

U.S. Chemical Safety and Hazard Investigations Board

Husky Public Meeting

December 12, 2018

University of Wisconsin - Superior, WI

U.S. CHEMICAL SAFETY BOARD MEMBERS PRESENT:

KRISTEN KULINOWSKI, INTERIM EXECUTIVE AUTHORITY

MANNY EHRLICH, MEMBER

RICK ENGLER, MEMBER

STAFF PRESENT:

Thomas E. Zoeller, Acting General  
Counsel

Mark Wingard, Investigator

MEMBER KULINOWSKI: Good morning. Welcome to this public forum of the U.S. Chemical Safety and Hazard Investigation Board, the CSB, on our ongoing investigation of the April 28<sup>th</sup>, 2018, explosion at the Husky Energy refinery here in Superior. I am Kristen Kulinowski, Interim Executive of the Board. I'm joined by my fellow Board Members, Manny Ehrlich and Rick Engler. Also with us this morning is: our Acting General Counsel, Mr. Tom Zoeller; the investigator in charge of the incident, Mr. Mark Wingard; and other members of the staff.

The CSB is an independent, non-regulatory, federal agency with the responsibility to investigate major chemical accidents at fixed facilities. Our investigations examine all aspects of chemical accidents, include physical causes related to equipment design, as well as inadequacies in regulations, industry standards, and safety management systems. We want to know not only what happened, but why it happened. At the conclusion of our investigations, we issue safety recommendations designed to help prevent similar accidents in the future.

As we will hear from our investigator, on April 28<sup>th</sup> there was a catastrophic failure in the refinery's fluid catalytic cracking unit. An explosion sent shrapnel across the refinery, puncturing a storage tank containing 50,000 barrels of asphalt, of which 15,000

barrels were released. The asphalt spilled out of the storage tank and subsequently ignited. The fire raged for approximately four hours. During this time, the Superior Fire Department, anticipating a much longer firefighting effort, recommended an evacuation of the community.

I know some members of the local fire and police departments are here today. I want to thank them for their service during the April incident.

By all accounts, the refinery and the local government worked cooperatively in responding to this incident. While some citizens of Superior have expressed concerns about the evacuation, we have found that the local first responders were well-prepared and followed established protocols for dealing with this incident. That doesn't mean that we're saying it's perfect. But one of the valuable contributions of the CSB investigation is that we can make recommendations for improvement, in addition to documenting what went well.

This past August, I was here in Superior to provide a factual update on the investigation. During my visit, I had the opportunity to meet with some representatives of the citizens of this community and neighboring Duluth. During our discussion, it was clear that the events of April raised serious concerns about

refinery operations and the evacuation order.

The CSB is committed to a transparent investigation so that you all can understand what happened here and how it can be prevented from happening again.

We are here today at the direct request of several Senators and Congressional Representatives. At this forum, we will provide you with a second factual update on the status of our investigation, and an opportunity to share your concerns with the full Board.

But I'd like to manage expectations here. It's important to note that our investigation continues, and it will be driven by the facts and circumstances of the case, as determined by our investigators. So, we're not drawing any conclusions, or making any recommendations, at today's forum. We're here to listen.

We, as Board Members, can take what we hear today with us and consider it as we review the final staff report, to ensure that it attempts to address your concerns, and provide a roadmap to a safer return to operations.

With that in mind, let me review the agenda for today's event. I'll start by recognizing my fellow Board Members for any opening comments. Then I'll recognize Mayor Jim Paine of Superior, and Ida Rukavina from Senator Klobuchar's staff, for some welcoming remarks.

Upon the completion of those remarks, I will ask Mark Wingard, our Investigator In Charge, to provide the latest factual update on the investigation. Mr. Wingard has a presentation and some animations to share that were previously released by the Board during our August update and are available on the agency's website at [www.csb.gov](http://www.csb.gov).

After Mr. Wingard's presentation, we will have an opportunity for public comment. If you have not already done so, and you wish to make comments to the Board, please sign up on the yellow sheet in the check-in area, and I will call your name at the appropriate time. I will first call those who have signed up, and then, time permitting, I'll open the floor to anyone who wishes to speak. We do have a hard stop at 5:00 p.m. this evening. So, to the extent that we cannot recognize everyone, you can submit your comments for the record, and they will be read and reviewed.

Please note that we will have to limit public comments to three minutes each. If your comments exceed three minutes in length, you can send an email with your full remarks to [HuskyComments@CSB.gov](mailto:HuskyComments@CSB.gov). You may also submit any additional materials with the Board to consider at that email address, [HuskyComments@CSB.gov](mailto:HuskyComments@CSB.gov). Please note that your comments, and any materials you submit, will become part of our public record.

I would also ask that we be respectful of, and courteous to, each other during the forum so that everyone can be heard. Before we proceed, because we are a safety organization, I feel compelled to point out some important safety information for our room. Please take a moment to locate the exits from this meeting room. There are six, as I can see them. So, if there's an emergency, please proceed to the exits. And please take a moment now to silence your cellphones so that these proceedings are not disturbed. Thank you.

I will now recognize my fellow Board Members for opening statements. Member Ehrlich.

MEMBER EHRLICH: Thank you, Dr. Kulinowski. Good morning. It's a pleasure to see you all here. This is my second time back. I was here in August. I'm certainly glad to be back here. I have been in the emergency response community for about 40 years. And I had the opportunity to talk to your first responders, and your fire officials, when I was here in August. And they did quite a commendable job. So, I'm glad to hear...I'm glad to be here, get your thoughts on this process, and look forward to talking to you later. Thank you.

MEMBER KULINOWSKI: Thank you, Member Ehrlich. Member Engler?

MEMBER ENGLER: Thank you very much, Interim Authority Kulinowski. I'm here to listen as well. I will make a statement later in the meeting. I'm not sure at what point, maybe quite later, on my own personal concerns, not necessarily speaking for the Board at all, concerning the hazards of HF alkylation units. And at this point, I just want to say again that we're here to listen.

Management, workers and their union representatives, including contract employees and their union representatives, frontline community members, emergency responders, and public officials, all have vital roles to play on this issue. When we have industrial facilities in our midst, whether we're workers who are often most exposed to hazards, or we're neighbors that directly surround the facility, these facilities can have enormous impact. In a sense, they're privately owned but they have broader public impact. And the role of the CSB is to help assess what those impacts are, and what we can do to prevent hazards moving forward in the future.

So, with that, thank you for your robust attendance at this town hall, and I look forward to hearing your concerns and issues.

MEMBER KULINOWSKI: Thank you, Member Engler. I understand

Mayor Paine has been detained; so, if he appears later, he'll be welcomed up here to make some remarks. I would like to recognize Ms. Ida Rukavina from Senator Klobuchar's office to give a statement on behalf of the Senator.

IDA RUKAVINA: Thank you. I will read the letter from Senator Klobuchar. "Dear Chemical Safety Board and Guests, thank you for holding and attending today's public town hall meeting regarding the Husky Superior Refinery explosion and fire, which occurred on April 28, 2018. I regret that I am not able to participate, but my Northern Minnesota Outreach Director, Ida Rukavina, is in my attendance on my behalf.

"Today's meeting is an important step in gathering input from communities surrounding the Husky Superior Refinery about the scope of the ongoing investigation and an opportunity for further public dialogue about the need for safety improvements to reduce future risks.

"I joined several of my Congressional colleagues from Minnesota and Wisconsin earlier this year in expressing concern about the catastrophic explosion, and urging that workers, residents, and local officials be given the opportunity to participate and provide input into the investigatory process.

"I appreciate the Chemical Safety and Hazard Investigation Board's



commitment to an open and transparent investigation. For those in attendance today, please do not hesitate to ask questions and share your views about how we can better address the risks posed by the use of chemicals at U.S. refineries.

"Again, to the Chemical Safety and Hazard Investigation Board, thank you for holding today's meeting. And to those who were affected by this accident, I am sorry you had to go through the experience and thank you for taking the time to attend today's meeting. Sincerely, Amy Klobuchar."

MEMBER KULINOWSKI: Thank you, Ms. Rukavina. I'd also like to acknowledge the presence today of representatives from Congressman Duffy's office, Congressman Nolan's office, and Senator Tina Smith's office. Thank you for your interest in the work of the CSB.

Mr. Wingard, please begin your presentation.

MARK WINGARD: Can you hear me in the back? Good. Thanks, everyone, for being here today. Really appreciate the opportunity to hear your input. I'd like to take a chance to give you all an update on where we are in this investigation. We're releasing a factual update today. We've had two videos we put out at a previous factual update. So, just to give an idea of what we found at this point, and kind of give an idea of where we're going

moving forward. So, just an overview of what I'm going to talk about today. A lot of people haven't heard of the CSB. I'm sure, at this point in the investigation, a lot of you have done some research on us. But I just wanted to give a little overview of who we are, what we do, and how we do our job. And then move into this specific incident. Talk a little bit about the Husky Refinery, give a brief overview of the refinery itself, as well as give a short overview of what an FCC unit is, how it operates, and a few of the risks involved, that got involved in this incident here. And then talk through the timeline of this particular incident.

This incident shares a lot of similarities, as our factual update talks a lot about, with a similar, previous incident the CSB investigated that occurred in California a couple years ago. So, I just want to talk about some of the similarities we're seeing, and some of the issues we're seeing, in operation of some of these FCC units that, as we move forward in our investigation, we hope to address through sharing our key lessons and recommendations.

Then, finally, tell where our investigation is, and then what we plan on doing moving forward.

So, just start with a brief overview of who the CSB is: CSB is the Chemical Safety Board. Our long name is the U.S. Chemical Safety and Hazard Investigation Board. But, colloquially, we're

"the CSB" or just "Chemical Safety Board."

We're a very small, very new agency. We were authorized in 1990 by the Clean Air Act Amendments, but we were just an organization on paper until about 20 years ago, in 1998, when we actually got funded. So, we've been in operation for only about 20 years. We currently have...The CSB is an actual Board, so we have our three Board Members there to my left, who actually represent the agency. Again, we're very small. We only have about 30 total staff members in the entire agency, spread between D.C. and Denver. Currently, we have about ten investigators to cover investigations like this.

More people are familiar with the NTSB, the National Transportation Safety Board, where they do planes, trains, and automobile incidents. We do industrial incidents. When we were created, we were modeled after them. We have a Board similar to theirs. And we have a function similar to the NTSB.

Just a little bit more. We are an independent federal agency. What that means is, we don't report up to any other federal agency. We don't go up through OSHA or EPA. In theory, we report directly to Congress. Our Board Members are appointed by the President, and they are confirmed by the Senate. And our whole purpose, our whole reason for being, is to cause root-cause investigations of chemical

accidents at fixed industrial facilities. So, a lot of that is petrochemical facilities. But, really, anywhere that handles, manufactures, or contains chemicals, the CSB can do investigations of the incidents that occur.

[I] think one unique thing about us, as opposed to a few other agencies that you might have heard of, that were at sites or that have their own investigations, that are involved in this process, is that we're not a regulatory company or agency. We can't issue fines. We can't issue citations. At the end of the day, we really don't have any tools to force a company to do what we say, or force any group to do what we say. Our entire mission is to make investigations that drive key lessons, that make recommendations to plants, regulatory agencies, such as OSHA, EPA, to make safety change.

So, we are created to be independent so we can go in, kind of without any bias, [to]: do our own investigations, find out what went wrong, why it went wrong, and make recommendations to prevent reoccurrence, to kind of be separate from companies, separate from the industry, and separate from the regulatory groups as well. We're supposed to fall in that middle area, to try to be kind of a referee, to say: "Here's what went wrong, industry, and here's how you can prevent reoccurrence."

It's something makes us unique, and something that we really take pride in—our independence—and the fact that we do these investigations. Really, the force of our investigation is what we rely on to drive safety change.

So, that's who we are, just very briefly. If you want to go to our website, you can see the website there. It's just [www.csb.gov](http://www.csb.gov). You can find out a lot more about us and our history.

But, for the actual investigation process, there's a number of steps. First off, we have a screening group located out of our D.C. office, who monitors incidents as they occur around the country. Like I said, we're a very small agency. We only have, really, a handful of investigators and staff to cover the entire country. And, so, it's really important that we use our limited resources well, to try to promote safety change, and really go to incidents that we think can drive positive change in the industry, in communities around the country.

So, we have a screening group that analyzes incidents as they occur. We'll bring them up to our executives, and they'll make the decision ultimately to deploy us. And then we'll enter the field stage, which, for a lot of people, the field stage of investigation is kind of what you would traditionally think of as an investigator doing. We show up on site. For this incident, we showed up the day

of the incident. And we'll come from around the country to actually go in. We collect evidence. We do testing. We'll secure things to be preserved for later. We do interviews. We'll review documents. We do document requests. We'll talk to eye witnesses. We'll talk to management. We just try to get an understanding of what actually happened, the timeline of events, and also, get an understanding of how the companies operate, how they do what they do safely normally, how they...just get some background information.

We take a very holistic approach to investigations. We don't just look at immediate causes. We try to look at the systems in place that existed, that prevent incidents in some cases, and allow incidents for the things we're investigating.

After the field stage, we essentially go back to our office, and we will work on our report. We do report-writing and analysis. In the past we've been told that we need more transparency, to give more updates to the public in a timely fashion. So, the last couple of years we've been doing factual updates in between the field stage and the final release, like we've done in this case.

When we leave the field stage, we frequently have a very large amount of data, and the public, yourselves, in the industry, and people who are interested in the incident, want to know about these incidents before the final release, which our target is about 16

months after the incident occurs. And, so, periodically—this will be the second one here—we'll give factual updates to the public, just to give an idea of some of the things we're seeing, where the investigation's going, just to try to be more transparent, and give an idea of the issues we're finding before the final report comes out.

After the report writing and analysis phase, there's a pretty intensive internal and external review process. A number of stakeholders, experts, and the Board, as well, will review our reports, and then they ultimately get released. Again, our final product is a public document. And, so, if you're interested in seeing what types of products we have, everything we've done in the past is up on our website. You can go through, look at different incidents, look at our videos, look at our animations, see our recommendations. And, so, our final goal is always a public-facing document that shares these lessons as widely as we can.

