## Working to Address Combustible Dust Hazards

*Walter S. Beattie, CSP, CFPS, CSHM, is a member of NFPA 655 (Standard for Prevention of Sulfur Fires and Explosions), NFPA 654 (Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids) and NFPA 91 (Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists and Noncombustible Particulate Solids) standards committees. In this interview, Beattie discusses revisions to NFPA 654 and explains how the revised standard is expected to help guard against combustible dust hazards.*

***Walter S. Beattie, CSP, CFPS, CSHM,*** *joined the volunteer fire service in 1969 and remains involved in fire suppression and protection. He has worked in the highly protected risk (HPR) insurance field since 1979 in various capacities, including senior loss control specialist, HPR technical manager, underwriting special agent and account engineer. He is senior consulting engineer, insurance services, with Matrix Risk Consultants Inc. in Miamisburg, OH. Beattie is the 2007-08 recipient of ASSE's Fire Protection Branch (now Practice Specialty) Safety Professional of the Year Award. He is currently Assistant Administrator of the Fire Protection Practice Specialty.*

**Q:** Please provide a brief description of your professional background and of your work with NFPA standards committees.

**A:** I am a senior consulting engineer, insurance services, for Matrix Risk Consultants, which is part of the engineering arm of AXA Corporate Solutions. Matrix performs unbundled fire protection and property loss prevention engineering consulting services, as well as insurance loss control surveys for AXA insureds around the world. I have worked for AXA since 2001 and have worked in the highly protected risk insurance industry since 1979. My experience working for European-owned insurance companies over the past 10 years has helped me develop valuable insight into the cultural differences in fire protection codes and standards between North America and Europe. During my career, I have focused on fire protection and property loss control.

In the late 1980s, I recognized a shift in our industry. I was interacting with safety managers much more than in the past. With the encouragement and assistance of managers and friends at CIGNA Loss Control Services, I began learning more about the safety aspects of our field, joined ASSE and earned the CSP designation. I also am a certified fire protection specialist and certified safety and health manager.

From 1991 to 1999, I was a principle member of NFPA 80, known today as Standard for Fire Doors and Other Protective Openings, and NFPA 105, Standard for the Installation of Smoke Door Assemblies.

In January 2005, I was appointed to serve as a principle member on the Committee on Handling and Conveying of Dusts, Vapors and Gases. This committee is responsible for NFPA 91, Standard for Exhaust Systems for Air Conveying of Vapors, Gases, Mists and Noncombustible Particulate Solids; NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids; and NFPA 655, Standard for Prevention of Sulfur Fires and Explosions.

**Q:** What is the status of the current projects for the NFPA 655 and NFPA 91 standards committees?

**A:** The 2010 edition of NFPA 91 was just released. Major changes included revisions related to exhaust system design and construction. These revisions incorporate requirements from NFPA 654 for correlation and consistency. A new chapter on air-material separators was added, and the chapter on testing and maintenance was revised to be made retroactive.

Inspection and testing requirements also have been revised. Inspection frequency for all system components is now monthly but under some circumstances may be extended to a frequency not greater than quarterly. Testing of existing systems is performed annually to demonstrate continued performance. Under some circumstances, this may be extended to biannual testing.

The current edition of NFPA 655 is the 2007 edition. It is beginning a new revision cycle, and the committee has elected to move the proposals back one cycle. NFPA 655 will now be in the Fall 2011 cycle, with a proposal closing date of May 28, 2010. This means that any user of the standard may submit proposals for changes in the standard. The form is available at www.nfpa.org or by contacting NFPA directly.

**Q:** Investigation of a dust explosion involves determining the actual hazard as well as the manufacturing process that led to high dust concentration levels. What should SH&E professionals look for when evaluating a workplace?

**A:** SH&E professionals should be thoroughly familiar with the processes and facilities that handle combustible particulate solids in a facility. They also should be familiar with the physical and chemical properties that establish the hazardous characteristics of the materials used in a facility. I suggest that a facility should have a documented process hazard analysis, and SH&E professionals should be familiar with the hazards identified in the study. A management of change program should be implemented, and any changes to the system should be reviewed and approved by the committee and management. Also, SH&E professionals should be familiar with the requirements of the NFPA standards that apply to a facility.

