UNITED STATES OF AMERICA

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CHEMICAL SAFETY AND HAZARD
INVESTIGATION BOARD

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DPC ENTERPRISES, INC.

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PUBLIC MEETING

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FESTUS, MISSOURI

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THURSDAY
MAY 1, 2003

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The Board met at the Holiday Inn Express, Grand Ball Room, 1200 Gannon Drive, Festus, Missouri, at 9:00 a.m., Carolyn Merritt, Chair, presiding.

I-N-D-E-X

P-R-O-C-E-E-D-I-N-G-S

MS. MERRITT: Good morning. I'd like to welcome all of you. We're very happy to see the turnout that we have here this morning to this public meeting of the U.S. Chemical Safety Board.

To begin, I'd like to let you know that there are a number of exits in the event of a fire. These exits on the side do go to the outside, just down these halls and outside. So in the event of a fire, now you know where to go.

Also, I please ask you to turn off your telephones and pagers so that we're not interrupted. I'd appreciate it.

Also, I extend a welcome to those of you who are watching us live on the Internet. We're being Webcast as we speak from the agency's website, www.csb.gov.

And I'm Carolyn Merritt, and I'm the Chemical Safety Board chairman. With me this morning are also our board members. There's Dr. Jerry Poje, Dr. Irv Rosenthal, Dr. Andrea Taylor, and Mr. John Bresland. And to my left is Charles Jeffress. He is our chief operating officer. And Chris Warner is our general counsel. And we welcome all of you.

Our main business today will be to review

the staff's findings and recommendations on the August 14, 2002, chlorine release at the DPC Enterprises facility here in Festus.

Following the report, and questions by the board to the staff, we'll proceed to a public comment period and possibly to a board vote on the report and recommendations after that. We've scheduled also a press conference here at eleven-thirty to recap the day's activities.

The Clean Air Act directed that the board would investigate chemical releases that cause public deaths or injuries, as well as those with serious potential to harm the public. The chlorine hose failure at DPC was a serious event that released 4800 pounds of chlorine and threatened hundreds of residents. If the wind had been blowing in any other direction than it was that morning, this would have been a much more serious event than it was.

Our job at CSB is to raise the level of awareness to the causes of such an event and to help to prevent this from happening again here or anywhere else in the country. We work to prevent accidents by making their causes known and issuing safety recommendations to many different parties.

Anyone using braided metal hose for the

transfer of hazardous materials should pay attention to this event. Preliminary findings show that the initial cause of the release was the rupture of a chlorine transfer hose. As a result, the CSB issued a safety advisory back in December, asking chlorine users around the country to verify that their transfer hoses were constructed from the correct materials.

We're not aware of any other incident like this one, which leads us to believe that this was an isolated failure. But it is an important wake-up call to all people who handle hazardous materials.

But the hose rupture is really just one aspect of this incident. And today we'll spend much of our time looking at the broader issues that complicated this incident.

Companies handle thousands of tons of chlorine safely every day in this country. To do so, they depend on various layers of protection to prevent events like the one at DPC or to minimize their impact.

One such layer of protection is to verify that materials of construction for hoses and other equipment are suitable for the use that is intended. Another layer of protection is to have functioning emergency shutdown systems to minimize any leak that

might occur. In this case, CSB found that automatic emergency shutdown valves failed to close, allowing the chlorine leak to continue for three hours.

Fire departments and hazardous materials units are also a layer of protection. They have a very important role to play. Where large amounts of chlorine and other chemicals are stored, emergency responders need to be prepared for the possibility of a release. Rapid response, along with training and planning, can be the key to protecting the public in the event of a chemical incident.

Those are some of the major issues that we'll be hearing about today. Following the staff's report, the board will ask questions of the investigators. And then the public will be invited to comment on the incident, on the report, or on the recommendations. We will not take questions of the staff or the board, but you are welcome to comment.

A few ground rules for the public comment period: If you wish to offer a comment, we ask that you register outside so that I have a list of the people who want to speak and also I have your names spelled correctly and, hopefully, I can pronounce them correctly when I introduce you.

Your comments should be no more than three

minutes long. And we will provide a light here so that you'll see if you're coming to the end of your time. And if you plan to offer comment, please be sure to tell the staff. And we'll be ready to take those comments, we hope, after our questions from the board.

Depending on what the board hears today, we may then proceed to a vote on the report and the staff's recommendations. The full report will be posted on our Website in about a month on www.csb.gov.

Now, after the public meeting, we have scheduled a press conference for about eleven-thirty, right here in this room. Members of the public are welcome to observe the press conference, but we'll only be able to take questions from accredited reporters.

Are there any other opening statements from any other board members this morning?

MR. POJE: Yes, Madam Chair. I'd like to make a few opening remarks. Thank you for your comments.

I'd like to acknowledge that today is celebrated internationally as Labor Day, and I want to honor all of those who have labored hard to help themselves, their families, and their economies in

their local communities and their societies through their hard labor.

This week, though, also marks what is commonly understood in our society as Worker Memorial Day, where we do recognize the toll that's still had in many occupations where people actually give their lives on the job. And, unfortunately, too many workers still remain at risk.

On average, based upon the latest statistics from the Bureau of Labor Statistics, 16 workers were fatally injured and more than 14,000 workers were injured or made ill each day during the year 2001.

Now, it's a toll that we have to do our utmost to reduce. But I would like to say that the board, in its work that began this January, has had to visit a number of very serious incidents that have had fatalities.

In January, we were at the BLSR facility, at which three workers were killed as they were trying to unload very hazardous cargo, unbeknownst to them how hazardous that it was, and a fire and explosion occurred, taking three lives.

Later that month, we visited West Pharmaceuticals, in Kinston, North Carolina. And, at

that incident, an explosion occurred, and a fire precipitated ultimately the fatalities at six people at that facility.

And, at CTA Acoustics, in Corbin, Kentucky, we are now investigating an incident which has claimed the lives of seven workers at a facility.

And, just a week or so ago, we had an investigation into a facility in Louisville in which another worker was killed.

This toll is extraordinarily high in the history of the board's investigative work. I honor the staff and the board members in our commitment toward safety, but I think all of us should recognize we can do much more to save lives and protect those in our communities.

MS. MERRITT: Thank you. Are there any other comments? Then, with that, I'd like to turn the meeting over to Charles Jeffress, who will introduce the staff and begin the presentation.

REPORT ON DPC ENTERPRISES, INC.

MR. JEFFRESS: Thank you, Chairman Merritt. When an incident such as this occurs, the Chemical Safety Board dispatches from our headquarters an investigation team to investigate the incident on site. That same team then stays with the

investigation, doing interviews of people affected, doing research into the particular type of accident that occurred, the type of equipment involved, does an analysis, works with trade associations and others throughout the industry to talk about what can be done to prevent accidents, and then produces their report and presents that report for the board's approval.

Today, the team that did the on-site investigation will be presenting that report. John Murphy was the lead investigator on the team. Giby Joseph was the second investigator. The two of them are with us today.

One comment before John begins: Some of you may have been present earlier at a presentation in Festus, Missouri, in the City Counsel chambers, when John Bresland, a board member, made an interim report to the community on the progress we were making on this investigation. That occurred back in -- when was that? It occurred this winter. I can't remember the exact date that it occurred. But that represented an interim report to the community. This represents the final report of the staff to the board for their vote.

John Murphy, please, the lead investigator, will you offer the report.

INCIDENT PROFILE

MR. MURPHY: Thank you, Mr. Jeffress, and good morning. Madam Chair, board members, and Mr. Jeffress and Mr. Warner, this morning, Giby Joseph and I will be presenting to you for your consideration the findings, causes, and recommendations of the investigation of the August 14, 2002, chlorine release that took place at the DPC Enterprise facility in Festus, Missouri.

Other team members included investigators Johnny Banks, Angela Blair, and recommendation specialist Doug Bell. Doug Bell is not going to be with us today, so I will be handling the recommendations.

I will be presenting what happened, background information and causes, and recommendations. Giby Joseph will present the incident details and key findings.

What happened: On Wednesday, August 14, 2002, a major chlorine release occurred at DPC Enterprises chlorine repackaging facility in Festus, Missouri. A chlorine transfer hose failed catastrophically. This is the hose that failed.

Chlorine was being transferred from a railcar into containers. County HAZMAT responders shut off the release. Here you can see the responders

walking through the chlorine cloud, climbing the railcar ladders to shut off the release.

This large uncontrolled release of chlorine gas resulted in 66 people being medically evacuated and hundreds of people sheltering in place. Adequate quality assurance in the hose supply chain, adequate mechanical integrity at the DPC repackaging facility, and adequate emergency planning could have prevented or mitigated the impact of this incident.

What were some of the consequences of this incident? As Madam Chair has pointed out, approximately 4800 pounds of chlorine gas were released over a period of approximately three hours. This resulted in 63 people in the community being medically evaluated due to release. Also, adjacent businesses and residences around the facility had to evacuate their homes and businesses.

Hundreds of people at the local hospital and other community establishments had to shelter in place for over four hours. Interstate 55 shut down for an hour and a half. Employees at the DPC facility, three workers attempting to clean up the remains of the chlorine release, were also exposed to chlorine vapors.

Why did the Chemical Safety Board

investigate this incident? First of all, this incident had potential catastrophic off-site consequences. If the wind direction had been toward the mobile home park, many people may have suffered adverse health effects.

Another reason why the board investigated is because chlorine is widely used and distributed in the United States, and there is a potential for other incidents to occur. Twelve-point-seven million tons of chlorine are produced in the U.S. each year. There are approximately 20 companies similar to DPC in the chlorine repackaging businesses. Chlorine is used in the manufacture of insecticides, bleach, PVC plastic, and water treatment chemicals.

Early in the investigation, we established key questions that had to be answered:

-Why did it take nearly three hours to shut off the release?

-Why did the chlorine transfer hose rupture?

-Why did the emergency shutdown valves not close?

This led us to looking at three key issues: mechanical integrity, emergency management, and chlorine transfer hose supply. We will be talking

about each one of these issues in detail.

What are some of the important characteristics of chlorine? Chlorine is a green-yellow gas at ambient temperatures. It has a bleach-like odor. In fact, it is used in the manufacture of bleach. It is heavier than air. This is important because this makes a cloud of chlorine stay close to the ground, where it can potentially affect people. It is also transferred as a liquid and under pressure in transportation such as tank cars.

Some other important characteristics of chlorine: Chlorine can contain various levels of moisture. Most chlorine used in transport from production facilities is dry chlorine. Dry chlorine has less than 50 parts per million water content at ambient conditions. Dry chlorine can be safely transported through carbon steel pipe as a material of construction. However, if the dry chlorine becomes wet chlorine, chlorine becomes very corrosive to steel. This is important because chlorine repackaging facilities are primarily constructed out of steel pipe.

What are some of the potential health effects of chlorine? It depends. The health effects of chlorine depend on two things: the concentration of

chlorine, and also the time of exposure to chlorine. At low concentrations, one to three parts per million, chlorine can irritate the mucous membrane. At intermediate levels, 35 parts per million for example, it can cause immediate chest pain, vomiting, and coughing. At high concentrations, over 1000 parts per million, there can be death within a few minutes.

I want to acknowledge that air sampling was not done during the release, so it was not known to what concentration people were exposed. However, dispersion modeling was done by the Chemical Safety Board, and it indicates that chlorine concentrations producing adverse health effects may have extended greater than three miles from the release site. This is a concentration below three parts per million, assuming a one-hour exposure. However, it's important to understand that dispersion models are only approximations of how a release might act.

A little background on the Festus site: It has been an industrial site since the forties. DPC bought the facility in mid-1998 and put capital into the facility to upgrade it from both a production and safety standpoint. I'd also like to mention that DPC is a member of the Chlorine Institute and follows the Chlorine Institute recommended practices for

operations and safety.

DPC Enterprises is part of the DX Distribution Group. It is a privately-owned company, and it operates 17 repackaging facilities and warehouses.

With that, I would like to now turn the presentation over to Giby Joseph to present the incident description and key findings of the investigation. Giby?

INCIDENT DESCRIPTION

MR. JOSEPH: Thank you, John.

Today, I'll present details about the incident, as well as the CSB findings from the investigation.

