U.S. CHEMICAL SAFETY BOARD

US INK/MILLARD REFRIGERATED SERVICES

PUBLIC MEETING

THURSDAY,
JANUARY 15, 2015

U.S. CHEMICAL SAFETY BOARD MEMBERS PRESENT:

RAFAEL MOURE-ERASO, Ph.D., Chairperson,
U.S. Chemical Safety Board
MANNY EHRLICH, JR., Member, U.S. Chemical Safety Board
MARK GRIFFON, Member, U.S. Chemical Safety Board

STAFF PRESENT:

RICHARD C. LOEB, General Counsel
JOHNNIE BANKS, CFEI, Investigations Supervisor
LUCY TYLER, CSP, Investigator
BEETA LASHKARI, Attorney/Investigator
MICHAEL CORONA, Attorney/Investigator
RICHARD GUNARATNAM, Investigator
SAMUEL OYEWOLE, Ph.D., Investigator
REEPA SHROFF, Investigator

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(Time not provided)

CHAIRPERSON MOURE-ERASO: Good evening and welcome to this public meeting of the U.S. Chemical Safety Board, the CSB.

First of all, I would like to call your attention to the agenda that everybody should have. There are copies in the front. As you can see, today we have a composite meeting in which we are covering two of our products that are in investigations. You can read the contents of the agenda.

We have opening statements. And first we are going to make a presentation of the Millard Refrigerated Services Safety Bulletin. That is the issue of anhydrous ammonia. Then we are going to have the Board asking questions to the investigators after the presentation. And then we are going to have public comment of anybody that wants to come to that microphone and speak. After that we are going to have a Board vote on the acceptance of the safety bulletin of
Millard Industries.

After that presentation we are going to have a short break and we reconvene. If we are able to do it early, we'll do it early, but I will be telling you the time. And then we are going to have a presentation on the US Ink case of East Rutherford here in New Jersey. That has to do with combustible dust. Again, there will be more questions particularly on the US Ink case to the investigative team, investigatory team. Then there are going to be public comments on the report and following again by a Board vote specifically for the US Ink study.

Then there will be a closing statement and that will be the end of our meeting.

So to get us started I am Rafael Moure-Eraso, the Chairperson of the Board. And with me today are Board Members Mark Griffon and Manny Ehrlich, Jr. to my left. Also joining me here to my left is our general counsel, Richard Loeb. And here you'll have a number of CSB staff members including all the members of the two
investigative teams, the one in Millard Industries and the one in US Ink. They are here for the agency. Besides that we have all our communication staff that are the ones that organized and prepared this meeting.

As probably you all know, the CSB is an independent non-regulatory federal agency that investigates serious chemical accidents. The investigations examine all aspects of chemical accidents including physical causes related to equipment design as well as inadequate regulations, industry standards and safety management systems. Ultimately, we use recommendations or findings that are designed to prevent similar accidents.

At this time I would like to recognize representatives from the U.S. Congress and the U.S. Senate that represent this district that are present here. With us is a Representative of Congressman Pascrell, and also I believe representatives from Senator Booker and Senator Menendez. If the representative for Congressman
Pascrell would like to address the audience, I invite him to please approach this microphone in the front.

(No audible response)

CHAIRPERSON MOURE-ERASO: If he's not, I ask for the representative of Senator Booker if he would like to say some words. Please.

PARTICIPANT: Just briefly. First of all, welcome and thank you for being here in New Jersey on behalf of Senator Booker this evening. We thank you for your work particularly on the report involving the US Ink incident in 2012. And for those who don't know, today Senator Booker did release a statement regarding a letter he wrote to OSHA echoing concerns and recommendations of the report that there be a standard for combustible dust.

So other than that I have some of those materials. I can leave some on the table in the back. But again, thank you for being here today.

CHAIRPERSON MOURE-ERASO: Thank you.
Thank you very much.

If the representative of Senator Menendez would like to address the audience?

(No audible response)

CHAIRPERSON MOURE-ERASO: No? Okay.

So we'll proceed. The purpose of today's meeting is to present two investigative reports. The first is a safety bulletin on anhydrous ammonia and addresses the release in a company called Millard Refrigerated Services from Mobile, Alabama. The second is a case study and it is a combustible dust explosion that occurred right here, or nearby in East Rutherford, New Jersey at the US Ink facility.

The safety bulletin that is entitled, "Key Lessons for Preventing Hydraulic Shock in Industrial Refrigeration Systems" addresses the design safety operations of ammonia refrigeration facilities. The CSB believes that if ammonia refrigeration facilities follow the key lessons learned that we present in the report from this Millard safety bulletin, first, dangerous
hydraulic shock events can be avoided that are not clear sometimes that they could occur in this industry, environmental damage could be prevented, and potential fatalities and injuries will also be prevented.

We think that the lessons learned in the Millard investigations are relevant to many anhydrous ammonia facilities in the U.S. including many that operate in the State of New Jersey.

The second investigation is a case study on the explosion and flash fires that occurred at the US Ink manufacturing facility nearby in East Rutherford, New Jersey. This incident occurred in October 9, 2012. Seven workers suffered burn injuries when they gathered at the entrance to the ink mixing room. As a result of the CSB finding, the Board is considering recommendations to OSHA and the State of New Jersey.

Before we begin I'd like to introduce the CSB's recently-confirmed Board member, Mr.
Manny Ehrlich, Jr. I know he doesn't kind of feel comfortable with this, but because of the pressures that we got in the Federal Government he is the Honorable Manny Ehrlich, Jr. now. He hails from this state of New Jersey and he is participating today in his first CSB public meeting. Mr. Ehrlich joins the CSB after decades of working in the chemical industry and most recently running his own consulting business.

Additionally, Mr. Rick Engler will be joining us in the Board. I don't believe he's here today. Is he here today?

(No audible response)

CHAIRPERSON MOURE-ERASO: But he will be taking his place on the Board in the middle of January. So he is not with us. I'm sorry, the middle of February. They corrected here. I think it's the 16th of February. I truly look forward to working with both of the new Board members and with Mr. Griffon on a new reconstituted Board.

Lastly, I also would like to
acknowledge the late Senator Lautenberg.

Following the 2012 incident at US Ink the senator formally asked the CSB to become involved in this investigation. The senator requested in October 2012 for the deployment of the CSB to investigate the fire and explosion at US Ink in East Rutherford. His request is a reflection of his lifetime concern for the well-being of the New Jersey's workers and the communities in New Jersey.

He had stated in his letter to the CSB requesting our deployment, quote, "Working with chemicals should not carry an unreasonable risk of injury and hurt." And that is a moral that he live for all through his life as a senator of the United States.

Senator Lautenberg was a great leader and an ardent supporter of work place safety and environmental protection. Among his many legacies was working to establish, to fund and to sustain the U.S. Chemical Safety Board. He is widely considered to be the father of the agency.
We can enter now into business.

Please take a moment to note the locations of the exits from this meeting room. In case of an emergency there is the exit on the back where you enter and there is another exit through that curtain, if need be. So there are two exits.

I also ask that you please mute your cell phones so that the proceedings are not disturbed.

Next I would like to acknowledge the CSB investigation team who will be presenting the draft report to us today. They will describe their findings into these two investigations. After each of the staff presentations, as you can check in the agenda, there will be an opportunity for public comments first for Millard Refrigerated Service on the anhydrous ammonia case, and second in the US Ink on the combustible dust case.

If anyone in the audience wishes to comment publicly, please sign up at the entrance in the tables in the check-in area and I will
call your name at the appropriate time at the
moment of the public comments.

Please note that we will have to limit
public comments to three minutes. And we would
like to request that the comments be relevant to
the two investigations being discussed today.

I would like to thank the D.C.-based
investigative team led by Johnnie Banks that is
here with us, the team lead, for their strong
commitment and dedication to their work. These
teams all under the direction of Mr. Banks were
in charge of both of these investigations, the
one in Alabama and the one here in New Jersey.

And I would also like to thank you,
the audience, for being interested in the work of
the CSB. I see a lot of familiar faces that have
been following our work through the years and I
appreciate your coming here and giving comments
to improve our work in the future and following
us and following the products of the agency.

I will now recognize my other Board
members for opening statements, and first I would
like to ask our newest Board member, Mr. Manny Ehrlich. So, Mr. Ehrlich?

MEMBER EHRLICH: Thank you, Mr. Chairman. Good evening. As the Chairman pointed out, I am a native of New Jersey. It's always good to come to a meeting like this and see the faces of some people that I've worked with in the past and it's always nice to have people not ask you what exit you live at in New Jersey.

I've got 45 or 50 years of experience in the chemical industry in positions that range from pilot plant manager to plant manager to vice president of health and safety and director of emergency response. My last 25 years have been focused on safety and health issues with particular emphasis on worker safety. I've been involved in several situations during my career where lives have been lost and I'm absolutely committed to take the lessons that I've learned and share them with members of this Board and the chemical community at large to see to it that they never happen again. That's the best I can
I promise to you, and I will work diligently at that.

I'm pleased and proud to be affiliated with an organization like this. This is a fine organization and I make my commitment to you as well as the people of the United States to work diligently on this Board to help further their commitment to reducing chemical plant incidents and saving lives. Thank you very much.

CHAIRPERSON MOURE-ERASO: Thank you, Mr. Ehrlich.

Now, Mr. Griffon.

MEMBER GRIFFON: Thank you, Chairman.

And very nice remarks, Mr. Ehrlich.

I want to say we're here tonight discussing two types of incidents that the CSB over the last 15 years has seen with great frequency, combustible dust incidents and ammonia releases.

First, with regard to the safety bulletin based on the incident involving an ammonia release at Millard. I believe this
report includes some important lessons for all similar industries regarding operation and design of these types of systems, as well as emergency response to releases when they do occur. I believe that in addition to these technical fixes there are also lessons to be learned regarding decision making.

I think industry leaders should be asking themselves a couple questions. Do our sites have adequate on-site expertise to operate safely during off normal conditions? How are emergency shutdown decisions made when the company is weighing the potential loss of product; in this case food, against safety and health consequences of an ammonia release? I hope the industrial sector takes away some valuable lessons from this important safety bulletin.

With regard to the US Ink incident my remarks are unfortunately going to be very similar to remarks I've made at the Hoeganaes meeting in November 2011 and at the recent AL
Solutions meeting in July 2014, two other combustible dust cases that we investigated.

At US Ink we have yet another tragedy resulting from a combustible dust explosion, an issue for which the Board since 2006 has recommended that a federal safety standard is needed. It is very troubling that we are here reporting on yet another combustible dust incident and reissuing a recommendation for a federal safety standard. The time for action is way past due. For this Board's part I plan to work with my colleagues on the Board to continue to advocate for the development of such a federal combustible dust standard. Thank you.

CHAIRPERSON MOURE-ERASO: Thank you, Mr. Griffon.

At this time I would like to introduce the CSB leading investigator on these two investigations, Mr. Johnnie Banks. I will ask him to introduce his team of investigators and to proceed with the presentation of the Millard Refrigerated Services safety bulletin.
Mr. Banks?

INVESTIGATOR BANKS: Thank you, Mr. Chairman, Board Member Griffon, Board Member Ehrlich, Mr. Loeb, ladies and gentlemen, good evening.

The Millard Refrigerated Services investigation team is prepared to present findings and key lessons from our investigation of an anhydrous ammonia release that occurred at the Millard Refrigerated Services facility in Theodore, Alabama on August 23rd, 2010.

The release was caused by ruptured piping on the roof inside the Millard facility. As a result of the release 152 members of the public and one Millard employee suffered injuries consistent with ammonia exposure. Thirty-two of those victims were hospitalized and four were placed in intensive care.

This evening's presentation will summarize the incident and list key lessons for the ammonia industry to prevent future ammonia releases from a damaging event called hydraulic
shock, also known as liquid hammer, that can occur in refrigeration equipment and piping.

I'd like to take this opportunity to provide an overview of the agenda for the evening's proceedings. We'll begin with the team's presentation of investigation findings. The team will then entertain questions from the Board. The public will be invited to offer comments. The Board members will then vote on the team's proposed key lessons. And finally, a closing statement from the Chair.

And before I start I'd like to introduce the Millard investigative team, which includes myself, Johnnie Banks, supervisory investigator; Ms. Lucy Tyler, investigator; and Beeta Lashkari, attorney/advisory investigator.

At the time of the 2010 incident at Millard Refrigerated Services it operated as a refrigerated warehouse and distribution company with 36 facilities in the United States and Canada. The company was headquartered in Omaha, Nebraska. The Millard facility in Theodore,
Alabama, the location of the 2010 incident, was a marine export facility that stored, packaged and froze poultry and other meat products. Millard loaded product onto ships docked at the facility for international shipment. And here we have a satellite image of the facility.

Now Millard operated a 240,000-square-foot cold storage facility that could store up to 24 million pounds of product, mostly frozen poultry and beef. It had storage freezers and three blast freezers that were capable of rapidly freezing product within 24 hours.

Now the Theodore facility was located along the Theodore industrial channel that served the Mobile Bay in Alabama. The facility became Millard Maritime in 2013 and the company stopped using cold storage and now stores and exports other products.

The ammonia refrigeration system at Millard contained up to 143,000 pounds of anhydrous ammonia. This slide shows a simple depiction of the ammonia refrigeration cycle. In
the refrigeration process ammonia is not
generated or consumed. It changes phase from a
liquid to a gas it moves from heat from the
freezer or refrigerated areas. Liquid ammonia
absorbs heat as it turns to a vapor and the vapor
is then compressed and condensed back into a
liquid where it cycles back through the
refrigeration process.

Now anhydrous ammonia is a very
commonly used chemical used in industrial
refrigeration as well as many other industries
and it is a hazardous material. Ammonia is a
colorless gas at a normal temperature with
irritating odor. When released to the atmosphere
it forms an aerosol with the moisture in the air
and produces a visible white cloud. It is
irritating to the eyes and respiratory system and
at high concentrations can result in death. An
explosion or deflagration can occur if ammonia is
present in the air at an exploisible concentration
and an ignition source is nearby.

Before we describe the incident, the
technical failure at Millard, we'll first briefly
describe the purpose and functionality of
evaporators in an ammonia refrigeration system.
In large refrigeration systems low-temperature
liquid ammonia is pumped through evaporator coils
located in the cold storage areas and freezers to
cool within those respective spaces. Air
temperature in the freezer decreases as liquid in
the coils transfers to a gas. Over time moisture
from the air builds up on the external surfaces
and the evaporator coil in the form of frost.

If not periodically removed the frost
accumulating on the evaporator coil surfaces
eventually reduces the evaporator's ability to
cool the space. A hot frost defrost cycle is a
common technique used to periodically melt the
accumulated frost from the evaporator coil
surfaces by interrupting the normal cooling mode
and circulating hot ammonia gas through the coil
to warm the evaporator surface.

Now Investigator Tyler will now
discuss the evaporating piping configuration and
defrost cycle.

INVESTIGATOR TYLER: Thank you. Good evening.

This figure is a schematic of the evaporator coil and its associated piping. Low-temperature ammonia is fed into the evaporator from the bottom. It evaporates to cool the space and the remaining ammonia gas is removed through a suction valve at the top. At Millard the liquid ammonia was at minus 40 degrees Fahrenheit. When the defrost cycle initiates, low-temperature liquid ammonia is pumped out of the evaporator coils and the coils are void of liquid. This is a crucial step in the process to ensure all cold liquid refrigerant is removed before adding hot high-pressure gas.

And to melt the frost on the coils hot gas at 110 degrees Fahrenheit is pumped into the evaporator coil for a short time. The hot gas fed into the coil increases the coil temperature and causes the frost on the surface to melt. After the hot gas melts the frost, the coil is
depressurized to remove any of the remaining hot
gas and liquid. When this is completed, the
liquid fills the coil and the refrigeration
process continues. The defrost cycle at Millard
was designed to last about 130 minutes.

Evaporator piping in ammonia
refrigeration systems is susceptible to a
damaging hydraulic shock event during the hot gas
defrost cycle. This is most common during the
transition between the low-temperature liquid and
hot gas and can be avoided by proper
refrigeration system design and operation.

