U.S. CHEMICAL SAFETY AND HAZARD

INVESTIGATION BOARD

* * * * *

PUBLIC MEETING

* * * * *

Wednesday,
October 15, 2003

The Public Meeting met in the Magnolia Room in the Lafont Inn, Highway 90, Pascagoula, Mississippi, at 9:30 a.m., Dr. Gerald Poje, Board Member, presiding.

BOARD MEMBERS:

GERALD POJE, Presiding Officer
IRV ROSENTHAL
JOHN BRESLAND
ANDREA K. TAYLOR

ALSO PRESENT:

CHRIS WARNER, General Counsel
CHARLES JEFFRESS, Chief Operating Officer

I-N-D-E-X

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

9:30 a.m.

BOARD MEMBER POJE: Good morning. Welcome to this public meeting of the U.S. Chemical Safety Board, better known as the CSB.

I am Dr. Gerald Poje, one of the five Board members. And I will be chairing today's session. The Board Chairman, Carolyn Merritt, was unable to make it here today, but she maintains a strong interest in the subject of this meeting.

With me today are my fellow Board members: Dr. Irv Rosenthal to my far left; Mr. John Bresland to my immediate right and Dr. Andrea K. Taylor to my far right. Together with our Chief Operating Officer to my immediate right Mr. Charles Jeffress and our General Counsel Chris Warner.

For the sake of everybody in the room and for the ability to hear our hearing, please put your pagers and cellphones on vibrate or turn it off.

Today's session is going to be videotaped and will be rebroadcast tomorrow from the Board's website, csb.gov.

On October 13, 2002, a thunderous explosion shattered the quiet of a single time in the Pascagoula area. Shortly 5:00 a.m. that morning at the First Chemical Plant on Industrial Road an unconsumed and violent chemical reaction destroyed a 145 foot tall distillation tower blowing off the top 35 feet of the structure and sending massive fragments of debris hurdling in all directions. Some of this debris traveled three-quarters of a mile from the explosion site raining down on surrounding industrial facilities.

Fortunately, this accident caused no serious injuries among the workers working there that morning at First Chemical and its industrial neighbors. Three employees did suffer minor injuries. However, as I pointed out here in Pascagoula last January, the consequences of this accident could have been far worse. The First Chemical Plant is located in a dense chemical corridor near a refinery and a fertilizer plant, large storage tanks some containing toxic or flammable substances dot the landscape in and around First Chemical.

One of the projectiles from this explosions damaged a large nitrotoluene tank some distance away, igniting a fire that burned for several hours.

We're very fortunate that there was not an even greater chemical release or a more damaging fire as a result of flying debris.

We arrived with a team of CSB investigators shortly after the event last October, and we have continued to conduct our investigation over the last 12 months. In January of this year, lead investigator Stephen Wallace, John Bresland and I came down to Pascagoula to meet with residents and discuss some of their concerns.

When the explosion occurred, all the residents were required to shelter in place to attempt to secure themselves in their homes against any potential chemical explosion. Naturally, we've had many concerns from people who were effected. Will they be safe in the future? How can we improve notification about what to do in another emergency? What hazardous chemicals could we be exposed to?

Some of these, of course, are questions for the facility now owned by DuPont and for local authorities and others.

Our purpose at the CSB is to determine the root causes of this accident and issue safety recommendations to prevent similar events in the future.

The First Chemical investigation has progressed to the point that today the investigators will present their completed findings and safety recommendations for consideration by the Board. Before the Board moves to any vote there will be an opportunity for members of the public to comment on what you have just heard. If you plan to register a comment, please sign up on a list at the back in the outside area, and I'll call your name at the appropriate point. We ask that you limit your comments to 3 minutes.

With that, I recognize any other member of the Board for any opening remarks?

BOARD MEMBER BRESLAND: Thank you, Dr. Poje. I just would like to make a few opening remarks

before we get on with the meeting.

As Dr. Poje said, I accompanied him to Pascagoula in January of this year to attend a community meeting. We gave the community an update on our investigation and we did hear about neighborhood concerns about the accident and about the emergency notification system.

I'm very pleased to be back in Pascagoula today to let the community hear the final results of our investigation.

I also am gratified that the First Chemical facility is now owned by DuPont. As a former DuPont employee many, many years ago I have always been impressed by their safety program and I'm sure that DuPont will strive to operate a safe facility here in Pascagoula.

I read from press reports that DuPont has started a community interaction program, and I commend them for doing that.

I look forward to the presentations this morning, and hearing from our investigators.

Thank you, Dr. Poje.

BOARD MEMBER POJE: Thank you, John.

If there are no other statements, then I recognize Mr. Charles Jeffress who will introduce the investigative team members who are with us today.

Charles?

CHIEF OPERATING OFFICER JEFFRESS: Thank you, Dr. Poje.

As you mentioned, a team of CSB investigators came down to Pascagoula the day of the actual event to begin the investigation. Ultimately--and will be presented to you today.

On behalf of that team there are three representatives who will make the presentation. Lead investigator who led the presentation is Stephen Wallace. He's been with the Chemical Safety Board for 3 years, we've known him for 3 years now. He previously worked in industry as a production manager, process engineer, process safety consults, he's been a manager of health and safety at industrial facilities. He has a chemical engineering degree from the University of Kentucky for which us North Carolina folks will get him on occasion, but he's also

registered Professional Engineer and he's a Certified Safety Professional.

Assisting him is Michael Morris, also an investigator with the Chemical Board for the last 3 years. He's worked as a Process Safety Engineer for major chemical/pharmaceutical company. He holds a master's degree in safety and environmental management from West Virginia University.

Also assisting is Jordan Barab, recommendation specialist. Has been with the agency for about a year. Prior to that he was a Special Assistant to the Assistant Secretary of Labor for OSHA in Washington, D.C. He's got 20 years in the health and safety field and directed the Health Safety program for the American Federation of State County and Municipal Employees.

Those are the three men who will make the presentation to us this morning. Taking the lead will be Stephen Wallace.

Steve?

MR. WALLACE: Thank you, Mr. Jeffress.

Board Members, today the staff would like

to present our findings and conclusions from the investigation into the October 13, 2002 fire and explosion that occurred at the First Chemical facility in Pascagoula, Mississippi.

I would like to note that on the opening slide the picture you are looking at, is a picture of the column that was involved in the explosion after the explosion. As you can see, the loose metal pieces at the top of the column. Approximately 35 feet of the column were actually blown away from the column.

Today we would like to discuss the background of the investigation, the process we used to conduct our investigation, a summary of the actual process in place at the First Chemical facility at that time. We would then like to talk about the incident itself. We would like to discuss the sequence of events and the consequences of the incident. We'd like to discuss the conclusions of our investigation, both the key findings and the root and contributing causes.

And finally, we would like to talk about recommendations that we would like to make and propose

to keep this and similar incidents from occurring in the future. In other words, this morning we would like to tell you what happened, why it happened and what we propose to keep incidents like this from happening in the future.

I'd like to acknowledge the very valuable contribution of each one of our team members. Besides myself, we have David Heller, Francisco Altamirano, Jordan Barab, Mark Kaszniak, Michael Morris, Stephen Selk and John Vorderbrueggen all played a critical role in this investigation. In addition to these individuals, several members of the staff participated in reviewing documents and reviewing our draft reports, and we want to acknowledge their contribution as well.

Some background on the First Chemical facility. The Pascagoula facility was owned by ChemFirst, Inc. at the time of the incident. It was purchased by DuPont Corporation a few weeks after the incident. At the time of the incident the facility employed 137 full time employees and 8 full time contractors. The facility produced aniline and

nitrotoluenes. We're going to speak today about the part of the process that refined mononitrotoluene. Mononitrotoluene is used in making dyes, rubber chemicals and agricultural chemicals.

AS an orientation of where the plant is actually located, this is an aerial view of the Bayou Casotte with the industrial park. The triangular shaded area that you see here is actually the First Chemical facility.

It is bordered on the west, the southwest by Mississippi Phosphates, and they also own a large gypsum pile that is to the northwest of the First Chemical facility.

To the east the facility is bordered by Chevron refinery. As you can see by the picture, there's a large tank farm area adjacent to the First Chemical property and Chevron also owns the wooded property just north of their tank farm.

You can see the Bayou Casotte running north to south in this area. There are some other industries along the Bayou, and then in this area are residential homes.

A brief summary of the incident is as follows: On October 13, 2002 at approximately 5:25 a.m. an explosion and fire occurred at the First Chemical facility in Pascagoula, Mississippi.

The explosion occurred due to a thermal decomposition in a distillation column that was actually shut down at the time. It was not under normal operating conditions at the time of the explosion.

This column processed mononitrotoluenes, or what we will refer to at MNT.

Three employees who sought refuge in the control room were injured. Two received first aid and one received further treatment for cuts.

