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Case: Research and Development Forum Meeting

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RESEARCH AND DEVELOPMENT FORUM

MEETING

1/17/2014

8:30 am

Department of Transportation

1200 New Jersey Avenue, S.E.

Washington, DC 20590

The research and development forum meeting, pursuant to notice, convened at 8:40 a.m., Ryan Paquet chair of the meeting.

SPEAKER LIST

RYAN PAQUET, Chair

DR. MAGDY EL-SIBAIE

DR. CAROLE LEBLANC

LUCY DIGHIONNO

CYNTHIA HILTON

BOB RICHARD

DR. JOSEPHINE COVINO

JOSEPH NICKLOUS

BEN BARRETT

GREG SMITH

LEONARD MAJORS

JOHN CONLEY

RICHARD GUPTON

JAMES SIMMONS

JOHN O'NEIL

MARK TOUGHIRY

RICHARD HOPKINS

RICHARD MILLER

BENJAMIN MOORE

CL PETTIT

SUSAN NAUMAN

SPEAKER'S LIST (CONTINUED)

MARK RANEY

BOYD STEVENSON

JIM GOLDSTEIN

BRIAN VOS

LON SANTIS

DR. RICHARD TARR

JULIE HECKMAN

DR. REFAAT SHAFKEY

MIKE CALDARERA

STEVEN GENTRY

WILLIAM FINK

SARAH ABDELKADER

DR. STEVE HWANG

DR. KIN WONG

BILL VOCKE

RICHARD BORNHORST

TOM SCHICK

DEPUTY ADMINISTRATOR TIM BUTTERS

PROCEEDINGS

MR. PAQUET: Good morning everyone, good morning. I think I am going to have to lean into the microphone so you guys can all hear me, but good morning everyone. Thank you for coming today, I am Ryan Paquet, I am the Director of Approvals and Permits here at PHMSA Hazmat Safety and I'm your emcee for today so if you misbehave you get to deal with me.

We have a lot to do today so I am going to start off with a safety briefing. Safety is our middle name here at PHMSA and so that's important that we set up those rules. This building has a fire alarm and there is one in the back and I'm sure there is a couple more throughout this room as they can close these partitions off. If that fire alarm goes off there will be an announcement that says what you need to do.

This building is also, this room right here there is also a shelter in place for this building and I don't know if any of you are aware but in recent history we have had to shelter in place in

this building unfortunately. If that happens, look for one of us PHMSINS's or a DOT'er and we will tell you what to do, likely if we shelter in place we will be staring at each other so we will continue on.

Other than that, the rally area for a fire emergency is down by the river, it is really pretty down there, you guys can see the new restaurants hopefully we won't have to see them now. You all have badges very few of you have pictures on your badges so that means once you walk out of security you have to hand over that badge.

To go out of the building you are going to lose that badge, you will have to go through security to get back in. The main entrance which is our closest one, that's the one you would have to come in and come out of, there is another entrance and exit over here but you can't get your badge back through that entrance so the main entrance you guys came in through today that's the one that you will want to go out and in so if some of you have bad habits throughout the day, that's what you are going to have to go through.

Restrooms out any of these doors, take a right at the end of the hallway there are two restrooms right there. Coffee, water all that, I believe that there are water fountains down there but then we have a little coffee shop right here. If you just go out these doors, take a left and another left, there is a little coffee shop with soda and snacks and things like that.

Cell phones we all know the drill, yet so few of us remember to do it. Please silence them, you don't have to throw them away just silence them.

We have a court reporter today Larry is our court reporter. He is going to help us out and all of this will be on the docket following the meeting and available.

Comments we have a lot to do today okay, we have a lot of presentations. If you can see the agenda it is pretty tight, so the way we set it up is we have about ten minutes for the presenter and about ten minutes for comments. That means that if you stand up with a pre-prepared comment that is going to take you fifteen minutes in your dry run, I am going

to tell you to stop, just setting expectations right now.

We want your comments and if you can't provide all of your comments today either right after the presentation and at the end of the agenda you see there is a few hours for comments. If you can't do it in those two time periods then send them in. We are going to provide an opportunity for all of the comments to come in. This forum is so that we can hear your comments. Although I'm joking around and saying that I will stop you if you run over your five minutes allotted time, that I'm not joking around about, I will do that but we want to hear your comments. We need your comments because we need to go forward with, or facing some of the problems that we are dealing with.

If we may ask you when you conclude your remarks to clarify some things that we didn't understand please don't interpret this to support or opposition to anything you said. Please don't be that sensitive it's an R & D forum. We all are trying to find solutions to the problems that both

industry and the office of Hazmat Safety faces.