Hydraulic shock is a sudden localized
pressure spike that can occur in piping and
equipment when there is a sudden change in the
velocity of a flowing liquid. It is very common
in steam and water systems and often causes an
audible hammering and knocking sound in piping.
During hot gas defrost evaporator coils
containing hot gas are isolated from the low
temperature side of the system by control valves.
If the defrost cycle is interrupted causing one
of the control valves to rapidly open, the hot high-pressure gas can come into contact with the low-temperature ammonia under vacuum.

A cause of hydraulic shocks more common in ammonia systems is the rapid opening of a valve from high pressure to low pressure. If the coil rapidly depressurizes, refrigerant liquid and vapor will accelerate into the downstream suction piping leading to a damaging hydraulic shock event. And this is similar to what happened on the day of the Millard release incident.

Now I will describe the ammonia release incident that occurred in August 2010.

On the evening prior to the ammonia release Millard experienced a loss of electricity for about seven hours. Operators reported experiencing issues with the control system when the refrigeration system got back on line. Immediately before the incident occurred at about 8:45 in the morning hot gas defrost was in progress for a group of blast freezer
evaporators. At about the same time an operator was troubleshooting alarms in the control system as a result of that power outage.

While clearing alarms the defrost cycle on a group of blast freezer evaporators was reset. Due to an error with the programming logic in the control system, the reset triggered the evaporator to automatically go into refrigeration mode without first bleeding hot gas from the coil. The system triggered a valve to open and liquid refrigerant was charged to the coil. This caused the hot gas to rapidly condense and liquid accelerated through the coil and into the suction piping on the roof.

Operators became aware of the ammonia release shortly before 9:00 a.m. Millard workers were in the process of loading two international ships with frozen poultry on the docks. An ammonia release occurred inside one of the facility's blast freezers which set of multiple alarm sensors alerting employees. On the right is a photo of the release taken inside the
warehouse shortly after the incident occurred.

At about the same time a visible cloud of ammonia appeared on the roof of the Millard Refrigerated Services facility from the piping. A large white cloud of ammonia traveled south across the canal in the direction of the wind. A total of 32,100 pounds of anhydrous ammonia was released. And on the left is a photo of the ammonia release on the roof. You will notice a white cloud from the ammonia leaking under the insulation that surrounded the ends of those pipes.

Here is a graphic that depicts the ammonia cloud produced by the release. Emergency responders reported to the CSB that the cloud formed on the roof and traveled down the south side of the facility and hovered near the ground as it traveled across the river.

On the day of the incident off-site contractors conducting cleanup operations for the Deep Water Horizon oil spill in the Gulf of Mexico were working at a temporary site about a
quarter of a mile to the south of Millard. Over
800 contractors were present working outdoors or
in large tents on the other side of the canal.

This next photo depicts the cloud from
the ammonia release as it traveled across the
canal where Deep Water Horizon workers were
staged. The workers were engulfed in the toxic
cloud and immediately reported experiencing
symptoms of ammonia exposure. The contractors
were instructed to go into their cars and
evacuate the facility.

Of those 800 off-site contract
workers, as well as crew members on the ships
that were docked at Millard, 152 reported ammonia
exposure symptoms. Thirty-two of those one
hundred and fifty-two were hospitalized and four
were placed in intensive care.

The Mobile Fire Department and
emergency medical services that responded to the
incident set up a triage near the Deep Water
Horizon cleanup site where many were evaluated,
treated and released and evacuated from the area.
Some were transported to the hospital.

In response to the number of off-site exposures, the Center for Disease Control's Agency for Toxic Substances and Diseases Registry, or ATSDR, conducted an exposure survey in Theodore following the incident. According to the CDC and ATSDR, common symptoms reported were headache, shortness of breath and coughing. Other symptoms included eye irritation, nausea, chest pain and dizziness. The CSB followed up with the Mobile County Health Department following the release and confirmed that there were no documented long-term effects of ammonia exposure from those who experienced symptoms following the incident.

One Millard employee working in the crane was overcome with ammonia from the rooftop release while he was loading the ships docked at Millard. He attempted to escape, reports briefly losing consciousness and falling several feet injuring his leg. In addition to his leg injury he reported symptoms consistent with ammonia
exposure. Another Millard employee who responded to the ammonia release by closing valves on the roof was treated for heat exhaustion and released from the hospital. In addition to the injuries, the Mobile County Emergency Management Agency ordered a shelter-in-place for the nearby community for several hours following the release.

Eight million pounds of product stored at Millard were contaminated and destroyed as a result of the release inside the warehouse blast freezer.

The Coast Guard also temporarily halted water traffic in the industrial canal until the release was contained.

The ammonia release was caused by a hydraulic shock event when the defrost cycle was interrupted on a group of evaporators. This resulted in a rupture of two pieces of ammonia-containing equipment associated with those evaporators. Here are two photos showing the cracked weld in an evaporator piping manifold
that was located inside the blast freezer.

This slide shows photos of the cracked suction header on the roof. This 12-inch-diameter pipe is associated with the evaporator equipment and the blast freezer. The force of the impact generated by the propelled liquid ammonia in the hydraulic shock event cracked the end of the suction line. The crack went through the circumferential weld on the end of the pipe.

On the bottom left is a photo of the fracture surface in this three-eighths-inch-thick suction line. Right there. This photo reveals that the metal failed under brittle conditions as the pipe was operating at minus 40 degrees.

Again, here is a schematic of the defrost cycle except this time we're showing what likely happened on the day of the incident. During the hot gas cycle the liquid feed valve and suction valves were opened prematurely. Right there and here. This resulted in the cold and hot ammonia to be present in the coil and into the suction header on the downstream side of
the suction stop valve. The rapid condensation propelled the liquid through the coil and into the suction piping. The approximate locations of the failures of the evaporator coil are identified here and here.

This slide shows the progression of a hydraulic shock event inside the pipe. Here is a cross-section of an evaporator coil containing hot gas at 110 degrees Fahrenheit. When the defrost cycle was interrupted, the hot gas and minus 40-degree liquid ammonia became present in the same pipe. The hot gas rapidly condensed to a liquid upon contact with the cold minus 40-degree refrigerant. Voids of trapped gas built up pressure and rapidly condensed creating a vacuum.

The reduction in volume produced an inrush of liquid from other parts of the system. The liquid accelerated at a high velocity when it arrived at an obstruction such as the end cap on the roof and it abruptly stopped and exerted a force on the piping. The force of the impact was
strong enough to crack the weld on the evaporator piping in the blast freezer as well as the 12-inch piping on the roof ultimately resulting in the release of 32,000 pounds of ammonia.

The CSB found in their investigation of the 2010 Millard ammonia release incident that both design and operational issues led to the hydraulic shock failure at the Theodore facility. The investigation team developed lessons learned in the CSB safety bulletin released today to prevent similar hydraulic shock incidents from occurring in the industrial refrigeration industry.

CSB safety bulletins are products that focus on the immediate and technical failures of an incident and focus key lessons on the prevention of future incidents. The intended audience for these key lessons is the ammonia industry, including refrigerated warehouses, food production and storage facilities, as well as institutions that provide training and education to ammonia refrigeration system designers and
operators with the aim of preventing hydraulic incidents from occurring in ammonia-containing equipment.

The CSB will be releasing a safety video about the Millard incident and hydraulic shock. The video will be available on our Web site, www.csb.gov, later this month.

And now Attorney/Investigator Beeta Lashkari will come to the podium to present the CSB's lessons learned from the Millard investigation. Thank you.

INVESTIGATOR LASHKARI: Thank you, Ms. Tyler.

Lessons learned. Refrigeration system design. 1) For the design of ammonia refrigeration systems avoid grouping multiple evaporators to a single set of control valves. This is especially important for large-capacity evaporators in excess of 20 tons. Evaporators with hot gas defrost systems should be controlled by individual valve control groups dedicated to each evaporator coil.
Refrigeration system operation. 2)
Program or configure defrost control systems with interlocks to ensure the low-temperature liquid feed and hot gas remain isolated during the initiation and termination of the hot gas defrost cycle in the event of a power outage, cycle interruption or other abnormal situation.
Program the defrost control sequence to automatically depressurize or bleed the coils and defrost upon restart after an outage or interruption prior to opening the suction stop valve to set the evaporator into cooling mode.

3) Avoid the manual interruption of evaporators in defrost and ensure systems are equipped with password protection to ensure only trained and authorized personnel have the authority to manually override system processes.

4) For time-initiated hot gas defrost systems ensure pump-out times are long enough to remove a sufficient amount of residual liquid refrigerant in the evaporator coils prior to introducing hot gas especially after low load
periods or power outage.

Responding to an ammonia release. 5)

In the event of an ammonia release that cannot be promptly isolated activate the emergency shutdown switch to de-energize pumps, compressors and valves instead of attempting to isolate leaking equipment while the refrigeration system is running. Shutting down the equipment will stop the circulation of ammonia and limit the release of additional ammonia from components running upstream of failed equipment or piping.

I now invite questions from the Board.

CHAIRPERSON MOURE-ERASO: Thank you very much. I now will invite my fellow Board members to ask questions to the investigation team concerning this Millard investigation. Mr. Ehrlich?

MEMBER EHRLICH: Yes, I have several questions and they're all focused kind of around the emergency response arena here. Was there any indication at all that pre-emergency planning had been done with the local first responders as part
of a HAZWOPER plan or an emergency planning session?

INVESTIGATOR BANKS: We don't have any documentation of such, but it affords the opportunity to address that and speak to the need to have an adequate pre-incident planning scheme so that the responding fire departments and emergency responders are on the same page. We've encountered several instances in other incidents where responders may be operating under the National Incident Management System, or NIMS, process and communications may not be clear and such. We have some indication that there was some issues with the volunteer fire department response in concert with the Mobile Fire Department, but I would imagine that those issues have been resolved since then.

MEMBER EHRLICH: Did they have and emergency response plan filed under the 1910.120 or an evacuation plan filed under 1910.38 OSHA standard, do you know?

INVESTIGATOR BANKS: No, we don't.
MEMBER EHRLICH: Okay. You mentioned the fact that there were audible or visual alarms inside of the building to indicate an ammonia release. Were any of those alarms set up so that there was visual or audible indications outside of the building?

INVESTIGATOR TYLER: No, there weren't. That was one of the things that we looked for early in the investigation, but we learned that all of the ammonia sensors and alarms were located inside the facility. So there was no indication for workers outside if there was an ammonia release unless they heard it coming from the inside of the facility.

MEMBER EHRLICH: Had any training been given to the employees of the ship crew or the ship members relative to the potential hazards?

INVESTIGATOR TYLER: I'm unaware of the training that they had related to ammonia hazards, but I do know shortly after the release occurred that one of the ship crew members was very concerned about a possible deflagration or
an ignition from the ammonia vapors that were escaping from the roof. So he worked with the Mobile Fire Department to get the engines on the ship shut down.

MEMBER EHRlich: And did the people inside of the plant -- do you know if they had any training under respiratory standards or any other general HAZWOPER standard?

INVESTIGATOR TYLER: We know that at least one employee that responded to the ammonia release was HAZWOPER trained, but we also learned in our investigation that there were other employees that responded to the release that had not had their training under HAZWOPER and they were -- they received a citation from OSHA for that.

MEMBER EHRlich: Yes. Just as a point of information, there is a company here in New Jersey who put in an ammonia refrigeration system for frozen food manufacturing and they evaluated a number of inherently safer technologies when they put this system in, and they got the okay
from the state DEP to go ahead and use ammonia.
And they have a fail-safe system where if there's
any problem at all in the system, all of the
ammonia drains back to basically a gas-tight
room. And the off-site consequences of an
ammonia release were reported at zero parts per
million.

If you want information on that, you
can contact the New Jersey DEP, John Notta, and
he'll be able to assist you with that
information. Thank you.

CHAIRPERSON MOURE-ERASO: Any other
questions? Mr. Griffon?

MEMBER GRIFFON: Yes, just a couple,
two questions, but each of them have four or five
parts.

First, can you tell me a little more
about the points of failure with the system,
specifically did the piping and components meet
required design specifications? Were they used
beyond their design life? Were they properly
maintained and inspected?
INVESTIGATOR TYLER: Yes, sure, I can answer that. The team conducted a visual examination of the pipe that failed on the roof of the Millard facility. We reviewed the manufacturing records as well as the pressure test records from the piping supplier. We learned that the pipe was ASTM A106 grade B pipe, which is one of the pipes that is recommended for this type of service. The pipe was about four or five years old at the time of the incident and did not possess any visual signs of corrosion, stress corrosion, cracking or any type of metallurgical defect.

MEMBER GRIFFON: And maintenance and inspection records, did you have a sense that they were meeting the inspection timing, or were there required inspection intervals and were they doing those inspections?

INVESTIGATOR TYLER: Millard did have a preventive maintenance program, but I don't recall the frequency of their visual inspections on that pipe.
MEMBER GRIFFON: Okay. Second question is how was the decision made? You speak about this decision to stop the leak rather than initiating an emergency shutdown, and I'm curious how the decision was made, and was loss of product a factor in making this decision? I know they were just coming back from a power outage for several hours, I believe, and food was probably thawing out. And also was there a procedure in place for this and were they following their procedure?

INVESTIGATOR TYLER: So to answer the first portion of your question, I think that product loss was definitely a concern for Millard employees and management on that day. Having a seven-hour power outage in Alabama in August, I think that they were concerned about their product starting to thaw. So when they had this second release, I think that there was an attempt to try to isolate it at the source instead of shutting down the entire system.

Their emergency plan for responding to
an ammonia release does state to attempt to
locate and isolate the release, but with the
particular system that was the location of the
release on that day it was almost impossible for
them to isolate the release on the roof because
other pieces of ammonia-containing equipment
continued to feed into that pipe. So in that
particular incident shutting down the entire
system would have decreased the duration and
quantity of that release.

MEMBER GRIFFON: And how did they
ultimately, or who ultimately made the call for
going to an emergency protocol, an emergency
shutdown protocol?

INVESTIGATOR TYLER: I'm not quite
sure who that was. I know that the plant manager
as well as the refrigeration operator or plant
ingenner were involved in that decision. And I'd
also just want to add that one of the things that
Millard had identified in their investigation
report that the emergency stop button should have
been activated to -- would have been the proper
MEMBER GRIFFON: Thank you.

CHAIRPERSON MOURE-ERASO: Thank you.

I have a couple of questions, too. But before I would like to recognize that among the audience here joining us is Mr. Rick Engler. He is in the audience. He was recently confirmed by the Senate for the position of a Board member and he will be taking his place on the CSB Board in February. I truly look forward to working with you in the future, Rick.

I have a couple of questions. Mr. Ehrlich mentioned that, like in every other state, there is an active food refrigeration industry in New Jersey. And I wonder if any of you can discuss the prevalence of ammonia incidents in the food industry, or of any other industries, and if you can give us an idea of how widespread is the problems with escapes of ammonia and problems with ammonia in the nation.

INVESTIGATOR LASHKARI: I'd be happy to answer that question for you. The CSB tracks
ammonia incidents of high consequence, high
consequence being those that report a result in
injury or a fatality, evacuation or shelter-in-
place of 500 residents or acute environmental
impact or economic impact of over $500,000 and
found that the total number of high consequence
incidents in all industries is 276 from the time
span of 2005 to 2014. And that accounts for 11
percent of all CSB-screened incidents.

    In terms of industry type 15 reported
from refrigerated warehousing, 111 from food
manufacturing and 19 from food distribution.
Fifty-two percent of ammonia release incidents in
CSB incident screening data are from industries
like Millard that store, manufacture and
distribute refrigerated foods.

    CHAIRPERSON MOURE-ERASO: Thank you
very much. I have another question. The CSB has
various options in conducting these
investigations. Some of the options include full
investigations that include recommendations to
different stakeholders, specifically regulatory
agencies in the federal and state level. In this case the choice was made to conduct an investigation to produce a safety bulletin that is designed not to make specific recommendations to either OSHA or EPA, but rather it takes lessons learned to the refrigeration food industry. It takes what you call a lessons learned approach. Why was this option taken?