A shelter-in-place was called due to the explosion and release of material.

Because of the serious nature of this incident, the potential for serious offsite consequences and also the involvement of a reactive chemical, the Chemical Safety Board initiated an investigation of this incident.

At a discussion of reactive chemicals, the

CSB has studied the reactive chemical problem in industry. We released a report in 2002. We determined that 167 incidents have occurred over the past 20 years that have resulted in a 108 deaths. The CSB made recommendations to OSHA and EPA as part of that study, which will be discussed in our recommendations further. But I would just like to point out that this incident further emphasizes the need to implement our previous recommendations regarding reactive chemicals.

As part of its investigation, the CSB staff reviewed several thousands of pages of documents which included drawings, it included procedures, various other documents. We interviewed employees of First Chemical, both current and previous employees. And we also conducted testing of material and equipment that was involved in the incident.

Also, as mentioned previously, in January 2003 the CSB held a community meeting here in Pascagoula to discuss preliminary findings and allow residents to provide comments.

The incident occurred in an area of the plant that distilled MNT or mononitrotoluene. The

column was shut down at the time of the incident.

And mononitrotoluene is a reactive chemical that can degrade rapidly if exposed to heat. Mononitrotoluene is very susceptible to being exposed to very high temperatures or to elevated temperatures for prolonged periods of time. In our key findings discussions we will talk about the time/temperature relationship and how long it takes to actually have an explosion under these conditions.

And a bit about the processed chemistry. Mononitrotoluene is made upstream of the column that exploded. It is actually refined in the column.

Mononitrotoluene has three different arrangements referred to by chemists as isomers: Orthro, meta and para-mononitrotoluene. The mononitrotoluene was separating these different isomers.

And just as a point of context, mononitrotoluene is in the chemical family of trinitrotoluene or TNT, but it has approximately one-third of the explosivity.

We're going to focus largely on the column

where the incident actually occurred today. In preparation for that I would like to give some background on what a distillation column is. Very briefly.

This is a typical distillation column. The feed line to the mononitrotoluene column flowed into the column. Because the column is a temperature that vaporizes some of the material, part of the material vaporizes, flows to the overhead, is recondensed into liquid in which a portion is sent back to the column. This is done to aid in separation. A portion of the material was also sent off site as product.

Some of the material that flows into the column stays as a liquid. It flows to the bottom of the column, which is then heated in a reboiler system and vaporized and sent back into the column. Again, this is to aid in separation.

The reboiler is heated by some particular heating method, in this case steam was used to heat the column. Steam would flow through the valves that you see, these are representative of valves. This is a

manual block valve. This is an automatic block valve which open and closes automatically controlled by a computer in order to control the flow of steam to provide the appropriate amount of heat to the reboiler.

There is also a bypass line which is usually kept closed so this valve can be taken out of service and maintained but the process would not have to be shut down.

This steam is then condensed in the reboiler and is sent back as condensate back to the boiler system and the process is recycled again.

A portion of the material from the bottom is actually sent off site.

We'd like to point out that there was material, although this column was not actively operating at the time, there was material in the bottom that had not been removed when the column was shut down.

I would like to talk about a definition of terms that you're going to hear throughout the morning.

When we discuss a runaway reaction, we are talking about an uncontrolled chemical reaction where the heat generated exceeds the heat removed.

When we discuss hazard reviews and hazard analyses, we are talking about formal management systems to determine risk and decide if additional safe guards are necessary.

We are going to discuss shelter-in-place. Shelter-in-place are the steps taken by people in their homes and workplaces to limit their exposure to chemicals. The steps consist of going inside, closing your doors and windows, turning off any ventilation which could bring outside air into the home or workplace, and then monitoring the radio or television to hear further instructions.

We're also going to discuss either column or still or vessel. These terms are used interchangeably. We're talking about the tank where the chemicals are separated.

With that background and context, I would now like to turn it over to Investigator Michael Morris to discuss the incident description and the

specifics of what happened that day, and leading up to the event.

MR. MORRIS: Thank you, Mr. Wallace.

Good morning, members of the Board, Mr. Jeffress, Mr. Warner.

As with many incidents the CSB investigates, this one involved events that developed in the days and months before the actual incident. I would like to highlight some of the important preincident events and share with you some details on how these events lead to the explosion on October 13 here in Pascagoula.

On September 7th the MNT distillation column was shut down. This was accomplished by closing the valves that supplied MNT to the column as well as the outlet valves that send distilled product to the next stage, basically stopping the input and the output from the column. And this was done by closing the input valves on this line and output valves on this line. And the column was actually basically recycling the material inside the column.

Now, the column was shut down because of

production problems upstream. However, it was not emptied. And about 1200 gallons of MNT was left in the column.

Again, input and output of the column was stopped, but the steam which heated the column and the cooling system was left on to reduce the amount of steam vented to the atmosphere and to also supply adequate condensate to the plant boilers.

On September 22nd there was a fire in a nearby number two hydrogen unit requiring operators to respond. And as a precaution, they quickly isolated or turned off steam supply valves to the MNT column by closing valves in the steam lines and also shutting off the cooling system.

They closed manual and automatic valves to block steam from reaching the column. This is the automatic valve and this is the manual block valves. Again, as Steve said, the bypass line is usually closed and also the cooling system was blocked out.

Now CSB recovered processed control data and found that after these steam valves were closed, the temperature did not decrease but actually

increased during the next 5 days reaching as high as 415 degrees fahrenheit. Keep in mind since this process was believed to be shut down and the MNT supply stopped, the temperatures and pressures were not being actively monitored by operations.

On September 29th the entire facility was shut down for maintenance, and this included shutting down the plant boilers which supplied steam to the processes in the plant. At this time the process control data that was recovered showed the MNT column temperature dropped to near ambient conditions or the temperature outside.

On October 5th when the boilers were brought back on line or started up again, the temperature in the MNT column rose again to approximately 415 degrees fahrenheit. Again, a steep temperature rise even though the steam valves allowing heat to the MNT column were believed to be closed.

The subsequent testing of the steam valves showed that they allowed steam to leak through the lines and heat the MNT remaining in the column. This is a picture of how one of the steam valve

arrangements were in the field before we had it disassembled for testing. The steam flow would run in this direction through a manual valve, through this is manual valve, and this is the automatic control valve. This is the bypass line. And this is actually what one of the stations looked like before it was removed to be tested.

One of the valves allowed as much as 180 pounds of steam per hour to pass through during testing. This is a picture of one of the steam valves that when it was taken down during analysis, as you can see, a large hole in the packing of the valve, in the seat of the valve.

This is a graph of the temperatures that I've discussed. This is actual recovered process control data from a few days leading up to the incident. As you can see, Steve talked about the column having temperature sensors and they recorded periodically information to the process control system and we were able to download it after the incident. And these are, the purple and the blue are the two lowest column sensors. As you can see when the steam

was shut off, as I talked about earlier, the temperature dropped. And, again, this is when the steam was turned back on and when the boilers were restarted, and you can see a gradual increase in temperature until the 13th when the incident occurred.

Now by the 13th of October the steam that had been heating the MNT in the column that was presumed to be shutdown had, in fact, raised the column temperature now up to 450 degrees fahrenheit. Now this is in the range that MNT starts to decompose which could lead to an explosion.

Due to the column being presumed shut down, operations were not actively monitoring the parameters, again, such as temperature and pressure inside the column. Now keep in mind this process operates normally around 360 degrees fahrenheit.

This is an overview picture of the First Chemical facility, just to get you oriented where some of the things are.

Again, this is the MNT distillation column. This is the control room where the operators control the process. The distance between the column

and the control room is approximately 50 feet.

This is a large ammonia storage tank on the facility. And this is PNT tank that was involved in the fire.

Now, the day of the incident around 5:00 in the morning at the time of shift change, operators in the area recalled hearing large rumbling and feeling the ground begin to shake. One operator outside the control room saw high pressure leak coming from the side of the top of the column. He believed the pressure safety valve was releasing. And he went inside the control room to tell his coworkers what was happening.

At this point inside the column the MNT, which had been slowly decomposing over the last 8 days, began to accelerate its decomposition. What you had now was a self-feeding rapid runaway decomposition reaction.

Around 5:25 a.m. on the morning of the 13th the column could no longer contain this pressure being built, being produced by this reaction and a huge explosion was the result. And this explosion

blew the top 35 feet off of the column.

This is a picture of the control room. And you can see the fire and the blast damage. Again, it was during shift change. There was several people in this area. With the explosion happening in the top 35 feet of the column, it was very lucky. There could have been a lot more serious personal injury if it would have happened at the base of the column.

Again, this is 50 feet from the distillation column.

This is a picture of the control room doors that the operator ran in. You can see the damage, structural damage to the block wall.