Before we start the speakers, I want to remind everybody of PHMSA's mission. Our mission is to protect people and the environment from the risks inherent in the transportation of hazardous materials. That's what we base our decisions on, that's how we think so if you hear something up here today that is in contrast to that mission you can always call us out on that, but also if you are opposed to something we say and you are not coming from that vantage point, it is a lot more difficult for us to consider where you are coming from because that is our mission and being a government agency, thankfully we have a noble mission but it also simplifies things because we don't have to worry about the other stuff, we just have to worry about our mission. That's what we are trying to do and we have been pretty good at it. So now I would like to introduce Dr. Magdy El-Sibaie, our Associate Administrator for Hazmat Safety.

DR. EL-SIBAIE: Thank you good morning everyone. I must confess I did not expect this crowd

so I thank you for coming and for participating first and foremost. I am not going to be speaking for too long, I just want to share with you quickly and briefly some of my thoughts, where I believe we are and where I believe we need to go.

And I want you to appreciate and factor in all of what we do today and say that our R&D program is rather small, at least from my perspective it is less than two million annual funding it is very, very small. I came to PHMSA from FRA where I use to run an R&D program at FRA and our budget was somewhere between forty and fifty million in the real side. And I don't know how I did at FRA, maybe some of the audience here can tell me but I thought and I may have been under a huge illusion, I thought we did a fairly well, ran a fairly well program and did a very good job in running the successful or what I felt a successful government funded R&D program.

Some, not everything, not too many, but at least some, few of the items and the products that are being used by many of the class one railroads today, many of these products or at least some that I

can think of originated in my shop and some of the ideas that went into practice and are being used to monitor and inspect our tracks every day today and our equipment, and rolling stock originated by ideas here in government and specifically at FRA.

So I've seen it, I've lived through it, I know what a successful R&D program could look like and what are the basic ingredients and I'll maybe briefly, very quickly share with you some of my thoughts.

Where are we at PHMSA? We are a small agency with a small R&D budget, but with a huge and a big mission. A million shipment of Hazmat, at least we think a million shipment of Hazmat daily in different types of transportation modes and different conditions and different materials presenting the public and transportation workers and the shippers and the carriers with a variety of risks and a variety of challenges.

We are fortunate that we have a fairly mature set of regulations on the Hazmat transportation side. A lot of these regulations, if

not the bulk of these regulations were developed by the industry or in conjunction with the industry so PHMSA cannot take a complete ownership or be proud of it all we are proud of it with you and as a result of your combined efforts that we have in the U.S. we have a fairly mature set of Hazmat regulations.

What we also have in the U.S. we have an industry that by and large, by and large, follows the regulations and wants to follow the regulations so the safety record that we have today is a very impressive and a very good safety record. So why do you need R&D, what is R&D going to do and how is PHMSA going to do R&D independent from the industry, all of these questions we need you to help us better answer and better solve.

I don't believe in a completely independent R&D program that is devoid and completely isolated from any input from the industry. That doesn't work, so we need your input and we need your participation and it may be admissible and acceptable in many cases to have a combined R&D initiative or effort. I look forward to that. It hasn't happened

much in the past, but certainly it could happen, it could begin to happen more robustly in the future but we also cannot have and we shouldn't have an R&D that is completely directed by the industry and doesn't factor in the public interest and doesn't address what we believe jointly with you to be safety challenges.

And on the Hazmat side, I'm not going to say unlike the real side, but even more so that the real side, on the Hazmat side because of the different industries and the different types of shipments and the different modes of transportation, the challenges are far greater and far more disbursed. So we have a lot of challenges and I hope through the presentations today you will see at least, get a flavor of what of the few items that we have worked on. I have directed the staff and I asked and I hope they responded to minimize the amount of time we spend on what we have done, although certainly give it it's fair share, but to spend more time on what we are planning to do.

And even though spend time on how should

we do it, or are we doing it right and can we do it differently, that's my own bias, if the audience doesn't want to do that, if the audience wants to dwell a little bit more on what has been done in the past, that's fine, obviously we will indulge you but I thought we should productively, certainly factoring in the past but as much as possible looking forward.

I have my own ambitions and goals obviously I want to grow the program but I don't want to grow the program for the sake of growing it. I want to grow the program because I believe it's a limit and I believe it's not responsible enough given the needs and the safety conditions and the safety questions that we all have out there.

