

Combustible Dust: Legislative and Regulatory Issues

**Adele L. Abrams, Esq., CMSP
Law Office of Adele L. Abrams, P.C.
Beltsville, MD**

Combustible dust has long been recognized as having the potential for catastrophic events that may result in loss of life and extensive property damage. Materials that may form combustible dust include metals (such as aluminum and magnesium), wood, coal, plastics, biosolids, sugar, paper, soap, dried blood, and certain textiles. The U.S. Chemical Safety and Hazard Investigation Board (“CSB”) has identified 281 combustible dust fires and explosions since 1980 – causing nearly 1,000 fatal or serious injuries. These incidents occurred in 44 states, mostly in food processing facilities or in those involving paper or wood dust.

In many combustible dust incidents, employers and employees were unaware that a hazard even existed. A combustible dust explosion hazard may exist in a variety of industries, including: food (e.g., candy, sugar, spice, starch, flour, feed), grain, tobacco, plastics, wood, paper, pulp, rubber, furniture, textiles, pesticides, pharmaceuticals, dyes, coal, metals (e.g., aluminum, chromium, iron, magnesium, and zinc), and fossil fuel power generation. There are often two types of explosions involved: (1) Primary (when dust suspension is ignited and explodes); and (2) Secondary (when dust accumulations on floor and surfaces ignites from primary explosion). The secondary explosions are often more deadly and damaging, and chain reactions involving dust suspended in air are common.

In 2008, one such event – the fatal explosion at the Imperial Sugar factory in Georgia – turned attention back to this issue in a big way. Activity included the involvement of the United States Congress, which was critical of the failure of the Occupational Safety and Health Administration (“OSHA”) to respond to the known hazard with a specific standard to help mitigate risks. OSHA regulations were called insufficient because they failed to regulate dusts other than grain adequately. During the 110th Congress, Congress sought to force adoption of fast-track regulation to govern all combustible dusts.

As discussed below, despite the change in executive branch governance, this remains a highly contentious issue and regulations are not currently on the OSHA agenda. Congress has, once again, introduced legislation to force promulgation of a combustible dust rule for OSHA-regulated general industry. This paper also includes a discussion of relevant standards of the Mine Safety and Health Administration (“MSHA”) concerning combustible and respirable coal dust.

As a general rule, OSHA normally has codified specific standards where there is a demonstrated significant risk and a feasible means of controlling such risks. Such specific safety and health standards serve as mandates to ensure compliance on a worksite by the primary employer, as well as to share information with, and ensure compliance by, contractors and/or non-employees who may be present at the worksite. However, OSHA’s rulemaking process has become highly complicated and

litigious, resulting in timeframes of a decade or more before a rule runs the gamut from an advance notice of proposed rulemaking to a final rule. Even then, a rule may be judicially challenged by aggrieved stakeholders, extending the process for several more years.

An alternative to a specific rule may come in two ways. The first is use of OSHA's "General Duty Clause," Section 5(a)(1) of the Occupational Safety and Health Act of 1970. This requires that, where no specific standard is codified, but there is a recognized risk that employers must control, enforcement action can be taken. OSHA's "General Duty Clause" requires each employer to "furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees." 29 U.S.C. § 654 (a)(1). Often, national consensus standards serve to set a benchmark for what employers knew or should have known, as well as to assist in determining what are feasible control methodologies.

The second approach that can be taken is to cobble together something of a "combustible dust" rule by using a patchwork of other existing OSHA standards. This has historically been done, using general rules on housekeeping, occupational air contaminants, and fire safety as discussed in more detail below.

OSHA Standards Related To Combustible Dust

What is "combustible dust"... and what are the real occupational safety and health risks? As OSHA describes the threat, "combustible dusts are fine particles that present an explosion hazard when suspended in air in certain conditions." The National Fire Protection Association's (NFPA) *Industrial Fire Hazards Handbook* states: "any industrial process that reduces a combustible material and some normally noncombustible materials to a finely divided state presents a potential for a serious fire or explosion." As demonstrated by recent events, a dust explosion can be catastrophic and cause employee deaths, injuries, and destruction of entire buildings. In many combustible dust accidents, employers and employees were unaware that a hazard even existed prior to the catastrophe. Therefore, it is critical to determine if your company has this hazard, and to take appropriate remedial action to prevent tragic consequences.