Also a large fragment from the side wall of the column was propelled like a missile over 500 feet to the south. Again, here's the area where the column is. The large part of the column was propelled this way. This is, again, the PNT storage tank.

This piece pierced the storage tank creating this large hole. This tank held more than 2 million pounds of para-mononitrotoluene and had burst into flames.

Some potential consequences that could have occurred.

A large tray from the top of the column slammed into an overhead pipe rack directly above, close to this 500,000 pound pressurized ammonia storage tank. The large piece landed on the ground.

Also, all of the packing material that was inside the column was blown out, some off site as far as nearly a mile away. Several pieces of this packing continued to burn after falling back to the earth due to a flammable residue coating on the packing igniting small fires around the plant and around the outlying area. And this is an example of what the packing that was actually inside the column.

This piece from the column, weighing nearly 6 tons, was thrown over a 1,000 feet away on the Chevron refinery property in the vicinity of a 250,000 barrel crude oil storage tank. A few other large pieces were recovered from a pond on Chevron property.

And after several searches, the top head portion of the column still has not been found.

Emergency response to the incident. Immediately after the explosion the First Chemical facility emergency plan was activated. All personnel was accounted for and on site fire brigade members began fighting several small fires around inside the plant with handheld fire extinguishers.

Local police and fire fighters responded to the site.

Smoke from the fire was blue in a southeasterly direction, which carried it over the Chevron refinery, and luckily out into the Gulf of Mexico.

The local emergency planning committee called for a shelter-in-place for nearby residents.

The large fire of the PNT storage tank was eventually put out by plant brigade members with the applications of foam about 3 hours later. So all of the fires were now out at 8:30 in the morning.

Now Steve Wallace would like to discuss the key findings from the CSB investigation.

MR. WALLACE: Thank you, Mike.

Mike discussed in vivid detail what

happened prior to and on the morning of October 13th. I'd like to recap the key findings that we determined from the incident.

The incident was caused by a runaway reaction in an MNT column that occurred because it was heated for an extended period of time by steam leaking through an isolation valve.

The CSB worked with a team experts to determine the nature of MNT hazards and the time until control of the reaction is lost, and this is what we found. There is definitely a time/temperature effect when you're dealing with mononitrotoluene, as you can see from the graph that I have on the board. This line represents the time when the reaction goes out of control. As you can see, if you are around 400 degrees, you have over 40 days before you have to worry about the reaction going out of control or running away. When you start getting around 425 degrees you're in the vicinity of 10 to 11 days before the material goes out of control. In the range of 450 degrees, you are a day or less away from the time that the material goes out of control.

As Mike noted, the base of the column, the temperature, was around 450 degrees the morning of the explosion.

Another way to say this is that the time you have before the reaction goes out of control goes from days, to hours, to minutes, to seconds as you increase the temperature. And as the temperature increases, it starts feeding on itself and increasing the temperature further; that's what we mean by runaway reaction.

We found that there had not been a hazard analysis performed on this process, and that lessons from an analysis of a different process unit processing mononitrotoluene were not applied to this unit.

The company had performed a hazard analysis of a batched process in 1996 that processed mononitrotoluene. And this resulted in updated hardware and procedures associated with that column. However, those lessons learned were not applied from that unit or that column to this unit and this column. So the knowledge was there, but it was not applied

broadly.

The column did not have safeguards to ensure that it remained safe. Safeguards missing from the column included:

Temperature alarms to warn operators of process upsets; Interlocks to shut down the column automatically if the column became unsafe; and Adequate overpressure protection.

The column had been isolated by closing only one manual valve in each steam line, as Mike showed us a minute ago. The line was not double-blocked-and-bled or blinded to provide additional isolation.

When we refer to being double-blocked-and-bled, we're referring to a procedure whereas two valves are closed and a drain is opened between them which will prevent material from one area of the process from going and flowing to another area of the process. In this case the steam, you did not want the steam to flow into the reboiler and continue heating the stagnant mononitrotoluene that was in the column.

When we refer to being blinded, blind is a

piece of metal that is put in the line that, again, provides insulation making it virtually impossible, assuming the structure and integrity of your blind is appropriate, making it virtually impossible for material to flow from one area of the process to another area.

And CSB determined that the isolation valves leaked. Without the additional isolation, the steam leaked through the valves thereby heating the material in the base of the column.

As was mentioned before, personnel in the control room were injured by shattering glass during the explosion. And although a shelter-in-place was called for the local community, it was not effectively communicated to them and residents were not aware of the appropriate steps to take had they been aware that a shelter-in-place had been called.

We also found that First Chemical conducted a safety audit as part of their Responsible Care obligations in 2000, which indicated that all systems, including hazard reviews, were in place. Responsible Care is an obligation under the Chemical

Manufacturers Association, which is now known as the ACC or American Chemistry Council. First Chemical was a member of the American Chemistry Council at the time of the explosion, one of the obligations is to periodically do audits and assessments to evaluate your management systems. During this audit, again, was indicated that all systems were in place including hazard reviews. However, the CSB determined that there had been no formal hazard review conducted for the MNT unit.

Therefore, our investigators pieced together our key findings to determine what the root and contributing causes of this incident were. When we look at root and contributing causes, we look at not only what physically happened to cause the incident, but we look at the underlying management system failures that allowed that incident to occur and would allow other similar incidents to occur if those problems were not corrected.

The plant did not have adequate systems for evaluating the hazards from processing mononitrotoluene.

Our first root cause is that the Pascagoula facility did not have an adequate system for evaluating the hazards for processing mononitrotoluenes in their continuous process and did not apply the lessons learned from hazard analysis conducted on similar processes in the plant. To reiterate, First Chemical had not conducted a formal hazard analysis on this process. Findings from the analysis of a different process handling the same material were not applied to this unit. And because no hazard evaluation was completed, that manifested itself because safety information did not reflect the potential hazards of mononitrotoluene.

The second root cause we determined is that First Chemical did not have a system to ensure that the column was equipped with sufficient layers of protection to prevent a catastrophic release.

In order to keep columns in chemical plants safe, you must have layer upon layer of protection so that people are aware if the column is becoming is unsafe, if the process is becoming unsafe and ultimately and take automatic action if the

process becomes too unsafe.

The column did not have critical alarms to warn operators that the temperature was increasing.

The column did not contain interlocks to automatically shut off the heat source if the column became unsafe.

And as a last line of defense, you want to have adequate overpressure protection where relief devices will allow vapor to leave the column, thereby bringing the pressure down rather than allowing it to continue to be generated.

We found that the column did not have adequate overpressure protection. Not only did the relief device not open during the incident, but we found that the relief device that was on the column was inadequate to relieve a thermal decomposition of this type.

A third root cause: We found that the Pascagoula facility had no effective system for ensuring safe work practices when isolating equipment.

Specific steps to isolate the column were not included in procedures.

Critical items to monitor during shutdown, such as temperature, were not included in the procedures.

Operators were not trained on the potential hazards of heating mononitrotoluene for an extended period of time. And as we saw from the graph a few minutes ago, when you heat mononitrotoluene for an extended period of time it can become an uncontrolled chemical reaction very quickly, especially when you get into the temperatures that we observed prior to the incident.

And the final root cause is that First Chemical did not have an adequate program to prevent leakage in isolation valves in steam lines connected to the number 1 MNT column. The steam supply valves had not been evaluated to determine how to keep them safe.

As part of a program which determines what critical equipment you need to maintain to keep it safe, First Chemical did not have a program to either identify the critical equipment that they needed to maintain or what they needed to do as far as

inspections and corrections to that equipment, including these steam valves. These were isolation valves on steamlines that were connected to a column which was highly susceptible to heat, when heat was not removed from the system such as in its shutdown state.

We also found two contributing causes. When our team evaluated the cause of this incident, we looked holistically at the incident, not only physically what happened at that unit but what made the consequences worse or could have exacerbated the consequences.

To that end we determined that First Chemical did not have a system to evaluate the structural integrity of the control room or its proximity to the process. As we noted before, three operators were injured in the control room due to shattering glass. The control room was located close to the process, it was not designed to withstand overpressure and there was glass on the door.

Thankfully, the operators only received minor injuries. But due to the fact that this occurred

early in the morning and there were no other personnel in that immediate vicinity, it probably contributed to this not having been a worse incident than it was.

We also determined that Jackson County did not have an effective system to alert residents about potentially catastrophic incidents and the appropriate actions to take.

These were our key findings and our root and contributing causes. I would like for Mike and Jordan to join me at the podium to address any questions on this portion of the presentation before we go on to the recommendations portion.

BOARD MEMBER POJE: Okay. Thank you, Stephen.

At this point in time I'd like to open up to the other Board members any questions that you might have about this presentation or any clarifying points that you would like to make.

Dr. Taylor?

BOARD MEMBER TAYLOR: I guess I could start it off.

Steve, and to the rest of the staff, I

have a few questions.

