

Chair Sutherland: I'll call the meeting to order. Good evening, and welcome to this public meeting of the US Chemical Safety Board, or the CSB. I am Vanessa Allen Sutherland, Chairperson and Board Member of the Chemical Safety Board. And joining me today are Board Members Manny Ehrlich, Kristen Kulinowski, and Rick Engler. Also joining is our Acting General Counsel, Kara **Wenzel**, and member, uh – members of the CSB investigative team. The CSB is an independent, non-regulatory, federal agency that investigates major chemical accidents at fixed facilities.

The investigations examine all aspects of chemical accidents, including physical causes related to equipment design, as well as inadequacies in regulations, industry standards, or safety management systems. Ultimately, we issue safety recommendations, which are designed to help prevent similar accidents in the future. The purpose of this evening's meeting is for the CSB investigative team to present to the Board findings and draft recommendations from their ongoing investigation into the fatal methyl mercaptan release that occurred at DuPont's La Porte facility on November 15, 2014.

At this time, we will have a moment of silence to remember the four victims killed as a result of this accident. They are Wade Baker, Crystal Wise, and brothers Gilbert and Robert **Tisnado**. Thank you. I'd like to thank the families and friends of the victims for both your patience and your attendance. At this time, please allow me to go over this evening's agenda. First, we will hear from the DuPont investigation team. Following the team's presentation, the board will be given an opportunity to ask the team questions. Thereafter, we will have a public comment period and then a vote on approving the draft recommendations.

Before we begin, I'd like to point out some safety information. Please take a moment to note the locations of the exits from this meeting room, uh, three in the back and several along the walls. I also ask that you please mute cell phones so that these proceedings are not disturbed. The November 15, 2014, accident at DuPont's La Porte facility killed four workers when highly toxic methyl mercaptan was released. A CSB team has spent the last 10 months, 7 of them onsite in La Porte, conducting their investigation. They have uncovered several weaknesses or failures in DuPont's safety planning and procedures.

DuPont is one of the world's oldest and largest chemical manufacturers and has long been considered a safety leader. But this is the third CSB investigation into a fatal accident at DuPont in the past five years. One worker was killed in 2010 when a hose carrying phosgene gas burst at a Bell, West Virginia plant. Later that year, a welder perished in an explosion at a Buffalo, New York facility. At the La Porte plant, DuPont makes insecticides, herbicides, and other products in a – in separate units. Methyl mercaptan is a raw material of **Lannate**, which is a top selling, broad spectrum, insecticide.

Production of insecticide has not resumed at the La Porte facility. After the 1984 release of methyl isocyanate at Union Carbide's insecticide plant that killed thousands in Bhopal, India, DuPont La Porte made proactive changes on how it handled a different chemical also used to make Lannate, methyl isocyanate, or MIC. The facility moved production of MIC to an open building and installed equipment to destroy toxic chemical leaks. Du Pont didn't broadly adopt those measures for methyl mercaptan and chlorine, however, even though they are also toxic chemicals in the building used to make the insecticide.

Tonight, we are going to hear an update and interim recommendations from the investigation team. DuPont has agreed to address these proposed recommendations as part of its plan to safely restart insecticide production. We believe the recommendations describe what the company should do to protect the workers and the public at the La Porte – La Porte facility. That being said, I'd like to stress that the investigation is ongoing. Although these interim recommendations will improve safety at DuPont La Porte, there are several additional significant process safety issues that the team wishes to address before the Board issues a final report.

Farmers and the global economy rely on the advanced insecticides and herbicides made by DuPont at La Porte. But these products must be made with the utmost regard for the safety of workers and the general public. DuPont has long been regarded as an industry safety leader, but their string of recent fatal accidents tells us is that even the best can slip into complacency. Process safety deficiencies cost four families their loved ones and eroded public confidence in DuPont. My fellow Board Members and I are determined to make sure this does not happen again. And we will

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all look to the day when DuPont has taken actions to restore its once envied reputation for safety.

If anyone in the audience wishes to comment publicly after the investigators' presentation, please sign up on the yellow sheet in the check area to the left of the entrance. And I will call your name at the appropriate time. I will first call those who have signed up and then open the floor to anyone who wishes to speak. But please note that we will have to limit public comments to three minutes each just given the time and the need to get to the vote. I will now recognize my fellow Board Members for any opening remarks or introductions.

Member Ehrlich: Thank you. Good evening. I'm Manny Ehrlich. I empathize with how difficult this must be for you tonight and hope that you'll accept our sympathies and condolences, and mine personally. Thank you for being here.

Member Kulinowski: Good evening, Kristen Kulinowski, new Member of the Board. I'm pleased to be back in Houston where I once lived – um, lived for 13 years, although sad that it has to be for such a tragic occasion. I, too, extend my sympathies to the families and friends and look forward to, um, deliberating on the findings of our investigation team.

Member Engler: I'm Rick Engler. My sympathies also to the families of this tragedy. I also want to thank the workers for their cooperation, the national union that represents them, International Chemical Workers' Union Local 900C, and to their active engagement in the ongoing investigation. And finally, I would like to thank the DuPont Corporation for their cooperation with our investigation, their continued commitment to not reopen the facility until critical health and safety matters are addressed while, at the same time, continuing to employ and pay their employees.

Chair Sutherland: Thank you, Board Members. At this time, I would like to introduce the investigation team. Mr. Don Holmstrom is the Director of CSB's Western Regional Office located in Denver, Colorado. Mr. Holmstrom joined the CSB in 1999 and has led and supervised a number of CSB investigations, including the 2005 BP Texas City investigation, uh, which was an explosion and fire. Prior to coming to the CSB, he worked for 18 years in the oil refining industry, and he has extensive experience in oil refinery operations, Process

Safety Management, occupational health and safety, and incident investigation.

You can raise your hand, Don. Mr. Dan Tillema is the lead investigator and has 20 years of experience in the petrochemical industry in process, research and development, and operations engineering prior to joining the CSB. While in industry, he developed a strong process safety background and has extensive experience with plant commissioning and start up, process hazard analysis, incident investigation, process simulation, and relief system design and has been in Houston for 10 months working on this investigation. Mr. Steve Cutchen joined the CSB in 2011. He has over 33 years of experience in the chemical industry in process safety and process control engineering.

Over the last 10 years, he has specialized in incident investigation, risk analysis, and safety instrumented systems. In addition to technical roles, he held various management positions ranging from technical supervision to worldwide technology management. Ms. Tamara Qureshi, or Tammy, joined the CSB in 2014. She has a background in both chemical engineering and law. Prior to law school, she worked for an environmental engineering consulting firm. In that position, Ms. Qureshi worked on all aspects of environmental cleanup, including design and site safety. Prior to joining the CSB, she also was a district attorney. Mr. Holmstrom, please begin your presentation.

Donald Holmstrom: Good evening. Thank you for attending tonight's presentation on the DuPont La Porte investigation. My name is Don Holmstrom, and I'm the Director of the Chemical Safety Board's Western Regional Office and the supervisor of the investigation. Tonight, three investigators will be presenting their findings associated with the interim recommendations from the DuPont La Porte investigation. The speakers are Team Lead Dan Tillema; Attorney Investigator Tamara Qureshi; and Investigator Steve Cutchen.

Uh, I want to personally thank Dan, Steve, and Tamara for their excellent work, their diligence, and their sacrifice for being away from their family, in many cases, for weeks on end. Thank you very much. I will now turn over the presentation to Dan Tillema. Dan?

Dan Tillema: Thank you, Don. My name is Dan Tillema, and I am lead investigator for the DuPont La Porte investigation. We will begin our presentation this evening by showing an animation of the November 15 DuPont incident. We will then – we will then present our investigation activities and the events that brought us here today. After that, we will discuss our key findings and our proposed pre-start-up recommendations. Then we will describe our potential investigation pathways. Our presentation will be followed by Board Member questions and public comment.

At the end, the Board will have the opportunity to vote on adopting the interim proposed recommendations. I will now show an animation depicting the November 15 DuPont incident.

**[Video]**

Dan Tillema: Since 2010, the CSB has deployed to three fatality incidents at three separate DuPont facilities. The first was at Bell, West Virginia, in January 2010, which was a toxic chemical release. A total of three releases of highly hazardous chemicals occurred over a two-day period. One fatality occurred as a result of exposure to phosgene. The second DuPont deployment was to the **Yerkes** chemical site, in Buffalo, New York. This incident occurred less than eight months after the first. One fatality and an injury occurred as a result of a hot work incident.

Today, we are presenting interim recommendations for a third DuPont deployment, our ongoing investigation of the La Porte site. Last November, a release of 24,000 pounds of methyl mercaptan resulted in 4 fatalities, 3 personnel injuries, and 3 other personnel chemical exposures. While we have been onsite investigating this incident, there have been other smaller releases of highly toxic chemicals at La Porte, including chlorine and hydrogen fluoride.