Prior to the latest attention on this issue, companies have been cited by OSHA related to various types of dust accumulation issues, as well as for inadequate coverage of dust-related safety and health hazards when implementing the worksite's hazard communication program and worker training. For example, saws, drills and other power tools typically create fine wood dust in furniture manufacturing or other manufacturing facilities that involve wood processing, and this wood dust can accumulate on floors and equipment. Depending upon ventilation systems, it can also become suspended in the air, and therefore susceptible to combustion if it encounters the right combination of circumstances. The same holds true in many food manufacturing facilities or those producing dust with combustibility potential – such as the sugar dust at the Imperial plant.

Typical workplace fires require heat, oxygen and fuel. In the combustible dust hazard situation, the fine particulate dust is the fuel and the dispersion of dust particles in sufficient quantity and concentration can cause rapid combustion known as a deflagration. If the event is confined by an enclosure such as a building, room, vessel, or process equipment, the resulting pressure rise may cause an explosion. These five factors (oxygen, heat, fuel, dispersion, and confinement) are known as the "Dust Explosion Pentagon." Contrary to popular belief, such events are not limited to small confined spaces such as grain silos, but can occur wherever these five factors converge. In addition,

an initial (primary) explosion may release more particulate into the air, triggering secondary explosions that are often more deadly than the first.

A primary step to determine if combustible dust is a potential hazard at a worksite is to conduct a hazard analysis. This analysis involves assessment of:

- All materials handled;
- All operations conducted, including byproducts;
- All spaces (including hidden ones); and
- All potential ignition sources.

Although OSHA does not have a specific combustible dust standard currently outside of the grain industry (hence, the legislative initiatives), it does have several relevant standards regulating individual aspects of the hazard. These include:

- §1910.22 Housekeeping;
- §1910.38 Emergency Action Plans
- §1910.94 Ventilation Requirements (covers operations such as abrasives, blasting, grinding, or buffing which involve dusts, including combustible dusts);
- §1910.146 Permit-required Confined Spaces
- §1910.157 Portable Fire Extinguishers
- §1910.165 Employee Alarm Systems
- §1910.176 Material Handling
- §1910.178 Powered Industrial Trucks
- §1910.269 Electrical Power Generation
- §1910.272 Grain Handling Facilities
- §1910.307 Hazardous Locations; and
- §1910.1200 Hazard Communication.

The steps to mitigate possible hazards, recommended by OSHA in its combustible dust materials, include hazardous dust inspections, testing, and housekeeping and dust control programs. It may be necessary to install dust collection systems and filters, engineering controls to prevent as much as possible escape of dust from processing equipment and ventilation systems, and access to all areas for inspection and cleaning. If ignition sources are present, cleaning methods should be selected that will not generate dust clouds; and vacuum cleaners used in these work environments should be approved for dust collection. Industrial settings that use high-energy ignition sources, such as welding torches, must also exercise caution where fine particulate dust is present and consider the test methods for dust ignition and explosion characteristics from ASTM International (www.astm.org).

In March 2008, OSHA launched a national Special Emphasis Program (“SEP”) concerning combustible dust enforcement. OSHA CPL 03-00-008 (3/11/08) provides policies and procedures for inspecting workplaces that create or handle combustible dusts that could cause deflagration, fire or explosion. One obstacle to vigorous enforcement, however, is the fact that only 50 out of OSHA’s federal inspectorate had combustible dust training ... and the SEP covers 30,000 at-risk worksites! Moreover, the SEP excluded manufacturing facilities that are under the PSM standard, 29 CFR Section 1910.119, and it also fails to cover explosives and pyrotechnics manufacturing.

The agency also issued OSHA SHIB 07-31-2005, which is guidance on *Preventing and Mitigating Effects of Fires and Explosions* (Combustible Dust in Industry). It is not enforceable, but the SHIB

highlights hazards, training, work practices and guidelines. In general, if there is more than 1/32 of an inch of dust over 5 percent of a room's surface area, fine particulate matter/dust may present a significant explosion hazard, according to NFPA and the OSHA SEP.