This is an outline of what I'll talk about today. I'll start by describing the events that took place on the day of the incident, then provide some background into the chlorine repackaging process, transfer hose construction, and the emergency shutdown system at Festus. I'll also briefly talk about the emergency response activities that took place on the day of the incident, then talk about the analytical results from the testing conducted after the incident.

But my main focus is going to be to discuss the findings that arise from the investigation

into key issues, which again are mechanical integrity, emergency management, and chlorine transfer hose supply.

Employees began chlorine transfer operations about six-thirty a.m. Around nine a.m., employees place the repackaging system on standby and take their morning break. At approximately nine-twenty, employees hear the chlorine detection alarm sound. And when this happens, they start looking around the repackaging building for leaks. Employees see a large chlorine cloud rushing into the building through an open door used to access the railcar unloading stations.

Seeing the huge cloud, employees immediately evacuate the building and the facility. Now, the plant manager, on the way out, presses an emergency shutdown button. This should have shut off the release, but it didn't. The facility also had breathing apparatus and other emergency response equipment, on which employees were trained, to shut off uncontrolled leaks. But the equipment was left behind in the building and became inaccessible after the facility was evacuated.

Now, this is an aerial map of the community surrounding the Festus facility. DPC-Festus

is right here. At the time of the incident, the winds were light and variable, coming from the west. I just want to orient everybody; west is right here. And so the majority of the chlorine cloud went across Highway 61, over two nearby businesses: Goodwin Brothers and Intermodal Tire Services. And then the cloud dissipated along the Platinum Creek Valley.

Several employees that worked at Goodwin and Intermodal Tire were exposed to chlorine. Also, I just wanted to point out Blue Fountain Mobile Home Park, which is at a close proximity to the facility. The source of the release I approximate to be around 150 feet from the nearest mobile home park. So, fortunately, the mobile home park was upwind of the release, and this limited the number of exposures. But several people from the mobile home park did go to the hospital.

The family-owned Almany Farm is just north of the facility. Jim Almany was exposed to chlorine and also went to the hospital. In all, 63 people from the community sought medical evaluation at Jefferson Memorial Hospital for chlorine exposure. They exhibited a variety of symptoms from runny eyes and coughing to severe difficulty breathing. Three were held overnight for observation, but were released the

next day.

Also, I just want to point out, I-55, which is less than half a mile from the facility, like John said earlier, it was shut down for an hour and a half, from nine-forty-five to eleven-fifteen.

Now, Jefferson Memorial Hospital is about a mile north of the facility, just off this map. And it was sheltered in place for over four hours.

Now I'll try to provide a better understanding of what operations take place at the DPC-Festus facility. Basically, what happens is, the facility takes chlorine from large railcars and then puts them into smaller 150-pound or one-ton containers. This is a part of the chlorine repackaging facility at Festus. Ninety ton, or 180,000 pound, chlorine railcars are brought into the facility, then attached by chlorine transfer hoses to one of three unloading stations. I just want to point out here at this time that only one railcar unloading station is used at one time.

So the dry liquid chlorine in the car is then transferred through the hoses to the plant piping, and then to the containers. The containers are then taken or loaded onto trucks and distributed throughout the St. Louis metro area for use.

The incident occurred at this spot, which is station number three. Facility production records indicated that this car had about 80,000 pounds of chlorine just prior to the incident. There was also three other cars on site, but these cars were not involved in the incident.

Now, this is a closer view of the attachment configuration of the car to the unloading station. Each station has three chlorine transfer hoses. The middle one is used to bring air into the vapor space of the railcar, which helps to push out the liquid chlorine out the two other hoses to the plant. The arrows just indicate the flow of air into the car and liquid chlorine out to the plant. The hose on the left is the one that ruptured and initiated the release.

Next, I want to focus in on the hose and its proper construction. The keyword here is "proper." The proper materials of construction of the hose are as follows: It has a plastic inner liner made out of Teflon through which the chlorine flows. It has an outer layer made out of Hastelloy. And this metal layer provides pressure containment, which basically means it keeps the hose from rupturing. And also the hose has a heavy-duty spiral guard, which

provides abrasion protection.

The two most critical components of this chlorine transfer hose are that plastic inner liner and the structural braid layer made out of Hastelloy metal.

Since chlorine, in very, very small amounts, permeates, or seeps, through the plastic inner liner, you need to have the right type of metal layer that can resist chlorine and maintain structural integrity of the hose. Like John said earlier, not all metals are suitable for chlorine service, especially when moisture is present.

Now, this photo is not an exact replication of the hose used at DPC, but it's very similar. This is only one end of the fully-assembled chlorine transfer hose. The other end also looks identical. These are the end fittings that are used to connect the hose to the railcar and the plant piping. And also you can see the spiral guard, as well as some of the metal structural braid.

After DPC bought the facility in '98, some improvements were made to the repackaging process. These improvements include replacing a majority of the plant piping, replacing all the chlorine transfer hoses at the railcar unloading stations, and

implementing an emergency shutdown system to mitigate leaks. This figure indicates the critical components of the facility ESV system, or emergency shutdown system.

Each of the unloading stations had five emergency shutdown valves, three on the railcar side and two on the plant side. And the system also has a chlorine detector.

Now, the ESV valves, or emergency shutdown valves, are supposed to close when the monitor detects chlorine over ten parts per million or when an employee presses one of the several shutdown buttons located throughout the facility. The manager pressed this button here as he exited the facility. Both the chlorine monitor and the button were activated during the release, but neither mechanism was able to shut off the release. And we'll discuss why this happened later on in the presentation.

Now I'll discuss the emergency response activities. Before I do that, I'd just like to commend the Jefferson County volunteer HAZMAT team members for safely shutting off the release, although it did take them some time to arrive on scene. But that matter we'll leave to later on discussion on community emergency management. Also, I'd like to commend the

local R-7 fire department and other fire departments that participated in the incident response.

Around nine-thirty a.m., the plant manager notified 9-1-1 of the release as he was exiting the facility. He also notified other parties required by law, such as the National Response Center, the Missouri Department of Natural Resources, and the U.S. Environmental Protection Agency.

However, there were no community sirens or other alert systems to notify businesses and residents surrounding the facility. This we found severely hindered the emergency response, especially the evacuation efforts. This will also be highlighted when I talk about the emergency management issues.

The local Jefferson County Fire Department, R-7, arrived on scene within ten minutes. Since the Blue Fountain Mobile Home Park was adjacent to the Festus facility, R-7 firefighters immediately began to notify residents there to evacuate.

A reconnaissance team was sent into DPC, Goodwin Brothers, and Intermodal Tire to search for employees. But all employees had evacuated by then.

Because of the magnitude of the release, the R-7 fire chief immediately notified 9-1-1 for mutual aid from other fire departments and to initiate

Jefferson County HAZMAT deployment. Evacuation activities at Blue Fountain Mobile Home Park continued on for over an hour.

Before I talk about this slide, I just want to remind everybody again that the incident began around nine-twenty. And the Jefferson County HAZMAT duty officer was notified of the release by 9-1-1 around nine- forty-five. When he got the page, he called the R-7 fire chief to get a better understanding of how many response personnel were needed for this incident.

I just wanted to add here again that the HAZMAT unit for Jefferson County is made out of all volunteer personnel, so most of the team members were at their regular jobs when the incident occurred. A page was sent out to all the HAZMAT team members at approximately ten o'clock. And as those of you who live here know, Jefferson County is a fairly large county. It has an area of 660 square miles. So it took some of the HAZMAT team members over an hour to get to the incident scene.

HAZMAT team members arrived on scene over a 30- to 75-minute time period. A majority of the team was assembled by eleven-fifteen and starting necessary planning and preparation activities. A

four-member team was chosen to make site entry. This team entered the site by noon and shut off the release by twelve-twenty.

Now, the reasons why it took nearly three hours to shut off the release will be discussed again as part of the emergency management issue.

John and I arrived on scene Thursday, August 15. Now, we were on site for about a week, collecting data, interviewing facility employees and various members of the community. Over September, October, and November, various tests were conducted including materials testing of the ruptured hose and torque testing of the emergency shutdown valves.

KEY ISSUES

MR. JOSEPH: The end results from these tests and other research allowed us to identify critical areas to examine in greater detail. These include the hose supply chain, the DPC mechanical integrity program, and the emergency management issues both at the facility and the community level.

The key analytical findings from the investigations were that the ruptured hose was constructed of a stainless steel structural braid layer rather than the required Hastelloy metal. Corrosion products were found within the emergency

shutdown valves, and this buildup impeded the emergency shutdown valves from closing.

Now, before I discuss how the stainless steel hose was mistaken for Hastelloy, I want to give some background into the normal supply chain for the chlorine transfer hose used at DPC-Festus.

Since April 2000, Branham had been the sole supplier of chlorine transfer hoses to DPC-Festus. I also want to point out that DPC corporate headquarters in Houston places all transfer hose orders with Branham. But these orders are sent, or these hoses are sent directly from Branham to Festus. So there's no middlemen in between. The hose is sent directly from Branham to DPC-Festus.

Branham buys Hastelloy braided hose, or raw hose, Hastelloy braided raw hose, and other components like the spiral guard and the end fittings from Crane Resistaflex in bulk. And what Branham does there is, they take the raw hose and cut it to lengths specified by DPC, and then put on the spiral guard and the end fittings.

Now, Crane has been the sole supplier of Hastelloy braided transfer hoses to Branham. But I just want to mention that stainless steel raw hoses were supplied by Crane and several other hose

manufacturers to Branham. I just wanted to make that clear.

So why did the hose rupture? Like I stated earlier, testing showed that the ruptured hose had a stainless steel structural braid layer. Now, stainless steel is not resistant to chlorine in the presence of moisture, and that's why it corrodes.

So we examined how stainless steel braid could get confused for Hastelloy. We found that both raw hoses look identical. And this photo indicates that. But, Madam Chair, I can bring you up two samples if you would like to see a closer examination.

We did visit Branham and Crane Resistaflex to observe quality assurance practices on the hoses. And from our investigation into the supply chain, we determined the following:

First of all, we ruled out a mixup at DPC. One, because chlorine transfer hoses are sent directly from Branham to Festus, and also because DPC-Festus does not use stainless steel hoses with similar dimensions for any operations within the facility. And also what we found was the shipping certification from Branham that accompanied the ruptured hose, or the hose that ruptured, indicated that it was constructed of a Hastelloy braid. Now we

know that, in actuality, it was constructed of stainless steel.

We also found that Branham relied solely on visual verification and had no testing procedures prior to shipment to ensure they were supplying the right hose to DPC.

These two facts led us to conclude that Branham sent DPC the incorrect hose. But we were unable to determine if Crane Resistaflex was involved in the hose mixup that caused Branham to send DPC the incorrect hose. In our visit to Crane, we found that they did have several quality assurance practices and procedures to ensure proper hose identification. But, again, the key finding out of this slide and out of our investigation regarding the hose supply chain is that the stainless steel braid and the Hastelloy braided hoses are not visually distinguishable.

The next question we had to answer was why DPC was unable to determine the hose was incorrect prior to installation. Now, we found that DPC relied on the shipping documentation, which we now know was wrong, to confirm the order. Also, the hose dimensions looked similar to past hose shipments. So based on visual inspection and shipping documentation review, employees thought they were getting the right

hose and put the hose into service. Thus, another key finding was that DPC relied solely on visual verification and had no testing procedures to ensure they were receiving the correct hoses.

We issued a safety advisory after the incident at Festus that asked chlorine handlers to verify the hoses that they had in service were suitable for chlorine transfer, because, at that time, we didn't know the extent of the problem.

Next question: What's the source of the corrosion that caused the emergency shutdown valves to fail? We identified that moisture intrusion into the chlorine piping system prior to the incident caused the corrosion. We identified the pad air dryer system at the tank car unloading assemblies as potential sources through which moisture was introduced into the liquid chlorine piping.

Now, once the system was corroded, some of the corrosion products migrated to the valves to cause the buildup and failure. I just wanted to make that clear. The valve itself didn't corrode. Some of the products from the piping migrated over to the valve, and that's what caused the valves to fail.

Now, this slide just gives a detail view of the valve. The valve ball mechanism is the

internal mechanism of the valve which allows the flow. Corrosion product had built up around the valve ball area, right here. So, when this actuator supplied air pressure to the valve ball to close it from open to close, it would not turn, leaving the valve open, thus allowing the chlorine to continue to flow through it.

