of the three case selection variables are related to the facility, while one applies to the company as a whole. For example, state industrial directories with companies and facilities of multi-unit companies categorized by three-digit SIC codes are readily accessible and information for ERR is available on a facility-by-facility basis rather than on a company-wide basis. Employment size is an indicator of the financial and personnel resources that might be available for environmental management. Size at the company level rather than at the facility-level was used since operating units within a company may benefit from the company's overall assets.

With the assistance of business directories, the researchers identified chemical manufacturers meeting size and location criteria. A total of 20 candidates, ten small and ten large, in each of three states were selected for a total of 60 companies. At this point in the case selection process the researchers characterized the ERR of the 60 candidates on a state-by-state basis and identified companies with contrasting ERR. When the case selection and recruitment process was complete, the researchers wanted a total of 12 cases, evenly distributed across selection variables (see Figure 1.2).

Figure 1.2: Case Study Matrix



Following the identification of companies with the desired characteristics, the researchers approached companies through the corporate environmental manager to request their participation in the study. A total of 37 companies were contacted and 15 agreed to participate in the study. The researchers collected data from all 15 companies, even though the companies were not evenly distributed among selection variables. The next sections describe the selection variables and company characteristics in greater detail.

Size of business. Since the availability of resources is often postulated to be an influential factor in environmental performance, size was used as a selection variable.⁷ Number of company employees was chosen as a measure of size over other

measures such as gross sales, profits, or production volumes, because it is a reasonably accessible measure. Consistent with the Small Business Administration's definition, the selection process defined 1000 employees as the breakpoint between small and large companies.⁸ A minimum of 50 employees was chosen as the lower limit in order to maintain some degree of comparability among small companies.

Corporate employment in the cases ranged from 27⁹ to more than 50,000. Since few small companies with 151 to 999 employees matched other selection criteria, the five small companies had fewer than 150 employees. Of the small companies, all were privately owned, and two were single location enterprises. All of the large companies were multi-unit companies. Of these, three were fully-owned subsidiaries of larger firms (all foreign), one is held privately, and the remainder are public companies. Table 1.1 shows the companies distributed by more detailed size categories. The number of employees by facility is shown in Table 1.2.

Table 1.1: Distribution of Companies by Size Category

<u>no. of employees:</u>	<u>no. of companies:</u>
< 151	5
151-1000	0
1001-10,000	3
> 10,000	7

Location. In order to avoid the potential for state or regional biases, location of the facility by state was used as another selection variable. It was thought that a state's regulatory atmosphere -- the comprehensiveness of a state's environmental regulatory program and its enforcement presence -- could influence the facility's environmental management programs.

Table 1.2: Distribution of Facilities by Number of Employees

<u>no. of employees:</u> (at location)	<u>no. of facilities:</u>
< 100	4
100 - 249	5
250 - 499	2
500 - 999	2
1,000 +	2

The state selection process used published rankings of state environmental programs¹⁰ as well as a telephone survey of the opinions of enforcement officials, trade associations, and government officials' associations. Other criteria included a sufficient number of chemical establishments and proximity to researchers. Using this selection process, three states were selected: one in the northeast with a reputation for extensive

environmental programs, one in the southeast with a reputation for minimal programs, and one in the midwest that fell between the extremes. The selected states thus differed by regulatory reputation, as desired, as well as by geographic region and U.S. EPA region (II, IV and V).¹¹

Environmental record and reputation (ERR). To ensure that both "good" and "bad" environmental actors participated, a method for characterizing each facility's

Some of the data shown here

environmental record and reputation was developed. The ERR rating combined EPA compliance records with confidential opinions of federal, regional, state, and local environmental officials and public interest groups. (See Box 1.1 for a more detailed discussion of ERR.) After compiling this information a state-specific environmental profile was developed for each facility. Recognizing the limitations of the data, facilities were grouped into three broad categories. Facilities with few, if any, recorded violations combined with a positive reputation were placed in Group 1. Conversely, facilities with numerous violations and negative reputations were placed in Group 3. Facilities with conflicting or unavailable information were assigned to Group 2.

The resultant ERR can be used as an ^{Relative}~~approximate~~ indicator of environmental performance. It was interesting that the index category correlated very well with the actual observed and self-reported evaluation of environmental performance reported to the researchers during data collection. Table 1.3 presents the participating companies by location, size, and ERR.

Table 1.3: Distribution of Companies by Size, Location, and Environmental Record & Reputation

Region:	Group 1:	Group 2:	Group 3:	Total:
Northeast	1 large 1 small		2 large 1 small	5
Midwest	1 small	2 large	1 small	4
Southeast	3 large	1 large	1 large 1 small	6
Group 1: few violations and positive reputation. Group 2: conflicting or unavailable data. Group 3: numerous violations and negative reputation.				

Focus Companies

The researchers have chosen to highlight some case companies throughout the report as a means of revealing patterns and associations among motivations, methods, and performance. This format assists the reader in threading the chain of evidence presented throughout the report and in understanding how the researchers arrived at their conclusions. Focusing on some companies helps avoid repetitious descriptions of relevant company characteristics. Even though particular cases will be highlighted, analysis is based on and specific examples drawn from all companies that participated in the study.

Six focus companies were selected and given pseudonyms. The researchers chose companies to highlight based on the following criteria: the facilities were not

Box 1.1: Development of Environmental Record and Reputation

Realizing that there are limitations in all the environmental records collected to develop the environmental record and reputation (ERR) for this study several measures were examined for consistency. The following records were collected and analyzed: compliance violations from air, water, and waste offices of U.S. EPA, Potential Noncompliance Profiles (by EPA region), the Inventory of Consent Decrees from EPA's National Enforcement Investigations Center, and the List of Civil Judicial Actions from EPA's Office of Enforcement Compliance Monitoring. To arrive at the ERR groupings, violations were ranked according to seriousness, and positive and negative records and comments were totalled, with the various measures in essence "voting" to determine the grouping. The groupings are used only as descriptors in presenting the data in the analysis. In addition, it should be noted that the records and opinions were gathered for specific facilities and may not necessarily apply to the entire company.

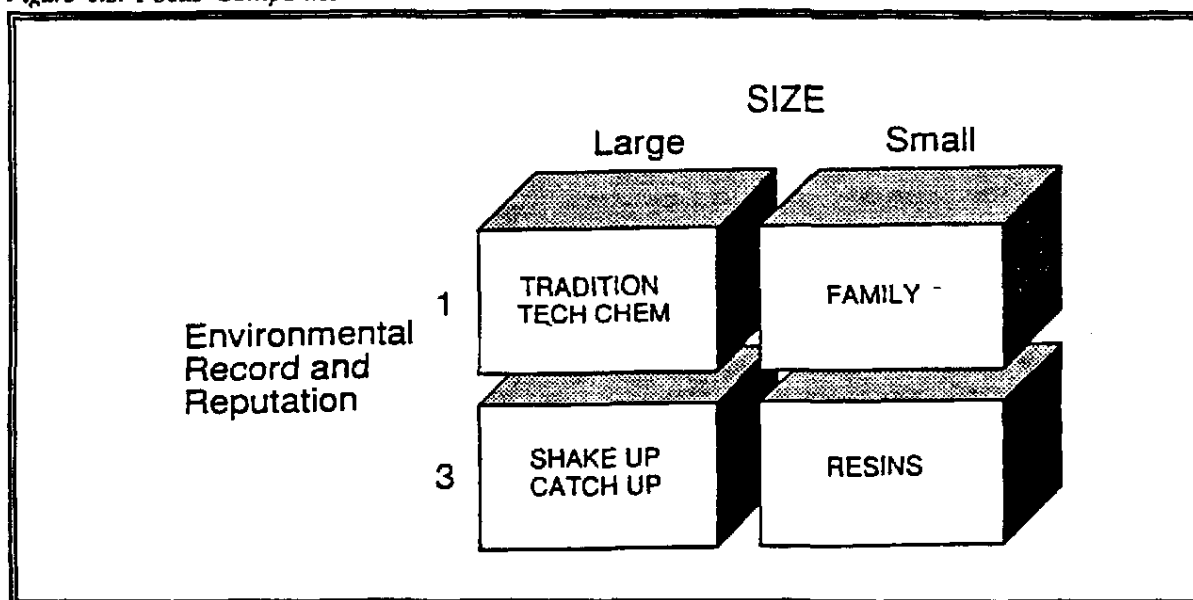
Many regulatory officials surveyed considered the EPA records of violations to be incomplete, uneven, and out-of-date. Accordingly, they represent a historical record that may not represent current compliance status. The Inventory of Consent Decrees may represent more thorough investigations of the companies, but may also represent some selection process on the part of the agency. Balancing these records were the telephone surveys with the case companies buried in longer lists of companies. While opinions are subjective, they were intended only as records of what people thought of the companies. The opinions of the public interest groups may reflect past performance and cannot necessarily be taken as comments on the companies' present programs or performance. The regulators polled probably gave a somewhat more current and closer picture of the companies as environmental actors, although their opinions also may have been colored by previous experience.

The question of how to measure environmental performance was posed during some of the corporate interviews and all respondents agreed that such program evaluations were difficult if not impossible to do in a generalizable manner. The methods suggested paralleled the ERR methods used. Most expressed little confidence in using compliance and enforcement records as a measure, preferring present process and programs over past performance. Some thought that a full facility assessment, such as they would perform in the course of an acquisition, would render a satisfactory evaluation. Several felt that agency and community opinions would contribute to a picture of the company, although one cautioned against agency bias, and another offered candidly that a good reputation may have resulted from good public relations. One suggested that "you cannot measure prevention," while another thought it reasonable to measure cost avoidance. One recommended reviewing compliance records, counting enforcement actions, talking to the agencies and community, then "form your own opinion."

self-selected; the facilities participated in interviews; the facilities were distributed among the three states; and the researchers felt strongly about the facility's ERR rating. That is, ERR coincided with the researchers' judgement of management practices, based on the on-site visits and personal interviews, and the facility had an ERR of either 1 or 3, indicating good or poor performance, respectively. Every attempt was made throughout this report to protect the identities of the companies by withholding information that was not critical to the analysis.

Figure 1.3 shows the distribution of the focus companies by size and environmental record and reputation. In addition, each state is represented by two companies with contrasting reputations. Box 1.2 characterizes the focus companies in greater detail.

Figure 1.3: Focus Companies



Limitations of the Data

The study collected data from 15 companies in specific sectors of the chemical manufacturing industry. Although many of the environmental programs and practices discussed in this report may be found throughout other sectors of manufacturing, the researchers make no claim of generalizability from these 15 to all of the chemical manufacturing sector (SIC code 28), much less to all of industry.

Company willingness to participate represents self-selection by the cases, an unavoidable characteristic of this kind of study. The final case companies do represent a broad range of sizes, locations, reputations, and sophistication of programs, thereby providing rich and diverse information for the study. The study data are limited also by the knowledge and bias of the individual participants, since they were obtained through personal interviews and written responses. The researchers had to rely on the participants' memory and perception of when and why significant events had occurred at their companies. Although it is prudent to assume that an individual's natural tendency is to protect his/her image and reputation, the researchers felt that the participants were quite candid and open with their responses, due perhaps to the assurances of anonymity. At most companies, the researchers were able to expand their base of information and decrease bias by conducting interviews with more than one individual at the company, and by using questionnaire responses, company documents, and other information to develop greater insight into company methods and motivations.

Box 1.2: Description of Focus Companies

- | | |
|-------------------|--|
| TRADITION: | <ul style="list-style-type: none">* more than 10,000 employees* good environmental record and reputation* worldwide operations* publicly traded* diversified products in a variety of industries* tradition of community responsibility* facility interviewed produces industrial chemicals. |
| TECH CHEM: | <ul style="list-style-type: none">* more than 10,000 employees* good environmental record and reputation* closely held foreign-owned subsidiary* worldwide markets* U.S. operation produces primarily chemical products* tradition of technical competence* facility interviewed produces agricultural chemicals. |
| SHAKE UP: | <ul style="list-style-type: none">* 1000-5000 employees* poor environmental record and reputation* private ownership* domestic sales* multiple locations in several states* limited product line* a lawsuit is prompting changes in environmental management attitudes and practices* facility interviewed produces industrial chemicals. |
| CATCH UP: | <ul style="list-style-type: none">* 5000-10,000 employees* poor environmental record and reputation* foreign-owned subsidiary with operational autonomy* multiple locations* growing* facility interviewed produces industrial organics. |
| FAMILY: | <ul style="list-style-type: none">* fewer than 150 employees* good environmental record and reputation* single family owner* worldwide sales* two locations in two states* produces industrial chemicals. |
| RESINS: | <ul style="list-style-type: none">* fewer than 150 employees* poor environmental record and reputation* privately owned* single location* produces resins and end products. |

Determining the definitive links among motivations, methods, and outcomes was beyond the scope of one research project. Since aggregate environmental performance was measured at one point in time, the researchers were unable to link

specific management practices to performance or measure improvements resulting from the implementation of a new practice. However, the results can provide the focus for broader based studies of corporate environmental management systems and influential factors shaping company practices by delineating the most relevant areas for further inquiry and by providing a foundation for the development of new hypotheses.

