U.S. CHEMICAL SAFETY BOARD NEWS CONFERENCE
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DU PONT BELLE PLANT INVESTIGATION FINAL REPORT

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CHAIRMAN MOURE-ERASO COMMENTS:

Welcome to this Chemical Safety Board news conference. We are here this morning to release the draft report and safety recommendations of the CSB investigation of three accidents that occurred at the DuPont facility in Belle, West Virginia, on January 22nd and 23rd 2010. One of these accidents involved the fatal release of phosgene.

Today we will be releasing a computer animation depicting the fatal phosgene release – which will be a part of the full safety video we will release when the report is ultimately approved.

DuPont started out as a gunpowder manufacturer in 1802. Within a hundred years, it had evolved into a major chemical company. DuPont has had a stated focus on accident prevention since its early days. Over the years, DuPont management worked to drive the injury rate at its facilities down to zero through improved safety practices. The Company became recognized across industry as a safety innovator and leader.

We at the CSB were therefore quite surprised and alarmed to learn that DuPont had not just one but three preventable accidents that occurred over a 33 hour period in January 2010.

The first accident involved an ongoing release of methyl chloride from process equipment that went unnoticed for five days.

The following morning, highly corrosive oleum was released through a hole in process piping.

Then, just six hours later, a transfer hose ruptured, releasing Phosgene. Phosgene is an extremely toxic chemical, it was used as a chemical weapon in World War One. The phosgene at DuPont sprayed the face and chest of a worker, who died later in a hospital.

Our investigators will provide details about all three of these accidents along with key findings. But first I would like to turn the podium over to CSB Board Member John Bresland.

Member Bresland was the CSB chair at the time of this series of accidents and became thoroughly familiar with the investigation.

Comments concerning the draft report will be carefully considered following the public comment period, after which Board Members will vote on the findings and recommendations. The report is not final until the vote is taken

MEMBER BRESLAND COMMENTS:

Thank you Chairman Moure. As you mentioned, given DuPont's reputation as a safety leader, the Chemical Safety Board was especially concerned about this quick succession of three accidents. Particularly distressing was the fatal release of highly toxic phosgene. We found that a phosgene transfer hose was susceptible to failure. We learned another phosgene hose had failed in a similar manner but was not investigated by DuPont… that hose failed just hours before the fatal release. Furthermore, the the phosgene transfer hoses were supposed to be replaced at least once a month. Our investigation found the hose that ruptured had not been replaced in seven months.

The CSB determined there were safer ways that DuPont could have run its phosgene operation…such as putting it in an enclosure equipped with a ventilation system. Documents we are releasing today show that DuPont considered building such an enclosure in 1988 but then decided against it.

You will see in our findings that poor design and inadequate maintenance of a battery-operated alarm system allowed for the methyl chloride release to go undetected for nearly five days. And, that a lack of preventive maintenance permitted corrosion in the oleum piping to go undetected as a larger hole grew prior to the release of the oleum.

These kinds of findings would cause us great concern in any chemical plant – but particularly in DuPont with its historically strong work and safety culture. In light of this, I would hope that DuPont officials are reexamining the safety culture throughout the company.

Thank you Mr. Chairman.

CHAIRMAN MOURE-ERASO COMMENTS:

Thank you Member Bresland.

The CSB incident investigation determined root and contributing causes for each of the three incidents.

The CSB report proposes several recommendations to DuPont and others. We will discuss those in a short while.

Right now I will turn the time over to our team lead, Johnnie Banks, and the investigative team to discuss the findings from the report concerning the three accidents.

TEAM LEAD JOHNNIE BANKS:

Thank you Chairman Moure-Eraso.

That a company like DuPont would have three accidents like this within 33 hours surprised and concerned our team. Methyl chloride, oleum and particularly phosgene, of course, are potentially very hazardous chemicals and companies must have procedures and processes in place to prevent their accidental release.

