“Impact of Hazardous Regulations on Small Firms in Delaware and New Jersey”

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Impact of Hazardous Substances Regulations on Small Firms in Delaware and New Jersey

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Regulations under the 1990 Amendments to the Clean Air Act impose significant requirements on firms handling hazardous chemicals. The nature of the regulations would suggest that small firms, because of limited resources and other structural limitations, would experience more difficulty complying with the regulations than large firms. To understand the difficulties imposed by the regulations on small firms, we interviewed ten small firms in Delaware and New Jersey, states with existing hazardous regulations similar to those being considered by the U.S. Environmental Protection Agency, and evaluated their responses to state regulations. The impacts of the environmental regulations on the firms and on the risk levels of their businesses are discussed. Propositions for research into small firms compliance are developed. Possible means for reducing the regulatory burden on small firms while enhancing regulatory effectiveness are suggested.

KEY WORDS: Clean Air Act; small firms; environmental regulations; chemical process risks; regulatory effectiveness.

1. INTRODUCTION

The 1990 Clean Air Act Amendments (CAAA) include regulatory requirements related to the prevention of accidental chemical releases.1 Section 112(r) of the Act, the Accidental Release Provisions, requires the Environmental Protection Agency (EPA) to develop and implement regulations to prevent accidental releases of regulated substances to the air and to minimize the consequences of releases that occur.1,2

The EPA has estimated that well over 66,000 facilities5 will be subject to this regulation. Most will be small businesses. Although there is an established literature on how small businesses deal with environmental regulations very little has been written on how they deal with regulations that depend on public interest for enforcement. We are interested in learning how small firms deal with regulations of this nature and whether such regulations are likely to result in reduced community risk.

Previous studies of the economics of safety regulations6 have examined differences between small and large firms in terms of regulatory compliance and enforcement and examined both compliance asymmetries and enforcement asymmetries. Compliance asymmetries are conditions under which some firms suffer a greater regulatory burden per employee even when regulations are evenly enforced against firms. Enforcement asymmetries are conditions in which regulations are more vigorously enforced against firms of certain size. Studies focusing on enforcement asymmetries have consistently found that regulations favor large firms.6-8 Fauss and

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Lowenstein\(^6\) point out that close scrutiny of industries can reveal specific mechanisms by which these advantages are achieved. In coal mining, for example, they found most regulations emphasized engineering controls and that large mines had an economy of scale advantage in adopting the controls.

Unlike the works mentioned above which contrast large-firm and small-firm compliance, our interviews focused exclusively on what small firms considered their biggest challenge for compliance in the area of chemical accident prevention regulations. This paper describes an investigation into small firm response to chemical process safety regulations in New Jersey and Delaware, regulations which have been in place for many years and which have many elements in common with the proposed Federal regulations. The objective of the investigation is to identify special problems small firms face addressing process safety regulations and the decision criteria and decision processes they employ in so doing.

2. REGULATORY BACKGROUND

The Delaware\(^{10}\) and New Jersey\(^{11}\) regulations are in many respects similar to one another and to the Occupational Safety and Health Administration (OSHA) Process Safety Standard.\(^{12}\) Both state regulations, as well as the OSHA standard, use a performance-oriented approach requiring that management controls are in place to ensure appropriate accident prevention measures. Both regulations require that facilities have risk-management programs, process hazard analyses, incident investigations, maintenance programs, inspections, and training and emergency preparedness programs. Both establish criteria for identifying sites subject to the respective regulation, and both have provisions for inspections and oversight. Agencies in both states conduct compliance audits. Major differences between the two State regulations are found in the purpose and scope, list, and quantities of substances covered by the regulations, fee structure, nature and schedule of process hazard analyses required, and reporting requirements.

Beyond the technical requirements, New Jersey and Delaware differ sharply in the manner in which the regulatory agencies interact with the regulated firms. New Jersey imposes annual fees based on the number and quantities of regulated substances at a site. Fees so generated are intended to support the regulatory apparatus and as the number of regulated sites has decreased, the financial burden of the regulatory apparatus falls on a shrinking base. Delaware's fees, by comparison, are nominal and not linked to the number of registered firms or agency costs.

New Jersey's enforcement procedures are highly structured, include mandated fines, and require the purchase of outside consultant services in certain cases of noncompliance. Delaware, on the other hand, has no requirement that consultants be engaged, and often does not levy fines for noncompliance with the regulation unless an incident has occurred. Delaware provides limited free services such as computer generated vapor cloud dispersion maps. This is especially useful to small firms which are required to generate this information but which, unlike most larger firms, do not have the necessary technical resources available in-house.

