UNITED STATES OF AMERICA

CHEMICAL SAFETY AND HAZARD INVESTIGATION BOARD

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PUBLIC MEETING:
MOTIVA ENTERPRISES LLC INVESTIGATION

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Wednesday,
August 28, 2002

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The Board met in the Christiana Ballroom of the Wilmington/Christiana Hilton Hotel, 100 Continental Drive, Newark, Delaware, at 9:00 a.m., Carolyn Merritt, Chairman, presiding.

BOARD MEMBERS PRESENT:
Carolyn Merritt                      Chairman
Gerald V. Poje, Ph.D.                Member
Isadore (Irv) Rosenthal, Ph.D.       Member
Andrea Kidd Taylor, Dr., P.H.MSPH    Member
John Bresland                        Member
Charles Jeffress                     Chief Operating Officer
Christopher Warner                  General Counsel

INVESTIGATIVE TEAM MEMBERS PRESENT:
David Heller                        Lead Investigator
Michael Morris                      Investigator
Don Holmstrom                        Recommendations Specialist
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P-R-O-C-E-E-D-I-N-G-S

(9:00 a.m.)

CHAIRPERSON MERRITT: Thank you everyone for being here. The meeting will come to order. Welcome to this public meeting of this U.S. Chemical Safety and Hazard Investigation Board, the CSB. I'm Carolyn Merritt and I'm Chairman.

With me today are my fellow Board members, Dr. Andrea Taylor, Dr. Irv Rosenthal, Dr. Gerald Poje, Mr. John Bresland. Also with us this morning is the Agency's Chief Operating Officer, Charles Jeffress and its General Counsel, Christopher Warner and members of the staff.

This is my first public meeting with the CSB as Chairman and it's a privilege for me to be here. John Bresland and I were just confirmed by the U.S. Senate on August 1st. This also marks the Board's first meeting in the State of Delaware. Unfortunately it's a sad event that makes this meeting necessary. As all of you know, on July 17th last year, a serious explosion occurred at the Motiva Oil Refinery in Delaware City.

The explosion occurred as workers with welding and burning equipment were attempting to repair a catwalk above a 415,000 gallon storage tank
of spent sulfuric acid. The sulfuric acid contained hydrocarbon residues from the refining process. Flammable vapors in the tank ignited and the resulting explosion destroyed the tank and ultimately caused the release of over a million gallons of sulfuric acid. This accident has cast a long shadow. Jeffrey Davis, a boilermaker, who was working above the tank was killed in the explosion. He left behind a grieving widow and five children. Eight other workers were also injured. Today we'll not hear about the incident and about Motiva's -- today we will hear not only about the incident and about Motiva's safety practices, but we'll also learn about a point of significant confusion in federal safety regulations that's pertinent to this event.

The finding of an important regulatory hole sets our work apart from other agencies. The CSB was specifically established by Congress to study the overall system of chemical safety regulation and management. The regulations we consider today will, I hope, emphasize how important it is to properly implement and adhere to safety procedures in our manufacturing facilities. The cost of not implementing effective accident and release prevention programs is very high indeed.
A severe accident can cause unacceptable consequences, loss of life, impact on the environment, and heavy financial cost to the companies. Companies that are predictive, preventive and proactive can limit such losses. The Chemical Safety Board has the job of investigating after the fact to identify the causes of these losses. Predominantly we find that these accidents could have been avoided if management systems had been more effective.

There has been a tremendous level of interest in this accident nationally but especially within the State of Delaware. The Jeffrey Davis Above-Ground Storage Tank Act passed on June 20th is one measure of this heightened attention to the importance of safety issues. I commend Governor Minner, State Senator McBride, and the Delaware State Legislature for their leadership on this issue and I look forward to ongoing cooperation between the CSB and the state government in helping to make this law as effective as possible.

Present today at the hearing are Senator Joseph Biden, Congressman Michael Castle and Nicholas DiPasquale, Secretary of Natural Resources and Environmental Controls. Also present Brian Bushweller, State Director for Senator Thomas Carper.
The people of Delaware, I believe, are resolved that there be no repetition of the Motiva accident. Congressman Castle, Governor Minner, Secretary DiPasquale, we of the Chemical Safety Board share your strong resolve. These accidents are avoidable. We hope to count on your enthusiastic support in seeing that our recommendations through to swift action.

Whatever recommendations we do adopt this morning, we will carefully track to completion over the coming months. Industry associations, unions and regulatory agencies have an important role in reducing catastrophic accidents through their oversight and advocacy. The circumstances that caused the accident probably exist elsewhere as we are holding the hearing on these events today. Prudent companies and unions will learn from the Motiva events and take the findings of cause and carefully examine their own sites to see if they can prevent this from happening there.

If they find some lapses, they can take steps to correct the problem now and avoid similar catastrophes. They can save lives, prevent damage to the environment, and protect the financial well-being of their own companies.
Following opening remarks this morning, our format today will be first a presentation by the investigators of the central findings and conclusion on the cause of the Motiva accident. We'll then have an opportunity for Board questions. And then we'll proceed to the staff recommendations and we'll also be followed by Board questions. If time available we will then open the floor to entertain comments, but not questions, from the public and we would ask you to limit your comments to three minutes.

If the Board satisfied, we'll move then to vote and approve the overall report. If approval by the Board of the report, it will be available shortly following on our website which you can look up at www.chemsafety.gov. If you're a member of the public who wishes to offer a verbal comment, please register at the sign-in desk and your name will be called in due course but we reserve the limit -- we reserve the right to limit comments based on time.

With that, I'd recognize other Board members for any brief opening remarks. Dr. Poje?

DR. POJE: Yes, thank you, Carolyn. Thank you for that introduction to today's proceedings. But first I would like to publicly welcome you and John Bresland to the Chemical Safety Board. Prior to your
arrival, the CSB had been absent a chair for more than
two and a half years. This month also marks the
first time ever that a full five-member Board has met
in session. Both actions are major milestones in the
evolution of the Chemical Safety Board.

I'm excited about your entry into the
agency and thankful for the actions of President Bush
to nominate and the U.S. Senate to confirm you to
your positions. Modesty denies you the opportunity to
present yourselves, so let me.

Carolyn Merritt was most recently the
Senior Vice President for Environment, Health and
Safety at IMC Global, Incorporated in Northbrook,
Illinois. In 1994, she was a senior project manager
with RMT/Jones and News, Incorporated, a major
environmental consulting firm in Houston, Texas. From
1988 to 1994, she was with Champion International
Corporation, first as a manager of solid and hazardous
waste and then as a manager of environment, health and
safety.

Mr. John Bresland, a native of Northern
Ireland, you'll hear that in his comments, became a
U.S. citizen in 1983 and most recently he worked as
President of Environment and Safety Risk Assessment,
LLC, a New Jersey based process safety consulting
firm. He has been a consultant with the Center for Chemical Process Safety of the American Institute of Chemical Engineers, and for 34 years worked for Honeywell International formerly Allied Signal, as operations manager, plant manager and director of environmental risk management. We look forward to learning from your experiences and working with you to enhance chemical safety.

Turning to today's session, Motiva's spent sulfuric acid failure, while unique in the annals of the Delaware City Refinery, part of a larger legacy of major tragedies involving tank failures. On January 2nd, 1988, the Ashland Oil Facility outside Pittsburgh, Pennsylvania, failed catastrophically, spilling a tidal wave of millions of gallons of fuel oil over the dikes and into the Greater Ohio River drainage and threatening the water supplies for millions downstream.

On October 16th, 1995, the Pennzoil Refinery in Rouseville, Pennsylvania became engulfed in a major fire and explosion that killed five and caused serious injuries. Parallel to the Motiva incident were deficiencies in vessel design, integrity and maintenance programs, problems in the hot works activity and material containment problems. Assuring
the safe management of large storage tanks more important than ever in an era of heightened concerns about chemical safety and security. I'm hopeful that the lessons from this tragedy, if understood and applied, can prevent others. I look forward to the staff presentations and the input and discussions among Board members, recognizing a significant research and analysis of evidence by all involved in today's deliberations. Thank you.

CHAIRPERSON MERRITT: Thank you, Dr. Poje.

Dr. Taylor?

DR. TAYLOR: No other comments other than just to welcome you again, to the Board and to welcome everyone here.

CHAIRPERSON MERRITT: Thank you. Dr. Rosenthal?

DR. ROSENTHAL: Likewise, welcome aboard, Carolyn and John. Good to have you and looking forward to working with you.

CHAIRPERSON MERRITT: Mr. Bresland?

MR. BRESLAND: Madam Chair, like you, I'm also a new appointee to the Chemical Safety Board. I'm very honored to have been given this opportunity. This my first public meeting of the Board. I've been working in Washington for approximately three weeks,
so I'm not quite an expert yet. I look forward to working with you and the other Board members on this very important issue of improving chemical process safety.

CHAIRPERSON MERRITT: Thank you. At this time, I'd like to introduce Senator Joseph Biden. He is a Senator from Delaware. He was elected at age 29 in 1972 and re-elected every six years since then. He's a graduate of the University of Delaware and Syracuse University Law School. He has a long-standing interest in environmental issues. Last month as Chairman of the Judiciary Committee, Subcommittee on Crime and Drugs, he held a hearing on whether the Federal Government has the necessary tools to enforce our environmental laws.

Senator Biden, we appreciate your appearance with us today and look forward to your statements.

SENATOR BIDEN: Madam Chairman, thank you and it was a pleasure to be able to vote for you --

CHAIRPERSON MERRITT: Thank you.

SENATOR BIDEN: -- to become the Chair of this Board which as reflected in the statements of some of your colleagues, -- has always been important but increasingly focused on by the public at large.
This whole notion of corporate responsibility that we have seen brought in the sharp relief a consequence of very, very innovative accounting practices and some outright fraud, has had an impact, I think, in ways that are good and bad, but good in the sense there's a heightened awareness, I think, on the part of the vast majority of corporate managers as to what their overall responsibility are decent honorable people who are trying to do the right thing by and large and quite frankly, I have a feeling that your Board going to be busier than not. And I would suggest as a very brief prelude to my statement, Nick DiPasquale who has been in charge in the State of Delaware here, has been -- and by the way incredibly helpful to me and I'm sure to Congressman Castle and to Senator Carper as well as the state legislators, in investigating another incident unrelated to your jurisdiction.

I was on site at a large chemical complex, a series of complexes and Mr. DiPasquale pointed out that one of the problems that we all face as a nation here the infrastructure of many of these operations are very old and very under-maintained. And we see in the absence of a Superfund fund being in existence, we see in sharp relief, not only the financial consequences of that but the health consequences and I
remember -- I don't want to get him in trouble but I remember Nick saying to me that there's a lot more than meets the eye out there and a lot of managers of chemical as well as other industrial complexes find themselves with all the mergers that have occurred, inheriting and owning facilities that are not quite up to snuff as what they thought they were with significant capital cost to bring them up to speed, up to the safety standards that are necessary. So I say that as a prelude to suggesting that I think, to state the obvious, your work extremely important. I believe it's going to become more and more critical. I believe your work load going to increase, not diminish and the combination of what -- and I want to make it clear, I am not going to comment today on culpability.

I must say, as a citizen, not as a chemist or safety expert, reading your report and other reports from the state, there seems to be -- it would be easy to draw conclusions that may not be warranted without my fully being aware of the quote "other arguments", but it's not my function here to do that. My function, as I see it, to determine whether or not there anything in a positive sense that the United States Government, the United States Senate,
the United States House of Representatives, the
President can do that will enhance your ability to
keep us safer and draw clearer brighter lines so
there's less -- reasonable lines so there's less
confusion, if there confusion, within the industry
about what their responsibilities are, because as you
have noted already, and we are fully aware, Mary and
her children, four of her children are in the back
here, the by-product, the terrible human tragedy that
occurs as a consequence of whomever responsible for
what happened, the loss of a father, the loss of a
husband, the loss of a decent honorable man and a
family left to deal with that in the aftermath.

Many of us, in our personal experiences,
know what that like under different circumstances and
when the Board disbands, when this over, when
everything gone, Mary still has five children and
there still a serious, serious, serious hole in their
lives, emotionally, physically and financially. And
so, I know how seriously you take your charge and I
just want to make it clear that there are those of us
and I don't speak for any other senator or
congressman, but I think you'll find that we're all in
very strong support of your vigorous oversight here
and us needing to be told what you need, what you need
if we don't.

    Mr. Jeffress an experienced hand. He
knows his way around and he knows sometimes that
administratively it takes a lot longer to get
something done than it may be if it gets nudged
legislatively and so that's -- I'm not here to tell
you what to do. I'm here in part to tell you what I
think I should be doing to be positive and I know it's
not appropriate necessarily for you to comment on that
now, but I would welcome, you know, constructive input
as to whether or not you think what I'm suggesting
makes sense or doesn't make sense.

    I have the -- I have the good fortune of
having had the number 2 person at EPA, Carol Browner
and then the acting director of EPA as a former
staffer and an advisor to me know, Mr. McCabe, Michael
McCabe. I've tried my best to take this as seriously
as possible but we would encourage your input if you
have any recommendations for what we shouldn't do.
There's an old bad joke, you know. I'm here from the
Federal Government, I'm here to help you, you know,
what I mean. We don't always help even though we
intend to help.

    Now, let me very briefly again, express my
deepest sympathies to Mary and to her children and I
know that none of what's going to happen here going to make things right. I understand that. We all understand that and I wish there was something that would happen. The only thing I can tell you from experience, in time, in time the loss never -- the pain goes away, the pain goes away.

Now, I'd also like to express my concern for the continued health problems suffered by eight workers injured in the tank explosion as well as my admiration, quite frankly, as you have observed for the heroism they showed in risking their lives during this incident. We showed it's not just fire persons and policemen and others who engage in heroic acts. It's ordinary people taking care of their mates, trying to figure out how to do the right thing, and they were heroic.

