



## White Paper for Agricultural Products by SonicAire President, W. Brad Carr

**2014**

### ***Options to Control Fugitive Combustible Dust***

#### New bill introduced in 2013

In February 2013, a new H.R. Bill HR691: Worker Protection against Combustible Dust Explosions and Fires Act of 2013 was introduced to congress. The essence of the bill is captured in this excerpt:

*“An emergency exists concerning worker exposure to combustible dust explosions and fires, and there is a significant risk of death or severe injury to workers employed at facilities where combustible dusts are present.”* [Bill HR 691 Section 2 (1)]

The bill seeks to require the Secretary of Labor to issue an interim set of standards regulating the control of combustible dust and to finalize a permanent ruling within three years of the interim standard.

The gist of HR691 is to set up timelines by which official standards must be accepted and enforced. Initially there was a proposed interim timeline that states that “not later than 1 year after the date of the enactment of [HR691], the Secretary of Labor shall promulgate an interim final standard regulating occupational exposure to combustible dust hazards.” [Section 3(a)]. This interim standard has not been finalized at this time. The bill then calls for the final standard to be set no later than 18 months after issuance of the interim standard. Both of these regulatory standards are based on those first set by *NFPA 61, Standard for the Prevention of Fire and Dust Explosions in Agricultural and Food Processing Facilities*.

At this point in time the bill has been referred to the Subcommittee on Workforce Protections for review. But OSHA activities are increasing nonetheless as a result.

#### What does all this mean?

All this boils down to the fact that the food and grain industry needs to pay close attention to the standards...or risk heavy fines or worse - employee safety.

So what are some of the details that are most important? Let’s take a closer look at some of the specifics of NFPA 61.

- Annex A.10.2.1.1, identifies the acceptable accumulation level:

**“...The facility should immediately remove any fugitive agricultural dust accumulations whenever they exceed 3.2mm (1/8”) at priority housekeeping areas...or should demonstrate and ensure, through the development and implementation of the housekeeping program, that equivalent protection is provided. ”** *(Author’s emphasis)*

Keep in mind that 1/8 inch is about the size of the tip of a highlighter pen. The practical reality is that this requirement means there is a zero-tolerance approach to dust buildup in a plant. Plants processing agricultural products must find ways to deal with this immediately or risk penalties for non-compliance.

#### Housekeeping Recommendations

NFPA recently updated their standards. The following NFPA 61 requirements need to be met:

- Annex A.10.2.1.1. “The housekeeping program should address fugitive agricultural dust accumulations at priority housekeeping areas. Priority housekeeping areas should include at least the following:
  - (1) Floor areas within 10.7m (35 ft.) of inside bucket elevators
  - (2) Floors of enclosed areas containing grinding equipment
  - (3) Floors of enclosed areas containing equipment used to heat, toast, or dry located inside the facility.
- Annex A.10.2.3. “**...Where the surfaces are inaccessible or create a hazard to employees working from stepladders or in hazardous positions while handling vacuum hoses and tools, alternative means should be followed....”** *(Author’s emphasis)*
- Annex A.10.3.1. “Techniques to prevent or reduce dust generation and dispersal are vital to any dust control programs. **Preventive dust control is encouraged, since it can effectively reduce total dust control costs** as well as the demands placed on the performance of subsequent dust control techniques....” *(Author’s emphasis)*
- Chapter 10.2.1.1. “The facility shall develop and implement a written housekeeping program that establishes the frequency and method(s) determined best to reduce accumulations of fugitive agricultural dust on ledges, floors, equipment and other exposed surfaces.”

Clearly, the imperative is to comply with these strict standards through a highly effective housekeeping program. A proactive approach is preferred as the ultimate solution. But in the real world, the question remains - Are there workable and affordable ways to meet these recommendations?



### Managed Solution vs. Engineered Solution

Let's take a quick look at all the options available.

There are two different approaches to control combustible dust: a managed solution or an engineered solution. In fact, the NFPA Standards refer to a managed solution, which has been the status quo to date. It is helpful to examine each approach, identifying the strengths and weaknesses.

