Testimony of John S. Bresland
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Subcommittee on Employment and Workplace Safety
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Thank you, Chairman Murray, Senator Isakson, and distinguished members of the Committee. I am John S. Bresland, Chairman of the U.S. Chemical Safety Board.

The CSB is an independent federal agency that investigates and determines the causes of major chemical accidents, conducts studies, and develops safety recommendations and outreach materials to prevent future accidents.

My testimony today is on my own behalf, and not necessarily for the Board as a whole.

I commend you for convening today's hearing on the issue of combustible dust hazards and the explosion at Imperial Sugar on February 7, 2008.

Like Senator Isakson, Senator Chambliss, and Secretary Foulke, I traveled to Port Wentworth and witnessed first-hand the tremendous devastation at the Imperial Sugar refinery (Figure 1).

Dust Explosions Affect Many U.S. Industries

Combustible dust can be a catastrophic explosion hazard at American workplaces. Since the CSB was established in 1998, three out of the four deadliest accidents we have investigated were determined to be combustible dust explosions.

Madam Chairman, such accidents – and the tremendous suffering they cause – do not need to happen.

In addition to the 13 workers who died from the explosion and fire at Imperial, six workers were killed in a polyethylene dust explosion at West Pharmaceutical Services in Kinston, North Carolina, and seven were killed in a resin dust explosion at CTA Acoustics in Corbin, Kentucky. Both the latter facilities – representing two major employers in two small American towns – were devastated and had to be demolished.

The CSB determined that both the West and CTA explosions could have been prevented if the companies had followed National Fire Protection Association (NFPA) recommendations for controlling dust hazards. However, neither company adequately implemented these standards. Although state OSHA personnel had inspected both plants, the dust hazards had never been identified or cited during those inspections.

In November 2006, the CSB completed a comprehensive study on the issue of combustible dust. We found that combustible dust explosions have been a recurrent cause of disasters at U.S. industrial facilities. Our study identified 281 dust fires and explosions that

occurred at U.S. businesses between 1980 and 2005 – not including primary grain handling or underground coal dust explosions. These fires and explosions resulted in 119 deaths and 718 injuries.

Dust explosions afflict many industries, including food products, plastics, automotive parts, drugs, chemicals, and electric utilities. A wide range of common combustible materials can explode in finely powdered form, including coal, wood, flour, sugar, and many chemicals, plastics, and metals. Many of these basic materials and chemicals are essential to commerce, and they can be handled safely with appropriate precautions. Sophisticated chemical and pharmaceutical companies have handled similar combustible powders safely for decades.

Even a material that is difficult to ignite in bulk form – like a block of solid wood or metal – can become a powerful explosive fuel when ground into a fine powder, dispersed in air, and exposed to an ignition source. Exactly such conditions can occur in factories where fine combustible dust has accumulated on horizontal surfaces – particularly on elevated surfaces that are difficult to reach and not frequently cleaned or even thought about.

Some minor event, such as a small fire, an unsafe cleaning operation, or a dust explosion inside equipment (called a primary dust explosion) may be all it takes to suddenly disperse the accumulated dust. This creates a dense, explosive atmosphere inside the confines of a plant, and if an ignition source is present, the stage is set for disaster. The suddenly dislodged dust can fuel a powerful "secondary" dust explosion that cascades rapidly through even a large factory. It is these secondary dust explosions that are generally responsible for multi-fatality accidents and huge property losses.

82 New Dust Explosions Since January 2006

When my CSB colleague William Wright appeared before the House Education and Labor Committee in March 2008, he testified that in the two years since the CSB compiled the data for the combustible dust study, media reports indicated the occurrence of approximately 67 additional dust fires and explosions.

Today, just four months later, that number has already grown to a total of 82. Dust explosions and fires that are significant enough to be reported in the media are now occurring at the rate of almost one a week at American businesses.

The CSB investigation found that good engineering and safety practices to prevent dust explosions have existed for decades. Current good practices are contained in National Fire Protection Association (NFPA) standards, such as NFPA 654, NFPA 484, NFPA 61, and NFPA 499.

Some state and local governments have adopted some or all of these NFPA standards as part of their fire codes, but many have not. Our study also found that enforcement of these codes at industrial facilities is, at best, uneven.