Investigators David Chicca, Lucy Tyler, Marc Saenz and I will now take you through the three incidents. This will be a summary of the main points, but we do call your attention to the full report which has many more details and also includes the documents that Member Bresland referred to concerning DuPont's consideration to improve the safety of the phosgene transfer area.

We'll discuss the two non-fatal accidents first, then the phosgene accident, which we will illustrate with a computer animation.

Mr. Chicca?

INVESTIGATOR DAVID CHICCA

For those not familiar with it --- DuPont's Belle, West Virginia facility produces a variety of chemicals and occupies more than 700 acres along the Kanawha River, eight miles east of Charleston, the state capital.

On January 17, 2010 a production unit was started up after extended maintenance.

Methyl chloride produced in a reaction vessel flowed through a blown rupture disk and escaped from an improperly located drain hole inside the production unit building. Rupture disks are safety devices designed to burst and relieve pressure so that a vessel will not explode. Operators were unaware that the rupture disk had failed during an earlier maintenance activity.

Methyl chloride is a colorless gas with a faint sweet odor at low concentrations. The odor may not be noticeable and cannot be relied upon as warning of concentrations that are dangerous to health.

It is extremely flammable; it has a potent narcotic effect similar to chloroform. It is listed as a potential occupational carcinogen by the National Institute for Occupational Safety and Health (NIOSH).

Symptoms of methyl chloride exposure include dizziness, confusion, and nausea, and at higher concentrations, extreme nervousness, trembling, and possible loss of consciousness. High concentrations or long exposure time can be fatal.

Although no one reported acute affects from this release, this was a serious release. The hazardous gas vented indoors in an area not frequented by workers and there were no reports by plant employees or the community concerning the methyl chloride vapor escaping from the exterior vent line.

Five days after the methyl chloride production began, on January 22nd, an air monitor alarm inside the building alerted personnel of the release. Approximately 2,000 pounds of methyl chloride had escaped.

When the rupture disc burst earlier, an alarm was triggered. But our investigation found that due to a history of false alarms, operators came to view this alarm as a nuisance that could safely be ignored.

DuPont management had gone through what is called a Management of Change process in approving a design for the rupture disc alarm system. However, we found that the alarm system lacked sufficient reliability to advise operators of a flammable methyl chloride release. We found that in addition to the design review, another root cause of the continued release was that DuPont did not resolve the "nuisance alarm" condition in a timely manner despite various safety reviews.

Now I will turn to Investigator Marc Saenz to discuss an incident involving yet another release of a toxic chemical not long after the methyl chloride release.

INVESTIGATOR MARCH SAENZ COMMENTS

Thank you Investigator Chicca.

Oleum is a concentrated solution of sulfuric acid and sulfur trioxide. Over time, the oleum had corroded piping in the plant's spent acid recovery unit. Caused by an unknown defect, oleum corroded through a small section of the pipe involved in the release on January 23, 2010. Starting as a pitting phenomenon, it finished slightly larger than a pin hole. The corrosion penetrated the insulated stainless steel sample pipe and an attached copper tube. Steam from the attached copper tube mixed with the oleum and created a large hole in the pipe.

Oleum escaped through the hole and formed a vapor cloud. Workers discovered the cloud shortly after 7 am on January 23rd. Approximately 22 pounds of oleum were released.

A cloud of steam and sulfuric acid mist from this release is reported to have traveled in a westerly direction and dissipated in an adjacent operating unit. A concrete dike surrounding the oleum tower pump tank captures liquid from the leak.

DuPont fire brigade members arrived at the site of the release and set up a water fog spray from the DuPont fire engine and an oscillating water spray from a nearby hydrant for about an hour. After donning an acid suit and self-contained breathing apparatus, one responder entered the area and closed a valve, which stopped the release at about 8:09 a.m. The gate guard sounded the "all clear" at about 8:27
a.m. There were no reports of exposure to any DuPont or contract employees or the public.

We found that DuPont had a previous oleum leak, resulting in a company recommendation to conduct regular maintenance inspections of all oleum piping. But the CSB found this was not done – due to ineffective communications between DuPont and its inspection contractors.