### Hotlinks

**ANSI**
American National Standards Institute
www.ansi.org

**ASABE**
American Society of Agricultural and Biological Engineers
www.asabe.org

**ASSE**
American Society of Safety Engineers
www.asse.org

**ASTM**
ASTM International
www.astm.org

**CEN**
European Committee for Standardization
www.cen.eu

**ISO**
International Organization for Standardization
www.iso.org

**NFPA**
National Fire Protection Association
www.nfpa.org

**NIST**
National Institute of Standards and Technology
www.nist.gov

**SCC**
Standards Council of Canada
www.scc.ca

**UL**
Underwriters Laboratories Inc.
www.ul.com

PHOTO COURTESY CSB

**On Feb. 7, 2008, a series of sugar dust explosions at the Imperial Sugar manufacturing facility in Port Wentworth, GA, resulted in 14 worker fatalities. Thirty-six workers were treated for serious burns and injuries.**

One obvious item to assess is housekeeping. Poor housekeeping may lead to accumulations of dust on machinery and building structural members. Locations around filling stations are areas of possible dust accumulation. SH&E professionals also should identify hidden areas that may not be obvious while standing at floor level. Other areas, such as spaces above drop ceilings and around ductwork junctions and gates, also should be inspected.

I tell my clients to "look up." Dust can accumulate on elevated building and equipment members. In the event of an initial ignition, the shock wave may shake this accumulation, creating another dust cloud and another potentially greater ignition that can shake even more dust from the elevated members, setting up a chain reaction.

Process equipment should be designed for the operation in which it is used. Typically, initial installation of a process incorporates several features to help mitigate a fire or deflagration. These may include explosion vents on machines and/or buildings. It may be a fast-acting explosion suppression system. Gates and dampers may be installed inside of ductwork or equipment. Whatever they are, SH&E professionals should identify and document these features. Each device should be inspected and tested regularly, with documentation created to record and verify its condition. Any inoperable devices should be repaired immediately.

Electrical equipment must be in good working order. Panel box doors should not be missing or open. Properly maintained and working electrical equipment should not be overly hot. Annual infrared thermography is a useful tool in identifying potential trouble spots and equipment that is beginning to fail.

Fixed fire protection, such as automatic sprinkler protection, should be in service. Verify that systems are capable of controlling an anticipated event and, if not, reinforce them. Building features that prevent a fire from spreading, such as fire walls and fire doors, should be reviewed. All system components should have an appropriate inspection, testing and maintenance program.

The operation should have a documented sequence of procedures for start-up, operation and shutdown. These procedures should be designed for specific equipment and mode of operation. Procedures should be followed without deviation. Any changes should be reviewed through the management of change program.

Ignition sources should be controlled. Efforts to prevent foreign materials, such as tramp metals, from entering the system should be provided. Mechanical parts, such as bearings and belts, should be in proper alignment and maintenance. Conductive components should be grounded and bonded.

Training is another important aspect of a dust hazard mitigation program. Operators should be trained on the equipment's operation and maintenance and emergency plans to follow. Initial as well as refresher training should be provided, and training records should be maintained.

**Q:** Some authorities claim that installation of dust removal equipment is the first real step—the idea of prevention through design. Others believe substitution of materials is the first step. How do you suggest that dust hazards be addressed from an engineering perspective?

**A:** Both methods are viable options, and the process must be studied to determine the best solution. Early in my career, most paints and coatings were solvent-based and flammable. At that time, few water-based products could do as well as solvent-based products. After many years of research and development, better water-based products were developed. Today, many flammable solvents and processes have been replaced with water-based products and processes. The fire potential of the large flammable liquids operations have been totally eliminated in many plants today.

Similar to the flammable liquids problem, substituting products and materials to reduce or eliminate dust hazards is an option, albeit more challenging. Often, dust is produced as a result of processing a product. If the product is made of wood, dust is formed when the wood is cut to size, planed and sanded. Plastic products may not need to be cut and sanded, but the molding runners, sprues and defects may be reground, producing dust. Even many of the foods and pharmaceuticals used today are manufactured as a powder. Despite this, some product ingredients may be replaced with a liquid, slurry or dissolvable solid.

