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Rapporteur's Report

## Practice Issues in Prevention through Design

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### 1. The Business Case

There are many examples of Prevention through Design (PtD) that illustrate current business practices. These examples and PtD concepts should be promoted to other businesses as being a favorable way to enhance their performance and improve their bottom line. The benefits, both tangible and intangible, should be identified and communicated to businesses in a way that is consistent with other business metrics, and emphasizes return on investment (ROI).

Products that are developed with PtD concepts in mind can become a good selling point. If a particular brand of a product is known to incorporate PtD processes, this may well build product loyalty and enhance the reputation of the company. The time-to-market can be shortened when PtD concepts are consistently applied, and productivity increased when the system is analyzed and engineering improvements are built into company operations. The cost of product recalls or returns can be reduced or eliminated if consumer injury prevention is built into the product.

Aside from the productivity and operational improvements, the company may well benefit from reduced injury costs to its workers when PtD concepts are implemented in the workplace. Workers' compensation, and other direct costs, can be reduced, as well as indirect costs, such as overtime pay, training new workers, the time it takes filling out injury reports, and other costs involved with non-injured workers. Reduced injuries can lead to healthcare cost containment. Companies may also be motivated to incorporate PtD by the social responsibility of undertaking design changes to reduce injuries to its workers and the public.

In order to communicate these business advantages, several steps should be undertaken. First, an extensive review of the literature and existing data should be conducted. Research on identifying easy-to-use ROI tools

can be shared with companies through many channels. Existing business case studies should be collected and companies queried for new case studies. Consistently applied approaches should be identified, as well as what is currently working for companies, and what can work better. On-line resources such as blogs, on-line training, webinars, and other sources of information, should also be identified and utilized.

### 2. Liability

Liability for effects of designs is perceived by some to be a barrier to wider use of PtD. Issues of liability, with regard to PtD, relate to both the designer and final owner, and are handled in various ways in various countries.

In Europe, safety in the workplace is created through different pieces of legislation that ultimately come together. A machine builder is required to construct machinery that is safe and meets a set of minimal health and safety requirements. When the machinery does not meet these requirements, and serious accidents occur, the constructor can be obliged to recall a complete series of manufactured goods from the European market. The employer is ultimately responsible for providing safe work equipment to the employees.

In the United States, further studies are needed to determine whether designers feel a sense of liability when designing tools or projects, and whether that perception is real or only perceived. The barrier to the use of liability as a motivator is the notion that it could sometimes be detrimental to innovation.

Possible leveraging of the liability issue, in regards to PtD, might be if state law was amended to require licensed architects/engineers to be responsible for the health and safety of workers and the public. Other methods should be explored to determine how to offer incentives to designers who understand the value and incorporate the concepts of PtD. Further study is needed on the impact of the current tort system in our society.

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The concept of liability can motivate owners to take responsibility. What is their responsibility for providing a safe workplace? When issuing price requests, owners might consider requiring PtD as part of the offer. Since it is sometimes hard to induce equipment manufacturers to implement the appropriate safeguards, equipment purchase contracts should also include language to mandate these safety features, which will insure the safety of workers through a safe design. Many feel that the technology for designing safe equipment is out there, but equipment purchasers are not asking for it, so manufacturers don't make it or market its availability.

Several suggestions have been proposed regarding the issue of liability. One appropriate step will be for attorneys, insurers, engineers, architects, and designers to participate in a workshop to discuss liability and focus together on solutions. Methods should be investigated and proposed to leverage the expectation of owners in requiring engineers and designers to include the principles of injury prevention into their projects. Clients and end users can request that PtD principles be integrated into designs, which will influence designers and engineers.

### 3. Small Business Issues

Small businesses comprise approximately 80% of companies in the United States, but the percent of workers employed by them is not as large. The nature and culture of small business itself may have a certain impact on PtD concepts. In general, small businesses want to do the "right thing," but often get overwhelmed with regulations and paperwork. Since they typically have smaller profit margins, purchase of new equipment may not be a priority. There may be a lack of knowledge and resources for owners to address safety and health concerns. Sometimes there are language barriers. Most are insured by state-backed insurance, not private insurance, and there may be issues of underreporting of safety incidents. Fatalities, however, are usually reported accurately.

ROI is a clear driver for small businesses; therefore solutions that involve PtD should be simple, straightforward, and at a low cost. Partnering through trade organizations, chambers of commerce, or insurance companies may be effective, since these organizations can then fulfill the role of identifiers, educators, and interfaces. A "simple solution book" can be prepared to educate the small business leader about the risks upfront and make the case for safety, emphasizing the direct and indirect financial ramifications of potential safety incidents. Case studies from small businesses that have experienced problems would be a good motivator, since some small businesses have the "I've been lucky" attitude, and therefore do not invest money in mitigating risks. Positive case studies, strategies, and storytelling can also be effective, as well as newsletters or fact sheets by industry. This information should focus on evidence-based best practices, and be prioritized for easy understanding by small businesses.

Not only might information be shared through partnering with other organizations, but cost effective solutions can be leveraged as well. For example, if small businesses create a pool or alliance, they may be able to get the same discount on PtD equipment as larger companies. Loans for equipment or education grants may be more cost-effective if allocated for groups of companies. In regards to training, small businesses, or a consortium of small businesses, should take advantage of recent emphasis and development of material by the Occupational Safety and Health Administration (OSHA). Training should be geared to small businesses, and can include financial assistance or insurance reductions. A good place to include health and safety information would be in business start-up kits.