Why did DPC not recognize that there was a corrosion problem within the piping system? Well, this question led us to focus on DPC's mechanical integrity program.

Mechanical integrity ensures that critical process equipment and components are designed, fabricated, installed, inspected, tested, and maintained to preserve their original integrity.

Our investigation found the following deficiencies in the DPC mechanical integrity program. I'll give an overview of these findings, but our report will discuss them in much greater detail.

First, we determined, from a review of DPC's standard operating procedures, that not enough detail was present for employees to carry out adequate preventive maintenance, inspection, and testing. For example, there were no testing and inspection procedures to verify the emergency shutdown system would operate as designed.

Second, the facility manager at Festus had been with DPC only about nine months. Now, he had no prior chlorine repackaging experience. The level of training he received on the job by DPC was not sufficient to adequately supervise activities such as maintenance, testing, and inspection.

Third, our interviews with some of the packaging employees indicated that they did not have a full understanding of the importance of keeping the piping system free of moisture.

The other key issue we focused on was emergency management. We felt that emergency management, which is the process of preparing for, mitigating, responding to, and recovering from an emergency, was an issue, because it took nearly three hours to shut off the release, and 63 people in the community needed medical evaluation.

We feel both the facility that handles the chemicals and the communities in which they are located share the responsibility for emergency management.

Emergency response plans outline how various aspects of emergency management are addressed. So we looked at both emergency response plans for DPC-Festus and Jefferson County.

One thing I want to make clear before I talk about our findings regarding the DPC plan is that we don't question the decision to evacuate the facility and request community emergency response assistance. Our focus is on evaluating elements of DPC emergency management to identify those elements that need improvement in terms of preventing exposures and reducing mitigation time for future releases.

We identified the following deficiencies in the DPC plan.

First, lack of clear guidelines and mechanism for community notification, like a community alert system. Although the local authorities have the primary responsibility to notify the public of an emergency, the company shares some responsibility to notify neighboring residences and businesses like Goodwin Brothers, Intermodal Tire, and, of course, the Blue Fountain mobile home park.

Next, the plan did not outline the responsibilities for the facility emergency response personnel. For example, no one was assigned the responsibility to collect emergency response equipment or notify neighbors and nearby businesses. The DPC plan, further, had no timetables or schedules for training and drills. Our interviews with facility

personnel reiterated that DPC did not conduct training and drills on a regular basis. Obviously, training and drills can improve emergency preparedness and coordination.

Proper storage and location of emergency response equipment was not addressed in the plan either. Placement of emergency response equipment in various locations, rather than in one, would improve accessibility.

And, finally, the DPC emergency response plan included no guidelines for post incident cleanup of hazardous materials. This led to the exposure of the three workers during cleanup operations.

In 1986, Congress passed the Superfund Amendments and Reauthorization Act, or SARA. It was designed to establish a national baseline with regard to planning, response, management, and training for chemical emergencies within a community. Title III of this legislation, EPCRA, or Emergency Planning and Community Right-to-Know Act, requires the establishment of both state and local planning groups.

The Jefferson County Local Emergency Planning Committee, or LEPC, includes members from various local emergency response authorities such as fire, police, and HAZMAT, and members of private

industry. The LEPC works with Jefferson County Emergency Management Agency, or EMA, in planning and preparing for emergencies. The EMA is part of the Missouri State Emergency Response Commission.

The EMA is responsible for writing the community emergency response plan. We examined the Jefferson County emergency planning and preparedness and found the following areas in this plan needed improvement.

One, the plan had not been updated since 1996. Although the old owner was listed, DPC was not included in the plan since DPC did not own the facility until 1998.

Further, the plan did not include methods and schedules for training and drills, which test plan coordination among local response authorities.

Finally, like I said earlier, local authorities have the primary responsibility to ensure the public can be notified of an emergency in a timely manner. We found that the community notification mechanism was not adequate. Evacuations of nearby residents took over an hour. Coordination between local authorities and DPC- Festus was not sufficient to ensure timely community notification and relief mitigation.

Madam Chair, that concludes this part of the presentation. At this time, we will answer questions on the material presented so far.

MS. MERRITT: I think what we're going to do is go ahead and go onto root causes. And then we'll take questions following your root causes and contributing causes.

MR. JOSEPH: That's fine.

MS. MERRITT: Thank you. Thank you, Giby.

ROOT AND CONTRIBUTING CAUSES

MR. MURPHY: Root causes are prime reasons why an incident occurred. If eliminated, the incident would not occur. Root causes are often deficiencies in management systems. With that, I'm going to read the root causes that the staff has proposed for this investigation.

The first root cause: The DPC quality assurance management system did not have adequate provisions to ensure that chlorine transfer hoses met required specifications prior to installation.

The second root cause: The DPC testing and inspection program did not include procedures to ensure that the process emergency shutdown system would operate as designed.

The third root cause: The Branham

Corporation quality assurance management system failed to ensure that the chlorine transfer hoses met all customer specifications.

Contributing causes are physical conditions or management practices that facilitate an incident. With that, I will read the contributing causes.

The hose identification system of chlorine transfer hose manufacturers was inadequate to visually distinguish similar-looking structural braiding materials of construction such as Hastelloy C and stainless steel.

The DPC Enterprises mechanical integrity program failed to detect corrosion in the chlorine transfer and pad air systems before it caused operational and safety problems.

The system of notifying the community of chlorine release was inefficient, which resulted in additional exposure to neighboring residents and businesses.

The DPC emergency preparedness planning was deficient. Jefferson County emergency preparedness planning was deficient.

This concludes the causes. Madam Chair, I'll just go on and read the recommendations.

MS. MERRITT: We'll go ahead and take questions now.

MR. MURPHY: You want to take questions now? Okay.

** QUESTIONS

MS. MERRITT: I open it to the board for any questions to the staff that you might have. Please, Dr. Taylor.

DR. TAYLOR: One of the questions I'd like to ask, Giby, you mentioned that, when the workers left, they were on break when they saw the chlorine release?

MR. JOSEPH: That's right.

DR. TAYLOR: And the emergency equipment was left behind. Was it left behind because it was inaccessible? Or where was it?

MR. JOSEPH: Well, it was left behind because, one thing, it was not in an organized manner. Another thing, they left in a hurry. So there was no one assigned to pick up this equipment, so no one thought about picking up the equipment because no one was assigned the responsibility for this equipment. So that's the two reasons.

DR. TAYLOR: Had they been trained in how to use the equipment, but it was just not --

MR. JOSEPH: Yes, they were trained on how to use their equipment to shut off uncontrolled releases. But, like I said, again, no one was assigned the responsibility to pick up the equipment as they left the building.

DR. TAYLOR: I see.

MR. JOSEPH: But once they left the building, they couldn't get access to it again because the chlorine cloud had filled the whole repackaging building. Okay?

DR. TAYLOR: Okay. Then I just have one other question, and it's regarding the corrosion products inside the valve ball. And I'm a little bit confused on, if you have the chlorine transfer hose that has the Teflon inner lining, where is the corrosion actually coming from, again?

MR. JOSEPH: From the piping within the plant piping.

DR. TAYLOR: I see.

MR. JOSEPH: Not the hose itself.

DR. TAYLOR: Okay.

MR. JOSEPH: The plant piping is the one that had corrosion because of the moisture.

DR. TAYLOR: And that piping is metal, and that's moisture from the chlorine?

MR. JOSEPH: That's right. That's made out of carbon steel. It had some moisture intrusion from the pad air dryer system or the tank car unloading assemblies, and that caused the corrosion mechanism to occur. The corrosion mechanism occurred. The corrosion products traveled through the plant piping to the ESV valve ball area. And the buildup just impeded the valves from closing when air pressure was supplied, asking it to close.

DR. TAYLOR: Okay. Thank you for that clarification.

MS. MERRITT: Yes, Dr. Poje.

DR. POJE: Yes, I'd like to ask a question. I'm interested in, you said that you visited manufacturers, you looked at quality assurance programs. What kind of elements go into quality assurance programs in the construction of braided materials like this? And are there many manufacturers? And do manufacturers, not just of chlorine, which probably has to deal with cold temperatures, high pressure, special hazardous materials, are there other high-hazard transfer hose materials that have quality assurance programs with this issue?

MR. JOSEPH: Sure. Let me try to break up

your question. I think the first part was quality assurance. I think some of the techniques that you can use for quality assurance are positive material identification, which is you can use like an x-ray fluorescence technique to shoot a ray onto the hose structural braiding. And it can tell you if it's Hastelloy, stainless steel --

DR. POJE: Is that a destructive --

MR. JOSEPH: It is not a destructive. It's a nondestructive. But they also have destructive testing, which you take a piece of the hose and put it into an acid bath. If it's stainless steel, it will corrode. If it's Hastelloy, it won't.

DR. POJE: So did you use that kind of testing to ascertain that the hose was stainless as opposed to Hastelloy?

MR. JOSEPH: Well, I don't really -- I mean, which part? The manufacturer or --

DR. POJE: No. With our testing of this particular hose. You used similar kinds?

MR. JOSEPH: Yes, we did.

DR. POJE: And how available is that? Is that specialized equipment only at one place?

MR. JOSEPH: Well, it depends if you want to buy it or you want to rent it. If you want to buy

it, it's about $30,000 for the equipment on PMI. And if you want to rent it, it's about $200-$300 per day.

MS. MERRITT: Are there other questions? Mr. Bresland?

MR. BRESLAND: Getting back to the impact of the chlorine release on the people who lived in the neighborhood, on the people who were working in the neighborhood. As I recall, you said there was not any measurements -- there were no measurements taken of the chlorine concentration?

MR. MURPHY: That's correct. As the event was unfolding, that's correct.

MR. BRESLAND: But there was mathematical modeling done to estimate what the chlorine concentrations would be?

MR. MURPHY: Yeah. The CSB did some modeling using a DEGADIS model, which is appropriate for heavy gas dispersion modeling. And we plugged into it the weather conditions at the time. We assumed some worst-case stability. And as I said in my presentation, in a three- hour period, concentrations that could produce adverse health effects went out to approximately 3.7 miles. As I said, these dispersion models are all approximations, and you have to take them as just estimates.

MR. BRESLAND: And the people who live in the mobile home park and the people who work across the street, how far away are they?

MR. MURPHY: Oh, they're probably, would you say --

MR. JOSEPH: We're talking about feet, not miles.

DR. TAYLOR: You said 150 feet, right?

MR. JOSEPH: Yeah. From the release source, it's about 150 feet to the nearest mobile home. And it's probably about another 100 feet across Highway 61 to Goodwin Brothers and Intermodal Tire.

MR. MURPHY: The modeling showed that, probably within 30 minutes, concentrations that could cause adverse health effects probably reached the mobile park area. Like I said, this is not measurements. This is just modeling. And it's an approximation. But it's useful to get some idea of what the consequences may have been.

MR. BRESLAND: Now, when you say "adverse health effects," what do you mean for somebody who's 150-200 feet away?

MR. JOSEPH: It depends on the concentrations they were exposed to. And without sampling during the incident, it would be difficult to

actually tell you what exact concentrations they were exposed to. It would still be very difficult.

MR. MURPHY: The number we used to determine the toxic end point is called the ERPG2 level --

MS. MERRITT: What does that mean?

MR. MURPHY: That means it's a level that people can, if they stay within that concentration for one hour, they could suffer adverse health effects. And it's not further explained. That's just a definition. I can't go on beyond, explaining what adverse health effects may be.

DR. TAYLOR: So what we know, John, is that adverse health effects that many of the community members experienced were the runny eyes. You mentioned the coughing.

MR. MURPHY: They appeared to be exposed to more minor concentrations or for less periods of time than the model predicted. And I think this is because of the wind direction and the direction that the plume went to. So if the plume went toward the mobile park area, consequences could have been much more severe.

DR. ROSENTHAL: The ERPG2 represents -- any concentration that is greater than the ERPG2 has the potential of calling for a serious health effect and

possibly interfering with the person's ability to be able to evacuate. You go to ERPG1, you're talking about irreversible health effects.

MR. MURPHY: And all of these assume --

DR. ROSENTHAL: ERPG3. Excuse me.

MR. MURPHY: And they assume a one-hour exposure.

DR. ROSENTHAL: Yes. What is indicated is that, under worst case conditions, a change of wind, there is the potential for significant health impacts.

MR. MURPHY: That is true.