So, for the Husky investigation, for this we've...we've completed the field stage. Again, we're heavily in the analysis stage. We've interviewed a number of witnesses. I think 50 is significantly on the low end, actually. We reviewed and requested

documents from a number of sources. We have tens of thousands of pages of process documentation. Been meeting with the industry on a variety of different fronts, to try to get an understanding of how these units can be safely operated, and if...and what changes need to be made. And we've worked with Husky and other stakeholders to...to work on chemical and metallurgical testing, to understand what happened on the day of the incident to actually cause this explosion and this incident.

So, that's briefly kind of our investigation process in a nutshell. To get more specific into the...this incident, I'm just going to start briefly with the overview of the refinery. Again, I'm sure a lot of you are familiar with the refinery at this point, especially after the incident. I'm sure it's gained a lot of interest. So, I might be saying some things that are already pretty well-known.

I'm sure all of you know the refinery's located here in Superior. It was constructed in 1950. So, it's a 50,000 barrel per day crude oil capacity, which probably doesn't mean a whole lot. But in the world of refining in the U.S., refineries range from about the 10,000 barrel per day capacity up to about 600,000 barrel per day capacity. And, so, the Husky Refinery is really on the...on



the smaller end of the U.S. refining in terms of size and throughput.

It's had a couple of owners, but most recently it was acquired from Calumet by Husky in November of 2017. So, about six months before the incident occurred.

So, this incident happened just downstream of the FCC, but essentially, in the FCC unit. FCC is a fluidized catalytic cracking unit. And what it essentially does is, it takes long value...or low value, long chain hydrocarbons and, using a catalyst at some very high temperatures, it essentially cracks it into smaller molecules that are more valuable, that are closer to octane you would find in gasoline.

And, so, the oil that comes from the ground, that comes into the refinery, gets processed, goes to the FCC, essentially gets cracked into a more usable, more energy-intensive molecule in this process. And, so, the FCC unit is very important in the production of gasoline at any refinery existing. A lot of times they're really the...the driving engine at a refinery, to help create gasoline and kind of that octane-level product.

In the U.S., there's a little less than 150 refineries. And a little less than 100 of those refineries have operating FCC units. Around the world, it's a pretty common technology. It's

been around since the...since the '40s, in one form or another. And, so, they're...they're pretty common. They're well-understood. They've been operating for a number of years. And they're frequently kind of the heart of the refinery in terms of what they do, in terms of converting crude oil into gasoline.

So, the Superior FCC unit was constructed in 1961, about 11 years after the refinery was in place here. It takes about 11,000 barrels per day of fresh feed, which, unsurprising, is kind of on the lower end of the FCCs in the U.S. in terms of throughput. It's referred to as a "stacked" FCC design, which will make a little more sense here in a second when I show a picture.

And a lot of FCC units have...have gas plants directly downstream of them. So, when the products come out of the FCC unit, there's a number of different chemicals, components, in there. And they need to be separated out to be kind of useful. And, so, the gas plant is attached and immediately downstream of the FCC unit. And that gas plant here in Superior is where the actual explosion initially occurred.

So, here's a...you can see kind of a rough graphic of a stacked FCC unit. I kind of caution you: This isn't exactly identical to what's going on in Superior, but...but in terms of inputs, outputs, and pieces of process equipment, it's all

functionally the same. And, so, how an FCC works, like I said, is, they use a hot catalyst to crack long-chain hydrocarbons. And, so, what happens is, there's a feed; there's something referred to as a "reactor riser." So, the hydrocarbons are fed into this riser. There's hot catalyst that comes down into the riser. And, although the reactor is up here, really, most of your actual reaction is occurring in the riser itself. And, so, this liquid feed that comes in, it gets heated with the catalyst. And as it rises up to the reactor, the reaction's occurring. You're turning, you're creating a variety of different smaller-chain hydrocarbons as it goes up. This liquid's turning into vapor. And so, at the top of the reactor, you have essentially a mixture of solid catalyst and you have hydrocarbon vapors.

This catalyst, it's essentially...it's a very small particulate size. If you think of, kind of like a powdered, very small powdered sand or clay or something, it's like that—very small particle size. And when you put vapor into it, although it's a solid, it essentially acts like a liquid, and that's where the term "fluidized catalyst" comes from—so, the "F" in the FCC unit.

And so, as the vapors go up the reactor, there's a...some pieces of equipment in there, referred to as cyclones, and they just throw the catalyst out. So, then your hydrocarbons can go down to get

processed more, to go into the...into the rest of the FCC unit, and then into the gas concentration unit. So, the actual explosion happened a number of pieces of process equipment kind of downstream from here. But this is where kind of...one of the items of interest for us is this case.

And, so, the FCC unit's very unique in a refinery unit, in that most refinery units have hydrocarbons. Most hydrocarbons in a refinery are flammable—can ignite to some extent. Whenever you're dealing with flammable materials, you have to think of the fire triangle. So, you need three things to have a fire: You need to have a fuel, which in this refinery case would be the hydrocarbons; you need to have oxygen; you need to have an ignition source.

And so, in the FCC, you're actually putting air purposefully into the...the unit itself, which makes it fairly unique. So, you have air in the unit, and you also have hydrocarbons in the unit, which kind of would give you two ends of that fire triangle. But...so, here it's very important to keep them separate. You can see here we try to keep the hydrocarbon side separate from the air side.

So, the question is: Why does the air side exist if you don't want to have hydrocarbons and air mixing? And, so, this catalyst, this hot catalyst, is very useful in doing what it

does. But, as it goes up the riser, and as it impacts these hydrocarbon...various hydrocarbons, it gets covered in, essentially, a covering of hydrocarbon that's called "coke."

And, so, by the time it gets to the top of the reactor, and gets up here, the surface area of this catalyst is kind of covered, and it's no longer as useful. It's now referred to as "spent catalyst". And, so, before that can be reused, it has to be regenerated. So, in order to have kind of a constantly flowing circle, and to reuse your catalyst and not always be constantly adding new catalyst, the FCC unit has a system where the catalyst flows back into the regenerator.

And this is very hot catalyst. The reaction itself creates heat. It's...it's hot already. And, so, the hydrocarbons on this catalyst are above what's referred to as "auto-ignition temperature".

And, so, if you can just get sufficient oxygen exposed to that catalyst, it'll auto-ignite. And, so, the catalyst falls down into the regenerator. You put air into the regenerator and, as it works its way down the regenerator, the hydrocarbons will burn off and, by the time it gets to the bottom, the catalyst is regenerated and is ready to go through the cycle again. And, so, your catalyst, during normal steady-state operation, is always kind of doing a

loop like this.

And the catalyst serves another really important function here, in that this fluidized catalyst, that acts like a liquid, creates a barrier that separates the hydrocarbon side from the air side. So, in the reactor, there's a catalyst-level layer here that stops the hydrocarbons from flowing into the regenerator. And in the regenerator, there's a catalyst level here that stops the oxygen from flowing into the riser, into the hydrocarbon side. And, so, it's imperative that those barriers, during normal operation, are maintained. And during operation, that's maintained with these valves called a slide valve. There's two primary ones. You have a spent catalyst slide valve, just because it deals with the spent catalyst slide...spent catalyst, excuse me. You have a regenerated catalyst there.

And, so, it's very important that these operate to maintain this level, which is important to stop one from flowing into the other, which is referred to as "reversal." Yeah.

MEMBER KULINOWSKI: [inaudible] Can we just take a moment and recognize Mayor Tom Paine and ask him to come up? I apologize. We were ahead of schedule. I expected my fellow Board Members to talk a little bit longer. And, so, we scheduled a little bit too much time for the opening session, and you're

right on time. So, please come up and...and say your welcoming remarks.

MAYOR PAINE: Thank you. Well, I actually do have a cousin, and a particularly famous American ancestor, named Tom Paine, but I'm actually Jim Paine, Mayor of Superior. I want to welcome everybody here today. Thank you for taking some time out of a weekday to come and sit during this very important factual update from the CSB.

I just want to state again what I think should be obvious, what the goals of the City of Superior, and I think the citizens of Superior, are in this process. There is a lot of discussion about safety versus the importance of our economy and jobs. And sometimes I hear that we need to have a balance between the two. I want to state emphatically that that is not true. Safety is our number one priority in moving forward with all of our industry here in the City of Superior. We will be putting our citizens, our neighbors, and our community first in all aspects.

That's why I'm so grateful for the work of the CSB and their updates to me, and now to the community, through these several months. This is not just a review of what has happened. This is an ongoing conversation of what must be done in the future to make sure that all of our energy industry, particularly our refinery,

are operating as safely as they possibly can, and that we are actually protecting the citizens of Superior, while working towards a stronger economy.

We want to keep a refinery in the City of Superior. It is valuable to...to our economy. But we must make sure that we are protecting our citizens, our employees, and our first responders before any other consideration.

And, so, I look forward to working with the CSB to implementing recommendations at the...at the Superior Refinery. You all have the factual update in front of you now, and I think the most compelling line in it is the very first. The most serious danger at that refinery is what actually happened, an explosion and a fire.

Now, I know from the City of Superior, and throughout our energy industry, our fire department, led by our Chief Steve Panger, has worked very hard over the last several years to implement many different safety mechanisms and systems and training to make sure that we can meet a disaster when it happens. And when it did, I cannot be more proud of our first responders in...in responding in a way that I don't think anybody could have expected. We were able to deal with this fire in a...a very unexpectedly quick time.



But that's not enough. Our goal here today is to make sure that this never, ever happens again, not just in Superior, but it's my hope that refineries across the United States, across the world, learn from this disaster, as well, and are able to prevent this from ever happening again.

So, thank you again for coming down here. Thank you for participating in this process. And welcome to Superior.

[applause]

MEMBER KULINOWSKI: Thank you, Mayor Paine. Mr. Wingard, please resume your flow.

MARK WINGARD: Now that I've thoroughly confused everyone, I'm sure.

MEMBER KULINOWSKI: I think they needed a minute to digest all that very heavy technical [multiple voices].

MARK WINGARD: So, we do have a...again, this...Recently the CSB investigated an incident at another FCC unit in Torrance, California. And, so, if you go on our website and look at that incident, we...we do have a...a very thorough description. It's slightly different. I'll get into that a little later. But, essentially, the fundamentals are the same. We have an animation video that talks through how the unit operates and...and kind of

what its purpose is. So, I would encourage anyone to go to our website and look at that Torrance investigation if you're interested more in learning about the operation of these units.

So, with that being said, just to get into this specific incident itself. We have an incident on April 26, 2018. It initiated when we have an explosion in the FCC unit. There's over 30 people who sought medical attention with the initial explosion. We have 11 onsite workers who reported OSHA reportable injuries. The initial explosion caused debris to kind of go in a couple of directions. You're in the middle of a refinery, and so that debris impacted surrounding equipment. Since you're in a refinery, a lot of that has hydrocarbons and flammables in it. So, it resulted in a couple of fires and a couple of releases.

And, as I'm sure you all...all know and might have been part of, there was an evacuation of Superior that took place for about a day. I'm...I'm sure a lot of you all have seen this, but I feel like our animation says it better than...than I can. So, I'll...I'll show this and then talk about some of our findings.

[Video plays]

MARK WINGARD: So...so this explosion occurred prior to a turnaround, as the refinery was gearing up to go into a maintenance activity time. During a turnaround, really at any

refinery, there are going to be a large number of contractors onsite, so you're going to have more people onsite than normal. And so, there actually were...were a significant number of people onsite, in and around the equipment, minutes prior to the explosion.

Fortunately, this explosion occurred during kind of the end of one contractor break and the beginning of another contractor break. All these contractors were located in...in blast-proof, temporary housing or storage or buildings—I should say...blast-proof buildings. There were no injuries, people who were in those buildings.

Just want to point out, from past CSB work, that...that moving forward, we really appreciate... We've had previous incidents that had contractors onsite, that were not located in secured, temporary buildings, that resulted in injuries to contractors. And so, it's good to see the industry and Husky really moving forward, using this...driving forward, doing blast-proof temporary storage. And there was no contractors in those buildings that were...suffered injuries.

So, debris went all around, like I said. It impacted a number of pieces of equipment. Kind of the...the one big one that caused the large fire was the asphalt above-ground

storage tank, an AST. This above-ground storage tank contained about 50,000 barrels of asphalt. Like any refinery, the refinery in Superior produces asphalt as a product of the crude oil that comes in. And so, there's a number of tanks of asphalt at the facility.

It's...thinking of asphalt, it's similar to what you would see putting down on a road somewhere. And, based on the location, which I'll show a picture here in a second, about 15,000 barrels, as we said, released into the refinery. Asphalt, generally, is not...it's very...very long-chain hydrocarbon, very low vapor pressure. So, it's not most, I would say, flammable of materials in the refinery. But this asphalt, just to keep it flowing, is kept at elevated temperature. And when you have that quantity that got released, eventually, after about two hours, it did find an ignition source, after the initial explosion, and caused a very large fire that I'm sure a lot of you all saw, or heard about, or have seen in the media afterwards.

So, here...here's a picture of the above-ground storage tank that got hit, the asphalt storage tank. So, we have post-incident. You can see there's the actual hole. So, a piece of debris that came from the FCC unit impacted the above-ground storage tank, and that resulted in the release of asphalt. You

can see it flowing out. You can see it flowing into various parts of the refinery. And eventually, once enough is released, it found an ignition source, kind of flashbacked, causing the large fire.

Just to show, kind of spatially, where we are: So, the initial incident happened around here. And our asphalt storage tank that occurred...that had the release, was about here. So, it flew over, impacted this...this storage tank, which then released asphalt kind of into the refinery.

So, again, I'm sure a lot of you all have seen these pictures and pictures very similar to this. So, asphalt, it...it's very kind of heavy. When it burns, it creates...creates this, creates a very dark cloud. There was a fair amount of asphalt that got spilled. And so, when it did ignite, you had a very large cloud, as you can see here. The actual storage tank that had the original is down there.