Code enforcement agencies heavily emphasize the inspection of high occupancy establishments such as hotels, schools, and nursing homes – not industrial facilities. These agencies often lack the training or staffing to inspect industrial sites or enforce technical standards for combustible dust. Because hundreds of different state and local jurisdictions are involved in code enforcement across the country, there is no straightforward way to improve this system.

CSB Recommended a New, Comprehensive OSHA Standard for Combustible Dust

In November 2006 the CSB study on combustible dust made five specific safety recommendations to OSHA. The Board called for a comprehensive regulatory standard for dust explosions in general industry, improved training of OSHA inspectors to recognize dust hazards, and better communication of dust hazards to workers using Material Safety Data Sheets (MSDSs). The CSB also asked OSHA to alert the United Nations Economic Commission for Europe of the need to amend the Globally Harmonized System to address combustible dust hazards.

The CSB recommended that, while a new standard was being developed, OSHA establish a national emphasis program on combustible dust hazards to better enforce existing standards – which OSHA began in 2007 and is continuing to implement.

A year and three months after the completion of the CSB dust study, the Imperial disaster occurred, and it caused even more death and destruction than any of the previous dust explosions we had studied. In fact, the 13 fatalities from the Imperial Sugar explosion place this accident among the very worst industrial disasters of any kind in the U.S. over the past two decades.

Dust Explosions Cause Severe Burn Injuries

In addition to the deaths and property damage, combustible dust explosions frequently cause massive burn injuries that forever scar even those who survive. The West and CTA dust explosions injured a total of 75 people, including some who were left severely disabled and disfigured.

At Imperial Sugar, there were 101 employees and contractors present on the evening of February 7, 2008. The explosion and fire left eight dead at the scene, and burned another five so severely that they later died in the hospital. In addition, a total of 39 people were injured, including 23 who were burned. Of these 23 burn victims, 15 had serious and life-threatening injuries requiring hospitalization at the Joseph M. Still Burn Center in Augusta, more than 100 miles from Port Wentworth. Today, more than five months later, three burn victims remain hospitalized in the Still Burn Center. As requested by the Committee, additional information on the number and severity of the injuries is included in Table 1.

CSB's Preliminary Findings about the Explosion at Imperial Sugar

The catastrophic explosion at Imperial Sugar in February resulted from massive accumulations of combustible sugar dust throughout the packaging plant at the refinery.

The CSB investigation to determine the causes of the accident at Imperial Sugar is ongoing. Our investigative team arrived in Savannah on February 8 and conducted work at the site almost continuously through June, and some field work still remains to be completed.

We have conducted detailed interviews with about 130 witnesses, including operators, managers, engineering staff, maintenance and cleaning contractors, and top executives. We have collected thousands of photographs and documents.

Let me briefly summarize our conclusions to this point, emphasizing that all information is preliminary and we continue to investigate.

The Imperial Sugar facility can trace its origins back to 1916. This was a large plant with hundreds of employees. Most of the employees we interviewed had worked at the site for the past 10 to 30 years. On the day of the explosion, it was the second largest sugar refinery in the U.S.

Raw sugar arrived by ship and was stored in a warehouse. In the refinery section of the facility, the raw sugar was dissolved in water and purified by filtration and crystallization. The purified sugar crystals were then stored in three huge silos, which were surrounded by a large, four-story packaging plant. Within this plant, which was several hundred feet long, workers operated machinery that not only bagged and boxed sugar but also pulverized it in hammer mills to make powdered sugar.

Like most catastrophic dust explosions, what happened at Imperial was a multi-stage event. At 7:15 p.m. on the evening of February 7, there was a primary explosion in the packaging plant, followed three to five seconds later by a much larger secondary dust explosion. The explosion blew through the roof of the building and rose high into sky; the moment of the blast was captured in images from a surveillance camera almost two miles from the refinery (Figure 2).

There were about a hundred employees at the facility that evening. As the secondary explosion occurred, witnesses inside the packaging plant saw a fireball rolling overhead. Some were engulfed in fire and flaming debris; others were burned by a sudden burst of scorching hot air.