The decision by the CSB to deploy to La Porte was based on our incident evaluation protocol, with important aspects being the seriousness of the incident itself with four fatalities, plus other injuries, and the fact that this was the third fatality incident for DuPont. This is the first time we've investigated one company for three separate fatalities, each at a separate facility. The investigation into the 2005 explosion of the **Isomerization** Unit at what was then the BP Texas City Refinery was, in many ways, a milestone for the Chemical Safety Board.

A point of emphasis was the distinction between personal safety, often described as slips, trips, and falls, from process safety, which addresses the control and prevention of fires, explosions, and accidental, uncontrolled releases of hazardous substances. Process safety can be further simplified as the management systems that ensure that hazardous chemicals stay inside the pipes and equipment. DuPont has a good personal safety record. But the incidents we have investigated raise concerns about their process safety performance. The CSB deployed to La Porte the day after the incident.

As we often do, we deployed a large response team consisting of almost half our investigative staff. Other agencies also deployed, and we coordinated our activities. I would like to note that our investigation team has had great cooperation from other groups and agencies throughout the duration of this investigation, including: DuPont and their employees; the International Chemical Workers' Union Council of the United Food and Commercial Workers and Local 900 C; KBR, a resident contractor and their employees; and federal OSHA, especially **Makiba Hagar**, Richard Nickerson, and Althea Powell.

We worked especially closely with these OSHA investigators, sharing our thoughts and findings as much practicable. Again, as we typically do, the initial deployment team was eventually pared down to a smaller investigation team, as most deployment investigators returned to their investigation assignments. We now have three investigators assigned. Since the beginning, we have held regular meetings with DuPont La Porte management and with local union leadership. CSB investigations go way beyond the immediate causal factors of an incident, delving into pre-conditions, management, organizational, industry, and regulatory causes.

This requires a lot of information, and you can see this reflected in the numbers for information we have reviewed. While this incident was not directly caused by equipment failure, there have still been tests to various plant equipment that have been carried out in order for us to fully understand the incident's sequence of events. We mentioned the regular meetings with DuPont. One of the things we do when we are onsite is talk with the company about findings and potential recommendations as we identify corrective actions that can be taken. CSB investigators do not

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want to wait until the end of our investigation to urge a company to implement needed corrective actions.

During our regular meetings, DuPont was cooperative and receptive to various opportunities for improvement. Many corrective actions that we have communicated during the course of the investigation have been accepted and incorporated into DuPont action plans. During the course of our investigation, CSB investigators were frequently told about pre-start-up plans and about potential restart dates. Ultimately, we learned from a DuPont manager at La Porte of a planned restart in August.

We were told that previously communicated corrective actions that we considered potentially critical pre-requisite – pre-requisites to a restart of the unit would not be implemented prior to the restart date. As a result, we interrupted the investigation to formally prepare pre-start up recommendations for Board consideration. I will now turn the investigation presentation over to Attorney Investigator Tamara Qureshi.

Tamara Qureshi:

Thank you, Dan. My name is Tamara Qureshi. And as Mr. Tillema has indicated, I'm an attorney-investigator. Today, we are presenting these pre-start-up recommendations for the Board's consideration. For each recommendation, we will discuss the findings they are based on. Included are recommendations in the following six areas: inherently safer design of manufacturing processes and facilities; worker safety in the manufacturing building; public and worker safety from the emergency relief systems; robust process hazard analysis; active workforce participation; and finally, public transparency and accountability.

First, I will discuss the findings that support our recommendations for using inherently safer design in evaluating DuPont's manufacturing processes and facilities. The DuPont La Porte plant was once a leader in applying inherently safer design. It is well-known for proactive changes made to the facility after the devastating December 3, 1984 accident in Bhopal, India. Considered the worst industrial accident in history, thousands of people were killed during a release of methyl isocyanate, also known as MIC, at a Union Carbide insecticide plant. That accident triggered global changes throughout the chemical industry.

One of the changes was to use inherently safer design. By inherently safer design, we mean that it eliminates or reduces hazards to avoid or reduce the consequences of incidents. The DuPont La Porte site was one such facility that had changed its practices. The DuPont La Porte insecticide business unit also uses methyl isocyanate. After Bhopal, DuPont made modifications that implied inherently safer design principles for MIC. At the bottom of this slide is an important excerpt from DuPont's actual design document for the MIC unit.

And it clearly shows how they applied inherently safer design principles by including an open building structure with equipment to direct potential leaks of toxic chemicals to an incinerator. As you can see here in this photograph of the MIC unit, DuPont implied inherently safer design principles through the use of an open building structure in systems to destroy leaks of highly toxic chemicals.

An open building structure and direction of toxic leaks reduces the hazards and consequences of a toxic leak because it minimizes the potential toxic chemical exposure to workers. DuPont's capability to apply inherently safer design principles in this situation has been previously acknowledged by the Chemical Safety Board. However, DuPont has not applied these same principles with other chemicals that they classify as highly toxic and that are used in the insecticide business unit. Two chemicals that they classify as highly toxic are chlorine and methyl mercaptan.

Unlike the MIC used in the same business unit, DuPont did not effectively apply similar inherently safer design principles to these other insecticide processes and facilities. For example, highly toxic chlorine and methyl mercaptan are located inside an enclosed manufacturing building and not in an open building structure. Note the differences between the photo of the MIC unit with the open building structure in the previous slide to the photo here of the enclosed insecticide business unit manufacturing building. DuPont's non application of inherently safer design extends farther than the manufacturing building.

Another example is pressure relief systems within the insecticide business unit. Displayed here are photographs of relief systems on the methyl mercaptan storage tank and the methyl mercaptan feed pump discharge. Both of these relief systems expose workers and

the public to potential toxic gas releases. These hazards will be discussed further in a separate section focused on pressure relief systems. The CSB is making a recommendation for DuPont to conduct an inherently safer design review prior to resuming insecticide manufacturing to evaluate the hazards created by the manufacturing building, and the discharge of pressure relief system with toxic chemical scenarios.

For an example, inherently safer design review for the building may answer questions such as, is an enclosed building necessary for this process? Can the stairways be opened up to eliminate trapping of toxic vapors? For the process, do you need an 18,000 gallon methyl mercaptan tank? Or, the relief valves, do they need to be routed to the atmosphere? Could they be routed to a destruction device to better protect the workers and the public? We are requiring that the results of the inherently safer design review be implemented to the greatest extent feasible.

The specific recommendation language can be found in the recommendation document. The next finding concerns a recommendation that addresses worker safety in the manufacturing building. For this recommendation, we'll look at several different areas of focus, including the manufacturing building structure and other elements of the manufacturing building, such as the stairways, the ventilation system, and the air monitoring system. First, we will discuss the hazards associated with the building itself. There are different reasons for why a company might put a process inside a building.

However, when we investigated the manufacturing building structure, we found that there were no documents that explained its design function. The building serves no apparent, essential, manufacturing purpose. Companies in the industry, at times, choose to enclose highly toxic chemical manufacturing equipment inside specially designed containment buildings. The general idea with the containment building is that, if a significant leak of a toxic chemical would occur, the leak would be contained in the building, and the toxic vapor would be routed to a destruction device such as an incinerator or scrubber.

DuPont has stated that the manufacturing building is not a containment building. But given how it encloses highly toxic chemical manufacturing equipment, it can – it can be compared to

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one from a worker and community – community hazards point of view. Industry has recognized that when containment buildings are used, there is a benefit to the community because it is less likely that the toxic chemical will travel offsite and impact the community. However, industry has also recognized that enclosing the leak within the building creates an increased hazard to workers.

The insecticide business unit manufacturing building introduces increased worker hazards similar to that of a formal containment building without the benefit. For example, if there is a toxic leak, it is trapped and concentrated inside. But these toxic vapors are not routed to a destruction device. Unlike a containment building, these hazards are not balanced by the benefit of providing risk reduction to the public. Instead, if the toxic vapors are collected, they're discharged from the roof five floors up to the outside atmosphere and, in turn, potentially, to the public. Next, we will talk about the hazards associated with the stairways and the manufacturing building.

The manufacturing building stairways are the primary means to access equipment or to enter or exit the building. The stairways were not a safe haven for workers from toxic gases in the manufacturing building. Although workers routinely access the stairways, they are not connected to the building ventilation system and have not been evaluated for toxic gas hazards or oxygen-deficient environments. DuPont designed these stairways for fire escape. There are internal fire doors separating the stairways from the process equipment area, as you can see from the prior slide. These doors do not provide barriers to hazardous gases entering the stairways from the process areas.

The next area of focus is the manufacturing building's ventilation system. As you can see in this simplified drawing of the ventilation system, the building is divided into two halves. On the left is the wet end where liquids are processed. And on the right is the dry end where powders are processed. On each side, fresh air enters through the louvers, is swept across the equipment, and up into the exhaust air duct. All of these exhaust air ducts from each of the floors and from each side of the building are collected into common headers. One for the wet end and one for the dry end.

The air is pulled through the ventilation system by fans mounted on the roof like the one shown here, which is for the dry-end fan.