So that...that's the fire. But the actual explosion that kind of started the chain of events, again, occurred in the gas concentration plant, which is kind of in the larger FCC unit. There's two pieces of equipment referred to as absorbers—primary and sponge absorber—that were involved in the explosion. These are located in the gas plant.

So, there's..."Absorbers." Just very briefly, what they do is, they take a gas stream that has certain hydrocarbons, and a liquid stream that has a set of hydrocarbons, and you're trying to absorb a certain number, type, of chemicals from the gas into the liquid or vice versa. You just pass them over each other. And so, that's their main purpose, is just kind of an efficiency to recover certain types of hydrocarbons. And so, that's what the primary and sponge absorbers do in the gas plant. They're pretty common pieces of equipment, and they're in most gas plants, at most FCC units in the U.S.

And so, we talked about the fire triangle. So, these absorbers, they...they have hydrocarbons in them. They have some...some light end flammable hydrocarbons present. So, you always have that one side of the fire triangle present. Also, in a number of different pieces of process equipment at, really, any refinery, you're going to have a substance referred to as "iron sulfide" or known as iron sulfide. And this is pyrophoric. And so, what that means is, if you expose it to air, it can...it can light off. It can catch on fire.

And so, this was known to be present in these absorbers. The refinery had steps they would take in place whenever they opened this up, to ensure that if there was the potential for a

fire, that there were steps being taken to ensure that the iron sulfide was mitigated prior to opening this up. And so, having the hydrocarbons as one side of the fire triangle, having the iron sulfide that's present, that can be an ignition source, really put the other side of the triangle in place. So, really all that's missing at that point is the oxygen, or an oxidizer, to have the fire occur.

So, the explosion occurred when that triangle did close. Here, you can see a picture. I'm sure a lot of you have seen this, as well. The actual explosion. So, here you can see the equipment as the initial explosion occurs.

So, not to get too into this, but just to show, kind of, where you get debris from. So, you have the primary absorber and the sponge absorber. The primary is the larger. It's about 70 feet tall, three feet in diameter. The sponge one is smaller. It's about 50 feet, 30 inches in diameter. It's hard to see, I know. But after the incident, you can see them, too. So, they went from about 70 and 50 feet tall to about 12 feet and 10 feet tall, respectively. And so, the overpressure, you can see, caused damage, and also sent debris into a couple locations that...that further caused damage

So, for operationally, what was going on? Like I said, the

entire refinery was going into a turnaround. For those who don't know, so, a turnaround is...is a pretty regular activity. Refineries tend to run constantly. They're designed to run...is what is referred to as "steady state." And so, they'll run for years at a time, just staying in operation, have constant inputs, have constant outputs. And that's kind of how they're primarily designed to operate during most of the time.

But, to go in and do inspections, to do maintenance, turnaround activity, you occasionally have to shut the refinery down, or shut the units down, so that you can go in and do inspections, do maintenance, do that type of work. And so, this refinery was entering into a turnaround, the entire refinery. So, all the process units were going into a turnaround. And that takes...it's a multi-day process. It can take weeks to shut down an entire refinery, normally.

And so, in the process, they had been doing this for a couple of days, and on the day of the incident, they were shutting down the FCC. And so, that morning, kind of at the beginning of the day, at 5:40 a.m., the FCC shutdown started. And so, the feed to the FCC stopped at 5:40 a.m.

And there's a couple of...of normal activities that going on



during really any FCC shutdown that's designed like this. You want to clear the riser, use steam to clear the riser of hydrocarbons, of catalyst. And also, the slide valves close to kind of stop the catalyst loop from occurring.

So, about 6:00 a.m.—so, about 20 minutes after the spent catalyst slide valve closed, which is one of those slide valves I talked about—it...it lost differential pressure [DP]. And, from then until the explosion, which occurred about four hours later, there was extended periods of time when there was no differential pressure. So, it doesn't show negative. The lowest it would actually go is zero. But during those time periods, it indicates that there was the potential for air from the reactor side to flow into the hydrocarbon side.

So, going back to our...our drawing, roughly speaking...So...so you have the shutdown. You have your slide valves closed. And so, you have the catalyst in the reactor, you have it in the regenerator. You have steam going up the reactor riser into the reactor to clear the riser. Steam can also serve as a barrier to kind of put an inert substance into this reactor to help prevent an explosion from occurring.

At about 20 minutes after the slide valve shut, there's a...there's a pressure indicator that gives you an idea of how much

catalyst is present in the reactor. And that pressure or that...shows zero differential pressure, which indicates there's not any catalyst present for extended periods of time. And so, when that happens, when...when you lose that across here, or really, whichever one of these systems has higher pressure, is going to dictate where the flow goes.

And so, in times where the regenerator is at a higher pressure than the steam in the reactor, you're going to have air flowing into the reactor and downstream into the process. And whenever the steam in the reactor is at higher pressure, you're likely going to have steam flowing into the regenerator system.

And so, when we look at the DP, there was times, looking at the information that indicated that there was likely air going from the regenerator into the reactor, into the hydrocarbon side downstream, for some extended periods of time. And so, what that does then is, you already have the hydrocarbons that were still present in the...in the gas concentration plant. You have sulfide, which is your ignition source. And then you're closing that fire triangle by introducing oxygen in sufficient quantities to allow the flammables to reach a flammability limit. And then you have the explosion. So, at that point, all the conditions were met for an explosion. That's when you have the...the incident.

So, the CSB has previously, again, like I keep going back to this one, but, some of the similarities that I'll talk about now are really on point. So, our Torrance incident investigation, just briefly, just to talk about some of the similarities we saw then. And, again, you can find all this on our website if you're interested.

But the Torrance refinery wasn't planned for a turnaround for another six months. But there was...there was some events that happened that caused the unit to go into an automatic shutdown, to what's referred to as a "safe park." And so, very similar to this Husky incident, the slide valve shut. The feed is cut to the reactor. And you have steam going up the reactor. And then pretty...So, we have the two barriers there, just like in the Husky incident. You have steam going up and steam is creating an inert barrier to make sure that the hydrocarbons that are further down the process equipment aren't flowing backwards, and making sure that the air is not going into the hydrocarbon side. And then the refinery considered the catalyst barrier [as] a barrier, as well. So, these slide valves were...were shut and stopped that...that flow.

Similar to Husky, shortly after the...the slide valve shut, the catalyst barrier fell out. And so, that was lost. And so, you now have the steam acting as the...the main barrier, the inert gas,

that was acting as a barrier between the hydrocarbon side and the air side. In this case you had the main air blower off. So, pretty much the entire time you have steam flowing both into the regenerator, both into the main column, acting to make sure that there's no flammable mixture occurring.

And I don't want to go into it too much here, but if you look at the report, we go into it in depth. There was a number of events that occurred to cause that steam pressure to be compromised. Essentially, they had a higher pressure than anticipated in this side, coupled with some operational moves where they cut back on the steam. And so, they lost that last barrier. And so, whereas in Husky we go from the air side to the hydrocarbon side, in Torrance, we had an incursion of flammables from the hydrocarbon side come into the air side, travel through the system, reach a flammable mixture somewhere in here, reach an ignition source, and again close that fire triangle.

And so, in both cases, you have erosion form where the sides cross here and then reach down further into the process equipment that's kind of far away from the initial mixture cause the initial explosion. Their unit at Torrance is slightly different. But the absorbers would be...would be downstream of...of these...these systems here.

And so, in both cases, they traveled quite a ways to find an ignition source. But then, when it did, had the explosions. Again, just to kind of reiterate some of this. You have a reversal, so you have air and hydrocarbon kind of crossing sides during non-routine operation, both times during a shutdown. Both cases, you have a flammable mixture form in the process, and find an ignition source that also exists within the process. And in both cases, there was a reliance on the slide valve during the shutdown process to provide some type of barrier. There's also a reliance on steam where there's kind of both of these things provide a shutdown process.

So, these slide valves, they're in constant use. Like I said, the refinery's always running, so, you always have this catalyst loop. You always have inputs. You always have outputs. And this catalyst, as I said, you can imagine, it's kind of like a sand.

It's very small particulate matter. And so, over time, it's kind of being, say, sandblasted day in, day out. And so, over time, over the years of operation, these things erode to some extent. And it's...that's kind of the normal operation of a slide valve, is they're going to erode. It's known there in the service.

And both of these incidents with Torrance and the Superior

incident occurred at the end of a run. Torrance had about six months to go until the next turnaround. Obviously, like I said, the Superior Refinery was actually entering their turnaround. And so, one thing we're looking at, and I'll get into this a little bit, is that the slide valve, while it does a good job, even during erosion, during normal operation, it might not be the best design for serving to stop, to create a barrier during a shutdown. Might be other things that are...that are better served to create that barrier between the air side and hydrocarbon side during a shutdown, during an emergency response.

So, just two pictures. A lot of times, I feel like, when I say something fails, I feel like a lot...Our last factual update came out and people...people think about a slide valve failing, you think about some big hole or some big failure really. Just...just to give an idea...This is the Torrance slide valve after the incident. And so, this is it in the fully closed position. And, as you can see just looking at it, it doesn't look that...that terrible. But it's just enough erosion around the outside that it's no longer tight enough to maintain that catalyst sitting there as it fills...fills out. And when you stop the loop, you're stopping continuing to give catalyst inside, and so you lose it all within a relatively short amount of time.

Again, this is probably hard to see. You can just see some of the erosion that occurred in that valve. And there's just some kind of all around, just kind of as you would expect during...during operation.

Did some testing of the...of the Torrance valve...Or, sorry, the Husky Superior valve. You can see the entire slide valve here. This is kind of zoomed in. Can't quite see the scale but it's about...about an inch or two there. So, you can see a hole kind of in the bottom there, which allowed the catalyst to come through and allowed vapors to travel back through.

But...but it's unclear to us right now whether or not even a brand new...Something we're looking into, I'll talk about in a second. Whether a brand-new slide valve...how long you can rely on it to actually maintain a barrier. So, all these were at the end of a run, something we're continuing to look into.

So that's...that's roughly our update. Where we are now in the investigation? We continue to do analysis and report writing. We continue to meet with industry experts. We're continuing to try to get input from various people to help us out. We're here today to give you some updates, to receive input from you all.

I really appreciate everyone coming out during the middle of the week, during the middle of a day during the week, to give us

input, to tell us what's important to you all. So, thanks for coming out. I think this is a valuable part of the process.

Our next step, like I said, we'll have the review. We'll have internal and external review. And then we'll likely have a final report released, and potentially another video that'll come out that will detail the findings of our investigation, make recommendations to prevent reoccurrence.

So, questions we're looking at. Obviously, since both of these happened during...during shutdowns, how to safely shut down an FCC without a reversal. What's the best means of maintaining a separation of hydrocarbon and air? How do you ensure that your safety barriers operate for all modes, not just steady state, but also shutting down in emergency modes? If you're going to rely on your steam pressure to create that inert gas, how do you account for that in your risk management systems, your PHAs and your LOPAs?

So that...that's what I have. Again, like Interim Executive Kulinowski said, but if anyone has comments that they want to give later, we do have an email address. We have [HuskyComments@csb.gov](mailto:HuskyComments@csb.gov). We welcome any comments people have as part of the public input, if you have more than three minutes, or you leave here and think of something else you want to say. We'll keep this up for some time period and we would appreciate anyone's comments. So, thanks.



MEMBER KULINOWSKI: Thank you, Mr. Wingard. Very much appreciate that. Now we're going to have questions from the Board Members. I'd like to kick it off. You mentioned the issue with the slide valves happening once in Torrance, and then again here in Superior. So, should...Is your investigation moving in a direction where we might be thinking about a broader recommendation to the industry, the refining industry, about the adequacy of these slide valves for providing that barrier?

So, I have a couple...multi-pronged question. Is this...is this slide valve a standard type of equipment in U.S. refineries across the country? And, if so, and we've seen two failures now in a few short years, is there a concern that this kind of slide catalyst failure could happen again elsewhere with a different set of circumstances?

MARK WINGARD: So, to answer the first question, the slide valves are very common. They're...they're commonly used to...in between the reactors and regenerators in FCC units. And...and so the question we're working on right now, that we're doing analysis and trying to get input on is, how common it is to rely on these during turnarounds? Obviously, we...we have two data points here. We're looking at the Torrance case and this case, obviously, where they fail, and they directly lead to an incident.

That being said, obviously, FCC units around the country are shutting down or starting up on a fairly regular basis, and we're not having these explosions constantly. These have been in operation since the '40s. And so, while it is very troubling that we're seeing two in a pretty short amount of time period, clearly there exist safe ways to shut down these units. And even the...the Husky refinery has operated since 1961 and hasn't had an explosion like this before.

And so, we're trying to figure out, one, what makes these instances unique in that these flammable atmospheres were created and found an ignition source? And also trying to understand what other companies, what other areas, what other things, exist out there to prevent this, to keep some type of separation in between the hydrocarbon and air side.

MEMBER KULINOWSKI: Member Ehrlich?

MEMBER EHRLICH: Nice presentation, Mark. Thank you. Just for my own technical curiosity, do you know what the temperature of the asphalt tank was? Was it...It had to be at it or near its auto-ignition temperature, was it not?

MARK WINGARD: Sorry, offhand, I don't know the...the AIT, but it was somewhere in the vicinity of 700 degrees Fahrenheit, I want to say.

MEMBER EHRLICH: I'm sorry?

MARK WINGARD: I think it's somewhere in the vicinity of about 700 degrees, I think.

MEMBER EHRLICH: Centigrade or Fahrenheit?

MARK WINGARD: I think Fahrenheit.

MEMBER EHRLICH: Okay.

MARK WINGARD: I can get back to you. That...I think that's right.

MEMBER EHRLICH: In...in both the case of this accident and the one California, projectiles were hurled some distance away, okay? In this case, it ruptured the asphalt tank. In the California case, there was no such rupture of anything. Is...is anything to be learned by studying the dynamics of that and the...the acceleration rate and pressure with which that stuff is discharged?