Thereafter, a large fire ensued and grew, fueled by sugar and combustible packaging materials. At least one victim became trapped and could not be rescued. He died in the advancing fire. Although the building had a sprinkler system, its water piping was immediately disabled by the explosion.

Had the accident occurred a few hours earlier during the day shift, about 300 people would have been present at the plant, and the number of deaths and injuries could have been far higher.

The nature of the primary explosion has not been conclusively determined. We do know that an explosion likely occurred underneath the sugar silos. Beneath the silos, there was a long, steel-enclosed sugar conveyor system, which carried granulated sugar from the silos to the packaging plant. This sugar could include fine combustible particles generated in processing and handling.

The explosion under the silos was strong enough to blow some of the steel enclosure panels of the conveyor system into the packaging building. To date, the immediate area of this explosion has remained largely inaccessible to investigators, and other possible primary explosions have not been ruled out.

Accumulated Sugar in Packaging Plant Fueled the Explosion

Inside the four-story packaging building, the secondary dust explosion was fueled by widespread accumulations of combustible sugar dust. It was this secondary dust explosion that caused the major loss of life at Imperial. Secondary dust explosions like this do not occur if dust has been prevented from accumulating on surfaces.

National Fire Protection Association guidance documents, such as NFPA 654, indicate that accumulations of combustible dust of 1/32 of an inch – covering just 5% of the available surface area – should be considered hazardous due to the possibility of a secondary dust explosion.

Multiple witnesses told CSB investigators of large accumulations of sugar at many locations throughout the packaging plant. Accumulations of dust were longstanding and were present until the day of the explosion, according to these witnesses. Near the powder mills, powdered sugar accumulated on the floor to a "mid-leg" height, according to a worker there. Airborne sugar in this room made it difficult for workers to see each other, we were told. On elevated surfaces, witnesses described seeing thick build-ups of sugar of around an inch.

Pre-Explosion Photographs from 2006 Show Conditions Inside Plant

The CSB obtained pre-explosion photographs taken at the Imperial facility by a third-party in September and October 2006. These photographs, which show different locations inside the packaging building, confirm the existence of substantial dust accumulations on various walls, pipes, ducts, motors, switch boxes, and pieces of processing equipment. The pictures show an inch or even more of accumulated sugar on elevated surfaces. On several production floors, the photographs show a foot or more of accumulated sugar (Figure 3).

A July 2007 Imperial Sugar incident investigation report of a worker's skin injury stated that "Powder sugar [sic] was piled up on the floor below the mill approximately 18 inches high.

When he stepped into the sugar it came up to around his knee." This internal report included photographs showing the accumulations of sugar, and stated that "The sugar on the floor in the Powder Mill Room is and has been a constant problem." Internal Imperial e-mail correspondence from December 2007 reported: "We clean up around 15,000lbs. weekly out of the mill room." And an internal Spill Control Team report dated December 5, 2007, describes conditions in the Powder Mill Room as follows: "The 2 lb elevator in back of the room blows powder everywhere … Approximate losses in November = 34,000 lbs."

After being shown the 2006 photographs, Imperial Sugar representatives asserted that the facility was clean immediately before the February 2008 explosion. However, the levels of sugar accumulation shown in the 2006 photographs are consistent with the July 2007 incident report as well as levels Imperial operators and contractors told the CSB existed at the time of 2008 dust explosion. In addition, we are not aware of any significant change in Imperial's housekeeping or maintenance practices which would account for a dramatic decrease in the amount of sugar accumulating on surfaces due to ongoing releases from operating equipment.

Imperial Lacked Formal Dust Training, Cleaning Programs

Imperial Sugar reported that its personnel conducted a weekly cleaning of the plant to collect and reprocess spilled sugar. In part, this cleaning was necessary to prevent employees from slipping and injuring themselves on accumulated sugar. However, Imperial Sugar did not have a written cleaning procedure or checklist and therefore could not assure the thoroughness of this program. Various witnesses told the CSB that the cleaning focused on accessible working surfaces and not on elevated surfaces. Interviewees also said the cleaning sometimes did not occur due to production needs. In addition, machines were commonly blown off with air, which contributed to the spread of sugar onto other horizontal and elevated surfaces.