2.1. Development of Process Safety Regulations

The performance orientation and program elements which characterize process safety management began to evolve within the chemical industry following the cyclohexane explosion at Flixborough, England, in 1975, and became codified recommended practices following the methyl isocyanate catastrophe at Bhopal, India, in 1984. Process safety management originated as in-house programs in several major U.S. chemical companies; Dow Chemical, DuPont, Union Carbide, Air Products and Chemicals, ICI Americas, and Rohm and Haas among them. These programs became the basis for the Chemical Manufacturers Association's Responsible Care® program and the American Institute of Chemical Engineers' Center for Chemical Process Safety guideline series.\(^{13}\)

When the state of Delaware announced its intention to develop a process safety regulation, DuPont and ICI Americas, working through the local industry council, provided extensive technical assistance to the State's Department of Natural Resources and Environmental Control (DNREC) which was charged with drafting and implementing the regulation. When OSHA sought input on a proposed process safety regulation, the chemical industry responded with technical expertise, working through Organization Resources Counselors (ORC). Utilization of industry practice was further leveraged by OSHA's adoption of many of the concepts found in the Delaware regulation. Similar assistance was provided to New Jersey officials by large firms through the New Jersey Chemical Industry Council.

As a result, these regulations incorporate many of the practices common among major chemical companies. Characteristically, these companies have competent in-house experts in all of the disciplines involved in process safety, usually at the corporate or business level.
Economies of scale make it more attractive to maintain these resources in-house than it would be for smaller firms. Moreover, the exposure to loss, liability, or public image may be seen as a more compelling incentive to take preventive measures among larger firms with greater assets at risk.

Small firms, in contrast, had little involvement in the development of these State and Federal regulations, having neither the resources nor materials relevant to the development of technical regulations. As a result, the regulations reflect almost exclusively the knowledge, expertise, and practices of large chemical companies as well as their unique resources, organizations, and cultures. Thus, while many large firms find compliance an administrative burden, they have in place the necessary infrastructure and programs and a culture predisposed to comply. Small companies, in contrast, often have none of these elements, nor is their usually entrepreneurial organizational structure likely to have the capacity or willingness to acquire them. We expected that small firms would experience economic and technical difficulties in complying with process safety regulations. As a consequence, their response to these regulations would be less effective in reducing risks.

3. RESEARCH METHOD

This study focused on the responses of small companies to existing state regulations in Delaware and New Jersey dealing with management of hazardous materials which pose potential risks to surrounding communities. We reasoned this information would provide a good indication of how small firms throughout the United States would react to the proposed accidental release provisions of the Clean Air Act which imposes similar requirements. Research consisted of a review of State and Federal regulations, interviews with state regulatory officials, and on-site and telephone interviews with management of small companies subject to their respective state regulations.

The firms that were interviewed are subject to the OSHA Process Safety Standard and either the New Jersey Toxic Catastrophe Prevention Act Program or the Delaware Regulation for the Management of Extremely Hazardous Substances. Each regulation is performance oriented, that is, to a large extent the methods of compliance are not specified, although certain required program elements are established. These include process safety analyses, a risk management program, maintenance, inspections, training, incident investigations, and documentation of information.

We selected companies from a list of all firms registered under the respective state regulations. Those firms meeting the study criteria, i.e., commercial firms with fewer than one hundred employees, were identified with the assistance of the state regulatory agencies. Candidates for interview were selected randomly within broad geographic clusters. A total of approximately 30 companies were identified, 22 were contacted, and ten agreed to be interviewed, five in each state.

The selection process contained opportunities for bias, such as an a priori willingness to be interviewed and the absence of any firms which failed to register as required by the regulation. Interview responses were fairly candid, however, in that many of the firms were willing to discuss steps they took to avoid compliance. However, given the small number of firms interviewed, the data should be viewed as exploratory.