DR. ROSENTHAL: Significant health impacts if you're greater than ERPG2. And if you're greater than ERPG3, they're irreversible.

MR. MURPHY: For one hour.

MS. MERRITT: John, do you have any other questions?

MR. BRESLAND: No, not right now, I think.

MS. MERRITT: Dr. Poje, do you have another one?

DR. POJE: Yeah.

MS. MERRITT: Well, let me go to Dr. Rosenthal. Do you have a question?

DR. ROSENTHAL: At least one. John, we talked about the response times being inadequate. But

we just said that, within 30 minutes under foreseeable conditions, you might have had the threshold of serious health effects. Is it reasonable to expect, under the best conditions, that an outside response team can get in place and close everything down? Or is it something that has to be done internally, or by mitigation measures? In other words, what are your thoughts on that subject?

MR. MURPHY: My thought is that -- this is just my opinion, that to get the outside responders to the release in 30 minutes would be optimistic. As we said in our presentation, if the plant people were properly trained and drilled, perhaps they could have addressed the problem within 30 minutes perhaps. And I think this begs the question that notification of the public as quickly as possible so they can take preventive action on their own is probably the key in this situation.

MR. JOSEPH: And the thing is that both the company and the community have to share in this responsibility of notifying the public. You can't just leave it up to the community to do all the notification. For those that are immediately affected, you have to get the company involved, and the company does have to do its share of the

notification.

MS. MERRITT: And when you talk about community, are you talking about the residents? Or are you talking about the agencies responsible?

MR. JOSEPH: That's right. I'm talking about the community local response authorities.

MS. MERRITT: And so the public agencies that are responsible for emergency response and the company are responsible for making sure there is adequate and quick notification?

MR. JOSEPH: If you look at the RMP regulation, under emergency response, it states that it's the responsibility of the company to notify the local emergency responders as well as the public.

MS. MERRITT: I see. Yes, Dr. Taylor?

DR. TAYLOR: I have a follow-up question to that. Even prior to this incident, how much awareness was there regarding potential for chlorine exposure? Had the community, all parts of the community -- the local community, the industries in the area -- did they know what the potential could be and have any information?

MR. MURPHY: Many of the residents we interviewed recalled an incident that had taken place some years before where there was a chlorine cylinder

damaged and there was a release, not nearly of this magnitude. But many of the residents remembered that incident. So there was some awareness of the chlorine hazards because of previous experience with releases.

MR. JOSEPH: But one thing that we recognized from our investigation and interviewing some of the community members was that there was not that level of communication between the facility and some of the nearby businesses and the local Blue Fountain mobile home park and some of the other residents. So there was a little bit of break in that communication.

DR. POJE: I just was also struck by this incident. It seems it occurred at nine-thirty in the morning on a weekday morning. So, therefore, most people were at work. Those who were out and about would have visual cues. The people across the roadway were able to see a cloud coming and were able to evacuate. So there is an enormous amount of serendipity. The cloud went in a direction that didn't target the largest population. So this issue is a very significant one of notification.

MR. JOSEPH: That's true.

DR. POJE: John Bresland and I were --

MR. MURPHY: We agree.

DR. POJE: -- in Pascagoula, Mississippi, in January. And the same issue was in play in that community. Notification does require a lot of thoughtfulness. And an alarm system is one way of providing awareness. But notification should go steps further and also deal with directions that people should take once they are alerted to the problem.

MR. JOSEPH: There is some education that needs to take place within the community. And it's important --

DR. ROSENTHAL: In a sense, I guess, to put it into a question, given even adequate notification, there is a need for some provisions for people who are not able to pick up and drive away, and, therefore, some measures or attention to the appropriateness of sheltering in place or, perhaps, first aid measures. So there are many aspects. And I guess the drift of my questioning is to ascertain whether, even under best-case emergency response conditions, one does not need to have provisions that will deal with the fact that the release may not be able to be shut off either by the employees or the community responders within the one-half/one hour time periods we're talking about.

MS. MERRITT: One half or one minute. You

have a hundred feet between the facility. How can you respond to that? I mean, how can anybody evacuate in the amount of time?

MR. MURPHY: Well, the data seems to indicate that they have probably a ten- to twenty-minute interval before the thing comes off, clouds come through. Not the employees, but the residents.

MS. MERRITT: Mr. Bresland, did you have a question?

MR. BRESLAND: I've got a comment and a question. Let me ask the question first. In your investigation of this, did you find examples of where the community emergency response agency and the company did some drills to test out their emergency response system, specifically related to release of chlorine from the DPC facility?

MR. MURPHY: I'll let Giby follow up on this. There had been some communication and visits by the local HAZMAT people with the DPC facility people. But we believe that the in-depthness of the visits and the training and the auditing probably wasn't done as well as it could have been. Do you want to comment on that?

MS. MERRITT: The question was, were there

any drills. Were there any drills conducted?

MR. JOSEPH: No drills were conducted. I mean, no one expected this magnitude of a release.

MR. MURPHY: There had been visits, but no drills.

MS. MERRITT: Are there other questions?

MR. BRESLAND: Well, just let me make my comment here. In your contributing causes, you talk about the Jefferson County emergency preparedness planning as being deficient. I'd just like to make a comment on that and differentiate between what I've called the management system of Jefferson County's emergency planning program and the more specifics of what actually happened on that day.

I worked in the chemical industry for many, many years. And I've got a lot of experience dealing with hazardous chemicals. I'm also, or I was before I moved to Washington, an emergency medical technician in Northern New Jersey. So I do have some experience with emergency response.

And over the last several months since this incident occurred, I've been, as all board members do, we do talks on the outside. And I do show a videotape of the chlorine release here at Festus. And it's a very dramatic videotape. It gets a lot of

attention from people in the industry. And that videotape shows the emergency responders climbing up on top of the railcar and closing it off. And you see a couple of emergency responders in their Level A suits, the pink suits, walking through a cloud of chlorine up to their shoulders.

And I would like to just make sure that there's no implication here that we're criticizing the emergency responders. Mike Siegel was the person who climbed up on top of that tank car, and I don't think I'd do it. And I certainly appreciate their bravery in getting up there and closing off this release.

MS. MERRITT: And they're all volunteers.

MR. BRESLAND: And they're all volunteers, and they certainly deserve a lot of credit for doing it.

DR. ROSENTHAL: I think your point is well taken. I wouldn't do it either, John, but I would send you.

MS. MERRITT: Well, I have a question. One of the things that, my years in industry also, I recognize that, in pad air systems or pneumatic air systems, moisture is a very important thing to prevent. And we have compressors, and then we had air dryers. Was this system equipped with air dryers?

And were these systems maintained in a way that would have prevented this? Was this certainly corrosion that was otherwise prevented and may have occurred from, you know, atmospheric sources? Or was this equipment failure?

MR. JOSEPH: It could be both situations, could have played into the corrosion. They did have a plant air dryer system. The air dryer system, we looked at the maintenance logs on that. Maintenance had been done. But when we looked at some of the readings on the dew point indicator for the dryer, it seemed like there was no shifting or changes on the analyzer results. So we questioned if the plant dryer was actually functioning at the time of the incident, or the air dryer system was functioning.

MS. MERRITT: Okay. And the other question I have is, were there inspections every day? I mean, would somebody have been looking at this hose? I can't imagine this hose was nice, shiny like that, and then, the day it failed it just failed. Were there indications that this hose was corroding? And did anybody inspect it or pay any attention to it?

MR. JOSEPH: Yes, there's daily inspections. And one of the things that we tried to bring out in the presentation is that the inspections

and testing were not adequate enough to identify or thorough enough to identify some of these things like the one that you're talking about. You know, looking carefully at the hoses to identify maybe there's slight corrosion and identify those kind of issues.

MS. MERRITT: What was their testing on these valves? Did they operate this emergency shutdown system on a regular basis?

MR. JOSEPH: Yes. They operated it on a daily basis. At the end of the day, they would shut it down. But no one actually visually verified that the valves would actually close. I mean, they'd press the button at the end of the day, but they didn't actually go up on top of the railcar and look at the actuator indicators to see if it actually closed.

MS. MERRITT: Now, you also indicated that they are members of the Chlorine Institute and there is a -- is it a responsible care code that they all sign onto? Is there a verification that people are actually doing what the code indicates when they claim to be doing it?

MR. JOSEPH: In terms of the Chlorine Institute, I don't think they have verification. It's basically --

MS. MERRITT: It's an honor system?

MR. JOSEPH: Yeah. It's basically recommended practices. They have like manuals and pamphlets that tell you, (a) if you're a chlorine repackager, you do these kind of steps. But, basically, it's recommended practices. You know, they don't say you have to do it. It's just recommended practice that you -- and it's a good --

MR. MURPHY: Yeah, there's no third-party verification or anything like that.

MR. JOSEPH: That would be with the National Association of Chemical Distributors.

MS. MERRITT: Well, thank you very much. Are there other questions?

DR. POJE: A follow-up to that question on the emergency shutdown system. So, at DPC, testing was done every day just to assure that the button would work, and presumably some noise was made about a solenoid attempting to trigger. But no actual observation as to whether the ball valve was closed?

MR. JOSEPH: That's true.

DR. POJE: I'm presuming that emergency shutdown systems are fairly common among chlorine distributors, that this DPC facility wasn't the first and only one to have that. So the question I have is, how problematic is corrosion amongst the community of

chlorine redistributors in their emergency shutdown systems, and is there any guidance that's been developed to recommend mechanical integrity checks with some degree of regularity to assure that failure to close is not cropping up on people?

MR. MURPHY: The Chlorine Institute does have a recommended practice in emergency shutdown systems. But it doesn't really address the specifics of corrosion and such and doesn't really address verification that the emergency shutdown system operate as designed. So, as you can see in our recommendations, we speak to that as one of the things the Chlorine Institute could do.

Now, as part of the investigation, I talked to all 20 chlorine repackagers in the U.S., just to get some insights as to what they do. From what I'm told, they seem to not see as much corrosion as we see at DPC. Or if they do see corrosion, they seem to have better programs in place to address the issue before it becomes as severe. So as part of our investigation, we also talked to other repackagers in the U.S.

MS. MERRITT: Well, that's probably a good segue, then, into proceeding with the recommendations. So if you would do that, I'd appreciate it, so we can

move on to public comment.

RECOMMENDATIONS

MR. MURPHY: Okay. I will now present the recommendations. The recommendations I will be presenting are proposed recommendations until voted on by the board. The recommendations are not mandatory, but the board promotes and tracks all recommendations until adopted or closed out by board vote. With that, I will read the recommendations.

The first set of recommendations are to the DPC Enterprise Festus facility. And the first set regard the mechanical integrity program, revise the mechanical integrity program.

Develop and implement a quality assurance management system such as positive material identification to confirm that chlorine transfer hoses are of the appropriate materials of construction.

Implement procedures and practices to ensure the emergency shutdown system operates properly. Include procedures to verify the emergency shutdown valves will close to shut down the flow of chlorine.

Revise the preventative maintenance and instruction program for the chlorine transfer system to address moisture-related corrosion. Evaluate and

correct any problems associated with corrosion that could potentially lead to chlorine transfer and safety system failure.

Require periodic inspection of the above critical safety systems by the operations or facility manager.

The next set of recommendations are also to DPC Enterprises Festus.

Revise the emergency response plan.

Develop procedures to clearly designate the roles and responsibilities of facility emergency response personnel, including post incident remediation.

Develop and implement a time table for drills to test emergency response personnel on various levels of response including a large, uncontrolled release that could affect the public. Coordinate these drills with local emergency response authorities. Provide a copy of the revised emergency response plan to the LEPC and review the plan with the committee and local fire department. Work with these authorities to implement and improve community emergency notification system.

Also to DPC-Festus. Improve accessibility of equipment required for emergency response

considering likely response scenarios.

The next set of recommendations are to the DX Group, which is the corporate group.

In light of the findings of this report, conduct periodic audits of the safety management systems involved in this incident such as mechanical integrity, emergency response, and material quality assurance at your repackaging facilities. Ensure that audit recommendations are tracked and implemented. Share the findings and recommendations with your work force.

Also to DX Group: To improve supervision of day-to- day operations, revise your corporate safety management training program on chlorine repackaging operations. Emphasize safety-critical systems including verification of safety system performance.

And finally to the DX Group: Communicate the findings and recommendations of this report to all DPC facilities.