INVESTIGATOR BANKS: Well, the entity that was Millard Refrigerated Services doesn't exist anymore. They don't do cold storage. They ship and store and move other commodities, but they don't do cold storage. There would be no recipient for recommendations which are a typical offshoot of our investigative reports and case studies.

We felt that the circumstances for this case lent themselves to a fairly comprehensive study of the hydraulic shock phenomenon and that there were lessons learned that were applicable to a wide array of food processing and refrigeration services that
typically use ammonia in their processes. So both factors were the main drivers for the decision to create a bulletin and the lessons learned that we have crafted for this product we feel there's a significant audience out there that can draw and learn from this to prevent recurrence.

CHAIRPERSON MOURE-ERASO: Thank you very much. Also, it is my understanding that the use of ammonia and the ammonia industry is highly regulated. There are a number of regulations that specifically address ammonia, and also of course they are included on the PSM standard of OSHA and the RMP standard of EPA. So will you consider it's a high-regulated type of industry, or there is a lot of law reading around how to handle ammonia correctly?

INVESTIGATOR TYLER: Yes, through our investigation we looked at PSM and RMP. The Millard facility was covered under process safety management as well as the risk management plan. It's a highly-regulated chemical. And, yes, there's a lot of literature available on the
hazards of ammonia, but what we thought would be most useful for the ammonia refrigeration industry; that includes anyone that handles in ammonia in cold storage or any other type of industrial operation, is the mechanism of hydraulic shock. And that was why we focused this bulletin on key lessons for the prevention of that phenomenon.

CHAIRPERSON MOURE-ERASO: Thank you.

Yes, I remember they handling of anhydrous ammonia and the production of anhydrous ammonia is one of the kind of building blocks in the teaching of chemical engineering. I mean, every chemical engineer that is here will know that in Chemical Engineering 101 is where you study the ammonia industry and how it functions. And so, not a lot about safety, but the ammonia industry is very well known. It's a very old industry. I think it's considered like the type of industry that defined chemical engineering. So it's a whole system of -- so thank you very much.

For anybody that follows the program
here, we just have finished the Board questions
to the investigators and we are moving into the
public comment. I would like for the public
comment to ask the managing director of the
Chemical Safety Board, Dr. Daniel Horowitz, to
preside the public comments.

So, Daniel, please?

DR. HOROWITZ: Thank you, Mr. Chairman.

The first commenter is Mr. Orville Morales (phonetic) representing Congressman Pascrell.

MR. MORALES: Good evening, ladies and gentlemen. Good evening, members of the Board. I am Orville Morales representing Congressman Bill Pascrell of the 9th Congressional District. Unfortunately he couldn't be here tonight, but he wanted to make sure that his thoughts were heard on this particular matter.

So on behalf of Congressman Pascrell, thank you to the Chemical Safety Board for coming to Bergen County and holding this public hearing
tonight and for your report on the explosion that occurred at US Ink in 2012. Our hearts go out to the employees who were injured and their families.

The events two years ago shed important light on the need for safety standards for combustible dust. These standards are long overdue. We know that the CSB has been pushing for these standards for almost a decade. The reality is without these standards our workers are simply not safe. We want the public and the Board to please be assured that Congressman Pascrell will work to push OSHA to establish meaningful standards for combustible dust which will go a long way in preventing a tragedy like this from happening again. Thank you.

CHAIRPERSON MOURE-ERASO: Thank you very much, Mr. Morales.

DR. HOROWITZ: Thank you. Next up is John Morawetz. And, John, if you don't mind to spell your name for the court reporter. Thank you.
MR. MORAWETZ: Sure. It's Morawetz, M-O-R-A-W-E-T-Z. Thank you again for doing the investigative work that the CSB, the Board and the staff do. When I talk about to people I work with and the members of about nine different unions that we train, we always point to the CSB reports as excellent reports for two primary reasons: One, the root cause analysis to what happen where many other agencies have other missions and other investigations they do and are limited by. And I think it's a real strength of the Board and the reports and the staff that they really get into how everything happened.

Number two is the recommendations, which in general I understand is the safety bulletin. But in general the recommendations are often far-reaching, as the staff have said, not just for one company, which right now at this facility they don't do refrigeration, but Millard is a very large company that has I think over 30 refrigeration warehouses. So those lessons can be spread.
I am here also in particular -- I'm part of the Chemical Worker Council of the United Food and Commercial Workers Union. And I was requested by the health and safety staff of the UFCW to come to the meeting because we have a great interest in ammonia. It's used in many of our facilities as documented by some investigators: meat, poultry processing facilities and refrigerated warehouses. And I hope that there will be further work by the Chemical Safety Board on ammonia. It's a very large volume chemical. There are a lot of releases as documented and they need further investigation with full recommendations.

I would hope also that, as I've said before, there could be adequate time to look at the reports. I got this electronically this afternoon as it was released in a press release in a link, but I think for helpful back and forth comments from the public and various professionals and organizations I would hope there was a method, which I leave to the CSB to
decide how to do that, where there could be time
for back and forth.

Limited in time, I would concentrate
on a few issues that I think that are touched
upon in terms of the lessons learned, which slide
No. 3 talked about operational issues. Operation
issues that I don't think were included are are
there adequate staffing levels? Were people
adequately trained? I think some of the Board
members mentioned that. There are a number of
applicable OSHA standards. It's not just
narrowly what happened, how was the response?
There are many factors go on.

Three years ago UFCW and Cargill did
a meeting of 10 different facilities about
ammonia and they identified that as a significant
problem of lean staffing, of non-trained workers
jointly by management activities. And quite
frankly, it's disappointing that that wasn't
looked at, wasn't examined. I understand again
it's a safety bulletin, but I think it's an
important factor.
Was there inspection of the piping integrity? In this case that didn't happen, but at least that should be looked at and reported on.

And then in terms of the OSHA standards, I understand this is not a place for full regulatory analysis, but I find it strange that there's very little mention of OSHA where correctly the CSB repeatedly has asked, as they will of the next, I believe, investigation, for a combustible dust standard, that we don't also look at when standards exist how were they implemented? And this is clearly covered by process safety management. I find it troubling there's no mention of process safety management or emergency response. No mention of HAZWOPER. Again, not a regulatory analysis, but there could at least be a list of what are the applicable standards that would have applied?

And lastly, I'd just say again to repeat, this is a safety bulletin. I would hope that there could be a meeting convened or an
investigation; I'm not sure of the mechanism, by
the CSB with labor and management to sit down and
talk about the uses of ammonia and to find out
how we can handle it better. Thank you very
much.

DR. HOROWITZ: Thank you. Mark
McDonald (phonetic)?

MR. McDONALD: Good evening. United
Steel Workers District 4 and the United Steel
Workers Health Safety and Environmental
Department would first like to thank the Chemical
Safety Board for their extensive and thorough
investigation striving to find the root causes
for these horrific accidents. We would also like
to thank the CSB for their dedication to
protecting workers and surrounding communities
from the hazards during these investigations and
their diligence in recommending and campaigning
for safer policies, procedures and laws to
prevent these tragedies from happening again.

Our long-time history of working with
the CSB has developed recommendations and later
laws that have prevented further tragedies from occurring. Our work is not done. We still have to push to keep laws and policies intact in order to keep our workers and communities safe.

New Jersey is not like the rest of the country. Our land use and risk factors justify more stringent state regulations. More stringent state regulations is authorized by most if not virtually all federal environmental laws, and New Jersey has led the country in that regard.

New Jersey's Toxic Catastrophic Prevention Act, TCPA Program, was the model for the federal program established under Section 112(r) of the Clean Air Act. Industries would obviously prefer backing off of the EP -- and using EPA thresholds. However, the increases made by the EPA on adoptions were so large, averaging some 18 times the CPA values, with 33 of the 60 substances common to both lists assigned from 5 to 167 times corresponding TCPA values, but they are not technically justified in an area as densely populated as New Jersey where
substances are generally handled on a small site and would correlate with a significant increase in the number of potential fatalities.

In New Jersey TCPA threshold quantity for anhydrous ammonia is 5,200 pounds. This lower threshold is justified by risk as a function of the New Jersey population density and proximity to chemical use. In contrast, the federal thresholds quantity is almost twice New Jersey's at 10,000 pounds. That means more facilities are regulated under the New Jersey program and that more people are protected from catastrophic release of a highly toxic chemical.

In addition to a lower threshold of the regulations the TCPA Program provides additional regulatory and oversight safeguards and far more compliance monitoring and enforcement resources per facility than the federal programs which include but are not limited to mandatory inspections versus discriminatory three-year federal inspections.

Risk considerations. The industry
testimony failed to mention the most critical issues, the risk of workers and nearby communities that could be exposed to the catastrophic release of an accident. TCPA and federal regulations require a facility to model the risks of such an event. To understand the natural and magnitude of these risks legislators need to ask the industries to present their consequence analysis on New Jersey's TCPA regulations.

Status of TCPA regulations. Contrary to the industry testimony that suggested that the New Jersey TCPA regulations were outdated and not informed for by more recent improvements of the federal programs, please be advised that the current New Jersey DEP TCPA regulations were readopted with amendments on March 16th of 2009. The TCPA rules were scheduled to expire in 2014, but were extended two years as a result of recent legislation that extended the sunset date for rules from five to seven years.

The TCPA is now under attack by two
bills, S-2511 and A-3881, that would weaken New
Jersey's Toxic Catastrophic Prevention Act. The
bill removes anhydrous ammonia used by
refrigeration as substances regulated by TCPA.
It is our understanding that anhydrous ammonia
refrigerant issues were specifically considered
by DEP in the 2009 readoption process and that
the DEP expressly reviewed and rejected the
industry's request to weaken New Jersey's
requirements.

According to the DEP TCPA regulations
the basis for regulating anhydrous ammonia is
twofold: Mandated by -- listed by Congress
ammonia is an extraordinarily hazardous
substance, and EHS lists vapors pressure 10
millimeters of mercury pressure according to the
Federal Agency of Toxic Substances and Disease
Registry. Risks from anhydrous ammonia include
death from inhalation, as we all know.

We ask for the CSB's continued support
on this fight to keep New Jersey's Toxic
Catastrophic Prevention Act in place and their
future support to protect workers and the
surrounding community. Thank you.

DR. HOROWITZ: Thank you, Mr. McDonald.

CHAIRPERSON MOURE-ERASO: Thank you very much.

DR. HOROWITZ: Next up is John Shin (phonetic). Mr. Shin?

MR. SHIN: Good evening. I'm John Shin. I'm the district director for the United Steel Workers in District 4. District 4 consists of nine states in the Northeastern United States, including the six New England states, New York, New Jersey, Delaware and also Puerto Rico. Also I sit on the board of the Work Environment Council in New Jersey.

I have one concern and a couple questions I'd like to ask. First one, my concern is the Steel Workers Union is very disappointed in the Chemical Safety Board's short notice of this public meeting. We would ask that longer notice be given in the future to give all the
stakeholders an opportunity to participate in these meetings.

Secondly, I have a question for the Chairman. The question would be: Why has the Chemical Safety Board lost its ability to provide Web casts of Chemical Safety Board public meetings? A lot of USW locals used to participate in the Web casts and we would be ask that they be re-instituted.

No. 3, third question: The Board announced this week in its next public meeting -- the next public meeting for later in January at the Chevron, Richmond, California case. This is a USW-represented facility. We're disappointed that the Chemical Safety Board decided to have this meeting just a couple weeks before the fourth Board member would be sworn in and would be able to participate in the meeting. We would ask the Board to reconsider holding this meeting after the fourth Board member is sworn in so they can also participate in this meeting. Thank you for your time.
DR. HOROWITZ: Thank you, Mr. Shin.
And to clarify one point that you did raise, we
do Web cast our meetings on occasion, and if
there's interest, we'll certainly look at
expanding that program. Thank you for your
comment.

Next up is Peter Levitt (phonetic).

Mr Levitt?

MR. LEVITT: Sorry, I wrote my name
down, but --

(Simultaneous speaking)

DR. HOROWITZ: Okay. It does happen.

Is there anybody who didn't sign up who'd like to
comment on this case?

(No audible response)

CHAIRPERSON MOURE-ERASO: Thank you

very much, Dr. Horowitz. So we move to the Board

vote on the safety bulletin. I pass the gavel.
I pass the meeting to my general counsel to

conduct the vote. I will start by -- as a Board

member I make the following motion: I move that

the Chemical Safety Board approve Safety Bulletin

PARTICIPANT: I second the motion, first of all.

CHAIRPERSON MOURE-ERASO: Okay.

PARTICIPANT: I'll second the motion and then I guess we can move to discussion.

CHAIRPERSON MOURE-ERASO: Yes.

PARTICIPANT: I just have one comment. I do second the motion and I support the motion. I do want to point out again; and I think Beeta went through the numbers for us, which is very good, there's been a lot of ammonia incidents and I think in the future I would hope that the Board will look at a study or a forum to discuss the broader national problems of ammonia and look at some of the other potential recommendations in
that area. That's the only comment I have.

CHAIRPERSON MOURE-ERASO: Anything more for discussion of the Board members?

(No audible response)

CHAIRPERSON MOURE-ERASO: Okay.

Hearing no more discussion, I will call the question. General counsel Mr. Loeb will record the vote.

MR. LOEB: The motion is on the question whether we adopt the report, and why don't we just take it left to right? Mr. Griffon?

MEMBER GRIFFON: I support and vote yes.

MR. LOEB: Mr. Ehrlich?

MEMBER EHRLICH: I vote yes.

MR. LOEB: Mr. Chairman?

CHAIRPERSON MOURE-ERASO: I vote yes.

MR. LOEB: The motion is adopted.

CHAIRPERSON MOURE-ERASO: Thank you very much. As a closing remark before we take a break, I would like to say that we choose this
very specific approach of use lessons learned
aimed to alert the food refrigeration industry of
events that could trigger hydraulic shock, and
this is an event of a magnitude enough to cause
enormous escapes of anhydrous ammonia that as you
well know could be lethal for workers and for
communities.

This knowledge about hydraulic shock
is not widespread in the industrial refrigeration
industry and facilities and requires explicit
analysis and examination or how to be prevented.
I think that's what the safety bulletin does.

The message to the food and
refrigeration industry in New Jersey, in Alabama
and in all other states in the United States is
that hydraulic shock should be prevented and we
believe that our safety bulletin is a
contribution to that effect.

I think we finish the first part of
our meeting and I would like for a 15-minutes
break. After that we will reconvene to have the
second part of our meeting on US Ink case study.
So I declare a recess of 15 minutes.

(Whereupon, the above entitled matter went off the record briefly.)

CHAIRPERSON MOURE-ERASO: Okay. We reconvene the CSB public meeting.

First of all, before proceeding to the US Ink case I would like to recognize Mr. Krzystof Jaje, Mr. Stanley Pernesky, and Mr. John Castro. They are all three workers for US Ink that are with us here at this meeting.

So welcome. Thank you for being here with us.

And we move to the next point of the agenda. That is the US Ink presentation. I would like to call again to Mr. Banks to begin the presentation. And I will appreciate it if Mr. Banks will introduce the members of his team.

So, Mr. Banks?

INVESTIGATOR BANKS: Good evening. The next portion of the presentation tonight, the US Ink investigation team is prepared to present findings from our investigation of an ink dust
explosion and flash fires which occurred at the
US Ink manufacturing facility in East Rutherford,
New Jersey.

This incident occurred on Tuesday,
October 9th, 2012 and resulted in seven workers
suffering serious burn injuries when they
congregated at the entrance of the ink mixing
room after hearing a loud thump from the newly-
installed dust collection system on top of the
facility and seeing signs of an initial flash
fire from a bag dump station.

Before I start I'd like to take the
opportunity to provide an overview of the agenda
for this portion of our proceedings. Again,
proceeding with the team's presentation of
investigation findings. The team will entertain
questions from our Board. The public will be
invited to offer comments. The Board members
will vote on the team's proposed findings and
recommendations. And finally, we'll have a
closing statement from our Chair.