I also want to thank all of you members of the Board for coming here this morning and convening the entire panel here. It's important to us and we appreciate it. We understand that it's substantively important but the gesture equally as important to us.

Now, I've read the report, Madam Chair, and quite frankly, I was deeply troubled by the Board's finding. I was particularly disturbed with the report's conclusion that Motiva's own engineers
repeatedly recommended internal inspection of Tank 393 as far back as 1996. In 1999, 2000 and 2001 these engineers recommended an internal inspection be done, quote, "as soon as possible", according to your report. What's worse, just three weeks before the tank exploded a Motiva operator submitted quote, "an unsafe condition", end of quote, report to his bosses, yet no repairs were made, none, none.

In spite of these reports, Motiva did nothing even though Tank 393 was emptied three times prior to the explosion, the last time just three months before Jeffrey Davis was killed and his colleagues were injured. Most of the recommendations being made by the Board relate to things Motiva itself can do to prevent future tragedies. I call on Motiva's management to fully completely implement those recommendations as soon as possible. As far as I'm concerned, these recommendations, these policies, procedures and practices are so basic that they should have been in place long before 2001 and I say that not as an expert but just has hopefully a mildly informed citizen reading a report and understanding a little bit of the background.

We've heard a lot lately about corporate responsibility as it relates to accounting practices.
But management responsibility and corporate responsibility goes much further than just to the bottom line in the corporation and whether or not investors are being told the truth which obviously critically important. It also extends to insuring that employees and the public are free from the threat of physical harm on the job or in the neighborhood and we should expect nothing less.

Since July 17th, 2001 I've received through my staff, regular updates from both OSHA and from EPA. And I want to thank them both publicly for their responsiveness and their availability, to their ongoing investigations into the explosion which occurred in Tank 393. Although OSHA and EPA have brought to my attention many issues surrounding the events of that day, it the Chemical Safety Board's work which really brings all of this together. In light of the Board's report, I've instructed my staff to do two things; first, to determine whether or not OSHA safety standards can be expanded to include not only sulfuric acid, the substance at issue here in this incident, but any other chemical compounds that can result in similar catastrophic events.

Mr. Jeffress knows better than anyone that it was an administrative ruling and quite frankly, I,
as years ago when I used to be on the committee
overseeing the EPA and OSHA, I thought, quite frankly,
this chemical was covered. I was unaware, to be
honest with you, that it was not covered and it was an
administrative ruling judge made a judgement that it
was not covered.

Well, rather than just go back and deal
with your recommendation of making sure it's covered
and that can be done administratively but as Charles
will tell you, it could take a couple of years that
route, we want -- I personally, and I don't know about
Congressman Castle, but I'd like to see this moved
more rapidly. But in the process, I'd also like to
seek the expertise of the committee in question to
determine whether or not there are other substances.
I am not an engineer, I am not a chemist, but are
there other substances that reasonably should be
covered, that OSHA has the ability to inspect for and
regarding. And so my staff has that effort underway
with the appropriate committee staff and experts in
the Senate and I will personally, with your
permission, we have a letter draft for you asking for
any additional recommendation you may have of what we
should and should not do relative to additional
chemicals if there are any. I'm not looking to over-
regulate anything, but I'm looking to make sure that there a rational basis for what OSHA can look at and to.

Let me explain briefly. As I read the current regulations, the compound involved in this incident, sulfuric acid, not on OSHA's list of covered chemicals. OSHA defines a catastrophic release as, "A major uncontrolled emission, fire or explosion, involving one or more highly hazardous chemicals that presents a danger to employees in the workplace", end of quote. I think the Motiva explosion qualifies as a catastrophic release and yet, let me repeat, the compound involved in this incident not on OSHA's list to be covered by -- list of covered chemicals.

And we need to, I think, make sure it and explore whether there's anything else being left out that should be included in my view. Secondly, I've instructed my staff to look at how the Federal Government can help, if it can help, if it's beneficial, and I personally think it may be, to states implementing regulatory control over above-ground storage tanks, similar to what Delaware has just done this past June. If this means that the best way to prevent these disasters in the future through
national legislation, making sure that there a uniform code, if you will, nationwide, then I will introduce it. Among other things, Delaware's Jeffrey Davis Above-Ground Storage Tank Act requires the registration, inspection and monitoring of storage tanks with a capacity of more than 12,499 gallons. Currently the EPA only regulates above-ground tanks that contain oil. And less than half the states have any regulations similar to the one that exists in Delaware.

I know my business Delaware, but my business and our business also the national safety, the safety of all Americans, and the question that I'm asking for the appropriate committee to investigate whether or not there should be a national standard relative to above-ground storage tanks like Delaware has, as you so accurately pointed out, Madam Chair, expeditiously adopted. The Board's report says the Motiva put off inspecting Tank 393 in order to comply with EPA's order to inspect 18 oil tanks on the property, this despite the fact that Tank 393 apparently had serious defects that needed to be addressed, including the holes on top of the tanks and things that were obvious to even a layman's eye had they been in a position to walk around and on top of
that tank.

We need to prevent situations where corporate managers put off inspections and repairs of tanks not subject to regulation even though they present a serious risk in order to comply with existing laws that cover only some tanks. That to me not an excuse to say the law required me to look at these tanks and that was a regulation; it didn't require me to look at these tanks in the same way, so I put off looking at these tanks.

I don't find that as a rational excuse. Let me conclude by saying corporate responsibility does not end with the filing of financial disclosure. Corporations have a responsibility to repeat myself, to keep their workers and the public safe. And I want to thank the Board again for being here today, for doing such a thorough job, for allowing us to speak and I hope that -- and I can't believe they won't -- that Motiva does the right thing and fully implements that Board's recommendation.

The fact of the matter that I think that we are going to find ourselves, as a consequence of an aging infrastructure, as a consequence of increasingly difficult problems relating to the confusion that exists as a consequence of vast mergers, as a
consequence of the international holdings that exist in many of the chemical and oil industry and companies, I think we're going to find managers very strapped because they're going to have fewer resources, greater infrastructure costs relating to repairs and maintenance of existing facilities, I think your work going to be -- your workload going to increase and I will say one thing to Mary and her children. There never any, any, anything that can rationally explain the loss of your dad and your husband, but the one legacy he may leave, this comes at a moment when the entire country beginning to wake up to the need to increase safety relating to everything from toxic waste sites to hazardous circumstances that need inspection within an industry that increasingly in a position of facing stiff competition with less resources and maybe, maybe, maybe this will be a catalyst for us to begin to change including the industry on its own, to change the intensity of their notion of what's required to maintain existing facilities as they are involved in significant international competition.

But, again, I thank you for your work. I thank you for being here and I truly appreciate the opportunity of being able to address you. Thank you.
CHAIRPERSON MERRITT: Thank you very much for your comments and we look forward to working with your staff on these very important issues. And also, I wasn't able to be introduced to Mary Davis before we started. I'd like to thank you for being here and offer our condolences to your family and to yourself on the loss of your husband and father from the Board.

At this time I'd like to introduce Congressman Castle. Congressman Castle has a distinguished career in public service. He has been a congressman from Delaware for the past 10 years. Prior to that, he was member of the Delaware House and Senate and in 1980 he was elected Lieutenant Governor and in 1984 Governor. He was re-elected in 1988. As Governor, he developed an environmental legacy program to address environmental issues in the 1980's.

Congressman Castle, thank you for coming this morning and I know that you have a continuing interest in the incidents that we are considering today. Please proceed with your statement.

CONGRESSMAN CASTLE: Thank you, Madam Chairwoman. I'd like to thank the Chemical Safety Board for being here and for all your interest in this matter.

The explosion of Tank 393 at Motiva on
July 17th claimed the life of one man, Jeffrey Davis and I, too, extend my great sympathy to the family of Jeffrey Davis, seriously injured eight others and created an unimaginable environmental degradation of a Delaware city area. But fortunately, this facility has had a history of serious safety and environmental infractions and only tough measures will produce good results.

This was a preventable accident which occurred in large part because of lax corporate safety standards. Motiva was not adequately setting or enforcing maintenance and safety rules at its facility before this accident occurred. Since then, Motiva has been trying to deflect the blame. But when it comes to the bottom line, these excuses do not hold water. A man died and others were injured because of poor corporate performance and critical safety issues.

After the tragic accident last year, the U.S. Chemical Safety and Hazards Investigation Board, a federal agency for which I strongly support an increase in funding and its involvement in this case, was called in to investigate the causes and make recommendations for change. The Board does not have regulatory authority, only the power to investigate and power to recommend. CSB's findings are a strong
indictment of Motiva's overall management of this facility's chemical maintenance and safety. I would like to comment briefly on some of these findings to make the case that Motiva should have done more to prevent the accident and must do much more to prevent future accidents.

I have read the CSB's report and the response prepared by Motiva. In summary, Motiva's assertions that it adhering to general industry guidelines on tank safety and maintenance are unconvincing. The accident did not happen just because a particular contract welding crew did not follow basic safety procedures as Motiva would have us believe. It was an accident waiting to happen because the tank facility was not being adequately maintained and the larger safety and maintenance plan inadequate.

While Motiva's response focuses on some of the safety steps that must be taken by its contract crews working around the tanks. I think Motiva continues to miss the overall point that the CSB makes and that Motiva's overall safety and maintenance plan and execution for this facility inadequate. It clear that Motiva has a history of non-compliance with federal environmental laws and regulations at its
refinery. The overall condition of the facility makes spills and accidents more possible and more of a danger.

Let me give you some examples. First, Motiva should have done more to detect problems with the tanks. As you will learn, after the tanks leaked and were reportedly repaired, Motiva had three opportunities to conduct an internal inspection of these tanks, which they did not do. In fact, the inspection of Tank 393 was put off until January 2002, six months after the accident which claimed the life of Jeffrey Davis and injured eight others.

Second, Motiva should have sought outside expert help to improve the safety of the tanks. Motiva missed an opportunity to bring in experts to help design the safety systems for the tank when it was converted to a tank that would hold a more flammable substance, spent sulfuric acid. These experts could have designed tank systems that would have not leaked flammable vapors.

Third, Motiva should have done more to warn the welding crew about the potential danger of the work on the tank. An opportunity to warn Jeffrey Davis and the welding crew in the work -- in the work permit about the presence of highly flammable vapors
in the area was missed, despite the fact the two
previous work permits were rejected by other welders
in the week before the accident due to concerns about
welding near flammable gas.

Finally, Motiva apparently ignored
warnings it had about the tank from other workers. An
opportunity was missed when an employee wrote, an
"Unsafe Conditions Report", about the tank when he
refused to weld near it. Yet, his report did not lead
to safety improvements for the tank.

As I said, earlier, the industrial area
near Delaware City has been the victim of various
environmental tragedies. In fact, something very
similar occurred when I was governor in terms of
chemical leaks at Formosa Plastics. As a result we
shut them down in October of 1985 and one year later
they came back and now are achieving lower emission
levels than both state and federal level requirements
and have proven themselves a good corporate citizen.

This a clear example of how tough
regulations produce acceptable results. We will soon
hear about the recommendations form the Chemical
Safety Board about what needs to be done. But I would
like to share some of my own remedies with you. For
all the reasons I cited above, I believe that changes
do need to be made at Motiva. First, there must be a
corporate commitment to working through the
existing problems and preventing future ones. Motiva
must stop hiding behind its corporate veil and take
responsibility for safety measures.

Motiva, one of the largest refiners and
distributors of oil and gasoline in the country. It
owned by two of the largest oil companies in the
world, Shell Oil and Aramco. There are not excuses.
Aramco and Shell are big corporations which absolutely
have top notch safety precautions in place.

Two, Motiva and their parent companies
must admit to and correct their existing problems and
work together with the community to correct and flaws.
DNREC and the EPA cannot be full time police
officers. Motiva, Aramco and Shell must take more
responsibility and improve Motiva's performance.

Three, EPA should pursue its civil
litigation on Motiva's violation of federal pollution
laws to a logical end, which may result in restitution
and fines but also hopefully will result in
determining a future course of action to prevent this
from happening again. Motiva should cooperate with
DNREC at all times to fully disclose what happening
at Motiva to make Motiva a good corporate neighbor to
the people of Delaware. This means keeping the community and local, state and federal leaders apprised of what going on with the plan in terms of inspections, tank repairs, et cetera.

And fifth and finally, if Motiva unable or unwilling to remedy their problems, DNREC and the EPA must take whatever steps are necessary to obtain all safety and environmental compliance. As I lay out my thoughts, I want all of you to know that it not my intention to judge the activities of Motiva harshly or unfairly, but through my reading and my history with the state and involvement with this facility, I believe they are warranted.

The remedies I have proposed will hopefully help Motiva resolve its problems and that exactly what my comments aim to do, help Motiva become a better corporate citizen and employer in our state. The future up to Motive and they hold it solely in their hands. Finally, I'd like to thank the Chemical Safety Board for coming to Delaware today to share their recommendations and findings with all of us. The Delaware community greatly appreciates your effort to insure worker safety and the safety of our environment and the public at large.

CHAIRPERSON MERRITT: Thank you,
Congressman Castle, for your comments and your support. At this time, I'd like to introduce Nicholas DiPasquale, Secretary of Delaware's Department of Natural Resources and Environmental Control. Mr. DiPasquale Secretary of the Delaware Department of Natural Resources and Environmental Control and he has served as Secretary since April of 1999.

He was appointed by former Governor Thomas Carper and reappointed by the current Governor Ruth Ann Minner. He has served for the past 15 years in management positions with responsibility for the administration of federally delegated environmental programs dealing with the regulation of air, water, pollution, waste management and hazardous substance cleanup both in Delaware and in Missouri. Secretary DiPasquale, we welcome you and look forward to your comments.