Then the next set of recommendations are to the Jefferson County Emergency Management Agency, which is the county agency responsible for emergency planning.

Work with DPC to implement a community

notification system that will immediately alert neighboring residents and businesses of a chemical release.

Also to Jefferson County EMA: Work with DPC, local emergency planning and response authorities in Jefferson and adjacent counties, the city of Festus, and Crystal City, to improve overall response and mitigation time.

The next recommendations are to the Missouri State Emergency Response Commission, which has state responsibility for emergency planning.

Communicate the findings and recommendations of this report to Missouri local emergency planning committees, emergency management agencies, and local fire departments.

The next recommendation is to the Branham Corporation, which is the hose fabricator that supplies DPC-Festus.

Implement a materials verification procedure to improve quality assurance during chlorine transfer hose fabrication and shipment such that hoses shipped to customers are readily identifiable and meet required specifications.

This is a recommendation to Crane Resistaflex, which supplied the Hastelloy C braided

hose to Branham. Work with the Chlorine Institute and the Association of Hose and Accessories Distribution to develop and implement a recommended practice requiring positive visual identification inherent to the material of construction for chlorine transfer hoses to prevent misidentification of hose material throughout the supply chain.

The next set of recommendations are to the Chlorine Institute. The Chlorine Institute is an international organization that provides guidance and information concerning chlorine handling, repackaging, and chlorine transfer systems.

The first recommendation: Work with Crane Resistaflex and the Association for Hose Accessories Distribution to develop and implement a recommended practice requiring positive visual identification inherent to the material of construction for chlorine transfer hoses to prevent misidentification of hose material throughout the supply chain.

The second recommendation to the Chlorine Institute: Develop recommended practices to address moisture in dry chlorine piping systems. Include information on suggested material specifications, prevention, and corrective measures, and adverse consequences, particularly for emergency shutdown

systems.

The third recommendation: Develop recommended practices for testing, instruction, and preventative maintenance of emergency shutdown systems for bulk transfer of chlorine.

And the last recommendation to the Chlorine Institute: Communicate the findings and recommendations of this report to your membership.

The next set of recommendations goes to the Association for Hose and Accessories Distribution. This organization is an international organization that provides information to hose distributors and manufacturers essential for running their businesses.

Work with the Chlorine Institute and Crane Resistaflex to develop and implement a recommended practice requiring positive visual identification inherent to the material of construction for chlorine transfer hoses to prevent misidentification of hose material throughout the supply chain.

And the second recommendation to this group: Communicate the findings and recommendations of this report to your membership.

The final recommendation goes to the National Association of Chemical Distributors. This organization is an international organization of

chemical distributors that provides guidance in operations and safety.

Communicate the findings and recommendations of this report to your membership.

I believe that's the final recommendation. Any questions on recommendations?

MS. MERRITT: Thank you.

** QUESTIONS

DR. TAYLOR: One question I had, John, I know that you mention in several places a recommendation, work with Chlorine Institute and Crane Resistaflex to develop a recommended practice requiring positive visual identification, and so on. I guess my question is, aren't there other manufacturers of this same type of hose? And rather than --

MR. MURPHY: In fact, there's six or seven manufacturers of the Hastelloy C braided hose. So that is a true statement.

DR. TAYLOR: Okay. So one of my concerns is --

MS. MERRITT: Well, could we save discussion for later?

DR. TAYLOR: Okay.

MS. MERRITT: If you have a question,

please present the question.

DR. TAYLOR: All right. Well, that was the question then. We'll have more discussion later.

MS. MERRITT: Are there any other questions, then, concerning the recommendations? Then we'll save discussion.

PUBLIC COMMENT

MS. MERRITT: At this time, we'll move on to public comment. If everybody takes three minutes, we have one hour's worth of public comment here, which is, you know, appropriate. But I am asking all of you to please be ready up here at the podium when it's time for you to speak.

I'll call your names off in threes, so that you who are speaking and two following then will be able to be ready so that we can keep time to a minimum so that we can stay on schedule as best as possible.

I ask you to keep your comments to three minutes or less. Please keep them germane to this issue, and please be respectful of other people who are commenting and of the board and the companies involved, please.

The first one is Mr. Timothy Ballew. No, Mr. Timothy Lewis. I'm sorry. And then following him

would be Tony Thompson and Eric Stotlerby? I'm sorry; I know I'm butchering that. If you would please come to the podium and be ready to speak, I'd appreciate it. Timothy Lewis? Mr. Lewis, are you here?

MR. LEWIS: I'll give my time to somebody else. I didn't know I was signing up to speak.

MS. MERRITT: Oh, all right. Maybe that's a lot of these. Mr. Tony Thompson?

MR. THOMPSON: Where am I supposed to go?

MS. MERRITT: Right up to the podium. Thank you. Eric Stotlerby?

MR. STOTLER: It's Stotler. I signed up in the wrong place too.

MS. MERRITT: Okay, good. And Rick Massie? Thank you. Go ahead, Mr. Thompson.

MR. THOMPSON: Thank you. Two points very quickly this morning.

The first one is, I would like to commend the people that responded in this incident. Going into an environment like the one that we have seen described this morning is, no question about it, putting your life at risk. So the people that do this, every time I see it on television, I kind of ask myself, why do these people do that. But certainly another example today of how the emergency response

capability of this community has made some significant contributions to the health and safety of all employees. So I admire what they have done.

The second is, I would like to thank the Chemical Safety Board for the information they're providing. As a long-time employee of the chemical industry -- and it's getting pretty close to 35 years for me now -- I can say that getting information, detailed information, from incidents like this has been very, very difficult. In some cases, it's been impossible. So having the results, the findings, the recommendations, the details of what happened for a significant chemical event is something that is invaluable to an individual like myself.

So I will take this information, and I will take it back to the company that I work for. And I will share it, and we will communicate it and, hopefully, prevent an incident like this from happening in another community like this one.

So from that, I want to thank the board for the information that you have provided to me today.

MS. MERRITT: Thank you, Mr. Thompson. Would you also identify the organization that you're with or if you're representing yourself?

MR. THOMPSON: I work for Monsanto Company.

MS. MERRITT: Thank you. The next one is Mr. Massie. If you would, tell what organization you're with.

MR. MASSIE: I'm Rick Massie. I'm national operations manager for DPC Enterprises.

Obviously, we at DPC regret, we sincerely regret, the incident that happened and everything that everyone was subjected to in terms of the concern it caused everybody. And, you know, we regret it very much. And we appreciate the assistance of all the local emergency response teams that helped in the incident and all the other officials that were there and doing things to help mitigate the situation.

The investigation of this incident has been a cooperative endeavor with DPC Enterprises, as well as the Chemical Safety Board and many other individuals and organizations that participated in it.

Our collective objective in the investigation has been to prevent a similar incident from happening anywhere else. So we appreciate all your help, John and Giby especially. We all worked together to try to find out what happened here.

We agree with one of the root causes that was identified by the Chemical Safety Board, that the

hose supplied by Branham Corporation failed because it was the wrong material.

We don't agree with one of the root causes identified. We know that quality assurance is critical. We believe the responsibility rests with the supplier, not the user. When purchasing a finished product, the user does not check the various pieces utilized by the supplier in making the product. For instance, when you buy a new car, do you check the rods and pistons inside the engine?

We want to clarify some circumstances under which DPC received the hose from our supplier. DPC knows that stainless steel does not work in chlorine service. For years, we have had safeguards for using and purchasing chlorine railcar unloading hoses.

Chlorine hoses are made with a Hastelloy braid, and they are purchased by DPC with threaded connections on both ends. We do not use hoses with stainless steel at Festus.

However, at other sites, DPC uses it for different products. We use railcar unloading hoses made with stainless steel braid. These hoses have a flange on one end. They will not fit in a chlorine unloading system. In addition, we furnish serial

numbers to the supplier for tagging the hoses. The serial numbers include a site identification number and the letters "CL" to indicate chlorine service.

Two other hoses were bought for Festus at the same time as the failed hose and shipped by our supplier, Branham Corporation, in the same box to Festus with the defective hose. The braid of these other two hoses was the correct material. It was tested.

DPC ordered a chlorine railcar unloading hose. The failed hose was certified by Branham to be a chlorine railcar unloading hose. The shipping documents stated it was a chlorine railcar unloading hose. It was labeled a chlorine railcar unloading hose, and it looked like a chlorine railcar unloading hose. But it was not.

Again, DPC Enterprises believes quality assurance for the materials of construction resides with the supplier, not the end user. The supplier's quality assurance program is the root cause, not DPC's.

And we would like to thank and express our appreciation for the efforts from the Chemical Safety Board and the dedication of the investigators and the cooperation of all the other involved parties. And we

are confident that this process that we are going through with CSB will have a positive effect on improving the industry. Thank you.

MS. MERRITT: Thank you. Mr. Kutz? Doug Kutz?

MR. KUTZ: Same thing.

MS. MERRITT: Mike Dolan?

MR. DOLAN: No comment.

MS. MERRITT: Devon Crawford?

MS. CRAWFORD: Dawn?

MS. MERRITT: Dawn. I'm sorry.

MS. CRAWFORD: That's fine.

MS. MERRITT: I don't have my glasses on either. Please state your name and also who you represent or if it's yourself.

MS. CRAWFORD: My name is Dawn Crawford. I am a resident of the community. I also have a background in medical knowledge.

A lot of this is based on assumption. I can speak for myself and my household. If we had known that it was a chemical plant with a public safety sign near the plant for us to have access to, we would not have moved in there.

As far as the assumption that the chemical cloud did not hit the community that bad that day, I'd

have to say that was wrong. I was asleep when this happened. I was awokened when a member of my household came back in to get me.

When we got out of the community, the cloud was bad enough that it was like going through a thick fog. We were ill. We suffered from nausea, vomiting, stomach irritation, respiratory irritation.

When we called for medical attention, we were told by the hospital and the administrators that, unless we were having severe or moderate respiratory difficulty, that these symptoms would dissipate within a week.

And that quells a lot of those assumptions.

As far as the community in itself and the economical, ecological, and the devastation to the flora and fauna of the community, we have not seen an environmental protection notification or any studies from that, which I, personally, would be very interested in.

Some of the safeguards that I understand have been installed by DPC I have not yet seen or heard, as well as hearing from the plant manager themselves. I think a lot of the residents would like to hear from them personally. And I know that this

probably will not happen because of the aggravation of the situation. And all of the blame may not be totally on DPC. But, let's face it: It was their plant. They should have enforced, reregulated, and thoroughly checked, not just once or twice, but three or four times, so that the other communities involved would have had a better knowledge so that they could protect their assets and their families in the community.

Thank you.

MS. MERRITT: Thank you very much. Mr. Tim Willis?

MR. WILLIS: Decline.

MS. MERRITT: Kerry Carpenter? Paul Rowland? Yes, Ms. Carpenter, go ahead. And Mr. Rowland, if you would line behind her there. And Mr. Phil Pontell?

MS. CARPENTER: My name's Kerry Carpenter, and I'm a Blue Fountain resident as well. I do have a medical background as well.

I find this very upsetting. They took this over in '98? There had not been an update since '96? All I'm hearing: inadequate supervision, inadequate personnel.

The first time the fire department came

through, they did not stop at my home. I heard it secondhand. They were ill-ready to respond.

I find a lot of negligence on DPC because of their inadequate personnel. There's been no notification the first time. You know, and for me to live there, continue to live there, and it will happen again by human error. This is going to be devastating and life-threatening to me because of my health condition, and I'm sure everybody else that lives down there that has problems.

That's all I have to say.

MS. MERRITT: Thank you very much. Mr. Paul Rowland?

MS. ROWLAND: I'm a resident of the community there, and I feel like the whole deal with the gas and the trailer community was passed over too lightly.

One statement was made that the wind was from the west, and it just kind of left the impression that the gas didn't even come into the park. I'd like for everyone to know that we have aerial photographs of this with the cloud hanging over the park, and my home was not even distinguishable from the air from the density of this cloud.

We've also been told that there is no

residue left of this chlorine. Back when the snow was on and it started to melt, when you would step in the snow, your footprints suddenly turned yellowish-green. It is in the soil. It is still there. When you mow the yard now, it just clogs up your breathing. We still have a problem, and no one is doing anything about it.

MS. MERRITT: Mr. Pontell? Cathy Politte? There you are. Debbie Birko? Vernon Clemons? Go ahead. Thank you.