As an agency and a duty we get I don't want to say distracted, but we get our attention divided between you know different issues depending on the crisis of the day sometimes. It is no secret to many of you that one of the issues that is occupying us and will continue to occupy us in the next few months if not a couple of years, is the issue of rail transportation and specifically Hazmat

include oil, and flammable liquid transportation by rail. Really bulk shipment of Hazmat by rail, where we have a situation where graphically in spite of the best efforts by everybody and I mean that, because I know firsthand what some of the steps that the railroads take and we do have derailments and these derailments occur and there are people who suffer and we had a severe accident in Canada our neighbor to the north where fifty people, almost fifty people lost their lives completely in an entire town, a beautiful town, I've seen pictures before the destruction, I wish I could live there. A beautiful town that was the center of the town was completely wiped out and I invite you if you have not seen already looking at the aerial photos of the site after the derailment, a complete disaster, all because we are shipping crude oil and we have to continue to ship crude oil by rail because that is a viable commodity and our options are limited.

So you can imagine the immense amount of safety and technical challenges that our staff here faces, along with the industry and everybody else in

insuring that that gets done and more safely. So there are many, many questions and there may be R&D issues and challenges that may arise from that situation but I will tell you what also I would like to do and what I have begun to do at PHMSA.

We want to build on a risk based approach. We want to have all of our steps, whether it is allocation of resources which issues we need to pay attention to, which issues we should pour some money onto, I want that to be done based on risk, truth and risk, truth and harm to society so if frankly if one issue seems to be hot because there are so many questions but we see from the risk exposure that it is not representing a whole lot of risk to us, we really need to be careful with throwing resources at it, so that's what I've done and that's what I am doing and so there is a pattern and process here that the R&D program hasn't fully meshed in how can we get all the risk analysis that is being done in a different, a different department in my office and how could that risk analysis and the data analysis and a more complete and better understanding of you

know, what we should worry about and how could that then drive also some of the R&D agenda.

I am proud to have Lucy DiGhionno, on our staff now she is managing and Lucy you will get to hear her and see her today, Lucy is now running my R&D program and I have full and complete faith in her and her skill set and her abilities and I look forward to her and her staff taking us into that direction, so we need to be more risk driven and we need to begin to craft our programs and allocate our resources based on where the greatest risk is.

We are not there by any means to date but I hope we can get there. We are not there because the risk piece itself is not completely where it needs to be but again I have a lot of good staff in Felicia's group and Felicia herself working to help us define that piece and I see Felicia sitting in the back of the room.

Many inputs are thrown into the R&D question industry needs, departmental needs, perceptions by us and by the public and by you know, and sometimes even it's not clear what made the

particular project a priority sometimes international meetings may throw a challenge at us or require us to look at something.

The accidents obviously clearly drive a lot of the problems we look at, so it's fine and I don't want necessarily to have single input, I think it's appropriate for the R&D world to observe all of these inputs. What is crucial for the R&D managers is to work with the industry and work with the stake holders and try to figure out - out of all of these inputs, what should come out, what is the right picture, what is the right distribution and what are the specific topics we need to work with and that's I think the challenge that we are trying to meet today, that is why we invited you we want to show you what we have done.

Please forgive us if what you think what we have done in the past is not what we need to do and factor again into your judgment that this was a very small program run by one staffer only, or even sometimes half staffer, half full time. We are changing that we now have more staff dedicated to the

R&D question and we are trying to tie in the R&D program to our mission and again I thank you for indulging me this few moments this morning. I will be here until noon if anyone wants to ask me or give me any specific input, I will be gone at noon but I may come back or not, depending on my time, but I will try to come back if I could. Thank you so much I appreciate it.

MR. PAQUET: Thank you Magdy, that ends the only comment set that I will not interrupt, okay if necessary, just putting that out there. So Carole that leads to you, Dr. Carole LeBlanc, the Director of Engineering and Research.

DR. LEBLANC: Thank you Ryan. I have the best and easiest job today. I have seen the audience and new friends, in particular from Canada, because of TRB just finishing up. And old colleagues, not chronologically old, mind you, but colleagues that I have worked with in the past from folks from the Department of Defense as well.

So all I am going to do is thank staff but you know how that goes on and on but that's not the

case here. Besides thanking Mr. Paquet for being our emcee, I would like to extend my gratitude to the admin support staff that has done all of that printing for you, for the while papers, we sometimes forget to thank them. Miss Tanika Dyson if you bump into her, tell her you appreciate that.

Then I would like to point out a couple of key staff members, Dr. Kin Wong in particular, Kin if you wouldn't mind standing. We are a very skilled set of professional people but we are also tend to be too humble and so I wanted to point out the wonderful work that Dr. Wong has done with the Federal Asian Pacific American Council, am I getting that right? FPAC and that work in terms of promoting equal opportunity as led Kin with recognition from the department secretary and now all I have to do is introduce Lucy to do and Magdy has already eluded to the fact that she is our fairly new R&D chief.