SECRETARY DiPASQUALE: Thank you, Madam Chair and I appreciate the opportunity to provide comments on the Chemical Safety Board report. I'll try not to be duplicative and there a few points that I want to try to elaborate on hopefully to the benefit of the Board.

And you've pointed out, I've been serving as Secretary since April of 1999 and I have served in
senior management positions in environmental agencies for the last 15 years with responsibility for most of the major environmental programs.

In my remarks this morning, I'd like to summarize the actions that the state has taken in response to the July 17th, 2001 incident at Motiva and provide some general context for those remarks with respect to corporate responsibility as well as the limitations on our environmental laws, which I think might need to be addressed.

With respect to the state response to the tank incident the governor demanded that Motiva agree to undertake a third party audit of its mechanical integrity programs at the refinery and to implement recommendations for improvement, findings consistent with your own. DNREC also has filed a civil complaint in Federal Court against the refinery for environmental impacts resulting from the tank collapse including air quality and hazardous waste violations. EPA likewise, filed a federal action for Clean Water Act violations and we have moved that those two suits be joined in Federal Court.

The General Assembly passed as several speakers have mentioned, passed Governor Minner's legislative initiative regulating above-ground storage
tanks containing hazardous compounds and petroleum products. I'd like to elaborate on these items further in my testimony.

As you probably know, the Delaware Department of Natural Resources and Environmental Control has a long history of regulatory oversight of the Motiva Delaware City Refinery. That oversight ranges from permitting, air emissions and waste water discharges, to regulating the transfer storage and disposal of solid and hazardous wastes. We also regulate the management of extremely hazardous substances at the facility, a program that's consistent with the risk management program under the Federal Clean Air Act.

The refinery holds more operating permits from our agency than any other industrial facility in the state. The facility has also consistently violated many of our environmental laws and regulations over many, many years since it originally started operation. Having said that, the findings of the Chemical Safety Board are consistent with and reinforce the observations of the Department of Natural Resources and Environmental Control with respect to the mechanical integrity issues at the refinery.
We recently reviewed the nature of those violations and we've estimated that approximately 70 percent of the environmental violations at the refinery during the past six to seven years were directly attributable to the lack of an effective maintenance and repair program for industrial process equipment. I'd like to point out and I will later in my testimony that the environmental laws are not structured to regulate those industrial process equipment. Typically, we pick up violations at the end of a discharge pipe or at the end of a smoke stack.

As Senator Biden pointed out, the financial scandals of recent months have raised questions about corporate integrity and responsibility regarding accounting and reporting practices. I think similar questions can be raised about the corporate responsibility for environmental compliance as well. In the first instance, such practices put shareholders' financial health at risk in the latter, the public's physical health. Fortunately this behavior involves only a small fraction of the corporate community. Unfortunately, I would include Motiva's Delaware City Refinery in that group.

There a myth that compliance among large
corporations inherently better than that of small or medium sized corporations that lack adequate resources, expertise or the will to comply with the country's complex environmental requirements. It's been my experience in administering these programs for over a decade and a half that large corporations with more than sufficient resources and expertise routinely are found to be in violation with our environmental laws. Sometimes this results from economic dynamics within a particular industry sector, sometimes due to a lack of attention and responsiveness from a huge corporate bureaucracy and for a variety of other reasons.

We've found that corporate mergers and acquisitions can create incentives to delay maintenance and repairs and other needed capital investments. Clearly this the case in the petroleum refining industry today in general and with this facility in particular. In response to concerns about maintenance, repairs and mechanical integrity of the Delaware City Refinery, Governor Ruth Ann Minner took the unprecedented step of demanding that Motiva pay for a third party operations and maintenance expert with substantial hands on experience in refining to review Motiva's mechanical integrity programs,
contractors being for by the company and working under the direction of the Department of Natural Resources. I'd also like to point out that the Governor made it clear and I was in a meeting with corporate officials, that those demands had to be satisfied in exchange for allowing that company to continue to operate in the State of Delaware.

If they don't abide by those provisions, I think it's her intent to shut this facility down as difficult as that may be not only for the economy and for continued provision of gasoline and other fuels but also for the workers that work at the plant and the contractors that work there. But her resolve unmistakable. She has made it very clear to them that if they don't begin complying with the environmental laws of this state, they will not be allowed to operate.

The goal of the evaluation to insure public health and safety and protect the environment by determining if the refinery has minimized risks of operation by appropriately taking into consideration the applicable industry standards and good engineering practices for maintenance, equipment repair, inspection, testing and replacement.

In summary, the scope of work being
performed includes evaluating the refinery's programs
to insure mechanical integrity of all process
operations including all equipment, storage tanks,
pressure vessels, and piping, evaluating the
refinery's organizational structure, including
management systems that are used to make decisions
concerning inspection, testing, monitoring,
maintenance, repair and replacement of equipment,
evaluating the refinery's capital expenditure plans
for maintenance, inspection, equipment repair,
equipment replacement and turnarounds. And this
really unprecedented. Getting behind the decision
making processes of the corporation, we believe
absolutely essential.

We intend, certainly to hold that
information confidential because it such, it's
protected under state and federal law but we want the
company to show us, to demonstrate to us that they're
making the capital investments that need to be made in
order to operate that refinery safely.

Recommendations that result from the
review for improvements, the refinery's mechanical
integrity programs will be part of a legally binding
agreement between the state and the refinery and will
include stipulated penalties that will be imposed
should the refinery fail to implement the recommendations on schedule.

With a few important exceptions, the nation's environmental laws do not reach into industrial processes. They set standards for air emissions and water discharges at the end of the pipe or the top of the smoke stack. Two very notable exceptions are the Resource Conservation and Recovery Act whose provisions are considered preventative in nature, doing things to keep accidents or keeping releases from occurring, as well as the risk management program under Section 112(r) of the Federal Clean Air Act Amendments of 1990 which requires risk management planning, hazards assessment, emergency response planning and prevention programs for extremely hazardous substances.

The scope of these laws, however, relatively limited. RCRA only applies to hazardous wastes. So tanks and containers holding chemical products or intermediates are not covered. In the later instance, extremely hazardous substances are only a small subset of chemicals in use, albeit the ones that represent the greatest potential risk of catastrophic accidents, the origins of the law are the result of the Bhopal incident, as you well know, which
led to the creation of this Board.

But by and large the other laws do not impose requirements or standards for inspection, maintenance or repair of industrial process equipment and I think that's an important point. We need to get into the operations of these facilities. Their jurisdiction limited to requirements for the use of pollution control equipment. A release or exceedence has to occur before the enforcement action can be taken.

The explosion and sudden tank collapse at the refinery that resulted in the release of spent and fresh sulfuric acid illustrates gaps in both federal and state regulatory programs. The company admitted the tank had a history of corrosion problems. Work orders for repairs had been submitted but the work had not been initiated. The tank collapse and release killed one worker and injured eight others, caused widespread contamination at the facility, released over a million gallons of sulfuric acid contaminated with hydrocarbons to the land and water and resulted in the fish kill and other environmental damage.

The spent acid not considered a hazardous waste because it's reclaimed and reused as part of the process. Nor it considered an extremely hazardous
substance. This a glaring hole in the regulatory programs that needs to be addressed. There no federal above-ground storage tank law and only about half the states have some kind of above-ground storage tank requirements. In some cases, those requirements only apply to oil tanks, some include chemical tanks as well.

I think Delaware has one of the most comprehensive programs in place and the regulatory requirements will flow from that. It's a fairly comprehensive program. We even regulate tanks between 250 gallons and 12,500 gallons. We require them to at least register, tell us what's in the -- what's contained in those tanks, what they're made of, whether or not they're compatible with the structural material of the tank, with the assumption that if we find that there are certain classes of tanks within that category that need to be regulated, we'll be able to come back to the general assembly and subject them to further regulation.

Tanks above 12,500 gallons then are subject to nearly full regulation under the program with few minor exceptions. In response to the Motiva collapse, along with other releases from above-ground tanks, Governor Minner proposed and the General
Assembly subsequently passed an above-ground storage tank law that will require companies to meet specific industry standards for construction, inspection, maintenance, repair and replacement of tanks containing hazardous substances. Recommendation in your report suggests that process safety management requirements be part of that program and we certainly intend to pursue that.

The legislation applies to tanks of certain minimum size containing circular regulating compounds so it's not just waste, it's a full panoply of chemicals that are in use currently in industry. Smaller tanks that are not subject to regulation must be registered with the Department so we can create a statewide inventory of those tanks. The legislation also requires tanks to be labeled so that emergency responders will be better informed as to the contents of tanks. DNREC will be able to conduct unannounced inspections of tanks and tank owners will be required to maintain inspection of tanks and tank owners will be required to make those records available to the Department.

Our agency currently working with an advisory group to craft the regulatory framework that we expect -- and we expect it completed in sooner than
the two years that specified in the law. Because it's a number of different industries that are involved, and because the standards differ from one industry to the next, we need to make sure we do a comprehensive and thorough job of memorializing those requirements in regulation.

There are a number of federal and state laws that were violated due to the releases at Motiva and their impacts. As a result, the Department and EPA filed complaints in Federal Court in July. EPA's complaint alleges violations of the Clean Water Act and Delaware's complaint alleges violations stemming from unpermitted air discharges and operating hazardous waste facilities without permits. The state complaint also seeks to recover investigative and response costs incurred by the Department and to have the Court's mandate that Motiva develop and implement an environmental management to assist them in achieving compliance with the environmental requirements. We have pursued that in a number of enforcement cases and we found that having those systems in place, if companies choose to use them, helps them gain compliance.

In closing, I'd like to compliment the Board on its report and findings. The report direct
and the findings and recommendations are consistent with our own review and experiences at this facility.

To quote from a recent newspaper editorial, "Motiva has become a scourge on the state". I agree wholeheartedly with that comment. Even today as we speak, as a result of an enforcement action that was taken against them by EPA and the state in March of 2001, which imposed a $4 million penalty and $116 million of environmental improvements, the company backsliding on its commitment to that legal enforceable document. This demonstrates an ongoing behavior even in light of the incidents that have occurred that show its recalcitrance in complying with environmental laws.

If they continue this course, they will be shut down by this governor. I'm convinced of that. I appreciate the opportunity to speak with you this morning. I certainly want to work with the Board and the Department staff will certainly be available to have further discussions with you and I thank you for allowing me to speak today.

CHAIRPERSON MERRITT: Thank you. At this time, I'd like to thank Senator Biden and Congressman Castle and Secretary DiPasquale for their comments. I know you have other responsibilities and we appreciate
very much your being here today and supporting this investigation and the recommendations.

At this time, I'd like to ask Charles Jeffress if he would proceed with the staff report.

MR. JEFFRESS: Thank you, Madam Chair.

The Chemical Safety Board following an incident such as happened here in July of 2001 dispatches a team of investigators to the site to begin our investigation. That team represented here today. The leader of the team, the investigator in charge David Heller and David will be the primary presenter today of the report.

Also on the team investigator who will participate in the presentation Mike Morris and with them also on the team Don Holmstrom, the recommendation specialist from the agency who will present the recommendations.

The team goes on site to do their investigation. They continue with the interviews, a review of evidence. They then continue with research on incidents of this type, equipment of this type, processes of this type, what appropriate rules and best practices there are governing operations of this type. They develop a draft report among the staff and then present that report to the Board. Today what
you're seeing the staff presenting that report to the
Board and it will be up to the Board to act on that.
But to make the presentation on behalf of the team,
David Heller, the lead investigator in charge.
Dave.

MR. HELLER: Thank you, Mr. Jeffress.

Madam Chair, Board members, Mr. Warner. This morning,
Mike Morris, Don Holmstrom and I will be presenting to
you the results of the CSB's investigation of the July
17th accident at Motiva Enterprises Delaware City
Refinery in Delaware City, Delaware. After an
introduction of some background, Mike will present a
summary of the incident. I'll then detail our key
findings and our determination of root and
contributing causes. We'll then take a short break.

We'll return. Don Holmstrom will present
the recommendations arising from our investigation.
There will be a number of opportunities for you to ask
questions of us as we proceed through the
presentation.

In addition to Mike and Don, the CSB team
who participated in the field phase of the
investigation and in the research and analytical work
included Kevin Mitchell, Steve Wallace, Giby Joseph,
Shannon Jones and Steve Selk. I'd also like to
acknowledge a number of organizations with which we
worked during the course of the investigation; Delaware Department of Natural Resources and Environmental Control, that's DNREC, Delaware Fire Marshall's Office, Occupational Safety and Health Administration, Environmental Protection Agency, the U.S. Coast Guard, and the U.S. Attorney's Office in Wilmington, Delaware.

On July 17th, Jeffrey Davis, a boilermaker with the Washington Group International or WGI, Motiva's primary maintenance contractor, was killed when Tank 393, a spent sulfuric acid storage tank failed as the result of an explosion. The shell of the tank separated from its floor, releasing its contents. The ensuing fire burned for close to one-half hour. Eight contract workers were also injured.

Three other acid storage tanks lost their contents due to leaks caused by the force of the initial blast and the ensuing fire. In total, the EPA estimates that 1.1 million gallons of acid were lost to the environment in the incident and its aftermath and Motiva has estimated that 99,000 gallons of acid were released into the Delaware River.

Now, the Delaware City Refinery located on the river. It can process 140,000 barrels per day
of crude oil. At the time of the incident, it had approximately 650 employees and about 300 contract employees. Motiva a joint venture. It's owned by Shell Oil Company and Saudi Refining Company and the Delaware City Refinery one of four Motiva Refineries.