Accumulations of dust on elevated surfaces are particularly hazardous, since they usually consist of the finest, most explosive material, are difficult to clean, and are prone to be dislodged into the atmosphere in the event of a fire or a primary explosion.

We asked Imperial Sugar for all policies and procedures related to dust control, records of weekly cleaning activities, and documentation of training on dust hazards, but the company was unable to produce any documents that were responsive to these requests. Based on the available evidence, Imperial did not have a written dust control program, a specific target level for the maximum dust accumulation, or a program for using safe dust cleaning methods, and the company did not impose combustible dust safety requirements on cleaning contractors. And the company produced no documentary evidence of any formal training program for educating its workers about combustible dust hazards.

Much of the electrical equipment in the sugar packaging plant was not dust-tight and therefore was not appropriate for use in plant areas where combustible dust could form an explosive atmosphere. Only a small portion of the building – the powder mill motor control room – was enclosed to prevent dust intrusion.

Finally, the packaging building on the south side of the silos was more than a half-century old, and the equipment did not incorporate effective design features to prevent the spread and accumulation of sugar dust. The building walls were of masonry construction and lacked provisions to safely vent the forces of an explosion. The 2008 dust explosion caused massive structural damage to the packaging building, which increased the human toll from the accident, as concrete floors heaved, brick walls blew out or collapsed, and windows flew hundreds of feet.

Operators Not Informed of the Risks from Combustible Dust

Among operations-level personnel, we found no significant awareness or training about the hazards of catastrophic dust explosions. In interviews, some management-level personnel described varying but limited levels of familiarity with dust explosion hazards. Although we have found no indication that this particular facility had previously experienced a major explosion, ten days prior to the February 7 disaster there was a small explosion inside a dust collector on the roof of the packaging building.

Employees reported another near-miss incident when a small fire erupted in the packaging building a few weeks before the February explosion. Accumulated sugar near a packaging machine was apparently ignited by an overheated motor or conveyor bearing.

NFPA Recommendations Likely Would Have Prevented Major Explosion

Madam Chairman, the standards developed by the National Fire Protection Association (NFPA) represent the consensus of industry's own experts about how best to prevent and mitigate combustible dust explosions. However, Imperial Sugar did not have a program to follow relevant NFPA recommendations for preventing dust explosions – including NFPA 61, NFPA 654, and NFPA 499.

The principal standard, NFPA 654, was first developed between 1943 and 1945, and has since been updated and improved a number of times. NFPA 654 describes a number of important safety practices and principles, which if diligently followed, would have made the catastrophic dust explosion at Imperial unlikely to occur. For example, NFPA 654 recommends that dust-producing activities such as powder milling be isolated from other operations – and that barriers be installed to prevent the migration and accumulation of dust.

Equipment should be designed and maintained to minimize the release of dust. New construction should be designed to facilitate cleaning, by minimizing horizontal surfaces where dust can collect and, wherever feasible, sealing areas that are inaccessible to cleaning. The standard also calls for regular cleaning – including overhead ducts, pipes, and beams – using safe cleaning methods such as vacuuming with appropriate equipment. Housekeeping should be comprehensive to control hazardous dust accumulations wherever they might occur, not just on walking and working surfaces.

The NFPA suggests immediate cleaning and removal of any dust accumulation over 1/32 of an inch, about the thickness of a paperclip. More than 1/32" of dust covering 5% of the room area is enough to create an explosive atmosphere if the dust becomes suddenly dispersed.

The NFPA standard calls for designing process equipment to ensure that dust explosions inside the equipment vent to safe locations away from personnel, and not into work areas where life-threatening secondary explosions could occur. It also calls for controlling activities and equipment that may cause ignition and requires that electrical equipment be suitable for dust-containing atmospheres. And buildings should be designed to be evacuated quickly in an emergency.

Finally, the NFPA standard calls for a basic safety management system at facilities that handle combustible powders. This system is similar to what thousands of oil and chemical facilities already follow under the OSHA Process Safety Management (PSM) standard. The NFPA recommends that facilities with dust explosion hazards develop worker training, hazard analysis, and change management programs, and conduct regular inspections and maintenance.