MARK WINGARD: Yeah, I think looking into, kind of, all aspects of the investigation, I think that's one area we're certainly interested in. When we...One of our recommendations in the Torrance investigation was to look at the over-pressure scenarios for the... That incident occurred in an ESP, which is an ElectroStatic Precipitator, which probably doesn't mean much more to anyone. But...

And so, we talked about how it's important to look at

what's around the piece of equipment when you're putting in new equipment, when you're making major changes, to look at over-pressure design, to look at what exists around it, see what risks there are. And so, we looked at that in Torrance. That's certainly an...an avenue we're looking in this investigation as well. But, yeah, I think it [inaudible].

MEMBER EHRLICH: Okay. And...and I'd just like to say when I talked to the fire folks, the fire officials, when I was out here in August, they talked about how they literally moved the burning asphalt with water. And I've had the opportunity to discuss that with a number of other entities to whom I've presented in the last six months. And that...that was just a phenomenally good move.

And, as I said in my opening remarks, the fire department and the emergency responders here, both on the community side and the industrial side, did a phenomenal job at containing it.

MEMBER KULINOWSKI: Thank you, Member Ehrlich. We'll have an opportunity for a second round of questions. Member Engler?

MEMBER ENGLER: Thank you, Investigator Wingard. You...your presentation extensively dealt with the technical factors, the ignition source. And I think that, within these complex FCC units, that's a...that's challenging, and very much appreciate your efforts in...in doing that. Direction of my question is somewhat different,

as will emerge.

So, I have a specific question about the...the debris. Why did the debris, if you know the answer to this at this point, go in the direction it...it did?

MARK WINGARD: Yeah, and so I think...I think this...some of this gets into response to Member Ehrlich. So...so you had debris going...going a couple different directions. There's a couple...a couple of reasons for that. We're certainly looking into kind of over-pressure, and what analysis should be done beforehand. I'll say that's something we're analyzing. I feel like right now, I can't really speak to that. That's something we're looking at...into and kind of the debris and where it went as something that's part of our investigation moving forward. So, sorry, but...

MEMBER KULINOWSKI: Can I follow up on that, just...and then I'll bring it back to you. The...I also had a question about the distribution of the debris. Because we saw in Torrance that a...a very large and heavy piece of equipment flew quite far, and in this case, also a piece of the debris flew and hit a different part of the facility. So, are we looking more generally at what is known as facility siting issues? That is, namely, how the plant is laid out and where process equipment that contains hazardous materials is in relation to other process equipment, which could fail. Is that a

general direction that we're pursuing?

MARK WINGARD: Yeah, I think facility siting in general is something that we're looking at. And, again, it was something we looked at in Torrance. It was a little different. The ESP there that ultimately failed was...was constructed in 2009, 2010, so it was relatively new construction in the world of...of refining. A difficulty that exists, in a lot of these places...Like I said, this has been in place since 1961. A lot of these units...some of these units have been there since 1950. So, actually moving existing units is...is very difficult if you're not doing...doing a rebuild.

But certainly, any time you're making major changes, any time you're doing new construction, I feel like taking a look at facility siting, excuse me, is something that's important, and something we're looking into in this investigation.

MEMBER KULINOWSKI: Member Engler?

MEMBER ENGLER: So...so I guess the question and answer may have been in the first factual update. But, how far from the FCC unit was quantities of HF stored in the alkylation unit?

MARK WINGARD: So, I don't have any hard data. But I...I was out there, so I can say, I mean...So, the...In...in really any refinery that has an alkylation unit, alkylation units are tightly interconnected with FCC units. A lot of times the...the feeds from

the FCC or the output from the FCC ultimately will go to an alkylation unit. So, a lot of times, they're physically pretty close, just because of that proximity. And so, you have the alkylation unit, in general, is on the range of 200 feet away from the...where the incident occurred, from the gas concentration plant.

MEMBER KULINOWSKI: Member Ehrlich, do you have any additional questions?

MEMBER EHRLICH: Not at this time, thank you.

MEMBER KULINOWSKI: Okay. Member Engler?

MEMBER ENGLER: Well, rather than posing this as a question, I think I'll just suggest that, in light of your answers around siting, I think it would be valuable, in terms of the path forward, to look at the question of whether debris, under slightly different circumstances, could have hit vessels or piping involving the HF alkylation unit. I just think that's a reasonable...a reasonable approach, a reasonable question. And since the CSB statute itself is supposed to...empowers us to look at the circumstances of our...of incidents, it's a factor that we at least should have in considering what actually happened at the...at the facility.

So, another question I have is, were plant utilities knocked out during the incident? And what impact did this have on safety safeguards, including alarms, and any deluge systems, or other

measures to mitigate releases?

MARK WINGARD: Sure. So...so to...to answer, I guess, the first part of that question, the...the fire...so the initial explosion. The fire, ultimately, there was some loss of power on the facility...some loss of power on the facility. To the second part, to the deluge system, we don't have any indication that any of the active mitigation systems related to the HF unit itself, the alkylation unit itself, were impacted or were compromised, by the explosion or by the subsequent fire. You do have...you do have...The control room was ultimately evacuated.

The refinery itself was evacuated because you had a very large fire there. And so, you don't have people present there. But there are active and passive mitigation systems that are in place in that event, and those activated at the alkylation unit, or in the alkylation unit.

MEMBER ENGLER: I'm sorry. Could you clarify...I...I may have misheard a little bit about the utilities. So, there was no...there was no interruption of...?

MARK WINGARD: So there...yeah, there was power loss...

MEMBER ENGLER: There was power loss?

MARK WINGARD: Yeah. Yeah, and then the people evacuated, which I mean, would...Your...your operators, your people who were there



were certainly part of any mitigation system. So, you have people evacuate. But there were other mitigation systems that were in place, that...that did operate and served as intended.

MEMBER ENGLER: Okay, thank you.

MEMBER KULINOWSKI: Member Ehrlich?

MEMBER EHRLICH: Thank you, Mark. You may have answered this question, but I'm...frankly, I have a hard time hearing with the sound being projected that way and me sitting here, and old age gets involved, as well. One of the questions I had is, have you looked, or is...do you know of any studies that have been performed on these particular types of fluidized bed cat crackers over time, both globe...both domestically and internationally?

MARK WINGARD: Yeah, so I'll say that that's a very integral part of our investigation. That's something we're looking into. We're trying to reach out to various people to...to get a better handle on that. We've had a lot of great cooperation from different people out there who are knowledgeable about this. And so, that's kind of very integral to our investigation. And so, that's a...I guess, not answer, but that's something we're looking [at] and the final report will talk about that in detail. And so, yeah, that's something that's heavily on our...on our minds.

MEMBER EHRLICH: Great, thank you.

MEMBER KULINOWSKI: I'd like to ask you a little bit more about this pyrophoric iron particles. You...I think you mentioned that this was a known hazard, having pyrophoric iron inside of the process equipment, because it could become the ignition source and complete the fire triangle. So, is this something that the company had an active program to manage those hazards? Is it something that they periodically go in and remove? Was there a buildup of this material over time that was unaccounted for? What do you know right now about the presence of that pyrophoric iron inside the equipment?

MARK WINGARD: Sure. So, pyrophoric iron sulfide, depending on what your feed is, and what the...kind of, what the components of going into various units, it can...can accumulate in a number of different pieces of process equipment. And so it...it's pretty common for crude oil that comes in to have the...the sulfur species that will...that will lead to this. And essentially...I mean thinking of, like, a rust-like material isn't a bad way to think of it. And so, while you're operating any unit that has hydrocarbons, as long as it's...it's fully filled with the hydrocarbons, and you're well above your upper flammability limits, there's no real risk of an explosion, even though the iron sulfide's there.

And so, the refinery did have a program to...to deal with it. It largely involves, before opening the equipment. So, during pretty much any turnaround, for a number of pieces of process equipment, you're going to open it up, send people in to do inspections. And when you open it, there's going to be some residual hydrocarbons, there's going to be the pyrophoric iron sulfide, and there's going to be oxygen when you open it.

And so, there are treatment steps that are pretty well known in the industry. And so, there were...there were programs in place for how to treat these...this equipment before opening it to...to kind of mitigate the hazard of the iron sulfide having a flash fire or a fire.

MEMBER KULINOWSKI: Thank you. Member Engler?

MEMBER ENGLER: Thank you. In your review of the circumstances at Husky, do you have any observations about the frequency of turnarounds in the FCC or other units? The trend in the refining industry, as I understand it, is that there's further and further time between major turnarounds. And that's an industry trend that refers, not to normal day-to-day preventive maintenance, but to a shutdown of the unit and a major overhaul. And there have been some observations at some sites, and some writing about this issue that goes back decades, that the tendency in the industry,

and it may involve also technological advances, has been to delay turnarounds.

Others have said that this is a potential run to failure.

Meaning that the way the...the resultant discovery of what a problem might be, a risk, a hazard, is, in fact, in the failure itself of the unit. Obviously, that has...could have negative consequences, if the way you find out that the unit's not working is by, for example, a major release.

Do you have any observations on the frequency of turnarounds at this specific refinery?

MARK WINGARD: So, the first part of the question, I guess, is easier than the second, I'll say. So generally speaking, in industry, and I think Superior Refinery's no...no exception to that, if you look back at the '70s and '80s, turnaround...time between turnaround was more frequent, or was a shorter time period. You're looking at a scale of two to three years. Now, industry-wide, and also here, those are getting extended. So, there is a trend to going longer between turnarounds, both in industry and at the refinery.

I think the much harder part to say is...is that causal in causing any increase in incidents? If you look over that same timeframe, incidents are also happening at a much lower

frequency, just across industry. And so, I think the reason people are saying that they can go longer between turnarounds is that there is improved methods for dealing with running...dealing with the process while it's at steady state. And so that there's a decreased need to shut down so frequently.

But, whether or not there's a causal connection, there is certainly something that we're looking into. Certainly it's something we're interested in. Just having it happen while you're shutting down is something that we're interested in, as well.

And I just want to point out, it's also, I mean...Anytime you're in non-routine operation—so, anytime you're not at steady-state operation—there are increased risks. There are increased hazards that...that are present in any refinery, in any hazardous operation. And so, just the fact that these both also occurred during a shutdown operation, even apart from the fact that a turnaround was coming up, is something we're also looking into.

MEMBER KULINOWSKI: So, I understand that the...the refinery's not operating at the moment. And there's a major effort underway to understand how to bring it back to operation. Are there any opportunities here for the CSB to consider...to...to have the company consider, if not a formal recommendation, any inherently safer modifications to be introduced during the rebuilding that might

help prevent this type of incident from happening again?

MARK WINGARD: So, broadly speaking, I would say anytime there's...there's a major rebuild, anytime there's a major change to a process, there's...there's definitely the opportunity to introduce safer systems, introduce inherently safer technology on a variety of fronts. One issue you have in refining is, when things are operating and when things are running, it's very difficult, very time-consuming, very hard, to actually do some of those IST approaches. But when you have the...the unfortunate opportunity that's here, I think, in a variety of different places, in small locations, in big locations, you can look into that.

The...the process, I understand it, is very ongoing, and I'm sure there'll be risk assessments that go on, but I can't speak to any specifics that we would point to or recommend. But the opportunity certainly would be there.

MEMBER KULINOWSKI: And the reason I raise it is, we had an opportunity to go back to a recommendation recipient, a completely different incident in a completely different industry. But the incident that occurred there, the company embraced the opportunity to not only look at the factors that caused the incident that we investigated, but do a sort of "stem-to-stern" analysis of their entire process, to understand if there were other safety and

efficiency improvements they could make.

And so that we actually gave them a Safety Spotlight Award, recognized them for their innovation, and for thinking broadly and not narrowly related to the incident that we investigated. So, there's more information on our website about that Safety Spotlight. I think, when companies embrace the...the opportunity to...to implement changes more broadly, and to...and to do that analysis, then there are greater opportunities, not only for safety, but as this other company told us, they're operating more efficiently as a result.

That was a comment, not a question. Member Engler?

MEMBER ENGLER: Yeah, my last question. What organizational factors may have contributed to this incident? What are you looking into in that regard? For example...I'll give two examples. One, what are the patterns of staffing? Has staffing overall been reduced? Has staffing been reorganized in a way that there may be—and this is entirely hypothetical and is indeed a question—that there are fewer operators monitoring a process than there might have been in the past?

Another example would be, does Husky have process safety...adequate process safety expertise, both at the plant level and at the corporate level, so that there is an ongoing attempt of

continuous improvement, as many firms do, when they approach highly complex questions in a world where technology is changing, and feel an obligation to understand what is not only their possible best practices in a particular facility, but also across the firm, across the nation and, for many multinational corporations, across the world, that it's not just good enough to say, "Well, this is what we do," but to fully understand how...what the best practices are toward continuous improvement across the...internationally?

MARK WINGARD: So, say, in general, it really, as I'm sure you're well aware, any CSB investigation into a place that has a complexity of a refinery or petrochemical facility, we're going to look at a number of the process safety management systems. We're going to look at how risk is managed, how risk is addressed. And so, as part of our investigation, we're certainly looking into a wide variety of different aspects of how risk is managed at the Superior Refinery. That comes across in a...in a wide variety of different ways.

I think if you look at some of our past refinery investigations, you can see some of the aspects that we look into, including staffing and organizational. I can think of the Texas City case, we looked into that.



So that's...that's on the radar of investigations. It's certainly potentially within the scope. I feel like it's too premature for me to actually say one way or the other what findings we have. And I think the final report, if we find something that is causal, that has a direct link to the incident, it'll certainly be included and analyzed in our report. So we're still in the process and haven't...haven't finalized that as of...as of yet.

MEMBER ENGLER: Just one brief comment in respond to that. I...I would urge that everyone here, in their comments, think about this in those broad terms as well. Because you may have insights and information, whether you're part of management, whether you're working at the facility, whether you're a contractor, whether you're a community member, that may be helpful for us to consider in that kind of regard. Because what this incident was caused by is not itself the ignition source. Meaning...and your...of course, your presentation went far beyond that and the triangle that you talked about, of course, is what goes into why we have fires and explosions. But it's one part of what we're trying to get at.