MS. POLITTE: Thank you. First, I want to thank the board for being here. Three times we've been chlorinated out here, so it's really great that somebody finally came.

But I feel like you need to test the air, the water, the ground. They're full of chlorine. The long-term effects of this are unknown. The things that they said happened to us? That was just the first day. The long- term effects of this are outrageous. This is my second chlorine spill.

The cloud evaporates like a mist, but it just soaks in, and it is everywhere. So if that's what -- I don't understand what all this is about, but we need someone out there checking our ground, restoring it. We don't want to wait till somebody

dies before they can say, oh, maybe it does a little more than what we said.

We don't want that chlorine plant next to us. We don't feel like they're going to make us safe. After three strikes, you're supposed to be out. And we know it. Anyone that lives in there knows we'll get chlorinated again. And we don't have hundreds of thousands of dollars. Most of us are lucky if we own our trailer out there. We're lucky if we own our car.

So we're told, well, you know, it's all past. But there are a lot of effects that haven't been even checked in here. And we're tired of it. We're tired of being chlorinated. We want this plant closed.

MS. MERRITT: Thank you very much. Debbie Birko?

MS. BIRKS: It's Debbie Birks.

MS. MERRITT: Birks?

MS. BIRKS: I guess, unless there's a Debbie Birko here.

I'm a property owner right directly behind Blue Fountain mobile home court. And this has been very informational today. But I do believe that there needs to be something for the general public, as we're called, just to be able to really get our questions

answered.

Some of my questions were answered, but not nearly all of them because, like everyone else, I've got a story to tell about how I was affected by the chemical spill. But that's neither hear nor there. I think there needs to be something for us that we can actually ask questions and get some answers somehow.

And that's basically all I have to say.

MS. MERRITT: Thank you very much. Mr. Vernon Clemons? Please state your name and make sure I've got it right.

MR. CLEMONS: I'm Vernon Clemons. I'm an independent trucker, and I wasn't there the day that that happened. I wasn't even in the state of Missouri.

But the deal is, I had to go over there when I renewed my driver's license and pay $25 to take a test on hazardous materials. Don't these people have to do nothing? Half the time I renew my license, I have to do that. And evidently they don't.

And I'd like to know how come the chemical company's insurance company is jerking everybody around on, you know, paying for their stuff. I had to have a new furnace and air conditioner put in, but they don't want to pay for it. I made six payments on

a motorcycle that was sitting there I couldn't ride. Well, this Nixon Company told me that the insurance company don't have to rent you a motorcycle. But they said, "But you will get your six payments back." Well, I haven't.

And that's all I got to say. I'd just like to know how come all this bull?

MS. MERRITT: Thank you. I'm sorry; we don't answer questions, but we'll take your comments. Thank you. Karleen Fortney? Delores Newark? Mike Siegel?

MS. FORTNEY: My name is Karleen Fortney, and I own Intermodal Tire Services, which is directly across the street. We knew the chemical company was there when we purchased our property and we built our facility. So we knew there was a potential that something like this could happen. I think every time you go down the highway and see the sign, you know the plant is there. I don't think it's a surprise to any of us.

Where I felt there was really a letdown was that we were not notified. And to say that there's visual -- you should be able to visually see the cloud, from our manufacturing facility, we cannot see the cloud. It would have been on us, and we would

have had a very serious situation had not someone been standing at our door, just by chance, and saw this happen.

This is not over by a long shot. It's continuing on and on and on. And a lot of this does not hinge on DPC. Their cooperation and anytime we've asked them questions or to do something, they've been very good as far as we were concerned.

However, we're a manufacturing facility. And I don't believe this community, and I don't believe that people that are outside of the area affected really understand what this does to a business or a manufacturing company. That's nothing compared to loss of life or people that are ill or those type of things, and I realize that. But we're fortunate. We didn't have loss of life. We didn't have -- you know, everyone got out, and I'm thankful for that.

However, whenever I send a load out on a trailer and I can't get my product to my customer because a main spring has rusted in half in back of the trailer and was sidelined -- this has gone on for eight and a half months.

The spill should have really been a problem between DPC and the hose manufacturing

company. However, most of us would agree it isn't. The losses to our company have been great in many different areas. But we're told by the insurance that their responsibility is limited under the law, and they do not hold responsibility to us, and that, really, in essence, it's just our misfortune that we were there and that we have the kind of equipment we have.

And the community isn't really, as a whole, understanding, I don't believe, the effect that this is having long-term, because maybe manufacturers won't want to move to that area. And this isn't DPC's fault. I look at this that a lot of people in this room would be a lot happier if the insurance company -- DPC did what they were supposed to do as far as having hazard insurance. They had the insurance, but it -- like other people have stated, we're not getting a lot of results. And it's very costly. It's very disturbing. It's eight and a half months of emotional ups and down and problems virtually every other day.

If you're trying to operate machinery and your main panel is completely corroded through, your electrical panel, it's only a matter of time until that goes out. And that's what we face over there every day -- not through DPC. We've gone beyond that.

Now it mainly hinges, my problem, with the insurance company.

And I want to thank you all for this meeting because it has been very informative.

MS. MERRITT: Thank you. Mike Siegel?

MR. SIEGEL: My name is Mike Siegel. I'm with the Jefferson County HAZMAT team. I was one of the individuals in the orange suits climbing the railcar along with Dick Tufts. We do this on a volunteer basis. I would really like and would be very happy if the county, as well as the government, would support us as far as monetary to allow us to become a full-time type of department like some of the fire departments in the area.

Unfortunately, some of the fire departments rely on volunteers as well. And it's just unfortunate the funding cannot come soon enough to support that. That would enhance our response capabilities.

I do appreciate the recognition, however, by several board members and other folks who appreciate our volunteerism and our support with respect to the response.

I do want to make one comment reference part of the investigation. I'm not sure how it got

missed. But we, indeed, did do some monitoring while we were there on the site. Our detector tubes that we used have a limitation of 1000 parts per million. At the fence gate where we did monitoring, the fence line of the facility, it exceeded that amount. So I can't tell you exactly how much was there at that specific point other than it was greater than 1000 parts per million.

I want to thank you for the time and the opportunity.

MS. MERRITT: Thank you. Tim Pigg? And Lawrence Hicks? Please state your name and who you're affiliated with.

MR. HICKS: I'm Lawrence Hicks. I'm a resident of Blue Fountain. I was there, home from work, that day by luck. I walked out of the house. And from the ground elevation dropping and the gas being heavier, the wall of smoke gained in height as it came across the park. It was about 30 foot tall. The one whole side of the park, you couldn't see the trailers as I was getting in my truck to leave. And that wasn't even the main -- that was the main part of the cloud. Now, there was a mist and a vapor that we drove through. I was coughing and hacking as I was leaving.

I went to a pulmonary specialist; I was at 60 percent lung capacity from this. It took them five months to pay my vehicle off, you know. My son's got asthma from it. I mean, that's just the numerous long- term effects from it.

The evergreen trees still haven't came back. All the vegetation in the park was killed. I don't know where they got the westward wind that day, you know. The wind sock over there, whatever. I'm telling you, I saw a 30-foot tall wall of smoke coming across there of chlorine gas. Scary, you know.

Chlorine gas was actually used first in chemical warfare to kill 5000 people, you know. That's a long- term effect. I mean, 1000 parts per million, it said, I mean, that's death. It said right there on you guys's own report. That's pretty strong. That's all I got to say.

MS. MERRITT: Thank you. Mr. Pigg?

MR. PIGG: Yes. I'm Timothy Pigg, Jefferson Memorial Hospital, director of public safety. I did want to make a few comments. I did want to correct some things that the gentlemen said in their investigation.

The hospital was never in a shelter-in-place mode. One of our facilities a little

further to the south, they were. They were for a couple of hours until we learned that the gas cloud was remaining to the south.

I do know the board has an opportunity to make some recommendations. I don't know what your level of recommendations are and what legislative powers you do have. But I see there's some response here that I think you can have the chemical company or at least make recommendations in the future that the distance between the chemical companies and manufacturers are away from residential areas.

MS. MERRITT: Thank you. At this time, would it be helpful to review again the recommendations? Or take a break? Yes. We're going to take a 15-minute break here, and then we'll be back to have the board discuss the recommendations.

(A recess was taken.)

BOARD DISCUSSION/VOTE

MS. MERRITT: What I'd like to do now is open the discussion concerning whether or not we have heard anything here that would prevent us from proceeding to a vote to accept the report. This is a draft report, and we would be voting on its technical content. Although we still have some editorial work to do on it, it would not be for the technical

content. So I'm asking the question if we have heard anything here that would not allow us to proceed with a vote.

DR. POJE: Madam Chair, I don't know whether you're precluding discussion at this moment in time in the matters of recommendation. There's one issue that I certainly want to have a little bit more discussion about before proceeding to a vote on the recommendations area.

MS. MERRITT: Well, then, if we would like to proceed to discuss the recommendations, we certainly can do that. Would you like to be recognized?

DR. POJE: Please, if I could be recognized. I think Dr. Taylor raised this point in her discussion about the recommendations area.

One of the things that concerns me is the framing of recommendations that speaks to the manufacturing community in the sole manufacturer of Crane Resistaflex. In other words, I think the issues that are framed about visual identification -- in this instance, we clearly have a chain of manufacturing, distributor, and ultimate implementer of a chlorine transfer hose that involved the three parties identified. However, the problem of visual

identification to know appropriately that you have the right material of construction could potentially affect a much larger community.

And so what I want to be -- have the board as a whole consider is the possibility of broadening the basis of that recommendation to get to the manufacturing community, to a trade association that might be more representational of the broader number of buyers, and to set in motion something that would involve all the parties identified, but expand it to include all those who might be involved in chlorine transfer hose manufacturing.

MS. MERRITT: Okay. Is there other discussion? Dr. Taylor?

DR. TAYLOR: I basically agree with Jerry on that point, that we've identified one particular manufacturer, but these hoses look very much alike. So if the industry is making hoses like this for both products, then there should be a way that all manufacturers are involved in a better way of identifying them.

MS. MERRITT: Are there other comments on that point?

MR. BRESLAND: Well, I would agree with the other two board members on this issue. And, again,

you could make it even broader, and I'm not sure if we want to do that in the context of this meeting. But transfer hoses are used in a variety of applications in the chemical business where very hazardous and toxic materials are being transferred.

I'm not an expert in this area, but I would think that we'd like to, in a longer-term sense, look at this issue as well to see what are the potential hazards from transfer hoses that are used for chemicals other than chlorine.

But certainly, in the context of this investigation, I would be willing to support a broader recommendation that applied to all of the people who manufacture chlorine transfer hoses and not just specify one specific manufacturer.

MS. MERRITT: Dr. Rosenthal, do you have any comments?

DR. ROSENTHAL: No. I think the other board members have framed my opinion that this thing has to be broadened, and has greater impacts than perhaps just transfer of chlorine.

MS. MERRITT: Yes, Dr. Taylor?

DR. TAYLOR: This is not on this issue, but --

MS. MERRITT: Another issue? Okay, so

we're moving off of this one. State which recommendation it is.

DR. TAYLOR: Well, there were several. Let's see.

DR. POJE: If I could just clarify on that point before we move to a second one?

MS. MERRITT: Yes.

DR. POJE: I believe that, should we act, as I'm hearing some degree of unanimity amongst the board members about it, that would require changing several recommendations. In other words, the recommendations I think would need to be changed and dropped would be the recommendations to Crane Resistaflex as one of a number of hose manufacturers. I think that it is not the objective any longer.

It would be to drop that recommendation and then to change the partnering that is implied in the current proposed staff recommendations with the Chlorine Institute and with the Association of Hose and Accessories Distribution, the NAHAD, to have them work with the community of manufacturers of chlorine transfer hoses.

MS. MERRITT: Okay. And I'm asking our general counsel to take note of your suggestions so that if we want to make an amendment we can do so.

DR. ROSENTHAL: Well, you know, if we look at the question of that amendment, I think enough information has developed during the hearing, and valuable in that sense, that would cause me to think we have to add some recommendations.

Clearly, there are concerns within the community which have not been addressed with regard to the longer- term effects of the chlorine release. And I'm not going to comment on what these are or aren't because, by statute, the board is just supposed to address acute effects. And here we have a community that has presented information and certainly a great deal of concern about longer-term effects. So I think we need to address towards the appropriate environmental agencies or perhaps ATSCR.