We are delighted to have her in the engineering and research department, division, excuse me. Her previous positions include serving as a senior technical advisor for the Department of

Homeland Security and as the lead for the U.S. Navy's F35 chem bio program. Lucy comes to PHMSA with a Bachelor of Science and Master's Degrees in chemical engineering from Villanova.

Her major accomplishments also include building a new hazmat manufacturing facility which gives her a wealth of mechanical engineering expertise as well so without further ado, Lucy.

MS. DIGHIONNO: Good morning everybody, thank you all for coming to the inaugural event. We are going to try to have this event every year so we want to get a good feel for how you like this event. Of course we are going to have a suggestion box, so any ideas you might have for improving or things that you like about the event, please let us know. Maybe fill it out towards the end of the day so give us your comments, if you want to be anonymous, be more than happy to not put your name down, we just want to make sure we mention that first and foremost.

I did check the federal register and I did not receive any comments from you all so that was what I was mostly going to cover today, is if you

have any comments regarding this presentation that we are going to have today. So if you have comments regarding the presentations let the presenters give their presentation to you and then go ahead and then ask your questions.

We did dedicate some time at the end of the day to allow you to give us your comments regarding our future work. Most of our future work, but again also anything that we did cover towards the beginning of the presentation so that is how we structure this presentation today and again if you think there is a better way that we have this forum in future years go ahead and write it up.

Maybe that kind of item maybe that's best to write in the suggestion box, the comments for the suggestion box. I think that would be more of an item to cover in that write-up, I think we want to concentrate today on the projects that we are presenting. The champions of these projects did a wonderful job with these projects, but go ahead and allow them to present these projects to you and ask them your questions on either the work that they

performed or the work that they are currently working on or give them your ideas on projects that we are looking to perform.

Any Ryan if you could with this website that we have created, if you go slide down and click to R&D, research and development there at the left, I'm sorry the right, all the way at the right, right there. You slide down and you can see there is a new link to R&D white papers. I don't know if any of you have had the chance to look at that that was just posted, right there, R&D, R&D, white papers right there.

This is a new item that I just created, I had most of the champions go ahead and write white papers for projects so you wouldn't have to read a long forty or sixty page report, because I know a lot of you are very busy so you might like to read, if you want to click on one of them if you like Ryan so you could probably take the time to read a one to three page report on some of these great projects that these champions have worked on to give you an idea on some of these projects.

Something that I had actually done at the Department of Defense previous work so again you could write that up and say I think that's a great idea, if you don't like it or maybe you could change the way it's formatted, we think it may be a good idea if you add this to this topic, or modify it in this fashion, so we would like to get your feedback before I move any forward with this idea.

And at the end of this project today, we are actually going to post all of our presentations as well. We didn't want to do it until afterwards in case we wanted to modify it in any way, in case you thought well maybe we could change this in some fashion. Any questions or comments, and I'll let the presenters go ahead and present each project instead of myself doing any kind of talking in that fashion. So yes ma'am.

AUDIENCE MEMBER: Hi, it's a pre-recorded meeting.

MR. PAQUET: Yes. So hi Cynthia, yes I have a microphone and we are going to allow comments afterwards, after each of the presentations but

please when you are giving your comments, please do state your name and your affiliation so that Larry here could capture all of that information for us. Cynthia would you have a comment now because I am going to keep you to a tight timeframe, okay. Hold on, I am going to bring the microphone to you I want to be close to you.

MS. DIGHIONNO: You knew he was going to say that.

MS. HILTON: Okay Cynthia Hilton, with the Institute of Makers of Explosives. So just generally as we all know and we are thrilled that you have an appropriation for FY14, congratulations, and a chart was just released of the project that you are doing so it looks like you have money that might not be committed yet, so are you opening this forum to receive ideas? I understand that we are going to hear projects which are ongoing which is great and we will comment.

MS. DIGHIONNO: And proposed projects. We are looking, we are going to present to you proposed projects, get your feedback on those proposed

projects, which we are looking at funding in the future and we want to make sure and get your comments on those projects before we move forward and go out to bid.

MS. HILTON: Okay.

MR. PAQUET: No the comments, we are not going to tell you to put in your comments but I will tell you that we as human beings, we would like positive comments too so if you have any of those please provide us those.

MR. BARRETT: You are doing a great job Ryan. Lucy, as far as, first of all the Hazardous Materials Cooperative Research Program now is no longer funded and I thought that was an excellent program because industry and government could work together and come up with ideas and were vetted to a committee that was unbiased and objective, so now you have this program, one question that maybe Magdy could answer this better you know is what is your perception of the HMCRP, is that something that you would like to see funded in the future and then secondly as far as ideas for research, if industry

were to submit these white papers or suggestions for research that we thought makes sense to get some of the risks and issues and cause safety concerns for the public, how can they be submitted and how will they be vetted in order to, how are you going to determine which projects you are going to fund.