Endnotes

1. For example, Leonard Lund, *Corporate Organization for Pollution Control*, (New York: The Conference Board, Inc., Report No. 618, [1974]); Richard Hopkinson, *Corporate Organization for Pollution Control*, (New York: The Conference Board, Inc., 1970); Harold Henry, *Pollution Control: Corporate Responses* (New York: AMACOM, 1974).
2. For example, Arthur D. Little, Inc., Center for Environmental Assurance, *Environmental, Health and Safety Policies: Current Practices and Future Trends* (Cambridge, Massachusetts: Arthur D. Little, 1988); Arthur D. Little, Inc., Center for Environmental Assurance, *Current Practices in Environmental Auditing*, Report to U.S. Environmental Protection Agency, EPA-230-09-83-006, 1984; Environmental Law Institute, *Survey Report on Corporate Environmental Policies* (Washington, D.C.: Environmental Law Institute, 1990).
3. For example, Frank Friedman, Occidental Petroleum Corporation, *Practical Guide to Environmental Management*, (Washington, D.C.: Environmental Law Institute, 1988); Thomas Sullivan and David Williams, ed., *Environmental Health and Safety Manager's Handbook*, (Rockville, Maryland: Government Institutes, Inc., 1988).
4. For example, Peat, Marwick, Mitchell and Co., *An Industry Survey of Chemical Company Activities to Reduce Unreasonable Risk*, prepared for the Chemical Manufacturers Association, 1983.
5. Of the 15 companies, six companies participated in both the questionnaire and interviews, four companies provided only a questionnaire and five companies participated only in interviews. Participation levels varied for a few reasons: a number of companies expressed interest in the research and pleaded lack of time to respond in writing; due to over-representation and resource constraints, the researchers did not request interviews of two large companies and their respective facilities; and, two small companies returned the questionnaire but did not have the time to participate in interviews.
6. Companies manufacturing organic and inorganic chemicals, plastic materials and synthetics, and agricultural chemicals were targeted (i.e., SIC codes 281, 282, 286 and 287). Manufacturers of drugs, soaps, and paints were avoided because the nature of their operations and their products were not considered comparable to other types of chemical manufacturing (i.e., SIC codes 283, 284, and 285).

7. Barbara Gray Gricar, " A Preliminary Theory of Compliance with OSHA Regulation," *Research in Corporate Social Performance and Policy* 5 (1983): 121-141.

8. The breakpoint for small companies varies between 500 and 1,000 employees for the SIC codes used in the study. For simplicity, the general definition of 1,000 was used. Source: Small Business Administration, *SBA Notice*, Consolidated table of existing and emergency interim size standards under 1987 Standard Industrial Classification System (Washington, D.C.: Small Business Administration, 1987).

9. One small company was identified as having greater than 50 employees, but actually had fewer than 50. Because the company took the time to complete and return a questionnaire, the researchers included the data in the study.

10. For example, Fund for Renewable Energy and the Environment, *The State of the States* (Washington, D.C.: Fund for Renewable Energy, 1987); Christopher Duerksen, *Environmental Regulation of Industrial Plant Siting* (Washington, D.C.: The Conservation Foundation, 1983).

11. Surveyed facilities were actually located in four states due to the self-selection of the facility by two corporations. The reasons cited by the two companies for exchanging the subject facility were convenience and first hand knowledge of operations and the phase-out of operations at the pre-selected facility. The researchers decided to accept these conditions in order to take advantage of the willingness to participate.

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CHAPTER 2

MOTIVATIONS

What influences the behavior of companies? According to the results of a survey of 98 U.S.-based multinational corporations, the greatest influences on company environmental, health, and safety practices are government laws and regulations, liability, and high visibility accidents.¹ The respondents considered customers, community opinion, and government enforcement less important. Based on their study of the management of health and safety hazards in 5 companies in diverse industries, Kasperson et al. suggest that the key variables influencing performance fall into two categories, external and internal, and include regulation, liability and insurance costs, public scrutiny, profitability, top management commitment, and degree of hazard.² Gladwin found that ecologically sound and socially desirable behavior resulted from external pressures, rather than voluntary action.³

Companies respond differently to influential forces. Some companies shun environmental responsibilities, other companies strive to comply with environmental laws and regulations, and still others voluntarily go beyond legal requirements to further manage or reduce environmental hazards. Based on a four-year study of environmental management in industry, Petulla classified companies into three categories: crisis managers, cost-oriented managers, and enlightened managers.⁴ While the first group, the crisis managers, often resist regulations until a crisis develops, the second group, the cost-oriented managers, concentrate on complying with regulations as cheaply as possible, with mostly short-term considerations taken into account. In contrast, the enlightened managers use long-range environmental planning to address future environmental costs and liabilities, in addition to ensuring regulatory compliance. Similarly, Hunt and Auster suggest five distinct stages of development for

corporate environmental management programs, from beginner to proactivist, which offer the company varying degrees of protection against environmental liability.⁵

This chapter explores the important influences and events, both external and internal to the company, shaping environmental philosophies, policies and practices of chemical companies. The order in which the motivational forces are presented reflects the emphasis placed on these influences by the case companies. Where applicable, this chapter also examines the focus companies to determine whether companies with contrasting environmental records and reputations respond to different influential forces.

Economics

Since companies are in business to make profits, it is not surprising that **economic considerations** topped the list of factors influencing company behavior in environmental affairs. Most companies described their motivations as deriving primarily from **cost considerations** -- controlling risks, reducing liabilities, aiming at full compliance in order to reduce company costs.

"The company applies its own standards independent of regulations, standards based on economics and our own judgement. We identify and solve problems rather than take costly gambles on non-compliance."

Environmental officer

Large diversified company

While many expressed ethical concerns and more abstract values of corporate responsibility or being a good neighbor, all readily translated those concerns to economic terms of profit and survival.

"Waste reduction practices are usually justified on the basis of their cost savings, but there is an overriding ethical concern driving practices that reduce exposures of toxic chemicals."

Corporate environmental manager

Large company

While economic considerations can have a positive effect on company actions, the cost of environmental management can also be a deterrent for financially strapped companies.

"The company is doing well economically, now, so there is more money available for environmental concerns, that is, discretionary expenditures."

Corporate environmental manager

Large, diversified company

Survival, that is, economic viability and remaining in business for the long-term is a basic drive or motivation for company behavior. Some companies

acknowledged that good environmental management practices are essential for survival.

"If Bhopal had happened to our chemical division, we would have ceased to exist as a consumer products company."

Corporate environmental manager
Large company

"We want to be here for the long term, so we must plan and pay attention to environmental concerns."

Plant environmental manager
TECH CHEM

Financial liabilities generated by poor environmental practices, such as improper waste disposal, can result in substantial environmental cleanup costs, lawsuits, or fines, which can threaten the very existence of a company. Liability, therefore, is a cause for deeper concern than short-term profit or loss for most of the companies.

"Liabilities have weighed heavily on our decisions over the years. We look at today's liabilities and to future 'what ifs' as well."

Corporate environmental manager
Large company

Some of the case companies have reduced risks associated with their activities, not because they are directly required to, but because they believe that they may be held liable for damages at some point in the future. For example, in order to minimize future liability associated with waste disposal, one large company developed a formal waste reduction plan, another large company now inspects and approves waste contractors, and a small company diked its chemical storage tanks.

Some environmental managers interviewed stressed their roles in ensuring company survival through environmental compliance, risk management, and planning, often describing themselves as internal advocates for change in a short-term, production-oriented setting. They promote the need for the company to go beyond compliance to further reduce and manage risks.

"It's my job to keep the company from getting sued out of existence".

Corporate environmental director
CATCH UP

Survival for some companies, such as TECH CHEM and TRADITION as well as some small companies, meant avoiding potential liability through preventive, proactive approaches to environmental management.

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"We manage the company's environmental liabilities through a preventive approach balanced by cost considerations."

Environmental manager
Small company

However, at CATCH UP and SHAKE UP, two companies with poor environmental records and reputations, the survival instinct was a reaction to very real threats to the economic viability of the firm resulting from poor, and possibly non-existent environmental management. At CATCH UP, where environmental concerns were traditionally viewed as a necessary evil, paying the price of poor environmental management is catching the attention of management.

"Cleanup of Superfund sites has cost the company considerable amounts of money, so there [now] is an intention to build environmental considerations into every design. The environmental problems with impending huge fines of a sister company also are having a great influence on us -- the president is getting religion."

Corporate environmental director
CATCH UP

While CATCH UP is reacting to Superfund cleanup costs and fines for non-compliance at a sister company, SHAKE UP is motivated by a lawsuit brought by a public interest group. As a result of the lawsuit, the firm has made management changes, including hiring a new corporate executive vice president, consultants, and attorneys and is upgrading facilities.

Regulation

In addition to economic factors, consistently cited influences were regulatory requirements. For many companies, the goal was striving for compliance with regulations; for others, the goal was managing risks by anticipating requirements. On the one hand, CATCH UP has reacted to regulatory requirements and has done as little as possible to comply with regulations over the years.

"While the company has not thumbed its nose at environmental regulations, it has done a minimal job. The new regulations in wastewater treatment and RCRA have been like a two-by-four over the head. We are installing two new treatment systems at a cost of more than \$115,000,000, so we've got top management's attention."

Corporate environmental manager
CATCH UP

On the other hand, TRADITION stressed a proactive, risk management philosophy that covers all environmental activities. According to the corporate environmental manager, the company is usually ahead of regulations and goes beyond regulatory requirements.

"The company has often been a leader, we don't wait for the regulations. For example, for us SARA Title III is just an extension of what we've been doing with CMA's CAER [Community Awareness and Emergency Response] program and our tradition of community involvement."

Corporate environmental manager

TRADITION

The reported influence of regulations was often colored by relations with regulators. Some environmental managers complained about the inexperience of state inspectors, and consequently, the need for companies to educate the regulators.

"They are hired right out of school with little experience or knowledge of industrial processes and operations and they use only the checklist of laws and regulations as a measure of company performance. One of these inexperienced state inspectors was walking through one of our plants, ignorant of the equipment. 'So that's an evaporator,' was his comment. We are trying to educate the regulators."

Environmental manager

Large company

Respondents unanimously called litigious, adversarial relations between business and government wasteful; regulations too numerous; and disclosure requirements, while beneficial in some respects, to be of little use to the public. Respondents often called for more cooperative relations with government, for positive incentives, and better communication. Regulations were described as too numerous, beyond the intent of the law, and difficult or impossible to comply with fully.

The environmental managers of two small companies, including FAMILY, expressed a frustration with the availability of information, its accuracy, and timeliness. These managers noted that at times accurate information was obtained only as a result of their persistence, which consumed their already overwhelming workload. For example, the environmental manager at FAMILY recalled his frustration when upon his request state regulators sent him the wrong reporting forms for SARA Title III and his difficulty in accessing accurate information for TSCA reporting. In addition to receiving erroneous information, he expressed a frustration with the lack of accountability of regulators. At another small company, repeated calls to United Parcel Service and the Department of Transportation yielded conflicting information about shipping a toxic material. Eventually accurate information was obtained and the materials were shipped properly. This environmental manager, though, felt that some companies, frustrated by the process and time constraints, would have given up and shipped the substance illegally.

Environmental Disasters and Incidents

Some companies respond directly to environmental disasters or serious problems at other companies, while others waited for new regulations that might result from the aftermath of disasters such as Bhopal. For example, TRADITION

assesses external incidents for their implications; any significant event such as Bhopal and the Rhine River and Ashland Oil Company spills can trigger reviews of company policies and procedures.

"After the Rhine River spill, we examined all our warehouses, found some problems, and strengthened company guidelines. Now we have a special team of auditors for all warehouses. Similarly, after the Ashland Oil Company spill, the chairman of the board asked our department to look at all such storage. As a result [of Bhopal], we appointed a vice president to lead a special task force of manufacturing directors. They came up with a list of extremely hazardous chemicals and developed a stewardship system to reduce the amounts used and stored, assess impacts on the community, and to ensure adequate transportation."

Corporate environmental manager

TRADITION

Other large companies cited the influence of Bhopal in developing a global perspective and preventive programs.

"Before Bhopal, we were just putting out fires. Afterwards, the chairman of the board asked me to assure him that the company had no Bhopals waiting to happen. When I said that I could not, he said 'Go look.' In a period of a year and a half, I visited every one of our operations throughout the world."

VP of environmental affairs

Large Company

"Bhopal prompted a shift toward prevention. The company participates in CMA's CAER program, and we have not found any big vulnerable areas in our operations. SARA Title III is making us look even deeper."

Corporate environmental manager

Large Company

Historical problems and incidents within the company also play a major role in shaping behavior. For example, as illustrated previously, a lawsuit at SHAKEUP and fines at CATCHUP's sister company awakened these firms, supposedly to a new level of environmental consciousness. Perhaps there is hope that these incidents will result in lasting changes in environmental management at these firms. Poor past performance and problems were recognized as pivotal influences and learning experiences for other companies, firms that had good records and reputations, according to the ERR rating.

"Management attitudes [about environmental issues] at both the corporate and facility levels used to be that attention to environmental concerns was a necessary evil, and there was not much support for environmental controls. However, the company has learned from its own mistakes at a number of plants. Now there is new life for environmental concerns."

Corporate environmental manager

TECH CHEM

At another large company, the current configuration of the environmental department was attributed to past problems at the company. In the early 1970s, the environmental department was a small office located in the corporate headquarters and acted only as an advisory group that assisted in permits and negotiations with agencies. A few years later, a problem at one of their plants prompted greater concern and action. Chemicals illegally discharged from the plant into the sewer literally blew up, and some employees were subsequently charged with falsifying discharge permit requirements. The engineering department shut the plant down and installed new sewer lines within days of the incident. The seriousness of the problem led the company to a major reorganization and establishment of greater authority for the environmental department.

Corporate Culture

This study proceeded on the assumption that in-grained ideas and expressed attitudes of a company play a large determining role in its behavior, in this instance, in the field of environmental management. In response to questions about corporate culture and company character, a number of the companies described themselves as good corporate citizens with in-grained traditions of community concern, technical competence, and quality. They also related these traditions and values to their management of environmental affairs.

One large company, TRADITION, and one small company, FAMILY, both emphasized that they were **family-founded and family-run businesses** dedicated to an environmental and safety ethic and to protecting the community. That is, they had transferred ideas of personal integrity to the values of the corporation. Discussions of family traditions were sometimes linked with a sense of social responsibility and dedication to worker and neighborhood safety. Family involvement, however, does not always lead to positive results, as in the case of SHAKE UP. SHAKE UP is a family run business, but until recently, according to the environmental manager, the family had no foresight in environmental matters and was not aware of what was going on in the company.

"In the past, the people surrounding the family owners did not care about environmental matters, only about production. Environment was a matter of sneaking and hiding problems."

Facility environmental manager
SHAKE UP

The environmental VP of another large company implied that the family traditions of the founders have been diluted by the high turnover among top management, resulting in "no corporate culture" and a negative impact. The regular arrival of new top staff from outside the corporation has led to turmoil, poor communication, and a resultant lack of consistent commitment to environmental affairs.