One is you mentioned that there was another MNT column on site that the process hazardous analysis has been performed. When you questioned the company, why had they not performed the same process hazardous analysis for this operation?

MR. WALLACE: What we were able to determine is the two processes were different. The one that was started in 1996 was known at the batch process. It's a different type of process in which material is basically put into a column, a large volume of material, and then is boiled off. It is not a continuous process, what we would refer to as a continuous process where material is metered in and products are sent out of the column at a controlled rate continuously.

BOARD MEMBER TAYLOR: They were somewhat different in that?

MR. WALLACE: They were somewhat different.

BOARD MEMBER TAYLOR: Okay.

MR. WALLACE: However, what we found out

during our interviews were a number of things. The 1996 batch column is the first time that this particular process had been applied in the unit, had been applied to the First Chemical facility. They were dealing with larger volumes of material in the batch process than in the continuous process. And the continuous process had operated for 30 some years with no problems. And so it was believed that a different approach was merited. It was, you know, an evaluation was conducted on the batch process not on the continuous process.

BOARD MEMBER TAYLOR: Okay.

MR. WALLACE: I'd like to say a word about that. You know, we talk in the process safety field about intrinsically safe or inherently safer chemistry. It's true that sometimes you can look at a batch process as being more inherently unsafe than a continuous process, which they had. Because you are dealing with larger volumes, you're dealing with some more variables that you're not dealing with. But even when you're dealing with what you feel to be an intrinsically safer process such as a continuous

process, you still must do hazard evaluations of that process and put in safeguards to keep it safe.

If that answered your question?

BOARD MEMBER TAYLOR: That did.

BOARD MEMBER POJE: Yes. Do you have one more?

BOARD MEMBER TAYLOR: I do.

Were there any environmental exposures reported related to the explosion and the release of the mononitrotoluene to the community or surrounding area?

MR. MORRIS: There was one guard reported exposed at the Chevron refinery. It was a very minor exposure. Luckily, through weather data that we collected afterwards and testing and monitoring done by the EPA, Environmental Protection Agency and the Coast Guard immediately after the incident, they determined that the plume from the smoke from the fire from the tank, like I said, all drifted to the southeast and out into the Gulf of Mexico, luckily away from residential areas where people could have been exposed to it.

BOARD MEMBER POJE: Okay.

BOARD MEMBER TAYLOR: This is the last one. Regarding contributing cause number 2 in that Jackson County did not have an effective system to alert residents. There were several other chemical facilities in this area, is my understanding. So had there been other incidents prior to this one where the residents were ever told to shelter-in-place and do you know anything about whether that had happened?

MR. WALLACE: There had been previous incidents in the area. There was a barge explosion that occurred, I believe, in the mid-'80s. There was also an incident at First Chemical where there was an explosion in a column which is in the report, which is part of our findings. We didn't present it today. But there was a serious incident that occurred on First Chemical property.

The second part of your question was a shelter-in-place called. I don't know the answer to that. In discussing that with people there was not a recollection and we were not able to find records of when a shelter-in-place had been called.

So there were some previous incidents in this vicinity that were serious. I am not sure if a shelter-in-place had been called then or not.

BOARD MEMBER TAYLOR: And so the residents did not have the training or enough training? There was some training, but not adequate?

MR. WALLACE: We found at our community meeting in January that the residents did not have appropriate training in the steps to take when a shelter-in-place was called.

BOARD MEMBER TAYLOR: Okay. Thank you.

BOARD MEMBER POJE: John, do you have some questions?

BOARD MEMBER BRESLAND: Yes.

Steve, getting back to the time/temperature analysis on the graph that you showed. Was that information developed back in 1996 as part of the study on the batch distillation process? And was First Chem aware of this -- of the time/temperature relationship back in 1996?

MR. WALLACE: In the information that we got, First Chemical did a fairly comprehensive

evaluation and analysis of the hazards of mononitrotoluene. Included in that were articles that they supplied to us which showed the time/temperature relationship and showed that if this material was an elevated temperature for an extended period of time, that it could actually become uncontrolled.

In addition to that, some of the leading sources of information in the field, both Brethericks and Saks, Saks Dangerous Properties of Industrial Material and Brethericks. Brethericks also discusses that holding mononitrotoluenes or holding nitrotoluenes at an elevated temperature for an extended period of time can result in incidents.

BOARD MEMBER BRESLAND: And I have a question about the steam leak which ultimately caused the column to raise in temperature. You showed that they had closed the control valve and closed one and two of the block valves. So for the steam to be leaking into the column, you had to have leaks in both the control valve and in one of the block valves? Can you elaborate on that exactly what you found?

MR. WALLACE: Yes. There were two -- what

we presented was a representation of one of the stations. There were two stations that were attached to the column.

What we found in our evaluation of the valves afterwards was that in one of the columns -- I'm sorry. In one of the stations attached to the column that it actually leaked through the bypass line, meaning that it would only have had to have leaked through one valve, one manual valve that was normally closed anyway.

In the other station, you are correct, it actually leaked through the main flow of the line. It leaked through the control valve, which had been closed, and also the manual valve which had been closed. But it is important to remember that these control valves were not meant to be tight shut off valves. In other words, they continue to pass some amount of vapor even when they are "closed." And so it is not adequate to rely only on the closing of a control valve and a single manual valve which may leak to ensure positive isolation.

BOARD MEMBER BRESLAND: Can you discuss

for a second the temperature monitoring on the column when the column was shut down? They had a series of temperature monitors on the column, but were there alarms that would indicate that you were getting above a critical temperature?

MR. WALLACE: No. As we presented, there were indicators, there were 8 indicators that ran the length of the column. Those only sent a signal showing what the temperature was. There were no alarms to heighten awareness that something was going out of bounds. And we found that that temperature was not being actively monitored at the time of the incident or prior to the incident.

BOARD MEMBER BRESLAND: Okay. Thank you.

BOARD MEMBER POJE: Dr. Rosenthal?

BOARD MEMBER ROSENTHAL: Yes. Thanks for the excellent report.

You noted that batch processes are generally considered to be more troublesome in regard to decomposition or other process accidents, inadvertent mixing. But in effect this was operated as a batch process, wasn't it? I mean, at the time of

the shut down they were cooking the material and recycling it, and so it was a batch process and you had long residence times, as just an observation?

MR. WALLACE: I think that's a fair analogy. Because it was shut down with material inventoried in the bottom and they were applying heat, I think it was akin to a batch process.

BOARD MEMBER ROSENTHAL: Okay. The other thing that just struck me as you went through with the leakage of the bypass valve and the probable leakage of it, didn't we have another incident where the primary failure or mechanical failure was failure of the bypass valve to close? I don't --

MR. WALLACE: That's correct, yes.

BOARD MEMBER ROSENTHAL: Yes. If that's correct, it kind of signals, maybe not in this report, somewhere is that hey pay attention to bypass valves. This may just be coincidence, but certainly -- okay.

Last thing is a question. This process was not regulated under either the PSM standard or the RMP standard, the Process Safety Management standard of OSHA or the Risk Management standard of EPA. Am I

correct?

MR. WALLACE: That's correct, yes.

BOARD MEMBER ROSENTHAL: Are there any aromatic nitro compounds covered under the standard, other than those that are explosives under the Explosive standard?

MR. WALLACE: Mononitrotoluene is not. Dynitrotoluene is not. And nitrobenzene is not. So I'm not aware of others.

Trinitrotoluene may be by virtue of the fact that it's considered explosive.

BOARD MEMBER ROSENTHAL: But that's in the Explosive standard?

MR. WALLACE: That's correct.

BOARD MEMBER ROSENTHAL: It's not in the PSM standard?

MR. WALLACE: That's correct.

BOARD MEMBER ROSENTHAL: Okay. Thank you.

MR. WALLACE: Thank you.

BOARD MEMBER POJE: And I just have a couple of points that I'd like to get some clarification on.

You did talk about the control room and its siting. I can recall a horrifically tragic event in Norco, Louisiana at the Shell refinery in 1988, I believe, in which 7 workers were killed in a control room when there was a horrific explosion at that facility. It certainly gave an inspiration to the fact of control room siting needing to become a matter of greater thoughtfulness and study for all existing facilities and future facility designs.

Can you tell me a little bit about how you researched this topic of control rooms and what kind of guidances that you referenced in your considerations?

MR. WALLACE: Certainly. One of the most prevalent guidance documents that's used regarding facility siting comes from the American Petroleum Institute. It's API 752, which is specifically dedicated to facility siting. It involves a number of steps. In general, it's looking at your process, looking at the buildings you have, determining what occupancy you have and deciding what type of safeguards you need to have.

If you have a control room where you have a lot of people or you have episodically a number of people for meetings, then those people in the control room in the middle of a process unit will be more at risk. This is a science that goes back a few years.