In addition, appropriate electrical equipment and wiring must be used where dust accumulation may occur. Older plants are notorious for getting citations based on haphazard wiring and use of extension cords in permanent installations, which is contrary to existing OSHA standards and can increase risk of explosions. Static electricity must be controlled. Exposure to open flames and sparks must be avoided, and smoking should be banned in work areas where fine particulate and potentially combustible dust is present. Heating systems should also be reviewed to determine if they present a risk, and they should be located separately from dusts. Cartridge-activated tools may also increase explosion risks and they must be used properly. All equipment should be subject to preventive maintenance to reduce risks of overheating, sparking and flame.

To ensure preparedness in the event that an explosion or fire could occur, all workplaces with potential for dust explosions should implement emergency action plans and maintain clear emergency exit routes. A fire safety professional may be able to determine whether supplemental fire suppression systems are needed and to train those workers designated to fight incipient fires. However, in the event of an explosion, evacuation of personnel to a safety location is paramount as such incidents are normally beyond the abilities of employees to control.

Finally, worker training is essential. In addition to the mandatory hazard communication training discussed above (which includes review of physical hazards on material safety data sheets for combustible dust-producing products and materials), employees must be trained to recognize and prevent hazards associated with combustible dust in the plant, to recognize unsafe conditions, take preventative action, and alert management so potentially hazardous conditions can be promptly abated. Training should occur before new employees start work, periodically to refresh their knowledge, when they are reassigned to new tasks or equipment, and when hazards or processes change. A trained workforce will be your best line of defense in preventing and mitigating fires and explosions.

OSHA Enforcement Initiatives

OSHA has initiated a Combustible Dust Special Emphasis Program, which can trigger inspections even for those companies not on the agency's "Site Specific Targeting" list, and employers whose SIC Codes or NAICS listings are included in the SEP may be subject to increased enforcement activities in the months to come. OSHA has set up a focused web section on combustible dust hazards on its website (www.osha.gov). Other relevant resources include:

- OSHA's Safety and Health Information Bulletin (SHIB) (07-31-2005) *Combustible Dust in Industry: Preventing and Mitigating the Effects of Fires and Explosions*;
- NFPA 61, *Standard for the Prevention of Fires and Dust Explosions in Agricultural and Food Processing Facilities*;
- NFPA 484, *Standard for Combustible Metals*;
- NFPA 654, *Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids*;
- NFPA 655, *Standard for Prevention of Sulfur Fires and Explosions*; and
- NFPA 664, *Standard for the Prevention of Fires and Explosions in Wood Processing and Woodworking Facilities*.

OSHA specifically states, in its Combustible Dust topic page: “A consensus standard can be used to show "industry recognition" of a hazard. However, the hazard must be recognized in the employers' industry, not an industry other than the employers' industry.” Although OSHA can issue citations under the General Duty Clause,¹ it will normally not enforce consensus standards that are couched in “should” language (as opposed to “shall” terminology) – but such standards can be used to impute knowledge to affected employers.

In its 2009 Field Operations Manual, which provides guidance to its compliance safety and health officers for enforcement actions, OSHA states:

If the relevant industry participated in the committees drafting national consensus standards such as the American National Standards Institute (ANSI), the National Fire Protection Association (NFPA), and other private standard-setting organizations, this can constitute industry recognition. Otherwise, such private standards normally shall be used only as corroborating evidence of recognition. Preambles to these standards that discuss the hazards involved may show hazard recognition as much as, or more than, the actual standards. However, these private standards **cannot** be enforced as OSHA standards, but they may be used to provide evidence of industry recognition, seriousness of the hazard or feasibility of abatement methods.²

The NFPA national consensus standards, and its handbook, discussed above can be obtained through the association’s website at www.nfpa.org. In addition, model fire codes have been adopted by many jurisdictions in this country, and they contain applicable information on dust explosion prevention, and can be a useful source of guidance. These include the International Code Council’s International Fire Code® and NFPA’s Uniform Fire Code®.