Technical competence was cited as a defining value for a number of the companies. Technical competence translated into long-term focus and goals of excellence in the environmental field. For example, TECH CHEM called itself a technology-driven company with a conservative philosophy emphasizing long-term future advantages over short-term gains. For this company, their emphasis on the long term means that they strive to avoid adverse environmental impacts and liabilities that might arise from taking production short cuts.

Reputation

Two large companies with high name recognition referred to the commercial value of sound environmental management practices. They were concerned about their public and consumer images and the need to avoid negative publicity. These companies noted that they have to uphold their reputations in order to maintain their consumer base and profits. For example, one large company has a reputation and public trust, established in its consumer products division, to uphold in its chemical activities. Maintaining the household-word nature of its benign reputation is essential for the company and reportedly guides all environmental activities. At the time of the interviews, TRADITION was buckling to public pressure (and negative publicity) to cease an activity which they had received EPA approval and felt presented little risk to the environment and public health. In contrast, another large company said that since they make no consumer products they can maintain a low public profile and low-key atmosphere which has translated into minimal environmental management initiatives.

Concerns over responsibility and company reputation extended to reputation within the business community as well as public and consumer reputation. The environmental vice president of one large company claims to enjoy an excellent reputation in both the chemical industry and in the corporation's consumer product divisions. He is active and prominent in chemical and other trade associations as well as in professional associations. The environmental directors of three other large companies in the study cited reputations for product quality and technical competence which they translated into wider social concerns of being good corporate citizens. They felt that their reputations in these areas were important foundations of stature among other members of the business community.

Leadership: The Critical Link

The case studies indicate that leadership is the critical component in providing a positive, effective response to the influential forces discussed in previous sections. In its response to the various forces, the leadership becomes an internal motivator for environmental behavior. As a transition to the following chapters on methods of environmental management, this section presents a framework for analyzing leadership and then applies the framework to the focus companies to illustrate the concepts.⁶

In Organizational Culture and Leadership, Schein presents a framework for the analysis of leadership, which can assist in analyzing and understanding the role of leadership in environmental management. Schein suggests that "the only thing of real importance that leaders do is to create and manage culture."⁷ This means leaders impose their assumptions and thinking on the organization as ways of solving problems -- problems of both adapting to external influences and problems of internal organization.⁸ By doing this, leaders determine, in large part, how the organization will be structured and will subsequently act -- in this case in the field of environmental management.

The most powerful primary mechanisms for embedding and reinforcing culture are relatively abstract ways that leaders do things. These mechanisms are:

- what leaders consistently pay attention to, measure, and control -- and systematically deal with;
- leaders' reaction to critical incidents and organizational crises;
- deliberate role modeling, teaching, and coaching by leaders;
- criteria for allocation of rewards and status;
- criteria for recruitment, selection, promotion, retirement, and excommunication.⁹

In addition, there are secondary mechanisms of articulation and reinforcement which must be consistent with the primary ones if they are to be effective in formalizing and institutionalizing cultural assumptions and ideologies. These secondary mechanisms include:

- the organization's design and structure;
- organizational systems and procedures;
- stories, legends, myths, and parables about important events and people;
- formal statements and organizational philosophy, creeds, and charters.¹⁰

Leadership can take place in many ways and at many levels within a company. While leadership is often thought of as coming only from top management, it can come from all levels -- from the board of directors, CEO, environmental department, or from a production line manager. Using Schein's framework, Box 2.1 provides examples of leadership from the focus companies with good environmental records and reputations, while Box 2.2 examines leadership within the companies with poor records and reputations.

FAMILY

FAMILY provides some of the clearest examples of endorsement, commitment, and leadership from the top management, as well as from the environmental director. The company president makes it very clear that she pays attention to environmental matters, carrying on a family tradition of dedication to protecting the environment, the community, and concern for the workers. While this company did not report critical incidents or organizational crises, their response to important events reveals an avoidance of crisis. For example, when the company founder and president died, his wife took over the company as president. The company responded to the increase in environmental regulation by establishing the position of environmental director and taking a thoroughly preventive approach to environment, health, and safety. The company leaders demonstrate that they consistently pay attention to environmental matters.

In the area of deliberate modeling, teaching, and coaching, the company has a full-time training director who presents regular training classes involving the environmental director. The president attends classes to demonstrate her involvement and commitment to environment and health. In the terms of the secondary mechanisms, the company has very detailed and orderly preventive systems and procedures; established legends about the founder and his commitment to the community, a commitment carried on by his wife; and, while they lack a written policy, they actively promote their organizational philosophy of environmental quality and community protection.

TRADITION

TRADITION demonstrates the importance of both top management leadership and leadership from the environmental managers. The leaders consistently pay attention to environmental issues as part of their tradition of safety and community concern. This large company takes a very proactive approach in responding to critical events whether within or outside of the company. For example, in response to the Bhopal tragedy and other hazardous materials accidents, the company appointed a vice president to lead a special task force which developed a stewardship system for extremely hazardous chemicals.

In terms of organizational design, the environmental, health, and safety functions have important representation in the company's executive committee; the company has elaborate training and standard operating procedures with institutionalized environmental elements; the legends of the company founders focus on safety and community concern; and statements of corporate responsibility are formalized and publicized in written charters.

TECH CHEM

TECH CHEM stressed that the company pays attention to the idea of technical competence, equating this with concepts of environmental safety of corporate responsibility. Company stories and legends attribute the derivation of this attitude to the company's European parent, which reportedly emphasizes future advantage and stability over short-term gain. Responding to its own mistakes as well as critical incidents of others, the company has elevated environmental positions within company hierarchy and integrated environmental concerns throughout procedures with controls, audits, and rewards. The detailed formal environmental policy declares that the company operations will not have an adverse impact on the environment.

Box 2.2: Lack of Leadership in the Focus Companies

CATCH UP

The environmental managers at CATCH UP talked about being the environmental advocates with the environmental department, rather than top management as the leaders. Yet there is a degree of endorsement and commitment at the top, since they at least hired experienced environmental professionals, demonstrating their criteria for recruitment and selection in order to make the changes from within. The company has not responded directly to critical events such as Bhopal, waiting instead for assistance from CMA or for additional laws and regulations.

The environmental manager described leadership from within his department. "The director, my boss, is trying to make changes, and we have made a bit of a change. Our group is pushing company attitudes and we are making inroads." The manager feels that the company is not very dynamic, and the environmental group has to push very hard for environmental issues. "Past and present presidents have been sales and marketing oriented, which does not fit with environmental concerns, and it shows: it's an uphill battle. There is a bottom line, profits mentality. Our environmental group is a maverick in the company -- it can deal across the board with all departments and at all levels in the company. We are considered pains, but we are respected."

The organization's design in the environmental area is somewhat informal, with responsibilities spread among a number of professionals with broadly defined duties. Neither an organizational chart nor a written environmental policy were available. However, in the face of mounting costs and potential fines and liabilities, the CEO has decreed that the company will have an auditing program.

SHAKE UP

The case of SHAKE UP shows how lack of environmental leadership and commitment from top management led to severe problems and a lawsuit. However, leaders' subsequent reactions to incidents and organizational crises indicates a shift in commitment and attention paid to environmental affairs. The demotion of the plant manager and the hiring of a new executive vice president demonstrates changing allocations of rewards and status, as well as standards for selection and excommunication. The stories related during the interviews were a recounting of bad environmental practices permitted by the family powers who allowed managers to disregard environmental rules for short term advantage. The company has no formal or written statement of its philosophy.

RESINS

Information from this focus company gave little insight into leaders' attention to environmental affairs. A reactive attitude to regulations characterized their statements and actions, environmental affairs receiving little attention, measurement, control, or systematic dealings. There was no written policy, no internal controls such as auditing, and few written procedures or sign offs for the environmental manager. By inference, it appears that leaders paid little attention to environmental matters.

Conclusions

The most basic driving force behind company decision making and actions in environmental affairs is economics. Economic considerations range from simple cost factors to financial liability and the ultimate survival of the company. This study found that financial liabilities such as Superfund, lawsuits, and fines significantly influence company activities. Other primary motivators reported by the case companies were regulations, environmental disasters and incidents within the company, company culture, and reputation. While the case companies reported this variety of influences, the underlying rationale behind their actions, often boiled down to economics. For example, a concern for company reputation translated into protecting the company's consumer base and profits.

Companies react and respond differently to the various influences documented in this chapter. These influential forces can shape company activities, resulting in positive or negative outcomes, that is, moving companies toward or away from achieving regulatory compliance and environmental risk reduction. Just why there are differences in company response is a matter of the complexity of the interactions of these influences as well as a matter of the variations and complexities among individual companies.

A number of factors distinguished the companies with positive environmental records and reputations from those with poor records. First, companies with positive records were characterized by expressions of company culture and values often involving founding family traditions and linked to a sense of social responsibility. This finding is supported by Vogel,¹¹ who found that a disproportionate number of firms with good records of social performance are headed by families or their representatives.

Second, the values and traditions of the companies with positive records and reputations were institutionalized into company systems of procedures and rewards, providing direction for specific actions and employees' behavior. These companies actualized and implemented their values particularly through top management commitment to environmental affairs and attendant characteristics of strong leadership. Examples drawn from six focus companies in the study reveal that the companies with positive records were distinguished by active involvement of upper management, clear response to critical incidents within and outside of the company, formalized control, measurement, and reward programs, positive legends and stories of company and founders' traditions, and formal, written company philosophies and environmental policies.

Third, companies with good records and reputations approached environmental management with a longer-term focus than companies with poor records and reputations. Companies with good ERR were concerned about controlling potential liabilities through prevention and anticipating and staying ahead of regulatory requirements. Companies with poor ERR were reacting to major financial liabilities in the form of lawsuits, fines and Superfund costs resulting from lack of

environmental concern in the past and a focus on short-term production gains. Interestingly enough, when asked during the course of the interviews, the companies with positive records and reputations described themselves as "proactive" in their approaches to environmental management, while those with poor records usually described themselves as "reactive."

Endnotes

1. Margaret Flaherty and Ann Rappaport, *Multinational Corporations and the Environment: A Survey of Global Practices* (Medford, Massachusetts: Center for Environmental Management, Tufts University, 1991), p. 7.
2. R.E. Kasperson et al., *Corporate Management of Health and Safety Hazards: A Comparison of Current Practice* (Boulder, Colorado: Western Press, 1988) p. 122-124.
3. Thomas N. Gladwin, *Environment, Planning, and the Multinational Corporation* (Greenwich, Connecticut: JAI Press, 1977), p. 169.
4. Joseph M. Petulla, "Environmental Management in Industry," *Journal of Professional Issues in Engineering*, Vol. 113, No. 2 (April 1987): 167-183.
5. Christopher B. Hunt and Ellen R. Auster, "Proactive Environmental Management: Avoiding the Toxic Trap," *Sloan Management Review*, Vol. 31, No. 2, Winter 1990, p. 9.
6. This report uses a definition of leadership which ranges from somewhat passive to a very active form. Leaders, for example, can guide or direct through endorsement and commitment or through persuasion and argument.
7. Edgar H. Schein, *Organizational Culture and Leadership* (San Francisco: Jossey-Bass, Inc., 1985), p. 2.
8. Ibid., p. 221.
9. Edgar H. Schein, pp. 224-225.
10. Ibid., p. 237.
11. Thornton Bradshaw and David Vogel, ed. *Corporations and Their Critics: Issues and Answers to the Problems of Corporate Social Responsibility* (New York: McGraw-Hill, 1981), p. xii.

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CHAPTER 3

ORGANIZATIONAL STRUCTURE

Ideally the management and control of company environmental activities occurs throughout the organization, that is, from the plant through the corporate level, within the line organization, and by various functional groups such as research and development, engineering, and legal. This study found that the corporate environmental department most often performs planning, advisory, oversight, coordination, training and information transfer functions for company-wide environmental activities and issues, while operating units have primary responsibility for implementation of corporate policies and regulatory compliance. Observations from the companies surveyed of how management of environmental affairs, often delineated in the company policy, is organized and its relationship to environmental performance will be discussed in this chapter.

Organizational Change

Formation of specialized units is the most common organizational strategy for dealing with risk from company activities.¹ In anticipation of and in reaction to early environmental control laws and regulations, most large companies participating in our study created environmental departments in the 1960s or early 1970s. The large companies with poor environmental records and reputations as well as the small companies were slower to respond. For example, it was not until 1985, in response to the growing number of environmental regulations and ultimately Bhopal, that one large company with a poor environmental record removed its environmental function from manufacturing and created its own department at the corporate level. SHAKE UP, another large company with a poor environmental record and reputation,

does not have any corporate environmental staff. SHAKE UP, however, is contemplating hiring a corporate environmental officer due to a recent lawsuit and the resulting expenditures for environmental consultants and lawyers in recent years.

As the prominence of environmental matters has increased externally, the stature of and influence of the environmental department within the company has risen. Organizational changes within companies reflect the increasing importance of the environment function. In a 1974 survey of companies, only a small number had created positions of vice president for environmental affairs. Instead, the titles of director, manager or coordinator were the most common in companies with a full-time environmental specialist.² In contrast, our study of chemical companies found that corporate or divisional vice presidents were the senior-most environmental affairs department members in about half of the companies and in all but one of the companies with over 10,000 employees. Among small companies in our study, the title of director was most frequent. Since 1986, two large companies, including TECH CHEM, elevated their senior-most environmental affairs position to senior vice president and vice president.

Some examples of organizational changes excerpted from our case materials along with the motivations behind these changes are found in Table 3.1. The primary motivating factors outlined in the table are regulations and negative experience, internal and external to the company, such as accidents and lawsuits. Budget cuts at the corporate and divisional levels were cited as reasons for shifting additional environmental responsibility to the plant level. The primary types of changes shown in the table are increases in environmental staff. In addition, as discussed above, the position of the environmental affairs department within the organization has risen in recent years. Sheriff cites both increasing staff in environmental departments as well as the elevation of executives overseeing environmental affairs as primary corporate organizational responses to environmental regulations.³

Assignment of Responsibility for Environmental Affairs

All but one company participating in our study has a corporate environmental staff function. The company without such a function is SHAKE UP, a large company with a poor environmental record and reputation, where the facility environmental managers, who report to plant level management are the senior-most environmental personnel within the company.