Control rooms are typically designed to withstand some pounds of overpressure, what they would call overpressure, such that if an explosion does occur people inside the control room will be kept safe because the walls are reenforced.

We also looked at the Center for Chemical Process Safety or CCPS documents regarding the evaluation of process buildings. And it's along the similar lines as what the API document determined. What risk you have with the people and the occupancy in the building and take steps to make sure they're safe.

BOARD MEMBER POJE: Did you do any inquiry of the FCC facility to find out whether they had gone through any kind of analysis like that for their control room?

MR. WALLACE: WE did. Our interviews

indicated that some of the employees had recalled that an evaluation had been done, but no documentation for such could be located and provided to us.

BOARD MEMBER POJE: Okay. Then in the other area, I'd like to get some elevation -- I was kind of disappointed to have heard that this was a facility that was operating nominally under Responsible Care and yet it seems from your layout of evidence that there wasn't any adherence to certain aspects of Responsible Care that speak to the very issues of process safety.

Can you give me a little bit of more of a background about responsible care in general and how that system is audited either by corporations or by facilities?

MR. WALLACE: The Responsible Care program that was in place at the time when the evaluation was done, which we referenced in 2000, had as part of its obligation of member facilities that they should do an annual audit to evaluate their programs that they had as far as management systems to keep their facilities safe. One of the specific line items in the

Responsible Care is to do hazard evaluations, that you have a good system for doing hazard evaluations and hazard reviews.

That was actually checked as being a practice in place, which meant that all aspects of that should have been in place which ran somewhat contrary to what we found. There was another aspect which we discussed in the report that says that there are layers of protection such that a single failure will not escalate into a catastrophic event. That was also checked as practice in place.

Responsible Care and ACC has gone through some revisions lately in which the audit process has changed somewhat. Before it was a self auditing process where basically facilities filled out the check list and sent that into Responsible Care. Now there are obligations under the new system, the very new system in American Chemistry Council, that audits have to be verified by a third party.

BOARD MEMBER POJE: Thank you.

And then just a couple of smaller points. You mentioned the term interlocks several times. Can

you describe for us what you mean by that term?

MR. WALLACE: Yes. When we talk about layers of protection, certainly the column had indicators which told you what happened or what the temperature was.

Another layer on top of that would be alarms that actually send a signal into the control room and alarm to allow operators to know that the temperature is getting too high.

Another layer on top of that would be an interlock where that signal, once you reach a certain high temperature, that signal sends a signal to the valve on the reboiler line, on the steam line to the reboiler, to automatically close that line.

The reason interlocks are important is because if your temperature continues to increase, you want to act quickly and even quicker than you can act manually by going out into the field and literally closing a valve.

BOARD MEMBER POJE: And finally, were there any other alarms that went off? I know you mentioned no high temperature alarms. But did any

other alarms go off on this column during this period?

MR. WALLACE: There was a level alarm that enunciated just prior to the incident. There was a level, a tray that was at the top of the column and a level alarm was enunciated. It was acknowledged but no further action was taken on it.

BOARD MEMBER POJE: So something indicating that there was a build up of fluid in the upper reaches of the column?

MR. WALLACE: Yes.

BOARD MEMBER POJE: Signaled an alarm, but it was not acted upon as an indicator that there may have been some very active temperature situation?

MR. WALLACE: That's correct. That's correct.

BOARD MEMBER POJE: Okay. Thank you.

Any other questions from any of the other Board members?

Very well. Again, thank you for your presentation. If we can now proceed into the area of the recommendations.

MR. BARAB: Thank you.

Mr. Chairman, Board members, Mr. Jeffress and Mr. Warner, I will now present the recommendations of this report.

Before I go into the recommendations, for the benefit of the audience, I'd like to explain a little bit about the recommendations process of the Chemical Safety Board.

Recommendations are the primary tools used by the Board to motivate implementation of safety improvements and to prevent future accidents that could endanger lives, the community or the environment.

Recommendations are made to businesses, trade associations, government agencies, safety organizations and labor unions.

The CSB's independent accident investigation process identifies trends and issues that may be otherwise overlooked. We not only look at specific issues that may have prevented this incident, but we also look at possible changes in management systems that could prevent similar incidents as well.

In developing recommendations, the CSB

also conducts research. We talk to experts in best practices and government regulations.

As Mr. Wallace said, we also held a hearing here in Pascagoula last January where we heard comments from effected citizens.

In addition to developing the Board recommendations, CSB staff also communicates these recommendations to the recipients. We work with the recipients after they're communicated to make sure that they understand the recommendation and to ensure successful adoption.

Finally, all recommendations are issues and closed by a vote of the Board.

I will now present and explain the recommendations.

The first recommendation goes to DuPont Corporation. As the report indicated, although DuPont Corporation owns the First Chemical facility at this time, at the time of the incident it was in the process of purchasing the facility and did not at that time actually own the facility. However, like any well run organization, DuPont has a responsibility to

audit the safety systems of its subsidiaries such as First Chem. We are therefore making the following recommendation to the DuPont Corporation.

In light of the findings of this report conduct audits to ensure that the First Chemical Pascagoula facility addressed issues detailed below in the section entitled DuPont-First Chemical Pascagoula Facility. Communicate the results of these audits to the workforce.

Our next 6 recommendations go the DuPont First Chemical Pascagoula facility.

As the report indicated, the facility had a number of problems in its safe handling of reactive processes. The first recommendation to DuPont-First Chemical Pascagoula Facility addresses the fact that there was no adequate system to evaluate hazards in processes that use highly energetic reactive materials. It also addresses the fact that although lessons were learned from a similar process that processed mononitrotoluene and, in fact, safeguards were implemented at that process, these lessons were not applied to the process where the incident

occurred.

In order to ensure that such gaps in hazard evaluations do not reoccur, we are making the following recommendation: Establish a program and conduct process hazard analyses of processes involving reactive materials.

Our second recommendation to the DuPont-First Chemical Pascagoula Facility results from the fact that although these processes involve reactive substances that could explode catastrophically, as the report indicated there were no alarms to warn operators of high temperatures nor were there any interlocks that could have automatically prevented a runaway reaction and the catastrophic release of material. In order to assure that such levels of protection are present in the future, we are making the following recommendation: Evaluate the need for layers of protection and install appropriate safeguards such as alarms and interlocks, to reduce the likelihood of a runaway reaction and catastrophic release of material.

The third recommendation to the facility

addresses the critical gaps that were identified in the written operating procedures and the work practices. These included isolation of equipment, information about the hazards of the process and instructions on how to safety perform a shutdown. To ensure that in the future these procedures are in place are used we are making the following recommendation: Review and revise as necessary procedures for units that process reactive materials and effectively communicate the updated procedures and train workers appropriately. Revised procedures should include: Specific steps for isolation of energy sources; warnings and cautions concerning process chemicals and consequences of deviations from operating limits; critical operating limits and guidance when the limits are exceeded; instruction on how to perform a shutdown for all foreseeable causes to ensure proper isolation, and to continue monitoring critical parameters such as temperature while the column is shut down; in addition, conditions under which the material must be deinventoried, such as during an extended shutdown.

The fourth recommendation to DuPont-First Chemical Facility addresses the failure of the pressure relief valve to open during this incident and our research that showed that the pressure relief valve was not in fact appropriate for this process.

I will read the recommendation. Conduct a facility-wide survey of pressure vessels to ensure that all equipment that processes reactive material has appropriate overpressure protection.

The fifth recommendation to DuPont-First Chemical Facility addresses the fact that there was no preventive maintenance program that included inspections of isolation valves. This somewhat addresses the concern that you raised, Dr. Rosenthal, about the critical need for well operating isolation valves. As the report indicated, a leaking steam valve led to the overheating of the material which then led to the explosion.

In order to assure that important equipment is included in a preventive maintenance program with adequate inspection schedules, we are making the following recommendation: Identify

equipment critical to safe operation of processes containing reactive materials, upgrade the maintenance program and establish inspection schedules to ensure the integrity of such equipment.

The sixth recommendation addresses the location and construction of the control room. As the report indicated, the control room was located only 50 feet from the unit and was not constructed to withstand an explosion of this magnitude, which resulted in the injury of 3 workers that were inside the control room. In order to address the problem of facility siting, we are making the following recommendation to DuPont-First Chemical.

Survey and take appropriate action to ensure that the buildings occupied by plant personnel are of adequate construction and are located in such a way as to protect people inside in the event of an explosion from equipment processing reactive material.

As the report indicated, this incident was not limited to the facility. There was a large amount of material blown around the facility. There was also a large amount of material blown off site, narrowly

missing tanks that contain highly hazardous materials that had they been hit, could have a major impact on the community as well as on the environment. Although there was no health or environmental impact from this incident, we do consider this to be a close call and a warning to the community.