AUDIENCE MEMBER: May I make a comment?

MR. PAQUET: Did any of you read the agenda? Is there a comment period right now?

DR. COVINO: I just wanted to make a comment because I'm vetting and stuff, I'm Dr. Josephine Covino from the Department of Defense and one of the comments I have is that if you want to get good ideas, the Department of Transportation, I think that you should respect the proprietary aspect of industry submitting proposals, so for example, putting their proposals on a website, you know if it is an idea you need, you should respect that and I don't know how you want to handle that, I don't know, everything is open forum but I think that there are some limitations and I think it would go a long way in getting some very good ideas.

MR. PAQUET: I don't know if right now is an appropriate time to talk about HMCRP or any comments on that but you can certainly track down Magdy or anybody else. As for, and I'm just you know the Approvals and Permits Division Director so, other people are in the room, but I am pretty sure that we are open to comments, we want to know what's going on, we want to know all of your comments, all of your suggestions, this is why we are here today please feel free to make short comments today, up until the afternoon anyways and then provide us comments both either to the docket or directly to Lucy after this forum is done.

And again comments on how the forum was run and what we can do next year you know, whether it should be two days next year, there is all kinds of ideas that we have heard already this morning so we welcome those as well.

All right so we are going to start, we are going to start right now with Joe Nicklous, the Chief of the Sciences branch.

MR. NICKLOUS: Well thank you for all of

the introductions from Magdy, Carole, Lucy, Ryan and thanks to everybody for coming. I am hopeful that this is a positive day and there are positive outcomes from it and I think it's just a learning experience in how to run it and how to get it going.

As everybody has already said all of the comments are going to be appreciated and looked into and taken so without further ado I drew the short straw and get to make first presentation so try not to beat me up too much, thanks Ryan.

So we started the research project within the UN manual testing criteria, the UN 6c test is more informally referred to as the bonfire test. There are multiple ways of conducting the test, set up and procedure. Typically what is used within multiple, within all the different test facilities in the U.S. and around the world, is either wood fuel or liquid fuel for the bonfire.

We decided there is a section in the regs or in the manual testing criteria that describe what a propane or gas fed fire would look like and need to be able to produce for that test. So we set out to

figure out how to set up this type of a fire and how to describe it so that others may potentially use it down the line.

So first question why develop a gas fed UN 6c test assembly? First it's a lot easier to sustain a constant temperature of 800 degrees c which is the criteria within the manual. Typically the cleanup of a wood fuel fire or liquid fuel fire is a rather long labor intensive gas fire you can kind of just shut off the valve, let it cool down and then just clean up the product, not necessarily all of the fuel as well.

You get to shut off the fuel when the reactions are complete, typically there is a little bit less cool down time when you associate a gas fed fire. Liquid and fuel, wood fuel typically gives a little bit more thermal radiance and your surrounding area will get hotter you have to apply water into the wood fuel or a suppression agent to the liquid fuel to stop the reaction and it would just create a bigger mess.

Fuel savings potentially at least right

now I believe the gas cost is a little less than some of the other types of materials and a little bit more environmentally friendly. So as I said there is a description of what this fire would need to do and look like in the UN manual testing criteria the chapters and paragraphs are up listed up there.

The set up that we used approximately covered two and a half square meters and was fabricated completed out of carbon steel inlets for gas at either end of the running pipes of gas feed underneath of the product when you test it. And we also wanted to determine the number the minimum number of cylinders necessary to achieve a thirty minute fire which is what is described as what is needed in a maximum scenario.

Obviously, if all of the product reacts prior to thirty minutes, you can shut it down beforehand and not consume as much fuel. Experimentally we determined that there were twelve cylinders that would be needed and they would need to be sufficiently surrounded by a water bath to maintain the temperature of the tanks to keep the

flow steady enough to sustain that fire for the two and a half square meters.

That's a photo of the test setup, I don't know what else to really describe. Two and a half square meters, you have the test grid on top, the four vertical pipes if you will are doing nothing more than holding thermal couples to determine that the temperature is being sustained, sorry, the temperature is being sustained above the fire and that's really all that is showing so the first test that we did and let me just sidebar real quick, there was multiple tests that were done to determine what those, the number of cylinders that are needed. We eventually got to the point where we could sustain a thirty-two minute test and it could have kept going quite frankly. We recorded that test two different methods, a regular video camera and a high speed video camera. We did achieve a constant temperature, approximately constant obviously there was always going to be a little up and down of 800 degrees c for the entire time.