### 4. Lessons Learned/Sharing Best Practices/Diffusion of Innovation Through Outreach, Communication, and Marketing

While there are many innovative ideas for encouraging use of PtD concepts, thought should be given to the best ways to communicate lessons learned, share best practices, and support diffusion of innovation. Ideas and concepts for PtD should be organized by industry, with best practices listed for each. Consideration should be given to the idea of a governing or organizing board to set priorities and format, which consists of representatives from each industry. This board will be responsible for creating and maintaining the database of best practices.

A rating system can be created by the board, so that best practices could be rated by interested parties. Fact sheets for each best practice should also be created, and prizes for innovative ideas or case studies can be awarded. The board will also be responsible for corporate outreach, coordinating case studies published online, disseminating publications regarding PtD, and implementing a system of "quick action" for immediate and widespread sharing of ideas.

Sustained and persistent outreach and educational promotion is necessary to show the consistent benefits of PtD in the short- and long-term. Tools for implementation of PtD can be disseminated to assist stakeholders in the process. For example, a website database of information with best practices can be created. Media materials might also be developed for disbursement through non-profit organizations, trade organizations, professional societies, and broadcasters. Success stories can be celebrated, through awards and publications highlighting them, and should attract media attention. A PtD certification, or registry, can be developed through professional societies or trade associations.

Business case studies should be created that demonstrate PtD benefits over baseline OSHA and Environmental Protection Agency compliance, and ROI. A library of sound bites, or short, high-profile media clips, with CEOs, COOS, and other high level executives, will demonstrate the effectiveness and ideals of PtD. Key political leaders should be identified to champion PtD and lobby for related line item

funding within NIOSH, while a well-known general spokesperson to champion the cause of PtD may also be effective.

NIOSH should play a critical role in the collection and dissemination of information, serving as a clearinghouse to link various sources.

Professional development online courses available from professional associations, such as the National Safety Council, the American Society of Safety Engineers, and the American Industrial Hygiene Association, might also be developed around PtD concepts. These courses can be for new professionals or continuing education for seasoned professionals. Courses should emphasize the “simple” or obvious solutions, and focus on the best practices of specific trades (such as an electrical panel or motor casing). Outreach to business schools, or other educational institutions, can include PtD competitions with cash or scholarship awards.

Finally, consideration should be given to the development of a professional brand or logo for companies that incorporate PtD ideas. This logo’s use would be restricted to approved companies who have been certified for implementing PtD throughout the development of designs and operations in their business.

## 5. Changing Culture

Changing the business culture so PtD becomes ingrained in organizations will require the cooperation of current business leaders who are involved in a comprehensive plan for educating all those in industry and the general public. These leaders will need to promote PtD issues, in their respective industries, by increasing awareness and disseminating information about best practices, advertising business cases that show success stories, and providing cost savings information specific to their industry. Changing the culture will not occur without a perceived need, so information should be customer-focused, customer-driven, and reflect current market pressures and cost concerns. A collaborative effort among labor, government, and industry may be the optimal approach to educate owners and customers, in order to drive initiative and innovation.

A number of specific recommendations should be considered in order to stimulate the involvement of business leaders and stakeholders. Increased visibility of information on PtD concepts should be included on websites for NIOSH, OSHA, trade associations, and other appropriate organizations. Articles in trade magazines and free “webinars” have already been discussed briefly. Presentations should be conducted at various conferences, in order to increase awareness, with standard presentation material available for sharing among stakeholder organizations.

OSHA can spearhead several useful activities. It should include PtD material in its OSHA 500 and 502 construction safety courses, and develop, through its committees, material to promote in the 10 OSHA regions. OSHA may also consider developing a PtD fact sheet, through the OSHA Design for Construction Safety Roundtable, for all sectors to utilize. NIOSH and OSHA should consider issuing a joint press release on the success of the PtD workshop, with proceedings published online, or in appropriate journals, so that all organizations could have access to them. NIOSH should draft a generic article about PtD that attendees could publish in their respective trade association and company publications.

Finally, consideration should be given to measuring the success of efforts to change the business culture. How do we know when someone adopts PtD concepts or a culture change occurs? Could PtD be on a “scorecard” or “benchmarked?” Further thought should be given to methods to accomplish this.

## 6. Integrated Throughout the Business—From Top to Bottom—Involve Workers

PtD should be integrated within a business, from top to bottom, and involve workers at all levels within an organization. Its integration should extend outside the company as well — to customers, consumers, suppliers, and the general public. If an organization has multiple facilities, divisions, or plants, special care needs to be taken to standardize PtD concepts across all operations.

One way to accomplish this is to develop standard procedures and checklists to guide the integration process. While standardized, these guidelines may need to be adaptable across various applications. The processes need to be confirmed repeatedly and may involve relatively unrelated activities, such as construction, machinery building, process, equipment, maintenance, and disposal.

Workers, users, and suppliers can be valuable partners in the quest for PtD. Users can be the motivators, if educated to request products that utilize PtD principles, as well as evaluators of the designs. Suppliers may be the educators for the company; promoting best practices and understanding from their knowledge and interaction with state-of-the-art products.

Finally, a system should be created for users to share their learning and identify possible solutions, while encouraging collaboration across functions, departments, and layers of the organization, and building trust and partnership.