Now Team Lead Investigator Johnnie Banks will discuss the fatal phosgene release.

TEAM LEAD INVESTIGATOR JOHNNIE BANKS

This was of course the most serious accident of the three, and resulted in the death of a worker. It came just six hours after the oleum release. As mentioned earlier,
It involved phosgene, an industrial chemical so toxic it was used as a chemical weapon in World War One. Phosgene severely damages lung tissue. This can result in a deadly buildup of fluid in the lungs which may not appear until hours after exposure.

We will now play a CSB animation depicting the accident in the phosgene unit.

PLAY DVD OF CSB ANIMATION

(Text of Animation)

BEGIN ANIMATION—

Narr:

The Belle plant's Small Lots Manufacturing unit purchased phosgene in one ton cylinders from an outside chemical company. The plant used the phosgene to manufacture five different pesticide intermediates.

Narr:

The cylinders were stored in a one story, partially-walled structure called a phosgene shed, which was open to the atmosphere.

Narr:

During use, the cylinders were connected to other equipment by flexible, braided stainless steel hoses. Inside each hose was a permeable liner made of Teflon, or PTFE. One hose used nitrogen to pressurize the cylinder, pushing the liquid phosgene into the manufacturing process.

Narr:

An electronic scale recorded the weight of each cylinder, and when it was nearly empty, an alarm sounded in the control room.

An operator then closed valves to the empty cylinder and opened valves to a second, full cylinder.

The stainless steel hoses to the empty container were purged of phosgene with nitrogen.

The empty cylinder was then replaced with a new one on the weigh scale.

Narr:

On the day prior to the fatal phosgene release operators were experiencing flow problems with one of the hoses, and began switching between cylinders to avoid disruption to the chemical process. In the course of switching cylinders, the valve was closed on a partially full cylinder. However, the hose was not purged, allowing pressure to build as the liquid phosgene inside warmed up.

Narr:

Sometime between 1:45 and 2:00 pm on January 23, a worker was inspecting one of the cylinders when the pressurized hose suddenly burst.

Narr:

He was sprayed across his chest and face with a lethal dose of phosgene.

Another worker was exposed to the deadly gas and a third was potentially exposed but neither reported any symptoms.

A total of two pounds of phosgene were released to the atmosphere. Small concentrations of the dangerous chemical were detected by monitors at the plant's fence line.

Narr:

The worker who had been sprayed with the poison called for help and was transported to a local hospital.

Four hours later, the worker's condition began to deteriorate rapidly and despite medical treatment, he died a day after the accident.

END ANIMATION HERE

INVESTIGATOR BANKS CONTINUES:

The CSB found the permeability of the transfer hoses to phosgene was a key factor in the accident.

During our investigation, we found that the Teflon-lined stainless steel hoses in use at the Belle plant are particularly susceptible to failure when using phosgene. That is because the phosgene can seep through the permeable Teflon lining and corrode the stainless steel.

We also learned that another phosgene hose nearly failed in the same manner; and was discovered just hours before the fatal phosgene release, but this did not prompt an investigation.

DuPont's standard operating procedure requires replacement of hoses in phosgene service every thirty days. However, by the day of the accident, January 23, 2010, the phosgene hoses had not been changed in over seven months.

The software used to manage maintenance at the Belle plant had been modified and it no longer notified operators when to replace the hoses. As a result, the hoses remained in use much longer than the prescribed service life.

Documents obtained during the CSB investigation showed that as far back as 1987 DuPont officials realized the hazards of using the braided stainless steel hoses lined with Teflon, or PTFE. An expert employed at DuPont recommended the use of hoses made from Monel, a strong metal alloy used in highly corrosive conditions.

The DuPont official stated:

"Admittedly, the Monel hose will cost more than its stainless counterpart. However, with proper construction and design so that stresses are minimized…useful life should be much greater than 3 months. Costs will be less in the long run and safety will also be improved."