Most of the fatalities and serious injuries from industrial dust explosions occur due to secondary explosions, which result from dust accumulations in work areas. These explosions – including the one at Imperial Sugar – can be prevented by adherence to the principles contained in the NFPA standards. Our investigation to date reveals numerous areas where Imperial was unfamiliar with and did not implement NFPA recommendations.

OSHA has recognized the importance of NFPA's dust standards and they are referenced numerous times in the National Emphasis Program that OSHA began last year and reissued earlier this year. We support the NEP, and I commend Secretary Foulke for its establishment. The creation of an NEP would appear to satisfy one of the CSB's safety recommendations from 2006.

Imperial Disaster Emphasizes Need for a Comprehensive OSHA Standard

A comprehensive OSHA dust standard is necessary to get businesses, government inspectors, and insurers to identify dust hazards and take appropriate actions to control them. Existing standards do not clearly identify what kinds of dust are hazardous and only address limited aspects of how to control those hazards.

OSHA's existing Walking-Working Surfaces standard (29 CFR 1910.22) – sometimes loosely referred to as "the housekeeping standard" – requires that "all places of employment be kept clean and orderly and in a sanitary condition." Its primary purpose is to protect individual workers from slips, trips, and falls from water, debris, or sharp objects. It does not specifically address fire or explosion hazards, does not mention combustible dust, and does not impose any specific enforceable limitations, engineering controls, procedures, cleaning methods, or training requirements.

There are also limitations in seeking to apply existing NFPA standards, as written, under the OSHA general duty clause. NFPA 654 does not include specific lists or criteria for what

combustible powders are covered (although two related standards, NFPA 61 and NFPA 499, clearly identify sugar dust as an explosion hazard). NFPA 654 also contains a number of general provisions that may be subject to differing interpretations. For example, the standard says that decisions about applying safety recommendations retroactively to existing buildings must be made on a case-by-case basis to achieve an "acceptable degree of protection" – a term that is difficult to define.

Instead of the present patchwork of miscellaneous federal, state, and local requirements, the Chemical Safety Board has recommended that OSHA develop a single, comprehensive, uniform standard – based on the sound, consensus-based technical principles and practices that are embodied in NFPA standards. Ambiguities in the NFPA standards need to be resolved in clear, enforceable regulations developed by a thorough, public rulemaking process.

The House of Representatives took a similar approach in H.R. 5522, the Worker Protection Against Combustible Dust Explosions and Fires Act of 2008, which mandates an OSHA standard that is based on NFPA standards, but considers input from all parties.

OSHA Grain Dust Standard Has Cut Explosion Deaths by 60%

Advocates of a new OSHA standard are encouraged by the success of the OSHA grain dust standard, 29 CFR 1910.272. In the 1970s and 1980s, the U.S. experienced a series of grain dust explosions that caused a number of deaths. OSHA responded in 1987 by issuing a comprehensive grain dust standard. This standard requires preventive maintenance, worker training, safe operating procedures, emergency planning, and formal dust-cleaning programs. In particular, grain-handling facilities (but not other industries) must adopt written cleaning schedules, identify priority housekeeping areas where combustible dusts are most likely to be present, immediately remove any dust accumulations over an eighth of an inch, and avoid using compressed air for cleaning.

According to OSHA's own review in 2003, this standard has cut deaths and injuries from grain dust explosions and fires by 60%. And as noted in the CSB study, the grain industry itself now credits the standard with helping to make the design of grain handling facilities safer.

Developing a new combustible dust standard will be a complex undertaking, and OSHA will face technical challenges along the way. A realistic timetable will need to be developed. But the time to start this important work is now. We should not await another tragedy on the scale of what we just witnessed in February before starting the rulemaking process.

In November 2006, when the combustible dust study and recommendations were before the Chemical Safety Board for approval, I had reservations about recommending a new OSHA dust standard for general industry. At that time, I hoped that the terrible dust explosions in 2003 would prove to be an anomaly, and that heightened awareness and vigilance by industry would make a new federal regulation unnecessary.

New OSHA Standard, Education, and Enforcement Will Prevent Future Deaths

Although I continue to believe that education and awareness are very important components, the tragic circumstances of the Imperial Sugar explosion have now convinced me that a comprehensive federal standard should be enacted to help prevent future disasters.