In order to address the problems that were identified with notification of the community, we are making the following recommendation to the Jackson County Board of Supervisors, the Jackson County Emergency Management Agency and the Jackson County local emergency planning committee.

Update the community notification system to: Achieve the capability of immediately alerting residents in the Moss Point community when an incident occurs that could effect their health and safety; determine when a community response should be initiated; communicate the nature of the incident and the appropriate response by the residents; alert residents when the incident is over, for example when an all-clear is sounded.

The next recommendation addresses the

problem that even had the residents been properly notified, many were not aware what a shelter-in-place meant nor how to conduct an orderly evacuation should one have been necessary. We are therefore recommending to the Jackson County Board of Supervisors, the Jackson County Emergency Management Agency and the Jackson County local emergency planning committee that they conduct an awareness campaign to educate residents on the proper steps for shelter-in-place and orderly evacuation.

Finally, we are making an identical set of recommendations to the American Chemistry Council and the Synthetic Organic Chemical Manufacturers Association.

As Mr. Wallace said, both of these organizations administer the Responsible Care and Management program for their members. Responsible Care is a set of voluntary guideline systems that all members of ACC and SOCMA are required to comply with. In general, these voluntary recommendations serve to fill in many of the gaps left by the regulatory system.

Our first recommendation to the American Chemistry Council and the Synthetic Organic Chemical Manufacturers Association is response to the fact that First Chemical had in fact done a hazard analyses of a similar MNT unit, had implemented a number of safeguards at that unit but had not applied the lessons learned from those findings to the unit in question. In order to ensure that such information is gathered as part of the hazard evaluation and that this information is applied to similar processes not only in the plants, but at other plants owned by the company as well, we are making the following recommendation.

Amend the technical specification guidelines in the Responsible Care Management System to explicitly require facilities to identify findings and lessons learned from process hazard analyses and incident investigations in one unit and apply them to other equipment that processes similar material.

Our second recommendation to ACC and SOCMA concern the finding that, as the report indicated, First Chemical had done a Responsible Care self audit

where they had certified that all safety elements were in place, although our investigation showed this not to be the case. ACC and SOCMA, as was related, have recognized this problem with self audits and had implemented a new system that involves third party audits.

We are making the following recommendation to ACC and SOCMA. Ensure that members of ACC and SOCMA understand the audit requirements of Responsible Care and accurately identify and address gaps in facility process safety programs.

Our final recommendation to ACC and SOCMA simply requests that these organizations communicate the findings of this report to your membership.

I want to end by reemphasizing a set of recommendations previously made by the Chemical Safety Board. As was related, this incident was a reactive chemical incident. In other words, a thermal decomposition in a process and it was not properly evaluated.

As with many reactive incidents that occur in this country, the chemicals involved in this

incident were not covered by OSHA Process Safety Management standard, nor were they covered by EPA's Risk Management Plan standard. The PSM and the Risk Management standards address systems that need to be in place in order to ensure the safety of processes that involve reactive chemicals.

In September 2002 the CBS issued entitled "Improving Reactive Chemical Management." The report concluded that OSHA's Process Safety Management standard and EPA's Risk Management Program had significant gaps in coverage because they were based on the limited list of individual chemicals with inherently reactive properties. In addition, they did not require specific reactive hazards to be examined when performing a process hazard analysis.

The CSB recommended in a report that OSHA amend the Process Safety Management standard to achieve more comprehensive control of reactive hazards by broadening applications of the Process Safety Management standard and requiring that multiple sources be consulted when compiling process safety information. And finally, by augmenting the Process

Safety Hazard element to explicitly require the evaluation of reactive hazards.

The CSB also recommended that EPA revise its standard for the Risk Management Plan to explicitly cover catastrophic reactive hazards that can impact the public.

To this date, neither OSHA nor EPA has taken actions adequate to successfully close these recommendations.

Because this incident involved reactive chemicals and was a reactive incident, we would like to take this opportunity to highlight and reemphasize the critical need for OSHA and EPA to implement the CSB's recommendations without any further delay.

Thank you very much, and I'd be glad to entertain any questions.

BOARD MEMBER POJE: Thank you very much, Jordan.

I'd now like to open it up to any questions or comments from Board members regarding the recommendations as proposed by the staff.

Dr. Taylor?

BOARD MEMBER TAYLOR: Thank you, Jordan, for your presentation.

I guess the only question I have is a follow up to the last comment regarding OSHA and EPA. Have they made any progress in responding to our recommendations? Have we heard from them?

MR. BARAB: We have been consulting with them. We actually organized a roundtable on reactive hazards where we cosponsored with EPA and with OSHA several months ago, in addition to a number of industry representatives.

OSHA has indicated that they are involved in a number of activities that involve providing information to the public and to the regulated community about reactive chemical hazards, and making a lot of material available on their website. They have not yet addressed the actual changing of their current regulations, however.

BOARD MEMBER POJE: John?

BOARD MEMBER BRESLAND: Just one. Could you just elaborate on the changes in the Responsible Care program as far as the audit requirements are

concerned, the new Responsible Care program that went into effect recently?

MR. BARAB: Yes. Previously facilities were required to perform self audits. In other words, they basically audited themselves and looked at their systems and checked off, as Mr. Wallace said, whether specific items were in fact practice in place. In other words, whether the safe practices were in fact in place.

As we heard in this incident, First Chemical had in fact checked off almost everything as practice in place when in fact they weren't. There were a number of items that were not in place that were, nevertheless, checked off.

Now, both the American Chemical Council and SOCMA have identified this in the past as a problem, a serious problem, and they have been working for a number of years on how to address this. They just came up with a new plan which has been implemented by ACC for a year and is just now being implemented by SOCMA that will involve third party audits. In other words, they will, each company in

addition to doing their own audits, will then every so many years depending on the size of the company will employ an outside auditor to come into the firm to audit its safety systems to make sure in fact that everything is running according to plan and according to the audits that the actual company has done.

BOARD MEMBER BRESLAND: Okay. Thank you.

BOARD MEMBER POJE: If I could just make a comment on that. The National Association of Chemical Distributors, which is very much more involved in repackaging and transmitting chemicals over the highways and byways has for years operated under a similar parallel code called Responsible Distribution. And as I understand that that has within it a requirement for third party auditing and, in fact, the president of that organization has said that they have actually had to ask members to leave who do not meet that audit analysis and comply with the program.

So, I do think this is a very important step that's being taken here.

But Dr. Rosenthal?

BOARD MEMBER ROSENTHAL: Yes. It simply

occurred to me that, you know, this is not a total surprise your recommendations of your report. It's funny to hear something over and over again and then something strikes you. I'm thinking to myself now, I'm sitting in the DuPont facility and I read the recommendation, conduct a facility-wide survey of pressure vessels to ensure that all equipment that processes reactive material has appropriate overpressure protection and likewise, establish inspection schedules of processes that contain reactive material. And I'm thinking to myself, now what's a reactive material? OSHA doesn't define it generally. We don't define it. I mean, everybody knows what a reactive material, but it just points out the need that when we talk about reactive materials since everything reacts, and I'm not proposing we change anything. But in the future, we ask ourselves this question: How do we know whether people have covered all the reactive materials? Do we use one of the suggestions put forth in the roundtable papers? Do we use the state of New Jersey's definition? Do we use OSHA's definition?

It's an issue that I think we all need to think about collectively. Just a comment.

BOARD MEMBER POJE: If I could comment on that one, too. I just would urge you, Dr. Rosenthal, as you travel to an important meeting next week to discuss reactive chemical management hazards that you also add this to your discussions at that meeting.

BOARD MEMBER ROSENTHAL: There is a better a forum under the AICHE, a new group called the reactive -- the management roundtable that hopes to grope with these issues.

But just reading it now and then putting myself on the other side of the DuPont person saying how the heck do I know it makes it an interesting issue.

BOARD MEMBER POJE: Yes. And I don't have anything other than an additional comment. When John Bresland and I were here in January, it was obvious that this community and the company already had underway a number of actions to improve their system of safety. So just want to make the observation while the Board is completing its work, it doesn't mean that

others aren't doing additional work out there. And we only want to celebrate people moving in these directions.

Is there any other comments by the Board members on the recommendations area?

Then with that, I would like to open up this portion of our meeting today to a public comment period. And currently I have three people who have signed their names onto a list asking to speak. And at this point in time, I would like to request that Mr. James Ellis provide us with his comments.

If you could please introduce yourself and an affiliations that you might have. Thank you.

MR. ELLIS: Yes. Good morning.

As Dr. Poje said, I'm James Ellis. I have a couple of roles here. First, I'm a DuPont employee, and I have responsibility for operations for First Chemical, and I'm a Senior Vice President of Operations for First Chemical. So that is a matter of introduction.