When substitution of materials or processes is not a viable option, then engineering options are needed. The overall goal is to control dust concentrations, emissions, accumulations and ignition sources. When new processes are designed, a process hazard analysis approach may be used. A collaborative effort may be made with management, process engineers, facility maintenance engineers, SH&E professionals, operators and others providing input. Failure mode and effects analysis, fault tree analysis or another methodology may be implemented to optimize the design.

Physical controls, such as detection and suppression systems with shutdown interlocks, should be integrated into the design. Operating procedures for start-up, normal operations, emergency situations and shutdown should be developed in conjunction with the process unit's design to ensure compatibility. Training for all personnel involved with the operation and maintenance of the unit must be provided and updated as needed. Refresher training must be implemented to keep employees' competencies up to date.

For existing processes, the hazard analysis should be reviewed regularly

and when the process or equipment is changed. Suggestions for improvement from operators and maintenance personnel should be incorporated into the system when possible. New advances in technology should be evaluated for inclusion into the design if possible.

Ongoing equipment maintenance is critical. Systems should be inspected regularly. Predictive maintenance using infrared thermographic imaging will identify hot spots in the process and in electrical systems and motors. Vibration analysis, and acoustic and sound monitoring are also important tools to use in determining and repairing potential maintenance problems.

**Q:** What makes the revision to NFPA 654 so significant? What new information will it include?

**A:** The NFPA 654 committee is aware that this revision may be used, at least in part, as a basis for OSHA's new dust standard, which is currently in the advanced notice of proposed rulemaking (OSHA Docket No. OSHA-2009-0023). Because of this, and as normal procedure during revision cycles, the form, definitions and general content were reviewed to verify that the standard conforms to NFPA protocols.

Definitions in the standard were reviewed and revised so they agree with standard NFPA definitions. Definitions were added and revised. The old definitions of combustible dust referenced 420 microns as a threshold, but that is not always the case. The revised definition states, "Combustible dust is a combustible particulate solid that presents a fire or explosion hazard when suspended in air or the process-specific oxidizing medium over a range of concentrations, regardless of particle size or shape." This change recognizes that not all combustible dusts will go through a standard 420 micron sieve. Flakes, chips and fibers will be included in the definition.

Sections pertaining to fugitive dust control and housekeeping were reviewed, and the committee has tried to emphasize the importance of good dust controls. Threshold dust mass received considerable discussion. A formula approach is proposed whereby the specific material handled may be quantified for its own unique properties.

This proposed change will enable users to make an engineering analysis of the material and to determine an acceptable appreciable depth for housekeeping purposes. The formulas are based on the dust explosion and dust flash fire hazards and use the partial volume methodology defined in NFPA 68, Explosion Protection by Deflagration Venting. Users not wishing to use this method may continue to use the prescriptive method that has been used in NFPA 654 for many years.

Housekeeping requirements have been revised. Housekeeping is a critical factor in the severity of a dust explosion or deflagration, and the committee clarified this portion of the standard.

A new section addresses contractors and subcontractors. It states that they should possess credentials and qualifications to install, test and maintain the systems on which they are working. In addition, contractors should be trained on site-specific safety practices, such as lockout/tagout, housekeeping, PPE usage, and emergency response and evacuation.

I encourage ASSE members to review the proposed changes. The proposal document is available at www.nfpa.org.

**Q:** Housekeeping formulae will be added to NFPA 654. What do these formulae help determine?

**A:** Users may determine the dust fire and explosion hazard area by formula. The dust in use may be tested in a prescribed manner, and the test values may be used to enter into formulas. This will help determine the amount of material that may be present before a dust explo-

sion hazard exists. A dust flash fire hazard area calculation may help estimate the fraction of the volume that could be filled by an expanded fireball from burning dust. The room or building volume up to a person's height is taken as the total volume for this hazard, regardless of actual building height. The threshold for the flash fire deflagration hazard is based on worst-case accumulations of dust mass. The approach is evolving toward an engineering method of controlling a deflagration hazard.