I'd like to take this opportunity to
introduce the team that investigated and participated throughout this investigation, some of whom are here, some that are not. There were many contributors to the work on this investigation and some that deployed on the initial deployment immediately after the incident. The core team consists of myself, Johnnie Banks, the supervisory investigator; Mr. Michael Corona, attorney/investigator; Ms. Rachael Gunaratnam, investigator; Maria Musakibring (phonetic), investigator; Ms. Badisha Parisrom (phonetic), investigator; Dr. Samuel Oyewole, investigator; Ms. Reepa Shroff, investigator; and Dr. Susan Casper-Onanberg (phonetic), or deputy managing director for recommendations.

The investigation team will conduct the presentation, will discuss the company background and provide an overview of the facility and process and present the incident description and the analysis of the incident, investigation findings and introduce propose
recommendations.

Now, the US Ink company is a division of Sun Chemical Corporation that's headquartered in Carlstadt, New Jersey. The facility in East Rutherford was established in 1993 and employed 34 workers, 24 of whom were on shift on the day of the incident.

In looking at the black ink process, we'll start with a brief description of the black ink process. The US Ink East Rutherford plant manufactures both black and color oil-based ink for various commercial clients. A key step in the ink production process is mixing solid and liquid ingredients to produce liquid suspension. The mixing operation for black ink ingredients is performed in the pre-mix room where the October 9th, 2012 incident occurred.

The black ink manufacturing process at US Ink involved the pneumatic transfer of bulk solid powder under vacuum to one of three mixing tanks labeled as T-106, T-206 and T-306. Two solid ingredients; carbon black and kaolin clay
were conveyed to the mixing tanks by a vacuum through piping from a manual raw material feeding station known at US Ink as the bag dump station, or by gravity from three overhead receiver hoppers containing carbon black and kaolin.

Gilsonite, a resinous hydrocarbon, is widely used as a primary carbon black wetting agent for black news inks and heat set and gravure inks. Gilsonite has a National Fire Protection Association, or NFPA, flammability rating of one and special precautions warn that dusts are subject to explosion upon contact with sparks, open flames or temperatures in excess of 1,000 Fahrenheit, or 570 degrees centigrade.

Petroleum distillate ingredients are received at the facility by rail and are pumped into the mixing tanks. Operators manage the ingredient mixing from the control room adjacent to the pre-mix room. Petroleum distillate used in the process is flammable so they can be considered as possible contributors to the formation of explosive atmospheres on the day of
the incident.

Here's the simplified plan view of the pre-mix room containing three large mixing tanks in which the various ink formulations were made. And if you look here, you'll see that the tanks were denoted T-106, T-206, T-306 right there. The room itself was about 30 feet by 17 feet deep. There was a control room immediately adjacent to the pre-mix room. The bag dump station was located here in the middle of the rolling service door and there was a man door that was located here that provided access to a stairway that accessed the mezzanine elevated stairway for access to the tanks themselves.

There was a corridor that ran directly in front of the pre-mix room and the exposed depression control panel and dust collector control panel were located across from this area. There was a man door that allowed access into the pre-mix room as well.

All three mixing tanks in the area are 5 feet in diameter and 10 feet high. An
automatic sprinkler system was installed as a fire protection feature in the pre-mix room. The sprinkler system was connected to an automatic audible alarm. Once the sprinkler system is activated, an automatic signal is relayed by an external central monitoring station to the local fire department for immediate response.

Now the bag dump station was positioned, as I said, in the doorway of the pre-mix room and an overhead roll-up service door was installed for access in the pre-mix room. At the time of the incident the CSB found that the roll-up service door had been chained in a fixed rolled up position to provide easier entry into the room. Witness accounts from the plant employees and contractors indicated that Gilsonite dust generated from the bag dumping operation often accumulated around the facility, but particularly on flat surfaces. US Ink did not provide effective means of containing fugitive dust at the bag dumping station since empty bags were often stacked alongside the bag
dump which in turn lofted the dust into the atmosphere.

Before the October 2012 incident a wet scrubber system was used to collect particulate materials during the dry material charging stages of the ink mixing process. The scrubbing system deteriorated over the years. In addition the wet scrubber system did not prevent the release of fugitive dust into the pre-mix room when new ink formulations used high-powder clay content producing higher levels of particulate emissions. The new dust collection system was installed to improve the management of particulate material and provide an overall improvement to the operating conditions of the black ink production process.

A US Ink lead engineer worked in collaboration with the manufacture of the dust collection system to design the new dust collecting process. The engineer retired before the dust collection system was installed and commissioned. When he left the knowledge of and
the rationale for the dust collector went with him.

Here we have a view of the dust collection system, an overview. And as before, we can see that the bag dump station was located here. There was duct work that went to -- allowed access for the material into the pre-mix tanks 106, 206 and 306. And there were various sized ducts that made their way to the dust collector, which was mounted on the roof.

The dust collection system illustrated here consisted of a system of various sized ducts including flexible connectors attached to the top of each mixing tank and the bag dump station. Dust particles were suctioned into the dust collector, which was located in the roof of the facility. The roof-mounted dust collector used a cartridge system to remove the residual particulate dust. Dust-laden air and vapor from the mixing tanks entered the collector from the cartridges and was drawn over the filters where the dust was removed from the airstream.
A 25-horsepower fan was designed to convey the dust up to the collector at a volume rate of 3,300 cubic feet per minute. Compressed air was used to periodically pulse the filter cartridge and dislodge the filter dust into a hopper of the dust collection system.

The collected dust was recycled back to the ink making process via a 10-inch-diameter pipe back to the top of T-106. A rotary air lock on the hopper controlled the discharge of the recycled fugitive dust via gravity from the collector back into the mixing tank T-106 for reprocessing in the pre-mix room.

Now, the dust collector was equipped with an explosion suppression system. If a rapid pressure increase was detected, sodium bicarbonate would be released into the dust collector. The explosion suppression system would actuate and inject sodium bicarbonate via an independent suppression container and chemical isolation container located at two injection points in the system, the dust collector hopper.
and the inlet riser.

US Ink considered an explosion vent panel system, but opted not to. The decision was based on the reduced cost of installation and external recommendations to avoid any potential environmental release of combustible dust particulates or fire into areas near residential homes.

The explosion suppression system would actuate and inject sodium bicarbonate via an independent suppression container and chemical isolation container located at the two injection points that I mentioned earlier. In this depiction here we can see the explosion suppression container was located directly into the hopper and the nozzle was directed into the hopper and actuated when the incident occurred. Here we have a view of the chemical isolation dispersing right there on the inlet stream to the dust collector.

US Ink/Sun Corporation provided the information for the manufacture of the explosion
suppression and isolation system including
specification of the raw materials utilized in
the black ink pre-mix process, flash points of
oils and the normalized rate of pressurized or
Kst values for solid ingredients.

The new dust collection system for the
pre-mix room was commissioned for service on the
morning of Friday, October 5th, 2012, and then
operated until the end of the production shift at
3:00 p.m. At commissioning US Ink employees
would operate the system. Several black ink
production supervisors and one of the day shift
operators received a 15-minute operational
training and instruction as well as a walk-
through of the explosion suppression and
isolation system.

The dust collection was designed to
start automatically when any of the mixing tank
modules were engaged and to automatically shut
off after a specified delay when all mixers were
shut off. However, the dust collection system
continued to run overnight even when all the ink
mixers were shut off.

On Saturday, October 6th, 2012 the plant maintenance employees used housekeeping connections on the dust collection system to vacuum dust and debris into the pre-mix room. At the end of housekeeping activities the dust collection system was manually shut down by a maintenance employee. The mixing tanks and the dust collection system were restarted on the Monday night shift, October 8th, 2012, in preparation for production runs scheduled for Tuesday, October 9th, 2012.

On Tuesday morning, October 9th, 2012, black ink production continued. The batch in T-306 was completed and the pre-mix room operator emptied the tank. At about 1:00 p.m. the pre-mix room operator was loading Gilsonite into the bag dump station when he heard a strange noise from T-206. Because of the odd noise the operator went to the control room to check the mixing tank temperature and speed to confirm that the equipment was working properly. As he left the
control room, he saw a flash fire originating
from the bag dump station where he had just been
working. The employee immediately proceeded in
the opposite direction to the pre-mix room to his
supervisor's office to alert him of the fire.

At about the same time other workers
heard a loud thump that shook the building. In
response to the flash from the bag dump station
and the subsequent loud thump, workers
congregated at the entrance of the pre-mix room.
Employees stated that the rubberized spiral-wound
duct tape duct hose material that connected T-306
to the dust collection riser appeared to be
melting and dripping onto the tank.

And here we have a view of the pre-mix
room again. And you'll note that the operator,
when he heard the noise, it was emanating from
this T-206. He went into this control room to
check his readings, and as he came out of this
door observed a flash from this bag dump station.
And at that point he proceeded to notify his
supervisor of the event.
Another employee who approached the pre-mix area noticed the lights on the alarm panel were red indicating that a pressure rise had been detected and that the system had activated. The employee alerted other workers in the area that the explosion suppression had activated and there was a fire.

In addition to the initial fireball from T-306 witnesses observed a thick black cloud venting into the corridor just ahead of the fireball and reported an audible "whoosh." These observations are consistent with the sights and sounds of a combustible dust deflagration. A deflagration is the propagation of a flame through a fuel air mixture at a speed below the speed of sound. It could be either a flash fire or an explosion depending on the level and consequences of the pressure generated during the flame propagation.

Observation by CSB investigators of the ceiling of the US Ink East Rutherford facility shortly after the incident indicated
that the outward L-shaped path of the fireball along the corridor near the pre-mix room.

The large flash fire and heated dust mixtures that originated from above T-306 and propagated into the corridor from the entrance of the pre-mix room caused all employee burn injuries. The injured employees had clothing covered in black dust and they experienced burns to exposed skin. Some burns resulted after the clothing ignited from the fireball. The injuries consisted mostly of burns to the upper torso, arms, necks and heads. Other employees helped the injured employees out of the plant and emergency responders transported the injured to hospitals. One of the injured employees was wearing a short-sleeved T-shirt that day and sustained third-degree burns on his left arm, neck and upper torso. The employees were not wearing flame-resistant clothing, or FRC.

I will now turn over the fire department and emergency response section of this presentation to Mr. Corona.
INVESTIGATOR CORONA: Thank you, Mr. Banks.

The flash fire triggered the fire sprinkler system in the pre-mix room which in turn notified the local fire department. Firefighters and other first responders arrived at the scene of the incident within three minutes of the first alarm.

After they arrived and entered the plant, members of the East Rutherford Fire Department did not see any flames in the pre-mix room because the sprinklers had extinguished any fires outside of the enclosed equipment. Although they observed no visible signs of flames after the large flash event at Tank 306, responding fire fighters reported that after checking with their heat sensors several duct work fires were detected. The fire fighters separated the affected ducts and extinguished the fires with water. The fire fighters also went up to the dust collector on the roof and opened the four covers but did not need to extinguish any
fires inside the dust collector itself.

Three distinct events occurred during this incident: First, an employee observed a flash originating from the bag dump station. The bag dump station is located right down here on this graphic. This attracted the attention of several workers in the area. At about the same time workers heard a loud thumping sound from above, later concluded to be the activation of the isolation and suppression canisters. The isolation and suppression canisters are located right here and right here.

This sound was accompanied by a pulse that shook the entire building drawing more workers from their respective work places to investigate. After about two minutes seven workers observed an approximately one-foot flame directly over tank 306. The flame was observed in this duct work right above tank 306. The flame then gained additional energy from the powdery mixture of accumulated carbon black, Gilsonite and clay in the duct work. This mixture acted as fuel and
caused the flame to flash over the assembled workers who were standing in the doorway of the pre-mix room.

The CSB investigated three possible points of origin of the fire: within the dust collector, within the duct work above tank 306 and within tank 306 itself. From the evidence obtained and examined the CSB concludes that the fire originated within the duct work of the dust collection system.

After an extensive investigation the CSB concluded that the explosion and flash fires occurred due to the self-heating and spontaneous ignition of accumulated sludge-like material and powdery dust mixture of Gilsonite, carbon black and clay in the duct work above tank 306. Several factors contributed to this ignition including the uncontrolled heating of the mixing tanks and the continuous operation of the dust collection system for several hours after commissioning.

Despite having temperature gauges and
recorders there were no temperature controls on the mixing tanks. Additionally, the ink mixing process design did not prescribe any safe temperatures. The continuous operation of the dust collection system for several hours after commissioning continued to draw condensable vapors into the duct. As a result, the dust collector drew air into the duct, enhancing combustion of the condensed vapors and combustible dust.

With the dust collection system still in operation the air within the system blew the dust mixture towards the collector while the fire burned. This caused ignition and a pressure rise in the dust collector which was already filled with a blend of Gilsonite, clay and carbon black. Although the ignition led to a dust explosion within the dust collector, the pressure rise activated the explosion suppression system. The pressurized discharge of the explosion suppression canisters caused the thumping sound employees heard below.
The sequence of events taking place in the dust collection system is illustrated by the following graph which was created using data pulled directly from the dust collector post-incident. It is important to note that the rapid rise in pressure and suppression of the explosion within the dust collector all took place in less than one-half of one second.

Right here on the graph we can see a slight increase in pressure before there's ignition inside the dust collector. Right here we can see a rapid increase in pressure which is indicative of an explosion inside the dust collector. Approximately 15 milliseconds after the explosion it is detected and the isolation and suppression canisters are activated. This activation accounts for the thumping sound heard by employees below. Approximately 30 milliseconds after the explosion is detected, it is suppressed and we can see a decline in pressure back down towards normal operating levels.
The designed maximum pressure for the
dust collector was 3.8 pounds per square inch, or
psi, but on the day of the incident the maximum
pressure rose to 4.4 psi. As you can see from
the graph, the discharge of the suppression
isolation canisters created a pressure spike.
This caused the flame front to propagate counter-
current back down the duct work. The flame
traveled towards the mixing tanks and triggered
an initial flash fire at the bag dump station and
within the rubberized ducts above tank 306 where
the second more volatile flash fire occurred.

The CSB inspected the interior of
various duct work sections and took material
samples from six different sections of duct work.
These inspections revealed large accumulations of
both burned and unburned materials. Most of the
accumulations appeared to be black sludge-like
material. The CSB collected these samples for
further chemical composition analysis and testing
to develop possible ignition scenarios.

One of the tests conducted by the CSB
was to determine how explosible and severe the
dusts where that were involved in the incident.
The Kst value of a dust is the rate of pressure
rise and is essentially a measure of
explosibility. This value is measured in bar
meter per second.

US Ink provided data regarding
chemicals in the ink making process to the
manufacturers of the explosion suppression
isolation system. This data provided by US Ink
included a Kst value of 165 bar meter per second
for Gilsonite. As you can see from this chart
the Kst values for the two Gilsonite samples
collected by the CSB were higher than the 165 Kst
value the system was designed to handle. These
tests results indicate that Gilsonite is a faster
burning dust that is more prone to deflagration
and explosion and presented a greater challenge
to the explosion protection system than it was
originally designed for.

The next portion of our presentation
will examine issues related to the engineering
design analysis of the dust collection system and
my colleague Dr. Samuel Oyewole will lead this
section of the meeting.

INVESTIGATOR OYEWOLE: Thank you very
much, Mr. Mike Corona. The CSB performed an
engineering design analysis of this incident and
believes that excessive accumulation of
combustible material in the duct work was the
causal factor responsible for this incident. The
duct work accumulation was the foil for the
primary deflagration.

Also, improper design and operation of
the new dust collection system was the major
contributing factor that led to the October 9,
2012 incident. The dust collection system
operated at low conveying velocity and low F-flow
rate. While excessive amounts of dust and
condensable vapors were pulled into the duct
work, most of the accumulated dust settled
without getting conveyed up to the dust collector
on the roof top.

The CSB identified eight major design
issues which contributed to material accumulation and low system performance.

Design Issue 1. Excessive amounts of condensable vapors and dust was pulled into the duct work. The air bleed, as you can see in these photos, were attached to each tank head space. This air bleed operated uncontrolled. As a result, it continued to pull air which led to conveying of excessive amounts of condensable vapors and dust mixture from the mixing tanks to the ducts during the operation of the dust collection system.