In one-on-one interviews at each firm, we asked the following questions of the owner/operator:

- Do you have a program, or plans for a program, to deal with hazardous materials such as chlorine, ammonia, etc.?
- Could you describe the program?
- Major program elements?
- How were hazards and risks assessed?
- What changes were made to operations or facilities as a result of the program?
- What is the status of the program, e.g., planning stage, implementation stage, or in place?
- Was the program developed in-house or did you use outside resources, e.g., consultants, trade associations, regulatory agencies, etc.?
- Are you familiar with the OSHA Process Safety Regulation and the Delaware (or New Jersey) Process Safety Regulation?
- What action has your company taken to comply with these regulations?
- Has your company established an overall objective or mission statement regarding compliance with State and Federal process safety regulations?
- If you have developed an overall objective or mission statement is it a written statement?
- How were your company's plans for addressing State and Federal process safety regulations developed?
- The research team would like to study the programs thus developed. Could we review them here or take them with us and return them?
- What parts of the State/Federal regulations have proven the most difficult to deal with?
Have you requested or received any assistance from an outside source, e.g., trade association, state agency, insurance company or consultant, complying with State or Federal regulations or developing a major accident management plan?

What was the nature of the assistance?

In what ways was it useful or not useful? (insert specific questions regarding key regulatory requirements to evaluate depth of understanding and compliance).

Has your company, or any site, been audited by the State or Federal agency responsible for enforcing process safety regulations? If so, what was the outcome of those audits?

May we meet with the person directly responsible for implementing the major accident-prevention program, such as the site manager or other designated person?

3.1. Description of Firms Interviewed

Included in the study were two propane distributors, two cold storage warehouses using ammonia refrigerant, three chemical processors, one chemical repackager, one chemical distributor, and one energy plant using ammonia to reduce nitrogen oxide emissions.

3.2. Delaware Firms

Company A. This site is a cold storage warehouse in Delaware, one of six owned by a regional firm headquartered out of state. It is about 5 years old and has about 45 employees. It receives technical and management support from headquarters staff, but appears to operate relatively independently.

The plant refrigeration systems contain over 8000 pounds of ammonia, which makes it subject to the Delaware regulation. The warehouse is located in an industrial park. Approximately 20 homes have been identified as being in the “vulnerability zone” as determined by application of state guidelines. Each home is on an emergency phone list which would be called in case of an ammonia release. Local management has visited each home to describe the emergency action plan.

While the site reportedly had an emergency response plan before the Delaware regulation became effective, the Risk Management Plan (RMP) was developed in response to that regulation with the aid of an outside consultant. Compliance with the regulation did not require significant physical or procedural changes; however, it did prompt updating of process and instrument diagrams, valve identification, and documentation of safety-related training programs.

Site management found the greatest problem created by the Delaware regulation to be the demand it placed on personnel resources to put in place the program and RMP. While this site could call upon corporate engineering for technical assistance, management speculated that it would pose a particular hardship on small companies with limited technical resources. The interviewers assessed the technical sophistication of local management to be good based on the appearance, apparent high maintenance, and operating standards of the firm.

Company B. This facility is a family-owned propane and heating oil distributor in Delaware. The propane storage and loading facility is located in a mixed residential and commercial area. While the firm had several written and unwritten procedures before the Delaware regulation became effective, the regulation has caused the firm to codify and organize these procedures and formalize training. Delaware’s Department of Natural Resources and Environmental Control (DNREC) provided the firm with a generic propane facility Risk Management Plan (RMP) which had been prepared by the Mid-Atlantic Propane Gas Association. The generic RMP must be customized by each firm to satisfy regulatory requirements. It was the interviewers’ impression that little had been done in this regard, and that the owner was not completely familiar with the contents of the plan.

The principal owner reports good community relations. No concerns over safety have been raised. The fire department is sensitive to the presence of the propane operation. However, it is the owner’s opinion that if they were required to communicate the “worst case” scenario, “we would be out of business.” The firm has not yet communicated with the Local Emergency Planning Committee (LEPC). It does have a rudimentary emergency response plan with the fire department, and recognizes the need to alert certain neighbors in case of a propane emergency.

The firm did not use outside consultants and only minor equipment changes were required as a result of the regulation. The owner found the greatest problem in compliance was the time required to understand and apply the regulation to the facility.

Company C. This is a closely held company engaged in the packaging and sale of hazardous gases and related compounds. Materials are received by pipeline and tank truck and are loaded into cylinders and cylinder trailers, or are processed on site. The site is part of a
heavy industrial area in Delaware, occupied by several chemical processors.

The site did not have a RMP prior to enactment of the Delaware regulation. The site plan was prepared with the assistance of DNREC, which used its computer model to develop the "worst-case" release plume. No physical changes were made as a result of the regulation; however, operating procedures and training were formalized and documented, and a change of design procedure was instituted.

This company utilizes trade association technical assistance, and OSHA consultation services and is part of a local CAER® (Chemical Manufacturers Association’s Community Awareness and Emergency Response) group which meets periodically with the community and county officials.