While significant analysis is needed to establish the appropriate criteria, some facilities might benefit from this type of approach for evaluating hazards to its personnel.

**Q:** What do you suggest SH&E professionals do with regard to housekeeping and dust concentrations resulting from operations?

**A:** Good housekeeping cannot be stressed enough in any industry, but even more so in occupancies where dust is present. Regular housekeeping should be provided in facilities that handle dust. Walls, floors, ledges and other surfaces should be vacuumed, broom-swept, water-washed or cleaned regularly so no dust accumulates. Keep elevated accumulations to a minimum. Avoid the practice of blowing down dust with compressed air.

Housekeeping activities should be initiated whenever dust is spilled or released. In the event of a system upset or deflagration, dust located on elevated walls or ledges may be shaken loose and may form a cloud as it drops to the floor. Other areas of concern are where dusts are introduced into the production stream, such as where bags of material are poured into a reactor or vessel.

A documented, planned inspection process should be implemented to evaluate cleanliness, dust accumulation rates and housekeeping frequency required to maintain dust accumulations below threshold amounts. Areas and spaces that cannot be accessed should be sealed to prevent dust accumulations. One recent severe explosion involved dust that had accumulated above a drop ceiling. If no dust accumulations are present, the chance of a dust explosion or deflagration is significantly reduced.

**Q:** Lift trucks and manufacturing and information technology equipment are potential ignition sources. What should SH&E professionals consider when evaluating ignition sources?

**A:** Several ignition sources can cause a dust explosion or deflagration. Primary sources of ignition include electrical; sparking from tramp metals or broken equipment pieces; heat from bearings, belts and misaligned buckets; improperly prepared maintenance and hot work operations; forklifts and vehicles; and natural causes, such as lightning.

One of the first considerations is to identify the electrical classification of the area or room volume. NFPA 70, the National Electrical Code (NEC), Chapter 5, Special Occupancies, addresses hazardous locations. It defines the classification of several special occupancies, such as flammable liquids, gases and vapors; combustible dusts; and other materials.

It is meant to integrate with other NFPA standards that more fully address the particular occupancy. For electrical issues, the NEC defines what electrical devices are permitted in a given area. The definitions located in section 500.2 are important to know when addressing special occupancies. This section defines terms such as dust ignition-proof, dust-tight, and purged and pressurized.

Section 500.5 defines the classification of special occupancies. When discussing combustible dusts, most are classified as Class II locations. Class II locations are those that are hazardous because of the presence of combustible dust.

Within NEC classifications are divisions. Class II, Division 1 locations have combustible dust in the air under normal operating conditions in quantities sufficient to produce explosive or ignitable mixtures, or where mechanical failure or abnormal operation of machinery or equipment might cause such explosive or ignitable mixtures to be produced. Division 1 locations also may provide a source of ignition through simultaneous failure of electrical equipment, through operation of protection devices or from other causes.

Class II, Division 1 locations include locations where Group E combustible dusts may be present in quantities sufficient to be hazardous. Group E dusts are combustible metal dusts, including aluminum, magnesium and their commercial alloys or other combustible metal dusts. Some metal dusts are particularly hazardous, with incredible energy output in a dust explosion or deflagration.

Class II, Division 2 locations are those in which combustible dust is not normally present but might be due to abnormal or periodic operations. During those times, sufficient dust may be present in the air to produce explosive or ignitable mixtures. A Class II, Division 2 location is an area normally free of dust, but due to some incident, dust may be introduced. Mechanical breakdown of a valve or a break in a pipe are examples of conditions that would require an area to be classified as Division 2. A Division 2 location also may be one where combustible dust accumulations are normally present in quantities insufficient to interfere with the normal operation of electrical equipment or other apparatus but could interfere as a result of infrequent malfunctioning of handling or processing equipment, which causes dust to become suspended in the air.