Design Issue 2. The CSB found that excessive amounts of dust was accumulated from the housekeeping activity. The housekeeping vacuuming activity that was done on Saturday, October 6th, 2012 did not help matters. As you can see in the middle image here, within a short time cleaning ducts were plugged just after on one housekeeping activity. The vacuuming activity contributed additional dust to the duct work, but did not have enough makeup air to
convey the picked-up dust to the dust collector on the roof top for recycling.

Design Issue 3. The CSB found that the dust collection system design was based on low conveying velocity and F-flow rates. This led to the accumulation of dust, oily sludge and condensable vapor in the ducts. The American Conference of Governmental Industrial Hygienist's "Industrial Ventilation Manual of Recommended Practices for Design" states that if solid particulates or condensable vapors have been transported through a system, a minimum velocity is required.

The American Conference of Governmental Industrial Hygienists, ACGIH, is a professional association of industrial hygienists one of whose objective is to advance worker protection by providing scientific information such as manuals, guides and recommendations on occupational and environmental health issues.

The CSB found that the engineers responsible for the design of the dust collection
system failed to ensure that the interior of the duct work was clean and free of accumulated material. The National Fire Protection Association, NFPA, produces more than 300 codes and standards intended to minimize the possibility and effects of fire and other risks.

One of such standards is the NFPA 654 standard for the prevention of fire and dust explosions from the manufacturing, processing and handling of combustible particulate solids. The 2006 edition recommends that all duct work shall be sized to provide the air volume and air velocity necessary to keep the duct interior clean and free of residual material.

The design conveying velocity of the US Ink dust collection system was 1,150 feet per minute, as you can see in the chart here. However, the American Conference of Governmental Industrial Hygienists, ACGIH, recommends the minimum dust conveying velocity of 4,500 feet per minute for average industrial dusts like the type used at US Ink. The designed dust collection
A system conveying velocity of 1,150 feet per minute was approximately 25 percent inefficiency when compared to the ACGIH recommended velocity of 4,500 feet per minute.

The fourth design flaw was the non-consideration for effective return of recycling dust into the system. The dust collector hopper, as you can see here in this picture, accumulated approximately 138 pounds of dust mixture within the first day of operation. The dust collection return line accumulated additional 184 pounds. This all combined for approximately 322 pounds of dust which was accumulated within less than two days of operation.

The dust return line design did not thoroughly consider the physical nature of chemical composition of the returning dust mixture into the ink manufacturing process. If this incident had not stopped the operation of the process, the dust collector would have been plugged within a few more days of operation.

The fifth major design issue was the
excessive accumulation of material in the duct work due to low minimum conveying velocity. The images shown above here reveal the amount of powdery dust mixtures and sludge-like material accumulation in several duct work within less than two days of operation.

Design Issue 6 was the lack of adequate system checkup at commissioning of the dust collection system. The US Ink/Sun Chemical over-relied on the outside contractors that performed all construction and installation of the new dust collector without checking on the performance efficiency of the installed system before accepting it. Upon accepting the dust collection system US Ink did not perform any on-site risk and hazard assessment or testing for effectiveness before starting up the new dust collection system to determine the effectiveness of performance of the newly installed system.

Best practices required that initial system testing be conducted to verify the system meets the target performance parameters. For
example, the National Fire Protection Association standards, NFPA-91 standard for exhaust systems for air conveying of vapors, gases, mists and non-combustible particulate solids, the 2010 edition, and NFPA-654 standard for the prevention of fire and dust explosions from the manufacturing, processing and handling of combustible particulate solids, 2006 edition, both recommend this type of initial system testing. However, this was not the case at US Ink.

Section 10.3.1 of the Annex of the National Fire Protection Association Standard NFPA-91 specifies this recommendation that when installing a new system has been completed, the system shall be tested to demonstrate performance before acceptance by the user. The Annex paragraph 8.10.3 provides a list of required system tests including the following:

Measurement of the air volume; determination of pressure drops across all components; recording of the test data and design specifications; and
finally, comparing the obtained test data with
design specifications to determine whether system
alterations or adjustments are necessary to meet
specifications. The CSB found that none of the
recommended system tests items specified by NFPA-
91 as indicated above was performed by US Ink.

The seventh major design issue was the
lack of system controlling parameters for
operators to monitor performance and detect
system degradation. The CSB found that although
the US Ink dust collection system had some remote
indicators of system performance, there were no
information available on any of the pressure
gauges or other pressure devices near the mixing
tanks or at the bag dump station to warn the
operators of any performance problem. For
example, there was no way the operator would know
if there was any accumulation of material in the
duct work.

The last major design issue, No. 8,
the CSB found that inefficient ineffective system
fire protection was responsible for the incident
that occurred on October 9, 2012. Some chemical
design engineers offered ineffective fire
protection for the dust collection system. The
newly installed dust collection system was not
designed to prevent or extinguish fires. Several
aspects of the dust collection system designed
showed limited concentration for the likely event
of a fire incident even though combustible
materials were being transported within the dust
collection system.

For example, the US Ink mixing tanks
were equipped with flexible hoses of lengths 6 to
8 feet within the duct work and about 8 to 10
feet along the back of the bag dump station.
Recommended best practice suggests using flexible
hoses only to aid mobility of moving parts or
equipment and making length as short as possible,
usually not more than three feet. US Ink
employee testimonies revealed that the rubberized
flexible hoses were the first part of the system
to fail when the duct fire started.

Although the explosion suppression and
chemical isolation system attached to the dust collector stopped an explosion, it was not designed to extinguish fires. Best practices recommends the inclusion of automatic fire extinguishing systems such as internal sprinklers in the duct work of dust collection systems.

CSB inspection of the ducts after the incident revealed that larger ducts with cross-sections of more than 75 square inches, about 9 inches in diameter, did not have an automatic fire extinguishing system.

CSB investigations revealed that US Ink engineers and third party loss prevention and risk management consultants hired by US Ink/Sun Chemical considered the inclusion of internal sprinkler protection and explosion venting within the dust collector, but ultimately decided against the inclusion of sprinklers due to the installation of the explosion suppression and chemical isolation system, as well as due to cost effectiveness purposes.

The National Fire Protection
Association Standard NFPA-91, the standard for exhaust systems for air conveying of vapors, gases, mists and non-combustible particulate solids, the 2010 edition, specifies the provision of an automatic extinguishing system for portions of duct work that are greater than or equal to 75 square inches. Incorporating sprinklers or some other extinguishing systems into the larger duct might have helped minimize or prevent the occurrence of the flash fires on the day of the incident.

US Ink focused its attention on protecting just the dust collector at the roof top with the explosion suppression and isolation system. US Ink did not make additional effort to protect or isolate other components of the dust collection system and the equipments used in the black ink manufacturing process such as the three mixing tanks, the various sections of the ducts and the bag dump station. This protection might have likely prevented the flash fires and most likely the employee injuries that resulted as a
result of the flash fires. If the explosion
suppression and chemical isolation system had
failed to stop the explosion in the dust
collector like it did on the day of the incident,
this incident will have been more severe.

At this point I'd like to turn over
the system management analysis section of this
presentation to my colleague Ms. Reepa Shroff.
Thank you.

INVESTIGATOR SHROFF: Thank you, Dr. Oyewole.

This section discusses the analysis of
US Ink's safety management of the dust collection
system. Sun Chemical Corporation management
personnel did not have adequate oversight of the
planning, design, installation and commissioning
of the dust collection system. The CSB
identified significant management issues
including inadequate project oversight,
ineffective hazard communication and emergency
response planning, ineffective employee training
on the dust collection system, and failure to
develop and implement corrective actions resulting from a previous incident.

I will now discuss a few details of how the project was managed. Before design of the new dust collection system the engineering team filed a capital appropriations asset request, or a CAAR, which allowed for plant and corporate-level approval. The CAAR is required under Sun Chemical project management policy and was designed so that Sun Chemical could approve or reject projects electronically and be able to reference information in the future. The CAAR indicated a process hazard analysis, or PHA, or management of change, MOC, was not considered. A process hazard analysis is a way to identify and evaluate hazards associated with chemical processes and operations to enable their control, while an MOC is a written process to implement changes to technology or equipment in a process.

During interviews with company engineers and senior management CSB investigators learned that the engineering team considered
installation of the dust collection system as a replacement in kind for the old wet scrubber system and therefore did not complete a PHA or MOC. The new system was completely different from the old wet scrubber system with different functions and different design specifications, so they thought they were exempt from developing and following written procedures to manage the changes to the new system.

In addition, US Ink/Sun Chemical management did not seek a building permit for a completely new process because they failed to acknowledge that a PHA was required under US Ink policy for the new process. If a PHA had been conducted, this would have triggered additional safety considerations including the need to obtain a building permit.

CSB interviews with the US Ink engineers revealed that US Ink/Sun Chemical Corporation lacked an effective process for management of organizational change. No procedures were allowed for transferring and
retaining design knowledge and forwarding
information to the new engineer. A senior
engineer who retired from US Ink before the
project was completed coordinated the design of
the dust collection system. Upon his retirement
another US Ink engineer and an engineering
contractor assumed oversight of the project.
Although not fully involved in initial design of
the dust collection system, the new engineers
completed contractor hiring and equipment
ordering and oversaw installation of the system.
There is no record of adequate communication of
transitional knowledge concerning the hand over
the dust collection system from the retired
senior engineer to the new engineers.

Outside contractors who were not fully
involved in the design concept of the dust
collection system performed all construction and
installation activities for the new system. The
ingenieurs who designed the dust control system
did not observe the actual installation process
for the system.
The US Ink hazard communication and emergency response plan required a designated fire coordinator to announce the presence of a fire, location of the fire and to pull the fire alarm. The plant did not require that employees attempt to control a fire with an extinguisher after a manually triggered fire alarm was pulled. Rather, the plan required them to evacuate the building immediately. During this incident no fire alarm was pulled and employees attempted to extinguish the fire. Employees did not evacuate until after the injuries were sustained.

Although the sprinkler system in the pre-mix room was connected to an automatic audible alarm which was relayed to the East Rutherford Fire Department, there was no record that the automatic fire alarm provided adequate notification to employees, if any. And effective automatic fire alarm would have immediately notified employees of the flash fires and triggered and immediate evacuation.

Witness interviews revealed that
although training and fire drills were occasionally conducted, the existing emergency response plan was not followed on the day of the incident. Fire hazard and emergency training received by plant employees was inadequate.

The limited training provided to employees did not adequately prepare them to address a malfunction of the dust collection system. After the initial start-up a 15-minute meeting was held by the system manufacturer where a walk-through of the dust collection system and a brief interpretation of visual indicators was provided. The meeting did not include information on how the dust collection system was designed to work and how to troubleshoot the problems.

In addition, US Ink did not develop a fire or explosion incident prevention program to reenforce employee understanding of the potential hazard severity associated with the newly installed dust collection system. There was also no way for pre-mix room operators to determine
if there were changes in performance of the system.

A similar fire incident involving ingredients overheating in a mixing tank occurred at the US Ink East Rutherford facility on February 29th, 2008. The East Rutherford Bureau of Fire Safety and the East Rutherford Fire Department responded to the fire incident at the US Ink facility. According to the Bureau of Fire Safety the duct work at the top of the tank was consumed by flames generated during the fire. An employee attempted to suppress the fire with a fire extinguisher, but after failing to do so exited the building. Fire fighters extinguished the fire and there were no injuries from this incident.

US Ink did not address any lessons learned from this previous by discouraging employees from attempting to extinguish fires in an environment with flammable vapor and combustible dust. In addition, US Ink did not install temperature indicators and temperature
interlocks that would activate when the
temperature from the ink mixing operation became
too high.

I will now turn over this presentation
to my colleague Ms. Rachael Gunaratnam to discuss
the CSB's findings on regulatory analysis.

INVESTIGATOR GUNARATNAM: Thank you,
Ms. Shroff.

This section discusses the regulatory
framework that applied to the US Ink East
Rutherford facility. As we just discussed it was
the presence of combustible dust mixing with
flammable materials inside the dust collection
system at US Ink that led to a series of events
that burned the seven workers on October 9th.

US Ink is not the first accident
involving combustible dust that the CSB has
investigated. The CSB has been investigating
combustible dust incidents since 2003 when three
catastrophic dust incidents occurred that year
and claimed the lives of 14 workers.

The CSB launched a study and found
that combustible dust was not well regulated though there were voluntary industry standards that existed to prevent dust explosions and fires. As a result, in 2006 the CSB recommended to the U.S. Occupational Safety and Health Administration, or OSHA, that it develop a general industry standard for combustible dust.

The CSB recommendation to OSHA calls for the agency to issue a standard designed to prevent combustible dust fires and explosions and to base the standard off of industry standards like NFPA-654. Currently companies who handle combustible dust like US Ink are not required to follow these industry standards unless it is required by the state in which the facility is located. Without a standard OSHA is unable to effectively regulate combustible dust hazards. Their only mechanism to regulate these type of hazards is to use the general duty clause which is not as effective as an actual combustible dust standard.

Here is a timeline of steps taken to
develop a combustible dust standard. In November 2006 the CSB made the original recommendation to OSHA to develop a combustible dust rule. Three years later in April 2009 OSHA announced it had begun rulemaking. In September 2009, after the CSB completed another combustible dust investigation, the agency recommended that OSHA proceed expeditiously with the dust rule. In April 2010 OSHA called the dust standard long-term action, but postponed some of the next steps of the rulemaking process. In June 2012 OSHA stated it cannot commit to a date for the proposed rule, but it remains a top priority for the agency. Most recently, in November 2014, OSHA maintained the status of the rule as long-term action on its agenda further delaying the issuance of the rule.

The CSB continues to track and investigate serious combustible dust accidents. The CSB has identified 50 combustible dust incidents that occurred before 2008 to 2012 which resulted in 29 deaths and 161 injuries. Of those
50 incidents the CSB investigated 4 major accidents.

First, in 2008 a combustible dust explosion occurred at the Imperial Sugar Manufacturing facility in Port Wentworth, Georgia which killed 14 workers and injured 36. Then in 2010 a combustible dust explosion occurred at the AL Solutions scrap metal processing facility in New Cumberland, West Virginia which killed three workers and injured one. And in 2011 three separate incidents involving metal dust flash fires killed five workers at the Hoeganaes steel and iron powder manufacturing facility in Gallatin, Tennessee. And then there was a US Ink incident in 2012.

As a result of these investigations the CSB repeated the recommendation to OSHA to promulgate a standard, however this recommendation is still not implemented. Had OSHA issued the standard soon after the initial recommendation in 2006, many of the severe combustible dust incidents that followed,
including the US Ink incident, may have been prevented.

OSHA has made some efforts to identify combustible dust hazards. For example, it revised its hazard communication standard to include combustible dust in its definition of a hazardous chemical. This would require employers to notify their workers of the hazards of combustible dust. OSHA has also intensified its inspections for industries that have combustible dust hazards.

The agency initiated a Combustible Dust National Emphasis Program, which is an inspection program that targets industries that have combustible dust hazards. This program targets certain industries that either have an accident history of combustible dust incidents or have the potential for the risk of a combustible dust incident. These industries are identified by their North American Industry Classification System code, or NAIC, which is the business classification.
The NAIC code for US Ink is the printing ink manufacturing code 325910, however, this code is not found on OSHA's list. This industry should be on the list to be regularly inspected because they use combustible dust such as carbon black as part of their ink manufacturing process.

While the intent of the National Emphasis Program is to prevent an accident from occurring, the NEP also provides guidance on how to inspect a facility post-accident where combustible dust is suspected to be the cause. After the October 9th incident at US Ink OSHA did a post-accident inspection and classified this accident as a dust explosion, however, OSHA did not issue citations related to the faulty design of the dust collection system, which the CSB believes to be one of the root causes of the accident. Without citations addressing the root causes of an accident problems may go uncorrected and accidents may reoccur.

The CSB continues to investigate
combustible dust incidents like US Ink and
advocates for a federal standard to demonstrate
the seriousness of this hazard. In a July 2013
public meeting the CSB voted to change the status
of the OSHA recommendation as an unacceptable
response for delaying the development of a
federal standard. The Board also voted in that
meeting to make combustible dust hazards its
first item in the CSB's Most Wanted Chemical
Safety Improvement Program.