The primary NFPA standard, NFPA 654, includes the following recommendations:

- Minimize escape of dust from process equipment or ventilation systems
- Use dust collection systems and filters
- Utilize surfaces that minimize dust accumulation and facilitate cleaning
- Provide access to all hidden areas to permit inspection
- Clean dust residue at regular intervals
- Use cleaning methods that do not generate dust clouds if ignition sources are present
- Only use vacuum cleaners approved for dust collection
- Locate relief valves away from dust hazard areas
- Implement inspection, testing, housekeeping and control program
- Use appropriate electrical equipment and wiring methods
- Control static electricity, including bonding of equipment to ground
- Control smoking, open flames and sparks
- Control mechanical sparks and friction
- Properly use cartridge activated tools
- Use separator devices to remove foreign materials capable of igniting combustibles

¹ Only hazards presenting serious physical harm or death may be cited under the general duty clause (including willful and/or repeated violations that would otherwise qualify as serious violations).

² OSHA Field Operations Manual, CPL 02-00-148, at 4-20 (2009).

- Separate heated surfaces from dusts
- Separate heating systems from dusts
- Properly use industrial trucks, and
- Adequately maintain equipment.

Legislative Initiatives and the Chemical Safety Board

Even before the Imperial Sugar tragedy, there were a series of similar events that prompted the U.S. Chemical Safety and Hazard Investigation Board (CSB) to issue a report in November 2006 that identified 281 combustible dust incidents between 1980 and 2005. The casualty toll in those incidents included 119 workers killed and 718 injured. CSB found that Material Safety Data Sheets for combustible powders frequently (41 percent of time) failed to provide warnings that the powders can explode and fail to provide appropriate NFPA references. The CSB recommended that OSHA expand dust warnings under its Hazard Communication Standard and that the agency train inspectors to recognize combustible dust hazards and to implement a Special Emphasis Program.

The CSB findings and recommendations included urging adoption of NFPA standards to prevent and mitigate combustible dust explosions; finding that OSHA enforcement was reactive – after accidents – and that the agency used either the General Duty Clause or standards only tangentially related to combustible dust; concluding that OSHA’s grain facilities standard was effective in reducing number and severity of grain dust explosions over past 20 years and was an example for addressing the problem in other industries; and recommending that ANSI amend its Z400.2 standard to provide more specific guidance on preparing Material Safety Data Sheets for combustible dusts.

In 2006, the CSB also called upon OSHA to develop a more stringent regulation governing a wider range of combustible dusts but got no response. Even now, OSHA’s only specific “combustible dust” standard is limited in scope to grain dust (29 CFR §1910.272, enacted in 1987, after a number of fatal incidents in that industry sector).

On February 7, 2008, following the Imperial Sugar catastrophe, the United Food & Commercial Workers Int’l and Teamsters unions called on OSHA to issue emergency standard. In a Petition filed with OSHA, the unions asked OSHA to regulate in a way that followed the CSB recommendations in developing permanent standard to control combustible dust hazards in general industry. OSHA refused and Congress took notice.

Lawmaker’s demonstrated impatience with the U.S. Department of Labor’s failure to move forward on its rulemaking agenda, during the waning months of the Bush Administration, by holding a series of oversight hearings that suggested the agency was “in bed with industry.” In the 110th Congress, the U.S. House of Representatives tried to get around the regulatory process entirely through legislative rulemaking -- telling OSHA what specific details a new combustible dust standard must include, and ordering it to adopt such a rule on a legislated timetable. This was not an isolated instance. There were legislative rulemaking actions proposed (but not enacted) last year on other OSHA issues, including ergonomic protections for health care industry workers, protection of food industry workers exposed to diacetyl (the subject of the “popcorn lung” controversy that has been widely reported in the media), and employer payment for workers’ personal protective equipment (OSHA finalized its rule before Congress could complete action on the legislation). None of these bills came to fruition because – at that time – the Senate lacked sufficient Democratic members to force a floor vote on such legislation. With the elections of November 2008, this is no longer necessarily the case, nor

would legislative proposals likely prompt a presidential veto, as had been threatened by the Bush Administration.