Corporate, division, and facility responsibilities for environmental affairs vary among the case companies. In our study, corporate environmental departments were most often described as:

- developing corporate-wide environmental policies and strategies;
- advising senior management and general business managers of company

Table 3.1: Organizational Change

<u>Overall Motivation</u>	<u>Specific Motivation</u>	<u>Company</u>	<u>Location Change^a</u>	<u>Nature of Change</u>	<u>Date of Change^b</u>
Regulations	RCRA enacted	large	C	increase staff	
	maturity of RCRA	large	C & F	decrease staff	
	increasing number	TECH CHEM	C	increase-staff	mid 1980s
	increasing number & Bhopal	large	C	created corp. env. dept.	1985
	increasing number	FAMILY	C	created env. position	1980
	OSHA Hazard Communication Rule	FAMILY	C	separate env. from health & safety	1985
	"regulations caught up"	large	C	increase staff	
Negative Experience within Company	internal incident	large	C	increase staff; change function of department from regulatory consultant to regulatory control (e.g., audits)	late 1970s
	lawsuit	SHAKE UP	C	created corp. env. position	plan
Management Commitment		large	F	increase staff	1981-1988
Decentralization	corporate budget cuts	large	C	env. dept. moved to operating division	1985
	cutting services at division	large	C	responsibility shift to plants	mid 1980s

a C=corporate, F=facility
b Data not available for all changes

environmental issues and responsibilities (for example, regulatory requirements); and

- providing counseling to, oversight of, or support to operating facilities.

Depending on the company's organization, the emphasis on the provision of guidance and training to facilities and the responsibility for conducting environmental assessments of operations is at the corporate or division level. In addition, corporate usually monitors and interprets regulatory developments which is often supplemented by the facility, particularly for state and local requirements. Some activities such as long-range environmental planning, permit negotiations, and communication with state and federal officials can be corporate, division, and/or facility functions.

All facilities participating in this study had assigned someone to oversee environmental matters, though, at all of the small companies, the corporate environmental manager was also the facility environmental manager. Commonly reported responsibilities of the facility environmental manager or department were:

- assisting in implementation of corporate policies and programs;
- developing facility-specific environmental programs and procedures;
- providing recommendations and assistance to production;
- inspecting production areas and pollution control devices
- interfacing with state and local regulatory agencies; and
- monitoring regulatory compliance, completing reports, recordkeeping and obtaining required permits.

At the facility-level, environmental managers report to line management, most often the plant manager, with functional (that is, indirect or dotted-line) reporting to the corporate environmental staff.

At all of the case companies, primary responsibility for implementation of corporate policies, regulatory compliance, and environmental costs (for example, waste disposal, spill cleanup, non-compliance fines) rests with the plant line organization. Production usually performs routine, day-to-day activities such as separating, labelling, and removing wastes from the production area, spill prevention and clean up, good housekeeping, production unit control and maintenance, and monitoring environmental controls. In a few case companies, production personnel operated environmental control devices such as wastewater treatment and air pollution control equipment. However, in large companies with poor environmental record and reputations, including SHAKE UP, environmental responsibilities were not as integrated with production responsibilities as in companies with good environmental records and reputations. At SHAKE UP, production was not responsible for any waste

management or held accountable for any of their actions which might affect environmental performance. When asked, the facility environmental manager labeled himself a waste manager.

Staff Function versus Line Management

Within our case companies, environmental managers perform a staff function. That is, environmental managers act in an advisory capacity; they do not have the authority to issue orders to production management or other company functions. Rather, environmental managers assist and advise top management and production managers or those who have authority within the company to issue orders down the corporate chain of command.

Corporate environmental managers, however, are not powerless, nor is their role within the company diminished by their lack of authority. To get their job done, many of those interviewed spoke of managing through influence and gaining the support of top management and production, who can issue policies and have control over operations, for environmental concerns. Descriptions varied, but environmental departments often characterized themselves as internal advocates for change. Top management often assign the corporate environmental department with the task of ensuring that company activities are meeting the company's environmental objectives. To accomplish this, environmental staff may then be given the authority to conduct environmental audits of operations or given a review function of certain business decisions (for example, review of environmental impact statements, facility expansion plans, budgets, capital appropriations.) (Chapter 5 discusses management controls such as audits and review functions in more detail.)

Location and Staffing of the Environmental Department

Of the large companies in our study, most corporate environmental departments report to general operations executives such as vice president of operations or chief operating officer. Other environmental departments of large companies report to technology executives, or in one case, to an employee relations executive. At small companies, all but one corporate environmental manager, reports to a company executive. In this study, the functional location of the environmental department and the title of the senior most environmental affairs official, as discussed in a previous section of this chapter, had no apparent relationship to environmental performance.

The number of corporate environmental staff at the large companies ranged from fewer than five to about 25 with an average of about nine. Staffing level of the corporate environmental department at large companies was not proportional to the size of the company nor did it vary according to the environmental performance at the facility. Rather, the size of the corporate environmental department, which changes over time, appears to depend on:

- the company's activities and severity of risks;
- the sophistication of corporate environmental programs;
- the degree of centralization or decentralization in the company;
- the extent to which other staff departments such as legal, government affairs, engineering, or public relations are involved in environmental affairs;
- the company's use of environmental committees in the development of programs and policies; and
- the degree to which environmental responsibilities are assigned to the line organization.

At small companies, the corporate environmental managers often had responsibilities and functions in addition to environmental protection and health and safety. All but one environmental manager had additional responsibilities such as technical service or research and development supervision. As with large companies, no relationship appears to exist between company size and the number of environmental staff or the percentage of time an individual spends on these issues. However, RESINS' poor environmental performance may be due in part to the limited resources it devotes to environmental affairs. At RESINS, the chief process engineer spends 20 percent of his time on environmental matters, the most by any employee in the company. In contrast, FAMILY, a company with the same number of employees and a good environmental record and reputation, had one full-time environmental staff, and two companies half the size of RESINS both had full-time environmental positions. The allocation of personnel to environmental concerns may be attributed to RESINS' perception of the degree of risk posed by its activities. Unlike the other small companies in our study, a substantial part of their business was not chemical manufacturing.

In addition, at the facility-level, it appears that environmental managers at both small and large companies with poor environmental records and reputations were more likely to have multiple areas of responsibility. For example, as mentioned above, RESINS' chief engineer spends only 20 percent of his time on environmental affairs, while his primary function is chief process engineer. At CATCH UP, the manager of two production units spent 50 percent of his time on environmental affairs. In contrast, both FAMILY and TRADITION, a small and large company, respectively, with good environmental records and reputations, have full-time facility environmental managers (one of which is a safety, health, and environmental manager) even though their facilities are smaller than RESINS' and CATCH UP's facility.

A study conducted by OSHA on health and safety practices in the semiconductor industry noted a similar relationship between performance and the

assignment of safety responsibilities. The OSHA study found that facilities with part-time safety and health staff had more difficulties complying with OSHA regulations than facilities with full-time staff and that the individuals with multiple responsibilities often neither had the appropriate training and education, nor the time to adequately perform safety and health duties in addition to other assignments.⁴

Background and Experience of Environmental Staff

Written responses to our question on what types of qualifications companies require of environmental professionals varied considerably among companies and particularly among the many functions performed by environmental professionals. Inquiry into the educational backgrounds and experience of all environmental professionals employed by our case companies was beyond the scope of this study. Table 3.2 provides a glimpse at the backgrounds and experience of both the senior-most environmental officials and the facility environmental managers at the case companies. Most of the senior-most environmental officials had experience in many phases of chemical operations, including process design, production, and research and development. There was no evidence that the type or years of industrial experience or the educational background of the senior-most corporate official in the case companies had a bearing on environmental performance.

Table 3.2: Education and Experience of Environmental Staff

	Years of Industrial Experience		Predominant Types of Educational Background
	Average	Range	
Facility environmental manager (total of 11) ^a	17.8	1.5 - 30	-
Senior corporate environmental official ^a			-
all size companies (total of 12)	29.3	8 - 40	
large companies (total of 7)	29.1	20 - 40	Engineering; Advanced degrees ^b
small companies (total of 5)	19.8	8 - 30	Chemistry; Bachelor's Degree

a all case companies did not provide data for all categories
b advanced degrees include doctorate, medical, law, Master of Science

As shown in Table 3.2, the amount of industrial experience and level of education varied widely among the facility environmental managers in this study. However, two large companies with poor environmental records and reputations employed the individuals with the fewest years industrial experience and the lowest level of education of all the case companies. While poor performance may not be the result of the tenure of these individuals, hiring these individuals is an indication of poor judgement and a low level of commitment to environmental affairs by company officials. While the facility environmental managers averaged over 17 years industrial experience, SHAKE UP had an environmental manager with only 1.5 years of experience who was under the age of 25. Moreover, because SHAKE UP did not have corporate environmental staff, this individual did not have the benefit of direction and guidance from corporate personnel. Another large company with a poor environmental record had a facility environmental manager with many years of experience in industrial hygiene but with no educational qualifications. The highest level of education attained by this individual was high school. In contrast, FAMILY and TRADITION, both of which had good environmental records, had full-time environmental or environmental/health and safety managers with over 15 years of experience and chemical engineering degrees.

Is there a "Right Way" to Organize?

There probably is no "right way" to organize environmental affairs because each organization is unique. The organization for environmental management is a reflection of a company's overall structure, management style, philosophy, and size. The company's organization for environmental affairs is also influenced by the perception of environmental issues (such as a technical problem or legal issue), the scope of company operations, the priority given to environmental affairs in relation to other company activities, and the real and perceived impacts of environmental problems on the company.

Given the characteristics of the case companies, this study indicates that there is no relationship between environmental performance and elements of the formal organizational structure such as functional location, hierarchical level, and staffing levels of the corporate environmental department. This finding is supported by Petulla who found that the quality of work seemed to have little relationship with the organization.⁵ It is important to note that many environmental managers participating in our study cited "people" and individuals within the organizational structure as well as their informal relationships and political and communication skills as critical to the success of environmental programs. Although not apparent among our case companies, it is reasonable to hypothesize that if a corporate environmental department lacked stature and visibility (for example, low level company officials) within the company, it would be less effective, particularly given the importance of gaining the support of top and line management for environmental programs.

This study reveals some factors that may distinguish companies with contrasting environmental records and reputations, for example:

- level of integration of environmental and production responsibilities;
- when and if corporate environmental functions were established;
- whether corporate or facility environmental staff have full-time or part-time environmental responsibilities; and
- amount of industrial experience and level of education of facility environmental managers.

The environmental department (or individual) at the corporate, division, or facility level of a company is not a static organization; it is dynamic in its hierarchical level and functional location within the company, assigned responsibilities, and staffing. It is evident from this study that the importance of the environmental function is increasing within companies as reflected by organizational changes such as the elevation of the senior-most corporate environmental officials and increases in environmental staffing levels within companies. The primary motivating factors for these changes appear to be regulations and negative influences, including lawsuits and incidents at other companies.

Endnotes

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2. Leonard Lund, *Corporate Organization for Environmental Policymaking* (New York: The Conference Board, Inc., 1970) pp. 37, 40.
3. Shereff, Ruth. "The Corporate Environmental Office: Growing Nowhere?" *Chemical Business*, vol. 15, no. 7, May 1985, pp. 34-37.
4. U.S. Department of Labor, Occupational Safety and Health Administration, *Evaluation Report Regarding the Semiconductor Industry Pilot Evaluation Program in California*, November 30, 1988, p. 3.
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CHAPTER 4

ENVIRONMENTAL PLANNING

Environmental planning is the process by which a company incorporates internal and external environmental requirements and concerns into current and future activities. This chapter discusses environmental planning processes as well as the resulting environmental plans, which typically state what the company wants to accomplish and how it plans to do it. For the purposes of this report, environmental planning includes the development of environmental policies and long-range plans as well as programs and procedures. These different types of environmental plans guide company activities ranging from day-to-day operations such as regulatory compliance or waste disposal to business planning for a new product or process. Plans provide a company with direction, establish a uniform framework for decision making throughout the organization, help to reveal future opportunities and threats, and facilitate control (for example, by providing a goal or standard against which performance is measured).¹

In our case companies, corporate, division, or facility personnel developed plans. However, corporate and divisional staff most often performed longer-term and more general company or division-wide planning, while facility personnel develop plans with focus on shorter timeframes and for plant-specific implementation.

Environmental Policies

Policies are a bridge, an expression of leadership, linking the company's attitudes toward environmental management and actual practice. An environmental policy sets the internal code of conduct for a company. It defines a company's goals, expresses its commitment to protecting the environment, and provides the foundation on which corporate, division, and facility-level environmental management programs

are developed. Environmental policies can communicate the intentions of top management to the various levels or divisions of the organization, can provide guidance to operating levels on environmental conduct, and can serve as a public statement of management's commitment to the environment. A written policy expresses a consistent message that can be communicated clearly and, if distributed widely, is available as a reference to company personnel in the conduct of their activities.

In addition to general environmental policies, some companies in our study have written policies covering specific issues. Examples of issue-specific environmental policies include hazardous waste management, waste minimization, groundwater protection or underground storage tanks. The following discussions will pertain only to general environmental policy statements.

Development of Environmental Policy Statements

In a 1974 Conference Board survey, a formal statement of environmental policy was found in only 40 percent of the 516 responding companies. Companies with environmental policies tended to be large, multiplant operations.² Fifteen years later, written environmental policy statements continue to be found predominantly in large companies that is, at least in the chemical industry. In our study, written environmental policy statements existed in six of 15 companies and only in large companies. However, none of the large companies with poor environmental records and reputations had written environmental policy statements.

The number of companies with written environmental policy statements has increased over the years, as environmental regulations have increased. Table 4.1 summarizes when the case companies developed their first environmental policies. With one exception, all of the environmental policies reviewed in this study were updated or written in the 1980s.