There are many problems with the ventilation system that make it ineffective. The previous slide showed how the ventilation theoretically creates an airflow pattern. In actuality, there are short-circuited air patterns that prevent the system from working effectively. The wet end and the dry end each has its own ventilation fan. The ventilation system was designed with the idea that each half of the building would operate independently. Additionally, the two halves would be divided by closed fire doors.

When we discussed the stairways, you may recall there was a sign on the door, a fire door, saying to keep it closed. Similar doors separate the wet end and dry end, as you can see here. Although these doors also have signs to keep them closed, these doors are often propped open. Moreover, doors to the outside would also be propped open, further interrupting air flow patterns. There are also holes in the outside walls of the building that are not sealed. The open fire doors and the holes in the wall allow air into the building and adversely affect the airflow patterns within the building.

We have a short video clip, which illustrates the effect of these short-circuited air flow patterns. In the middle-top of the picture, there is a light bulb, around which is a cloud of steam. When you watch the video, as the camera zooms in, you will see that the steam is stagnant and not being swept towards an exhaust duct. As you will see in this video, there is not good ventilation even when the fan is in operation. The ventilation system had two design objectives. Preventing flammable and toxic conditions inside the building. The ventilation system, like other parts of the building, was designed to deal with chemicals that are flammable.

One of the values used is a Lower Explosive Limit. The limit they would use for methyl mercaptan would be 65 times greater than the amount that would be immediately dangerous to life or health. However, the ventilation system does not meet its toxicity design objectives to control contaminants to acceptable work place exposure levels. There are no documents describing how DuPont planned to meet this objective. And it is important to emphasize that this design objective is communicated to workers. It is written in the operating manual and the safety and occupational health section of the unit technical standards.

Workers reading this objective would reasonably assume that the ventilation system would protect them from a toxic release.

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However, preliminary calculations indicate that even had the fans been running, the design objective of acceptable work place exposure levels could have not been met during this incident. There would have been insufficient ventilation to avoid a lethal atmosphere inside the room where the release occurred. The performance capability of that ventilation system in the wet end area is unknown because it has not been tested. A 2009 audit of the DuPont La Porte's Process Safety Management system found that the ventilation was not being tested as it was supposed to.

The audit team created an action item to fill this gap. However, all that was required to close the audit action item was to create a periodic work order or dilution air flow testing. Two years passed before it was identified that testing had not occurred. Because DuPont technical did not understand the testing requirements, the ventilation system was not fully evaluated. Despite the 2009 audit finding, the flow rate and effective distribution of dilution air for the wet end fan was never tested. Moreover, only dilution air flow measurements for the dry end fan were taken. But there was no analysis—just measurements.

Finally, maintenance of the building ventilation fan as been ineffective. The ventilation fans are classified as process safety critical, or PSM critical equipment, meaning that their failure could result in a high-consequence event. Neither ventilation fan was operational at the time of the November 15, 2014, incident. The wet end fan and dry end fan both had poor reliability. The dry end fan had been down for five months since 2000 – June 2014 due to an electrical problem. The wet end fan was shut down on October 20, 2014, because it was making a noise significant enough that DuPont operators turned it off and wrote an urgent work order to have it repaired.

Despite the urgent work order, this fan required to ventilate the room where the release occurred was not fixed. The failure of these safety-critical fans did not result in additional safety precautions, such as special operating procedures, special emergency response procedures, worker access restrictions, or additional Personal Protective Equipment requirements.

The final focus is the manufacturing building air monitoring system. One of the chemicals that the manufacturing building's gas detector system monitors is methyl mercaptan. At the time of

the incident, there were three methyl mercaptan detectors located in the building.

Two on the first floor, one on the fourth floor, zero were located on the third floor, where the release took place. The design of the gas detectors did not effectively protect workers. They do not provide an effective warning. For example, there are no gas detector alert systems in the building. The only alarm is in the control room. Workers in the building have no independent way to know if a building gas detector has gone into alarm. Furthermore, there is no warning to prevent workers from entering the building if there is a hazardous atmosphere. A worker could enter the building without knowing that a gas leak has occurred and then become incapacitated before being able to react.

DuPont has designed a building with atmospheric monitoring to protect workers. They have done so with the analyzer house shown here, which is located in the same business unit where the incident took place. As you can see, there is a green light at the door. If it is not safe to enter, a local alarm sounds at the door, and the green light outside turns off. Unlike the manufacturing building, this DuPont analyzer house provides warning to workers to prevent entry into an unsafe atmosphere. DuPont's response to a methyl mercaptan gas detector alarm is not sufficient to warn workers or the public.

Hours before the November 15, 2014 incident, multiple, highly toxic chemical gas detectors alarmed. Furthermore, methyl mercaptan releases on November 13 and 14 were picked up by methyl mercaptan detectors, but they were never reported as releases nor investigated as serious process safety incidents. DuPont's methyl mercaptan detectors are intended to provide early warning of significant leaks with potential offsite impacts and do not protect workers from exceeding short-term exposure limits. The alarm point of the methyl mercaptan detectors is 25 Parts Per Million.

The alarm is set at the Emergency Response Planning Guide 2, or ERPG 2, which is where irreversible health effects begin after a one-hour exposure. This alarm point of the methyl mercaptan detectors is above the permissible exposure limit for workers. The OSHA permissible exposure ceiling limit is 10 Parts Pper Million. This means that workers should not be exposed to concentrations

greater than 10 Parts Per Million for any duration of time, even instantaneously. It is important to note that OSHA has recognized that this exposure limit is outdated. OSHA, instead, recommends companies use [inaudible] [00:55:13] or **CALOSHA** exposure limits of 0.5 parts per million.

To ensure worker safety inside the manufacturing building, the CSB is making pre-start-up recommendations to DuPont to conduct an engineering evaluation of the manufacturing building and ventilation system and implement corrective actions to ensure worker safety to the greatest extent feasible. In addition, the CSB recommends that DuPont document the design basis for the manufacturing building and ventilation system, and identify controls for highly toxic asphyxiation and flammability hazards. And, again, as we have emphasized, the specific recommendation language can be found in the recommendations document. I will now turn the presentation over to Investigator Steve Cutchen.

Steve Cutchen:

Thank you, Tamara. My name is Steve Cutchen, and I'm an investigator with the Chemical Safety Board assigned to this DuPont incident. Next, we'll discuss worker safety from emergency relief valve systems. DuPont has been in the process of implementing a five-year program at La Porte to validate that pressure relief systems comply with existing DuPont standards, process safety regulations, and industry standards and codes. Industry standards and codes and regulations for relief systems are well-established.

The American Petroleum Institute Standard 521 is included in this, as is the American Society of Mechanical Engineers Boiler and Pressure Vessel Code. On the regulation side, OSHA's Process Safety Management Regulation is enforced with respect to these relief systems. DuPont's five-year plan to evaluate relief systems is due to be completed this year, 2015. However, the work is only 35 percent complete. And the CSB has identified that the scope of DuPont's program is not sufficient. It does not effectively evaluate relief scenarios. It also does not effectively evaluate whether relief system discharges are routed to safe locations.

As a result, the evaluation program does not effectively ensure the safety of workers or of the public. I have four examples of relief systems in the insecticide business unit that the CSB has identified as not meeting standards. The first is on the methyl mercaptan

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storage tank. This is the tank that was involved in the November 15 incident. In 2002, DuPont evaluated the potential to exceed offsite concentrations from a release of methyl mercaptan through the relief valves on the top of this 18,000 gallon methyl mercaptan storage tank due to a fire. The relief valves are located up here – oops, I'm sorry, up here on top inside this yellow circle.

And these vertical sections here are the discharges to the atmosphere. DuPont's evaluation of these relief valves found that they could release as much as 10,000 pounds per hour of methyl mercaptan if there was a fire under this tank and that, if they did do that, the relief rate was, uh, high enough that it would exceed the ERPG 3 values for methyl mercaptan. If you recall from Tamara's presentation, ERPG 2 was the point where irreversible health effects began after one hour. ERPG 3 is where the concentration is high enough that life-threatening effects are expected after one hour.

And while the ERPG 2 limit is 25 parts per million, ERPG 3 for methyl mercaptan is 100 parts per million. To mitigate this risk to the public, DuPont invested over \$17,000.00 to insulate this tank with fire proof insulation. Proper fire proof insulation will slow the rate at which heat enters a tank due to a fire. And, as a result, the relief rate will be smaller. DuPont's analysis found that the addition of fire proof insulation could reduce the relief rate from these two relief valves from 10,000 pounds per hour to 4,500 pounds per hour, which would avoid ERPG 3 concentrations in offsite as an exposure to the public.

However, as you can see from this photograph, the tank is not insulated. The insulation intended to protect the community from ERPG 3 concentrations of methyl mercaptan was removed. So since that time, workers and the public have been exposed to unacceptable risks. The CSB has been unable to determine when the insulation was removed. DuPont lacks documentation, for example, management of change. And the change is not documented in the process hazards analysis associated with this tank. Also, current DuPont personnel were unaware of the tank ever being insulated for the purpose of limiting toxic gas exposure to the public.