We'd like to spend some time talking you through the situation or the acid tank farm. These are the tanks in this tank farm. There's six tanks that were built in I think it was the late '70s and the picture up on the board here, on the screen here, shows the three west tanks, 396, 391 and 392. The tanks are about 47 feet in diameter, 32 feet tall to give you an appreciation for the size. They're about 20 feet across from each other in the east/west direction and about five feet apart in the north/south direction.

This a view taken from the northwest looking towards where 393 would have been. This 393 on its side, 394 in the background and 396 in front. You can see some of the fire damage on 394 and 396. Again, there are six tanks in the sulfuric acid tank farm. They provided storage for both fresh and spent sulfuric acid for the refinery's alkylation process and the tanks had a capacity of 415,000 gallons each.

Concentrated sulfuric acid used as a
catalyst in a refinery's alkylation process. It's extremely corrosive. Now, the spent acid also contains several percent hydrocarbons, including a small amount of volatile flammable hydrocarbons such as isobutane. Now, these hydrocarbons can evaporate into the vapor space above the liquid inside the storage tanks.

Now, to have an explosion three conditions are required; fuel, oxygen and a source of ignition and these are the three sides of the fire triangle. Take one away and an explosion cannot occur. Now, these conditions came into alignment on July 17th, 2001. The tank normally contains sufficient fuel but the very nature of spent sulfuric acid, a condition not well understood by those working that day.

And inerting system was not doing its job and allowed air, which oxygen, to enter the tank. The purpose of an inerting system to reduce the concentration of flammable vapors and air in the vapor space of a vessel below the point at which a mixture can sustain combustion. And finally, hot work, burning and welding to cut metal which generated sparks, was being conducted around the tank with holes due to corrosion. And these holes provided a pathway for the sparks to meet the flammable atmosphere inside
Tank 393. And I'd now like to pass the speaker's platform over to Mike Morris, who will take us through the incident itself.

MR. MORRIS: Thank you, David. Madam Chair, Board members, Mr. Jeffress, Mr. Warner, the July 17th incident was preceded by a few important events, but before we get into that I would like to show you a couple slides to give you an idea of what was up and down on the catwalk. The slide up here looking south from a tank from above Tank 393, this area looking south toward Tank 395.

This the grating that we'll be talking about in the catwalk sections. You can see the stairs in the back. Those are going down Tank 395. This slide looking south from above Tank 396, from there, looking down to Tank 392. And again, you can see the catwalk sections and the grating sections. Work that was being done up there that day and the previous days was sections of this catwalk that were corroded were being cut out and replaced with new sections. How they did it was they would cut out a section and then they would immediately replace that section with a new section so they would not leave any holes.

A couple of -- again, the corroded catwalk above the acid storage tanks was what the assignment
was to replace those days. Those catwalk was corroded from the acidic environment that was present in the acid tank farm. Contract workers were assigned to replace these sections. Over the previous month, they had worked on this project four times. However, hot work was denied on at least two other occasions; once for high sulfur dioxide levels in the acid tank farm and then again on June 27th, when flammables were detected by an operator when he went out to do his checks before issuing the hot work permit.

That operator went onto write an unsafe condition report outlining the hazards that he believed existed in the acid tank farm. The time line for the July 17th event, the beginning of the shift, four workers were assigned the catwalk job. They went to the acid unit to try and obtain a hot work permit for that day. Around 7:50 a.m. acid unit management issues a hot work permit. Workers begin carbon arc gouging on the grating directly over Tank 396, in this area. Now, I'd like to explain what carbon arc gouging is. It's a method of cutting. It uses and electric arc generated between the tip of a carbon rod and the piece of work. It generates high heat and melts the metal and then a stream of high pressure air, streams down the carbon and blows away the metal
and it blows the sparks a good distance.

Work in the morning was on this section of grating in this area. They replaced -- they would cut out these sections and then replace them and then between 12:00 and 12:30, they broke for lunch. Now, at 12:30 they returned. The grating that they cut out in the morning, they stacked in this area right here. And when they returned from lunch, the workers lowered the grating down, the cut-out grating, and they stacked it along the north wall inside the dike.

Around 1:30 two workers resumed carbon arc gouging on the catwalk above Tank 393. What they were doing at this time, since they replaced this catwalk section in the morning, they were beginning work over here and their thinking was to work back towards Tank 396 for the afternoon work. Upon doing this, sparks either entered holes in the roof of Tank 393 or they contact fumes escaping from those holes and this triggers an explosion, a blast which ignites vapors, triggering an explosion and lifts Tank 393 off the ground, separates the shell from the tank floor and sends it 40 feet to the north landing across the dike wall and releasing the contents of its sulfuric spent acid.

Jeffrey Davis was killed in the collapse
of the tank. Eight other contract workers were
injured. The release of the entire contents of Tank
393 and 396, soon after the release hydrocarbons in
this acid ignited and burned for approximately 30
minutes. This release overwhelmed the containment
dike surrounding these tanks. It was spoken before
that it was estimated that over one million gallons of
acid reached the environment resulting in a
significant kill of aquatic life in the Delaware
River.

This a map of the Delaware City Refinery,
in this area. This the Delaware River. Another
point of reference the Red Line Creek to the north
and this the Delmarva Power and Light Channel. The
release of acid went in several directions. One
direction -- this the acid tank farm. One direction
that it took was to the south. It entered the oily
water sewer system of Motiva's waste water treatment
and it made its way underground to the waste water
treatment plant in this area and then was released and
made its way into the Delaware River. Also, sulfuric
acid was released to the east and this acid made its
way into the storm water sewer. The storm water sewer
runs underground and discharges into the Delmarva
Light Channel. This was a significant portion of the
release and this where the greatest amount, which was estimated at 99,000 gallons of untreated sulfuric acid reached the Delaware River.

Also acid release flowed to the northwest around these ash ponds and made its way into a tributary of Red Line Creek in this area. At this time I will be able to answer any questions that the Board may have.

CHAIRPERSON MERRITT: Yes, are there any questions from the Board?

DR. POJE: Yes, I have one. Yeah, if you could clarify for me, Mike, a couple of points; one that the work began at 7:50 in the morning. What was your estimate temperature then and temperature around 1:30 or so?

MR. MORRIS: The actual temperature was, the low that day in the morning was 71 degrees and it increased to 85 degrees in the early afternoon.

DR. POJE: Part of my concern there would be the release of vapors in a much higher temperature might be much greater than in the morning.

MR. MORRIS: Correct.

DR. POJE: The second issue the diking area. Can you describe for me what the nature of the dike was, what size release was it designed to
contain and what type of release was it designed to contain?

MR. MORRIS: Sure. The dike wall around these six acid tanks designed to contain 100 percent of the largest tank inside of the dike. So it could contain 110 percent of any of these tanks, since they were all the same size. The type of release that occurred on the 17th was a catastrophic release, which the dike not built or designed to contain something like that. Dikes are usually built to contain a small leak, a steady leak, nothing with this catastrophic amount in this short amount of time.

DR. POJE: Just one more clarifying point; you did say that the tank, when it had a degradation in it, released off of its base and was propelled for some distance beyond where it had originally stood. How far was that distance?

MR. MORRIS: It was approximately 40 feet.

DR. POJE: And what was the distance between 393 and 394 and the distance between 393 and 396?

MR. MORRIS: The distance between the tanks north and south was approximately five feet and I believe the distance between the tanks east and west was 19 to 20 feet.
DR. POJE: I'm presuming there's no real analysis that says it couldn't have gone in the west direction or in the south direction if it was propelled off of that base.

MR. MORRIS: Correct, it was -- it just happened to go to the north.

DR. POJE: So we are -- another happenstance to be had of a failure that wasn't even more monumental than the one that occurred that day.

MR. MORRIS: Correct.

MR. BRESLAND: Mike, the employees who were working at the time, were employees of which company?

MR. MORRIS: They were employees of Washington Group International, a contractor that the primary maintenance contractor of Motiva.

MR. BRESLAND: And how long had they been working at the facility?

MR. MORRIS: Each individual worker?

MR. BRESLAND: Well, as I understand there were four workers working on or around the tanks during that day.

MR. MORRIS: Correct.

MR. BRESLAND: there kind of a general time frame of how long --
MR. MORRIS: The range of the four workers was I believe one worker had been there pretty much consistently throughout his career for over 20 years. Another one of the workers was there throughout his career for 15 years. Two of the other workers were apprentices or journeyman, apprentices, I believe, and they had been there a short time, maybe one to two years, not consistently in that plant but as projects would come up, they would come in and do the work and then they would go to other jobsites.

MR. BRESLAND: And there was a burning and welding procedure in operation in the plant, which I assume we'll get to later on. Had they been trained in that procedure?

MR. MORRIS: Yes, the workers that come in from Washington Group routinely go through a half a day of training of the Motiva safety practices, policies and procedures. They're shown video tapes and they are given -- they are fitted for respirators at that time and go through a long list of requirements before they are permitted to work.

MR. BRESLAND: Okay, thank you.

MR. MORRIS: Thank you.

CHAIRPERSON MERRITT: Are there any other questions?
DR. ROSENTHAL: Yeah, just one question.

You said the distance between the I guess east/west of 393 and 396 was approximately 19 feet?

MR. MORRIS: Correct.

DR. ROSENTHAL: And the catwalk was in that in between area? Where was the catwalk located?

MR. MORRIS: That catwalk was in this area between the tanks and it touched every one of the tanks, connected them and gave access to the roofs of the tanks.

DR. ROSENTHAL: So in other words, if you worked on the catwalk on one side of the tank, you weren't very far from the other tank.

MR. MORRIS: No, definitely not. The maximum distance here 19 feet and the height of the catwalks also about 32 feet which puts them right on top of the tank roofs.

DR. ROSENTHAL: Yeah, in other words, it's very difficult to isolate sources of ignition when you're working on one tank from another tank.

MR. MORRIS: Correct, it would have to be a critical thing to do. It would take a lot of planning.

DR. ROSENTHAL: Okay, thank you.

MR. MORRIS: Thank you.
CHAIRPERSON MERRITT: Are there any other questions?

MR. MORRIS: At this time Dave Heller would like to overview the key findings of the report.

CHAIRPERSON MERRITT: Following Dave's presentation, then we'll take questions and a break.

MR. HELLER: Thanks, Mike. We identified quite a few key findings, there are 15 in number to walk you through here. The first key finding an explosion in the vapor space of Tank 393 generated sufficient pressure to separate the tank's floor to shell joint. The explosion, classified as a weak deflagration, most likely occurred when either a spark from the maintenance work contacted flammable vapor coming out of one of the holes in the tank or a spark physically went through one of the holes into that vapor space of the tank.

Our second key finding covers a number of regulatory issues but first some background. First, we talk about OSHA's Process Safety Management standard, that's 1910.119 in the Federal Regulations. The Process Safety Management standard or PSM, it's a systematic approach to safety in the prevention of catastrophic incidents. And the standard details 14 elements of good safety management practice. The
standard requires adherence to these elements for processes containing a specific list of hazardous substances, including flammables. Now, the key points are sulfuric acid not covered by the PSM standard. Flammables above a threshold quantity of 10,000 pounds are covered. However, in 1995, a judge ruled in a decision called the Meer decision that PSM coverage does not extend to storage tanks -- to stored flammables in atmospheric tanks even if the tanks are connected to a process that covered by the standard.

Now, OSHA has not challenged this decision and atmospheric tanks or low pressure tanks not designed to withstand any buildup of internal pressure. Now OSHA did not issue any citations to Motiva under the PSM standard in the citations they issued following this incident, and that leads us to our second key finding.

Motiva did not consider the acid tank farm covered by the requirements of the OSHA PSM standard. If Motiva had followed the good process safety management practices for the tank farm processes and equipment, practices such as mechanical integrity and management of change, the incident would likely not have happened. Now, mechanical integrity a system that covers the design and maintenance of equipment
and it insures that equipment meets codes and standards and that their equipment inspected and repaired to insure safe operation and management of change, as the name implies, a system that insures that changes to equipment and to processes are made correctly and safely.

To complete our regulatory findings, I'd like to acknowledge the recently enacted Jeffrey Davis Above-Ground Storage Tank Act. And the State of Delaware found that sulfuric acid tanks also fell outside of the coverage of the state safety process management regulation, so as a result of this incident and others, the state enacted the Jeffrey Davis Act and it's designed to control the installation, operation, and maintenance repair of above-ground storage tanks. The purpose of the legislation to provide for the safe containment of petroleum and other regulated substances in tanks that exceed 12,500 gallons in capacity.

DNREC, the Department of Natural Resources and Environmental Control in Delaware now developing the regulations under the Act to address these issues; maintenance, inspection, upgrade, closure of the vessels, along with regulations for the cleanup of spills and releases that might occur.
Our third finding, Tank 393 and other acid tanks had a history of leaks. There was an internal inspection of the tank done in 1994. No internal inspections were done after that as we've heard brought up already by our speakers. But in 1998 there was a shell leak, there were two leaks in 1999, two leaks in 2000 and another leak in May of 2001. All these leaks were repaired except for the leak in May of 2001. This a photo of the unrepaired leak. Now, we believe this leak was about three inches in width initially. After the incident, it expanded to about 21 inches we believe from the force of the blast of the tank coming off its foundation.

This slide shows the series of carbon patches that were installed on the tank over the years to repair these leaks. There's one you can barely see down here, a circular one here, another one here, and a rectangular one here. Here's that three-inch leak and finally one you can barely see the corner of on the top. Now, these leaks were all in a vertical row on the tank and they were all in the western, southwestern, western side of that tank. It's an area where there was a level gauge and air bubbler that would contribute a little bit to that corrosion and also it's an area that would have received the most
sun exposure and sulfuric acid more corrosive as it's -- as it gets warmer.