Corporate environmental officials developed the majority of the environmental policies in our study although some environmental policies were developed by environmental committees whose members included corporate environmental staff as well as senior management (vice presidents) of operating units. When developing policies, corporate environmental staff, in some cases, solicited input from other staff departments such as legal, or from operating divisions. All of the policies examined for this study had the endorsement of one or more members of top management such as the board of directors, the chairman of the board, or the executive committee.

Table 4.1: Development of First Policy

	Number of Companies Developing First Environmental Policy
before 1960	1
late 1960s	2
late 1970s	2
mid 1980s	1

Evolution of Environmental Policies

According to a study by Arthur D. Little, over the past two decades, with the increased recognition of environmental hazards and the subsequent increase in laws and regulations for environmental control, environmental policy statements of companies have evolved from social responsibility statements to explicit statements of compliance with laws and regulations. More recently, some companies have gone a step further to adopt policies covering all significant environmental, health, and safety risks whether regulated or not. In addition to expressing corporate intentions, environmental policy statements with implementing requirements or management directives are now common.³

Evidence of an evolution in environmental policies was revealed in a comparison of different editions of policies provided by some companies in our study. One company's new (draft) environmental policy, which was in the process of being reviewed at the time the data was collected, reflected a greater commitment to environmental protection than the old environmental policy statement. The old policy contained social and corporate responsibility statements only and consisted of three sentences. For example, the old policy stated that the company "recognizes the need to conserve air and water resources," "control of environmental pollution is one of the obligations of responsible corporate citizenship," and "it is company policy to be a good neighbor." In contrast, the company's new draft policy goes beyond social and corporate responsibility to include an objective of worldwide compliance with environmental laws and regulations; to delineate in detail the responsibilities of corporate staff departments, manufacturing divisions, facility management, and each employee; and to specify actions and procedures to be followed in routine and special circumstances.

Incorporated into TRADITION'S revised environmental policy, dated 1985, are three important additions, reflecting changes in societal concerns and the corporate philosophy. (The earlier version of the policy was written in the early 1970s and except for the additions, remains virtually unchanged.) First, the company combined environment, health and safety into one policy. This is an apparent recognition of the interrelationship between risks to workers and the public and subsequently, the need to manage these risks under one set of guiding principles. Second, the revised policy, released after Bhopal, addresses worker and community right-to-know as well as emergency planning and response. Third, the revised policy applies to worldwide operations and covers domestic and foreign subsidiaries and affiliates for which the company or subsidiary has operating responsibility.

Elements of Environmental Policy Statements

Environmental policy statements vary in length and specificity as to how the company will operate with regard to environmental affairs.⁴ Ranging in length from three sentences to five pages, the most common length for policies in this study was one to two pages. At a minimum, all the environmental policies explicitly stated that

the company would comply with environmental laws and regulations. In addition:

- Most, but not all, contained a social responsibility statement.
- To varying degrees, the policy statements assigned responsibilities to corporate staff departments and the line organization. For all of the companies, fulfillment of the company environmental policy was stated as principally being the responsibility of line management. Two companies, one of which is TECH CHEM, go one step further in assigning responsibility; their policies state that each employee bears responsibility for achieving company environmental objectives.
- Some policies require specific practices to ensure that company goals are achieved and in a consistent manner. For example, policies include requirements for environmental audits, environmental review processes for new products, processes, or capital projects, and long-range planning.
- Only TECH CHEM'S policy mentioned the provision of resources to accomplish company environmental objectives.

Box 4.1 presents a composite environmental policy, incorporating many of the ideas expressed in the policies reviewed for this study.

Going beyond compliance to minimize or eliminate harm to the environment was a common theme in environmental policy statements. Most of the environmental policies in our study mentioned goals beyond legal requirements which varied in strength or the degree of commitment. For example, TECH CHEM stated that their operations "will not have an adverse impact on the environment." Other companies gave themselves more latitude by including modifying statements such as "the ultimate objective" is or "continue to work" towards manufacturing products to eliminate harm to the environment. For TRADITION, a cost/benefit provision was the criteria for going beyond legal requirements.

Policies as Expressions of Companies' Characteristics

The comprehensiveness and specificity of environmental policy statements does not provide insight into environmental performance, as a comparison of the policies of TRADITION and TECH CHEM, the focus companies with good environmental records and reputations, indicates (see Box 4.2). TECH CHEM'S strategy is to delineate clearly the responsibilities of all personnel and to specify procedures for manufacturing operations and research and development (for more detail see Chapter 5, Box 5.4), while TRADITION's policy is not as specific. TRADITION states general environmental management principles such as compliance and communication with employees and the public, that the company will "routinely review its operations," and that the policy is administered by the line organization.

Box 4.1: Composite Environmental Policy

Principles and Goals

The general corporate environmental policy usually contains broad statements about a company's social or ethical principles, its commitment to comply with applicable environmental laws and regulations, and its environmental goals and objectives.

- Be a "responsible corporate citizen" and a "good neighbor."
- Comply with environmental, health and safety, and product safety laws and regulations.
- Protect the health and safety of employees and the community, and preserve environmental quality in the community.
- Conserve natural resources such as clean air, water, and land.
- Ensure that products can be manufactured, used, and disposed of safely.
- Minimize or control environmental pollution through proper management of wastes, design of manufacturing processes, and development of internal standards designed to protect the environment.
- Go beyond compliance to reduce environmental, health and safety risks.
- Work with government agencies to develop environmental policies and regulations.
- Communicate safety and health hazards to employees, customers, the public, and government bodies.

Assignment of Responsibilities

Environmental policies often delineate who is responsible for carrying out the company's environmental objectives. The following provides examples of corporate staff and manufacturing responsibilities and functions outlined in policies.

- Corporate Environmental Department:
 - advises and consults with business and plant managers;
 - audits environmental status of operations; and
 - coordinates worldwide implementation of company's environmental policy.
- Other corporate staff departments (e.g., legal, engineering, external affairs):
 - provide support, expert counsel, and advice.

(continued next page)

Instead, our study found that the comprehensive nature and level of detail in the assignment of responsibilities and delineation of practices appears to be a function of such factors as the breadth of the policy, degree of centralization of the environmental function within the company, business diversification, the existence of internal environmental assurances or practices, and company's overall culture and

Box 4.1 (continued): Composite Environmental Policy

- All Levels of Management:
 - monitor and assess the environmental impacts of their operations, identify potential problems, and take corrective actions.
- Division Management:
 - develops, implements, and enforce plans and programs;
 - ensures that plants are given the necessary authority, responsibility, resources and direction to fulfill the policy; and
 - ensures that environmental considerations are incorporated into research and development, application of products and product lines, and major projects and acquisitions.
- Plant Management:
 - develops plant specific policies and plans;
 - responsible for overall conduct and performance of the plant on environmental matters;
 - ensures that plants are operated in full compliance with environmental regulations and company policy; and
 - provides training and education for employees.
- Each Employee:
 - responsible for upholding the company's environmental policy within their job function.

Management Practices

Management practices are often written into an environmental policy as a means of ensuring its proper implementation. The following are examples of such assurance mechanisms.

- Environmental review of new products, manufacturing processes, research and development, major capital expenditures, and other activities.
- Environmental audits, procedures for reporting audit results, and required follow-up actions.
- Environmental assessments at plant sites to measure effects on the surrounding environment.
- Environmental status reports prepared by facility managers for division management.
- Long-range planning.

management style. When developing policies, specific factors appear to influence companies differently. In addition, the nature of the environmental policy sometimes reflects the preference of individuals within the organization. Box 4.2 provides illustration of some of the factors contributing to the nature of the environmental policies of the case companies. Other examples are found in the literature. The

Conference Board study found that some companies with diversified and geographically widespread operations find a policy statement with details of operations included necessary to provide consistency and continuity among the widespread and varied operations.⁵ While Arthur D. Little's study reports that a highly decentralized company may issue an environmental policy and require each division to develop implementing procedures; a more centralized company might issue both its policy and the implementing guidelines at the corporate level.⁶

Box 4.2: Factors Influencing Policy Specificity

- TRADITION integrates environmental, product safety, and health and safety into one policy statement. With one exception, this study found that separate environmental policies were more specific than the joint environmental, health and safety policies when assigning responsibilities and requiring reviews of company activities. The lack of specificity in the joint environmental, health and safety policies, however, does not indicate a low level of commitment to the environment or company action. Rather, covering a broader spectrum of activities probably permits less specificity. As is the case with TRADITION, additional policy statements and guidelines address specific environmental issues and further delineate responsibilities and requirements.
- *7/1/82* ~~At TECH-CHEM~~, corporate environmental officials provided their rationale for clearly delineate responsibilities and practices in the environmental policy: they can help the plant by putting out the right policies because the environmental policy, issued by top management, carries weight within the company. The plant environmental manager can say "the policy says..." and then, there is no question how top management intends the activity to be carried out.
- The draft environmental policy of one case company reflected its extremely risk-conscious philosophy. This policy was heavily weighted toward the responsibilities of the legal department, the policy gave specific procedures for reporting incidents to management and regulatory authorities, and required specific interactions with the corporate legal and public relations departments.
- The policy of one case company incorporates routine one-on-one communication with the corporate office and specifies forward planning for environmental concerns. The company's environmental director explained why this was done: "The routine turnover of our corporate executives, even at the senior Division level, makes it difficult to keep everyone informed. 'People forget.' For example,...I put forward a major \$65,000,000 project which I had been planning for years. This was a 'surprise' at the corporate offices."

Programs and Procedures

Companies develop programs to direct activities in areas in which the company is committed or required to take action. Programs provide personnel with uniform guidelines, for the implementation of company policies and for the accomplishment of goals and objectives. A company's commitment to regulatory compliance as expressed in its environmental policy, for example, is often translated into a regulatory

compliance program that assists personnel in carrying out their responsibilities for meeting this commitment. The development and implementation of an environmental auditing program that verifies facility compliance with regulatory requirements can provide company management with assurances that its commitment to environmental compliance is achieved.⁷

Companies may develop a variety of programs depending on their activities and needs. Some common environmental programs encountered in this study include:

- regulatory compliance
- training
- environmental auditing
- waste management
- waste reduction
- energy and water conservation
- community relations
- emergency planning and response.

Procedures are detailed directions that usually specify a set of required actions to be taken in a given circumstance. Usually reserved for issues of considerable significance or risk to the company, procedures can address regulatory or internal company requirements. In this study, company procedures covered, for example, internal and external reporting of permit excursions and accidental releases, the introduction of new chemicals to a facility, accident investigations, and selection of waste disposal contractors.

In this study, written standard operating procedures (SOP) that incorporated environmental procedures (for example, recycling, operation and maintenance of pollution control equipment) as well as the existence of up-to-date SOP for the general operation of processes were characteristic of the small and large companies with good environmental records and reputations (for example, FAMILY, TRADITION, TECH CHEM) and were not available at companies with poor environmental records and reputations. In addition, one small company, FAMILY, had an impressive training program, which included SOP (see Box 4.3).

It is not surprising that the small case companies rely less on written

Box 4.3: Training Program for SOP

FAMILY has SOPs for every process. Environmental requirements such as waste handling and pollution control are integrated into the SOPs. Training on standard operating procedures and SOP revisions is a fundamental part of FAMILY's training program for new and existing employees. In addition to initial training in SOP, before changes are incorporated into procedural manuals, personnel receive training on revised procedures.

To measure comprehension of training materials by personnel as well as the effectiveness of the training, FAMILY's full-time Director of Safety and Training verbally quizzes and grades employees on SOPs. These grades are then recorded and used as part of employees' performance reviews.

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programs and procedures than do large companies. The necessity for formal, written programs or procedures might be argued. If, for example, written programs and procedures provide uniformity across company operations, then why does a small company operating just one or two facilities need such guidelines? However, programs and procedures also provide direction for plant personnel, who perform many of the day-to-day environmental tasks such as operating waste treatment units, monitoring effluent, and labeling wastes. In large companies, company programs and procedures are augmented by facility-specific guidelines. Small companies, however, anticipated a trend toward more formal, written plans.

Long-Range Environmental Planning

The principal objective of long-range environmental planning is the development and implementation of preventive programs and procedures based on identified issues and trends.⁸ Environmental planning is important to protect companies from long-term liabilities associated with business activities as well as compliance with regulations. Long-range environmental planning:

- defines current issues and concerns of the company (for example, compliance issues, environmental liabilities, internal management systems);
- forecasts future issues and trends (for example, regulatory developments, public concerns);
- establishes objectives to be achieved in a specific time period; and
- presents a strategy that specifies how to accomplish the objectives (for example, new programs, environmental assessments of company activities, resolution of scientific, technical or scientific uncertainties).

Long-range environmental plans help direct the actions of both top management and operations. For example, the long-range environmental plan can provide input into strategic business planning of the company by providing an assessment of the impact of future environmental issues or legislation on the company and its lines of business. If circulated to senior management and the Board of Directors, the long-range environmental planning document can act as "a major lever forcing prompt action."⁹ On the operational level, priorities identified in the long-range planning process can be utilized to develop short-term (less than one year) action plans for day-to-day operations.

According to Petulla, long-range environmental planning is characteristic of enlightened companies and used to address future environmental costs and liabilities in addition to ensuring regulatory compliance.¹⁰ In a 1981 survey of the environmental planning activities of companies in a number of different industry

groups, Arthur D. Little found that companies' philosophies, ranging from reactive to anticipatory, are reflected in their approach to environmental planning. Few companies attempted to plan beyond the one-year time frame or to analyze environmental issues not covered by regulations.¹¹ According to the Arthur D. Little study, environmental planning activities of leading firms were characterized by: 1) long-range planning horizons; 2) planning for risk as well as for compliance; 3) direct link between the planning process and CEO; 4) strong interaction between corporate and division staff; 5) formal channel through which the corporate environmental staff can direct input into the strategic planning process; 6) driving forces which extend beyond compliance to social responsibility and a recognition that environmental management can result in economic benefits.¹²

Our study found long-range environmental planning to be characteristic of large companies with established environmental organizations. Of the companies without long-range environmental plans, for example, one was a newcomer to environmental management having established a corporate environmental department as recently as 1985 and the other, SHAKE UP, has no corporate environmental function. In addition, the two companies without long-range environmental planning have poor environmental reputations and are reactive. One company is trying to catch up with regulations and SHAKE UP is reacting to a lawsuit.