Company D. This facility is an independently owned propane and heating oil distributor located in a sparsely developed semi-rural area of Delaware. The site is bounded by a trailer park, woods, and open fields. Scattered dwellings are located within a few hundred feet.

Prior to implementation of the regulation, this site had no organized safety or operating procedures. Following enactment of the regulation, the site implemented the Mid-Atlantic Propane Gas Association’s generic risk-management plan developed for its Delaware members. Assistance is also available from other propane distributors, the bulk propane supplier, and DNREC.

In response to the regulation, the firm established written procedures, instituted formal, documented training, and made minor equipment modifications. The facility manager reported that finding time to complete the paperwork and other tasks associated with the regulation was a problem for a small organization.

Company E. [Telephone Interview] This firm operates a cold storage warehouse in a semi-rural area in Delaware. The plant uses ammonia refrigerant, which makes it subject to the Delaware regulation.

Management recognizes that a large ammonia release could expose a large number of people, and that their resources for dealing with such a release are limited. The person interviewed has taken a course in ammonia refrigerant safety at a Delaware community college, but believes the Delaware regulation is not sufficiently defined.

3.3. New Jersey Firms

Company F. [Telephone Interview] This firm is a chemical distributor in New Jersey. It was initially subject to the New Jersey regulation because of two chemicals stored in above-threshold quantities. Management later determined that concentrations of bulk quantities of the two chemicals could be reduced below those subject to the regulation while limiting inventories of higher concentrations of those chemicals to below the threshold quantities. Thus, the firm is no longer subject to the New Jersey regulation.

Most of the firm’s New Jersey customers who formerly used the higher strength chemicals found that they could convert to lower concentrations and thereby be exempted from the regulation. The impact of these changes on safety and community exposure is not known.

This firm became aware of the regulation through trade publications and a seminar presented by a consulting firm. Other sources of information on regulatory requirements include trade associations, insurance carriers, and consultants.

Management estimates that, of 33 employees, the equivalent of three full-time employees work exclusively on regulatory compliance, including hazard communication, distribution, Department of Transportation regulations, and safety and environmental issues.

The firm has not specifically communicated with their residential or industrial neighbors. The National Association of Chemical Distributors, the industry trade association, has an outreach program which this firm expects to use when required by the Clean Air Act.

Company G. [Telephone Interview] This privately held New Jersey chemical processor operates a single site utilizing two highly toxic chemicals covered by the New Jersey regulation. The site is located in a residential area.

After a fine and citation by the State, outside consultants were engaged to bring the firm into compliance and develop a risk management plan. While the consultants proved helpful in meeting the legal requirements of the regulation, they did not address technical issues of process safety. Vendors provide useful technical assistance, and state inspectors were found to be knowledgeable and generally reasonable in this area.

While management recognizes the need for the regulation, it regards the fee structure as egregious, noting that the bulk of the regulatory budget is funded by registration fees and fines. The burden on small firms is significant and increasing as the number of registrants in the program shrinks.

Company H. This site is a small, closely held New Jersey firm engaged in preparing and packaging various concentrations of a regulated chemical. The firm is lo-
cated in a mixed residential and light industrial community.

When made aware of the regulation by a vendor, management attempted without success to understand and implement it. Ultimately, consultants were engaged, first to aid in implementation, and finally to modify the operation to enable the facility to be exempted from the regulation. The process modifications actually resulted in the introduction of more hazardous chemicals, but below reportable threshold quantities. Management believed the overall risks to the community actually increased in the process of being exempted from the regulations. Management also believed the cost of modifications would be recovered in savings in registration fees within 2 years.

The firm has not communicated with its neighbors or the LEPC. Management believes communication of the "worst-case" scenario would cause serious concern among neighbors.

Company 1. This New Jersey power generation firm uses anhydrous ammonia as an additive to reduce nitrogen oxides in exhaust gases. The unit is located in a heavy industrial complex.

In response to the regulation, the site engaged a consultant to provide a "turnkey" compliance program. The program includes risk assessment, documentation, and representation during inspections. This approach is consistent with the firm's management philosophy, which is to contract out most functions, including employment, training, and ammonia storage system maintenance. Regulatory inspections have been uneventful and have resulted in few changes.

Interaction with the community is largely limited to contacts with the local industrial emergency response committee and meetings with local politicians. The parent company has sponsored talks on risk characterization before schools and civic groups.

The interviewers were impressed with the businesslike approach taken vis-à-vis the regulation, commitment to compliance, and the quality of the documentation. However, there was little evidence of direct management involvement in the risk management program.