The total consumed materials is 8.3, 8.4

kilograms per minute for the fire itself which works into .7 roughly per cylinder just to elaborate on that, in theory you could conduct this with a fewer number of cylinders based on the consumption however, given the rate and the cool down effect of the cylinders in order to sustain that 800 degrees for thirty-two minutes the twelve ensured that that product or the propane fed the fire, didn't ever shut itself off to do the cool down effect so you can tweak the number of cylinders that are used, you just have to increase the water bath around the cylinders to keep the cylinders producing the propane fast enough.

So there's a photograph of the propane assembly it just shows a nice clean burning fuel relatively familiar to any of those in the explosives industry that have seen a 6c test, obviously a little bit different, you don't have a pan for liquid or a big stack of wood underneath.

So after the proof of concept if you will, the thirty-two minute test that we did, we decided to do a demonstration test. We just wanted to show some

of the other potential side benefits of running tests in this fashion as opposed to the other two more commonly used. We took two packages of a propellant commercially available, each of those packages had two inner packages containing roughly eight pounds of powder.

One was placed in a single wall, one was placed in a double wall, they were placed in a test stand, exposed to the propane fire and we also instrumented the fire with thermal couples radiometers at various distances which kind of mimics some of the criteria in the 6c and during this test again, this is not a full 6c test, it was just a proof of concept if you will, a demonstration that shows some of the other side benefits like I said, but just as a side note, none of the, during this test there was no experience of a four kilowatt at 15 meters, just a nice little side note.

Again, there are no real conclusions there, solely because it wasn't a full 6c scale up, there wasn't any witness screens or anything along those lines, it was just a demonstration.

So in summary, these were some of the other side benefits, some of them I've already kind of talked about. Cleaner burning it doesn't give you as much smoke as the liquid fuel, it doesn't give you as much smoke as the wood fuel either, and it also gives a little bit better environmental impacts. You can shut it off, you don't have to throw extra just to make sure the fire is going to continue long enough to react to all the product, much cleaner burning, typically you could probably see the reaction is a little bit clearer, you don't have that smoke again.

The thermal irradiance from a gas fed fire is typically more constant and is less than either wood or liquid fuel and since you can extinguish it easily after everything has been reacted to the fire, there are some cost savings, given the fuel consumption as well as the ability to quickly run back to back tests due to that cool down that I mentioned earlier and that's really all I have about the tests that we have done so if there is any questions and or comments.

Oh, sorry Cynthia, Magdy did remind me, next step. This is going to be, we have already given an introductory paper to the last UN SCOE TTG meeting basically saying that we have conducted this, that there is a paper that is going to come this will be presented at the Igus EPP meeting as well as the next summer session of the subcommittee of experts on TTG. Again this is just an option for test labs to us, not necessarily a mandate it is just letting people know that the feasibility of setting up and carrying out a gas fed fire in lieu of the traditional wood or liquid fuel, just an option, so.

MR. PAQUET: All right so this is our first foray into comments, I did see a hand go up, we have ten minutes for brief comments and then we will have some opportunity later in the afternoon so if you don't get to say everything remember that.

MS. HILTON: Okay hi Joe, thanks.

MR. NICKLOUS: I need your name Cynthia.

MS. HILTON: Hilton, Cynthia Hilton, Institute of Makers of Explosives. We are very interested in this project and so we wanted to know

and I also want to relate it because later on there is supposed to be a presentation on the bonfire testing, and information that we got from the department yesterday doesn't list this as a project so let me try to narrow this down to a couple of questions for you.

I am still confused maybe I'm the only one in the room, it sounds to me like work has been done but it is not reflected on or is it on this table and I just don't know what you are calling it but it is already on this table, one, two, when you get around later today and you have the presentation on the bonfire test is this like a part of that larger study?

Three we are really thrilled that you are doing this kind of investigation we are totally supportive of that. We wrote Carole a letter back I think in September telling her how important this stuff is so we would encourage you to continue this work and the last question that our guys want to know is, is this like an authorized way of doing things now, I mean they really like for all the good reasons

that you said and the ability to use this option in testing, they wonder if you have more specific information like numbers of burners okay you get the idea.

MR. NICKLOUS: All right I will try to address them very quickly. Yes it is authorized now, like I said it is described in the UN manual testing criteria. Yes there will be more detailed information like I said it will be presented to the Igus Committee, EPP as well as the subcommittee of experts. That paper will contain all of the engineering diagrams and everything else that you would need to basically mimic this test.

Again, it is already authorized, it just it hasn't been widely done and there are some technical reasons why it hasn't been done because it is a difficult setup to sustain that combustion for that long of a period of time. I apologize I don't know exactly what table you are talking about but we can update that if it is not accurately reflected and yes it does kind of feed into the larger study but you will hear about that later. This was just one

that's kind of already been completed and is getting ready to be presented which is why it is kind of first on the list.