Additional information on the classification of Class II materials may be found in NFPA 499, Recommended Practice for the Classification of Combustible Dusts and of Hazardous (Classified) Locations

PHOTO COURTESY CSB

**Fire followed an aluminum dust explosion at a Hayes Lemmerz International facility in Huntington, IN. CSB determined that the explosion likely originated in the dust collector, which had not been adequately vented or cleaned, and was too close to the aluminum scrap processing area.**

for Electrical Installations in Chemical Process Areas.

Another classified, closely related hazard is that of easily ignitable combustible fibers, such as those found in textile operations handling cotton and rayon fibers; cotton gins and cotton seed mills; flax processing plants; woodworking plants; and other industries involving similar processes. Ignitable fibers are classified as Class D locations and also have Division 1 and Division 2 subdivisions.

Tramp metals and other foreign materials may be present in raw materials, such as grain shipments received directly from farms. These materials must be removed from the product as it is received. Dump grates are usually the first step to separate this material. Also, strong magnets located in the chutes and ducts attract and hold ferrous metal parts.

Bearings are used in duct systems and on belt systems. They can become very hot when they fail and can be an ignition source. Thermal probes and infrared thermography maintenance programs can identify potentially failing bearings before they become a problem. Rotation sensors are designed to alert operators of stopped or slowing belts. If a belt is rubbing against a turning shaft, it will usually begin to produce heat.

Some facilities, such as older grain-handling silos, have used bucket conveyors. Many bucket conveyors use metal link mechanisms to move a metal bucket. Dust accumulations inside the bucket conveyor enclosure may be in the ignitable concentration range. When a link breaks or a bucket comes loose, there is a potential for the loose metal to scrape against other metal parts and cause heat or sparks, igniting the dust-laden atmosphere within the bucket enclosure. When this happens, the resulting deflagration may travel through the conveyor to a head house, tunnel or into a silo, causing multiple explosions.

Maintenance and repair operations bring a host of ignition potential into a dust-laden area. Maintenance operations should be conducted regularly, and proper inspection and lubrication activities should be performed religiously. Every time maintenance is performed in a classified dust area, safety procedures and audits should be implemented. Many facilities use a work permit system, which requires a supervisor and a safety engineer to sign off on the area. Dust removal operations should be conducted not only in the area, but also within the piece of equipment on which work is performed. Duct systems should be isolated from the equipment under repair whenever possible.

A hot work permit program should be followed rigorously. NFPA 51B, Standard for Fire Prevention During Welding, Cutting and Other Hot Work, should be followed as a minimum level of operating procedures. Hot work operations should be followed always, no matter what the occupancy.

Lightning has been the cause of many dust explosions, particularly in the grain industry. Buildings and equipment should be grounded to earth, and lightning protection should be provided. Sometimes, people think that the humidity levels during a heavy thunderstorm are too high to allow a dust explosion. This is a myth. The dryness of the dust itself is a greater factor in the potential for a dust ignition.

The use of lift trucks, powered industrial vehicles and other material moving equipment is a concern. In addition, depending on the industry, vehicles such as dump trucks, front-end loaders and agricultural equipment are a potential source of ignition. Careful analysis is needed to determine the acceptability of the vehicle or moving equipment for use in a given occupancy.

Due to the wide range of dust materi-

als, and their related hazards, limited specific overall guidance is offered in NFPA standards. NFPA 505, Fire Safety Standard for Powered Industrial Trucks Including Type Designations, Areas of Use, Conversions, Maintenance and Operations, recognizes hazardous dust locations; however, the final determination is often left open to the opinion and ruling of the authority having jurisdiction.

As to the hazard of information technology equipment and controls for dust-handling operations, today, many operations are controlled with computers and programmable logic controllers. Sensors should be rated for the hazardous location in which such equipment is installed. Computers should be in a remote area, separated from the operation. Equipment that cannot be separated should be installed in pressurized rooms which prevent the accumulation of dusts within the enclosure.

**Q:** How have high-profile dust explosions, such as the fatal 2008 incident at Imperial Sugar Co. in Chatham County, GA, influenced the revisions to NFPA 654?

**A:** NFPA 654 committee members are aware of the large dust explosions and the findings from those losses were discussed in committee meetings. CSB has representation on the NFPA 654 committee, and CSB employees attended several committee meetings. OSHA representatives also attended a meeting, spoke to the committee and engaged in dialogue.