The most difficult problems experienced with the regulation are the short phase-in time for changes, and the immediate reporting and follow-up requirements for releases, even with no off-site potential. Concern was also expressed over possible additional fees and the cost of mandated improvements which could not be passed on to customers under long-term contracts.

Company 2. This New Jersey site, no longer in production, was engaged in manufacture and resale of chemicals and pharmaceuticals. The site is located in a mainly light industrial neighborhood with some residential and commercial occupancies. An open-air arena is located about 1 mile distant. The decision to terminate manufacturing operations was reportedly influenced by the environmental regulatory burden as well as business considerations.

Several regulated chemicals were used, but inventories of all but one were eventually reduced below the regulatory threshold after the regulation became effective. In some cases, actions taken to reduce on-site inventories may have resulted in a shift rather than reduction in community risk. For example, reduced inventories required more frequent truck deliveries of hazardous chemicals, or storage in off-site public warehouses, thus, transferring risk to the highways and to unregulated warehouses.

The site has received some technical assistance from chemical vendors, the Chemical Industry Council, and the Synthetic Organic Chemical Manufacturers Association (SOCMA), a trade association. However, management demonstrated a high degree of technical competence and awareness of regulatory requirements.

This site played a leading role in developing an emergency response capability and in community relations. Nevertheless, management does not believe it possible for the public to respond rationally to a "worst-case" scenario.

The interviewers felt the location and hazardous nature of chemicals formerly used at this site presented a potential community risk which would justify the highest degree of process safety management obtainable.

4. DISCUSSION AND CONCLUSIONS

4.1. Implications for Research

Of the ten companies interviewed, the investigators judged only four to have the technical competence or the resources available to them to deal with the state regulation to which they were subject. In two of the ten companies the firms were associated with, multilocation umbrella organizations that could make technical resources available to them. In two other cases, the firms turned the issue of compliance over to outside consultants that provided all of the assessments and documentation required by the regulation. In the case of the two firms which collaborated with outside consultants, it is suspected that local management derived little understanding of process safety or otherwise enhanced their
ability to knowledgeably manage process safety. It is not suggested that the work was of no value; hazards were identified, risks assessed, and measures to reduce risks were recommended and implemented. But the essence of process safety management, as originally conceived\(^{14}\), is to assure management involvement and oversight in activities which may influence low-probability, high-consequence events.

**Proposition 1.** Managers of small firms that rely on outside consultants for technical risk assessment, in comparison with those who work with consultants to develop their firm’s risk management plans will: (1) remain less knowledgeable about the risks their firms pose; (2) engage in fewer activities to oversee and reduce those risks.

Two New Jersey companies were advised by their outside consultants to take technical measures which exempted them from the regulation. Two other companies with technically competent management and in-house experience in regulatory issues likewise identified and implemented measures which exempted them. It is the subjective conclusion drawn by the investigators based on their substantial process safety experience in the chemical industry that these measures did not materially reduce community risks and might actually have increased them. Examples of those measures illustrate this conclusion:

- Inventories of hazardous substances are reduced to below the quantities addressed in the regulation, the “threshold quantity.” However, demand remains unchanged, requiring more frequent shipments through residential neighborhoods, and increased handling. Inventories of hazardous substances in excess of threshold quantities are stored off-site in a public warehouse equipped to deal with an accidental release.
- Hazardous substances are received at slightly lower concentrations which exempt them from the regulation, but which, from a practical standpoint, does not alter the risk. In one instance, process facilities were provided to “put up,” or increase the concentration in batches smaller than the threshold quantity to meet customer demand. The processes required for this step increases the complexity of the process and introduces another, more hazardous substance, but at below the threshold quantity.

**Proposition 2.** Compliance with regulations does not necessarily correspond to a reduced community risk.

All of the firms interviewed are subject to the Occupational Safety and Health Act, and at least five of the ten, including the two propane distributors, are subject to OSHA’s process safety standard. The more technically sophisticated firms were aware of this standard but others were not.

**Proposition 3.** Firms with managers who are technically competent in working with risk assessment will have greater awareness of regulatory requirements that bear upon them. While cost of compliance data was not specifically sought, a few New Jersey firms volunteered that they spent from $15,000 to $50,000 in fees to outside consultants for assistance in developing RMPs and satisfying other requirements. This expenditure would be of little consequence to most larger companies, but it was clearly viewed as a significant burden by some of the firms interviewed. Also in New Jersey, where the enforcement organization is largely supported by registration fees, those fees have increased significantly as the number of registered sites has decreased from approximately 500 to approximately 100. In Delaware where the registration fee is fixed, the number of registered sites has increased from approximately 50 to approximately 100.