I'd like to show you two other holes. This was a hole that was under insulation. It was initially about two and a half inches in diameter but it was discovered after the incident. It was about 14 inches long. That increase in size was due to corrosion. Again it was under the insulation at the time of the incident but it's representative of the kind of problems that the tank was having in that vapor space and the holes that were up there.

And finally, a hole that we'll be talking about more as I guess the presentation on the inerting system, there had been a nozzle on this hole and it had corroded off. It was about a one and a half inch hole now, and the hose that supplied the carbon dioxide inerting gas to the tank was dropped into this hole through about a three-quarter inch hose, so there's a little play around all the sides of that hose. There were a number of other holes. There was a hole that was under the roof to shell seam, about a five-inch diameter hole and there was also a number of other spots. There was a gauge hatch that operators would drop down a gauge tool to see what the level in the tank was that didn't close tightly. Again, those
are other opportunities for air to enter the tank for flammable vapors to leak out.

Now, beyond the Project 393 other tanks in the acid tank farm had leaks also. 394, 391 and 395 were sister tanks in the acid tank farm here with the 393. 395 was replaced in 1995 because of corrosion. The two other tanks listed there, 320 and 398, were tanks that were also in sulfuric acid service that were over in the alkylation unit of the refinery and also 320 was replaced, again, as recently as five years before the incident.

Our next key finding, Motiva's tank inspectors recommended internal inspection of Tank 393 as soon as possible, in 1999, 2000 and 2001. Now the tank inspectors were certified under the American Petroleum Institute, their standards. 653 their standard for inspection of storage tanks. We'll be talking about that standard in a little more detail. Now, Motiva did not act on these recommendations to have the tank inspected. It's likely that this inspection would have identified the serious localized corrosion occurring inside the tank that resulted in the holes. They had deferred that inspection a number of times. Tank 393 was emptied three times between April of 2000 and April 2001. Each of these occasions
was an opportunity to prepare the tank and conduct an
internal inspection. Now it takes some time to
prepare a tank for internal inspection. It's to be
emptied out and cleaned out, parts have to be
sandblasted so people can go inside of this storage
tank.

It requires some juggling of inventories
and acid movements, but there was no evidence that
Motiva looked at alternatives for managing its acid
inventories in order to conduct this inspection. Out
six key finding, that design and implementation of the
sulfuric acid tank inspection program was inadequate.
Now, in 1994 in the last internal inspection,
inspectors had recommended based on their measurements
and the thickness readings that the next internal
inspection be conducted in 1996 and it was never
conducted.

There was another opportunity that Motiva
had to determine where the leaks were and this was to
do a full external inspection. Now, an external
inspection could be done while the tank in operation
and it requires the removal of insulation to expose
areas for observation and to do thickness readings but
again, it's done from the outside and it's -- you
know, the tank still running. So again, it's an
opportunity for Motiva to really could have likely identified the holes in the tank.

    Now, for concentrated sulfuric acid, the National Association of Corrosion Engineers or NACE International, they specify an inspection period of five years for an internal inspection and two years for an external inspection. Instead, Motiva was using the American Petroleum Institute's guidelines of scheduling internal inspections for tanks every 10 years and externals every five years and again, they weren't conducting those inspections on Tank 393. They were hoping to adhere to this standard but again, 393 never got these inspections.

    Now, API's tank standards are not written for sulfuric acid tanks, they're written for hydrocarbon storage in general but they're used by industry for tanks, for most tanks. Continuing on with some more information on this finding, the tank standard 653, the API standard, it requires that flaws and deterioration be evaluated and a determination made of fitness for the intended service. Tank inspection intervals need to be modified based on a service history and that can be evidence of corrosion in the tank in question or evidence of corrosion in related tanks, again, you saw the corrosion in the
other tanks in the acid tank farm.

Obviously, this was evidence of deterioration in the tanks. Motiva's tank inspectors attempted to meet this requirement of the tank inspection standard and in their repeated calls for an internal inspection. It's clear that the holes in the vapor space of a tank containing a flammable atmosphere render it unsuitable for that service.

Our next finding; management stated in the interviews with the Chemical Safety Board that they did not consider Tank 393 to constitute an eminent danger to safety or the environment. They stated in interview, their belief that patching the leaks allowed the tank to operate safely even though inspectors noted that repairs were temporary and that an internal inspection was required to insure vessel integrity. They also believed that lowering the liquid level in the tank below the leak point and manage the hazards, they were focused, the plant was, in the hazards of sulfuric acid and stopping leaking of acid out of the tank and they didn't take into consideration the flammable vapors in the tank.

Now, Tank 393, our next finding, was converted from fresh to spent acid service with minimal engineering support. Now, fresh acid
percent acid with one percent water. It's not flammable. The spent acid, however, contains the several percent of various hydrocarbons and a critical issue here then that those hydrocarbons, some of them are flammable. Motiva recognized that they had to protect against this potential flammability.

They installed an inerting system, they installed a combination pressure and vacuum vent to maintain tank pressure and they installed a flame arrester on this -- under this vent in case there was a problem. However, Motiva did no engineering and they did not issue an engineering request to their contractors to -- for engineering support in the work order for the conversion of the tank from fresh to spent acid. The sizing of the inerting flow requirements for normal and upset conditions was inadequate and the carbon dioxide flow was insufficient to maintain the non-flammable atmosphere in the tank. And the tank lacked a weak seam roof or other emergency venting provisions which likely would have prevented it from separating at the floor and catastrophically releasing its contents.

Our finding number 10 that Motiva did not use it's management of change practices to review the conversion of Tank 393 from fresh to spent acid
service. Management of change again, one of the good process safety management practices that was not followed by Motiva and as a result, the conversion of the tank from fresh to spent did not benefit by these good practices. First, there was no review and sign-off for the proposed changes by subject area experts, corrosion engineers or tank design experts and no review by higher level management. Now, a management of change or MOC system requires reviews by a diverse group of technical and management personnel to insure the changes are done safely.

Secondly, as part of a management of change system, there no process hazard review conducted to assess the safety of the proposed change. A process hazards review or process hazards analysis another process safety tool in which a multi-functional team reviews the hazards of a proposed change.

And finally, there was no pre-start-up safety review. A pre-start-up safety review another tool. Again, it's used after the change constructed. A team goes out to review the physical aspects of the change and if there's any changes to procedures or operating instructions, to insure the project method design and intent. And here, it's possible that the
use of a hose to supply inerting gas to Tank 393 would likely have been observed and corrected.

Our next finding, the vapor space contained flammable vapors and this was a given from the nature of spent sulfuric acid. Remember the fire triangle we looked at, this one of the requirements to have that explosion in the vapor space. On the second side of the triangle, the vapor space was not adequately inerted. The carbon dioxide flow was insufficient to keep the internal atmosphere below the flammable range. I'd like to take you through a little diagram of the inerting system.

Now, initially the refinery inerting Tank 396 and they set it up with a carbon dioxide inlet going through a pressure reducing valve into the tank was all right, but when they decided to inert 393, as we saw earlier, they took this three-quarter inch hose and ran it from this system for 396, piggybacked it over to 393. And because of the length of the hose, about a 50-foot standard length of hose and the small diameter, it was not able to pass enough carbon dioxide to put enough into the tank to keep the atmosphere below the flammable point. And again, we saw that the tank, the hose was dropped through a hole. There was room around that hole for air to get
in and out. There was other places for air to get in and out. 393 was connected to these two tanks, 394 and 395. They had a common overflow line, so if you filled the tank up too high, it would overflow down to the ground but that was open to the atmosphere and these two tanks were also open to the atmosphere. So again, maintaining the carbon dioxide inside the Tank 393 was defeated.

You saw the holes, evidence of the holes again, places where carbon dioxide could leak out, air could get in. And I think a final point was that there was on instrumentation -- there was no way for the operators to really assess if the system, the inerting system was working properly whether there was enough carbon dioxide in the tank to keep it below the flammable range.

Now, our next finding that Tank 393 exhibited severe localized corrosion beyond that considered normal in sulfuric acid service. Sulfuric acid corrosive. And when you design a tank for sulfuric acid, you typically design it with what they call corrosion allowance, some extra thickness in the metal so as that tank goes through the normal corrosion cycle, that one way we still have got all the life and integrity of the tank. But what we saw
in Tank 393 was severe localized corrosion and this was due to the water that was entering the tank through the various holes. Water dilutes the acid and this would typically be at the liquid level, where the acid, you know, at the top of the liquid level of the tank, and water dilutes the acid. Diluted acid much more corrosive than the strong sulfuric acid, either fresh or spent acid.

So at that liquid level where the water would gather either from rain water or from moisture in the atmosphere coming in through the holes, that's where we were seeing the extreme localized corrosion. Corrosion leads to holes, leads to more water getting into the tank, more corrosion.

The Unsafe Condition Report, our next finding, detailing holes in Tank 393 and 396 was submitted to management on June 27th, 2001. That was about 20 days before the incident. Motive investigated but it did not take any actions to correct the deficiencies or implement temporary safeguards such as banning any hot work in the vicinity of the holes. Now, the operator had submitted this report after he had gone up on the cat walk to try to issue a hot work permit for the work that was being done and he obtained readings of
flammable vapors on a hand-held monitor.

Our final key finding that Motiva allowed hot work to be performed in the vicinity of a tank with holes in its roof and shell. Work should not have been authorized. Motiva was aware of the condition of the tanks and the fact that they contained material that contained flammable vapors. Workers should not have been allowed to burn or weld near the tops of the tanks. However, once the work was authorized, no precautions were taken for retesting or continuous monitoring of the area around the work. Motiva did not take other steps that could have been used to minimize the risks.

Contract workers were not aware of the hazards they faced and there was no communication between Motiva and the contractors as work methods and work locations were changed. We'll be going on to the root and contributing causes, but first, let me ask you if at this point you have questions.

CHAIRPERSON MERRITT: Yes, Dr. Taylor.

DR. TAYLOR: I want to go back to the issuance of the hot work permit and get some clarification.

MR. HELLER: Sure.

DR. TAYLOR: And I have two questions
related to that. You mentioned that 20 days prior to
the incident, a hot work permit was denied and an
Unsafe Condition Report was submitted. On the day of
the incident and prior to the work being performed had
management monitored the area?

MR. HELLER: Right, to issue a hot work
permit, you -- the field operator went up on the cat
walk and took readings for sulfur dioxide and for
flammables and they were negative, there were not
readings so they were able to issue the hot work
permit at that time.

DR. TAYLOR: Was that above both tanks or
above Tank 396 or how do they do that?

MR. HELLER: Typically, the operators
would go up there and they would take readings around
the hole catwalk area, not just the one --

DR. TAYLOR: And on the day of the
incident they did monitor.

MR. HELLER: Yes.

DR. TAYLOR: And I guess my second
question then related to that what the common
practice in industry concerning retesting areas where
hot work performed?

MR. HELLER: Industry going more and more
to -- first of all, one option continuous monitoring,
where you have a monitor up there that's always in place. Monitors are new technology getting to be much less expensive, maybe 500 bucks for a continuous monitor and that can be up there the whole time and it's a continuous monitor which gives off like an alarm if there's any readings detected.

Another method to do some retesting and retesting done if the operator, if the workers leave the area and come back, conditions could change while they're away from the area eating lunch or whatever. So retesting another option.

DR. TAYLOR: And the workers did leave and come back for lunch and then they came back.

MR. HELLER: The workers went for lunch and they came back, yes.

DR. TAYLOR: And there was no monitoring.

DR. POJE: Dave, I'm interested in a couple of aspects. One the bigger picture issues and then we'll get into something more narrow. Now, the Board, throughout our history of investigations has focused in on best practices as defined by the industry itself, frequently going to the Center for Chemical Process Safety, asking questions about what -- how does one define working around very hazardous materials and define best practice. So that has led
from early development in the late '80's to the
requirement that it be enforced by federal
regulations, the OSHA Process Safety Management Regs.

Can't you give me some insights as to what
kinds of approaches towards process safety management
were deficient in this area? I think you've
identified a few but I want you to synopsize where
you've been.

MR. HELLER: Well, again, hot work one of
the elements of process safety management. One of the
first things that need to be done with a hot work
permit to assess the area, determine what the risks
are and what the hazards are. And in other standards,
such as the OSHA standards for burning and welding, if
there are hazards, you have to take steps to control
the hazards. In this situation, we don't think the
hazards could have been controlled because of the
presence of all these holes on the tank.

Options are to take the work down and do
the welding away from the area, wasn't possible for a
cat walk which was obviously up there in place.

DR. POJE: But I also worry about the
other big issue which mechanical integrity and that
certainly a central issue in this whole incident,
getting towards repairing work that has been corroded
because of releases of sulfuric acid should be part of a larger program that doesn't wait for holes to appear before you begin to take action.

MR. HELLER: Right. Mechanical integrity programs should be predictive and should be proactive in trying to determine what problems are on a tank. Again, that's where you do your inspections, you take your tank out of service, you get the full picture. Programs and companies that have a mechanical integrity program, all their tanks are listed. There's voluminous data bases of all the tanks and all the inspection reports and a means to follow up on issues that are identified and take action where necessary and also to cross-check between various areas of similarity from different parts of a facility to see if there's any common issues that need to be addressed.

DR. POJE: So part of the Board's issues here, really, are framing what best practice from a private sector vantage point but then how does that best practice get framed in federal responsibilities through the Occupational Safety and Health Administration in this case and you're telling us that this an incident in which the company and OSHA did not consider the application of process safety
management regulations to --

MR. HELLER: Right, these tanks were not considered covered. They did do a number of the elements of process safety, again, there was some attempt at doing some management of change when earlier tanks had been converted. There was procedures and so forth, all things required by process safety management, but the rigorous control of these tanks was not there.