We have also additional information that has been presented that concentrations at the trailer park were in excess of what we implied. We know we didn't have measurements there, but new information has developed. And I would propose that we reconsider these recommendations at greater length before we vote on the report and adopt it today.

MS. MERRITT: That is a comment. Unless you make that into a motion, I haven't called for a motion yet.

DR. ROSENTHAL: I'm just making a comment.

MS. MERRITT: It's a comment, okay.

DR. TAYLOR: Madam Chair, in fact, that's what I wanted to talk about a little bit more. We did hear today that we did not have in our possession the knowledge regarding some of the community concerns of the long-term health effects. So I do believe that we do need to go back or at least consider making recommendations to the environmental protection agencies, as Dr. Rosenthal has suggested, or to ATSDR or whatever organization can assist with the local community on making sure that their problems are addressed and their concerns are addressed.

MS. MERRITT: My intent is to add to these recommendations a recommendation which requests of the Missouri EPA or DEP or whatever they are to hold a community meeting in Festus, Missouri, to hear the concerns of the local citizens that have been affected by the DPC incident and respond to their issues that have been raised here by the community. And that's one of the suggestions. I think we should add a recommendation to do that to respond, because that really is outside of what we do as an agency.

The other one would be to request ATSDR to participate. It would be to work with the Missouri

EPA to help the state address the local long-term health effects that have been raised by the community here in Festus.

So I would propose that, if we proceed to a vote, that I would add those two motions to the recommendations that have already been presented.

DR. TAYLOR: That would be an additional --

MS. MERRITT: Those are additional recommendations I would add to this report. Dr. Poje?

DR. POJE: Madam Chair, I'm not in disagreement with you on those. However, I do know of the difficulty of trying to craft something of that nature here at the podium today and to execute a vote. I'd like to have the opportunity for the staff to review the information that we've heard here today. And I'm favorably inclined that we develop a recommendation that could be very specifically targeted to the most appropriate people. I would worry that we don't know all of those parties right at this moment.

And Dr. Rosenthal has raised the point of concern about approving based upon additional information. I do feel that what has been presented today -- the findings, the causations, and the recommendations, albeit with the ones that I've

suggested for changes already -- to be approved. And I wouldn't feel shy about saying we can consider at a future time, shortly after this meeting, how best to frame the coordination of the objectives that you've laid out for us.

MS. MERRITT: I would ask the board to consider that the facts, findings, and root causes, contributing causes in the report, that we haven't heard -- I don't think I have heard anything that makes me believe that there is any error in the findings in the report and the recommendations that have been made as a result of those findings.

What I have heard from you is that we should change some of these or amend some of these recommendations to broaden them to include other manufacturers. And I have also indicated that I think we should add at least two recommendations that are broadly stated. I don't believe that we should try to solve all the problems that we heard here today, because that is not part of our authority or part of our statute authority to do. But we can make recommendations to agencies who are in place who ought to be responding to the community with regard to these concerns that have been raised.

We did hold a public meeting several

months ago in which I don't know whether these issues were raised or not. But, you know, this certainly -- I mean, if every time we have a public meeting and we have public comment, we delay because of additional concerns -- one of the things I implore the community to do is to communicate with your local agencies your concern. Call the EPA. Call the DEP. Call your mayor. Call the local elected officials and express your concern, because there's definitely an undercurrent of anger hear, and I'm certain it's justified, because you do not know what's going on. That is a part of, you know, what you can do in order to address it.

What we can do as an agency is to put these organizations, these agencies, state agencies, on notice, because there is a concern in the community and it needs to be addressed.

And so what I would ask the board is, at this point, and I will propose this as a --

DR. TAYLOR: Can I propose a motion?

MS. MERRITT: I would propose this as a motion: that we accept the draft report as presented by the staff, and then we would go through each of these recommendations and vote on them by exception if there are any that we feel we want to amend. So what

I would like to do is make that motion and get a formal vote from the board as to whether or not we should proceed with this report and the recommendations as amended. And is there a second?

DR. TAYLOR: Can I ask a question first? Do I have to second before I ask a question about the amendment for -- an informational question.

MS. MERRITT: Are you asking a question about the motion?

DR. TAYLOR: Yes.

MS. MERRITT: Okay.

DR. TAYLOR: So are you saying that with the amendments that were discussed? Or are we just going to go through each recommendation and then go add the amendments? I'm a little confused.

MR. WARNER: I believe the motion was to have two votes: one on the report, and then an individual vote on each specific recommendation.

DR. TAYLOR: Okay.

MR. WARNER: Then go through the recommendations. That's the motion that's before the board.

DR. TAYLOR: All right. So then I'll second it.

MS. MERRITT: All right. Then I would call

for a roll call vote. Dr. Poje?

DR. ROSENTHAL: We have discussion of the motion.

MS. MERRITT: Oh, and we have discussion of the motion. Thank you.

DR. ROSENTHAL: In principal, I have no problem with what you're proposing. I just wonder whether we would be better served by taking an extra week to have these things reworked carefully, the words chosen and looked at, with the staff having an opportunity to review them, rather than do it today. I raise that as an issue.

MS. MERRITT: Okay. Any other comments?

MR. BRESLAND: I have one comment. And that is that, if we're looking at a proposal to invite the Missouri environmental agencies in and the agency for toxic substances, which is a federal agency, to come in and evaluate the health concerns of the community, this incident occurred last August. We're now in May. Eight months have passed. And I don't want to delay things too much more.

The community is obviously concerned. I don't want to be passing -- waiting for another month to vote and then send that recommendation off to these two agencies and have more delay. From the

community's perspective, I think we need to get this information developed and get them satisfied as quickly as possible.

MS. MERRITT: So the motion has been seconded. There has been discussion. I would call now for a roll call, please, if you would on this, the motion. State it again.

MR. WARNER: The motion is to approve the report and to vote individually on each specific recommendation as specified in the report. Dr. Poje?

DR. POJE: As a point of information then, as we vote on the individual recommendations, the amendments to those recommendations can be brought then forward?

MS. MERRITT: Yes, absolutely.

MR. WARNER: Or new recommendations added.

DR. POJE: Then I do vote affirmatively to approve the report and to proceed with a review of individual recommendations for their approval.

MR. WARNER: Mr. Bresland?

MR. BRESLAND: I approve.

MS. MERRITT: Dr. Taylor?

DR. TAYLOR: I approve.

MS. MERRITT: Dr. Rosenthal?

DR. ROSENTHAL: I approve.

MS. MERRITT: And I also approve. So we will proceed. What I would like to do is, at this point, look at the recommendations and approve a group that we have no amendments to. So do we have the listing of those?

DR. POJE: If I could just say, the only recommendations that I was speaking to for amendment would be R-15, R-16, and R-20 as they are currently listed and as were presented by the staff.

MS. MERRITT: Okay. Could I ask the staff to get those three ready? Then what I would do is call for a motion to accept all of the recommendations as presented except for those three. And do you have a listing of those three?

MR. WARNER: If I could just clarify, Dr. Poje, you're referring to the amendments to Crane Resistaflex - -

DR. POJE: R-15. Yes, that's the one.

MR. JEFFRESS: I think we have some different numbers over here. If we could go back through there too, that would be effective.

DR. POJE: Crane Resistaflex --

MR. WARNER: Crane Resistaflex, the Chlorine Institute, and the National Association of Hose and Accessories Distributors?

DR. POJE: Yes, those are the three.

MS. MERRITT: All right. So would someone please present the motion?

DR. POJE: I move that all recommendations except those three identified recommendations be accepted as presented.

MS. MERRITT: Is there a second?

DR. TAYLOR: I second.

MS. MERRITT: Is there discussion?

DR. TAYLOR: All of the recommendations from DPC to Branham Corporation we accept, right?

DR. POJE: And, actually, I'm just going further. In other words, I'm accepting the recommendation to the Chlorine Institute that they also communicate to their members and that they --

MS. MERRITT: Yes, right.

DR. POJE: -- also address the other matters, all matters except the matters of a coordinated effort from manufacturers of chlorine transfer hoses, the Chlorine Institute, and the National Association of Hose and Accessories Distribution?

MS. MERRITT: Right.

MR. WARNER: To clarify your motion, you're referring to recommendation number one to the Chlorine

Institute and recommendation number one to NAHAD?

MR. POJE: And the recommendation to Crane Resistaflex. All except those three.

MR. WARNER: Right.

MS. MERRITT: If that is the understanding, is there any other discussion? Then I'd like to call for a vote. Dr. Poje?

DR. POJE: Approve.

MS. MERRITT: Dr. Rosenthal?

DR. ROSENTHAL: Approve.

MS. MERRITT: Dr. Taylor?

DR. TAYLOR: Approve.

MS. MERRITT: Mr. Bresland?

MR. BRESLAND: Approve.

MS. MERRITT: And, as Carolyn Merritt, I also approve. Then what I would like to do is, I asked our general counsel to state, with the discussion that we had concerning rewording for that, those three recommendations, the three recommendations that we are objecting to. And would you be able to read that?

MR. WARNER: Madam Chair, the motion towards those three recommendations would read as follows. It would be in two parts. The motion would be to delete the recommendation to Crane Resistaflex,

delete recommendation number one to the Chlorine Institute, and the recommendation number one to the National Association of Hose and Accessories Distributors, and substitute a new number one recommendation to the Chlorine Institute and National Association of Hose and Accessories Distributors to read as follows:

Chlorine Institute number one: Work with the Association of Hose and Accessories Distributors and chlorine hose manufacturers, such as Crane Resistaflex, to develop and implement a recommended practice requiring continuous positive visual identification, e.g. coding, stenciling, or stamping, throughout the supply chain from manufacturing to the end user of the product.

Then there would be the second part, the National Association of Hose and Accessories Distributors, recommendation number one: Work with the Chlorine Institute and the chlorine hose manufacturers, such as Crane Resistaflex, to develop and implement a recommended practice requiring continuous positive visual identification, e.g. coding, stenciling, or stamping, throughout the supply chain from manufacturing to the end user of the product.

MS. MERRITT: We do have some copies of this. Sorry I didn't hand them to you sooner. Let me give you a minute to take a look at that. And if it is agreeable, then I would like to call for a motion.

DR. ROSENTHAL: Can we comment on the proposed recommendations, the substitutes?

MS. MERRITT: Yes.

DR. ROSENTHAL: I am happy with the recommendations except for the word "visual."

MS. MERRITT: Okay.

DR. ROSENTHAL: There's some discussion that visual identification may have flaws for color-blind people. And I think that, in order to be continuous positive identification, if under some circumstances they have redundant tests that people can visually identify, fine. But there may be other tests that are required. And so I would not like to put "visual" as a limitation.

DR. POJE: If I can concur, I think that's wise. That makes it more generic and it leaves it up to that community of experts to come back and come to their own agreement about how best to achieve the end. The end is, obviously, clearly stated. And the adjective "visual" I think is too restrictive.

MS. MERRITT: What if we put in there in a

way that would allow identification -- I mean, one of the gentlemen mentioned that they have stamping on the end pieces. I have seen piping myself where it's stenciled with words that say "PVC 4-inch pipe." I mean, it doesn't necessarily have to be color-coded. It can have words on it. But there should be some way to identify this so that you don't have to have an expensive $300-a- day piece of equipment in order to identify it.

DR. ROSENTHAL: I agree. But I think it's up to the industry association to put that forward. They can propose just what you said. But I was just --

MS. MERRITT: But I think it has to -- otherwise they may come back with, you have to have this piece of equipment. And I'm not sure that's what we want.

DR. ROSENTHAL: Well, if the industry association believes that they can get their members to buy the equipment. I mean, it's not the government telling them to buy the equipment. I'm saying --

MS. MERRITT: Just take out visual?

DR. ROSENTHAL: -- just take out visual. And the industry association can take that into account.

MS. MERRITT: Then I would need someone -- I need someone to propose a motion. This has not been brought to the floor yet.

DR. POJE: Well, then I need to propose the motion. You want me to read it in its entirety?

MS. MERRITT: I think we better.

DR. POJE: It's the motion that was just read.

MS. MERRITT: Why don't you read the paragraph you want to change?