The second example of an unsafe relief system involves two relief valves located on a nitrogen supply system in the IBU. These two

relief valves could open if controls that regulate the nitrogen system pressure were to malfunction. In the photograph, you can see the discharges of the relief valves are directed to the underside of a rack containing piping and other process equipment. So that's – that's these two arrows. Here's the relief valve, the little gray relief valve. And you can see the arrow from this other one as well directed up at the underside of this piping. Also, if you look in the back, you can see this ramp and doorway.

This is an access point into the building for workers. If those relief valves open, nitrogen will deflect off of that piping and be directed toward the ramp in that opening. This is an asphyxiation hazard. DuPont's standard specifically prohibit both of these scenarios. Relief systems are not to be designed to impinge on piping. And relief systems are not to be designed so that they're directed toward platforms or other areas used by workers. The third example involves a relief system that activated while we were on site doing our investigation in December—on December 16 of last year.

Highly toxic chlorine was released from a relief valve on a caustic scrubber located within this – the relief valve was located within this yellow oval that you see in the photograph. Now, it's hard to see the actual valve because there's so much congestion with the piping. Where this is located is on the outside of the manufacturing building. And there are portions of the building on three sides. The detector – the chlorine detector that actually detected the – the relief valve going off is located on the other side of the structure that you see in this photograph.

Recall from the previous example that DuPont's standards specifically prohibit relief systems that are directed toward platforms or areas used by workers. For this relief system, DuPont actually evaluated this. And they concluded that the location was safe because the platform associated with the valve was located 10 feet below the valve. But if you look at the photograph, there are platforms also located above that valve. Finally, like the storage tank example, this example includes a relief system that was on the equipment that was associated with the November incident.

The relief valve shown here is on the discharge piping of the Lannate® feed pump that feeds methyl mercaptan from the storage tank into the manufacturing building. This is the feed pump that

feeds the feed line that was frozen. Relief valves on this piping are designed – in the circle that you see here, are designed to discharge liquid methyl mercaptan to the ground adjacent to where workers were stand – would be standing if they were starting that pump. Now, there are actually two pumps. And they're virtually identical. The other pump also supplies methyl mercaptan, but it's to another process called API.

The API pump also used to have relief valves just like this one here on the Lannate® pump. But they were removed in the 1990's. No process hazard analysis or relief system analysis documents these Lannate® valves and answers why they are not still present. And key DuPont technical personnel were unaware that these valves existed. The CSB is making recommendations to DuPont to ensure that all IBU pressure relief systems are routed to a safe location prior to resuming IBU manufacturing. And we're also recommending that DuPont commission a pressure relief device analysis consistent with standards and codes.

And that implementation of the results of that analysis must specifically result in all pressure relief discharges being routed to safe locations. And as we've been saying, the details of our recommendations this evening are found in our document. Next, I'm going to talk about Process Hazards Analysis. Process Hazards Analysis, or PHA, come in many forms. For example, if there's a new capital project that's being implemented, a series of PHAs are typically performed at various stages: design, construction, and pre-commissioning. OSHA's Process Safety Management Regulation requires periodic PHA's be conducted for existing processes.

A PHA is also included as part of the OSHA-mandated Management Of Change process that discovers – that – that covers any modifications that you make to a given process. I'm going to describe two areas associated with the incident where the CSB investigation has revealed deficiencies in the PHA process at the DuPont La Porte facility. The first example has to do with the manufacturing building ventilation system, which Tamara described earlier. The left photograph here shows the dry end and the wet end fans located on the roof of the manufacturing building on the fifth level.

On the right at the bottom are the louvers that she described through which fresh air is drawn in. And the photo at the top is the ductwork, which routes the exhaust air to the outside collection duct and up to the fan located on the roof. The ventilation system for the manufacturing building, a process safety-critical system described as designed to control contaminants to an acceptable work place exposure level, has never been evaluated by a Process Hazards Analysis. The DuPont PHA schedule indicates that the initial PHA for the manufacturing building ventilation system will not occur until 2017.

The second example that I'm going – that I'm showing involves the valves that were described in the video of the incident. These are the valves that connected the liquid methyl mercaptan feed system to the vapor waste gas vent header at each of the two railcar spots. One of these five valves that was open at each railcar spot to create this pathway was installed as part of a project to build a new incinerator for the insecticide business unit. The design change for this new incinerator re-routed the railcar vents from an old existing incinerator. And instead, the vents were routed through the manufacturing building into this new incinerator.

The project PHA did not identify this new connection or the routing of this methyl mercaptan vent from the railcars going through the manufacturing building as potentially causing a hazardous event. And on the evening of the incident, the plan for using hot water on the outside of the methyl mercaptan piping to melt the hydrate—that plan was developed by DuPont technical and operations staff on the morning of Friday, November 14. This plan included using this new railcar unloading spot valve to purposefully connect the liquid methyl mercaptan feed line that they were trying to thaw to the vapor waste gas vent header. No written plans or instructions were developed.

No PHA was used to evaluate the potential hazards of this plan. In the photograph, the white valve on the far right, so that's this valve right here, is the valve that – that – the new valve with the new connection through which the liquid methyl mercaptan flowed in order to reach the third floor of the manufacturing building. This photograph was taken by DuPont three days after the incident in order to document the position of the valves as found. It's a little hard to see, I think, on this big screen, especially if I change the slide. But, so, this is the hand wheel of this valve. And there's a

stem sticking out here pretty far, which is an indication on a valve like this that this valve is open.

DuPont determined the valve was fully open at the time of the incident. I mentioned earlier that OSHA's Process Safety Management Regulation requires periodic PHA's be conducted for existing processes. Well, there are two types of periodic PHA's. Baseline PHA's are conducted from a clean sheet of paper. They amount to a fresh look at a – the process safety of a particular unit. Revalidation PHA's, on the other hand, start with an existing PHA and check for required updates. DuPont had divided – has divided their insecticide business unit into 15 different areas for conducting these OSHA-required periodic PHA's.

And DuPont decided to, prior to start-up, to conduct two new baseline PHA's for two of the areas out of these 15. Now, there are several methods for conducting a PHA that are approved and actually listed within OSHA's regulation. At the 2012 Global Congress on Process Safety, which is hosted by the American Institute of Chemical Engineers, a DuPont corporate PHA expert presented a new, robust PHA method, which combined advantages of several existing methods. DuPont decided to implement this new method for these two new, baseline PHA's.

Many new potential hazardous events were identified, and hundreds of new corrective actions have been developed using this new method. DuPont has since agreed to implement an expedited schedule for the remaining IBU PHA's applying this new methodology and prioritizing high hazard processes. So the CSB is making recommendations to DuPont to formalize this agreement. Develop and implement an expedited schedule to perform more robust PHA's consistent with the previous recommendations of systems that we've identified this evening for all of the IBU units, and prioritize that schedule based on anticipated risks to the public and workers, in order to ensure that the highest risk areas receive priority consideration.

And, again, the specific language is found in our document. Our next topic is the importance of active work force participation. Throughout our investigative work, the CSB has identified that workers and their representatives play a very important role in major accident prevention. The Center for Chemical Process Safety is an organization of the American Institute of Chemical

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Engineers, and they endorse this importance of worker involvement and participation with strong language in the book *Guidelines for Risk Based Process Safety*. Now, I'm going to read their quote verbatim.

“Workers are potentially the most knowledgeable people with respect to day to day details of operating and process and maintaining equipment and facilities, and they may be the sole source for some types of knowledge gained through their unique experiences. Work force involvement provides management with a mechanism for tapping in to this valuable expertise.”

With these benefits in mind, the CSB is making recommendations to DuPont, to the International Chemical Workers' Union Council of the United Food and Commercial Workers, and Local 900 C, to work together to develop and implement a plan for effective participation of the work force and their representatives in the implementation of the CSB recommendations regarding the issues we've talked about this evening: inherently safer design review; ensuring worker safety in the manufacturing building; ensuring a relief system design that is safe for workers and the public; and the performance of more robust Process Hazards Analysis.

In addition, the CSB recommends that DuPont provide a copy of their integrated plan for restarting the La Porte processes to the workers and their local union representatives. And, again, the specific language is in our document. Finally, we discuss the importance of public transparency and accountability. In our Chevron Richmond Refinery investigation, the CSB identified that transparency between the industry and the public improves health and safety for both the facility and also for the community.

So, with these benefits in mind, the CSB is making recommendations to DuPont to make publicly available a summary of the DuPont November 15, 2014, incident investigation report and a summary of the actions to be taken to implement those same four items that I just listed: inherently safer design review; ensuring worker safety in the manufacturing building; ensuring a relief system design safe for workers in the public; and the performance of a more robust Process Hazards Analysis. And I know you're getting tired of it, but the specific recommendation language is in our document.

As we described at the beginning, the recommendations presented today are interim recommendations that the investigation team considered potentially critical prerequisites to a re-start of this unit. We interrupted our investigation to develop these recommendations for Board consideration. And with this work completed, the investigation team will now shift back to putting its full attention on the investigation of the November 15 incident. Our focus will include the following potential investigative pathways.