First, on behalf of DuPont and First Chemical, whose now a wholly owned subsidiary of

DuPont, I'd like to recognize first the CSB and the work that they have done on the review of our October incident. The recommendations that are presented here today are in alignment with our findings associated with the root cause investigation that we have conducted. And the corrective action measures and recommendations that have taken place or recommended here have already taken place at that facility. And I'll elaborate on some of those later on in my comments.

I'd also like to thank the CSB for giving us this opportunity to work with you. I think there's been a good exchange of information through the process. We've been able to do that throughout. There's been learnings for both the CSB, DuPont and First Chemical through the process, and that's always beneficial when you talk about improving. And so we do appreciate that.

Again, these ideas that have come from the CSB in recommendations are going to ultimately help us improve our process safety management, something that you know that we are committed to within DuPont and

within First Chemical now.

So with the First Chemical knowledge of this process and DuPont's knowledge and commitment to safety management and the systems associated with it, I am very confident personally that we are going to implement all the safety measures and put those in place to prevent incident reoccurrence. That's the most important thing to us.

Our plans are to safely restart this specialty operations. It's important to DuPont, it's important to First Chemical, it's important to this community. And we've got to do it safety, number one.

This business decision comes only after thousands of hours of manwork that has gone into the root cause failure analysis and tens of millions of dollars of expenditures to put in the appropriate fix to ensure that we can operate facility safely in the future.

In DuPont our core value of safety comes in everything that we do. It's number one. And it's not anything other than number one here today.

We've got to protect our employees at

Pascagoula. We've got to protect our surrounding community. And it's essential to our ongoing right to operate this business in the future.

Based on our own internal root cause failure analysis safety measures that we have implemented to date include:

The installation of multiple layers of protection and redundancy in our operations in all of our safety systems, including enhancing our instrumentation and control, the alarms systems that you've heard about. The process interlock system, all of these to ensure that we have early warnings to prevent reoccurrence.

This not only applies to the fail column, to applies to other equipment in this process and other processes that are on this plant site.

We have upgraded the internal components of each of our distillation columns in this process and in line of the comments on the CCR relocation, we have done a very rigorous and thorough siting analysis. We've spent almost $2.5 million to relocate that control room, and it's up and operating today.

In addition, we have done formal and a very thorough process hazards analysis to ensure ongoing safe operations and has established a set time line for future processes analyses and reviews that are focused on continuous improvement in all of our processes, including intraprocess studies, not just this process.

OSHA's Process Safety Management standards have now been deployed addressing Dr. Rosenthal's point, across the entire Pascagoula operation even though parts of the Pascagoula operations are not covered today under the OSHA PSM standard.

Finally, site operating procedures have been reviewed thoroughly and updated. Ad we have gone through a very rigorous reformal training of our employees. That's been conducted to ensure that the changes in the standing operating conditions are well understood and that operating discipline is a core value in terms of how we operate our facilities.

As a part of a commitment we have maintained open communications and dialogue with our near neighbors during our investigation. We recently

shared over a course of several meetings with our near neighbors of the results of our investigation and the protected measures that we're implementing.

We will continue to seek guidance and counsel from our near neighbors, and from our newly formed community advisory panel. And through these community interactions we want ensure that ongoing dialogue with the community at large.

While we anticipate our continuous specialties operations and facilities to restart by late October, we will not start those facilities until we can start them with all the safety measures that I've talked about in place and after we have done a very rigorous pre-startup safety inspection.

Finally, let there be no doubt by this Board or by this community about our commitment around safety. We are committed as leadership, we're committed as employees to protect our employers, their safety, their health, their well being and also protect the environment associated with this community.

In conclusion, we clearly understand again

that the community gives us the right to operate. To that extent, we must behave with the highest levels of operating discipline in our process.

Again, we want to thank the Board and we want to thank the community for their support, and we look forward to our ongoing interactions.

Thank you.

BOARD MEMBER POJE: Thank you very much.

May I ask that Becky Gillette give us her comments?

MS. GILLETTE: Hi. My name is Becky Gillette. I'm from Ocean Springs. I'm speaking today as Conservation Chair for the Mississippi Chapter of Sierra Club.

I think one of the things that's most startling to me sitting here and listening to this again this morning is that we've had a year now since this incident and the actual recommendations that the Chemical Safety Board had made that would have prevented this kind of accident from happening were made before that. And yet the wheels of government grind so slowly that we still don't have these

protections in place at this and other communities.

When bad things happen, we could say well maybe let's look at the silver lining. The silver lining from this could be that this community's experience should be now shared with the rest of the country in order to strengthen these regulations.

These kind of regulations not only protect the community and the workers better, but they probably also, I would imagine, cost effective for industry. Because it costs a lot of money when you have an accident like this.

So, I would say that the public, and I'm speaking for Sierra Club, that we strongly support these long overdue -- the recommendations aren't long overdue, but the implementation of them is long overdue.

When you drive across the new bridge to Pascagoula, you can see the industry that we have out there. And we know that it's important for people to have jobs, but the people who live next those industries deserve maximum protection. They deserve for the best of technology to be used to make sure

that there aren't accidents that effect their neighborhood and can cause harm to the environment.

The other thing I'd like to say on the positive side, is I think some good things have come out of this as far as the county. And I'd like to compliment the county for moving forward with the reverse 911 calling program and other efforts to try to educate the community about things like shelter-in-place. These sorts of things were not even being discussed previous to that.

And just one other thing I would like to ask, I know there are some representatives of Senator Lott and probably Gene Taylor here today. And I would ask you, again, to put your political effort or your strength behind getting OSHA and EPA to adopt these recommendations of the Chemical Safety Board.

Thank you.

BOARD MEMBER POJE: Thank you very much.

Would Paula Vassey please come to the microphone?

MS. VASSEY: As a private citizen, I'm concerned still about a few problems. It seems to be

the most important thing that was determined after this incident was that the winds were blowing the proper direction to not have effect on the general population on this area. A better alternative would be to lower the amount of volume of toxic materials that are -- or explosive materials that would be held on site. This process had been shut down in this particular distillation chamber, there was no reason and no benefit to anybody to have that much product still stored in a distillation chamber that has the explosivity of this particular product.

At this meeting I did not hear any reason or argument for leaving that product in that tower. I believe I understood in previous this chamber had been left empty. What I need to know is when incinerating on hazard waste or storage of hazard waste, they do not need to keep on site what they will not have need for in the near future because of the possible ramifications of an explosion and having the wind blowing the wrong way.

The other thing is although we have an alert system in place now paid partially by DuPont, I

understand and the county, which would help, it would not protect the people from the downfall or the outfall of what would come from the release of the toxic materials.

So what recommendations can the Chemical Safety Board raise or make aware of to DuPont or First Chem to further protect the people other than shelter-in-place, which other than being the only recommendation does not really protect anybody?

Thank you.

BOARD MEMBER POJE: Thank you very much.

That is all the people who were on my list presented to me shortly ago to speak, but I would also open to anybody who also wants to make a comment, to come to the microphone now.

Again, if you could please give your name and any affiliation.

MR. WATSON: My name is Ray Watson. I'm the fire coordinator and district fire manager for the county. I also work out of the emergency management office, and am fairly familiar with reverse 911 system.

The county brought on line the reverse 911 system in the March/April time period. Since that time we have used it on numerous occasions for alerting people about control burns that either the state forestry or Mississippi Sandhill Crane had -- was doing a prescribed burn and they would call into us. We would use the system. It's a mapping system. It has the phone numbers of personnel or people in the county. And we draw out the little section and it calls all of these people with a programmed message telling them what's going on, when it's going on and this sort of thing.

The interesting thing is that we've had between 75 to 85 percent positive results with this system. The major problem we have is the system is only good as the database. People change phone numbers like they change cloths. And that's where we've had problems is that we get -- the system calls it operator interrupt. And this means, you know, the message that comes on your phone system that says you've dialed the wrong number, please hang up and try again. And that's mainly what we've had. But the

system has been very effective.

It was just recently used with the patient that left the home in Escatawpa, an Alzheimer's patient, the system was used there to notify the residents around to be aware that he was out.

So we have made progress in that, and we do have an alert system in place. We're still working on the database on it, but we think it is an effective system.

And we want to thank industry who contributed to that for us to get the system within the county.

Thank you.

BOARD MEMBER POJE: Thank you so much.

Is there anyone else who would like to make a comment? Okay.

Thank you all for the comments that you've offered here today. I think you've added an important dimension to this public meeting.

BOARD MEMBER TAYLOR: Just based on one of the comments from the others. I have a follow up question for the staff.

BOARD MEMBER POJE: Sure.