Planning timeframes in our case companies range from three to 15-years and include periodic (for example, annual) updates. Compared to the Arthur D. Little survey, our case companies have longer planning horizons, which can be attributed to two factors: one, companies are now planning further into the future; or two, companies within the chemical industry have longer planning timeframes. While our study did not examine past planning efforts, it is likely that the case companies are planning further into the future due to heightened environmental awareness both inside and outside companies. Longer planning timeframes would be consistent with other positive trends in organizational structure and development of policies, as previously discussed. According to TECH CHEM, a company with a good environmental record and reputation, the rationale behind its 15 year forward planning report is "we want to be here for the long-term, so we must plan and pay attention to environmental concerns." Box 4.4 describes another large company's long-range environmental planning process.

The small companies in our study had shorter planning horizons, focusing mostly on current and upcoming regulatory requirements and utilize a less formal, less labor-intensive planning process (that is, no written documentation). (Less formality is also a reflection of the overall management style of small companies, where there is easier and more frequent access to senior management, staff functions, and operating personnel.) This is not to say, however, that all small companies are reactive to regulations. FAMILY, for example, anticipates, comments on, plans for, and participates in studies supporting changes in upcoming regulations. Another small company cited specific examples of how the company incorporates future regulatory predictions when making equipment or other operational changes.

Not surprisingly, the small companies that were more proactive shared at least two organizational features which would allow for greater anticipation and planning for regulations: the companies had assigned one individual to be the principal coordinator of environmental affairs and this individual's major responsibility was environmental. These companies differed however, in that one environmental

Box 4.5: Long-range Environmental Planning

This large (20,000- 30,000 employees) diversified, decentralized company utilizes a ten-year forward planning document, updated annually, to define significant environmental issues of today and tomorrow. The planning process tends to "reduce the degree of urgency." The company's first priority are "always" issues potentially affecting compliance.

The corporate safety, health, and environmental staff takes the lead in defining company-wide environmental issues, soliciting input from a variety of company departments such as legal and government relations. In addition, a Washington, D.C. law firm staffed with EPA alumni provides additional legal assistance and regulatory insight.

As outlined in the company's environmental policy statement, each facility is then responsible for developing and implementing a 10-year plan for their operations. The plan addresses plant-specific issues and programs such as:

- current compliance status;
- unresolved compliance issues from the past;
- the effect of new regulations on the facility, what actions the facility will take, and the timing and cost of actions; and
- the impact of future internal and external requirements.

Each year, plant managers from 25 plants world-wide personally and individually meet with the division president and corporate environmental staff to review and discuss plant projections.

manager reported to a plant manager while the other reported to a vice president of the company.

Conclusions

For large companies the existence of an environmental policy seems to be more important than its specificity. This conclusion is supported by the fact that only companies with poor environmental records lacked policies, while the level of specificity in environmental policies varied among companies with good environmental records and reputations.

From this study, it appears that the level of specificity in a policy is a matter of company preference and management style. At a minimum, however, the authors believe that environmental policies should state a goal of compliance with regulations

and clearly assign responsibility for the implementation of the policy. Of equal, or perhaps greater importance, the environmental message must be conveyed throughout the organization so that the intentions of management are incorporated into business decisions and daily operations. However, the existence and communication of a policy is not enough. In order not to be perceived by employees or the public as only rhetoric, the environmental policy must be supported by the company's actions.

Other characteristics that distinguish companies with contrasting environmental performance include: the existence of SOP, the integration of SOP and environmental procedures, and long-range environmental planning. Small companies tended to rely less on environmental policies, programs, and procedures. This study also provided evidence of some positive trends in environmental management practices of the case companies, including: the number of companies issuing environmental policy statements has increased and these statements are evolving to reflect current public policy demands.

Endnotes

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CHAPTER 5

MANAGEMENT CONTROL

Control is the task of ensuring that activities are meeting desired outcomes. Control involves establishing a standard or goal, measuring performance, and identifying deviations and taking corrective action. Control systems are aimed at influencing employees' behavior.¹ Referring back to Chapter 2, a powerful mechanism for reinforcing company culture is what leaders pay attention to, measure, and control.

Three basic management controls -- internal reporting, performance reviews, and auditing -- and their application to environmental affairs are discussed in this chapter. In addition, the chapter examines company requirements for the incorporation of environmental concerns into business decisions.

These management controls help to ensure that the intentions of top management as stated in the environmental policy, for example, are carried out at the operational level; provide a mechanism to monitor facility progress in implementing programs and in adherence to company procedures; keep management informed of the environmental status of operating units; and, raise the environmental awareness of company personnel at the corporate and facility levels.

Internal Reporting

Routine and timely reporting through written reports, notifications, or presentations at meetings can keep officials at the plant, divisional or corporate levels apprised of environmental matters. Reporting provides personnel at higher levels with the opportunity to assess the environmental status or situation of the operating unit

and, if needed, recommend or require further actions. In addition to transferring information to top or plant management, the preparation of reports or communications may assist the environmental staff in understanding the environmental issues or incidents compiled for the report.

Local Facility to Corporate

In our study, we found that facilities report environmental status or problems to production management and/or corporate or divisional environmental staff. Most frequently facilities report exceptions such as non-compliance, spills, or company-defined incidents rather than routine or day-to-day environmental activities. "Management by exception" brings only deviations from day-to-day operations to the attention of line management or corporate and divisional environmental staff. Companies often develop definitions and procedures for internal reporting of environmental matters. Box 5.1 provides an example.

Box 5.1: Internal Reporting

TRADITION classifies environmental incidents, defined as "any release, leak or spill of a hazardous or toxic substance," into four categories, according to the impact of the incident (with category 1 having the least environmental impact). (In addition, any release of a non-hazardous substance resulting in Category 2 through 4 conditions, it is considered an environmental incident.) Environmental incidents in any of the four categories must be reported to supervision, analyzed and recorded at the plant. A safety report which includes the number of category one and two environmental incidents and brief descriptions of each category three and four incident is compiled each week by the plant's safety, health, and environmental manager and forwarded to the plant manager. This information is then incorporated into the plant's weekly production report, which is sent to the production division. At the divisional level environmental incidents from all plants within the division are compiled into a safety report which is then disseminated to all plants and division staff (for example, environmental managers). In each safety report, environmental incidents are tracked on a weekly and year-to-date basis. Brief summaries of category three and four incidents are provided with contact names at the plant location for anyone needing further information.

In addition to reporting non-routine events, facilities participating in our study often provide corporate staff with courtesy copies of required monthly or annual regulatory reports. Some companies also require facilities to submit annual reports tracking waste minimization progress, manual or computerized periodic (for example, weekly, monthly) environmental status reports or compliance statistics, or permit status reports.

Given organizational responsibilities and authorities, reporting to corporate and divisional staff or production management can serve different purposes. Due to the staff-line relationship, the corporate or divisional environmental staffs have little direct control over facility activities. For this reason, reporting through line management, or the production chain-of-command, is an appropriate management control because line

managers are authorized to issue orders, control activities, and provide resources down the chain-of-command. Of course, this is only effective as long as line managers are committed to environmental performance.

Unless given functional authority, company requirements to report environmental status or problems to corporate or divisional environmental staff provides staff with the information necessary to do their jobs. For example, in keeping with the staff-line relationship, if corporate or divisional environmental staff are kept informed of facility activities, they can provide recommendations to operating units on environmental matters. Corporate or divisional environmental staff might also use the information to directly influence the decisions of facility management or to persuade production managers higher in the organization to exert their authority or to influence activities down the chain-of-command. In addition, reporting to corporate or divisional environmental staff, provides them with information needed to monitor company-wide environmental activities so they in turn can keep top management advised and to develop environmental policies, plans, and procedures.

In our study, the incorporation of environmental incidents into routine production reports from the facility to higher levels of management was characteristic of the large companies with good records and reputations and, in contrast, was lacking in large companies with poor environmental records and reputations. Examples of environmental reporting in production communications include: at TRADITION, as described in Box 5.1, environmental incidents are incorporated into weekly production reports which go up through the manufacturing reporting chain; and, at TECH CHEM, environmental performance is part of the plant manager's quarterly facility review with the vice president of production.

From our case materials, it is difficult to discern whether enhanced performance resulted from this type of internal reporting. However, it is probably reasonable to conclude that the incorporation of environmental concerns into production reports is an indication of a company's commitment to environmental matters and that environmental issues are considered an important responsibility of line management along with more traditional production concerns.

At SHAKE UP, a company with a poor environmental record and reputation, the new corporate executive vice president of manufacturing, hired in the wake of an environmental lawsuit, apparently believes that routine reporting of environmental matters to production management will soon help to improve the company's environmental performance. In an effort to get a grasp on and correct chronic environmental problems, the executive established routine reporting by the facility to corporate production management. Under these new requirements, the facility environmental manager sends the executive vice president of manufacturing a written report each week covering routine and non-routine environmental issues.

Environmental Staff to Top Management

Within corporate headquarters and the facilities of our case companies, various reporting mechanisms, including written reports, verbal presentations during routine meetings of management, and informal discussions, are used by environmental staff to keep management apprised of environmental activities. It appears that differentiation of our case companies by their environmental record and reputation also occurs by the existence or lack of routine and formal reporting mechanisms between environmental staff and top or plant management. (For the purposes of this report, formal reporting included routine, written reports and scheduled presentations or discussions at meetings, while unscheduled interactions such as "hallway conversations" were considered informal.) Without exception, companies with informal reporting mechanisms only had poor environmental records and reputations.

In addition to the production reports cited above, some examples of routine, formal reporting to the company's top management include: at TRADITION the corporate environment, health and safety department reports on environmental and safety issues at each executive committee meeting; at two large companies the corporate environmental, health and safety department prepares monthly overview reports on environmental affairs which are circulated to vice presidents; at FAMILY, a small company with a good record and reputation, environment and safety are routine agenda items at the monthly executives' (vice presidents and up) meeting. At the facility level, environmental issues are a regular agenda item at TRADITION's weekly plant management meetings. In addition, environmental and safety incidents are incorporated into the facility's weekly "plant staff notes" along with production information for circulation to all plant staff and production supervisors. At TECH CHEM, environmental and safety issues are the first topics for discussion during a daily conference call between all department managers, including the facility environmental manager.

Although it was difficult to determine the effect of these reporting mechanisms on environmental performance, keeping management informed certainly should not hinder environmental performance. In addition, it is most likely that the existence of these reporting mechanisms signify a higher level of management commitment to environmental affairs, however, caution must be used in making this assumption. For example, reporting through presentations or regularly scheduled discussions probably supports the notion of management commitment because with this form of reporting management has control, that is, control over their meeting agenda. Written reports if not requested by management might not reflect management commitment. For example, the environmental manager from one of our case companies stated specifically that he initiated the written report to top management as a means to raise the visibility and awareness of environmental affairs within the company.

Performance Appraisals

When managers see that their execution of socially responsible policies and programs is evaluated in promotion and compensation decisions, along with performance in meeting familiar profit, cost, and productivity goals, they will believe and they will be motivated. For obvious and valid reasons middle managers concentrate their attention and skill on the accomplishment of performance objectives for which they know they are held responsible. They appraise responsibility in terms of two familiar criteria. The first is what is measured, and the second is what is rewarded.²

The environmental goals and objectives of the company, for example, compliance with environmental regulations as expressed in the company's environmental policy or the achievement of waste reduction goals, can be translated directly into line managers' goals and objectives on which their performance is evaluated. By making environmental performance a criteria in the evaluation of line managers, environmental performance becomes a key consideration along with traditional production-oriented criteria such as cost, quality, and profits in salary increases and promotions. Factoring environmental performance into the company's overall performance appraisal system reveals a tangible commitment by top management to environmental concerns.

In our study, two corporate environmental managers at large companies cited significant improvements in environmental performance at the facilities after environmental criteria were incorporated into the company's performance appraisals system. One of these manager's specifically stated "when we made the environmental responsibilities more personal through performance reviews, we saw improvements." At this company, 100 percent environmental compliance is built into each plant manager's job performance requirements. The accomplishment of or deviation from this environmental requirement is combined with production considerations to evaluate the individual's job performance, ultimately effecting salaries and bonuses.

Another large company in our study utilizes management by-objectives (MBO) throughout its organization. By corporate directive, each division and plant as well as personnel at all levels, must agree on objectives, which include safety, health and environmental concerns and issues. The safety, health and environmental objectives are established throughout the company using guidelines prepared by the corporate safety, health and environmental department that state the company's expectations of environmental performance objectives. For example, annual waste reduction goals are included in the facility manager's performance objectives. Salary is then contingent upon meeting objectives. The corporate environmental manager said "with salaries depending on performance, it makes environmental objectives very tangible."

Environmental Audits

The environmental audit is one of the most widely acclaimed environmental management tools in use today. Several hundred major firms in diverse industries have environmental auditing programs.³ Within the chemical industry alone, a 1982 survey revealed that 93 percent of responding companies conducted environmental audits.⁴ Numerous examples of the environmental auditing programs at specific companies are found in the literature.⁵

The U.S. Environmental Protection Agency's Environmental Auditing Policy Statement, issued in July 1986, encourages companies to establish environmental auditing programs. The U.S. Environmental Protection Agency (EPA) defines environmental auditing as "a systematic, documented, periodic and objective review by regulated entities of facility operations and practices related to meeting environmental requirements." At its most basic level, environmental audit programs are intended to evaluate and verify compliance with federal, state, and local environmental laws and regulations. But environmental auditing goes beyond just verifying compliance with legal requirements. Audits can be used to identify actual and potential environmental problems, evaluate the effectiveness of environmental management systems, and assess the risks from regulated and unregulated materials and practices.⁶

EPA's policy states that because "ultimate responsibility for the environmental performance of the facility lies with top management", these managers have strong incentives to use techniques such as environmental auditing to secure reliable information about their facilities' compliance status.⁷ Similarly, from the perspective of top management, the purpose of auditing is to ensure that the corporation is responding quickly and effectively to environmental issues and concerns.⁸

In a review of more than a dozen environmental auditing programs in diverse industries, the Environmental Task Force of the Business Roundtable found that audits were most effective when they were individually tailored to accommodate a company's management goals, internal organizational structure, and regulatory requirements.⁹ In his book on corporate environmental management, Frank Friedman of Occidental Petroleum remarks that by itself, auditing can provide only limited control and awareness of potential issues because it is only a "snapshot" of existing controls at a facility. To be effective, auditing must be combined with other environmental management systems.¹⁰ The elements of an effective environmental auditing as defined in the appendix to EPA's 1986 Environmental Auditing Policy Statement are found in Box 5.2.