**Proposition 4.** Regulations that involve high regulatory fees will tend to drive firms to take steps that remove them from regulatory coverage; may promote no decrease in total societal risk.

Small firms which process, package, or distribute chemicals designated as hazardous by State or Federal regulations may be obliged to exercise technical judgement and managerial skills quite different from those which enabled them to achieve and maintain commercial viability. These technical and managerial demands have been defined by the process safety management programs developed by major chemical companies in response to catastrophic incidents and, to a significant extent, reflect their unique capabilities and cultures.

Thus, there appears to be a disconnect between the regulations as they exist and a large part of the regulated community. The regulations were developed by technically competent people combining the most advanced process safety management practices with the incentives contained in the enabling legislation. Dean and Brown\(^{15}\) suggest that incumbents might be able to use environmental regulations to strategically enhance competitive advantage. Certainly large firms with sophisticated process safety systems in place would benefit if the expense of similar systems were imposed on all competitors. It is unlikely, however, that such a strategic ploy would be specifically aimed at small businesses. In
the process, and absent meaningful representation in the rule making process by small businesses, a seemingly incomprehensible burden has been placed on this segment of the business community. A similar burden has been observed in studies of new firm entry when subject to pollution and hazardous waste regulations. As a consequence, many small firms are driven to comply with the legal requirements of the regulations without regard to, and sometimes in conflict with, their goals. The results often are significant costs and administrative burdens without commensurate societal benefit.

Unlike some regulations, such as those developed by the EPA to implement the 1990 Clean Air Act Amendments, the State regulations in this study made no provisions for exceptions based on the size or volume of regulated materials handled. Judicious use of exemptions from air pollution emissions regulations has been shown to significantly reduce the burden on small businesses. It should be noted, however, that there are sharp distinctions between risks from air pollution emissions and accidental releases.

4.2. Implications for Regulations

All three agencies cited in this investigation, OSHA, New Jersey DEP, and Delaware DNREC, took pains to solicit and carefully consider input from the regulated community when developing their regulations. However, the greater resources and regulatory sophistication of large chemical companies and their trade associations made it more feasible for them to influence the regulatory process. As a result, there was very little representation of the small company perspective in those regulatory hearings. Future regulatory hearings should be structured to actively encourage input from small companies. Among the measures which should be considered are:

- Conducting small company focus groups regionally.
- Contracting with small companies or small company trade associations to submit comments and to appear at hearings.
- Designating a small business ombudsman within the regulatory development team.

Given the paradigm of the regulatory process with technical input almost exclusively from large chemical companies, it might be instructive to speculate how these regulations might differ had small chemical manufacturers significantly influenced the regulatory process. For example:

- Generic risk management plan templates might be included in the regulation for common chemical uses and processes.
- Far less emphasis might be placed on technical studies and analyses and far more on compliance with accepted good practice and existing regulations.
- Existing installations and processes might be "grandfathered," that is, protected from required compliance with new regulations.
- More emphasis might be placed on nonpunitive consultative visits by regulators.
- Documentation requirements might be minimized and the burden of need for documentation placed on the regulatory agency.
- Greater emphasis might be placed on work experience and apprenticeship, rather than on formal, documented training programs, and
- The cost of supporting the regulatory organization might be redistributed over a broader base rather than borne solely by regulated firms (in New Jersey).

Given the wide diversity of businesses, technologies, and communities, it is unlikely that any technical regulation with public safety implications could be developed that would meet the needs of the full spectrum of industries to which it must apply. However, while small companies are often unable to match their large counterparts in technical sophistication and resources, they have proven to be commercially viable, and thus must have unique strengths. It would be useful for regulators to identify and characterize these strengths in order that they might be used to rationally differentiate regulatory requirements between small and large firms. For example, the size and complexity of large firms may require administrative functions not necessary in small, closely-held entrepreneurial firms. Also, internal communications, a widely-recognized problem in large companies, is usually not an issue in small firms.

Many small firms employ chemicals in common, long-established, and well-understood processes. Requiring comprehensive process hazards analyses for each of these applications adds little to what is already known. Examples include chlorine water treatment, ammonia refrigeration, and propane distribution. For these applications, the feasibility of generic programs designed to capitalize on the strengths of small organizations and
the existence of widely accepted technical standards could be explored.

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