MR. BARRETT: Hello Ryan, thank you. I'm Bill Barrett, Sporting Arms and Ammunition Manufacturers Institute, otherwise known as SAAMI. Hello Joe, thank you for this presentation and the work that you have been doing. I think everyone is interested in doing technical improvements to the methodologies for improving the test, and I know that PHMSA has already presented this at various forums and other countries also have some input I think that could be of use.

One thing that we are concerned about as we looked at this research and also the 6c improvement project that is going to be brought up later I think, is that we support general research that will produce facts which they can be assessed and reactions can be taken.

But what we've been concerned about, and we are especially concerned to see it again in this test, is that that in the other project, is said it

was improving the whole test but it was specifically only tested smokeless powder in very confined scenarios and this again deals with smokeless powder and we just wish to note that the UN manual testing criteria is specifically non-prescriptive, it does not lend itself, just prescriptive enforcement and specifically says that it must be interpreted by experts otherwise the results will not be valid so we support the work but we would be leery of seeing it focus on one particular product and draw conclusions which may later color people's thinking on how allergic their product is classified when if you tested other products you may see that they cleanly fit within the boundaries, thank you.

MR. NICKLOUS: Yes, thanks Ben, like I said we took a commercially available product and it was just more of a demonstration of the test assembly. It wasn't trying to draw any conclusions regarding the final classification of that, it is literally just to communicate the ability this type of a set up to meet the description within the UN manual testing criteria for labs worldwide.

I mean I completely agree with you that you know we want to base it upon facts we just want other people to be able to see how to set up and run this particular style of test, for some of the side benefits as I have already kind of noted. Not necessarily going back and reinventing the wheel of all the different classifications, you know I think it would be beneficial to see some of the test sites potentially utilizing this and seeing if there are potential changes to the classifications.

Maybe this makes it a little bit easier to determine when things are on the borderline cases. But again it's just a set up procedure. It doesn't necessarily have to go into the UN we just want to share the setup, the test apparatus so that other labs could potentially utilize it.

MR. SMITH: Hi, I'm Greg Smith, one of the principal investigators, a principal investigator on one of the current HNCRP projects and I have a more technical question, a sort of curiosity. It seems to me that you have done a very good job of designing a test that uses propane to mimic an actual burning

fire and I am curious if the fire element is critical or if you are simply wanting to achieve the temperature indicated because if you are simply looking for the temperature, you might be able to create a slower moving forced air flow of hot gasses with a control burn and use that to achieve the temperature instead of really quite a large amount of fuel, and so I'm just curious if you have considered that or if there is the need for a natural fire is critical.

MR. NICKLOUS: Thank you. Off the top of my head no that hasn't been considered and I can definitely have this in depth conversation with you subsequent to this if time starts to cut short Mr. Paquet. But within the UN manual there are three setups, three different options that are per described, I won't say prescribed but described. The liquid fuel fire, the wood fuel fire and a gas fed fire. This criteria, pretty nonspecific criteria that need to be met, thirty minutes, 800 degrees c, then it tells dimensions, there's not much more than that.

To add another option of a style of test would probably take, actually let me rephrase that, it wouldn't take a change to the manual because you could always run a new type of test based on a competent authority's decision, so things along what you are describing are definitely an option. They have not been considered yet and I think it would be something to undertake, but it would be starting from something that hasn't been considered before, it would be much broader, deeper, bigger, longer type research and if there are potential benefits to it, it's something that I think we should consider and you know if you have any ideas the write up would be great.

MR. PAQUET: Thank you. There are no other comments on this so we are going to move on. So good job guys, eight minutes and thirty-three seconds, see we can do it. I was a little leery, I didn't know if we could but we can so. Just trying to get everybody out on time, so our next presentation is about nurse tanks and, oh here's Leonard, great, Leonard Majors.

MR. MAJORS: Good morning. My name is Leonard Majors, I am with the Engineering and Research Division, I am engineer with the engineering branch here to present the nurse tank safety project. The project was a collaboration between the government, FMCSA, is David Goettee present? David Goettee he was responsible for the FMCSA piece of the project, James Simmons and I represented the PHMSA aspect of it. We also have Virginia Tech, Iowa State University also we had many industry partners, such as Trinity and some of the builders that were also peer reviewers of the project as well.

The study was conducted in two phases. Phase one was December 2008 until May 2011. During this phase we were trying to get an idea of how to examine the tanks, if there was a stress corrosion cracking, crack growth rate and we tried to do some computer modeling in that first phase.

Phase two began in October 2010 to August 2013. We wanted to know did pinhole leaks cause certain ruptures, certain failure of the tanks. We also wanted to know the effects of stress leaving or

a possible heat treatment. We did a survey of five hundred tanks of ultrasound in the wells and also we did another, we wanted to go deeper into the stress corrosion cracking and study specimens in three conditions.