In our study, large companies with poor environmental records and reputations either did not have environmental auditing programs or were the last of our cases to have developed programs. At the time of the interviews, environmental audits were performed by seven of the ten large companies surveyed. Two companies with poor environmental records and reputations, SHAKE UP and CATCH UP, did not have environmental auditing programs. One of the three large companies without an auditing program was not rated as a poor performer. This company, an extremely

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Box 5.2: Elements of an Effective Environmental Audit Program

The elements of an effective environmental auditing program as defined in EPA's 1986 Environmental Auditing Policy Statement are summarized below.

- 1) Top management must make explicit its support for the environmental auditing program and its commitment to follow up on audit findings.
- 2) The environmental auditing function must be independent of the activities being audited. Auditors must be free to conduct objective and unobstructed inquiries, observation, and testing without conflicts of interest or fear of retribution.
- 3) Auditors should be adequately trained and audit teams should be adequately staffed.
- 4) The objectives, scope, resources, and frequency of the audit program should be made explicit. Explicit written procedures should be used for planning audits, establishing audit scope, evaluating audit findings, communicating audit results, and ensuring follow-up actions.
- 5) The audit process should collect, analyze, interpret and document information sufficient to achieve audit objectives.
- 6) The audit process should include specific procedures to promptly prepare candid, clear and appropriate written reports on audit findings, corrective actions, and schedules for implementation.
- 7) Quality assurance procedures should be used to ensure the accuracy and thoroughness of environmental audits.

risk conscious company, has resisted the establishment of an environmental auditing program because of potential legal implications arising if audit documentation, which included notations of facility deficiencies, were discovered.

At the time of the interviews, CATCH UP was in the process of developing a company-wide auditing program, mandated by its Chief Executive Officer after environmental "problems" that might result in several million dollars in fines and possible criminal action were uncovered at a sister company. Interestingly, CATCH UP was not alone in its reaction to an internal incident. One other case company specifically cited the development of its environmental auditing program in late 1970 following an internal incident and a decree by top management to provide additional oversight of facility activities and regulatory compliance.

Specific features of audit programs varied among our case companies and no additional trends in corporate environmental audits were apparent from our data. The following summarizes some key environmental auditing program features and their variability among our case companies.

- With the exception of two companies, audits are conducted by corporate staff. At one of these exceptions the division environmental staff leads the audit, while the other company has facilities audit each other with guidance from corporate.
- The frequency of audits is between one and three years, with half of the cases conducting annual audits.
- Audit results are most often reported to top management. Most of the audit programs have specific procedures for communication of audit results and to ensure that actions are taken at the facility to correct any deficiencies uncovered in the audit process.

TECH CHEM and TRADITION, companies with good environmental records and reputations, however, stand out among our case companies. At these companies, the facilities conduct weekly audits, which are independent of the company's auditing program, to assess the environmental and safety performance of their operations. Box 5.3 provides descriptions of these facility level auditing systems. This finding is important because it demonstrates that facilities of large companies perceive the need to augment company-wide audits with frequent and formal audits of their own. In addition, the fact that a small facility of a large company conducts its own audits implies that small companies too could benefit from facility audit programs.

Box 5.3: Facility Environmental Auditing Systems

At TECH CHEM's facility (1000 -1500 employees), twice a week a permit compliance group performs hour-long spot checks of production areas. The results of the audit are scored (e.g., 0= compliance; 1= possible non-compliance; and, 2= non-compliance) and presented to the appropriate production area on the same day. A computer printout of the results is sent to all departmental managers at the facility and the results are discussed the following day during a daily conference call among department managers.

TRADITION's facility (100 - 200 employees) conducts "Safe Acts Audits", which cover environmental issues. Under this program, each area within the plant is inspected once per week on specific topics, which are decided upon by the facility's safety committee. The audits last about one hour and are conducted by plant employees who have volunteered to serve on the Safe Acts Audit Committee for approximately one year. During the audits, the number of "safe" and "unsafe" acts (i.e., the activities or procedures which are being performed correctly and incorrectly) are recorded. After the audit, the environmental manager of the facility is informed of the audit results and each month the number of safe and unsafe acts are tallied and presented as the Safe Acts Index (the number of safe acts/unsafe acts) to the facility's safety committee, which is chaired by the plant manager. Based on the audit findings, the safety committee files recommendations to production areas and monitors progress to ensure that corrective actions are taken.

Although less comprehensive than the annual corporate audit, TRADITION's and TECH CHEM's facility auditing systems share at least three features of an effective environmental auditing program as defined by EPA, which often are not

found in routine inspections of facility operations and equipment. First, these facility audits systematically evaluate performance through rating systems which provide a quantitative and consistent measure of performance for analysis of trends and comparison between production units. Second, the audit systems have procedures for the communication of results to high level plant management, environmental staff, and production areas. Third, the audits incorporate mechanisms to ensure that actions are taken to correct any problems noted during the audits. This finding suggests that facility environmental performance might be enhanced by the establishment of a more rigorous evaluation than routine inspections of facility activities and a more frequent evaluation than the periodic corporate audit.

None of the small companies participating in our study conducted environmental audits of their operations nor did these companies perceive the need for auditing. The environmental managers believed that auditing was unnecessary because their office was located at the facility and as a part of their job, they walk around the plant each day, often numerous times each day. On these walk through, the environmental managers note deficiencies and take action, as needed, to correct any problems. In addition, the small companies cited insurance company reviews as a double check on operational deficiencies. In light of the discussion above, it appears that small companies might benefit from a more systematic evaluation of facility activities, particularly given the fact that three of our five small companies had the same number of or more employees than TRADITION's facility. Furthermore, three of the small case companies operate two facilities, one of which does not have an environmental manager onsite.

Environmental Considerations in Business Decision-Making

From the boardroom to the operational level, fundamental to the success of a manufacturing business is the need to make decisions regarding production, development of new or modifications to existing products and processes, acquisitions and divestitures, capital expenditures, and operating budgets. Many of these decisions, made by business managers, have potential environmental consequences for the company and could negatively impact the environment and public health.

The environmental repercussions of business decisions are not always avoidable, but opportunities often exist to minimize the impact on the company, the environment and public health: for example, the selection of less hazardous constituents in the formulation of a new product, identification of waste reduction or management opportunities for a new process, or the selection of pollution control technologies with optimal efficiencies. Incorporation of environmental concerns into the business decision making process is essentially a preventive strategy.

The existence of a process for incorporating environmental considerations into business decisions and the environmental review of these decisions varied considerably among the companies in our study. Some types of business decisions are described below with examples of how and why companies incorporate environmental

considerations into decision-making processes. Box 5.4 illustrates how TECH CHEM, a company with a good environmental record and reputation, incorporates specific guidelines for environmental review of business decisions into its environmental policy statement.

Box 5.4: Environmental Considerations in Business Planning

TECH CHEM's environmental policy statement provides numerous mechanisms to ensure that the company's commitment to environmental protection is fulfilled by various functions and levels within the organization. As stated in its environmental policy, company officials intend to accomplish their environmental objectives by clearly delineating environmental responsibilities and "making environmental aspects part of the evaluation process in the research and development of manufacturing processes, thus minimizing the creation of hazardous waste material and applying technology that minimizes environmental impact."

The policy proceeds to provide specific assurances and to delineate responsibilities, for example:

- *The corporate environmental department reviews major capital appropriations.*
- *Divisional management ensures that environmental considerations are included in:*
 - *research, development and application of products;*
 - *major projects; and,*
 - *acquisitions.*
- *Project engineering must consult the environmental manager for new or modification projects.*
- *Development of manufacturing processes must include environmental considerations. "Environmental problems and their economic implications must be assessed and respective solutions and alternatives recommended for implementation." All new and revised processes, including processes transferred from another site, are submitted to the plant environmental manager for assessment and recommendation.*
- *Operations managers must initiate an environmental impact assessment and consult with the plant environmental manager if a process with environmental impact is modified (e.g., specification, raw material, or production rate changes).*

Within our case companies, environmental considerations were most often taken into account in the capital investment decision-making process. Capital Appropriation Requests involve the company's decision to invest in building construction or modifications, equipment, new products, or property, for example. Incorporating environmental considerations into capital investment decisions, therefore, can cover a wide range of business activities. The environmental review of capital appropriation requests can ensure that proposed projects identify environmental risks and potential financial liabilities, address environmental impact, are compatible with internal and

external environmental requirements and concerns, and allot adequate funding to achieve regulatory and internal compliance.

The capital appropriation requests and the environmental reviews of these requests vary from company to company along the following dimensions:

- type and size of projects subject to capital appropriation requests;
- the scope of the environmental review;
- who conducts the review, for example, the requester of funds, corporate or facility environmental staff, and/or a technical group; and,
- requirement for formal approval by environmental staff before the capital investment process proceeds.

Some of our case companies also have requirements for the environmental reviews of new products, new chemicals, new processes or modification to processes, property acquisitions, or operating budgets. Again, many of the variables noted above for capital appropriation requests hold true. However, environmental reviews which are separate from the capital appropriation request process may include different personnel, project sizes, and scope.

Some small companies have environmental reviews. For example at one small company, an initial environmental review of new products and raw materials is conducted because the company does not want to generate hazardous waste. When RCRA was enacted, the company made a conscious decision not to manufacture hazardous waste-generating products because the cost of RCRA compliance was considered too high. At another small company, management was in the process of discussion a formal approval system for new products and processes. The new protocol would require an environmental review among other considerations and the signatures of the vice president of operations, the plant manager, and the laboratory and environmental directors.

Some general observations from our cases as well as informal discussions with environmental managers over the course of the project include:

- It is most common for business managers to be responsible for assessing and documenting the environmental impact of business decisions. Often the environmental department develops checklists or manuals for business managers to use to assess environmental issues.¹¹
- Many environmental managers felt that their opinions were voluntarily solicited for important matters by other departments or functions within the company. They "hope" they are called in to provide advice to business managers and often "see things" even though no one is required to show them.

- Timeliness was often cited as a problem. The corporate environmental manager at one large company in our study said "we are almost always called in, often much later than we'd like, though." Another facility environmental manager said "once the facility decides that it wants to use a certain chemical, it's difficult to say, 'is there something safer'?"
- Many environmental managers from large and small companies would like to see more formal procedures instituted within the company to include environmental professionals in the review of business decisions, particularly new products and processes and real estate transactions.
- Formal review processes for environmental considerations were often absent at our small case companies. Instead, environmental managers cited a general awareness of company activities such as new products or processes. This knowledge often comes from the additional functions they perform in the company.

Ideally, the researchers believe that companies should have a system in place to ensure that environmental considerations are an integral part of the business decision process. Business managers should involve environmental managers or experts early in the business planning process when alternative courses of action are feasible and cost-effective. The approval and signatures of environmental managers are also recommended as safeguards. However, the perceived optimal solution must be tempered with some business realities. For example, will the environmental review process lead to excessive delays in the business decision-making process? Does the environmental department have the resources to review business plans? Despite potential constraints at a minimum the researchers believe that companies should establish minimum requirements or protocols appropriate to their organization for addressing environmental considerations in business decisions.

Conclusions

In this chapter we discussed four management controls -- internal reporting, performance appraisals, environmental auditing, and environmental reviews of business decisions. Analysis of our data revealed that companies with contrasting environmental records and reputations were distinguished from each other by a number of factors. Companies with good environmental records and reputations incorporated environmental issues into routine production communications; utilized routine and formal reporting mechanisms to communicate between environmental staff and top and plant management; and, conducted environmental audits at the corporate level. In addition, two large companies with good records and reputations stood out among our case companies in that they had developed facility level auditing systems that were more rigorous than routine inspections of operations and more frequent than corporate audits.

The assertions of corporate environmental managers, based on real world experience, led the researchers to draw additional conclusions from the case materials. The incorporation of environmental performance criteria into the company's overall performance evaluation system for production personnel can lead to improvements in environmental performance. Companies must develop formal procedures that involve environmental professionals early on in the business planning process and review of business decisions.

Endnotes

1. Gary Dessler, *Management Fundamentals* (Reston, Virginia: Reston Publishing Company, 1985), pp. 346-347.
2. Melvin Anshen, *Corporate Strategies for Social Performance* (New York: MacMillan Publishing Co., Inc, 1980), p 23.
3. U.S. Environmental Protection Agency, Notice, "Environmental Auditing Policy Statement," *Federal Register* 51, no. 196, 9 July 1986, 25004-10.
4. Chemical Manufacturers Association, *An Industry Survey of Chemical Company Activities to Reduce Unreasonable Risk*, (Washington, D.C.: Chemical Manufacturers Association, February, 1983), p. 52.
5. See for example: Arthur D. Little, Inc., Center for Environmental Assurance, *Current Practices in Environmental Auditing*, Report to the U.S. Environmental Protection Agency, EPA No. EPA-230-09-83-006. (Cambridge, MA: Arthur D. Little, 1984); Scheid, Daniel C., "Health, Safety and Environmental Protection: A New Audit Program," *Plant/Operations Progress*, Vol. 6, No. 4, October, 1987; and, Frank B. Friedman, Occidental Petroleum Corporation, *Practical Guide to Environmental Management*. (Washington, D.C.: Environmental Law Institute, 1988), p. 57-81.
6. U.S. Environmental Protection Agency, p. 25006.
7. U.S. Environmental Protection Agency, pp. 25006-7.
8. Frank B. Friedman, p. 58.
9. The Business Roundtable Environment Task Force, *Background Report for the World Industry Conference on Environmental Management, November 14-16, 1984*, prepared by R.M. Dowd & Co., (Washington, D.C.: R.M. Dowd & Co., 1984), p. 16.
10. Friedman, p. 57.
11. For an example checklist see Frank Friedman, Appendix D, pp.169-194.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

This research project seeks to contribute to the understanding of the methods and motivations of private companies in complying with environmental regulations and reducing and managing environmental risks. Traditionally, regulatory agencies have relied on command-and-control techniques as their principal tools in protecting the environment. This project studies underlying motivations and companies' internal strategies and programs, providing insights into what companies do, why they act in certain ways, and how they achieve their environmental goals. With additional knowledge and insights, policy makers and regulators can evaluate alternative strategies for achieving and exceeding compliance and encouraging environmental behavior. In addition, from this report, businesses can learn about the activities of other companies and use the findings to garner internal support for their own programs.