MEMBER KULINOWSKI: Member Ehrlich, any final questions?

MEMBER EHRLICH: Not so much a question as a comment. I've been out talking to a lot of people this past year about issues

around exactly what Member Engler talked about. And that basically is not only the safety culture, but the culture of process safety. And I don't think that's any better identified than in what happened at BP in Texas City a number of years ago. But I would encourage you to get as much of that information as you can, so we, as Board Members, can take it out during our outreach and our advocacy efforts and spread the gospel. So, good job, and thank you.

MARK WINGARD: Thank you.

MEMBER KULINOWSKI: Thank you very much. That concludes this portion of the meeting. We are ahead of schedule, so what we're going to do is: begin the public comment period; do as many of those as we can until noon; then we will break for lunch and resume at 1:00.

So, I will go in order of the names on the list. Do we have a microphone for the speaker? We do. And, how are we going to handle the timing? You will see a timer up on the screen there. And please keep your remarks to three minutes, and use the microphone. And please address your comments to the Board, and not to anybody else in the room. Thank you.

We begin with Ginger Juel from the Twin Ports Action Alliance.

GINGER JUEL: Hi, thank you for being here. I want to

illustrate to the citizens in the room and who live...I want to illustrate to the citizens in this room, who live in this community, that we met with the Board before they agreed to hold this hearing. And we asked them to hold this hearing, based on research and outreach to the community of Torrance, California, who dealt with the near-miss disaster where shrapnel landed within five feet of their hydrogen fluoride tank. They guided us and said, "You need to ask for this public hearing."

The CSB couldn't commit to it at that time, and then we organized with our allies behind the scenes at Congress, who then requested this hearing. So, they're here today, thankfully, because our Congress Members listened to us. So, I just want to demonstrate that what the community does, matters. And we can have federal agencies respond to us when our safety is in jeopardy.

I'm going to add something here that really stood out to me when Jim Paine spoke today. He kind of called out that the CSB's here to investigate what happened that day. But in the event outreach, the CSB wrote that the CSB is charged with investigating accidents and hazards that result, or may result in, catastrophic release of extremely hazardous substances.

Jim Paine doesn't want to talk about hydrogen fluoride anymore. Jim Paine has told constituent as recently as last week

that hydrogen fluoride is less dangerous than automobiles. So, I urge you all to find me and reach out to me because we have a lot of work to do, to get rid of hydrogen fluoride in our community.

There is state legislation that will be proposed in Minnesota very soon, hopefully either banning hydrogen fluoride at the St. Paul Refinery...And I hope that Wisconsin legislators will then do the same, and either call for an immediate phase-out, or banning hydrogen fluoride before the Husky Refinery resumes their operations. So, we have the opportunity to do that.

I want you all to know that the local Douglas County LEPC has been given the authority by Congress to use the documents created by the refinery, required by Congress in their risk management plan, that details 180,000 lives are at risk. That is a number that comes from the refinery. That is not a conspiracy number. The local Douglas County LEPC is supposed to use the information from the RMP created by Husky to let citizens know, who live in the ERPG-3 kill zone...That is a term coined by California legislators for the citizens who live too close to the refinery, that if a worst-case scenario happens, they cannot evacuate, and sheltering-in-place will either mean death or serious lifelong injury.

You need to contact the LEPC and ask them to calculate the kill zone. That is their job.

MEMBER KULINOWSKI: Thank you.

[applause]

MEMBER KULINOWSKI: I would ask that speakers address their comments to the Board, please. Atticus Larson is next on the list. And just, if you want to queue up, Dorie Reisenweber is next after that.

ATTICUS LARSON: Hello, everyone. My name's Atticus Larson. I'm an electrician for Husky at the Superior Refinery. Along with that, I serve as [inaudible] board member, and I'm also District Director for Local 420 International Union of Operating Engineers, which represents some members at the Superior Refinery. And I'm here to speak on their behalf.

I would like to thank the Board and all who have made this possible. It's been a pleasure working with all organizations involved.

So, I thought long and hard about what I'm going to say and, really, three minutes is not enough to say everything. But I'm going to give it a try.

Every time I think about this, there are six things that come to my mind. And they are policies, procedures, training, safety, communication, and the last one I'll save for later. The reason I believe we are all here today is, things that need to be improved.

I'm going to touch on these things very briefly.

Policies. They must be followed, not only when they're convenient, but inconvenient. Procedures. Writing proper procedures, following those procedures, and training and informing employees on changes to procedures, and updating in a timely manner. Training. Taking advantage of not only in-house training, but training that is provided by the International Union of Operating Engineers. We want the most highly-trained workforce as much as the company, because we represent them and it is a reflection on the union.

Safety. It cannot be just a word. If people think safety was expensive before, look at what it costs us now. We need to start using the most up-to-date safety standards that have been in the industry for years. The most important thing, period, is for everyone to go home safely, after every shift, to their family. There can be no price tag on safety ever.

Communication. In our jobs, we all have a lot going on, but you must communicate effectively with your employees. Sometimes, in upper management, what doesn't seem like an important thing to you, because you're looking at the big picture, means everything to your employees. Communicate, work together. You have to, to be successful. We are all in this together. It cannot be done...it

cannot be an "us versus them." It will never work.

And number six. This is a big one. It's culture, culture change. You see, without changing the culture, everything I just talked about, I wasted my time and my breath, your time, and everything else. There's an old saying out there by Warren Bennis. He quotes, "Managers do things right. Leaders do the right thing." Husky Corporate, myself, and the members of Local 420 are asking you to do the right thing. Husky Corporation has proven to myself and employees that you are leaders and, although to change the culture it means making hard decisions, but that's what being a leader is all about. And although Husky is new to the employees, and we are, really, in still the getting-to-know-each-other stage, I believe Husky will do it right and do it...do it safely.

Husky has been a class act. They have done this...to this point, everything they said they would. They have followed every recommendation, to my knowledge, that has...was given to...to them from outside agencies. I look forward to a long, strong, and healthy relationship with Husky. I'm proud to call myself a Husky employee. And let's do it the Husky way. Thank you.

[applause]

MEMBER KULINOWSKI: Thank you, Mr. Larson. Next is Dorie Reisenweber, volunteer for Duluth Clean Water, followed by Lucas

Deitsche[?].

DORIE REISENWEBER: My name is Dorie Reisenweber. Can you hear me?

MEMBER KULINOWSKI: Yep.

DORIE REISENWEBER: I'm going to speak rather holistically. Fresh water drives people to live and work along Lake Superior shores and in the Twin Points...Ports. "Blue gold," Dr. Helen Caldicott calls it. As populations burgeon, Lake Superior's 10% of the world's fresh water becomes more like gold—more precious, more scarce.

In the last few weeks, we've learned the dire consequences of accelerating climate change. A growing concern is climate migration. A Harvard climate adaptation expert predicted that thousands will migrate from the US...from throughout the U.S., from flooding coastal areas, as well as from drought-stricken locations. The November New Yorker reported that Buffalo, New York, and Duluth, Minnesota, will become a climate refugee's destination of choice.

The Twin Ports area has long been sought out for clean air and clean water, yet the risks of contamination from mining, bursting pipelines, and exploding refineries threaten the life-giving water so vital to area residents, future generations, and climate



refugees. Who would want to live under the threat of hydrogen fluoride clouds? The continued use of hydrogen fluoride in Superior could keep people from coming...coming here to live, possibly from even being able to live here. Safety is a major determinant in relocating. Both Mayors Paine and Larson of Superior and Duluth have stated that the refinery's use of hydrogen fluoride is not acceptable. They've urged the Husky Refinery to replace it with a safer chemical alternative. The Superior Refinery is one of very few refineries, as I understand it, to still use hydrogen fluoride. Husky can afford to make the change, and surely Husky doesn't want to risk another, perhaps worse, refinery disaster.

I urge the Chemical Safety Board to insist that Husky uses safer chemical than hydrogen fluoride.

Emergency responders were apparently unaware that hydrogen fluoride was even being used at the refinery, at least some of them. How very dangerous for the responders. No wonder public announcements during the disaster seemed confused.

If a refinery[sic] occurs, there's no place to hide. Sheltering in place, whether indoors or out, could lead to many deaths and certain problems. Homes and Superior schools are within that two-mile kill zone of the refinery. This endangered area,

however, extends to 20, 25 miles, encompassing at least a 180,000 people in the Twin Ports area. There must be a better way.

If CSB has advice for improving the emergency response plans, I urge you to offer it, demand it, and to make sure of compliance if you can. Water, water everywhere. Will it be safe to drink? The future depends on it. Thank you.

[applause]

MEMBER KULINOWSKI: Thank you. Mr. Lucas Allen Dietsche.

LUCAS ALLEN DIETSCH: Hello, everyone. Thanks for coming. On the day of the explosion, I was actually reading a poem at Swenson Hall, so, I thought it would be kind of ironic to read a poem about the Husky fire here.

It's called "The Sky Was Scarred." In our harbor, from our phone[?], windows, or at Swenson Hall, we all saw the plume, the ghastly and growing, grade-reversed waterfall. The air was scarred. We are witness to the plume. I had to run to view it at [inaudible] window, to have both eyes filled with a coughing volcano. It was my city on fire, and it was about to sink. Now, right after the fire has been liquidated, they say the everything, the air is breathable. They say our gardens, water, light, and power is unhurt in Superior. The geese, Faxon, Newton Creeks, do not churn up burnt asphalt, all under the wounded sun.

After our Chernobyl, constantly looking over our shoulders to see if that ghostly shadow is upon us again, which even trauma doesn't recover from. Next time we won't have mercy from the depopulating chemical. We are vulnerable up here, separated by sky and the water. It would be an evacuation nightmare, climbing out of this island, crossing hills, sky, and water. Thank you.

[applause]

MEMBER KULINOWSKI: Thank you. Next up will be Lisa Fitzpatrick, citizen from Minnesota.

LISA FITZPATRICK: Hello. And I wanted to thank the Board for doing a thorough investigation. And I'm very concerned, as a citizen of Minnesota, that there aren't emergency plans for us. And I'm also extremely concerned about the use of the chemical hydro flor...for this plant. I want...I don't want that chemical to be used. Thank you.

[applause]

MEMBER KULINOWSKI: Michelle Rowell, Pastor of Concordia Lutheran Church in Superior. And then next up will be Carol Thomas.

MICHELLE ROWELL: I'll be brief. I also...I express praise to the people who did the evacuation. And I understand how important it is that we not let...not do things to make people panic and try

to get out, you know, haphazardly. And so, I think that was well done. However, after that nearest evacuation was done, I think it was irresponsible that the rest of the community was not informed of the existence of that very dangerous chemical at the plant. Because some of us have been here fewer than the six years, when it was last publicized that the hydrogen fluoride was on the site. And we did not know that there was a possibility that even people within 10, 15 miles would be affected by this dangerous chemical.

So, it would be responsible to be made aware of these things so that we can...especially after the initial evacuation of the closest people, that the people further away could get out safely, just in case something worse would happen as the explosions continued to happen. Thank you.

[applause]

MEMBER KULINOWSKI: Carol Thomas. All right. If Carol comes back, we can get her later. Jo Haberman, community member.

JO HABERMAN: Thank you so much for doing this public hearing. I rent an apartment on Park Point, part of the evacuation area. When I saw the Husky fires blazing, I was scared. My granddaughter lives in a dorm room across the street from where we're meeting today. Was she there? Was she at risk? Was she on a bus on her way to Lake Superior College for classes? When I heard about the

evacuation, I went to get my daughter from her classes...my granddaughter. I saw the fires. We saw the fires. The enormous plume of toxic chemical pollution. My granddaughter was deeply frightened. She asked me to take her far away. She missed several days of class.

I believe that the City of Superior would like my granddaughter and others like her to not be afraid to live here and to see themselves in a future that is safe here for them. My concern for my grandchild, for me, and for others, is hydrogen fluoride on this site. Husky is a very profitable company. Hydrogen fluoride is a very lethal substance. It is unconscionable not to substitute a non-disaster alternative. This is a best practice. This is continuous improvement.

When I look at hydrogen fluoride and the...the risk of a release...I've seen 180,000 as the number would be at risk. This is the company's number, in my understanding.

So, I ask you to categorize what happened here as a near-disaster, as you did in Torrance. And thank you so much for the work that you're doing in Torrance, and that you're doing here. It makes such a huge difference to everyone that faces the risk of these...these disasters, and especially this HF is a lethal disaster chemical.

Categorize what happened here as...as a near-disaster.

And...and...and recommend no HF onsite at Husky. Recommend requirement of conversion to non-disaster alternative. And...and recommend the requirement of kill zone calculations. Recommend that legislation that Ginger talked about in Wisconsin and Minnesota. That's absolutely critical, as recent cancellations of EPA proposed risk management planning regulations.

I grew up in a union family. Unions have always been health-and-safety organizations for their members. And I thank the unions. We need more unions. And I also ask the unions to partner with the community. And if the company can be trusted, it would be an extremely important to have a community, union, company partnership, much more partnership. This is really what a "good neighbors" partnership would look like.

Unions use science and data to protect the safety of their members. This is why unions have opposed the use of HF. When looking at HF, a deadly, toxic substance, people here will never be protected by evacuation plans. That is selling people a false hope. People want to believe their elected officials at the county and city and school district have plans that will protect them when it comes to HF, and all the chemicals onsite at Husky. That is false, also.

When HF is released, shelter-in-place risks dying in place. "Run for your car" risks dying in your car. People were victimized by explosions, fires, toxic chemical plumes, and over the months since April, they have been asking for help and solutions. But they have been re-victimized by being largely ignored, lied to, and put down by all the levels of elected and appointed officials so far. Maybe this hearing will change that dynamic. I hope so.

MEMBER KULINOWSKI: Thank you. Thank you very much.

[applause]

MEMBER KULINOWSKI: Sierra Moen, followed by Susan Hedman.

SIERRA MOEN: Hi. I have three quick things. So, first, about the evacuation plan. Evacuating people from Superior to Duluth, which is just like two miles away, doesn't seem that safe because toxic plumes of chemicals don't respect state boundaries. So, I don't understand why it is so much safer two miles over the state border than it is here in town.