BOARD MEMBER TAYLOR: To Steve or Mike, I believe. The question that was raised from one of the persons who presented just a few minutes ago was regarding reducing the amount of chemical stored. So my question, you said that regarding the storage of the mononitrotoluene inside the distillation column when it was shut down, why wasn't consideration given to removing the mononitrotoluene from the column since it was shut down for a few days

MR. WALLACE: We determined that it was at that time normal operating procedure to leave the column inventories even when it was shut down unless they had to enter the column for some reason. We queried as to exactly why that was the operating practice, but there wasn't a specific reason given. That had just been the procedure --

BOARD MEMBER TAYLOR: The procedures at the time.

MR. WALLACE: -- and the protocol that had been developed up to that time.

BOARD MEMBER TAYLOR: Okay.

BOARD MEMBER POJE: Dr. Rosenthal?

BOARD MEMBER ROSENTHAL: Yes. I don't think that may have been the full sense of the question, Stephen. I think the question may also be interpreted as to what is the total inventory of perhaps raw materials or finish product, the tank that burned, was related to this process. Right? So I think that was the sense of the question.

I am not in a position knowing the difficulties of transportation and what the average size of a shipment is, and what the -- for the plant to comment on that. But I think that was the issue that was raised.

And there have been situations, and I know this was true when I was in industry, that after an accident we looked around and said why the heck are we storing so much of this stuff on site. So I think that is the question that was raised was an appropriate amount stored given the business demands and the potential hazard to the population if something occurred.

MR. WALLACE: Well, that is an issue that

we considered. And to reiterate, one of the recommendations that Jordan discussed to the facility we actually are making the recommendation that they have instructions on how to perform a shutdown and also conditions under which material must be deinventoried, such as shutdowns.

BOARD MEMBER ROSENTHAL: Okay. Again, that's inventory during shutdown.

MR. WALLACE: Right.

BOARD MEMBER ROSENTHAL: And I think we ought to think a little more broadly, and I don't think we'd have to necessarily do it at this particular time. We don't have the information.

MR. WALLACE: Right.

BOARD MEMBER ROSENTHAL: But I think that is the sense.

BOARD MEMBER TAYLOR: On site. Yes, I think there were two parts to it, and one that I asked regarding with what was in the column and perhaps removing when there is a shutdown, removing the chemical that's been used as well as the amount that's stored on a facility.

MR. WALLACE: Yes.

BOARD MEMBER TAYLOR: There were two.

I agree.

BOARD MEMBER POJE: Are there any other comments by the Board members?

Then with that, I would like to ask does anybody want to offer a motion?

BOARD MEMBER TAYLOR: I'd like to make the motion that we approve the CSB staff investigative report and recommendations regarding the explosion and fire that occurred at the First Chemical Corporation facility in Pascagoula, Mississippi on October 13, 2003. Report Number 2003-01-IMS.

BOARD MEMBER POJE: Does anybody second that motion?

BOARD MEMBER ROSENTHAL: I'll second the motion.

BOARD MEMBER POJE: Great. Okay. And is there any conversation that we want to have about the motion or any discussion of the motion?

BOARD MEMBER BRESLAND: Just one. One point of clarification from Dr. Taylor. The explosion

was -- you said 2003, it was 2002.

BOARD MEMBER TAYLOR: Two, that's right. Thank you.

BOARD MEMBER POJE: Thank you for hearing with great accuracy.

BOARD MEMBER TAYLOR: That was yesterday, the day before. Okay.

BOARD MEMBER BRESLAND: Yes.

BOARD MEMBER TAYLOR: 2002. Thank you.

BOARD MEMBER ROSENTHAL: I think the report mirrors a good understanding and elucidation of what occurred. I think the recommendations are appropriate. And, however, while not part of the motion, I would look forward to having the Board and the investigators in their free time get some kind of idea of inventory just so that we can satisfy the stakeholder as to approximately some idea of what's on there.

BOARD MEMBER POJE: And then if I could just comment on top of it. We are now -- it's next year entering the 20th anniversary of the Bhopal tragedy. And similar to what you described at Noroca,

I think there was a great outpouring of effort that occurred in the few years following that event to really seriously address the needs for inventory, particularly of highly reactive hazardous intermediate chemicals, chemicals that were kept on site but only to produce other materials. And I'm aware of a number of companies, including the DuPont Corporation that they inventoried a large amount of highly reactive intermediate chemicals going to a just in time production system to continue the economic basis of the company, but to change the processing. So very important question.

BOARD MEMBER TAYLOR: Yes. I just wanted to say again, staff did a great job on this investigation, and thank you for this report. And, again, it also really I guess adds to the need for reviewing our previous recommendations to OSHA and EPA regarding reactive chemicals and moving the Process Safety Management standard forward on getting some changes there as well.

BOARD MEMBER POJE: Are there any other comments?

BOARD MEMBER BRESLAND: Well, I'd just like to again commend the staff for a very good report.

Also commend the companies involved for the actions that they have taken since the incident.

And also Jackson County on installing the reverse 911 system, which will certainly make it a safer place for the citizens of the county to be living.

BOARD MEMBER POJE: Then if there are no other comments, then are we prepared to take a vote? Okay.

Then if I can ask individually each of the Board members how they're voting.

Dr. Taylor?

BOARD MEMBER TAYLOR: I approve.

BOARD MEMBER POJE: Dr. Rosenthal?

BOARD MEMBER ROSENTHAL: I'll think about it. I do, too.

BOARD MEMBER POJE: I will approve.

John Bresland?

BOARD MEMBER BRESLAND: I approve.

I also have a proxy vote here from Carolyn W. Merritt, who is the Chairman of the Board and was unable to attend today. And her proxy vote is to approve the report.

BOARD MEMBER POJE: Okay. Good.

Then with that motion, I've been assured by Chris that he has recorded everything, this is now an accepted report and recommendations. I also thank the staff for that.

Let me make some wrap up statement then. With that vote to approve the report we are at the end of the scheduled business for this morning's public meeting.

I thank the investigative team for their exemplary work on this important case: Stephen Wallace, Mike Morris and Jordan Barab. The field team also included Steve Selk, John Vorderbrueggen and Francisco Altamirano, and all the other individuals within the CSB that made important contributions to this work.

As we've just passed the first anniversary of the explosion at First Chemical, I thought I'd also

though like to reflect for a moment on the longer term significance of this event.

This was an accident which, as we've heard, inflicted only modest injuries and damage but had the potential for being much worse. We're lucky that this explosion happened early on a Sunday morning. We're lucky that only a handful of workers were near the explosion site during the time of the explosion. We're lucky that the flying debris largely spared the tanks of toxic and volatile chemicals nearby.

This accident, though, did jar Pascagoula's residents awake and sent them hurriedly to take shelter. And I think it's time that we in the chemical safety community are also jarred awake.

As was stated earlier, last year the U.S. Chemical Safety Board formally recommended to OSHA and EPA that they tighten their regulations to cover processes like the one at First Chem, processes that use potentially dangerous reactive chemicals. When the Board voted on September 17, 2002 to issue these recommendations, we hardly imagined that such a

dramatic demonstration of the need would occur just three weeks later.

We've just heard from the investigation team that a root cause of this accident was a lack of an effective hazard analysis when the process was established. Hazard analysis is a basic safety practice and everyone who manufactures chemicals should be do them routinely for those highly hazardous aspects of their processes. But because of the limitations in the current regulations, they're not universally required. As we've heard, unless you use one of a hundred or so regulated chemicals or classes, you may not be required to analyze the hazards of your process. Mononitrotoluene is not included in these existing chemical lists, and so the process safety rules do not apply.

MNT is definitely dangerous and the explosion last October potentially had the force of several thousand pounds of high explosives like TNT. It's only one of many reactive hazards that remain outside the boundaries of public regulations designed to prevent catastrophic accidents.

As we've just heard from Jim Ellis with the new ownership of First Chemical has come a fresh opportunity to make this a safer facility. It's taken the investment of time and talent and significant capital. And I think we should be thankful for that.

With the recognition of how community notification systems functioned on October 13th last year, there came a good opportunity to make this chemical corridor a safer place to live and work. The business community and the emergency management agencies have taken steps, and I think we're seeing ripple effects that benefit even situations that were not originally contemplated here. I think the statement was about a poor individual lost from a hospital situation and needing to guide the community on that. So ripple effects can come out of this.

All these good things are underway and, hopefully, we'll develop further. But what about the other unrecognized reactive hazards at plants all around the country? It's time today to make those changes that we would automatically make in the aftermath of a significant disaster. If, heaven

forbid, the consequences had been worse here on October 13, 2002, I fully believe that today there would be new and potentially onerous safeguards on the rulebook, but truly it would have been too late.

The Board welcomes increased OSHA attention to the problem of reactive hazards, and these are leading a series of new and useful initiatives. I do believe, however, that the time for a strong and mandatory action has arrived in terms of regulatory coverage. Let's all be jarred awake by the explosion at First Chem.

With that, this meeting stands adjourned.

(Whereupon, the public meeting was adjourned at 11:20 a.m.)