DR. POJE: And then if you could clarify one step further, while federal regulations can speak to the big picture or what needs to be done in a certain set of elements, sometimes the practice of implementing the elements, mechanical integrity, might fall then to a private sector standard program that defines how to do things and why. Give us a little background on the API and the NACE activities here that speak to this issue of the tank's integrity and role and responsibilities for inspection on that.

MR. HELLER: The API standard used by vast parts of the industry to inspect their tanks. It's very comprehensive on how to inspect. There's checklists in the standard, what to look for and how to make repairs and it's quite comprehensive, but the key thing that they wanted to determine the frequency
of the inspections. Again, API says, "Here's some
generic frequencies but modify these based on your
history, based on what you find through your
mechanical integrity program". This an area where we
didn't see that work out at Motiva.

DR. POJE: But in this case, there are two
different standard organizations and they're not
consistent with their recommendations.

MR. HELLER: NACE was looking specifically
at concentrated sulfuric acid. Again, NACE a
technical organization and metallurgists and corrosion
engineers. And their work and their frequencies, the
five years for the internal inspections, two years for
externals, followed by a lot of companies that do
handle spent and fresh sulfuric acid.

DR. POJE: So in this case, NACE has very
specific focus on sulfuric acid tanks and the API 653
focused more generally on --

MR. HELLER: It's focused more generally
with the caveat that you have to, you know, take a
look at your specific situation and modify those
inspections based on what you're actually seeing.

DR. POJE: And does the API standard focus
just on tanks that have flammable materials in it or
does it also encompass things like spent sulfuric acid
tanks where there a layer of a flammable material but it's not the primary constituent of the --

MR. HELLER: I think they're generally written for hydrocarbon tanks but really the API standard for construction of atmospheric storage tanks in general and most folks apply those inspection guidelines to all their tanks, not just the hydrocarbon tanks.

DR. POJE: We have a flammable incident here so --

MR. HELLER: Yeah.

CHAIRPERSON MERRITT: Andrea?

DR. TAYLOR: I just have one other question. Can you explain why the OSHA PSM standard does not cover tanks such as the tank involved in the incident?

MR. HELLER: We believe that OSHA's initial intent in the Process Safety Management Standard was to cover these tanks. They're inter-connected to a process that covered by the standard, but again, through the years, through the Meer decision and through the Akzo-Noble decision another issue, this area has been muddied and it's an area we think needs to be refocused and brought under control.

CHAIRPERSON MERRITT: Are there other
comments, questions?

MR. BRESLAND: Yeah, I've got a couple of questions for you, David. Talking about Tank 393, as I understand it, it contained spent sulfuric acid with approximately one percent insoluble organics which we would assume would be floating on the top of the tank, and that would give you perhaps if the tank had about -- let's say the level of the tank was approximately 30 feet, you'd have three or four inches of organic layer floating on top and this may be a little bit outside the scope of your investigation, but if there are holes in the tank and you have this organic floating layer, would that give cause to an environmental compliance issue of release of VOCs?

MR. HELLER: We didn't look into the amount of emissions that could possibly be coming out of the tank. Again, the amount of organics in the tank in that layer was really never determined. Just, you know, the very nature of sulfuric acid, it doesn't take much to have a flammable atmosphere in that tank.

MR. BRESLAND: Still talking about the tank and the holes in the tank, that -- what's general industry practice when it comes to operating storage tanks which have identified holes in them caused by corrosion?
MR. HELLER: In my experience, if you have a tank like that, you would -- you'd probably do an assessment and determine what needs to be done and I think in this situation, the determination would be to take it out of service and get those holes repaired. Now, at a minimum to make sure that no work was being done in the vicinity of those tanks during the time it takes to get that tank down and ready.

MR. BRESLAND: Okay, thank you.

DR. ROSENTHAL: I have just one question, Dave. Was there a system in place, you know a formal system, that identified deviations from standards safety reports, identified them, assigned someone to follow them to completion, and noted where the required actions or recommended actions were actually completed?

MR. HELLER: Yeah, there was a recommendation tracking system that covered the recommendations that came out of various tank inspection reports and those recommendations went to the unit management. It also went sometimes to higher management and what we found was that there was no one in really control with oversight to take the piece that here we have a tank with holes in it and here we have a production issue of inventory. There's no one
kind of looking at all those issues and making a
decision, "Okay, we can run, no, we have to take it
down".

DR. ROSENTHAL: I mean, yeah, there was
not a closure date that was -- the recommended action
was either completed or formally reviewed and signed
off on.

MR. HELLER: I can't recall if the
recommendations included completion dates, recommended
completion dates.

DR. ROSENTHAL: All right, thank you.

DR. POJE: I have just one other issue
that I wanted to raise with you, Dave. I was very
happy to hear Mr. DiPasquale talk about the state's
efforts, particularly in regards to the new Above-
Ground Storage Tank Act that works, obviously, for the
State of Delaware but it's not likely to cover other
facilities in other states. And Motiva's domain
includes four other major -- or three other major
facilities and there are many others who use spent
sulfuric acid tanks. I also was struck by the fact
that EPA in May of 2000, conducted a very explicit
public sector review of tank integrity but their focus
was narrowed down to the oil containing tanks and they
made some urgent recommendations that needed to be
implemented by the Delaware City Refinery to improve
the mechanical integrity of those tanks to assure that
there was no environmental problem.

Unfortunately that blinded -- they were
blinded perhaps by policy or regulatory reach into
looking at spent sulfuric acid tank. that your
analysis, that the EPA program restricted to the --
in the spill prevention control counter-measures
program just to the oil?

MR. HELLER: Right. EPA went in and under
the spill prevention counter-measures control program
and it's really an oil pollution prevention program
looking for spills and leaks from oil tanks. Again,
they did find significant problems. Three tanks they
asked to be taken out of service immediately. This
in the year 2000, tanks that had never had an internal
inspection since they had been built in the mid-
1950's.

DR. POJE: I think this will bear some
vigilance on the part of this Board as we think about
the coverage of above-ground storage tanks and roles
of federal agencies.

CHAIRPERSON MERRITT: Are there any other
questions? Then I think at this time I'd like to
thank you, Dave, and -- oh, we're going to do root
causes before we go to a break. That would be fine, thank you.

MR. HELLER: We identified three root causes and two contributing causes for the incident. Our first root cause that Motiva did not have an adequate mechanical integrity system to prevent safety and environmental hazards or address safety and environmental hazards in the deterioration of sulfuric acid storage tanks. Again, a repeated recommendation of the tank inspectors that Tank 393 be taken out of service as soon as possible for an internal inspection were unheeded.

A leak in the shell of Tank 393 in May of 2001 was not repaired. Instead the tank level was lowered below the leak point and the tank was allowed to remain in service. Management failed to recognize the eminent hazard posed by the holes in Tank 393 and did not promptly initiate repairs or take the tank out of service.

Our second root cause, Motiva's engineering management and management of change systems inadequately addressed the conversion of tanks from fresh to spent sulfuric acid. No engineering was done to size the inerting system for Tank 393 and as a result, the inerting flow was insufficient to
prevent a flammable atmosphere from developing inside
the tank and not using the management of change
process meant that reviews by subject area experts or
management that might have identified the flaws in the
design were not uncovered, did not occur.

Our third root cause finding that the
Motiva hot work program was inadequate. Again, hot
work should not have been authorized in the vicinity
of Tank 393, but then once hot work was authorized,
Motiva did not take steps to minimize the hazards such
as by requiring continuous flammable monitoring.

We also identified two contributing
causes, the first one being that Motiva Refinery
System for investigating unsafe condition reports,
informing workers about such reports and tracking the
satisfactory resolution of issues was inadequate.
Three weeks between submittal of the unsafe condition
report and the incident, Motiva investigated, did some
communications but did not correct the deficiencies
and did not implement any temporary safeguards.

And our second contributing cause that
Motiva Enterprises' corporate management oversight
system failed to detect and hold Motiva Refinery
management accountable for deficiencies in its
mechanical integrity, engineering management and
management of change systems. Corporate oversight and auditing systems can provide a fresh set of eyes that identify systemic problems that might be overlooked by local management. In this case auditing did not identify the problems. In addition, corporate management was informed of decisions to defer the inspection of some storage tanks which included Tank 393.

They did not question the deferrals or inquire into the basis of these deferrals. And those are our causes. Any questions at this point?

CHAIRPERSON MERRITT: Yes, Andrea.

DR. TAYLOR: Just one quickly, it goes back to the Unsafe Condition Report, you said that management did investigate after the Unsafe Condition Report was filed. Was there a report of what to do or the next steps they would take or what happened?

MR. HELLER: A member of the plant safety department, an inspector went up and looked at the situation and wrote on the back of the Unsafe Condition Report about the problem with the fumes up there and the hazards, and this information was passed to the area management. And area management was in the process of putting together a team to address a wider range of problems in the acid unit.
They added this to that list of problems. The report gets communicated to area management safety and health department, again, that's how this inspector got involved, and the union management safety committee.

DR. TAYLOR: So they were in the process but had not necessarily -- hadn't taken any action on what improvements could be made. They were still investigating a total.

MR. HELLER: Right.

DR. TAYLOR: Okay.

DR. ROSENTHAL: I have one quick just matter of fact. You say that the corporate system failed to detect these systems. Did they have a system in place, do you know? Were there corporate audits being performed?

MR. HELLER: We did obtain some of the corporate auditing results and they were -- there was some work done in the plant for process safety management audits. Again, they didn't look at this area specifically.

DR. ROSENTHAL: So the system was in place, it just was not functioning to what we think were reasonable standards. Thank you.

CHAIRPERSON MERRITT: Any other questions?
No? Then thank you, David. And at this time, we'd like to take a 15-minute break and that would bring us back here about 10 minutes after the hour. Thank you.

(A brief recess was taken.)

CHAIRPERSON MERRITT: I'd like to announce at this time, also that if there are any others who would like to make a comment, you still may register out at the registration desk. We also have provided power point copies of the presentation and also copies of the executive summary. If anyone would like to have one, they are available. And we thank you for that. And with that, Charles, I'll turn it back over to you and --

MR. JEFFRESS: Thank you, Madam Chair. Now, for the final portion of the staff report are the recommendations coming out of our findings and the root causes and contributing causes. The staff has prepared recommendations for the Board to consider, to people involved and others with impact on this incident. Don Holmstrom, our lead recommendation specialist, here to make the presentation on the recommendations.

MR. HOLMSTROM: Madam Chairman, Board member, Mr. Jeffress, Mr. Warner, I will present the
staff recommendations. Safety recommendations are the primary tool used by the Board to motivate implementation of safety improvements and prevent future incidents. We use our unique independent accident investigation perspective to identify trends or issues that might otherwise be overlooked. CSB recommendations may be directed to corporations, trade associations, government entities, safety organizations, labor unions and others.

Board recommendations begin the process that eventually saves lives and protects the environment. The CSB recommendations program not only participates in the development of Board recommendations but also just as importantly, advocates for tracks and helps insure that successful adoption of recommendations. Board recommendations are issued and closed only by a vote of the Board.

The first recommendation today a recommendation to the Occupational Safety and Health Administration, OSHA. Insure coverage under the Process Safety Management Standard, 1910.119, of atmospheric storage tanks that could be involved in a potential catastrophic release as a result of being inter-connected to a covered process with 10,000 pounds of flammable material.
I would note to the Board that under current OSHA definition, a process means any activity involving highly hazardous chemicals including the use, storage, manufacturing, handling for the onsite movement of such chemicals or combination of these activities. For purposes of the OSHA definition, any group of vessels which are interconnected and separate vessels which are located such that a highly hazardous chemical could be involved in a potential release shall be considered a single process.

The PSM standard applies to a process which involves flammable liquid or gas on site in one location in a quantity of 10,000 pounds or more, with the exception of flammable liquids stored in atmospheric tanks or transferred which are kept below their normal boiling point without the benefit of chilling or refrigeration. The question arises about inter-connected tanks containing flammables.

OSHA, early on, took the position that such tanks were covered by the process safety management standard. Subsequent decisions, as indicated earlier in the presentation, such as the Meer decision and other interpretations took the position that such tanks were not covered. This recommendation seeks to insure coverage by OSHA of
such tanks.

The next recommendation to the Delaware Department of Natural Resources and Environmental Control or DNREC. Insure that regulations developed for the recently enacted Jeffrey Davis Above-Ground Storage Tank Act require that facility management take prompt action in response to evidence of tank corrosion that presents hazards to personnel or the environment. The Jeffrey Davis Act requires DNREC to among other things, develop tank performance standards, corrective action regulations to prevent releases from above-ground storage tanks.

The next recommendation to Motiva, the Delaware City Refinery. Implement a system to insure accountability for mechanical integrity decision making that includes review of inspection reports by subject area experts, such as metallurgists, or equipment design engineers to insure adequate analysis of failure trends and suitability for intended service.

Establish a planning system to insure timely repair of equipment. The Center for Chemical Process Safety Publication Plant Guidelines for Technical Management of Chemical Process Safety Chapter 3, accountability objectives and goals,
presents a model for such a system.

The next recommendation to Motiva Delaware City Refinery, review the design of existing tankage that contains or has the potential to contain flammables to insure that at a minimum, inerting systems are installed where appropriate and are adequately sized and constructed. Emergency venting provided.

The next recommendation to Motiva Delaware City Refinery, insure that management of change reviews are conducted for changes to tank equipment and operating conditions such as tank service and contents, tank peripherals, such as inerting and venting systems.

The next recommendation to Delaware City Refinery, Motiva, revise the refinery hot work program to address the circumstances that require the use of continuous or periodic monitoring for flammables.

The final recommendation to Motiva Delaware City Refinery, upgrade the refinery's Unsafe Condition Report system to include the following; designate a manager with decision making authority to resolve issues, establishment of a mechanism to elevate attention to higher levels of management if issues are not resolved in a timely manner, identification of a
means to insure communication of hazards to all potentially effected personnel, work with PACE, which the Paper Allied Industrial, Chemical and Energy Workers Local 2-898 to design and implement the improved system.