There are circumstances that existed at DuPont, which may have created pre-conditions to the incident in the areas of safety culture, normalization of deviance, and equipment design. There are also systems that we were investigating, which are intended to create awareness of hazards and risk, such as Process Hazards Analyses and Management Of Change systems. There are potential pathways centered on the organizational techniques and practices that were – are used for trouble-shooting operational issues such as the blockage of this methyl mercaptan feed line. These include areas of leadership, communication, and the development of procedures for ad hoc, or one-off non-routine activities.

We will also continue to investigate the emergency responses that occurred after the release and will continue evaluating guidance for industry sources, for example, in the areas of equipment design, PHA requirements, and the safety of ad hoc procedures. And, finally, we will continue to investigate whether there are potential improvements to existing regulatory requirements, which would be effective in preventing a recurrence of an incident like this. So this concludes our presentation, and we're now prepared to proceed with the agenda for this evening, beginning with questions from the Board.

Chair Sutherland: First, thank you to the investigative team, uh, for a very detailed presentation. And before we take public comment, we will take questions from the Board. The Board will, uh – or any Board Member that has a question will indicate so by slightly raising their hand. I will ask the first question of the investigation team. We have listened to – I have personally listened to - union members, DuPont management, um, and even received a call directly from, um, a VP and the CEO of DuPont, to talk about their commitment. But Mr. Tillema, you mentioned that they are starting work, or beginning work, on some of the recommendations.

Can you provide a little bit more detail about, um, their progress and – and how many resources you could glean? They've committed to it, even though they've orally committed that they're beginning to look at the draft recommendations and commence work based on what we have identified.

Dan Tillema:

So, to discuss how much DuPont has done already? Okay. Um, you know, when we – we started first developing these interim recommendations back in early June – June – June 11, at which point in time, DuPont was not willing to do the recommendations we're presenting here tonight. After we got that first draft, um, completed (that was around June 23), we were able to provide a copy of that to DuPont for our factual and CBI process for quality control that we have.

And, uh, after DuPont received that document, about a week later, they had changed their position on the recommendations, and had verbally or orally agreed to adopt the recommendations and get them implemented. Since then, you know, we've had several conversations with them about their – their progress on those. There's, you know – it's a big scope of work. And DuPont will tell you that, you know, they do not have a re-start date at this point in time. They've – they've postponed what we believed was the August start-up.

Um, and they've been working still on developing a more comprehensive re-start plan, which is what we've asked them to share a summary of with the public, share the more full details with the union workers at the site and ourselves. Um, but the – the details of that re-start plan are – are still being developed. And I don't think there's a start-up date even as of yet.

Chair Sutherland:

But would you expect the re-start plan to include, or progress reports to include, significant progress on all of the draft interim recommendations before you would consider the facility safe to re-start?

Dan Tillema:

I think so, yes. I mean, definitely, like with the relief valves, we – we've been told there's a lot of work going on with relief valves to make sure those systems are going to be safe before they restart. Some of the PHA's will even be completed. The new baseline PHA's with the more robust methodology, um, will be completed

before we start. Um, they're committing to an expedited schedule rather than the five-year regulatory review. Uh, what we've been told thus far is that it will be more like a three year schedule for the relief valves.

The inherently safer design reviews are taking place, and they've committed to looking at everything, um – I – I – I won't go into the specific details of some of the things they're looking at because I don't want like to commit them to things that might not wind up happening. But what we've been told is they are taking these very seriously. And they are looking at the inherently safer design options very seriously.

Chair Sutherland: My last question before I recognize, uh, individual Board Members is, Ms. Qureshi, you mentioned that, um, the containment facility did not have any destruction device. Can you explain, uh, to us whether it is equally safe if they had had a – a containment building with some appropriate destruction device or routing system versus a more open structure? Are those equally safe, or should they be looking at one versus the other?

Tamara Qureshi: That is actually part of what, um, DuPont is actually doing. They're actually investing money in getting resources so that they can evaluate what would be an appropriate structure for that particular building. So they are going to be the ones who have all of the analysis and the data to determine: whether or not would it be safer to have walls or what parts of the area would have walls; what type of ventilation system would be appropriate; um, or to actually just take all of the walls off. That is all part of what DuPont will be doing, and part of their analysis.

Chair Sutherland: Thank you.

Dan Tillema: Might I just add to that that, you know, looking at the containment building and open structure versus closed is really a risk tradeoff that DuPont has to look at and make a decision on. There's an increased work – increased risk to the workers with the containment building type design. There's a risk reduction to the public. And it's really a corporate level decision on what their ultimate preference is going to be.

Chair Sutherland: Thank you. I saw a hand from Member Ehrlich.

Member Ehrlich: First of all, I want to thank you for the commitment you made to this and an excellent presentation. Thank you all very much. I'm always interested in the emergency response aspects of these things. Uh, you stated that you're going to look at all of the emergency response incidents that have occurred. But beyond that, are you going to look at all of the requirements, uh, that are set forth by OSHA and other regulatory agencies for implementing, equipping, training, and exercising, an, um, adequate emergency response function?

Dan Tillema: Um, uh, short answer will be yes. I mean, the longer answer is DuPont is actually doing a lot of that. I mean, since the incident happened, um, ultimately, the emergency response itself we don't see as causal to the incident in any way. However, they saw a lot of shortcomings in their emergency response programs. And they've – they've gone back and reassessed that entire program. And a lot of that work is still pending. So it's not fully complete yet.

Member Ehrlich: Okay. And I have one more question.

Steve Cutchen: I'll – I'll add to that just briefly. I mean, one of the things that we've come to realize is one of the – the – the supervisor who perished in this incident, Wade Baker, was – had a very, uh, important role with respect to emergency response on that – on night shift like he was on. And when he went down as part of this incident, that created a – a pretty big gap in how they could respond and how to fill that gap in a situation like that is something that we need to look into. Uh, another area is that there are multiple companies associated. All that used – this – this used to be one big, DuPont facility.

And now, there are several companies associated with bits and pieces of this what formerly was one big site. And they all work together to effectively put their emergency response teams as one. That process is still difficult though because you're looking at trying to coordinate that across different companies. And we'll be looking into some of the effectiveness of how that works.

Member Ehrlich: Thank you. Well, on top of that, um, not only different companies but different product lines and different training requirements for the responders as well. Um, emergency response on-off shifts is always a problem where you don't have a full staff. And it just requires an absolute commitment to some type of public group or

public service group or, uh, just people that are available for emergency response training 24/7. I have one more question. You commented that, I think it was you, Steve, that the, um – or maybe it was Tammy, the – the, uh, ventilation system PHA was supposed to have been done and has been postponed until 2017, is that right?

Steve Cutchen: I think it's – what's happened is it hasn't been part of a PHA. And the first scheduled PHA for the ventilation system was scheduled for 2017.

Member Ehrlich: Okay. But that's going to be expedited, I assume, right?

Steve Cutchen: We would expect so, certainly, yeah.

Member Ehrlich: Okay. Thank you. Thank you, Chair.

Chair Sutherland: Thank you, Member Ehrlich. Member Kulinowski?

Member Kulinowski: I'd like to ask a question about Personal Protective Equipment and its role in this tragedy. Did you find any evidence that there were safety protocols for the use of Personal Protective Equipment, particularly a respiratory protection, uh, for these workers when they were conducting such non-routine operations as – well, non-routine that became routine - of opening this valve to relieve the pressure?

Dan Tillema: So, I mean, DuPont has a great many policies and procedures. There are policies and procedures that, if you read them, they will imply to you that Personal Protective Equipment, like respiratory protection, should have been worn for that job. However, at the same time, the daily instructions that operators were following to go out there and drain that line, um, did not specify any additional, um, Personal Protective Equipment or respiratory equipment and the practice that developed over time was not to use it. Um, I don't know, do you guys have anything else that you would add to that?

Steve Cutchen: I think, I mean, the material that they were normally draining was something that was pretty smelly. But I don't know that they felt like that there was a particular hazard associated with it. What happened in this situation was that you – you had methyl mercaptan almost – well, essentially pure methyl mercaptan on the other side of that valve when it was opened and not the normal liquid that they were used to having collect in that vent header.

And so it – you know, it’s a situation where maybe the normal response is – or the response that’s been normalized based on what your initial instructions were is to not use respiratory protection because you just don’t see a need for it.

But then there’s alternate scenarios that maybe everybody hasn’t thought about and hasn’t come up in a PHA, uh, that, as a result, can catch you by surprise.

Member Kulinowski: And it is your conclusion that these – if these PHA’s had been done, this – the potential for this hazard could have been identified?

Steve Cutchen: I believe that – that – that this was, essentially, a line break on these lines when these lines were drained. And as such, uh, DuPont should have been requiring, uh, that they be wearing full respiratory protection, yeah.