The researchers used a case study method, selecting 15 chemical manufacturers based on criteria of size, location, and environmental record and reputation. The report contributes to environmental policy development in three ways. In the area of investigative methods, the researchers developed an index of environmental performance called Environmental Record and Reputation (ERR) in order to ensure that both "good" and "bad" environmental actors were studied. While using a number of available but problematic sources, such as agency records and regulators' opinions, poses limits for the technique, the resultant index can be used as an approximate indicator of environmental performance. In its findings, the report delineates key elements of environmental management that distinguish companies with contrasting records and reputations and presents a model describing influences on company behavior. The report concludes by making recommendations in three areas: regulatory policy, education, and research.

What Motivates Companies

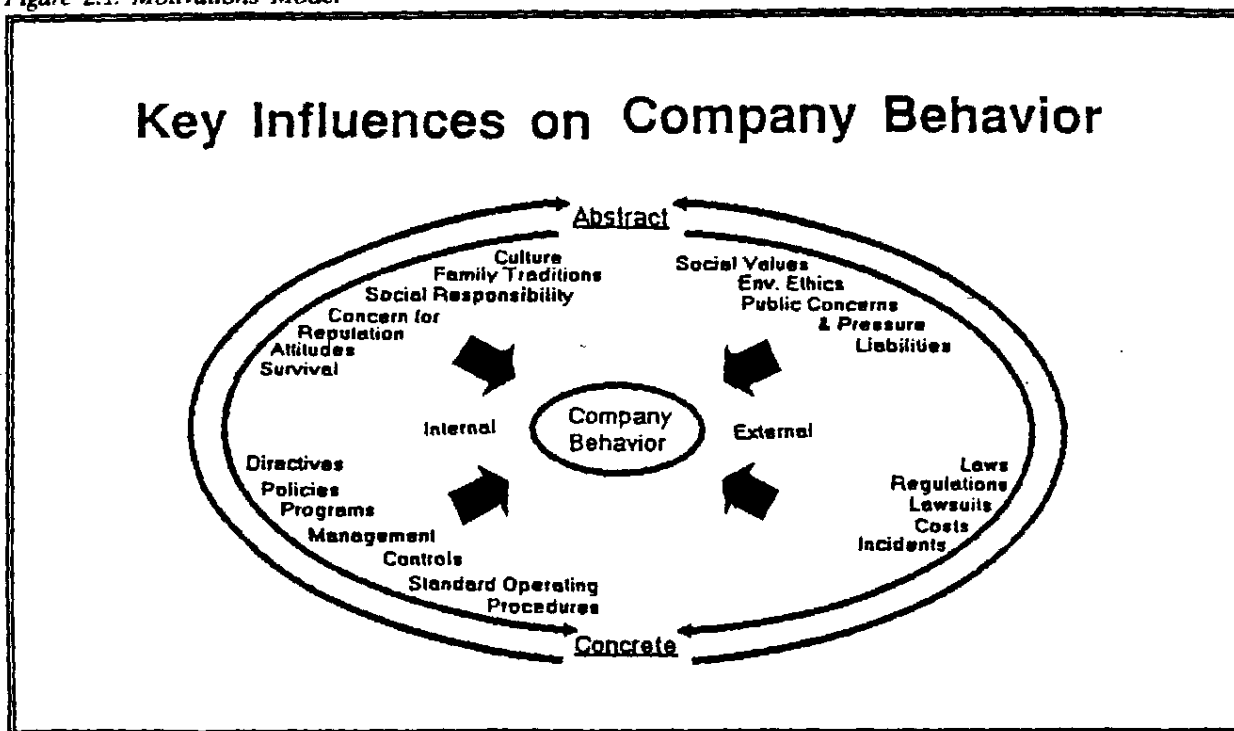
The question of what motivates companies to act in response to environmental concerns may suggest some common sense responses such as "It's the law." However, companies differ widely in their attitudes, organization, and behavior. This research explored the question of what motivates companies and, based on the companies' responses, found that a number of influential factors or motivations emerged consistently.

- The primary motivators reported by most companies included economic considerations, regulations, environmental disasters and incidents, and company reputation. Financial liabilities such as Superfund cleanup costs, lawsuits, and fines and the implications for company survival weighed most heavily on company decisions and resulting actions.
- Company traditions, especially those of founding families, of commitment to community and environmental quality appeared to have significant, and pervasive influences on company attitudes regarding compliance and perception of environmental issues as well as on specific actions and behavior of employees.
- Strong leadership, which may come from different levels within the organization, was important in translating company culture, values, perceptions, and attitudes into effective programs and actions. This leadership provides internal motivations and influences for the rest of the company.

The forces acting upon companies are often not discrete. Rather, companies and their employees may respond to a series of events or aggregate forces. For example, some companies reacted to the Bhopal disaster, while other companies waited for the regulations which were an outgrowth of the disaster and public pressure to control chemical risks. As depicted in figure 6.1, company actions in environmental affairs are influenced by a mixture of internal and external factors ranging from very abstract to concrete. On an abstract level, motivational forces can include company culture and attitudes or external pressures that shaped the companies' basic approach in complying with regulations and managing or reducing environmental risks. On a more concrete level, regulatory requirements, lawsuits, environment incidents or internal policies can shape or dictate the actions taken by the company or individual employees. While all the influential factors or motivations appear to bear on "company behavior," the factors that companies stressed were more concrete factors such as costs and particular events. This is not surprising, since the more abstract influences such as internal culture or external social values are difficult to identify and isolate.

In a simplistic fashion, the model also illustrates the interrelationships among the various factors. For example, abstract notions of ingrained culture can influence

Figure 2.1: Motivations Model



the formulation of company policies which are intended to guide actions. The more abstract motivations also can influence how individuals will carry out the more concrete policies and programs. That is, the way people think about environmental concerns will influence how they behave in that area. At the same time, the more concrete motivators can shape abstract values. For example, Superfund liability can contribute to a change in the organization's attitudes about the need for waste reduction. In another example, internal abstractions, such as ideas of social responsibility or attitudes toward environmental affairs, can influence public opinion and the formulation of laws and regulations through advertising, news releases, and lobbying.

Practices That Differentiate Companies

An environmental management system comprises many interwoven elements and methods, some of which stem from the company's overall management system. Because of this interplay, any one method may not be critical to successful management of environmental affairs. Lack of one component, or weakness in one, might not affect overall environmental performance. In our study, for example, even companies with exemplary records and reputations lacked some of the individual management components described in the report. In some cases, this can be attributed in part to a simple company characteristic such as size, while in other cases, an interaction of numerous factors, such as company culture, general management practices, or the collection of environmental management practices that

exist within the company, may override the need or lower the importance of specific practice. However, the use of all components should provide corporate and facility management with greater assurance that current and future environmental management issues are addressed.

Comparing the characteristics of companies with contrasting environmental performance records and reputations can provide insight into some features of successful environmental management. The following highlight some **positive characteristics** of companies' environmental management systems. However, no inference of causal relationships between these positive elements and environmental performance should be made.

Organizational Structure

- Facility environmental managers predominantly assigned environmental, health, and safety responsibilities.
- Integration of environmental activities and responsibilities with production responsibilities at the facility-level.

Environmental Planning

- Existence of a written environmental policy statement.
- Long-term environmental planning process.
- Solid operational foundation, which included elements such as regularly updated standard operating procedures, routine maintenance, and training.
- Incorporation of environmental considerations in standard operating procedures.

Management Controls

- Incorporation of environmental issues into routine production communications.
- Use of routine and formal reporting mechanisms to communicate between environmental staff and top and plant management.
- Corporate environmental audit programs.

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- Facility-level audits, more rigorous than routine operations inspections and more frequent than corporate audits.
- Incorporation of environmental criteria into performance evaluations of production personnel to enhance accountability in environmental management and to provide incentives for achieving the company's espoused environmental goals.
- Involvement of environmental professionals early in business planning processes and decisions (for example, capital appropriations, new products and processes).

While the above characteristics delineated companies by their environmental performance rating, in this study, no differentiation between companies was evident along other dimensions:

- Functional location of environmental department.
- Level of the senior-most environmental official within the company hierarchy. Effectiveness of the environmental manager or department depends more on the individual's experience and communications, influence, and leadership skills than on formal organization. However, status in the formal organization does carry significant importance and influence.
- Staffing level of the corporate environmental department at large companies. The size of the department seems to depend on such factors as the degree of centralization of company functions, the extent to which other functions perform environmental control activities, and the company's activities and severity of risks.
- Specificity or comprehensive nature of environmental policies. Existence of a policy, management commitment, and company actions that are consistent with the policy appear to be more important than its specificity.
- At small companies, there was no apparent relationship between company size and number of environmental staff or amount of time reported spent on environmental issues.
- typo? ■ At all cases, there was no indication that environmental performance varied with the type or years of industrial experience or educational background of the most senior environmental official.
- The location of the facility. While the researchers hypothesized that a state's regulatory atmosphere might affect environmental management programs, no such influence was detected. Each of the states had their

good and bad actors. For companies with multiple facilities, the development of corporate-wide programs appears to limit the variability in practices at different locations.

Despite these findings of no differentiation, environmental programs could probably be strengthened and certainly not hurt by more rather than less of the above dimensions. That is, elevation of the senior-most environmental official, increased staffing levels, the development of a more comprehensive policy, and environmental officials with more experience and education should be advantageous rather than detrimental to any company. Intuitively, this makes sense. However, given the limited sample size and the case study methodology employed in this study, additional research is warranted before definitive links can be drawn between the characteristics of environmental management and environmental performance. ?

Taken together, the concepts and management tools presented above and in the preceding chapters constitute a partial listing of the fundamental elements of an environmental management system. This should not be regarded as a checklist for successful environmental management in companies. Some additional ingredients are critical to the development and implementation of effective environmental management systems. ?

- Since environmental managers have little authority to enact change, influence and politics play a very important role in the environmental management process as environmental managers try to persuade and enlist the support and cooperation of top and production management for environmental concerns. Therefore, critical to the success of environmental initiatives is the environmental manager's experience and communications, influence, and leadership skills.
- Again, due to the staff-line relationship, top management commitment and leadership is crucial, particularly for the adoption of management controls (for example, performance reviews, internal reporting requirements) and enlistment of production support.
- "People" were cited as an important element, along with environmental policies, plans, and controls. Environmental managers often stated that it was important to have the "right" people. Characteristics of these people included long-time, trusted chemical operators; appropriate education or training; loyalty to the company; and ability to learn and adapt to new conditions and requirements.

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RECOMMENDATIONS

This study contributes more than an understanding of corporate methods and motivations. In addition, it provides a basis for recommendations for future directions in environmental management. There are implications for change and continued work in the three areas of regulatory policy, education and training, and continued research. The following sections outline a framework for change with roles for government, research organizations, and business.

Regulatory Policy Implications

- Considering the reported primacy of economic considerations:
 - ▶ make business costs reflect the true social costs of environmental damage through pollution fines, penalties, or adding contingent liability to annual financial statements;
 - ▶ publicize penalties, fines, cost of clean up and environmental damage, and settlements in tort liability cases as deterrents for other companies;
 - ▶ improve tools to calculate costs and long-term liabilities, and promote their use and acceptance.
- When designing alternative regulatory and enforcement strategies consider important pressure points for change, such as company concerns for technical competence, excellence, and corporate peer pressure; or public pressure and company concerns over reputation and consumer image.
- Since experience, both internal and external to the company, is an important influence on company practices, publicize both positive and negative company practices and results; and, promote information transfer between companies.
- Incorporate management controls -- internal reporting, environmental auditing, or environmental review of business decisions -- into regulatory strategies such as permits or enforcement tools.
- Improve the accessibility and accuracy of regulatory information, while increasing agency accountability, to overcome barriers to compliance for small or recalcitrant companies.

Incentives?

Education

- Education and training of corporate and business leaders, environmental specialists, plant managers, and operating personnel in the benefits of good environmental management practices and the consequences of environmentally irresponsible behavior. An awareness of environmental issues is needed throughout companies because environmental responsibilities and decisions with environmental implications are not delegated only to environmental staff, rather they are distributed throughout many functions and levels within companies.
- Education of future business leaders through the incorporation of environmental materials in business school curriculum.
- Improve agency and regulator expertise in business management and decision methods. One mechanism is through the promotion of peer-to-peer exchanges between business and government.

☒ Early education of engineers, etc. in env. principles

Research

- Study methods and motivations of smaller companies and facilities.
- Carry out a broader study of a large number of companies in different industries to delineate further the characteristics of successful environmental management.
- Carry out a few case studies in great depth to seek out relationships among company culture and values, policies and methods, and environmental performance.
- Refine and expand an index of environmental performance -- such as the Environmental Record and Reputation.
- Conduct an experiment on a case study company: measure environmental performance; change company practices; then measure environmental performance again to test hypotheses of effective environmental management practices.

This research project was begun on the premise that improving environmental protection and quality will require research and understanding of the private sector motivations and business methods of response to environmental matters. Seeking additional means to augment command-and-control regulatory approaches will require a coordination of research into private sector methods and motivations and educational programs and information transfer for all sectors involved. Each item in

the recommendations presented in this chapter can be expanded into extensive regulatory, educational, or research programs which could contribute to improved environmental quality. However, the recommendations would lead to greater contributions if coordinated in a way that each area supplied the others with additional information, insights, or tools and techniques in seeking to eliminate, reduce, and manage environmental risks.

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