The next recommendation to Motiva Enterprises, LLC. Conduct periodic audits of storage tank mechanical integrity and design, Unsafe Condition Reports, hot work, management of change and accountability for these systems at Motiva Oil Refineries. Share the findings with the workforce.

Another recommendation, communicate the findings and recommendations of this report to the workforce and contractors at all Motiva Refineries.

The next recommendation to the American Petroleum Institute. Work with NACE which the National Association of Corrosion Engineers, international to develop API guidelines to inspect storage tanks containing fresh or spent sulfuric acid at frequencies at least as often as those recommended by NACE. The American Petroleum Institute, API an oil industry trade association. It membership consists of approximately 400 companies and covers all aspects of oil and natural gas industry including exploration, production, through to refining and
marketing. API now maintains some 500 industry
specific standards covering all segments of the oil
and gas industry.

The next recommendation to the American
Petroleum Institute revise API tank inspection
standards to emphasize the flammable liquid storage
tanks with roof or wall holes or thinning beyond
minimum acceptable thickness are an eminent hazard and
require immediate repair or removal from service.

The next recommendation to the American
Petroleum Institute, insure that API recommended
practices address the inerting of flammable storage
tanks such as spent sulfuric tanks, include
circumstances when inerting recommended, design of
inerting systems, including proper sizing, appropriate
inerting medium, instrumentation, including alarms.

The next recommendation to NACE
International. NACE stands for the National
Association of Corrosion Engineers. Work with the
American Petroleum Institute to develop API guidelines
to insure that storage tanks containing fresh or
spent sulfuric acid tanks are inspected at frequencies
at least as often as those recommended by NACE. NACE
was established in 1943 and develops corrosion
prevention and control standards. NACE International
has become the largest organization in the world committed to the study of corrosion. NACE has sulfuric acid and corrosion expertise with storage tanks.

The next recommendation to PACE, the Paper Allied Industrial Chemical and Energy Workers International Union Local 2-898. Work with Motiva management on the design and implementation of an improved Unsafe Condition Report program. The final recommendation concerns the communication of findings to the following organizations; the Building and Construction Trades Department of the AFL-CIO, American Petroleum Institute, NACE International, National Petrochemical and Refiners Association, Paper Allied Industrial Chemical and Energy Workers International Union. The recommendation communicate the findings and recommendations of this report to your memberships.

That concludes the presentation on the staff recommendations. Are there any questions?

DR. ROSENTHAL: I look at the recommendations and find them generally in order but I have one question and that your recommendation to Motiva. You don't treat with the closure on those recommendations. That my understanding, when you say in light of the findings, that's Motiva Enterprises
MR. HOLMSTROM: Yeah, we don't currently have any language concerning the insuring, tracking and closure of the recommendation.

DR. ROSENTHAL: Thank you.

CHAIRPERSON MERRITT: Are there any other questions?

MR. BRESLAND: Yeah, I have one. Looking at the recommendations that were made to the American Petroleum Institute, the second recommendation to revise API time inspection standards to emphasize that flammable liquid storage tanks with roof or wall holes or thinning beyond minimum acceptable thickness are an eminent hazard and require immediate repair or removal. The implication on this to me that it only applies to tanks that hold organic liquids or refinery products. I would think it would be more clear in the -- especially in this particular case to include a statement that would mean that it would also apply to tanks like the spent sulfuric tank which has a floating liquid, a floating organic liquid on top of it and organic vapors in the vapor space of the tank.

MR. HOLMSTROM: That sounds like a very reasonable suggestion.

CHAIRPERSON MERRITT: How would you reword
that and we would consider that an editorial change in the recommendation. How would you reword that?

MR. HOLMSTROM: I think instead of flammable liquid, we would include language that addresses the -- or coverage of tanks that have a flammable vapor space.

DR. ROSENTHAL: I believe that's a substantive change more than an editorial change.

CHAIRPERSON MERRITT: Okay, all right, so then we can bring that up when we call for a vote.

DR. ROSENTHAL: Yes.

DR. POJE: And I'm presuming in response to Dr. Rosenthal's comment that you're not and staff wouldn't be in disagreement about taking action beyond the auditing into the implementation of the auditing recommendations.

MR. HOLMSTROM: I think that insuring a tracking and implementation of the audit recommendations an improvement to the recommendation.

CHAIRPERSON MERRITT: Okay, are there any other questions? Then at this time, I would like to open the floor to those who have registered to comment. There still time, if you would like to still register for comment, please do so. I may have difficulty reading your name. We'd like you to
restrict your comments to three minutes and Mr. Warner, if you would keep time for that, I would appreciate it.

First, we had Marianne McGonagle. I'm sorry if I've mispronounced that. Please -- McGonagle. If you would, please, stand, say your name and come to the mike and tell me who you are affiliated with or what your interest.

MS. McGONAGLE: Good afternoon and thank you for coming here to Delaware to hold this first meeting outside of Washington. My name Marianne McGonagle and for 15 years, until about two months ago, I conducted oversight of the state agencies for the General Assembly, so I'm aware of the very good and very thorough analysis of the Motiva incident that your report has indicated here and the very strong wording on the findings and I'm here to totally support the findings as a member of the public. I'm speaking on behalf of myself but and also the fact that you did make the information available. We ran into a little problem when I first came here and the executive summary was denied to the members of the public but I thank you for releasing the information during the break.

In light of some of the findings, I had
hoped that the recommendations would be a little stronger in holding Motiva and Motiva LLC responsible for not only informing the workers, but allowing the workers some recourse when they're sent into these dangerous situations that have existed at the refinery. And it isn't just the PACE workers, there are other allied building trades who are involved. And I speak with some knowledge because my son worked for some years as a boilermaker and I'm aware of what occurs when you're sent into perhaps an unsafe situation; if you don't go, then you don't have a job any more.

So I believe to my mind and there may be something that I'm missing, but to my mind, the report does not accurately address the protections for the workers and what they do when they are -- when some of these conditions are noted and here in Delaware we had some people from the refinery who came and spoke on the radio with their voice muffled who were very critical of Motiva and what happened in -- the actual workers, the people who actually do that work, were very aware of what was happening at Motiva. And you know, we don't always have this thorough follow-through on behalf of the workers. And in my own position as an oversight analyst for the General
Assembly, I'm aware that we do regulate pressure vessels. I heard Mr. DiPasquale talk about that. But we often don't adequately fund these functions in Delaware and perhaps it might be worthwhile to make a note of this.

We have lots of regulations in place but we don't always have the money to adequately compensate for the services and I'm aware, having done these reviews, that sometimes we skimp on safety in the State of Delaware. And again, thank you for opening this up, for a wonderful report and for including the public in the process and also I want to say that I met the wife of one of the workers and we really owe these people a debt of gratitude, the men who are left with these terrible memories of this horrible accident. Thank you.

CHAIRPERSON MERRITT: Thank you, Ms. McGonagle. Mr. John Flaherty. Please introduce yourself, tell me who you are representing.

MR. FLAHERTY: Madam Chair, my name is John Flaherty. I'm a lobbyist for Common Cause of Delaware. It's a non-profit, non-partisan citizen lobby organization dedicated to government reform and accountability. I'd like to echo what Ms. McGonagle said. In addition, I would like to commend the Board
for coming, taking the time to come to Delaware today.
I'd also like to thank the staff for a very concise, very understandable report and I'd like to thank all the hazardous duty people that responded to the accident and also our government officials that have made this a top priority.

So one of the speakers talked about Motiva being a scourge on the state and I have to agree with that. Their history of contempt for the laws and contempt for the safety of the workers I think unbelievable, but I would like to thank you all for coming here and bringing this to light here today, thank you.

CHAIRPERSON MERRITT: Thank you, Mr. Flaherty. Next, Mr. Alan Muller.

MR. MULLER: My name Alan Muller. I represent an organization known as Green Delaware which primarily and environment and public health advocacy organization and I would like, first of all, to echo the comments of the previous folks and thank you for being here today. This the first time I've encountered the Chemical Safety Board and I find the entire event very interesting.

My reaction to what I've seen, I'm satisfied that you have characterized the accident
correctly, at least in its narrow sense of what happened and why it happened. I'm less satisfied with your recommendations and I would like to make a couple of initial comments and then I have some specific suggestions.

You heard a number of observations this morning from Delaware elected officials and I believe they were made in good faith, but they don't necessarily accurately characterize the nature of Delaware's political culture which one that historically has been overwhelmingly subservient to industrial interests and particularly to the petrochemical industry and the history that I've observed and I've lived in Delaware since 1960, that the state able to respond to a dramatic event that receives media attention but the ability of the state to follow through with regulatory initiatives less impressive and because of that, we would look for remedies based on federal regulatory programs of a compulsory nature that hopefully would not be delegated to the states.

Secondly, it's no secret that the petrochemical industry and particularly the refining industry, will continue to conduct aggressive legal and political initiatives against improved -- programs
intended to improve safety and I think it's fair to say that this industry overall and perhaps Motiva and Equilon even more saliently characterized by an attitude and a culture that's caused that industry to be notorious all over the world for the hazards it poses to the health and safety of its neighbors.

So the big picture that there's a very well demonstrated need for an aggressive program to bring this industry under more comprehensive supervision and I can't always do that but I can certainly echo Secretary DiPasquale's comments in that regard. I think it would not be inappropriate to note that Secretary DiPasquale not going to be in his position for very much longer and it seems very likely to me that his successor will be less aggressive than he has been in paying attention to Motiva.

Now, with regard to your recommendations, there very little said there about the issue of secondary containment or diking systems. And I think that the history of tank failures shows that it's not unusual for them to be of a catastrophic nature and the requirement that the impoundment have a volumetric capacity of 110 percent of the single largest tank clearly inadequate. Similarly, the provision of drainage systems negate the effectiveness of the dike
seems to be common and that clearly needs to be changed and I'm not prepared to suggest design details but common sense would imply that that kind of a system ought to have normally closed valving. It would only be opened when it was necessary to drain storm water and not be open as a matter of course and rely on emergency action to close it.

Thirdly, on that point, it's clearly necessary in my view to consider the dynamics of a tank failure. In other words, we don't want the contents sloshing over the dike. So I would like to see your recommendations upgraded in that regard and I'd certainly be happy to talk to your staff about it in more detail.

With regard to inerting systems and let me go to the precise wording, if I may, this your item 2 which begins on page 11, you make reference to inerting systems installed where appropriate and adequately sized and constructed. There's no mention in here of the need to keep them in continuous operation which might seem like an obvious point but the history of this whole episode suggests the need to belabor things that should be obvious.

Similarly, I don't see any specific mention in here of the need to insure that a tank
constructed of materials that are appropriate for the
service that it's in, that the methods of fabrication
are satisfactory and so on. And I'm sure that at some
level that's covered under various industry consensus
guidelines but if you're going to address some of
these issues in specific wording, you should do so
comprehensively.

Now, with regard to the organizations that
you recommend to be involved in this, I see no mention
of the public. I see mention of industry
organizations. I see mention of unions. What about
an organization such as ours, what about local
emergency planning committees whose existence
mandated by other federal statutes and so on and so
forth, particularly, although we certainly think that
the employees' unions should be involved, there are
two problems there, one of which that I frankly think
there's been a certain reign of terror maintained in
which people fear for their jobs and consequently the
labor organizations have not been as aggressive as
they might have been on safety issues. I think it's
been mentioned that many of the dirtiest and most
dangerous jobs tend to be assigned to contractors who
may or may not have either effective representation or
even necessarily an effective management chain of
command because it's no secret that contracting
sometimes used as a means of evading the processes of
employment.

So I may be talking more than I ought to
be talking and I'll pipe down but I would suggest that
you make an effort to revise your recommendations so
as to include a broader participation, so thank you.

CHAIRPERSON MERRITT: Thank you for your
comments. Next, Mr. Wally Kremer.

MR. KREMER: I represent the organization
called CCOBH. It's a civic organization of 150 civic
associations, 80,000 people in Northern Castle County.

CHAIRPERSON MERRITT: Did I pronounce your
name correctly?

MR. KREMER: Yes, correct, thank you. I'm
a chemical engineer with 41 years of industrial
experience being responsible for and approving safety
hazards review, risk analysis in the United States and
all over the world. I commend you for coming to
Delaware and I think your presentation was excellent.
The total proceedings was carried out very well. And
what I see so far in the report and the
recommendations look good. As the previous gentleman
said, there's probably some details and I would like
to read it and spend some time with it and send in
recommendations if there anything I see.

I do believe that all industry and all people from the COO to management to supervision to the individual worker need to be empowered, empowered when there a safety or health issue to right now it shuts down and then we decide what to do. And there are industries, companies in the industry that operate that way.

Secondly, there expertise and consultants that can be hired and can provide any knowledge that lacking and can help set up the appropriate system. And I recommend that companies -- the state should look at companies that are not appropriately performing, should be asked to hire those type people.

I think the government needs to think about also their own industries. We have the Three-Mile Island incident which we reviewed quite a bit. There are facilities that need to have this information.

The last recommendation I think you ought to consider, I'd like you to do, with official cover letter, transmit the final report to the CEOs of the appropriate petroleum, chemical and so forth industries and the appropriate plant managers. There's an old saying that I guess, I got in the Army, 10 percent of the people never get the word. So we
need to make sure officially they are notified. I think that puts them on notice on another level that they need to be doing something.

I think this may serve as many other cases of one that people can learn from, universities could use it to teach safety and so forth. And again, thank you very much for coming to Delaware. We appreciate it and the first letters you send out please send to those companies, petroleum and chemical, just north of the Delaware border. Thank you very much.