And then you said you only interviewed 50 witnesses, which you said was smaller than usual.

MARK WINGARD: No, it's a higher number than that. That was just a [inaudible] number.

SIERRA MOEN: Cool. I just wanted to make sure that you

interviewed the people that had been working for the...the plant before it became a Husky plant. Because that was just about five months before the accident happened. So, I think that interviewing people that had been working with that machinery, and making sure that they were still involved in the process, is important, to get their perspective on it.

And finally, climate change and environmental concerns weren't really mentioned that much today. But really got to do something about climate change, and, having the refinery right on the river, where it's about to leak into Lake Superior, is also very concerning to me. Thank you.

MEMBER KULINOWSKI: Thank you.

[Applause]

MEMBER KULINOWSKI: Susan Hedman.

SUSAN HEDMAN: Madam Executive, and other members of the Board, good morning. My name is Susan Hedman, and I'm an attorney for Clean Wisconsin, a non-profit organization that works to protect public health and the environment on behalf of our 20,000 supporters across the state, including many people who live in this area.

If my name is familiar to you, it may be that it's because I was the Great Lakes manager for the EPA region. I was appointed



by President Obama during the Deepwater Horizon crisis. And, you may recall that during that time, one of the problems is, it was discovered that RMPs were cookie cutter, and BP was using an RMP that...that...that talked about walruses. One of my very first acts as Regional Administrator in the Great Lakes Region was to direct a review of all RMPs for facilities located within the Great Lakes basin. And I would like to think that my staff's work on that helped make this disaster a little less worse.

Clean Wisconsin thanks our local, state, and federal representatives for asking the Chemical Safety Board to hold this town hall in Superior. And Clean Wisconsin appreciates the CSB's decision to be here today.

The Chemical Safety Board's website contains helpful information about the investigation of the Husky Refinery explosion. The website also includes a new performance and accountability report that assesses the work of the Chemical Safety Board. The CSB's 2018 performance and accountability report emphasizes the importance of safety recommendations produced as a result of investigations of incidents like the explosions at the Superior Refinery.

The CSB's performance and accountability report notes something quite interesting about the Husky Refinery explosion.

Specifically, that the incident occurred during a scheduled break, when many workers had moved away from the unit that exploded into blast-resistant buildings. The performance and accountability report goes on to point out that the use of blast-resistant buildings was a key recommendation from the CSB investigation of another refinery explosion in Texas more than 13 years ago.

All of us here today are thankful for the CSB's recommendation regarding blast-resistant buildings 13 years ago, and the steps taken to do that.

Today, Clean Wisconsin calls on the CSB to include safety recommendations in the report that CSB is preparing on the Husky explosion—safety recommendations that result in changes that will protect refinery workers and local residents here in Superior. Clean Wisconsin is particularly concerned about the risk of hydrogen fluoride releases from the Husky Superior Refinery.

The CSB's most recent update notes that the storage tank for hydrofluoric acid is located only about 150 feet from the source of the explosion. Fortunately, the hydrofluoric acid tank was not impacted by debris from the explosion. In other words, last April, we were very lucky.

Today, Clean Wisconsin is calling on the Chemical Safety Board

to make sure that we don't have to rely on luck in the future.

Clean Wisconsin is calling on the CSB to issue a report that includes specific recommendations to reduce the risk of hydrogen fluoride to refinery workers and the public. Clean Wisconsin is calling on the CSB to recommend that Husky discontinue, or at least phase out, the use of hydrogen fluoride at the company's Superior Refinery. And, failing that, Clean Wisconsin calls on the CSB to recommend that Husky implement changes to operations and processes to reduce risk posed by hydrogen fluoride before the refinery starts up again.

And Clean Wisconsin calls on the CSB to recommend that Husky perform a full assessment of safer alternatives to hydrogen fluoride before the refinery starts up again.

MEMBER KULINOWSKI: Thank you very much.

[Applause]

SUSAN HEDMAN: Clean Wisconsin thanks you.

[Applause]

MEMBER KULINOWSKI: Deepest apologies. I cannot read the last name, but I have initials A.M. somebody goes by the...there we go. Okay. If you could state your name and...your full name when you come up, I'd appreciate that.

ANNA MARIE [INAUDIBLE]: Hello, I'm a Duluth resident.

Duluth, Minnesota; Anna Marie [inaudible]. I've been listening and observing, and I keep hearing this reference to best practices. But best practices don't seem to include hydrogen fluoride. And everyone seems to trust Husky, but Husky's not going to stop using hydrogen fluoride as long as they legal can, regardless of what best practices, or what would be good for everyone. And we know this, all right. I've heard over and over again, groups of men in...of industry, laugh that it's cheaper to pay the fine and ask forgiveness than to ask permission.

Okay, so we...we know that corporations are only looking out for themselves. I don't trust...I don't...I don't trust Husky Energy. I don't trust these processes. I am seeing an epidemic of state-sanctioned eco-terrorism rampant throughout our entire country. And this is showing no evidence of being any different.

While I'm thankful that this is happening, I know it's only happening because tenacious individuals took it upon themselves to sacrifice their own time, energy, and resources to fight for this. And this is not happening because it is the best practice. It's happening because citizens have demanded this.

I'm shocked at the proximity of the school. I'm shocked at all the things I'm not hearing about. There was a chemical plume

that went into...south into Wisconsin. Yet, there's been no discussion of what that plume...where that went, what that did. And I don't see that anyone is even concerned about that because those people live so far away, it's difficult for them to get here. This was difficult for me to get to from Duluth today, in the middle of the week. Parking here during school hours, I parked three blocks away. It's not very accommodating. This does not feel like the public is important. I don't feel like the corporations care about our safety and well-being. I think they care about their bottom line, about making money, and about feeding an addiction, an addiction to fuel that is accelerating this climate change, that's not being taken into account, the realities of what these changes mean for our region immediately and...That's all I have to say, thank you.

MEMBER KULINOWSKI: Thank you.

[Applause]

MEMBER KULINOWSKI: Tom Thompson, Sierra Club. No, you passed? Okay. Can we go back and see if Carol Thomas is now in the room? Carol Thomas? Okay. Next Norm Heron[?], citizen and resident. Norm.

NORM HERON: Thank you very much for holding this hearing.

Today we have our say in the level of risk the residents or workers

of the Twin Ports are subjected to. The Husky Refinery personnel believe that it is acceptable to use hydrogen fluoride for refining petroleum. This chemical is highly toxic; has the capacity to injure...injure and cause death to those residents living near the refinery, especially those with health concerns. And, depending on wind conditions, harm those downwind of the explosion plumes of gases.

In the event of a leak of hydrogen fluoride, those residents closest to the refinery would be unable to evacuate in the extremely short window of safe time. The Husky Refinery must replace the hydrogen fluoride with a less toxic and less dangerous chemical.

The cost to manufacture a product must never take precedence over the safety and health of the people who reside and work in the Twin Ports. When cost is considered over safety and health, that's called negligence.

The Husky Refinery should remove hydrogen fluoride from its processing. Thank you.

[Applause]

MEMBER KULINOWSKI: Thank you. Kevin Swanberg[?], followed by Theresa Hoffman.

KEVIN SWANBERG: Good morning. Some claim that hydrogen

fluoride is not a risk in our community. However, it was admitted later by officials in this room that a risk of hydrogen fluoride release motivated our evacuation. The refinery's own risk management plan claims that 180,000 people are at risk of a release. That number is not, as some elected officials claim, a conspiracy.

That is why I ask the CSB take a commitment to take this disaster as seriously as you have taken the refinery disaster in Torrance, California. In Torrance, you are in litigation for documents regarding hydrogen fluoride. You must commit to doing the same here in Superior, Wisconsin.

Yesterday, your team told me that you would not do this because litigation has taken years, and you do not want to spend more time in court. That is a slap in the face to our community. What you are saying...[Applause] Yes, thank you. What you are saying is that you are willing to fight in Torrance in court, but you are not willing to fight for the people of Superior. You must do the same. What is about...what is it about our community that is not worthy of your time like Torrance is?

I ask that the CSB focus on the near-miss hydrogen fluoride disaster scenario that happened here, just as you did in Torrance. Yesterday, your team told me that the shrapnel could have just as

easily punctured the hydrogen fluoride tank as it did an asphalt tank. I ask that you recommend legislation preventing chemical accidents, similar to the legislation you supported in California. In Torrance, you devoted a large portion of your public meeting to a discussion of legislation protecting that community. We need the same here. We need you to recommend to our legislators strong chemical accident prevention legislation.

As I stand here, I hope that the members of this Board recognize that we need real advocacy for this community from you, because the elected officials here are not giving it to us.

This company is responsible for this disaster. They are responsible for refinery fires in Lima, Ohio, and they are also responsible for a massive oil spill in Canada last month. Every time after these disasters, they say, "I'm sorry." But, "I'm sorry" does not save lives. Proper process safety, and using the best technology, saves lives.

But they won't do that. Husky will not do that because it's cheaper to have an accident, collect insurance, apologize, and move on. And we trust them with our lives. Thank you.

[Applause]

MEMBER KULINOWSKI: Theresa Hoffman, followed by Dan O'Neil.

THERESA HOFFMAN: My name's Theresa Hoffman and I'm speaking



in behalf of the victims. Because I have been a two-time victim of chemical poisoning in two businesses in the Northland[?]. I had the...When I was poisoned by hexane, I died, I was brought back, and I had been intubated and put in a seven-day coma. I now have been on disability for nine years. Besides the fact that these chemicals are horrendous, I...I now have life-threatening convulsions. If...if the hydrogen fluoride tank would have exploded, I would be dead because I have severe, extreme allergies to chemicals.

This is not about money. This is about the loss of quality of life, which is irreplaceable, which is people are harmed and they have long-term health issues like I do. I have half the quality of my life now. Also, financial. I can't work. I've been living in poverty for nine years.

Also, I think it was...also a disservice to our community because we weren't informed that this hydrogen fluoride tank was even a possibility of exploding until 7:00 p.m. that night. They evacuated people ten miles south, three miles northeast...north, east, and west. When technically it should have been 30 miles—30 miles for people to be safe in the Duluth-Superior area. And think about it: I would be dead. Dead. Along with a lot of other people, and so many people would...would be dramatically...dramatically

injured, dead by this.

This tank should not exist in our community. As a victim, I just stand for these other people who are not being heard. It's...it's traumatic. I have PTSD. It is just horrible and heart wrenching, what this chemical would do to people. Thank you.

[Applause]

DAN O'NEIL: Hi, Dan O'Neil; live here in Superior. Appreciate you guys coming here. Your presentation was really good. I learned a lot of stuff I'm never going to use, but it still was interesting.

I read in the literature they gave us today that in Torrance, you guys were denied access to some documents. Has Husky given you everything you've asked for, or are they doing the same thing?

MEMBER KULINOWSKI: This is...this is your time to...to tell us what you want us to hear.

DAN O'NEIL: Okay. Remove that hydrogen fluoride. Here's what really ticked me off about that day. I was out at the hospital when an explosion happened, and someone called me and told me about it. So, I went home, dropped off some people, and then I ran and got my grandchildren, and we went to my house because we were outside that three-mile area. I sat on my roof and watched it. And then I come to find out that there was this

horrible, horrible chemical out there that could level Superior and Duluth and kill all of us. And it's still there. But no one told us about it. The mayor, everyone else, they knew about it, and they knew how dangerous it was. But they did not provide us with that information. Because if I would have known that information, I would have grabbed my grandkids and the rest of my family and we would have been gone.

And that's the part you got to tell the citizens—what's going on—so we can make a choice based on facts. And...and I hope next time, they have the common courtesy to let us know.

Thanks again for coming out here.

[Applause]

MEMBER KULINOWSKI: Thank you. We have time for one more comment before the break, and that's from Diana Brainerd[?].

DIANA BRAINERD: Hi. Thanks for being here. On the day of the explosion, I was home. But my daughter was at work. I live north of Duluth. And my daughter, at the time, lived in Superior with a friend and her two dogs. And she was kind of on the...right on the perimeter of the evacuation area. And I was watching the news and Googling asphalt.

But, again, like the fellow before me, nobody told us that it could be hydrogen fluoride. I wasn't Googling that. I would

have told her immediately, "Get the dogs and get out of there."

I did house her and her friend and the dogs. They did evacuate eventually. But, I don't feel that we were treated honestly.

I'm newer to the area. I didn't know about hydrogen fluoride.

And then, even in the presentation, I didn't see...So the debris is flying. I would like the CSB to follow up and see if the debris could have hit the hydrogen fluoride. You didn't show us where it was on that presentation. I don't know how close it was. And I would also like the CSB to look into...Besides explosions, we have to worry about terrorism. And I just really think it's best to get rid of this chemical, and to do whatever is necessary to make the plant safer, not just from the hydrogen fluoride, but from the asphalt and everything else that might go into Lake Superior. Thank you.

[Applause]

MEMBER KULINOWSKI: Thank you very much. Okay, we will now take a break from our session and give an opportunity for people to get something to eat. We will reconvene at 1:00.

[BREAK]

MEMBER KULINOWSKI: Welcome back, everybody. Thanks for sticking with us through the lunch break. We are going to resume the public comment period, and I will go through the remaining

names on the list. And then, if there's anybody who still wants to make a comment but has not signed up, I will invite you to come up to the microphone at that time.

[inaudible]

MEMBER KULINOWSKI: I will remind you please to address your comments to the Board and to limit your remarks to three minutes. We're going to try to get that three-minute timer back up there. There it is. And so now I invite...I just have a last name. Nocomez...Nicommez[?]. If you could state your full name for me, that would be great. Thank you.

[UNIDENTIFIED]: [Non-English] I am here to let you know that I have been here for 14 generations. And...and...and you have been here for how long? 50 years? And you have successfully poisoned the fish, the frogs, the air, the water, and the food. I'm really quite embarrassed; it's 2018 and I have to be here to discuss this.