In 2008 and again in 2009, legislation has been introduced to address combustible dust hazards in the workplace. Last year's model, H.R. 5522, was introduced on March 4, 2008, shortly after the devastating accident in February 2008 at the Imperial Sugar plant in Georgia that killed 12 workers and severely injured more than 60 others. It went far beyond regulation of the sugar industry and had implications for the many industry sectors whose production methods result in production or accumulation of dust and other fine particulate materials that are capable of combustion and explosion under the wrong set of circumstances.

H.R. 5522, which passed the U.S. House of Representatives but was not voted on in the Senate, demanded that OSHA issue an interim final standard within 90 days of the bill's enactment, to take effect immediately upon publication, and that the standards be at least as stringent as those contained in the National Fire Protection Association's *Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids-2006* (NFPA 654) and *Standard for Combustible Metals-2006* (NFPA 484). A final rule would have been due within 18 months of the law's enactment.

The "at risk" industries listed as within the scope of H.R. 5522 (and, therefore, any future OSHA combustible dust standard) included: agriculture, chemicals, food manufacturing, grain, fertilizer, tobacco, plastics, wood, forest, paper, pulp, rubber, furniture, textiles, pesticides, pharmaceuticals, tire and rubber manufacturing, dyes, coal, metal processing, recycling operations, and fossil fuel power generation (coal).

The latest version of the legislation is H.R. 849, introduced by Rep. George Miller (D-CA) on February 4, 2009. The *Worker Protection Against Combustible Dust Explosions and Fires Act of 2009* again requires the Secretary of Labor to promulgate an interim final standard regulating combustible dusts, which will apply to manufacturing, processing, blending, conveying, repackaging, and handling of combustible particulate solids and their dusts (including organic dusts, plastics, sulfur, wood, rubber, furniture, textiles, pesticides, pharmaceuticals, fibers, dyes, coal, metals, and fossil fuels), but will not apply to processes already covered by the OSHA standard on grain facilities.

The standard would have to provide requirements for: (1) a hazard assessment to identify, evaluate, and control combustible dust hazards; (2) a written program that includes provisions for hazardous dust inspection, testing, hot work, ignition control, and housekeeping; (3) engineering controls, administrative controls, and operating procedures; (4) housekeeping to prevent accumulation of combustible dust in places of employment in depths that can present explosion, deflagration, or other fire hazards, including safe methods of dust removal; (5) employee participation in hazard assessment, development of and compliance with the written program, and other elements of hazard management; and (6) providing safety and health information and annual training to employees. The interim standard would have the legal effect of an occupational safety and health standard and would apply until a final OSHA standard became effective.

The final OSHA rule would have to provide requirements for: (1) managing change of dust producing materials, technology, equipment, staffing, and procedures; (2) building design, such as explosion venting, ducting, and sprinklers; and (3) explosion protection, including separation and segregation of the hazard. The legislation also requires the final OSHA rule to include relevant and appropriate provisions of the National Fire Protection Association combustible dust standards. Finally, the

legislation requires the Secretary of Labor to revise the hazard communications standard to amend the definition of "physical hazard" to include "a combustible dust" as an additional example of such a hazard.³

Combustible Dust in the Mining Industry

The mining industry has regulated combustible coal dust for many years, dating back to its recognition as a potentially fatal hazard in the 1969 Coal Mine Safety and Health Act. In October 2008, one coal operator was assessed \$736,300 in fines for repeated violations over a year, five of which related to accumulation of combustible materials near ignition sources. These were assessed under the new "flagrant violation" criteria adopted by the agency after Congress passed the MINER Act of 2006, in the wake of the tragic Sago mine explosion that took 12 lives in January 2006. In announcing the near-record penalties, the head of the Mine Safety and Health Administration ("MSHA") told the press: "The result of coal dust accumulating underground could have been a catastrophic fire or explosion."⁴ In that case, accumulations along energized conveyor belts. During both inspections, MSHA's inspectors found that the mine conveyor belt and/or rollers had been turning in the coal dust accumulations, producing dangerous frictional heat and suspending additional combustible coal dust in the atmosphere. The inspectors also discovered empty rock dust bags, coal and coal dust accumulations in contact with the moving rollers and the belt, producing frictional heat. As a result, MSHA issued high negligence unwarrantable failure orders for permitting dangerous accumulations of combustible coal and debris along a beltline.