CHAIRPERSON MERRITT: Thank you for your comments. Mr. John Kearny. And if I've mispronounced your name, please say it correctly.

MR. KEARNY: You did, it's John Kearny.

CHAIRPERSON MERRITT: Kearny.

MR. KEARNY: I'm a staff attorney with the Clean Air Council in Philadelphia and the Director of the Clean Air Council here in Delaware. The Clean Air Council founded in 1967 actually the oldest non-profit environmental organization in the region. I was motivated to come up at the last minute and just say a few brief comments basically on the recommendations.

First, I would like to commend you and thank you for coming to Delaware. It does mean a lot.
to organizations like Clean Air Council that you took
the time to come and I also would like to commend the
investigators and, you know, the workers for their
findings and their recommendations. You know, I think
that an excellent job was done and they're all
excellent and I commend you for that.

But I don't think that they went far
enough. You know conspicuous by its absence are any
recommendations to the EPA or any recommendations that
any of these be implemented as regulations that are
mandatory for Motiva and the other Motivas like --
refineries like Motiva around the country. Motiva a
poster child of why these should be federal standards.
This year alone they've had 40 upset reports filed to
DNREC, that have amount in 3500 pounds of sulfur
dioxide, 40 reports alone this year.

This company has been fined over 20 times
by DNREC, EPA going back to 1989. Twenty times,
they've been fined and it doesn't stop. It just
continues and goes on and on and on. And it shows
what voluntary regulation by industry does. It
doesn't work. Your recommendations here, they're
excellent but they need to be enforced industry-wide.
They need to be enforceable industry-wide standards.

That would be my recommendation. I also
would like to, you know, digest further the entire report and have some opportunity to submit written comments if possible. I don't know if there's a procedure for that or how long a window open for that but I would appreciate that opportunity if it's available. And again, I would like to close by extending my sincere condolence to the Davis family and the other members -- workers that were injured and their families as well, because that's the -- you know, that's the real tragedy here. It's the workers that have to come into plants like this that don't have, you know, notification standards of safety hazards. That's the loss here. It's the communities living around these facilities, the children that live and play around these facilities that have to put up with 40 upset emissions in one year.

That's what takes place when there's not federally mandated regulations on this industry. Letting the industry do it on a voluntary basis just does not cut it. I thank you for letting me comment.

CHAIRPERSON MERRITT: Thank you. At this time are there any other comments? Please state your name.

MR. FLAHERTY: Madam Chair, my follow-on comment which I forgot to mention was there were two
elected officials here today that did not get recognized that worked very, very hard in the General Assembly to enact the Jeffrey Davis Above-Ground Storage Tank Bill. One of them sitting over here, Senator Dori Connor and Senator Dave McBride, who was here earlier and they did yeoman's work in making sure that this bill did not get killed in committee and was able to get the bill out of committee and enacted into law and signed by the governor, so I wanted to make sure they were recognized here today.

CHAIRPERSON MERRITT: Thank you for that.

Yes, sure.

SENATOR CONNOR: It's kind of nice when a big guy acknowledges a little woman. I appreciate that, John, very much, and please I apologize for my back. There are several members of workforce --

CHAIRPERSON MERRITT: Excuse me, for the record, would you please --

SENATOR CONNOR: I'm sorry, State Senator Dori Connor and I represent now with the redraw of the new districts, this facility now within my senatorial district.

CHAIRPERSON MERRITT: Thank you.

SENATOR CONNOR: Lucky me. Several members of the public that are attending today were
workers on site that day. Several of the injured members are here today and I know that they would like maybe in many ways to remain anonymous but they also need to be acknowledged for their bravery and their persistence to I'm sure call to attention the working situation. But they're to be honored in other ways. They have endured a lot. They have been in many of our thoughts and prayers and also being a widow, I can identify with Mary.

I lost my husband to a health issue. I cannot imagine what this like for her and her family. My boys were 14 and 17. She has a 10-year old son. It's a terrible, terrible thing. I applaud you for coming here. I applaud the panel for their recommendations and findings. Our hearts and thoughts have to be in your actual findings of what you're going to do and how the company itself going to rectify what happened.

It was a true labor of love to have worked so diligently on the Jeffrey Davis Above-Ground Storage Tank Bill, which came as a recommendation from one of the injured parties but it did not go quite as far as we would have liked. It a step in the right direction. Do I think there will be more oversight? As my one son might say, "You betcha". And I think
that that's the task ahead of us and with the help of the governor and the other 61 members of the legislature, we can achieve that goal to make safe for not only the people that work on the site but the people that live around it and for all of our state, it's very, very, very important and I thank you from the bottom of my heart for coming to Delaware. We may be small but we were first, and we want to remain first on this issue too, to bring this to the issue across this country. Please, like we say, take it on the road, go, make it happen on the federal level. We need it to keep coming. Thank you.

CHAIRPERSON MERRITT: At this time we would accept written comments although we are going to bring this to a vote, I'll ask the Board whether we are ready to. We do have other opportunities to include many of your comments which are broader, possibly than this event as well, and broader regulatory recommendations. We heard some this morning from Senator Biden and from Congressman Castle and we hear those statements for recommendations, broader recommendations as well, and we have many opportunities to do that outside of this forum and in addition to this forum.

But we would accept all written comments
following this and take them into consideration in future reports and future actions from the Board as appropriate. So we would appreciate that and we thank you all for your comments. All of this tends to broaden our scope and broaden our perspective and remind us that we have other partners out there that are important to include in our investigations and our proceedings and we appreciate your reminding us of that.

MR. JEFFRESS: Board discussion.

CHAIRPERSON MERRITT: Yes, at this time I would like to ask the Board if there was anything in the comments that you feel that would postpone our bringing this report, recommendations to a vote.

DR. ROSENTHAL: No. My own feeling that a number of the suggestions and recommendations on changes are valid items of attention. However, I do not believe that following our practice of not making recommendations unless they were established reasonably well on explicit findings in the report would allow us to include some of these valid subjects and valid needs for actions into the recommendations on --

CHAIRPERSON MERRITT: At this time, yes.

DR. ROSENTHAL: -- this report. So to
make it short, I think we can proceed to raise the issue of what do we want to do with the recommendations arising from this investigation?

CHAIRPERSON MERRITT: Okay, there any other comment?

DR. POJE: I just would like to echo what Irv said, but also what you said, Carolyn. I believe that there opportunity here for the Board to also think about other matters that have been raised today that may bear some more deliberation and maybe some more research by the Board. But the matters before us, I think, are ripe. I think they are fair for us to consider right now and I certainly would support bringing it to action by the Board.

DR. ROSENTHAL: Yes, really once the issue raised, some of the members may have suggestions around these recommendations, so -- but I think the issue should be raised and I guess one of us has to make a motion.

CHAIRPERSON MERRITT: Yes, I would call for a motion.

DR. ROSENTHAL: I'll move that we open consideration for the adoption and approval of the recommendations of the report that were raised.

DR. POJE: I'll second.
CHAIRPERSON MERRITT: there a second?

Seconded by Dr. Poje. At this time, I'd like to open the floor to any comments with regard to the report or its recommendations. Is there anyone who has a comment?

DR. ROSENTHAL: Well, I think two issues were raised in the course of the recommendations. And I'd like to discuss one of them and that is recommendation to Motiva Enterprises LLC as Mr. Holmstrom acknowledged, it might be valuable to add on a sentence and I'd put it in after the report as the recommendation now reads, "In light of the findings of this report, conduct periodic audits of the storage tank, mechanical integrity and design, unsafe conditions report, hot work, managers in change and accountability of the systems at Motiva Oil Refineries."

I would like to suggest inclusion of the sentence as follows, "Insure the audit recommendations are tracked and implemented", and then of course, keep in the last sentence which share the findings with the workforce. So I would like to make that as a formal suggestion, subject, of course, to my Board members' agreement.

CHAIRPERSON MERRITT: All right, would you
make that in the form of a motion, that we make this change?

DR. ROSENTHAL:  Yes, I would move that recommendation one to Motiva Enterprises LLC be modified to include the sentence "Insure the audit recommendations are tracked and implemented", period.

CHAIRPERSON MERRITT:  Fine.  there a second?

DR. TAYLOR:  Second.

CHAIRPERSON MERRITT:  Dr. Taylor seconds that.  I'd like a voice vote, please, to accept that change.

(Voice vote.)

CHAIRPERSON MERRITT:  Thank you. Everyone approves. I approve. Are there any others?

MR. BRESLAND:  One other suggestion for a change and this, again, refers to the second recommendation that was made to the American Petroleum Institute regarding tank inspection standards. And I'd like to suggest that we change the wording of that recommendation to the following; "Revise API tank inspection standards to emphasize that storage tanks which may contain a flammable vapor with wall or roof holes or thinning beyond minimum acceptable thickness, are an eminent hazard and require immediate repair or
removal from service", basically adding the point that we talked before about tanks containing a flammable vapor.

DR. TAYLOR: So we're removing flammable liquid storage.

CHAIRPERSON MERRITT: Yeah, right, we're changing it to flammable vapor. Are there any comments on that? Do make that --

DR. POJE: I second that.

CHAIRPERSON MERRITT: Okay, second that and could we have a voice vote?

(Voice vote.)

CHAIRPERSON MERRITT: With those two changes then, the motion on the floor, could you read that.

MR. WARNER: The motion on the floor, Madam Chair, to approve the CSB report and recommendations as presented with the following changes to the recommendations. To Motiva Enterprises LLC and to the American Petroleum Institute, the recommendations as currently revised by the Board now read as follows, "In light of the findings of this report conduct periodic audits of storage tank mechanical integrity and design, unsafe condition reports, hot work, management of change and
accountability for these systems in the Motive Oil Refineries, insure the audit recommendations are tracked and implemented, share the findings with the workforce". That's Motiva Enterprises LLC, the first recommendation.

The second change to the American Petroleum Institute and the second recommendation now reads as follows, "Revise API tank inspection standards to emphasize that storage tanks which may contain a flammable vapor with wall or roof holes or thinning beyond minimal acceptable thickness are an eminent hazard and require immediate repair or removal from service".

CHAIRPERSON MERRITT: Okay, this has been -- a motion has been made and seconded. Are there any other comments? Then I'd like to call for a vote.

MR. WARNER: Madam Chair, with your permission, Board Member Andrea Taylor, how do you say, approve or disapprove?

DR. TAYLOR: Approve.

MR. WARNER: Board Member Rosenthal?

DR. ROSENTHAL: Approve.

MR. WARNER: Board Member Poje?

DR. POJE: Approve.

MR. WARNER: Board Member Bresland?
MR. BRESLAND: Approve.

MR. WARNER: Madam Chair?

CHAIRPERSON MERRITT: I approve. And the vote carried.

MR. WARNER: Motion carried, five, zero.

CHAIRPERSON MERRITT: This has been an important investigation for the Chemical Safety Board and I am pleased that it has reached a conclusion. I think the investigative and recommendation teams did an excellent job as has been stated by others who are not as biased as I am. This accident was rooted in three elements; maintenance and the mechanical integrity of the tanks, management of hot work performed in the area, and the management of engineering and process changes within the plant.

Had any one of these elements been handled more effectively, this accident in all probability would now have occurred. This a message not only for Motiva but for all the companies. Process safety procedures are best management practices. Motiva very likely will take or has taken measures to insure that an accident like this won't happen again. They have a compelling reason to act as you've heard. For Motiva, the cost of this accident has not only been the loss of life and eight injuries, and the environmental and...
property damage, and the clean-up but also the
interruption of business, the adverse publicity, legal
bills and so forth.

The monetary cost also will run into the
tens of millions of dollars. By comparison, the kinds
of safety programs that could have prevented this
tragedy are not very costly at all. So Motiva will
act, but what about the other companies out there and
across the country? For the companies that have not
put in place effective safety programs, this a very
concerning issue. This a theme that I intend to
return to throughout my chairmanship. Implementing
process safety programs not only save lives and
protects the environment, it's good business.

Companies can directly benefit by adopting
a broader view of process safety regulations and
standards. It evident from the Chemical Safety Board
report that Motiva's decision not to include the tank
farm within its process safety program had tragic
consequences. The Chemical Safety Board's
recommendation to the U.S. Occupational Safety and
Health Administration that they seek a permanent
resolution of this important issue. This change will
save lives. The recommendation to expand the process
safety management standard will establish a baseline
of good practice for many hazardous storage tanks.

Under the Clean Air Act OSHA will have a
period of 180 days to consider this recommendation.
I'll be working immediately to establish a dialogue
with Secretary Henshaw on this matter and to bring it
to a conclusion and with the other parties that are
involved who have made recommendations and have had
recommendations made to them.

The next public meeting of the U.S.
Chemical Safety Board scheduled tentatively for
Tuesday, September 17th, in Houston, Texas. The focus
of that meeting will be another important industry-
wide safety issue, the problem of controlling reactive
chemical hazards. I'd encourage anyone with an
interest to visit our website www.chemsafety.gov for
the latest information on this meeting. Like today's
session, this meeting on the 17th will be broadcast
live and without charge on the Internet.

I'd like to thank the investigating team;
Dave Heller, Mike Morris, for their excellent work and
for their thorough presentation today and I would also
like to recognize Don Holmstrom, who worked closely
with the team on developing the safety recommendations
and also gave an excellent presentation this morning.

Finally, I'd like to thank the CSB
investigating team, Steve Selk, Kevin Mitchell, Steven Wallace, Giby Joseph, and Shannon Jones, who all participated in the field phase of the investigation.

I'd also like to thank those on the CSB staff, who organized this meeting and made sure that it came across and came over smoothly. It's not small task and I appreciate all of their efforts.

With that, if there no further comment, the meeting stands adjourned.

(Whereupon, at 12:06 p.m. the above-entitled matter concluded.)