Have you...have you...have you...I guess really maybe you haven't. But have...has anybody been over to...to let the...over to Newton Creek to let them fish know that they're poisoned? How about those swans and those geese that were swimming in that? Who ate them? Husky says they're good neighborly. What does that mean? What does that mean, to be good neighborly? You know, to me, that...that

means I have to go take care of my elders and see how they're doing and check up on them and...and make sure they're good and...and make sure that the children are healthy and happy and safe and have food and...Right? Isn't...isn't that what that means? Bring a piece of pie over or something. Isn't that what that means, to be good neighborly, to make sure that your...your community is safe? Is that what Husky is doing? In 50 years, is that what Husky has done?

How about the 1837 Treaty? How about the 1854 Treaty? Have you been to talk to any of those signatory bands[?]? Federal to federal, right? Sovereign to sovereign nation, nation to nation. Has that happened?

[Non-English], Ginger, for bringing this on. [Non-English] Way to rock it.

MEMBER KULINOWSKI: Thank you very much.

[UNIDENTIFIED]: My...my...

MEMBER KULINOWSKI: Time is up.

[UNIDENTIFIED]: My famous last words here, as an indigenous...as an indigenous for my seventh generation, for your seventh generation, I say this is Husky's eviction notice. Get off my land.

[Applause]

MEMBER KULINOWSKI: Next we have Mark McConnell.

MARK MCCONNELL: [Non-English] Thank you for holding this today.

MEMBER KULINOWSKI: Can't hear you.

MARK MCCONNELL: I'm a Fond du Lac Band member, I'm an elder, I'm a veteran. I've lived here my entire life. All of my...all of my ancestors came from Wisconsin Point area and Fond du Lac area. I...I've watched my whole life as this area has gotten bigger and bigger and bigger and gotten dirtier and dirtier and dirtier. We can't eat the fish out of the lakes and rivers anymore. I worry about the medicine that I harvest and all because I live in the plume area. Some people say...the University and the County Extension go, "Don't worry about it. Don't worry about it. Don't worry about it. Don't...no problem." But yet we see in the East End area near the refinery, [inaudible] area, all these people that have cancers and tumors and...and leukemias and all these strange, different types of diseases.

When you get on the computer and start researching these things, all communities that have big refineries all have the same problems. This stuff is going up in the air all the time. This stuff is going up in the air all the time. Don't worry about it. Don't worry about it. So I don't know where we draw the line.

Just like the CSB. I know that you can make recommendations to the industry. But you have no way to really grip them and force them to do anything. So it's kind of like another bloated government agency. We've watched over the years the Environmental...the EPA spend millions and millions and millions of dollars in this community, restoring contaminated sites, capping them, covering them up, digging them up, moving them someplace. Only to have other things happen.

And what I'm...what I'm starting to figure out is, anytime somebody speaks up, like if the Mayor speaks up, or Emily Larson in Duluth, the Mayor over there, speaks up, the trade unions go to them and they go, "Well, you need to shut your yap, you know, or...or we won't support you in the next election."

So, it's all about money. But what good is that money going to do you when you can't breathe the air, and you can't drink the water? You can't eat the fish or harvest the animals that I have a right to do. And eat that food that we grow. I...I grow medicinal plants for elders, for medicine. And I can't take those plants from that plume area that I grow and spend hours growing and talking to and praying with and...and make medicines to give to people, only to make them sicker. It makes no sense. We, as a community, need to wake up. We really need to wake up,



and do it quick. Thank you.

[Applause]

MEMBER KULINOWSKI: Thank you. Next on the list is Jared Hawes from AFPM.

JARED HAWES: Good morning...Excuse me. Good morning, and thank you for having me. My name's Jared Hawes. I'm the Director of State and Local Outreach at AFPM, the American Fuel and Petrochemical Manufacturers. And I just wanted to thank you again for inviting me, and I just wanted to provide a brief statement, and submit a more comprehensive written testimony later.

As background, AFPM is over 100-year-old trade association representing more than 95% of the nation's refining and petrochemical manufacturing capacity, with more than 120 refineries around the country that supply gasoline, diesel, jet fuel, home heating oil, and other products to consumers here in the Twin Ports region and around the country.

Safety is a core value for the petroleum refining...excuse me, petroleum refining industry. AFPM members, their employees, and contractors are dedicated to operating safely, reliably, and in an environmentally-responsible manner. In keeping with our safety mission, the lessons learned from this incident will be shared broadly within our industry. And, in fact, AFPM and our

members are working together to provide the Chemical Safety Board information on our members' practices, to prevent a similar incident.

Over the years, AFPM has acted as a conduit between CSB and our members, and we have provided the Board with technical information, and ensured the learnings from incidents are being shared broadly through a variety of venues. It is common practice for our members to take those learnings back to their companies, to review practices, procedures, and research new technologies that prevent a similar scenario from occurring at their company. This relationship has been mutually beneficial, and we will continue to work with CSB moving forward.

We're here today to address the incident in the Superior Refinery in April of this year. It is important to remember this incident occurred at the fluid catalytic cracker, or the FCC unit, and not the hydro...excuse me, hydrofluoric acid or HF alkylation unit, as aptly explained by Mr. Wingard.

Investigation findings from this incident will be shared broadly in order to prevent a similar incident from occurring.

And, therefore, the report should focus on safe operating practices for the FCC unit where the issue occurred. Still, I would like to address the heightened sense of awareness about the

use of HF. In total, refineries only represent about 1.5% of global HF demand and the remaining 98% is used by a range of industries that make products for...such as detergents, semiconductors, cars, computers, and agricultural departments. Roughly 50 refineries utilize HF, or modified HF, around the country.

In order to continuously improve operation and safe uses of HF, our industry meets and exceeds regulatory requirements. One of the recommended practices we utilize is API/RPI 751, Safe Operation of Hydrofluoric Alkylation Processing Units. We can explain more in our written testimony on this.

But, in closing, I just wanted to say, the refining industry take the safety of our equipment, employees, and surrounding communities very seriously. There's no one-size-fits-all solution to all risk at all facilities. But we do work every day for every facility, to keep it the safest as possible.

Thank you for your time and for your effort today.

MEMBER KULINOWSKI: Thank you. Next up on the list is Catherine McKenzie.

CATHERINE MCKENZIE: Thank you for being here. I let Senator Johnson's office know and Senator...Representative Duffy. I hope that he sent someone here, because the

government...the federal government will make the decision, or Congress will make the decision, and that's important.

I don't know if Mr. Hawes lives within a mile of a HF facility, but I do, and I have for 44 years. I...I have taught at the university, and I was there in the middle of the semester because the previous teacher had cancer and his treatment wasn't working. And one of the other professors said his doctor said, "Won't someone do something? This place is full of cancer."

And I tried. I was on the Board of Health at the time, and I got information. I gave it to the paper, and after we had the benzene spill, just after that, our then-Mayor, who lived near me, asked the paper who knew about it. And I said, "Well, I did." Well, it never got printed. And then our Board of Health got subsumed into a...the Department of Human Services.

I was on the County Board for 18 years, and on our Executive Committee, three of the people either had worked...one was retired and two were currently working for the refinery.

I'm saying all this is a political issue. It always has been. And jobs are important. My husband was a union president. My father was a union president. And there's money here. And once upon a time, I spoke about when corporations ruled the world. I spoke to a forum in Madison and they clapped. And I felt that it

was...nothing's changed.

After the benzene spill, I was evacuated. This is the second time. It doesn't feel good. I think I'll have more that I'll put in writing. But, this is how I feel. It doesn't feel good to know that we, our lives, our health, the future health of our families, our soil, our water, and our air are all expendable. Thank you.

[Applause]

MEMBER KULINOWSKI: Thank you. Can't read that. Coture? Sherry.

MEMBER EHRLICH: That'll work.

BRENDA MARTINI: Hi. I'm Brenda Martini. I'm a resident of Cloquet, Minnesota, in Carlton County. I am here as a concerned citizen. I also have family and friends who live and work in Superior, Wisconsin as well. I want to let you know I don't have any prepared remarks. But I'm just going to speak from the heart. And just to let you know some of the...my travels that day. Now, April 26<sup>th</sup>, I had to be at a class on the UMD campus, over in Duluth. And it...class started at 3:00, so, about 2:30-ish, 2:45-ish, I was walking across the parking lot. I was catching little...little whiffs of burning rubber. Well, the fire was...you could clearly see the plume. I mean I saw it coming in from

[inaudible]. It was easily seen over the tops of the trees, coming into town.

So, I knew the fire was going. I watched the news and...and stuff. But, yeah, so there was already, at about 3:00 that afternoon, a wind shift in progress, or starting, because the University of Minnesota, Duluth campus, is west of here. So, if I'm smelling burnt rubber in little puffs as I'm walking across campus, yeah, there was a wind shift. That's what we deal with in springtime here, is this...this whole area is a wind tunnel. East wind is very common in...in April.

So, we over in Minnesota felt that, you know, what about us? You know, everything was concentrated over here like, oh, yeah. Here's the state line. Smoke plumes and all that stuff is...is going to adhere to state lines. Well, sorry, the air doesn't work that way. Neither does the wind. Neither does the rain. Water flows...it's going to flow where it's going to flow. The air's going to go where it's going to go. So I...I don't know.

The following day, there was a chemical smell in the air in Cloquet. So, we're talking, you know, 25, 30 miles away from the actual site. So, I'm...I'm sitting on my front porch, outside, and I'm feeling...getting this taste in my mouth, chemical taste. And my throat's sore and my lungs are starting to feel like balloons.

Well, it was safe to go outside, so I had to go to work that morning at the Miller Hill Mall, top of the hill in Duluth. Same thing, but it was worse.

So, I...what I would like to...to have you do, is also work with our local officials. The only mentioned of Carlton County, St. Louis County, and all the communities in any kind of emergency response plan, is the Douglas County emergency response. Minnesota didn't get garbage...or didn't get anything for information. Oh, shelter-in-place. What does that mean? I didn't know anything about that.

I lived through the benzene spill, too. Here's Carlton County Sheriff's Office, going door-to-door that day. And they're not in safety equipment. So, now we're talking first responders' safety and work...because they're also workers. They work for us. I worry about the refinery workers, too, and everybody else.

You know, this needs to get addressed. We need to be working with local authorities. Let's get a good emergency response plan that actually makes sense and is workable. Thank you.

MEMBER KULINOWSKI: Thank you.

[applause]

MEMBER KULINOWSKI: All right, we have a Sherry...begins with C. Sherry C. [inaudible]

MEMBER KULINOWSKI: Okay. And Carl...begins with a Z. I'm sorry. I can't read the handwriting.

CARL ZORAVICH[?]: My name is Carl Zoravich[?]. I thank you for this time to address the CSB Board. I have, in the past, worked in management for a refinery, and I have written safety manuals. I listened to the presentation that was made today and there are a number of holes that I saw, or at least, I think they're holes that I think this committee should be made aware of.

Number one, when we saw that simulated fire, I saw a lack of containment of the asphalt tank. We saw the fire spread throughout the whole refinery area. It might be a good idea to segment...I'm sure they had a perimeter wall to contain any spills that they had. But it might be a good idea to segment a hot tank from the others so that the fire can't spread throughout the refinery, and it would have been much easier to put out.

Let's see. Regarding shutdowns, god, they're a negative expense for management, and the pressure is on them. They want to keep that shutdown as short as possible. And...and I think Mark, in his presentation, had...had talked about looking at the frequency of shutdown. And maybe it should be a shorter period of time.

Another approach might be to simply have two towers that do the same thing—shut one down while the other is operating—so that you



don't have that long period of shutdown.

Now, it was brought to my attention that the whole refinery is shut down. But obviously, the cool-down time wasn't long enough because we had auto-ignition of these hot oils. If they were down below a...a dangerous temperature when they were exposed to oxygen, we would not have had an explosion.

Also, in the design that was presented to us, they didn't say anything about any redundant valves. Now, it's possible that they had a valve failure. But, why wasn't there a manual valve in line that was also shut off, if they know that there is corrosion possibility on this one valve? And if you looked at the design, the valve that he had in the picture, there would have been that hot sand, or that sediment, that was sitting there that would have allowed corrosion to take place. Maybe a new valve design where it didn't have the ledge on it that allowed the sand to come through, if you want to call it that, might have been a better design and might have had less corrosion.

Also, I...in my work, I traveled throughout Europe and...and I don't think we'll see it here, but in Europe, on the Board of Directors, they also have a...a union member. They have an independent member that's elected by labor. They have different

members from different aspects of the community. Let's say that we're in the zone here where we might be affected, both in St. Louis County, and over here in Douglas County, if we have a catastrophic explosion. Well, maybe we should have a representative from the counties on the board, and the city on the board, so that we can ensure that the safety concerns of the citizens of Superior are met.

MEMBER KULINOWSKI: Thank you very much.

CARL ZORAVICH[?]: Thank you.

[Applause]

MEMBER KULINOWSKI: So that's all we have on the list. At this time, I would invite anyone who did not sign up, but wishes to still make a comment to please come forward. State your name, any affiliation, or if you're a citizen, unaffiliated, and you'll have three minutes. Can you bring the microphone closer, please?

JULIUS SELINAS[?]: My name's Julius Selinas. I'm from Esko, Minnesota, and I am going to say things that other people have already said, but I think it's important.

The hydrogen fluoride is a known hazard. And there's reasonable, safer alternatives to that. I think if there's a future event that involves hydrogen fluoride, I think that would be considered negligence or gross negligence on the part of the industry. Of

course, that wouldn't make any difference to any of the...any of the victims involved.

With the size, the materials that are involved in the Husky operation, I think it's reasonable for Husky to be required to have their own 24/365 days a year fire department in operation. The Superior Fire Department probably did everything they could, as best they can. But had there been a fire department onsite, I'm sure it would have mitigated the situation.

I'd also like to know if the kill zone, and that was brought up this morning...the kill zone does exist. I think that should be made public so that people can make decisions on where they want to live or what the situation is.