This revision of NFPA 654 is the largest revision in decades, and this is a direct result of some recent large dust explosion losses. In addition, there were many public proposals for change. Many of the proposals were accepted, accepted in principle or in part, and were incorporated in some way into the revised standard.

**Q:** How has your risk management/insurance experience assisted in your work with NFPA standards committees, particularly with NFPA 654?

**A:** Visiting facilities in many varied industries has been an asset to my learning and experience over the years. The more facilities and industries I visit, the more I learn.

I have been fortunate to have lived in several areas of the country and to have visited facilities unique to those regions. In the northeastern U.S., I visited many manufacturing facilities. While living in the Southeast, there was an emphasis on textiles and other industries found in the south. While living in the intermountain west and serving the western states, I visited many types of high-hazard facilities that manufactured and used various materials, including dusts, flammable liquids and explosives in manufacturing, storage and end use. During my career, I have visited mine properties for many various minerals, some of which had significant combustible dust exposure, such as coal mines. In the West, I also visited several grain-handling facilities for the storage and transportation of agricultural products.

In addition to working in various regions of the country, I have focused on industry segments. During the 1990s, I worked for several years in the utility/petroleum division of an insurance loss control department. This group performed loss control for facilities involved in power generation and heavy-hazard chemicals. During this time, I visited power generation and cogeneration facilities. Many of the base load-generating stations fired with coal.

Cogeneration power plants used alternative fuels to create steam to generate electricity and to provide steam for a host facility. Just about anything that will burn can be used in the cogeneration facility, including items such as sawdust, ground tires or trash. The business interruption implications for these facilities are significant, and strict adherence with good practices is needed.

I visited heavy-hazard chemical and pharmaceutical plants. Basic pharmaceutical plants create the base ingredients for further blending or reactions to make medicines. Many compounds in the pharmaceutical industry have deflagration or explosion potential. Liquids are sometimes introduced into the top of large drying chambers as a fine atomized spray. The material dries as it falls through a chamber. At the bottom of the chamber, the material may be a fine, dry powder in a cloud suspension. If the inert atmosphere is lost or if an ignition source occurs, a violent pressure release may result. A reactor or drier explosion is extremely dangerous due to high pressures or high temperatures present. Process safety management is used to ensure a safe process and to specify recipes and procedures.

Another area of concern in the pharmaceutical industry is the pilot plant of the research and development of a drug. During the development of a new process, unexpected actions or reactions can occur. There is also a temptation to make impromptu changes in the process. These on-the-fly changes can result in unexpected results, and restraint must be used to prevent such changes. These experiences have helped me understand how various industries operate and the hazards they face on a daily basis.

PHOTO COURTESY CSB

**Q:** CSB released a new safety video on combustible dust. Have NFPA and CSB consulted during NFPA 654's revision?

**A:** CSB has released several good videos, and each is available for public viewing and downloading from www.csb.gov. I encourage SH&E professionals to review and share the videos. CSB is an active participant in the NFPA 654 process. CSB employees are a wealth of information on the committee and actively participate in discussions during meetings. Committee members also look to CSB studies as learning tools when evaluating proposals and comments.

**Q:** What do you consider to be the most challenging part of a revision of this scope?

**A:** The committee encountered several challenges. NFPA 654 is considered by many to be the main and first standard referenced for guidance in the handling of dusts. OSHA uses the standard as a principal reference document for its enforcement of dust handling. The language must not be vague or ambiguous, and the definitions and terminology must be consistent with other NFPA standards. NFPA 654 was written as a protection standard, not necessarily as an enforcement standard.

The depth of dust accumulations must be made relevant for many various materials. The depth of permissible accumulation of dust before a hazardous situation exists varies by material, size, humidity and orientation of the dust itself.

One of NFPA's greatest strengths brings about one of its most challenging tasks. Committee members have varied backgrounds and interests. Each member brings valuable insight and experience to the committee. The objectives, ideas and opinions of each member must be meshed to make a standard that works for everyone. Fortunately, NFPA's standards-making process accounts for these differences and gives everyone a voice. The outcome is a strong standard that survives the test of time.