DR. POJE: It's the motion for the Chlorine Institute number one: Work with the Association of Hose and Accessories Distributors, NAHAD, and chlorine hose manufacturers, such as Crane Resistaflex, to develop and implement a recommended practice requiring continuous positive identification, e.g. coding, stenciling, or stamping, throughout the supply chain from manufacturing to the end user of the product.

Second, the National Association of Hose and Accessories Distributors, number one: Work with Chlorine Institute and chlorine hose manufacturers, such as Crane Resistaflex, to develop and implement a recommended practice requiring continuous positive identification, e.g. coding, stenciling, or stamping, throughout the supply chain from manufacturing to the

end user of the product.

DR. TAYLOR: And I second the motion.

MS. MERRITT: So that was your motion? The motion is to accept this with the change as you read. And, Dr. Taylor, you second it?

DR. TAYLOR: Yes.

MS. MERRITT: And then I would call for any other discussion? I would call for a vote. Dr. Poje?

DR. POJE: I approve.

MS. MERRITT: Dr. Rosenthal?

DR. ROSENTHAL: Approve.

MS. MERRITT: Dr. Taylor?

DR. TAYLOR: I approve.

MR. BRESLAND: Approve. I'm sorry.

MS. MERRITT: No, you did right. I'm debating. I feel the word "visual" needs to be in there. I would abstain.

DR. ROSENTHAL: So the motion is carried?

MS. MERRITT: So the motion is carried. At this time, I would like to propose another motion: an additional recommendation from the board. And that would be that the Missouri EPA hold a community meeting in Festus, Missouri, to hear concerns of the local citizens affected by the DPC incident and respond to the issues raised by the community. And I

propose that as a motion, or I present that as a motion. Is there a second?

DR. ROSENTHAL: If I second it, could I vote to modify it?

MS. MERRITT: No.

DR. TAYLOR: Okay, then, I'll second it.

MS. MERRITT: What you want to do -- what we should do is, if there is a modification, then we'll have discussion. I think you're supposed to second it before you have discussion. But go ahead.

DR. TAYLOR: I second it.

MS. MERRITT: You second it?

DR. TAYLOR: I do.

MS. MERRITT: Okay. And, with that, then we have discussion.

DR. ROSENTHAL: I would just say to respond to the longer-term health effects of the --

MS. MERRITT: I'm going to make another one to the ATSDR to address that issue.

DR. ROSENTHAL: Okay. Then I object --

MS. MERRITT: You object?

DR. ROSENTHAL: Then I withdraw my objection.

MS. MERRITT: Okay. Is there any other discussion? Yes?

DR. POJE: I just want to make the point that I'm not expert at this moment in time knowing all of the relevant state agencies, their titles as agencies, the local entities that they would need to partner with. And, you know, I'm in agreement with the thrust of your recommendation. And I would say, even if we got to ATSDR, their partnership is generally with the state department of health and with the local county health departments. And this is where I would want us to broaden the recommendation that would allow for all of the appropriate parties to be brought to the table. And I'm a little bit uncertain that I know enough on how to shape it exactly today.

MS. MERRITT: Do you have a suggestion?

DR. TAYLOR: This is my suggestion for amending that, would be to say "to the state environmental protection agency and other appropriate local or state environmental agencies" or something --

MS. MERRITT: Other agencies?

DR. TAYLOR: Other agencies, right. And that would broaden it enough that we could look and investigate which other agencies would be responsible for it. Did you write it down? Did somebody write it? Okay.

MS. MERRITT: So then you're asking that I amend this to "to the Missouri EPA and other agencies as recognized by" --

DR. TAYLOR: Other state or local agencies.

MR. BRESLAND: I would make it even more general, rather than talking about the Missouri EPA, because I'm not sure if that's the correct term. I think it might be Missouri DNR.

MS. MERRITT: Department of Natural Resources.

MR. BRESLAND: To make it a recommendation to appropriate environmental and health agencies in the State of Missouri and in the County of Jefferson.

MR. WARNER: John, would it help if we identified the Missouri Department of Natural Resources, Missouri Department of Health and Senior Services, and Missouri Department of Conservation?

DR. TAYLOR: That's some of them.

MR. BRESLAND: I don't know, because I don't if those are --

DR. TAYLOR: See, I think it's because we don't have the base -- I mean, we can say all or some. I think we should leave it as something along the line of "other appropriate state agencies," so that we can get all of them.

DR. ROSENTHAL: There's no reason that, having done that, Madam Chair, that we could not substitute at our next core meeting while this is being done, specific names.

MS. MERRITT: Okay. So then the motion was made, and it was seconded. Do we need to amend it then?

DR. TAYLOR: To say "other agencies," yes.

MS. MERRITT: Okay. So the amendment, then, would be to say, "other appropriate agencies"?

DR. ROSENTHAL: Right.

MS. MERRITT: So what we would say, "the Missouri Department of Natural Resources and other appropriate agencies hold a community meeting in Festus, Missouri, to hear concerns of the local citizens affected by the DPC incident and respond to the issues raised by the community." Okay. All right?

DR. POJE: I second that motion.

MS. MERRITT: Okay. Do I call for a vote, or is there any other discussion? Dr. Poje?

DR. POJE: I approve.

MS. MERRITT: Dr. Rosenthal?

DR. ROSENTHAL: I approve.

MS. MERRITT: Dr. Taylor?

DR. TAYLOR: Approve.

MS. MERRITT: Mr. Bresland?

MR. BRESLAND: I approve.

MS. MERRITT: And I approve. So then the second one is -- would anybody else like to propose this? I do agree the long-term effects, it certainly isn't anything that we can address. But we certainly can make a recommendation that somebody take a look at this, and that would be the ATSDR.

DR. TAYLOR: You know, again, I think we might want to add "and other appropriate agencies."

MS. MERRITT:: Well, would you make the motion then?

DR. TAYLOR: Okay. For the second motion, I move that we say to ATSDR and other appropriate agencies, that they investigate the long-term health effects from exposures related to the DPC chlorine release.

MS. MERRITT: Is there a second? Can we repeat that?

DR. TAYLOR: All right. That ATSDR and other appropriate agencies investigate the long-term health effects related to the DPC chlorine release in Festus, Missouri, and communicate their findings to the community.

MS. MERRITT: Is there discussion?

DR. ROSENTHAL: Yes. I'd just like to suggest that, we're asking ATSDR to address the concerns about long- term health issues, because addressing the long-term health issues of something of this type is probably a five-year study.

DR. TAYLOR: That's correct. I agree with his amendment.

MS. MERRITT: So you're asking that we --

DR. ROSENTHAL: To address the concerns about the long-term effects.

MS. MERRITT: Okay.

DR. POJE: So instead of "investigate the long-term effects," "address the concerns about the long-term health effects."

MS. MERRITT: Then would you read that for me?

MR. JEFFRESS: The motion is that the recommendation is that ATSDR and other appropriate agencies address community concerns about the long-term health effects of the chlorine release in Festus, Missouri, and communicate their findings to the community.

MS. MERRITT: Okay. Is there a second?

DR. POJE: I second it.

MS. MERRITT: Is there discussion?

DR. POJE: I just want to make the observation that, in our first recommendation that we've developed to deal with the matters that we heard today we're asking for environmental agencies to hold a meeting with the community. Now, this recommendation, we're not seeking a meeting. We're taking it one step further, and we want to address the concerns of the community. And I think there's some inconsistency in that approach that we need to be thoughtful about. Are we interested in the environmental agency also addressing the concerns of the community?

Here is where I would say crafting en banc has a little bit of potential for writing it in a way that -- I appreciate the thrust of the intentions of what we're trying to achieve. But I also want us to be very thoughtful about the language can have different implications and might be viewed differently by the parties. And I think we've heard clear identification of concerns about environmental impact that occurred at the event and has continued afterwards and concerns about public health impacts that have occurred at the event and have continued afterwards. I'd want us to be consistent in approach

towards both matters, that to pass the baton, if you will, to other public agencies to act on those matters should be consistent with each other.

DR. TAYLOR: And I agree. And I think, probably --

MS. MERRITT: Except that does not -- that is not significant to the vote on this amendment. What I would ask us to do is proceed with the vote on this amendment. You're perfectly welcome to add another recommendation that EPA or the DPC from Missouri address the concerns. I have a little more confidence, I guess, that I would assume, if they held a public meeting with these angry people, they would address their concerns. I would hope. But it certainly is opportunity to do that.

DR. TAYLOR: Can I ask another question about that? What I think about it is, even though we have these recommendations that we did state that there would be -- I'm just asking a question about, with that recommendation, if there were some language changes that needed to be made, like getting the additional agencies or finding out who they are, we would still be able to do that?

MS. MERRITT: Oh, yes. Yes, because we put in there "and other agencies." So that allows us to

be able to do that, yes. So may I call that we second this?

DR. TAYLOR: It was seconded.

MS. MERRITT: Then I'd like to call for a vote. Dr. Poje?

DR. POJE: I approve.

DR. ROSENTHAL: Approve.

DR. TAYLOR: I approve.

MR. BRESLAND: Approve.

MS. MERRITT: And I approve. Then we have two additional recommendations that the board is adding. I open the floor if there are any others. Would the board like to add at this time any others?

DR. POJE: May I make an observation then without adding?

MS. MERRITT: Absolutely.

DR. POJE: Again, I took Dr. Rosenthal's comment that, should, in further reflection, I see a better way of writing this, you may hear from me in our next core meeting.

MS. MERRITT: All right. With that action, then, we are at the end of our planned agenda. Oh, we didn't vote on the report. I'm sorry. The report and all the recommendations as amended. All right.

This is the motion, and I make this

motion: to approve the CSB investigation report, Report Number 2000- 0401MO, and recommendations as amended by the board in the meeting today, including conforming editorial changes for the amended recommendations in the body of the report regarding the incident that occurred at DPC Enterprises' Festus repackaging operation on August 14, 2002. Is there a second?

DR. TAYLOR: Second.

MS. MERRITT: Is there any discussion?

DR. POJE: My only point of discussion is that I think there were additional matters raised here that generated additional recommendations. And I'd want to see an incorporation of that information also be added to the report.

MS. MERRITT: Yes. I think that's also stated in here, that that would be included.

DR. POJE: That's fine.

MS. MERRITT: So the motion has been seconded. Then I would call for a vote. Dr. Poje?

DR. POJE: I approve.

MS. MERRITT: Dr. Rosenthal?

DR. ROSENTHAL: Approve.

MS. MERRITT: Dr. Taylor?

DR. TAYLOR: Approve.

MS. MERRITT: Mr. Bresland?

MR. BRESLAND: Approve.

MS. MERRITT: And I approve. Then the motion to accept the report and the amended and improved recommendations is carried. This is hard work.

DR. ROSENTHAL: But the pay is good.

MS. MERRITT: With that action, we are at the end this time of our planned agenda. I'd like to thank all of the members of the community who are here today who took the time to come. I'd like to thank the staff for your hard work and your efforts in regard to this investigation. To John Murphy, Giby Joseph, and to Doug Bell, I appreciate your hard work and effort. And to the board also for your hard work on this.

The chlorine release at DPC was an accident that just did not have to happen. Industry complains over and over again that they are over-regulated. Companies that handle hazardous chemicals want the trust of the communities that they operate in. They need to demonstrate to the communities and the elected officials that they are committed to their responsibility to public safety, a responsibility to make sure that critical safety and

response systems are in working order at all times.

There are many opportunities to prevent or minimize the impact of this release. Verification of materials in use, emergency shutdown equipment, emergency notification and response systems -- none of these systems functioned well enough to protect the workers and the public. Companies just have got to do better.

Citizens should get involved in learning about the industries in their communities and work with the elected officials and community emergency response organizations to be sure that they are ready in the event of such an emergency.

The CSB now looks forward to working with DPC, the Chlorine Institute, and all the other parties that were named here to promote a full implementation of our recommendations and to prevent this same type of incident from occurring here or anywhere else in this country.

With that, our full report will be posted later this month on our Website, www.csb.gov. And that site will also have up-to-date information on the status of our recommendations. You can follow how we are tracking their implementation from this site from this case.

So we would now go to our press conference, to begin shortly in this room. The board's next meeting will be in the early summer, where it will conduct a community meeting focusing on a recent plant explosion at West Pharmaceuticals in Kinston, North Carolina, where six people were killed.

If there are no other comments from the board, then I declare this meeting adjourned. Thank you.

(Whereupon, at 11:00 a.m., the proceedings went off the record.)