Of course, a standard by itself will not prevent all accidents. Therefore, we need a new standard, an emphasis program, *and* an awareness campaign to tackle this problem. Without all three elements – strong regulations, education, and enforcement – workers will continue to be put at risk.

A combustible dust standard will save workers' lives. It will save many others from devastating burn injuries.

After witnessing the terrible human and physical toll from the Imperial explosion, I believe the time for further debate should draw to a close. It is time for all interested parties – industry, labor, and government – to move forward toward a standard that will protect workers, businesses, and communities well into the future.

Thank you for the opportunity to testify today.

Figure 1. Aerial photograph of Imperial Sugar Port Wentworth facility after explosion.

Figure 2. Surveillance camera captures secondary dust explosion from two miles away.

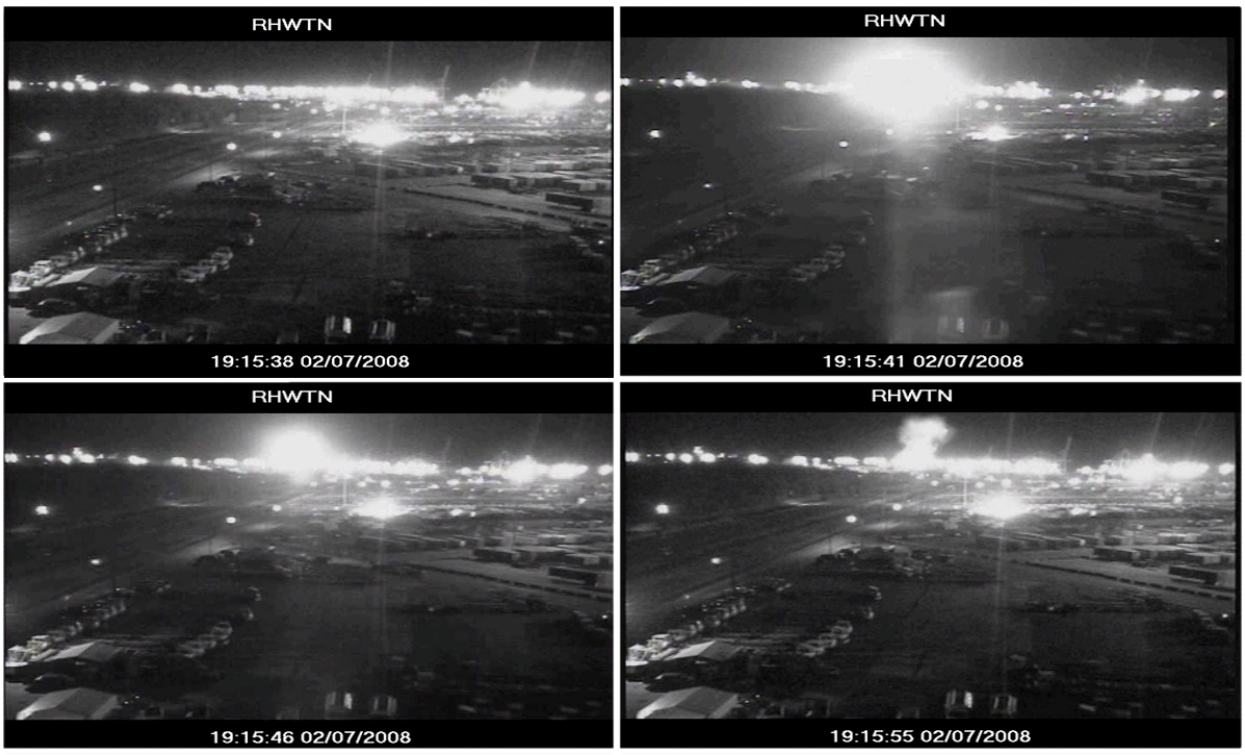

Figure 3. Photographs of sugar accumulations inside the Imperial Sugar Port Wentworth facility from September – October 2006.