Dan Tillema: But going back even further with the PHA, I mean, liquid in a vapor vent header system is something DuPont has dealt with in two other applications on the same vent header in other applications that have a drain line hard-piped to other process equipment, so it would not have to be released to atmosphere at all. Um, and – and I think a PHA would be reasonably expected to catch something like that and to offer corrective actions.

Member Kulinowski: Thank you.

Chair Sutherland: As a related or follow-up question to Member Kulinowski, how would the methyl mercaptan – uh, methyl mercaptan detectors, um, sort of work together with this? Because, clearly, they are implementing, or DuPont says they’re going to implement, new alarm detectors. But even if the alarm detectors had been there and – and working - had it been set at an appropriate level, they still wouldn’t have been able to enter. Is there going to be more specificity placed on the detectors setting it at the right level, making sure that people know, even with our equipment, we shouldn’t go in because the amounts or concentrations here are too deadly?

I mean, tell – tell me a little bit more about how the new alarms or detectors might also, um, prevent people from walking in, even if they do have the appropriate PPE.

- Dan Tillema: Yeah. So, we still don't have the full details of how many detectors are going to be installed. Clearly more are going to be installed. We saw some of them on our field review this week, new detectors out there. We saw lights on the outside of the building that appear to be some kind of a pre-warning system that there's an – an unsafe atmosphere in the building to prevent people from going in there. Um, but we still don't have the full details of what DuPont's plans are there. Um, that's – that's something we'll look at as those – as those details are provided to us.
- Chair Sutherland: Okay. I heard you. Um, I'll recognize Member Ehrlich.
- Member Ehrlich: Um, was there any indication that they had completed a comprehensive Haz Com, uh, either under the old 1200 standard or Haz Com 212 training, uh, in that unit?
- Dan Tillema: Um, gosh, off the top of my head, I don't remember that. I know there's – there's a lot of training that DuPont employees take. I don't remember the specific Haz Com training. Um, I'm sure we've seen training records for that, I just don't remember.
- Member Ehrlich: Okay. And I guess one other question I had was, are they going to use or implement a procedure where they use four gas monitors when they go into these areas aside and apart from the fixed sensors?
- Dan Tillema: And I think – I think a lot of that is – is still not fully known to us. I mean, you know, we haven't talked about it, but, you know, there's even the explosion potential during the incident.
- Member Ehrlich: Right.
- Dan Tillema: That's all stuff that we're still continuing to evaluate and understand how they intend to address that in the future because at – at one point, you know, you're worried about the atmospheric from an inhalation toxicity. From another point, you don't want anyone going in there because it's, you know, an explosive atmosphere in there. And that has to be considered, as well. Again, those are details of what we'll be looking at as we go forward. But we just don't have sufficient information.
- Member Ehrlich: Thank you.
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Chair Sutherland: Member Engler, do you have any questions?

Member Engler: Thank you. I have a quick comment and one question. Over two months ago, the International Chemical Workers' Union Council and the United Steel Workers, which represent DuPont, workers across the nation wrote to the CEO of DuPont, Ellen Coleman, asking her to start a dialogue about how to better protect safety and health in the environment with the two unions. But to date, she has not agreed. I encourage DuPont to reconsider its position and engage in such a national dialogue, which can only help implement the CSB's recommendations at La Porte, particularly if there are issues with limited resources to conduct PHA's in a timely fashion.

Uh, my question is, and it speaks to the larger question of safety culture, is that I understand that a DuPont La Porte employee with eight years of experience was disciplined in 2013 for allegedly leaving a valve open involving chlorine. Now, we find out from our investigation that La Porte site policies, procedures, and training were fundamentally flawed. Is it appropriate in – in your view to penalize individual workers in these types of situations? In my view, blaming workers creates a climate of fear, which suppress reporting and open discussion of health safety and environmental concerns. I would appreciate your comments on that question.

Dan Tillema: Um, in – in general, um, in that particular incident, if it's the one I'm – I'm thinking you're referring to, is – is something we are looking at as part of our investigation. Our focus with that incident is really, since we've been at the site, we've heard from the workers that DuPont incident investigations do have more of a focus on blame and less of a focus on preventative corrections. Um, that's something we really want to better understand. It's one of the areas where we're hoping the union and DuPont management will better collaborate so that every incident that is investigated by DuPont gets full preventative learnings, um, rather than a focus on blame.

I – I don't know that I'm in a position yet to state whether that was the case or not because the – the investigation is still something we're looking at.

Member Engler: Thank you.

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Steve Cutchen: You know, I – I think that when you look at what people typically do when they go to work, what people want to do is they want to work for a company that – that performs well. They want to work for a company that treats them right. And when people go to work, they're typically trying to do a good job. And when the decisions they make are decisions they make because it seems like it's the right thing to do at the time. So it's very – it's almost unprecedented for somebody to – to make some kind of a move or to push the big, red button out of spite or something along those lines. They're doing it because it seems like the right thing to at the time.

And that's why, uh, what we try to investigate – Dan mentioned about going into very deep, uh – deeply into what the preconditions and causes are organizationally, uh, for these – for these kinds of incidents because it's very rare that it's the actual individual who is just, on a wild hair, decides to – to do something. Usually, it's because what it seems like the right thing to do at the time. And the question then becomes why – why was that? And so you're looking at pre-conditions. You're looking at organizational issues. And – and it's – that's why we try to stay so far away from individual blame.

Chair Sutherland: Are there any final questions from the board? Then, at this time, we would like to open the floor for public comment. We have, um, several requests from the signup sheets. And we will read them, uh, off. When you hear your name, I think we have a microphone. Where is – there it is with Shauna. Um, please come to the microphone so that we'll all be able to hear you, and state your name. We will also, um, uh, because of the – the hour and the number of people who may want to make comments, restrain – uh, restrict everyone to three minutes. I think there is a timer to my immediate right, if you can see it in red. The first public comment, um, will be from Betty LeBlanc.

Betty LeBlanc: Thank you. Uh, I appreciate all of these recommendations and everything I heard and all the hard work that you all had done investigating this. But it seems like you all have repeated the made recommendations before this. And things haven't been taken care of. So how do we get people or companies to comply with what you all's recommendations are? How many lives do we have to lose or injuries do we have to suffer because of negligence? And so

many of these things can be highly financially costly, but then some don't cost hardly anything. They possibly could have saved someone's life.

Uh, safety equipment, when I first heard about wearing a mask that for 15 minutes, I said what is that? When you're climbing up on a third level and doing your work and – that's not very long. But I also watched tonight, and I saw this, not only did we not have responders that could even go in because they had not the proper equipment. Of course they can't go in if you don't have the proper equipment. And it took an hour and a half to get somebody there that did have that could get in. But what I see is also, you know, I see these buildings. Who designs them? Who has the blue print for what they're needed for? Who has the codes for them? And who inspects them?

When I build a house, I have a blue print, an architect I have to bring it to and get a permit. I have codes I have to go by. And then you have engineers and inspectors who inspect these buildings. So it looks like these buildings here wasn't even designed properly for what is needed for it. So I don't – I don't get it. These people are so smart nowadays, and I know they can design a proper building that would be safe and sufficient to manufacture their product. And that's all I want to say. But I do appreciate you all's work very much. And I hope we do not have to lose or have another injury because DuPont I always thought, I'm 75, and I never heard anything but great things.

And when my daughter went to work there, I said, "Gee, baby, this has got to be the best thing that could happen. And I know you are happy about it," because all we ever heard was good things. Never dreamed this would happen. Thank you very much.

Chair Sutherland: Thank you very much for that comment. Next, um, if Michael Alexander would like to still make a comment. If Michael has stepped out, we will call him again at the end. Uh, is Brent **Coone** available? We will welcome you to the mic.

Brent Coone: Uh, good evening, Madam Chair and, uh, Members of the Board. Uh, I have not had the pleasure of visiting with you guys before. It's, uh, not the first rodeo for us with, uh – with Don and some of the older statesmen with the CSB. Uh, I'm Brent Coone. I'm a trial attorney here in Houston. Uh, we're actually in trial now in two

fatality cases involving a boiler explosion, uh, up in Oklahoma. Uh, our firm, and I personally, represented thousands of people in the petrochemical industry throughout the United States.

And unfortunately, I've had to attend these types of meetings before, uh, regarding the family members, uh, the – the widows and orphans of corporate negligence just like my client, Betty, and the rest of her family here. Um, we would like to say a few things about the – the investigation and some of the things that have taken place in this case. Uh, I represent the United Steel Workers. Uh, we're very close friends with the Chemical – uh, Chemical Workers' Union. They actually share space down in La Porte. Uh, we work regularly with the unions and know very intimately what goes on in these plants.

Uh, what we're seeing here tonight is the same thing we saw here several years ago when the CSB had to come down and explain the findings associated to the BP Texas City case, which I served as lead counsel. The frustration that people like Betty and these other widows and orphans have is that the blue print of the findings that you have tonight is interim, which, hopefully, this Board will adopt, are not dissimilar to what we have as findings in every other case involving fatalities in the petrochemical industry. We know these companies are sophisticated. We know they're not ignorant. And we know that the reasons these things happen is because they cut corners.