In the absence of an OSHA standard
states must rely on their own regulations, but in
New Jersey no state agency regulates combustible
dust hazards. When US Ink began the construction
of the dust collection system they had to obtain
a number of permits. The company did obtain an
environmental permit under New Jersey's Air
Pollution Control regulations. This type of
permit required that the dust collection system
be able to control emissions to the outdoor
environment. This type of permit does not
regulate the safety of the equipment and prevent
a combustible dust fire and explosion.

US Ink was also required to obtain a construction permit under New Jersey's Uniform Construction Code, or UCC. This code is overseen by the New Jersey Department of Community Affairs which has the authority to promulgate or modify the regulations of the UCC. This state agency also provides guidance and technical assistance to local building officials who enforce the UCC in their jurisdiction.

New Jersey's UCC was promulgated in 1975 as a single mandatory construction code. The intent, as stated in its own code provisions, is to ensure the health, safety and welfare of occupants or users of buildings and structures, and they do this through the adoption of sub-codes such as a building or electrical code requiring companies to obtain a construction permit.

US Ink was required to but did not obtain a construction permit for the new dust collection system because the company
misinterpreted the code thinking they were exempt from its requirements. Therefore, local code officials never learned of the new construction of the dust collection system.

The CSB investigation found that New Jersey only required a permit for the new electrical and structural changes associated with the construction of the dust collection system, but not for the engineering design of the dust collection system. The CSB found that the New Jersey UCC actually exempts manufacturing, production and process equipment from the permit process. Because the dust collection equipment at US Ink was being used as part of the ink manufacturing process, it appeared to qualify for this exemption.

An 1992 New Jersey notice provided an interpretation of that exemption stating that process equipment is often unique to its function and designed beyond the reference standards in the UCC. This makes it impractical or impossible for code officials to review it in an appropriate
way. They do however review electrical, water and sanitary connections to such process equipment as these can affect public safety. At that time there were no engineering or fire protection standards referenced in the UCC, and local code officials do need these standards to appropriately inspect process equipment.

However, in 2010 New Jersey adopted an amended form of the International Building Code which is a model building code that is adopted throughout most of the United States. This code applies not only to the physical structure, but also to the use and occupancy of the building and includes the equipment inside the building. The International Building Code references industry standards that apply to specific occupancies giving local code officials guidance on how to inspect these buildings. For example, the International Building Code requires that buildings and structures that pose a deflagration hazard or a hazard from accelerated burning from materials such as combustible dust follow
reference standards such as NFPA-654.

If the dust collection at US Ink had been covered under New Jersey's UCC, the provisions of the International Building Code would have applied. This would have required US Ink and other facilities handling combustible dust to design their equipment in accordance with standards such as NFPA-654.

I will now turn to the investigation key findings.

1) A flammable mixture consisting of hydrocarbons and combustible dust accumulated in the duct work during the start up of US Ink's dust collection system. The mixture spontaneously igniting leading to a series of events that caused a flash fire burning seven workers.

2) The original design of the dust collection system was intended strictly for dust collection, but was modified before commissioning to include a housekeeping function. This also caused insufficient flow rate and contributed to
an accumulation of a flammable mixture in the duct system.

3) System controls such as temperature and pressure indicators were not installed for operators to monitor the mixing tanks and dust collection system during start-up. This led to the overheating of the flammable dust mixture which accumulated in the duct work and ignited above T-306.

4) US Ink/Sun Chemical Corporation did not provide adequate oversight into the planning, design, installation and commission of the dust collection system. As a result, safety management elements such as a process hazard analysis and management of change procedures were not conducted.

5) No processes were in place to confirm adequate start-up or commissioning of the dust collection system. As a result, the blockage of the duct work went undetected and design flaws were not revealed until after the flash fire occurred.
6) US Ink's hazard communication emergency response plan and other incident prevention programs did not reenforce an understanding of the potential hazard associated with flammable vapors entering the dust collection system and mixing with the combustible dust.

7) US Ink/Sun Chemical Corporation did not obtain a construction permit for the installation of the new dust collection system.

8) No federal agency or state agency in New Jersey regulates combustible dust hazards.

9) A comprehensive OSHA federal regulation specific to combustible dust is needed because the reliance on industry to voluntarily comply with fire protection and engineering standards is insufficient to control combustible dust hazards.

10) OSHA did not include the NAIC code for printing ink manufacturing 325910, the industry classification code for US Ink, to its list of industries in the combustible dust NEP.
OSHA inspectors refer to this list as guidance on inspections for combustible dust hazards in their region.

11) The New Jersey Uniform Construction Code adopts the International Building Code which does reference fire protection and engineering standards for facilities that handle combustible dust such as NFPA-654, however, the UCC exempts certain process equipment that could apply these provisions.

12) The New Jersey Department of Community Affairs conducts training for local building code officials on some NFPA standards in the New Jersey UCC, but does not provide training on relevant NFPA standards that address combustible dust hazards.

I will now turn it over to Mr. Banks who will discuss the recommendations.

INVESTIGATOR BANKS: Thank you, Ms. Gunaratnam.

As a result of this investigation the
investigative team is proposing that the CSB reiterate one of its previous recommendations to the Occupational Safety and Health Administration, or OSHA, and issue eight new recommendations, two to OSHA, three to US Ink and three to the New Jersey Department of Community Affairs.

First, I will discuss recommendations the staff proposes for reiteration.

The CSB continues to believe that the OSHA general industry standard for combustible dust is needed to prevent future tragedies caused by dust explosions. Therefore, the staff are proposing that the Board reiterate its 2006 recommendation calling for the development and issuance of an OSHA general industry standard for combustible dust. As Ms. Gunaratnam mentioned, the Board voted to designate this recommendation and three related recommendations with the status open, unacceptable response in July of 2013.

The Board also voted at that time to designate a general industry standard for
combustible dust as the agency's first most
wanted chemical safety improvement. It should
also be noted that this will be the first time in
the history of the agency that the CSB has
reiterated one of its safety recommendations.

The text of the reiterated
recommendation No. 2006-1-H-1 is as follows: As
an OSHA general industry standard for combustible
dust is needed to prevent future tragedies, the
CSB is reiterating its 2006 recommendation to
OSHA which is currently designated with the
status open, unacceptable response. A dust
standard is the first item on the CSB's most
wanted safety improvement list. This
recommendation was reiterated by CSB in the AL
Solutions investigation. So we have reiterated
this recommendation at the AL Solutions
investigation closing.

Now the new recommendations. We have
a recommendation to OSHA. R-1 is to add the
North American Industry Classification System, or
NAICS, Code 325910, printing ink manufacturing,
to the list of industries in Appendix D-1 or Appendix D-2 of Combustible Dust NEP Program Directive CPL-03-00-008.

 Recommendation R-2 to OSHA.

 Communicate with all OSHA area offices to encourage appropriate application of the following existing provisions of Combustible Dust NEP Program Directive CPL-03-00-008, Paragraph 9, Section (a)(2) which indicates that the area offices may add their NEP establishment list to those facilities in their jurisdiction with the Standard Industrial Classification System Code, or a NAICS code, or both, other than those listed in Appendix D-1 and D-2 of the Combustible Dust NEP Program Directive if those facilities have a known pattern of combustible dust hazards.

 Paragraph 9, Section (b)(4) indicates that if a fatality or a catastrophe investigation is performed at a facility because of a combustible dust deflagration or explosion, the inspector shall use the guidelines of the Fatality Catastrophe Investigation Procedures
Directive CPL-02-007-137 and in Combustible Dust NEP Directive CPL-03-00-008.

The first proposed recommendation to the New Jersey Department of Community Affairs reads as follows: "Revise the exemption for manufacture, production and process equipment under the New Jersey Uniform Construction Code, NJAC 5:23-2.14 and require equipment that is not already covered by a federal standard to be covered under the New Jersey UCC. Also provide authority to allow local code officials to solicit third party certified professionals to evaluate the type of equipment."

The second proposed new recommendation to the New Jersey Department of Community Affairs, R-4, is develop and implement training for local code officials on the National Fire Prevention Association, or NFPA, standards referenced in the New Jersey adoption of the International Building Code, or IBC, for occupancies with a high-hazard classification of group H. Specifically include training on
equipment that handles combustible dust and the hazards involved.

The third proposed new recommendation for the New Jersey Department of Community Affairs, No. R-3, reads: "Promulgate a regulation that requires all occupancies handling hazardous materials to inform the local enforcement agency of any type of construction or installation of equipment in an industrial or manufacturing facility. Also, require that the local enforcement agencies evaluate that information to determine whether a construction permit is required."

The first proposed recommendation to US Ink/Sun Chemical Corporation, R-6, reads as follows: "At the US Ink East Rutherford facility install automatic fire alarms consistent with NFPA-72, or the National Fire Alarm Code, in manufacturing areas such as mixing where heat generation could occur."

The second proposed recommendation to US Ink/Sun Chemical Corporation reads: "Revise
the capital appropriations request, or CAR, form procedure for new installations and modifications to existing equipment to require at a minimum the following: Process hazard analysis, or PHA; management of change, or MOC; review of engineering drawings for permits; safety management of contractors; training of plant operators based on applicable dust collection systems guidelines and standards including NFPA-91 and NFPA-654."

And the last proposed recommendation to the US Ink/Sun Chemical Corporation, R-8, is develop and implement a management organizational change protocol to allow for the transfer of knowledge and information to new personnel. At a minimum include initial or refresher training in the following: Safety and health procedures, lessons learned from previous incidents, technical information for equipment and routine plant operations.

Now this concludes the staff's presentation of the CSB investigation of the US
Ink incident, and I will now turn the meeting to CSB Chairperson Dr. Moure-Eraso.

CHAIRPERSON MOURE-ERASO: Thank you very much, Mr. Banks. I think we'll proceed with the agenda with Board questions to the investigators. So I start with Mr. Ehrlich.

Mr. Ehrlich, do you have any questions?

MEMBER EHRLICH: Yes, I have a couple of questions. Well, it's a two-part question. Was the source of ignition every identified and was there adequate data to show that the system was properly grounded to rule out possible static discharge with all those hoses?

INVESTIGATOR BANKS: We were not able to pinpoint the point of origin for the fire. There were several indicators of where the fire most likely occurred, an eyewitness recount of his activity and the actions at the bad dump. The equipment itself was properly grounded.

MEMBER EHRLICH: Okay. It was stated clearly that the emergency response plan said
that they pull the alarm and evacuate the facility. Who made the decision to send people into fight the fire? Had they had previous fire fighting training?

INVESTIGATOR BANKS: The alarm did not go out to the entire building. As we understand it could be heard in the control room. The decision to attempt to extinguish the fire, the gentleman took it upon himself to approach the fire with an extinguisher and attempt to extinguish the fire. There was fire emergency training that was offered by the plant prior to the incident.

MEMBER EHRlich: And was there an emergency coordinator involved in this whole operation?

INVESTIGATOR BANKS: The emergency coordinator is designated to be the supervisor, and in this instance they were assessing the fire, the flames that were observed in the pre-mix room. And before they could evacuate the flash fire washed over them. We feel that had
there been a louder alarm that all of the employees could have heard, they would have more likely evacuated.

MEMBER EHRLICH: I see. Thank you.

CHAIRPERSON MOURE-ERASO: Mr. Griffon?

MEMBER GRIFFON: Yes, just a couple questions given the time of night here. I'm curious just to maybe go over this or emphasize this. I think you might have mentioned it in the presentation, but was the company complying with the current NFPA Standards 91 and 654 prior to the incident?

INVESTIGATOR BANKS: As required under those guidelines, yes.

MEMBER GRIFFON: Okay. And then so if they were complying with those and the incident still occurred, then did you identify any gaps or deficiencies in those two standards, 91 or 654?

INVESTIGATOR BANKS: None that we were able to bring to the fore in this case.

MEMBER GRIFFON: Okay. I mean, I'm just trying to get a sense of if those standards
are in place and this incident still, happened it
seems something might be wrong with those
standards or it might need to be further
considered. That's all I'm exploring.

INVESTIGATOR BANKS: Okay.

MEMBER GRIFFON: Another question:
You mentioned in Finding 1 hydrocarbons and dust
being present, and I'm wondering if you classify
this as a hybrid incident, a hybrid dust/vapor
event.

INVESTIGATOR BANKS: There were
multiple possible causes for this event. You had
the oils that were used in the process, you had
the Gilsonite, the carbon black. They were all
possible contributors. The proximity of the
flames observed after the initial flash and the
subsequent sound and action on the roof. The
material that we found in the duct work
afterwards was a mixture of an oily powdery
substance that had adhered to the inner surfaces
of the duct work. So the attempt was made to
replicate some type of a hybrid incident in a
lab, and we weren't able to reproduce it to that extent that we could say absolutely that it was a hybrid event.

MEMBER GRIFFON: Okay. And did the company in their planning prior to the incident consider a potential for a hybrid situation? I don't know if they considered that. I didn't notice it in the report.

INVESTIGATOR OYEWOLE: We don't have any record of that that the company actually did any concentration --

MEMBER GRIFFON: Okay.

INVESTIGATOR OYEWOLE: -- for the hybrid type of mixture.

MEMBER GRIFFON: And the last question is just we did some testing and I wondered if prior to the incident if the company tested the Gilsonite material or other materials for combustibility.

INVESTIGATOR BANKS: Yes, they had information that indicated the explosibility of the material that had been tested prior to, and,
as we found afterwards in our tests, there was a
difference in the explosibility of that material.

MEMBER GRIFFON: Okay. And I assume
their results were below --

INVESTIGATOR BANKS: A little bit lower.

MEMBER GRIFFON: -- their design specifications of 165 --

INVESTIGATOR BANKS: Yes.

MEMBER GRIFFON: -- for the -- okay.

INVESTIGATOR BANKS: Yes.

MEMBER GRIFFON: All right. Thank you.

INVESTIGATOR BANKS: You're welcome.

CHAIRPERSON MOURE-ERASO: Thank you.

I only have one question for the team. How prevalent are those explosions and what specific studies the CSB has done to find that prevalence?

INVESTIGATOR BANKS: Well, it's extremely widespread and troubling and continues to occur. There's a wide range of material that's involved in these type of events from
pharmaceutical dust to sugar to metal to any number of different powdery materials that are combustible. And over the years we've conducted a dust study that initiated in 2003, and recommendations were issued in 2006 to address that problem. Subsequent to that there have been incidents at Imperial Sugar, at Hoeganaes, at AL Solutions. The numbers of tragic outcomes from these events is staggering.

In this incident the victims were burned, but they could walk out on their own afterwards, so it wasn't as bad as it could be. But the problem is prevalent and the efforts of this agency to address that have continued throughout my tenure to try to be a voice of reason that there is a profound need for some type of comprehensive dust standard to provide a greater sense of awareness of the risk, that's more programmatic in how the inspections are done, to give folks a sense that the material that they're working with exactly how volatile it is and to respect it.
CHAIRPERSON MOURE-ERASO: And if I remember well, I guess we were able to follow in a period of 10 years about 50 incidents with fatalities.

INVESTIGATOR BANKS: That's correct. Yes, 50 incidents with I think 29 fatalities.

CHAIRPERSON MOURE-ERASO: Thank you very much.

INVESTIGATOR BANKS: Sure.

CHAIRPERSON MOURE-ERASO: Okay. I think we've finished this part of the program, and I am asking Dr. Horowitz if he could step forward to moderate the public comments.

INVESTIGATOR BANKS: Mark, Just a point of correction. They were not following NFPA-654 at the site. So I mis-spoke on that. My apologies.

MEMBER GRIFFON: Thank you. Yes, I think that's important.

INVESTIGATOR BANKS: Yes.

MEMBER GRIFFON: That's for that clarification, because it was a little concerning
to hear that if they were complying with all
these standards and it still happened, so --

INVESTIGATOR BANKS: Yes.

MEMBER GRIFFON: Thank you. Thank
you.

INVESTIGATOR BANKS: Yes. Sure.