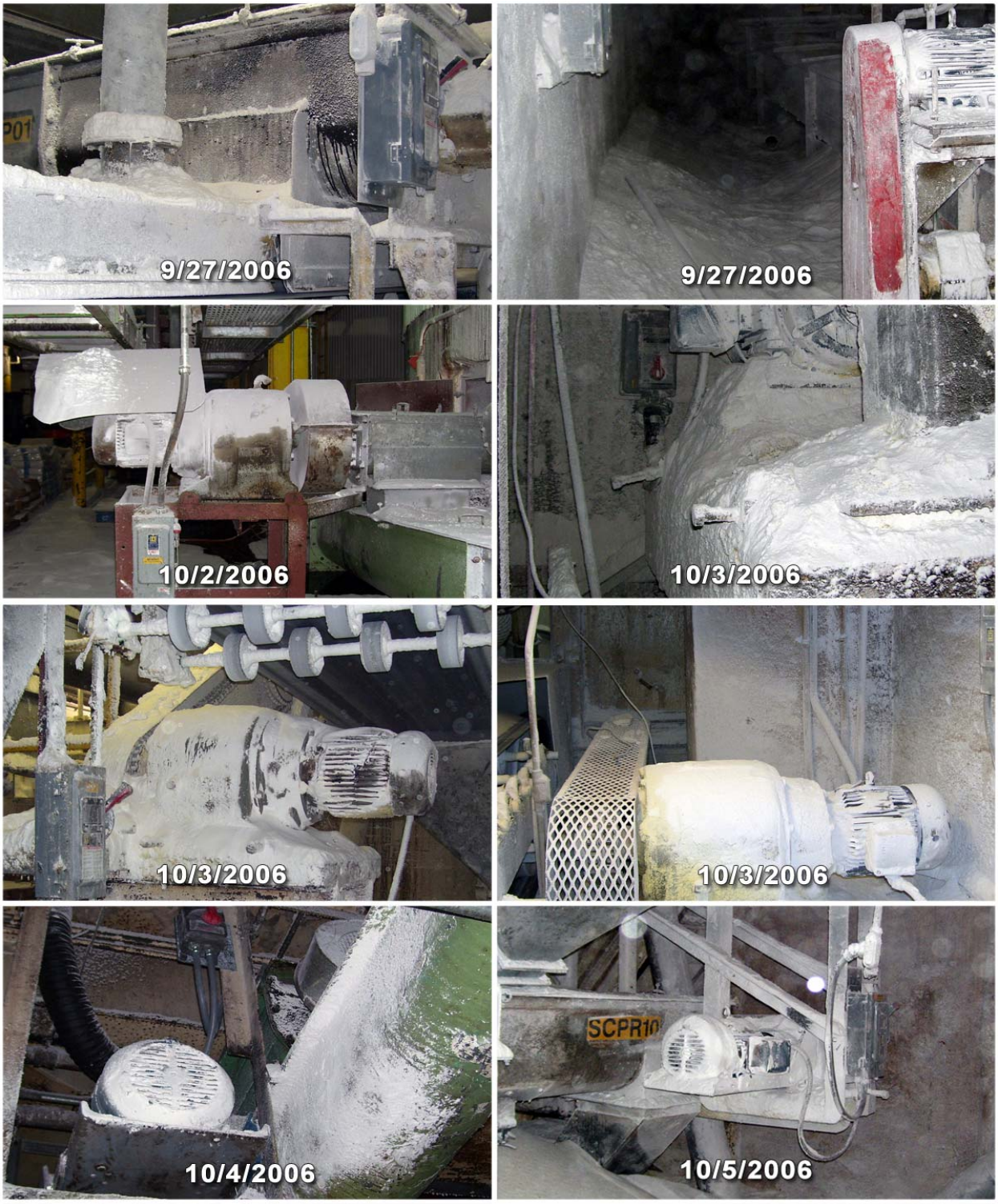

Table 1. Information on fatal/nonfatal injuries from the explosion and fire at the Imperial Sugar facility in Port Wentworth.