If we can have Amber alerts, we can have evacuation alerts using the same technology. I didn't see anything similar to that going on, on the...on the day of the event. Schools, hospitals, nursing facilities need published, coordinated evacuation plans, along with the general public. And the lady who spoke just a little while ago from Carlton, she pointed that out, that there's...doesn't seem to be any coordination. A future event, again...and the gentleman, Mark, if...if...you were...mentioned the NTSB. I know you're not regulatory, but you can make recommendations for that. It would seem to me to be mandatory to have coordination

between communities. At least for an evacuation plan.

The public has a right to know what hazards are in their community. You know, we've learned to accept hazards of being attacked, blown up, and gassed on airplanes, and people still continue to fly. Children participate in active shooter drills in schools. I mean, that's what's going on today. We need to accept the hazards that are around us. We need to have that information made public to us, so that we can make good decisions and...and plan. Thank you.

MEMBER KULINOWSKI: Thank you.

[Applause]

MEMBER KULINOWSKI: Any other people wishing to make a comment?

[inaudible]

MEMBER KULINOWSKI: No, we're not taking questions, just comments.

[UNIDENTIFIED]: Is it possible for me to say a little bit.

MEMBER KULINOWSKI: You may.

[UNIDENTIFIED]: When we had the benzene spill, I was on that committee afterwards. And the after-effect of that spill, I was near the...the river and I still have problems. So, I have two air filters—one's a CFA or...I hope

I have it right. Anyway, I have two filters in my house, one in my bedroom, that I need [inaudible].

And there was that committee then with many agencies, federal, state. We have had nothing of that sort for the public on this. Maybe it's here. But we don't hear about it. It...it seems to me that the public has a...like I've heard, a right to know. And I also am curious about the PFAs...PFAS. I know it's being taken care of by a contractor with carbon. And it...and I...I used to be on the Citizens Action Committee for the AOC[?]. I helped fund...found it. And I worked on Hog Island and Creek. It should have been a Superfund site, and it wasn't because of the DNR in Wisconsin. But I also helped with remediation, or at least with the restoration. But it's still not clean.

And the PFAs are being cleaned up by carbon, and where does the carbon go after it's been cleaned up? I'm told that that's not enough, and that's still...at least, in the whole situation...that some of it still isn't...the smaller particles aren't taken care of. So, that was in the foam for the firefighting. Thank you.

MEMBER KULINOWSKI: Thank you. I'd like to invite my fellow Board Members now to make any final closing remarks. Member Ehrlich?

MEMBER EHRLICH: Thank you, Dr. Kulinowski. I've listened to

what all of you have had to say. And I've been in the chemical industry for nearly 60 years. And I've heard remarks like this before. And I think that what I can tell you is that I've made notes on a number of your issues. And in my commitment to outreach and advocacy, I can take some of these comments back to the local LEPCs that I deliver presentations to. I've delivered presentations to probably 14 LEPCs this year, some of which are very highly developed, some of which are in need of help.

But I would encourage, and I have encouraged both the groups that I've talked to in the LEPCs, and public audiences, to get involved with, either CAP committees that are put together through...Community Action Panels...through the organization, or the LEPCs. That's not to say that you haven't been, but I think there's an opportunity here to raise the flag further up the pole.

I want to say one more thing about the Fire Department, and I said this before the Chief got here. I don't know if he's still here or not. But they did an awesome job in keeping that fire contained once the tank had been ruptured. I came out and talked to them about that in August.

And there's always issues to be discussed and opportunities for improvement. But I personally thank you for your thoughts and your comments, and look forward to moving forward and having

some improvements here, as well as other parts of the country.

Thank you.

MEMBER KULINOWSKI: Thank you, Member Ehrlich. Member Engler?

MEMBER ENGLER: Thank you. Thank you for all the comments today. It is quite clear that many people in this community, in this area, are concerned about this incident. I frankly, not having ever been here before, knew what to expect. And I thought, when I saw the number of chairs out in the room...I didn't know how many would be filled, and I was a little worried. So, I want to thank everyone for coming today, during the day. I know that, because this was a daytime session, it was harder for employees who are working inside the refinery at the moment to be here, and I'm glad that the...there was representation of the workers and the local operating engineers was here. Sometimes it's best to bifurcate meetings so that we can get more worker engagement, because people are not...have the liberty of getting off daytime shifts so easily. Two...basically three points. Number one, as a scientifically-based Board, we have to follow the facts of the investigation as to where they go. And I look forward to further discussions with staff on our Board about the findings of the investigation, the direction of the investigation as we move forward, and in being transparent to the community here about

what we found and, of course, what our recommendations are.

And I would urge everyone here to sign up to be...to get information from the CSB, which you can do by going to CSB.gov, and that will help you stay in touch with what the CSB is up to far away in Washington, D.C. Our quarterly public meetings, for example, which are held in Washington, there is an opportunity to listen in by phone from outside of the...outside of, inside the beltway, so to speak, and to hear the discussion, and to actually make comments at the end of meetings. So, I urge you to do that.

So, the facts of the investigation have to dictate where it goes. But so do the circumstances. And it's kind of trying to sort out...that out, is where the conundrum can be. Because, while the incident clearly happened in one distinct refining unit, the fluid catalytic cracking unit, we also know that there is a history at other locations in the country of incidents involving hydrofluoric acid alkylation. In fact, between 1961 and 1972, according to the Oil Insurance Association, which was the industry insurer, there were 13 hydrofluoric acid alkylation unit losses. And the...and the same insurance pool, which was funded by the industry, found that they were increasing in magnitude. And, as early as the mid-1970s, Hydrocarbon Processing Magazine found that the switch from sulfuric acid alkylation, which admittedly has its



own risks, to...from sulfuric acid to hydrofluoric acid, was motivated by lower costs, and that factor alone. It doesn't appear that there was any safety evaluation done when choices were made about what technology to adopt.

In 1974, the Oil, Chemical, and Atomic Workers, which subsequently merged with the United Steelworkers, which represents many refinery workers in the United States, published a booklet, "Hydrogen Fluoride is a Dangerous Question Mark," and distributed it to thousands of their members across the country, warning of the health hazards of hydrogen fluoride. And since the mid-'70s, there have been a number of studies by public interest groups and other entities on the risks of hydrofluoric alkylation.

In 2013, the United Steelworkers, the Tony Mazzocchi Center, and the New Perspectives Consulting Group did a survey. They enlisted frontline workers at 23 of the 50 refineries using HF alkylation and involved 12,000 workers, to look at the question of how many violations of OSHA standards there had been at...at the hydrofluoric acid units within refineries. And three-quarters of the teams had one or more HF-related incident or near-miss during a three-year period prior to the publication of the study.

So, there's an issue...There's one issue that's clearly of national consequence in those areas where there is this technology used. And there's also the investigation here. And sorting out how they intersect, or don't intersect, is one of the challenges I face as a Board Member moving forward.

The CSB itself has had its own history on hydrofluoric acid issues, and you can go and look on our website, that in July 2009, at Citgo in Corpus Christi, in Texas, there was a fire and release. One worker was critically injured. 42,000 pounds of HF released. 4,000 pounds of HF escaped from the perimeter of the facility. We made recommendations, including commissioning an independent third-party audit of the two of the hydrofluoric units.

And you've also heard reference today to the investigation in Torrance at Exxon-Mobil. And that is an issue that involves continuing litigation with Exxon over the...over what information we can access.

I just want to say about this, is that this is not an easy question going forward, about how to best handle, given the context of litigation. Given the facts here in particular, that do not involve...that do not directly involve an incident that was technically caused by an HF release. Whatever the impact is on the community, if there had been on a release.

But I do think that the CSB has a major public responsibility here. In a period where government is being...government safeguards are being rolled back, and we can expect this winter that the Federal EPA—and I'm not speculating here; I'm just reporting on what the EPA, under the current administration, has said—will issue a new risk management rule rolling back the last administration's proposed risk management rule.

There are really very, very few federal agencies that have the opportunity in this climate of deregulation to say, "This is what needs to be done. This is what needs to be considered." And I feel very deeply, independent of this investigation...Again, I realize that this meeting is about this investigation.

But, I want to tell you that I feel strongly that there have been enough incidents over history, there's enough, I think, consensus among many, although I certainly think there will be disagreements among industry management on this, that hydrofluoric acid alkylation poses a potential severe risk to communities.

And the CSB needs to take very seriously some type of action steps to move this question forward. What they specifically will be, I don't know. I look forward to engaging in discussion with other Board Members. We're also hindered by some of the...the actual technological state of the industry and what we've found

out. For example, or perhaps most notably, there are experiments going on toward pilot...pilot plant operation of alternative HF technology refining. And what we will be able to learn as a small agency...it's not exactly like we're capable of setting up a...you know, a potential pilot plant or a commercial, viable operation ourselves. That's quite out of the question.

So, we're also dependent on the state of industry knowledge. But I do think we have to give a renewed look at that. And...and Investigator Wingard has led the effort to help the Board do that in the past couple of years. And thank you for that. We have to, I think, renew our commitment to really understanding what's happening within the industry, and knowing what the best possible approach is, in terms of specific technology that's capable of helping to produce high-octane gasoline. And I say that very clearly. Whatever your position is on climate change, I don't think anyone here has proposed getting rid of all refineries and shutting them all down. Whatever your position on use of fossil fuels...

I, personally, not speaking for the Board, would argue that we need oil refineries in any transition to a very different future. So, in that period, I want refineries to be as safe as possible. I want workers to be as safe as possible. And I want the communities

around those refineries to be as safe as possible.

So, I look forward to having that discussion with my fellow Board Members, which, I think, is a difficult one, which is one which, I think, should be informed by this meeting, and about your expectations of what public service, and the role of government, should be all about.

And, lastly, a couple of thoughts about observing the meeting today. I think it's really important for people to take a little bit of a step back here and understand all points of view. If I was a worker in the refinery here—and maybe I'm being presumptuous to even use that term...that kind of expression, because I've never been a frontline refinery worker, even though I've worked with hundreds, if not thousands of refinery workers and union leaders and managers in...in the past—I would be very worried about the commercial viability of this facility. And I would be thinking, hmmm, I'm not that far off from retirement. Job situation in this area, perhaps, is not the best. There's a lot of job insecurity. There's not a lot of alternative work. If I got a job, maybe it would only pay half as much, and what about health benefits?

And I say that not, again, in my capacity, or in any way speaking for the CSB, whose sole duty is to focus on the safety elements and not on, say, balancing these types of concerns. But I

say it for very practical reasons that I hope that the Husky management, which I wish could have been here today to...to offer their commentary, will, with open ears, hear the concerns of the community.

I hope the folks from the community who are out in good numbers today, speaking of their concerns, will listen to the voices of those who work at the refinery, whose jobs and futures are on the line. I hope that the emergency responders and folks on the LEPC will ask, "While we may have done a really good job on the emergency response in part, what more can we do?" And what's the role of the LEPC in primary prevention? Because you wouldn't have to worry about drastic emergency responses, and how many miles to evacuate, if you could minimize risk in the first place.

So, I urge people to talk to each other. I urge consideration, echoing somewhat similar remarks to what Member Ehrlich said, about working through the LEPC. That may or may not be appropriate.

There's also creative ways that different constituencies and stakeholders have worked with each other—direct meetings involving management, the union, the community, the emergency responders, and public officials. There are different ways of exploring those possibly shared concerns in different settings. If I can be of any assistance in just talking to people about

past experience, or what else has happened around the country, to try to move forward with collaborative approaches to chemical safety, I would be happy to do that.

So, I just heard a little bell go off. I don't know if it was coincidence...

MEMBER KULINOWSKI: I thought I silenced all my devices.

MEMBER ENGLER: The bell was well-deserved at the end of a...at the end of the day anyway. So, I just want to close by saying, thank you very much for coming. I've heard your concerns. And you have very much...When I...when I go to these meetings...I only have to tell you that when I go to meetings where I talk to loved ones whose...you know, of the...of the victims who have passed away in these incidents, that lasts...those impressions lasted a very long time. And propel the work that I try, you know, to do with the Board.

But today's meeting was of tremendous importance as well. And I look forward to the discussion...to the difficult discussions—and I'm sure they'll be difficult—with Board Members about how we can move chemical safety forward, both in terms of this incident, and the broader issue of the safety of hydrofluoric acid used in refining. Thank you.

[Applause]

MEMBER KULINOWSKI: Thank you, Member Engler. I want to echo

some of the statements that each of my fellow Board Members has made, in terms of letting you know that we were listening. We have listened. We are listening. We heard you. I heard a lot of shock at not knowing this material was in your community, concern that you weren't informed, and that you didn't have information about how to respond to it. We hear these kinds of sentiments in communities around the country. And there are mechanisms in place to address that. They are not always fully effective. And so, we hear that.

I also want to echo the statements that the CSB is not a political organization. We don't...we're independent so that we can avoid being swayed by the political winds of the day, which is a nice place to be sometimes. It allows us to focus on the...the technical aspects of the investigations, the social factors. But really focused on what happened in the facility that...that we're investigating, and the surrounding community, without worrying about who's in office, or how it's going to be perceived from a political perspective. So, that's very important for us, that we maintain that neutrality and objectivity. It's one of our core values.

So, as we move forward in our investigation, we're going to continue to follow the facts and the findings of...of what we're



learning from the investigators, and use that to come back to you at some point in the future, hopefully not too long from now—sometime in the New Year, certainly, to share with you what we've learned. We'll do what the CSB does—investigate and provide answers to questions about what happened and why it happened.

So, with that, I want to thank you for your attendance at this public meeting. I thank the team for their dedication to this ongoing investigation. Mark Wingard is the...is the front face of a team that's working behind the scenes on this...continues to work on this case. I want to thank the staff for arranging this venue, and our AV folks for doing an excellent job with the...with the sound and video, which doesn't always work smoothly, and it did today. So, that's...that's nice.

I also want to thank my fellow Board Members for their contributions here today. All of us share a strong interest in preventing chemical accidents like this one in the future. And, most of all, thank you for your participation. We know that there was some challenges of...to getting people here at the time and place. And appreciate your willingness to come and share with us your concerns.

So, I thank all of you today for your attention. And, with that, I will adjourn the meeting.[Applause].