But the CSB found that the Belle plant never followed the recommendation to install the safer, Monel hoses.

Now I will ask Investigator Tyler to discuss DuPont's earlier consideration of enclosing the phosgene cylinder storage area.

INVESTIGATOR TYLER COMMENTS:

The CSB determined there are safer ways that DuPont could have run its phosgene operation. For example, phosgene cylinders should have been kept in an enclosure equipped with a ventilation system and a scrubber. If the enclosure were designed for human entry, workers should have been required to wear fully encapsulated protective equipment.

Documents from 1988 show that DuPont considered building such an enclosure, but then decided against it. One DuPont official wrote, and I quote:

"It may be that in the present circumstances the business can afford $2 million for an enclosure; however, in the long run can we afford to take such action which has such a small impact on safety and yet sets a precedent for all highly toxic material activities?"

DuPont decided not to enclose the phosgene unit at that time, but the potential for a deadly release remained a concern. The danger was noted in a 2004 process hazard analysis which recommended constructing an enclosure equipped with a scrubber.

Originally the enclosure was scheduled to be completed by December 2005, but the deadline was extended four times and still had not been met in January 2010, when the fatal phosgene release occurred.

Without an enclosure around the phosgene operation, no barriers were present to prevent exposing operators or the community to deadly phosgene.

Investigator Banks?

TEAM LEAD INVESTIGATOR BANKS CONCLUDING REMARKS:

In our report, we write that our overall analysis revealed common deficiencies in the following management systems at DuPont, relating to all three accidents.
These were:

• Maintenance and inspections

• Alarm recognition and management

• Incident investigation

• Emergency response and communications

• And hazard recognition

The CSB found that each incident was preceded by an event or multiple events that triggered internal incident investigations by DuPont, which then issued recommendations and corrective actions. But this activity was not sufficient to prevent the accidents from recurring.

That concludes the presentation by our investigation team.

Member Bresland and Chairman Moure-Eraso now will discuss the recommendations we have proposed in the draft report.

MEMBER BRESLAND COMMENTS:

Industry groups have established various good practices for the safe handling of phosgene and other highly toxic materials in compressed gas cylinders. The CSB found that the most comprehensive guidelines are those set forth by the National Fire Protection Association, or NFPA.

The CSB draft report recommends that industry organizations such as the Compressed Gas Association and the American Chemistry Council adopt the more stringent guidelines of the National Fire Protection Association for the safe handling of phosgene and other highly toxic gases.

The report also recommends that OSHA update its compressed gas safety standard to include modern safeguards for toxic gases.

These improved safeguards include :

- Secondary enclosures for units using phosgene
- Mechanical ventilation systems
- Emergency phosgene scrubbers, and
- Automated audible alarms

Chairman Moure?

CHAIRMAN MOURE RECOMMENDATIONS COMMENTS:

As mentioned previously, the CSB investigation team found that each of the three serious incidents at DuPont's Belle plant was preceded by another event or series of events. However, these early warnings and near misses did not result in action to prevent them from recurring.

Therefore, the CSB investigation team recommended that the Dupont Belle facility revise its near-miss reporting and investigation policy to encourage anonymous reporting by all employees so that problems can be addressed before they become serious.

There is a complete list of all the recommendations in the draft report. Remember that the recommendations are not final until they are approved by the Board Members. The report now is a publicly available document and we are inviting comment.

In summary, let me say that the incidents at DuPont show that tragedies can occur even at companies with highly-regarded safety cultures.

Safer management practices and proper attention to near misses are critical if the DuPont company is to maintain a higher standard of safety performance that the corporation has historically claimed. Correction of common deficiencies of safety management systems, found by the CSB investigation, will help the company accomplish its goal of eliminating incidents.

Nationally, adoption of the CSB recommendations by OSHA Compressed Gas Association, and the American Chemistry Council would greatly increase the safe handling of toxic gases and will protect workers from the deadly exposures.

Thank you.

We will now be available to take questions. Please state your name and news media affiliation.