The MSHA standard that primarily regulates coal dust in underground coal mines is 30 CFR Section 75.400, *Accumulation of Combustible Materials*. Experience and tests have shown that accumulations of coal dust can contribute greatly to the propagation and severity of mine explosions. Such accumulations are also potential fire hazards since they are more readily ignitable and, once ignited, are more difficult to control and extinguish. The intent of the MSHA standard is to prevent the accumulations of the specified combustible materials in order to reduce the dangers of mine fires and explosions.

For MSHA enforcement purposes, "coal dust" means particles of coal that pass a No. 20 sieve. It is this fraction of the coal that participates in the dust explosion reaction. Loose coal means coal fragments larger in size than those passing a No. 20 sieve. Tests have shown that intermittent piles of coal dust are more hazardous than smooth layers because the irregular piles are eroded more readily by the air movement generated during an explosion. As little as two 300-pound piles, under experimental conditions, has caused an explosion to propagate when the entry otherwise was adequately rock-dusted to 65 percent incombustible content.

Coal dust or coal and loose coal accumulations present a fire as well as an explosion hazard. Broken coal has considerably more surface area per unit mass than solid coal. For example, should an electric cable fail and cause an arc, the probability of igniting accumulations is greater than igniting solid coal. Also, when broken coal is ignited, fire propagates faster than in solid coal. As another example, if hydraulic oil is spilled into broken coal, the broken coal would ignite more easily and propagate flame faster than a similar spill on the smooth floor or against the coal rib.

³ See Congressional Research Service Summary of H.R. 849, <http://thomas.loc.gov/cgi-bin/bdquery/D?d111:1:./temp/~bdKkJM:@@D&summ2=m&/bss/111search.html>. |

⁴ MSHA News Release Number 08-1465-PHI (October 22, 2008).

Accumulations of coal dust, loose coal, or the combination of the two offer serious fire and explosion hazards and must be removed from the mine if, in the judgment of the inspector, they would lead to an intensification or spreading of a fire or an explosion. In evaluating whether the coal dust and loose coal would lead to an intensification or spreading of a fire or an explosion, the inspector is required to consider all the facts concerning the deposit. For example, float coal dust, loose coal and/or coal dust deposited near working faces and in active haulage entries, where sources of ignition are likely to be, are more hazardous than similar deposits in back entries. However, the remoteness of back entries is not necessarily a safeguard. Stoppings that normally isolate back entries may be destroyed by the force of an explosion, and accumulations of float coal dust, loose coal or coal dust in the back entries would add fuel to the flame.

In citing a mine operator for a violation of this standard, the inspector must describe fully the conditions and practices, such as the location, dimensions, etc. Imminent danger conditions (which are cited under Section 107(a) of the Mine Act and require withdrawal of all miners from an area until hazards are abated) normally can be considered to exist when accumulations of coal dust, float coal dust, loose coal, and other combustible materials are exposed to probable explosion and fire ignition sources, and the conditions observed could reasonably be expected to cause death or serious physical harm to a miner if normal mining operations were permitted to proceed in the area before the dangerous conditions are eliminated.

Experience has demonstrated that the loading of loose coal caused by sloughing ribs creates a hazardous condition in that the pillar size can be substantially reduced and the width of the entry or room dangerously increased; therefore, such loose coal shall not be considered accumulations of combustible material if such material is rendered inert by heavy applications of rock dust. However, such loose coal is not permitted to accumulate in the roadways or outby timberlines.

MSHA also mandates a "cleanup program" under 30 CFR Section 75.400-2. The program must be in written form and made available to the Secretary of Labor or her authorized representative upon request. MSHA examines whether the program is effective, systematic, and adequate under normal circumstances to control dangers from float dust, dust and loose coal along beltways, and dust and loose coal in the area between the face and loading point. Observance of quantities of inadequately inerted loose coal or coal dust throughout various areas of the mine during a single inspection, or from shift to shift, or from day to day, is taken into consideration and may be a strong indication that a systematic and effective cleanup program is not in operation.