CHAIRPERSON MOURE-ERASO: But and you
call it a standard? Is that the correct
termology? I think they are guidelines.

PARTICIPANT: Well, industry
voluntarily -- yes.

CHAIRPERSON MOURE-ERASO: Yes, it's a
guideline. Yes.

PARTICIPANT: A guideline. Yes,
right.

DR. HOROWITZ: Thank you, Mr.

Chairman. The first commenter is Bruce Johnson
(phonetic) from the International Code Council.

Mr. Johnson?

MR. JOHNSON: Good evening, Chairman
Moure-Eraso, Chemical Safety Board members and
staff. My name is Bruce Johnson and I'm the vice
president and government relations for the
International Code Council, or ICC.

ICC is a membership association
dedicated to building safety, fire prevention,
energy conservation and sustainability. The ICC
develops model building constructions code and
fire safety codes used to construct most
residential and commercial buildings and ensure
those buildings remain safe throughout their
useful life. It is the mission of the ICC to
provide the highest quality codes, standards,
products and services for all concerned with the
safety and performance of the built environment.

The family of correlated ICC codes,
called the I-Codes, undergo a triennial review
and revision process that is an open an
consensus-base code development forum. Our code
development process considers new building and
fire safety data and research reports, the latest
technology, installation techniques, new building
products and methods, along with cost and
affordability in producing published model codes
every three years.

Most U.S. cities, counties and states that adopt codes choose the International or I-Codes developed by the ICC. The 2009 International Building Code, IBC, and the International Fire Code, IFC, with New Jersey amendments are among the model codes adopted and enforced by the State of New Jersey. The International Building Code is a model construction code that establishes minimum requirements for a reasonable level of safety, public health and welfare through structural strength and stability, adequate occupant egress and safety for occupants and fire fighters, as well as the protection of property from fire and other hazards attributed to the built environment.

The International Fire Code, or IFC, is a model construction and maintenance code that establishes minimum fire safety levels for both new and existing buildings. The intent of the IFC establishes minimum requirements for all
commercial buildings consistent with nationally-recognized good practice for providing a reasonable level of occupant safety, property protection from hazards of fire, explosion, dangerous conditions, and also to provide for the safety of fire fighters and emergency responders during emergency operations.

The IBC and IFC are designed to work together as a correlated system to address minimum levels of safety for the construction of new buildings and the maintenance of that minimum level of safety for the life of the building.

ICC believes that the most effective method for states to ensure their built environment remains safe, sustainable, affordable and resilient is through adopting up-to-date model construction and fire safety codes and having a system in place for the administration and enforcement of those adopted codes for all buildings. This includes compliance and commissioning inspections of buildings as they are being constructed and periodic inspections of
existing buildings for compliance with the IFC to ensure the minimum required fire and life safety levels are always maintained.

The IBC has specific construction requirements for high-hazard occupancies and also references the IFC for fire safety requirements in these buildings. The IFC contains requirements for the storage, use and handling of all hazardous materials such as combustible dust in both new and existing buildings including those classified as high-hazard and other manufacturing facilities such as factory or storage occupancies.

Since the CSB investigation report and recommendations based on the dust explosion at the Hoeganaes facility in Gallatin, Tennessee were released in 2011, new combustible dust hazard mitigation requirements have been added to the 2012 International Fire Code. The ICC Fire Code Action Committee is continuing to develop code change proposals for the 2018 IFC that further address the mitigation of combustible
dust hazards and incorporation of IFC references to applicable safety standards such as those developed by the NFPA.

        ICC has also taken steps to include a specific focus on the hazards of combustible dust in our training programs delivered to thousands of code officials every year. These education programs now include information and illustrations of combustible dust hazards along with an explanation of the IBC and IFC requirements that address mitigation of those hazards. It is our hope that this education of code officials will improve the enforcement of combustible dust safety requirements and thereby help prevent combustible dust deflagrations and flash fires.

        In conclusion, the ICC would like to thank the Chemical Safety Board for its thorough accident investigation reports and the recommendations that are essential to improving safety of our built environment. ICC will continue to work with the CSB to ensure that the
recommendations aimed at improving the safety
requirements of the I-Codes are considered in our
ongoing code development process.

I'd like to thank the Chemical Safety
Board for the opportunity to offer these comments
this evening and I would be happy to answer any
technical questions about the ICC or our model
codes. Thank you.

DR. HOROWITZ: Thank you, Mr. Johnson.

CHAIRPERSON MOURE-ERASO: Thank you

very much.

DR. HOROWITZ: Next is Ashley

(phonetic) Fitch, United Steel Workers.

Ms. Fitch? An could you please spell

your name for the transcriber?

MS. FITCH: Sure. F-I-T-C-H. Good
evening, Chairman, members of the Board. Thank

you for the opportunity to comment today.

My name is Ashley Fitch and I join you

on behalf of the United Steel, Paper and

Forestry, Rubber, Manufacturing, Energy, Allied

Industrial and Service Workers International
Union, more commonly known as the USW. We represent 850,000 workers in the United States and Canada. Our members work in sectors I just mentioned above and in many others, including the majority of unionized workers in the paper and metal industry and hundreds of thousands of men and women whose jobs expose them to combustible dust hazards.

The explosion in 2012 at the US Ink facility in East Rutherford, New Jersey injured seven people. The lives of these workers are now changed forever. They suffer more than just physically. The occurrence at US Ink will affect these victims and their families for the rest of their lives. The severity of this explosion could have been greater. The damage to this community and its infrastructure could have been more greatly altered due to a chemical dust explosion or fire.

The USW does not represent the workers at US Ink, however, we do represent many workers who are today and every day exposed to
1 combustible dust hazards. USW members, just as
2 the workers of US Ink, are highly skilled and
3 highly trained workers who operate and maintain
4 various manufacturing facilities across the
5 nation. And to further protect these workers
6 there must be further regulation and awareness of
7 potential catastrophic explosions and fires to
8 occur due to this type of hazard.
9
10 We have worked closely with the
11 Chemical Safety Board and would like to take this
12 opportunity to strongly support the
13 recommendations related to the prevention of
14 combustible dust fires and explosions. We also
15 support the CSB's highlighting the need and
16 necessity of further regulation on the subject in
17 light of OSHA's failure to move forward with a
18 combustible dust standard. We encourage the CSB
19 to work collaboratively with OSHA to facilitate
20 the agency's progress on combustible dust to
21 protect workers across the country.
22
23 Since 1923 when the NFPA published the
24 first national consensus standard on the
prevention of dust explosions in grain and flour mills these hazards associated with combustible dust has not been unknown. In 2009 OSHA reported that loss from these explosions of fires affected 350,000 companies across the nation. These tragedies are becoming all too familiar for the working men and women of this country. Each of these accidents could have been prevented with proper regulation to employers and regulations to prevent these catastrophic accidents.

Today the Board has shared information gathered during their inspection. These findings provide lessons learned to all facilities within this industry to prevent it from reoccurring, but will the findings of this recommendation of the CSB be enough to impact the risk of another explosion or fire? No. Therefore, we strongly urge the Board to continue to shed light on these catastrophic accidents and draw attention to these regulatory gaps. Thank you.

CHAIRPERSON MOURE-ERASO: Thank you.

DR. HOROWITZ: Thank you, Ms. Fitch.
Next is Paul Hofmann. And, Mr. Hofmann, please spell your first and last name for the recorder. Thank you.

MR. HOFMANN: Well, Paul is P-A-U-L. And Hofmann is H-O-F-M-A-N-N, one F and two Ns.

I thank the Board for giving me the opportunity to speak on behalf of my three clients, two of whom are here. All three were individuals that were burned, seriously injured in the event at Sun Chemical's US Ink facility.

I have several comments that I wish the Board to think about before it makes its final vote on the report.

The first one is a comment that the report unfortunately was released this afternoon for me to be able to review, so I really didn't have an adequate time to fully review it. From my initial review, though, I do want to commend the Board for the thoroughness of the investigation. I would have liked more time to have reviewed it, and I think that in the next time that you have such a hearing, please give
the public a little bit more time to digest what
the proposed findings would be.

That being said, there is one area
that I do quarrel with on behalf of my clients
with a certain conclusion that was reached, and I
would like the members before you vote to
consider.

The conclusion is that the initial
flash fire and the thump that was heard was the
suppression and isolation system going off. I
don't think that the report fully justifies that
conclusion. An alternate explanation of the
thump that was heard could have been the actual
first initial flash fire that was observed coming
out of the bag dump and there's no justification
necessarily to conclude that the suppression and
isolation system went off at that time.

I think an alternate explanation would
be that the initial flash fire did initiate
further burning in the duct work and that since
the blower continued to draw air through the
system that embers from the smoldering fire in
the duct work then were drawn up into the dust collector setting off an explosion in the dust collector which the suppression and isolation system then attempted to prevent. Unfortunately, I think the conclusion could easily be reached that the deflagration that came out of the dust collector was not suppressed and was not isolated as supposedly it was intended to be and that that flame front that came out of the dust collector is what burned my clients.

An alternate explanation is that in that second and much more serious flame front that burned my clients, that perhaps the system did also go off and it was the isolation system pushing in a back pressure situation the flaming material from the duct work which burned my clients rather than the suppression and isolation system having gone off minutes before. And before you make your final vote I think that needs to be analyzed.

I think another important thing that seems to be missing from the conclusions here is
you have a situation where this was a brand new
system; and it’s mentioned numerous times in the
report that this was a new system, and this was
certainly in part poorly engineered as to the
duct work, etcetera, and I agree with that
conclusion. But I disagree with the total
emphasis on Sun Ink as being the progenitor of
the problems.

Sun Ink hired and involved numerous
contractors that were expert in the field of dust
collection. They hired the United Air Systems to
produce the dust collector itself. They hired
Fike (phonetic) and SSI (phonetic) to incorporate
a sensing system plus suppression and isolation.
They hired another contractor called Faber
(phonetic), which is an engineering firm, to
assist it. There is no mention about the four of
these entities working together. There is one
little footnote that mentions that there were
some other contractors.

And I think that a conclusion or a
recommendation from this Board must be that all
entities involved in the design and construction of these dust collector systems must all analyze the safety issues and not just rely on the manufacturer, although that's an easy target. But UAS, Faber, Fike, SSI all were involved in the design of this system. They were also -- they either were or should have been; and I believe that they were, aware of the fact that there were the volatile chemicals that were involved and they did not take into account the potential fire hazard and explosion hazard that the volatile chemicals would also be involved.

And so, I think that there is a lack in the proposed report as to who else should have -- should have -- and the recommendation should be that other entities should also be involved in analyzing before a system is put into place. Everyone that's involved in the design should look at it from a safety standpoint, particularly those entities that are recognized as experts in the industry.

So I want to thank you for that and
hope that you consider my comments.

DR. HOROWITZ: Thank you. Next is

Professor Glenn Corbett.

PROF. CORBETT: It's Glenn Corbett,
two Ns and two Ts, for the recorder.

Mr. Chairman, members of the Board and
staff, thank you for allowing me to speak
tonight. I'm not sure what's going on next door,
but something's happening there.

Tonight just for the purposes of full
disclosure, I've worked for the Board as a
consultant on other projects. And also tonight
I'm not speaking on behalf of my college or the
New Jersey State Fire Code Council, which I sit
on. I'm speaking on my own behalf tonight.

I'd like to focus on a couple of the
recommendations, which by the way are incredibly
important. These are two excellent reports that
we heard tonight and the actual recommendations,
as we all know, are so crucial.

The first one is the gap that the
Board has identified in New Jersey's regulations
dealing with combustible dust. It's clear; we heard from Bruce Johnson earlier, that the model codes intend for jurisdictions who adopt their codes to actually have a role in oversight and inspection of these systems. These systems, while they may play a role in terms of environmental protection, they're also the code enforcer there for obvious reasons in terms of the potential for an explosion in the dust accumulation scenario. In particular, the exemption that New Jersey provides for these systems has to be closed or should be removed. We have to close that gap and get rid of that. So again, I'd like to really strongly endorse that particular recommendation.

Also the recommendation that's in the existing codes for NFPA-654. It's a fire protection standard. It's a standard for this kind of situation. And of course it wouldn't be there if it wasn't important to actually enforce, right? So we shouldn't have something that's in the code that we're going to exempt people from.
So that's important.

The other really important provision in the recommendation you've made deals with the issue of training. East Rutherford is a small community. I also have to disclose I'm a resident of this county, Bergen County, at the north end. Sixty-nine communities. Sixty-nine fire departments. We're all small towns. And a lot of these communities don't have a lot of technical expertise.

And I think it's important -- I think Investigator Banks mentioned, which I think perhaps should go in your recommendation specifically, is that there should be encouragement for local jurisdictions to use the sections in the code that allow for special expertise to be brought in at the behest of that inspecting agency and paid for by the developer or whoever is actually going to propose this particular installation. That section in Chapter 1, Section 103 allows for again that special expertise to be brought in, provide a report to
the local people to make sure that they 
understand exactly what the system is going to do 
and if there are any issues with that system 
design they provide that independent expertise. 

I've used it in my own career. I 
spent 10 years in code enforcement in Texas, San 
Antonio and Austin, and there are occasions where 
none of us can know everything about everything, 
right? So we brought in consultants to help us 
understand on particularly complicated situations 
what to do. And I think I would suggest that 
that be put in the report specifically that 
jurisdictions should be encouraged to use that 
particular provision of the code. 

So again, thank you all so much for 
your hard work, both the Board and the staff. 
And I'd also be happy answering questions later 
on. Thank you.

DR. HOROWITZ: Thank you. Eric 
(phonic) Frumin, Change to Win Labor Coalition.

MR. FRUMIN: My name is Eric Frumin, 
F-R-U-M-I-N. I'm the health and safety director
for Change to Win, which is a national labor
federation that includes the Teamsters Union and
several other unions. First, I just want to
express my feelings of -- well, regret for the
suffering that the workers at the US Ink have had
to endure and their families, and even the people
who weren't injured. I'm sure it continues to be
a difficult experience to go back there every
day.

I had a couple of questions about the
report and the investigation, and then I want to
say a little bit about the historical context for
some of the issues that we're dealing with today.

So I just want to confirm what year
the change in the system was implemented. I
don't actually see that in the report, so it's
not clear. What year was the CAR approved and
therefore what were the applicable voluntary
standards in NFPA? What version of them were
applicable at the time? So do you know what year
the change was done?

INVESTIGATOR BANKS: Well, we don't
have that information at our fingertips. We're happy to get that and provide it you at a later time.

MR. FRUMIN: Well, I think it would be useful for the reader of the report for you to just have that in there, because you make reference to NFPA-654 in 2006, or the earlier version. And we might as well know at that time had they applied the management system tools and used the applicable standards, which standard they would have used.

So, Mr. Hofmann, do you happen to know what year it was just --

MR. HOFMANN: Well, they started the process in 2011 and in 2012 the final decisions were made.

MR. FRUMIN: Okay. So, you know, these were very recent, so we have an idea informally anyway. Perhaps you could confirm it and put that in the report what year that was.

I wanted to just confirm what the sequence was for the alarm system. Was there a
point at which an alarm was activated which had it been properly designed would have alerted not only the other people in the plant and perhaps triggered an evacuation, but also alerted the East Rutherford Fire Department? Do you recall what the sequence was, when that alarm actually occurred in relationship to the different fires?

INVESTIGATOR BANKS: The alarm was activated with the deployment of the suppression system and the alarm could be heard in the control room. It just wasn't heard plant-wide.

MR. FRUMIN: So roughly how long was it after the --

INVESTIGATOR BANKS: It was --

MR. FRUMIN: -- suppression system before the flash fire hit them?

INVESTIGATOR BANKS: The notification would go to the East Rutherford Fire Department almost at that same time and they responded in due course.

DR. HOROWITZ: I think the question was how long between the activation of the
suppression system and the subsequent flash fire
where the workers were?

INVESTIGATOR BANKS: Well, the signal
goes out immediately.

MR. FRUMIN: Right.

INVESTIGATOR BANKS: There were
minutes between the activation of that alarm and
the discovery of the flames from the hose over
the mixing tank.