That's something that I know, something the Board Members know, certainly something our investigative team knows and probably most of the people in this room know. And it's up to you guys to make these people do the right thing. And CSB has that responsibility and obligation. And we thank you for the work that you do because you're one of the few sources of public sentiment that come out and express these findings in a public manner because most of the other ones, unfortunately, get swept under the rug. Uh, this industry has historically failed to self-monitor, which they're allowed to do by OSHA.

The things that we see here are the things that we see time and time again with these types of incidents in our petrochemical industry. These plants are getting older. There's increased pressure on the bottom line at these plants to do more with less. Less employees, less safety culture, less training. They also do this with less

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reinvestment in their units. Units were postponed for reinvestment for turn arounds and shut downs for many years now. And they're operating on a patchwork system of what they call Band Aiding with clamps. And that's the way these units all run now because management doesn't want to shut them down and take the losses associated with a shut-down and the cost associated with repairs.

That happened here. It happened in Texas City. It happened in almost every case I've worked with the CSB on and the many hundreds of cases I've worked on that the CSB was not involved in. So with that, we would like to recommend a few things. We would ask of you guys, as a Board, adopt all of these findings. We want to thank the CSB and their investigators for the Victims' Assistance Program and educational program, which is something newer, which my clients have derived a lot of benefit from and the other victims have gained benefit from. We would like you guys to have a broader mandate so that you can investigate all of these fatalities.

I have two fatalities in trial now that the CSB didn't have the resources to investigate. So we had to do all of that on our own, which we are happy to do. But we love to have the collaboration and cooperation of CSB. And last, we need you guys to, somehow, get a broader mandate from Congress to do the other thing that makes a difference. And that thing that makes a difference is criminal accountability. When these management people make these decisions over and over again with impunity to the legal system other than paying some fine, which is usually trivial, and other than some penalty from somewhere else and taking a slap in the face from the CSB, they all walk home.

And these workers don't walk home when they're killed. And if they did the same thing to someone else, they'd go to jail. And we've only been successful in doing that one time, and it was Texas City, uh, one that Don was involved in. And we got the DOJ involved. And, at least, we got a criminal indictment and a plea of 15 counts of felony manslaughter. But even then, not one person went to jail.

And you guys need to work with Congress to expand the criminal accountability because, unless management that makes these decisions that are all based on bottom line monetary issues, and

there's no accountability for that, nothing is ever going to substantively change. So with that, thank you.

Chair Sutherland: Thank you, Mr. Coone. Is Larry Wilson available to come to the mic? Thank you, Mr. Wilson.

Larry Wilson: Thank you, uh, Madam Chair, and your fellow Board Members, thank you all as well, and especially investigative team. I appreciate you all. And if I might, uh, single out, uh, Dan Tillema, uh, for all of his courtesies, uh, through the many months at, uh, helping to educate us and keeping us apprised of everything. Uh, there are three reasons I want to encourage the Board, if you would, to adopt, uh, the recommendations that have been made tonight. First, uh, the – the magnitude of the – of the event. Uh, the one thing I might change the language on just a little bit is I don't think this is three, uh, DuPont death events.

It's really six, uh, DuPont death events. And – and to me, these last four are just, uh, incredible, uh, in – in – in their nature. Uh, we have a man who opens a valve, and a completely unexpected, unintended thing comes out of this, a deadly gas comes out. He dies. A lady who sees that dies. There are now two dead people in the plant, and nobody knows it. Nobody knows it. Here is – here is DuPont with all of its resources, its incredible safety system. There's not a signal that goes out that two people are dead. There's not a signal that goes out to warn people that, uh, here is why they are dead.

We've had a massive release. Nothing is going – being communicated. And – and as a result of that, we have others, my, uh – my clients, uh, Robert Tisnado's family. Uh, Robert Tisnado goes in there trying to help out with no idea at all that there's a massive gas leak, with no idea at all that there are people who have died due to that leak. And so for the first – uh, the – the first reason, I would say is that you ought to, uh, adopt this is because of what seems to be systematic failures or systemic failures here.

The second reason I think you should adopt it is, it is shocking to think that DuPont, after these four deaths, was ready to do this start-up and ignore the earlier, informal recommendations of the investigative committee. Incredible. I – I tell you one of the reasons you ought to adopt them is these interim recommendations are the reason that DuPont is now making at least some of the

changes that were talked about. But for the interim recommendations, DuPont would have already started its plant. It would have already started its plant. The only benefit to restarting its plant right now, the only benefit, is profits.

That's it. And – and it was going to be at the risk of the lives of other workers. And – and the final reason that I would encourage you to adopt these, ultimately, as an attorney representing, uh, the family members of one of the Tisnado family members, um, we have very little that we can do. We are strictly limited by the Texas legislature that has limited the amount that can be recovered in civil lawsuits. And that means largely. If there's going to be change by DuPont, it rests with you all. And – and I hope that you realize that. Uh, the other thing I would say is, and I would encourage you to do this, um, at – at least consider this in terms of a long-term solution.

We talk about monitoring the gas, but I haven't heard any description or discussion of possibly personal monitoring. I – I wonder if in this day of Apple watches and things like that if there isn't an ability to have personal monitoring so that when people go into a system where there is no ventilation, where we've got a critical, uh, problem that exists from – from things like that, if there's an ability for personal monitoring that could signal when people aren't breathing or when people's heartbeat has stopped. I also wonder if there could be external personal monitoring where you could have cameras set up at – at locales.

I mean, there was literally no way for anybody to know that there were people dead on the floor because of a massive leak here. No way for anybody to know. And I wonder if that isn't another solution. Thank you.

Chair Sutherland: Thank you, Mr. Wilson. Is Robin **Pitblado**? Welcome.

Robin Pitlotto: Yeah, okay. That's good. Uh, yeah, my name is Robin Pitblado. I'm a senior vice president at DNVGL, which is one of the world's largest safety companies. Uh, and I've worked on a number of, uh, major accident investigations as – as well. Uh, obviously, DuPont's coming under some criticism tonight. But I do want to say as a preamble, uh, I did have an opportunity to tour, uh, a DuPont facility for chlorine in – in Northern Ireland and – and, uh, they had some excellent systems for building safety culture, which

I wish, uh, most companies here in the US would adopt. So I think, uh, DuPont is not all bad at what they do.

Uh, but I did want to say, um, one thing that we've noted, uh, is that the – the industry as a whole is much better at occupational safety than it is at process safety. And this was seen in Texas City, which, uh, I know the CSB also commented on, as well as the Baker panel. Uh, and I think what that says is the current PSM program, uh, is insufficient. Uh, and – and just doing more of the same, which is one of your recommendations, more PHA. Uh, we don't think that's good enough.

Uh, we have issued a – a document here, a public document, uh, for six things, which the process industry, particularly the offshore industry where we work more, might do that would improve process safety by the same factor of 10 improvement that, uh, occupational safety has improved in the last 20 years. And – and – and the one specific thing here, which I think applies to this accident, is, uh, uh, a focus on safety barriers. Uh, what we saw here in your description is multiple safety barriers that weren't recognized as proper safety barriers, weren't treated as – as special items requiring due attention and knowledge of their current status, uh, and – and that is a growing, uh, technique, uh, here and – and – and abroad.

Uh, I specifically have – have participated in a major accident investigation of nine fatalities earlier this year where the ventilation system was a critical part. It was an enclosed space, and here we have an enclosed space as well. Uh, and – and so, basically, what I would say is that, uh, uh, a focus on safety barriers, uh, which leads to identification of safety critical elements for which you can then establish performance standards and then monitor those safety barriers on a continuing basis looks like the most productive extension to the current PSM regulations. And I encourage you to, uh, make a recommendation of that type.

A – a general recommendation. You've made some very good specific recommendations. But I think this calls out for a general one. And – and, in fact, I think it matches your recommendations in Volume 2 of the **Macondo** report, uh, that there should be a greater focus on, uh, safety critical barriers. And I think that would have been a big help in this incident. Okay.

Chair Sutherland: Thank you. Is Bob **Simmel**, Simmel, Simmel. And we will welcome you to the microphone.

Bob Simmel: Hi, my name is Bob Simmel. Uh, I have 37 years of experience in, uh, research, design, start up, construction, and over-pressure protection of chemical plants and refineries, 29 years in release system design. I worked on several of the **flares** at BP Texas City after the **isom** explosion. Um, there's some discussion about toxics and release systems going to closed systems I desperately need guidance on, because the – the – the criteria here on some atmospheric relief valves about 10 feet above the nearest, unoccupied platform is relatively common. I completely agree that you do not have a liquid, um, mercaptan relief valve discharging to grade when you can go into the tank that's next to it.

So some of those things are, unfortunately, very poor practice in – in – in those things. But there are relief valves that discharge to the atmosphere. We do need guidance. We do a lot of dispersion analysis to make sure clouds or plumes do not affect the public, do not affect workers. We need to know if that is satisfactory or not. Uh, that's – that's – that's a big one for me. Um, I am familiar with inherently safe design. Uh, my first exposure for that was some 30 years ago with **[inaudible] [01:58:07]**. Um, I know there are many papers that are presented on that. Uh, I, frankly, don't know if that is out as an API standard.