MSHA also mandates "Rock Dusting" under 30 CFR Section 75.402. If worked-out areas which are not rock-dusted are near active working areas and the rock-dusting can be done safely, the areas must be rock-dusted, but the agency will not require rock-dusting of worked-out areas if miners would be exposed to potentially serious hazards such as bad roof, poor ventilation, etc. However, where high-pressure rock-dusting machines are available, MSHA normally requires that these machines be used at the outby edges of abandoned areas to rock-dust as much of the area that can be done safely.

The final primary standard dealing with mine dust explosion hazards is 30 CFR Section 75.403, Maintenance of Incombustible Content of Rock Dust. This permits application of wet rock dust to rib and roof surfaces in the face areas and but not for redusting of mine surfaces. In such applications, only limestone or marble dust which meets the specification contained in 30 CFR Section 75.2(d) shall be used. The application shall be at the rate of not less than 3 ounces of dust per square foot of surface, and shall be by a mixture of not more than 6 to 8 gallons of water with 100 pounds of dust, whether by premixed slurry or by mixing at the nozzle of a hose to assure that the mixture is not too

fluid and that sufficient dust adheres to the surfaces. After the wet rock dust dries, additional dry rock dust must be applied to all surfaces to meet applicable standards. Wet rock-dusting of ribs and roof does not eliminate the necessity for dry rock-dusting the floor.

In addition to combustion hazards, MSHA also has regulations addressing the hazards of respirable coal dust relative to prevention of black lung disease. Mine operators are required to continuously keep dust levels at or below the legal limits required by MSHA, and also to train miners on the reason for taking dust measurements; the reason for placing dust control plans in effect; and the need for MSHA health regulations. In addition, operators must make available NIOSH-approved respiratory equipment to all miners exposed to excessive levels of dust, and sample, every other month, in all underground coal mines and designated occupations at many surface coal operations. Sampling results must be posted at the mine for at least 31 days so miners will have access to this information. Sampling results must also be provided to MSHA enforcement agents upon request. Mines must have MSHA-approved dust control plans, and regulations mandate on-shift examinations to ascertain compliance with MSHA-approved dust control measures at underground coal mines. There is an affirmative duty to report to MSHA, within three working days, any changes in operational status that affects dust sampling. Finally, mining industry employers must report to MSHA within 10 working days after being notified or otherwise learning that a miner has an occupational lung disease, or this illness for which an award of compensation has been made.⁵

Conclusion

Combustible dust will likely remain a volatile issue in the months and years to come, particularly if there are additional high-profile events such as occurred in Georgia in February 2008. By the time this is published, Congress may well have enacted legislation to force rulemaking or OSHA may have voluntarily added combustible dust to its Spring 2009 semi-annual regulatory agenda. Even absent a Congressional or regulatory mandate, employers who fail to adequately address combustible dust hazards will face enforcement activity under OSHA's emphasis program, and could also face third-party tort liability if non-employees are injured or killed in a combustible dust incident.

Prudent employers who have potential combustible dust hazards in their workplaces will abide by the recommendations in the relevant National Fire Protection Association consensus standards, as well as in the guidance published by OSHA. These include adoption of "best practices" to mitigate combustible dust hazards, including conducting hazard assessments, developing written programs on control of combustible dust, training workers and ensuring that contractors also have adequate training, conducting dust inspections and samplings, and implementing feasible control methodologies for adequate ventilation and housekeeping. It is critical that employers consider appropriate engineering, administrative and operating controls to limit dust emissions and ignition sources, as well as implement appropriate building design features (e.g., sprinklers, explosion vents). Electric installations where dust could be present also should meet NEC Ch. 5 for hazardous locations. Explosion ignition sources should be monitored, including: open flames (welding, cutting etc.), hot surfaces (dryers, bearings, heaters), heat from mechanical impacts, electrical discharges (switch and outlet activation), electrostatic discharges, smoldering or burning dust, and heat from tobacco sources if smoking is permitted in the workplace.

⁵ See, generally, MSHA guidance on respirable coal dust at <http://www.msha.gov/s%26hinfo/blacklung/control.pdf> (website as of 3/08/2009).

Recognize that events can happen quickly, from a chain of events or factors. Therefore, employees must be trained to recognize and detect early in chain, so appropriate remedial measures can be taken. In short, the primary prevention is to minimize or eliminate fuel load with good housekeeping, ventilation, extraction and removal systems.