MR. HOFMANN: Mr. Banks, I don't want
to be in a debate, but my clients have testified
under oath and my clients advised that there was
no alarm before the major flash fire.

DR. HOROWITZ: Yes, I think the
report is in concurrence with that. But go
ahead, Mr. Frumin.

MR. FRUMIN: Okay. So I just -- well,
this is a little confusing and it's because there
is precedent for this issue that I just wanted to
try to clarify it. So I understand that the
suppression -- that the activation of the
suppression system triggered an alarm which,
among other things, notified the fire department. And the question -- so whether it was audible to the workers or not, that -- and it was -- that occurred minutes, as you said, before the fire that then hit the workers, including in the control room. Am I getting that right, or no?

INVESTIGATOR BANKS: All of the eye witness testimony that we have is their recall. So when we say minutes, it's -- time gets distorted when --

MR. FRUMIN: Okay.

INVESTIGATOR BANKS: -- folks are under stress.

MR. FRUMIN: But there was some -- it wasn't like instantaneous? I mean, the suppression system occurred. That was activated. You're not talking milliseconds here?

INVESTIGATOR BANKS: No.

MR. FRUMIN: All right. Okay. Those are the only questions I had about it.

I want to thank you for the detailed investigation. As always, we appreciate very
1 much the Board's focus on combustible dust and
2 the Board's leadership in calling attention to
3 the price that workers pay for the failure of
4 management to own up to its responsibilities to
5 design systems and to operate facilities
6 properly.
7
8 I think you've adequately identified
9 what's at stake by virtue of the delays in the
10 implementation of standards, whether it's
11 management's adoption of the recommendations of
12 voluntary organizations like NFPA or the failure
13 of the powers that be, whether it's the Labor
14 Department or the people who determine what the
15 Labor Department does in setting standards. So
16 we're still in a crisis here and you continue to
17 draw attention to that, so we appreciate that.
18
19 I do want to just mention for
20 historical context a similar event that's quite
21 important in the history of the Board. On April
22 21st it will be 20 years since another community
23 nearby suffered an incident that was as horrible
24 as this one was, orders of magnitude worse. This
was the incident at the NAPP Technologies plant
in Lodi, New Jersey that killed five people,
destroyed the town center, did a lot of damage to
the Saddle River, etcetera.

The Board didn't exist at that time.
The Board's existence was precarious at that
time. OSHA and EPA at that time were maintaining
that they could adequately investigate these
kinds of incidents. And to OSHA and EPA's
credit, after they issued their report on the
subject -- excuse me. And I would like to give
credit to the efforts that the OSHA and EPA
enforcement staff made to come to grips with that
problem. When OSHA issued its citations, they
acknowledged that they had no standard for
reactive chemicals and they couldn't cite this
company under the existing PSM standard. And
that was a terrible loss.

One of the problems, one of the --
well, the evaluation of the significance of that
incident had a lot to do with the Board's
existence, because it was after the review of the
OSHA/EPA report that the White House and the Congress agreed that it was necessary to create the Board.

One of the people who reviewed the report that OSHA and EPA issued was Jerry Scannell, a New Jersey resident, former corporate safety director for Johnson & Johnson, subsequently head of the National Safety Council. And he pointed to some of the very -- this was in 1997, a couple years later. He pointed to some of the very same issues that you've identified today. He said, for instance, that the management systems need to be examined further. In fact, in the ways that you've done it, but in ways that you haven't.

He said, for instance, that the qualifications, credentials and competence of the managers involved in the decision making from new product review to emergency response need to be examined. And then he expressed his frustration with the failure of the management to comply with the existing standards, whether they were
mandatory standards or others. He said one of
the recommendations is essentially that companies
should comply with existing rules such as in that
case PSM and RMP.

What does this change, he said? Do
companies not know about the rules? Don't they
care? Aren't they worried about the consequences
of non-compliance, or don't they think they will
get caught? Essentially is why did this company
ignore the law and what should be done to reduce
the likelihood of companies ignoring the law in
the future?

So we're in the same boat today that
we were 20 years ago where managements of
sophisticated chemical companies continue to
ignore their responsibility, whether they're the
financial managers approving requests or that
they're the chemical engineers or other kinds of
engineers. And I just wanted to place this
particular incident -- because we're close to it
geographically but also on the anniversary of the
NAPP incident and the importance to the Board --
to place this incident in context and to commend
the Board for drawing attention to the
management's safety issues, both in this incident
and in others that you've done because of how
important those are in protecting workers. Thank
you.

DR. HOROWITZ: Thank you, Mr. Frumin.
The next is Paul Piantino. And please
do spell at least your last name.

MR. PIANTINO: Sure. Good evening.

Mr. Chairman, Board, I'm a partner at
the law firm of White and Williams. I have the
privilege and honor of representing one of the
injured workers in connection with this incident.
For the sake of brevity I just want to note for
the record that I join in the comments of Mr.
Hofmann that he's already noted and placed on the
record here this evening.

I did have a couple of discrete
questions separate and apart from the issues that
have been raised by Mr. Hofmann. I note that
earlier in the evening there was a slide by Ms. Shroff. I think she's left the dais, but I know Mr. Banks is aware of all of the details of this investigation as the chief investigator. The slide that Ms. Shroff put up indicated a quote/unquote "heavy reliance" by outside contractors. Mr. Hofmann alluded to this briefly, I think, in his comments.

Did the CSB consider its charge to include an analysis of the contracts and the letters of engagement between US Ink and the various vendors, dust collection experts and fire suppression experts that it engaged? It seems readily apparent that US Ink was in the black ink business for purposes of manufacturing black ink for newspaper printing. And like many of us, when you get into an area requiring specific expertise, you ask the experts.

So I noted a lack of reference to the vendors and the experts in dust collection and fire suppression in the report. It may have been purposeful. So all I'm trying to ascertain is
did the CSB believe it was within the scope of its charge to evaluate what US Ink had contracted with others to handle by way of receiving recommendations, advice, counsel, and of course ultimately purchase and installation services?

So in the absence of Ms. Shroff, you know, Mr. Banks, I --

DR. HOROWITZ: Yes, I think the report makes the point that US Ink did not provide adequate oversight of contractors involved in the installation of the system. I guess the caution I would make is the CSB report and its recommendations are in no way seeking to apportion responsibility for the accident among US Ink and any other parties who were involved from a prevention standpoint. We direct the recommendations, the proposed recommendations to US Ink simply because they are the party that owns the system, in the future is responsible for its safety. So we certainly understand the kinds of comments you and the other attorney for victims are raising and I would just say we are
not apportioning responsibility from the parties
by who we describe them in the report.

MR. PIANTINO: Okay. So it's a fair
reading then that where we might see certain
references to US Ink that that could
interchangeably be interpreted as being not only
US Ink W-2 employees or full-time employees, but
agents or contractors that they have retained?
That's a fair inference?

DR. HOROWITZ: It's strictly a safety
analysis, so we looked at who in the future would
be in a position to prevent the accident.

MR. PIANTINO: And, Mr. Banks, I
gather you agree with that?

PARTICIPANT: We're going to have to
hold off on that type of -- the staff doesn't
answer questions per se and they make their
presentations, they certainly receive public
comment, but they are not here to answer their
assessment or evaluations of the report
themselves. They may, to a limited extent, have
answered some very factual questions, but in
terms of their own assessment, the report stands for itself.

MR. PIANTINO: Right. Yes, and I think our moderator has answered the question, but I'm trying to just ascertain what really the scope of the investigation was. And I think he's answered the question, so we can move on.

Again, one of the other interesting elements of the report, again not having a full opportunity to review it prior to this evening, is an indication that the flash fire, the second flash fire in or around tank 306 had caused the injuries that these individuals had sustained. And that, according to page 14, seems to have been brought about by the increased pressure in the duct work which led to a discharge of the suppression system.

And my question to Mr. Banks or anyone who was part of the investigation is whether or not there was any consideration given to the fact that while the suppression system may have prevented further damage to equipment,
particularly equipment on the roof, if it may have actually hastened or caused the flash fire which ultimately was the decisive force that injured these gentlemen? And was there any investigation into the suppression system in this case doing more harm to human life than good?

INVESTIGATOR BANKS: Well, I think the absence of a fire suppression system in the duct work is captured in our examination of this event. They explosion suppression system inside the dust collector was designed to suppress an explosion or deflagration. And when there was a pressure registered, the explosion suppression system performed. We examined inside the dust collector post-incident. We removed the filters and we could observe where the suppression activated the nozzle, the indentation that it left on the filters themselves. It was pretty clear that that performed as designed. The absence of a suppressant for fire in the duct work is something that, as I said, we captured in the report itself.
MR. PIANTINO: Did the CSB draw any conclusions as to whether or not the discharge of the suppressing agent and increasing the pressure in the duct work itself though may have hastened the flash fire itself?

INVESTIGATOR BANKS: I would say --

CHAIRPERSON MOURE-ERASO: I'm sorry, I have to interrupt this train of questions. The report speaks for itself. You can read the conclusions, the findings and the recommendations. I mean, if you are trying to elicit some new facts here, what I suggest is that you read the report. And we stand by it.

MR. PIANTINO: Okay.

CHAIRPERSON MOURE-ERASO: And that is what the object of the report is that, to present our recommendations. I don't think that we can second-guess it right now in this meeting through public comment.

MR. PIANTINO: Yes, thank you, Chairman. I'm not second-guessing the report in asking these questions, but some of them are more
of clarification. But I thank the Board for its time. Thank you.

DR. HOROWITZ: Thank you.

CHAIRPERSON MOURE-ERASO: Thank you.

DR. HOROWITZ: Is there anyone in the audience who didn't sign up who would like to speak? John Morawetz?

MR. MORAWETZ: Mr. Chairman, the Board and the staff, what I mentioned earlier was exactly the kind of --

DR. HOROWITZ: John, could you say your --

MR. MORAWETZ: Again?

DR. HOROWITZ: -- spell your name once again?

MR. MORAWETZ: M-O-R-A-W-E-T-Z.

DR. HOROWITZ: Thank you.

MR. MORAWETZ: This is exactly the kind of report that I think is -- what I mentioned earlier, that we use in training programs, we talk to our local unions about.

It's a root cause analysis. Very thorough
recommendations, which are really good.

I'm here more on this report for the Chemical Workers Union because we do represent about three or four facilities that manufacture carbon black. So it is of interest, the ins and outs of this. A very thorough investigation, that it wasn't, as far as I can tell, a simple carbon black situation. Still lessons to be learned.

I have four minor questions, or I can make them as points. One is actually on the slide up there. Is there a particular reason why this recommendation to the company, the only one, is oriented only to new personnel, not new and existing personnel, and why there's an "or" for initial and refresher? It's one thing we've seen continually is it has a communication. It's a one-shot deal training. If conditions don't change, workers do not get any refresher training unless another standard is triggered. So I don't know if there's a particular reason. It's a really minor point, but I would hope you would
consider it in the future.

DR. HOROWITZ: I think it can be read as "initial and refresher training." Perhaps it was a poor choice of word.

MR. MORAWETZ: No. 2, as the gentleman spoke from the trade organization on construction and building construction, I think that's a really -- it shows the far-reaching effects of your recommendations. Whether it's required or not, people pick up on them, they read about them, they try to make the right improvements. And it's something I think of benefit.

Is there a trade organization that covers the SIC codes that you identified for ink product manufacturing?

DR. HOROWITZ: There is an association of print ink manufacturers. I believe there is a gentleman here at the meeting.

MR. MORAWETZ: So what I'm thinking about; and again not necessarily to amend this report, but as something to go in the future, it's been a strength of other reports that it has
these far-reaching recommendations to other applicable organizations, that they should to hazardous analysis, management of change and do that analysis.

Three, you mention in Section 6.3 the hazard communication and evacuation plan, but there's no particular mention of the OSHA standards that govern that. Not that that's your responsibility; that clearly is OSHA's, but it would seem to me this is an opportunity to mention and reference applicable OSHA standards. Is there a particular policy on CSB about mentioning or not mentioning other standards?

DR. HOROWITZ: Not to my knowledge.

MR. MORAWETZ: Okay. A suggestion in the future.

Last but not least, I stand here also as a member, a board of director of the American Conference of Governmental Industrial Hygienists, and it's good to see the use, as we know industry uses the Industrial Ventilation Manual. There also is -- it's one of the major courses that we
do regularly, is put on industrial ventilation
classes. So I don't know where that would go in
terms of interaction between the CSB and ACGIH,
but I think that is an opportunity for
collaboration and joint work that we should both
look into.

DR. HOROWITZ: Well, we appreciate
that and any context you could help us in terms
of the distribution of this work or further
education efforts we'd be very, very interested.

MR. MORAWETZ: We'll be in contact.

DR. HOROWITZ: Thank you. Any others?

(No audible response)

CHAIRPERSON MOURE-ERASO: Thank
everybody for its comments. And we now proceed
to the vote. I am prepared to hear motions on
this report and this case study.

MEMBER GRIFFON: Mr. Chairman, I'll
make a motion. I move that the Chemical Safety
Board approve Report No. 2013-01-I-NJ, titled,
"Ink Dust Explosion and Flash Fires in East
Rutherford, New Jersey at the US Ink/Sun Chemical
Corporation That Occurred on October 9th, 2012," including all findings and recommendations contained or referenced in the case study.

CHAIRPERSON MOURE-ERASO: Is there a second?

MEMBER EHRlich: I'll second that motion, Mr. Chairman.

CHAIRPERSON MOURE-ERASO: So I will ask is there any discussion among the Board, further discussion on the case report?

(No audible response)

CHAIRPERSON MOURE-ERASO: Hearing none, I will call the question, and I ask the general counsel to proceed.

DR. HOROWITZ: The question on the motion is the approval of the report just referenced by Member Griffon, so I will call the roll accordingly. Mr. Ehrlich?

MEMBER EHRlich: I vote in favor.

DR. HOROWITZ: Mr. Griffon?

MEMBER GRIFFON: I vote in favor.

DR. HOROWITZ: Mr. Chairperson?
CHAIRPERSON MOURE-ERASO: I vote yes.

DR. HOROWITZ: In that case, the report has been duly adopted.

CHAIRPERSON MOURE-ERASO: Our business is almost done. I only have a closing statement.

I would like to reiterate that the message of this report is that we are summarizing our findings in the recommendations, and that we propose a total of eight safety recommendations that are very specific that include recommendations the U.S. Occupational Safety and Health Administration, the State of New Jersey and the US Ink Company. Let me emphasize part of those recommendations.

First, we are reiterating a call to OSHA to issue a comprehensive combustible dust standard to follow the guidelines that are already state-of-the-art in the control of combustible dust on the National Fire Prevention Association to include those.

We also ask OSHA to add the printing and the ink manufacturing facilities to the list of
industries that are part of the Combustible Dust National Emphasis Program.

To the State of New Jersey we also made recommendations to the New Jersey Uniform Construction Code, to the New Jersey Department of Community Affairs to address issues that you saw the details in the presentations.

And finally, we made recommendations to the US Ink specifically to install automatic fire alarm systems consistent with the National Fire Prevention Association Guidelines and also to address the issue of training workers on these facilities and the training that should include not only the original training course, but refreshers that we specifically make in our recommendations.

So those are the messages of this report and that we would like everybody to carry on.

I would like also to thank Mr. Griffon and Mr. Ehrlich for their participation in today's meeting. All of us share a strong
interest in preventing these tragic explosions from occurring. Our hope is to make sure that workers, that the communities and the emergency response personnel are not forced to experience an incident similar to the two discussed here today. In the next few months the CSB will be working with recommendation recipients to create safer working environments and communities.

I would like also again to thank all the participants, especially the people that participated in the public meeting with their comments. And with that, I declare this meeting adjourned.

(Whereupon, the above-entitled matter went off the record.)
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CERTIFICATE

MATTER: Public Meeting in the Matter of:
US INK/MILLARD REFRIGERATED SERVICES

DATE: 01-15-15

I hereby certify that the attached transcription of pages 1 to 204 inclusive are to the best of my belief and ability a true, accurate, and complete record of the above referenced proceedings as contained on the provided audio recording.

[Signature]

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