**Q:** Once the revised NFPA 654 standard is published, how can SH&E professionals who work in facilities with combustible particulate solids best incorporate it into their safety practices?

**A:** NFPA 654 is being expanded and improved. Those facilities that have followed it in the past will have little to change in their existing practices to meet the minimum criteria of the latest proposed document revision. In fact, I

**On Jan. 29, 2003, a dust explosion at a West Pharmaceutical Services facility in Kinston, NC, killed six workers and destroyed the facility. CSB determined that had the site adhered to NFPA standards for combustible dust, the explosion could have been prevented or minimized.**

believe they will be given additional opportunities to improve their existing plant operations and conditions and more latitude to customize their programs within the revised standard.

I consider the NFPA standards as representing the minimum level of protection, and the management of most conscientious facilities has dust-related programs that meet or exceed NFPA 654's minimum criteria. I think facilities that have not implemented good dust-related processes and procedures will experience a greater impact.

Safety managers should perform a thorough review of existing dust-handling facilities, operations and written procedures. A comparison of the existing program and NFPA 654 will help them identify areas for improvement. The list may then be prioritized for implementation. I like to advise clients that the noncapital-related items, such as housekeeping procedures, developing written human element procedures and safety training and recognition education, offer immediate improvement until capital investments are implemented. Those facilities not following current NFPA standards should start now rather than wait for the new standard's release.

**Q:** Do you see more state/federal interaction with voluntary national consensus standards?

**A:** Along with CSB, many government bodies have representation on NFPA committees in both direct and indirect capacities. Representatives of state and local government bodies, as well as any member of the public at large, may attend meetings as guests. Associations, such as those representing fire marshals and fire chiefs who represent the interest of government agencies, already provide input to the NFPA standards. In addition, many cities and states have employees who are NFPA committee members.

The difficulty I see with government agencies' involvement is the availability of funding through taxpayer dollars to support these tasks. State and local governments are trying to close existing financial shortfalls, and many do not have funds to expand their involvement. Despite this, members of government agencies may submit proposals to change the existing standards whenever they see areas of improvement.

## CPSC Issues Warning About Infant Slings, Massive Recall Follows

Consumer Product Safety Commission (CPSC) has issued a warning about sling-style infant carriers, stating that they can pose a suffocation hazard to babies. CPSC is urging parents and caregivers to be cautious when using slings for babies younger than 4 months old. In the days following the warning, CPSC, Health Canada and Infantino LLC issued a recall of the Infantino SlingRider and Wendy Bellissimo infant slings. One million units in the U.S. and 15,000 in Canada were recalled.

According to CPSC, at least 14 deaths are associated with infant slings, including three in 2009. Most of these deaths involved babies younger than 4 months old. Currently, there is no standard covering infant slings. The CPSC warning does not include soft infant carriers, for which there is an ASTM standard—F2236. In fact, that standard specifically does not include slings.

According to *Consumer Reports* "Safety Blog," some infant slings contain misleading labels that claim the product "meets or exceeds ASTM F2236," as well as warnings and instructions that actually apply to infant carriers but are inappropriate for slings. According to *Consumer Reports,* this labeling is misleading and the instructions could be misinterpreted, putting babies at risk.

In January, CPSC added infant slings to its list of durable infant products that require a mandatory standard. Until one is developed, the agency says, it is working with ASTM International to complete a voluntary standard for infant slings. The Sling Carrier Task Group, under the jurisdiction of ASTM subcommittee F15.21 on Infant Carriers, Bouncers and Baby Swings, is working on the issues relating to slings. The subcommittee met on March 16, 2010, to review a draft standard for sling carriers and work to develop a voluntary standard is ongoing.

Learn about the recall at www.cpsc.gov/cpscpub/prerel/prhtml10/10177.html. View CPSC's warning at www.cpsc.gov/cpscpub/prerel/prhtml10/10165.html or CPSC's public service announcement on infant slings at www.cpsc.gov/vnr/asfroot/slingwarnpsa.asx.