But I would recommend that you suggest that API develop that because that's something that we could all use. Um, technical issues. The, uh – the – the comment about the relief systems were capable of 10,000 to 12,000 pounds an hour and the fire rated insulation could get to 4,000. If you go to API 521, it may actually be 400 pounds an hour. It could have – it – it could have been down that far, which would have been an extremely low amount and been very good dispersion probably. Uh, the – the other issue there is, I can't tell from the pictures, but those relief valves may not be adequately supported. Thank you very much.

Chair Sutherland: Thank you, Mr. Simmel. I would like to re-invite Michael Alexander if he has returned to the room. And if not, uh, we would now open the floor to anyone who would like to also make a comment. As Mr. **Morawetz** makes his way – his way to the microphone, if anyone else has a comment that they'd like to

make, you can just queue behind, uh, the speaker immediately in front of you.

Mr. Morowitz:

Uh, my name is John Morawetz. I'm with the Health and Safety Department of the International Chemical Workers' Union. It represents the workers at this facility. And also, I should say three other companies that are spinoffs of DuPont at this physical facility. Uh, first of all, my condolences to the family, friends of the deceased. Uh, it's a loss, uh, in these circumstances. I can't even imagine. Um, Chairperson Sutherland, Board Members, and the staff both here and for your small agency in Washington D.C. and the Denver office, I think that it – you've done an excellent job on interim recommendations.

I think it's a huge step forward. Thank you very much for it. And I urge their adoption. Uh, it's important to also know it's just a first step. I think, as the Board Members have said, there will be a final report. You have to decide what that will include. And, uh, I look forward to seeing that. In particular, the final reports traditionally have included root cause analysis. The bottom line as to how to prevent this from taking place, which is, obviously, as you've seen, everybody has seen, a very complex situation. Uh, it includes recommendations. And recommendations that can – traditionally, have been very broad.

Recommendations not just for methyl mercaptan, not just for the La Porte facility, not just for DuPont. But how are highly hazardous chemicals handled, and how can we move steps forward so these kinds of incidents don't happen again? Um, I – in particular, one of your recommendations – we were very happy and pleased to see Recommendation 5, and we're working with the local union, the members, as well as international staff. I think that's important. And we hope that DuPont will follow that in working together on a – a range of health and safety issues.

In terms of four particular areas I'd hope that you would include in your final report, one is the Process Safety Management Standard, that's been alluded to in the report, sufficient to prevent similar incidents. Was it just lapses and failure to implement that standard? Or does the standard need to be improved upon? We know it's difficult for OSHA to improve a standard, to change it. But at least getting it on the books and making recommendations, uh, to a range of organizations, not just OSHA, but to many other

voluntary organizations, the [ANSI](#) standards can be an important step forward.

Uh, Two is: did the hourly and salary personnel know how rapidly fatal methyl mercaptan could be? Those that work for us know now how dangerous all of the chemicals can be as, uh, Board Member Ehrlich had mentioned. Uh, further, uh, La Porte facility right now, I believe, uses computer-based training. Is that really efficient and effective for the work force? And in particular, also, does the management learn how effective that kind of training can be when it's just computer-based, uh, not just signing off on a record? Three, does the work force know when to use escape packs or SCBA's, especially when there are hundreds of alarms going off?

A very difficult situation—people want to respond rapidly. Uh, do they know what to do? And lastly, what procedures should be in place to respond to alarms, to calls for assistance, not just what's in writing, but are there drills, are there practice so that when something happens, people can act rapidly? In particular, I would also add, as I mentioned, there are these four companies here: DuPont, [Invista](#), [Cororri](#), and [Chumores](#). They're all part of the response team. So the Board Mmembers, uh, investigators mentioned there'll be investigation on the response team. A question I would ask is: Will that investigation include looking into all four companies' coordinated response? Thank you.

Chair Sutherland: Thank you, Mr. Morawetz. We will welcome the next speaker.

John Burgess: Uh, good evening. My name is John Burgess. I'm a process safety consultant here in Houston. Uh, I – I worked with Mr. Holmstrom before. I have one specific question associated with this particular meeting in that the goal of this meeting is to outline interim recommendations that need to be implemented prior to starting up the facility. And since emergency response was such an inherent part of this, not in the causal part but in the consequence, why are there no recommendations associated with upgrading the, uh, emergency response that need to be implemented prior to restarting the unit?

Dan Tillema: We'll just give a quick response to that. Um, in general, just to back where – where these recommendations came from, these were the things that we had identified that we thought needed to be done

before start up that DuPont was not willing to do back in June. The emergency response, I think DuPont readily recognized had deficiencies. And they've – they've definitely taken that very strongly, and they're working on corrective actions. So they're not part of our interim recommendations specifically because DuPont is actively working on corrective actions. We haven't been able to completely evaluate the corrective action plans for those items yet.

But, in general, that's why they're not part of these recommendations. Sure, we – we do. I mean, but, you know, as – as – we – we just don't have all that information prepared right now.

Chair Sutherland: We welcome our next speaker.

John McLain: I'm John McLain. I'm a design professional here in Houston. I also work in process relief systems. Uh, I share his puzzlement about the way API 521 is applied, particularly in different design philosophies, vis-a-vis refining versus chemicals. So I've had a lot of discussion with my colleagues now about the way relief valves have short tailpipes going to atmosphere. And the chemical industry, as opposed to the refining industry, which manifolds them and takes – takes them to knock-out drums and disposal systems. So again, we need guidance on these sort of things because they cut across – they're a huge philosophy difference between different industries, chemicals and refining.

So again, I'd like to reiterate what he says. We're really in a bit of a pickle here about how to change these practices. And there are a lot of release systems like that in Houston because of the older plants. So I don't – most of these companies, I don't think, are going to change because a lot of these things are grandfathered right now. And – and PSA – PHA findings, even though they're pointing out the deficiencies of the systems, these companies aren't necessarily responding and changing things, which leads to, of course, the incident that happened in Texas City where a vent stack was used when the flare header had been recommended in previous PHA's.

So it's just an expression that perhaps some more regulatory push needs to be applied.

Chair Sutherland: Thank you. We will recognize our next speaker.

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Dan Barton: My name is Dan Barton. I represent Wade Baker and his family. First, I'd like to thank the board, Madam Chairperson, and investigative team. I'd – I'd like to thank you for your tireless effort in investigating this matter and your willingness to spend all of the time that we needed for you to answer all of our questions. And when you didn't have the answers readily available, you emailed me the answers. And I really appreciate that. And I'm impressed with the professionalism of the investigative team. Brent and Larry, my colleagues, have addressed adequately the concept of profits over safety. There's one thing I would like to address.

And that's trust. Can we trust DuPont? Can we trust a company who sells a safety program for a profit over many years? And I learned the fact last night that none of the operators or staff have ever seen this safety program that they sell to other corporations and chemical companies. To me, that's a shame and embarrassing. You can't trust DuPont. And if you don't adopt the interim recommendations, what message would you be sending to DuPont and corporate America? And for that reason, I urge you to adopt the – the interim recommendations. Thank you.

Chair Sutherland: Thank you. Are there any final public comments? I would like to thank everyone who made a public comment. Um, we are very, um, open and – and eager to hear comments, suggestions. Um, and I appreciate you all taking the time to share your, uh, sentiments, your urgings, your thoughts, and your stories. Members, uh, if there are no further discussion points, um, or comments from the Board, then I will call for the question. Is there a motion to adopt – did you have a question?

Member Engler: So moved.

Chair Sutherland: I have to read it first. Is there a motion to adopt the proposed interim recommendations on the CSB's investigation of the DuPont La Porte facility as presented?

Member Engler: So moved.

Member Ehrlich: I second that motion.

Chair Sutherland: Thank you. Having been moved and seconded, there's a motion to adopt the proposed interim recommendations as presented. We will now conduct a roll call vote of Board Members who will indicate approve or disapprove when called. I will have the Acting General Counsel, Kara Wenzel, lead the roll call.

Kara Wenzel: Member Ehrlich?

Member Ehrlich: Approved.

Kara Wenzel: Member Engler?

Member Ehrlich: Approved.

Kara Wenzel: Member Kulinowski?

Member Kulinowski: Approved.

Kara Wenzel: Member and Chairperson Sutherland?

Chair Sutherland: Approved.

Kara Wenzel: Motion passes.

Chair Sutherland: Thank you, General Counsel. The interim recommendations have passed. They will be, uh, issued formally. Thank you to everyone for your attendance at this public meeting. I thank the team, too, for their dedication to the ongoing investigation. And I know the work that still has to be done. And more importantly, I thank the family and friends, who stayed last night and tonight, uh, to contribute and share comments. We – we thank you, as well, for your patience and participation. With that, the meeting is adjourned.

**[End of Audio]**

**Duration: 131 minutes**