Victim	Employer	Location at time of incident	Status / Condition	Nature of Injury
1	Imperial Sugar	Unknown	Burn center - critical	Thermal burns 45%
2	Stokes Contracting	Unknown	Burn center - critical	Thermal burns 85%
3	Imperial Sugar	2nd floor south packaging	Burn center - good	Thermal burns 45%
4	Imperial Sugar	1st floor south packaging	Deceased at burn center	Thermal burns 60%
5	Imperial Sugar	1st floor south packaging	Deceased at burn center	Thermal burns 90%
6	Imperial Sugar	2nd floor south packaging	Deceased at burn center	Thermal burns 85%
7	Imperial Sugar	3rd floor south packaging	Deceased at burn center	Thermal burns 20%
8	Kerby Contracting	Palletizing	Deceased at burn center	Thermal burns 85%
9	Imperial Sugar	2nd floor Bosch	Deceased at refinery	Thermal burns
10	Imperial Sugar	2nd floor Bosch	Deceased at refinery	Thermal burns
11	Imperial Sugar	2nd floor Bosch	Deceased at refinery	Thermal burns
12	Imperial Sugar	2nd floor break room	Deceased at refinery	Thermal burns
13	Imperial Sugar	2nd floor break room	Deceased at refinery	Thermal burns
14	Imperial Sugar	3rd floor south packaging	Deceased at refinery	Thermal burns
15	Imperial Sugar	4th floor south packaging	Deceased at refinery	Thermal burns
16	Stokes Contracting	4th floor south packaging	Deceased at refinery	Thermal burns
17	Imperial Sugar	1st floor south packaging	Released from burn center	Thermal burns 40%
18	Imperial Sugar	1st floor south packaging	Released from burn center	Thermal burns 20%
19	Imperial Sugar	2nd floor south packaging	Released from burn center	Thermal burns 25%
20	Imperial Sugar	2nd floor south packaging	Released from burn center	Thermal burns 51%
21	Imperial Sugar	2nd floor south packaging	Released from burn center	Thermal burns 24%
22	Imperial Sugar	3rd floor south packaging	Released from burn center	Thermal burns 19.5%
23	Imperial Sugar	3rd floor south packaging	Released from burn center	Thermal burns 24%
24	Imperial Sugar	3rd floor south packaging	Released from burn center	Thermal burns 20%
25	Imperial Sugar	3rd floor south packaging	Released from burn center	Thermal burns 12%
26	Imperial Sugar	3rd floor south packaging	Released from burn center	Thermal burns 18%
27	Imperial Sugar	3rd floor south packaging	Released from burn center	Thermal burns 12%
28	Imperial Sugar	Electrical and instrumentation shop	Released from burn center	Thermal burns 1% Fracture Laceration
29	Imperial Sugar	2nd floor break room	Treated/released	Fracture
30	Stokes Contracting	2nd floor lab	Treated/released	Laceration Contusions
31	Imperial Sugar	2nd floor lab	Treated/released	Contusions Smoke inhalation
32	Imperial Sugar	2nd floor lab	Treated/released	Contusions

33	Imperial Sugar	2nd floor south packaging	Treated/released	Thermal burns Contusions Smoke inhalation
34	Imperial Sugar	3rd floor south packaging	Treated/released	Contusions Smoke inhalation
35	Imperial Sugar	4th floor south packaging	Treated/released	Thermal burns
36	Imperial Sugar	Bulk sugar	Treated/released	Contusions
37	Imperial Sugar	Electrical and instrumentation shop	Treated/released	Contusions
38	Kerby Contracting	Handstack - manual pallet loading	Treated/released	Thermal burns Hearing loss
39	Kerby Contracting	Handstack - manual pallet loading	Treated/released	Contusions Hearing loss
40	Imperial Sugar	Liquid sugar	Treated/released	Contusions
41	Imperial Sugar	Palletizing	Treated/released	Contusions
42	Imperial Sugar	Palletizing	Treated/released	Thermal burns
43	Imperial Sugar	Palletizing	Treated/released	Hearing loss
44	Imperial Sugar	Palletizing	Treated/released	Contusions
45	Imperial Sugar	Palletizing	Treated/released	Thermal burns
46	Imperial Sugar	Raw sugar	Treated/released	Contusions
47	Imperial Sugar	Unknown	Treated/released	Contusions
48	Imperial Sugar	White sugar stand	Treated/released	Thermal burn Contusions
49	Imperial Sugar	White sugar stand	Treated/released	Contusions