A managed approach means that personnel or third party businesses clean the overhead structures on a continuing basis. This has been the conventional approach to controlling combustible dust. One benefit of a managed approach is that there are low upfront costs: contracts are set up for ongoing payments that become part of annual operating expenses.

There are also other issues to consider with a managed approach, however. There is risk to personnel for the overhead cleaning. The levels of clean in the facility varies based on the proximity to the scheduled cleaning time: for example, if overhead cleaning is scheduled monthly on the 15th of the month, the combustible dust has had time to accumulate by the 14th of the month, making it possible for the plant to be out of compliance with OSHA regulations...and risk the safety of the employees. Even if a plant owner/manager were not inclined to procrastinate the cleaning, the cyclical nature of the buildup is inevitable with a managed approach. Also inevitable is lost production due to the necessary shutdown of the plant.

The assumption for an engineered approach is that technology can be leveraged to automate cleaning processes and continuously protect against the risks of combustible dust accumulation.

### Two Engineered Options

There are two different types of engineered solutions. With an engineered approach, an enterprise-wide system is needed. This enterprise-wide solution often combines technologies, depending on the size of the food or grain facility. The first technology is localized filtration. With this, the equipment captures the combustible dust by either vacuuming or suctioning. This approach is often needed, but the reality is that it can't be used alone because localized filtration can't capture every particle.

The second technology is barrier technology, which prevents combustible dust from accumulating on overhead structures. With barrier technology, a robotic clean fan automatically maintains OSHA compliance throughout the plant. With this approach, there is a one-time deep clean of any fugitive dust built up in existing plants (as opposed to no need for a one-time clean in new facilities). Once that dust is removed, barrier technology prevents any new dust from ever accumulating again. Often there is synergy between the filtration and the barrier technologies and they can be effectively used together in one facility to assure ongoing compliance.



With either engineered methodology, there are higher, one-time costs for implementation. But these are one-time costs, as opposed to the ongoing costs of a managed solution. An engineered approach also allows for automated, controlled cleaning that doesn't interfere with production. Depending on the sophistication of the specific technology, it also delivers consistently higher levels of clean for ongoing compliance to government regulations and for employee safety.

### Evaluating the Options

So how do you know which approach is the smarter, more affordable way to get the job done, and maintain OSHA compliance?

Facility managers and plant owners should evaluate the overall cost for any solutions based on a range of variables including the criteria of:

- Initial cost
- Operating cost
- Ongoing labor cost
- Employee morale
- Disruption to normal production
- Safety of cleaning personnel
- Energy usage

Consider an independent consultant's opinion:

"I like the fans... because they can control dust in hard-to-access areas. The fans provide an option for controlling dust accumulations without the risks to worker safety that would result from the use of ladders or scissor lifts to reach those difficult places."

Walter Frank, President Frank Risk Solutions Inc.

NFPA 654 Committee Chairman 302.521.7588 [wlf@frankrisk.com](mailto:wlf@frankrisk.com)

"The overhead fan approach has several advantages. Most importantly, it reduces the risk of creating a hazardous dust cloud during cleaning. "



*Housekeeping Solutions, Walter L. Frank, P.E. et. al.*

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W. Brad Carr, SonicAire, Inc. President

SonicAire has developed new, innovative BarrierAire™ Technology that meets these federal regulations by creating an overhead barrier throughout facilities. Our line of automatic SonicAire® fan systems robotically prevents dust from accumulating.

Brad Carr has a passion for providing the best engineering solution to a business problem. He founded SonicAire in 2004 because he had innovated a new way for plant owners and managers to keep their facilities free from the problems with fugitive combustible dust and fiber.

He has worked closely with clients as they've worked to comply with OSHA to deal with these complexities. His clients include Pilgrim's Pride, General Mills and Georgia-Pacific. Carr has also authored articles on safety issues with combustible dust for *Timber Processing*, *Industrial Safety and Health News (ISHN)*, *Pallet Central*, *American Laundry News*, and *Recycling Today* magazines. He has also been invited to speak at trade events in a wide range of industries.

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