As some people in the room may know we have nurse tanks that have been in service since the 60's, they are still being used to the day. There are no testing requirements as of yet, that was part of the study for us to come up with this. We do have testing requirements for nurse tanks that are missing the ASME plates. As you can see if you get a large enough crack, this is the result.

For the pinhole leak aspect of the project, we just wanted to ask a couple of questions. What causes pinhole leaks and can a pinhole leak cause the effect that you saw on the previous slide.

What causes pinhole leaks is weld veracity. That means your welding, where the weld is wet that could have rust, some kind of contamination in the well. We found that it is very unlikely that a pinhole leak could cause to set in the failure that

you saw earlier in the picture.

Phase two of the study as I spoke earlier, we had two hundred sample of leaks, divided them up into three environment samples. Half of the samples were in the vapor space, half were in the liquid and these samples were put intense stress in a range from 25 to 95 megapixels.

These are the three environments, and hydrous ammonia and hydrous within serve and you know we vacuumed the tank and tried to create a pure nitrogen environment and hydrous.

The findings, we noticed that the purged in or any of the cracking that we saw in serve didn't cause more cracking but we saw that it has some corrosion effects. And we kind of found out that some recommended inspection terminals could be calculated based on what we saw from the specimens.

Stress relieving, basically after you complete your wells, you put it in the over you raise it to a temperature and it relieves the effects of the welling process in the heat affected zones and we tried to use the technique that is going in the next

slide to see if we could measure how much the reduction of the stress would be.

This is a picture from Los Alamos, they did neutron diffraction in the weld area as you can see this weld is way joined as shell to the head, that is the high residual stress and that is where the analysis was performed. We saw the residual stress was lower by thirty percent on average. We used stress relieved on the nurse tank itself and we found out that when you use stress relieve you get less cracks.

This is going to the tank survey, the students at ISU were trained in the EDE methods, using angle beam ultrasonic base, they had a procedure where they had to inspect all the wells, seam wells, surface oil commercial wells, wells on the lakes that adjoin nurse tanks to a chasse. Only nurse tanks with legible plates and tanks that we could get data from all those, those were the only ones considered.

It typically took two to four hours to get around the tank. Some of the results you know as you

can see ninety percent of the indications that we found were in that well from head to shell mostly in a perpendicular plane and what we found out was that pinhole leaks are not critical to the tank, you know, we found out that stress corrosion cracking happens mostly in the break area, also post loyal heat treatment can reduce the stresses and reduce the cracking.

And as mentioned before most of the indications were found in the heat effect zone, eighty-four percent of the indications were in the heat effected zone and most of the, well it will be in there but most of the younger tanks from 1999 or after, because there are different types of materials, thinning steels, we found more indications in those than the older tanks.

That concludes my presentation.

MR. PAQUET: All right so now is the time for questions on this topic.

MR. CONLEY: Good morning, my name is John Conley, Artist formerly known as President of National Tank Truck Carriers. Two questions, have

you developed some information that can be used in also looking at MC331 cargo tanks that are in this type of service and secondly did you look at all or have you been watching at all the performance of these tanks in the shale oil field environment?

MR. MAJORS: We have not particularly looked at the shale oil field environment but we do know that some of the materials that are pulled out of the shale would be consistent with hydrous ammonia effects but we haven't officially looked at that aspect of it.

Going to the MC331, we were trying to separate the two because the MC331 you have testing and inspection criteria already so we were trying to focus on the nurse tank aspects so we can try to bring it up to that level.

MR. CONLEY: Thank you.

MR. GUPTON: My name is Richard Gupton, I'm with Agricultural Retailers Association and I have I guess several questions. The first question would be I think you said you reached out to some of the private industry you mentioned Trinity who makes

tanks. I saw listed, was Dow part of those studies as well since they are the maker of the product, sell their product?

MR. MAJORS: I don't know specifically if they were involved, they may be indirectly involved so I couldn't tell you that.

MR. GUPTON: The other question is you mentioned some students take five hundred and thirty some tanks, how did you select the tanks? How were those, you know how was that process, which tanks you decided to test?

MR. MAJORS: Well as stated in the presentation we wanted to keep the nurse tanks to the legible plates, plates that had data plates, but most of them were done at the Iowa co-ops in the area around the university.

MR. GUPTON: So you went into the local co-ops, you went there and got their volunteer participation?

MR. MAJORS: Yes.

MR. PAQUET: Great. Any other questions James?

MR. SIMMONS: James Simmons, PHMSA. I just want to express the gratitude to the industry as well as the CSA all in the development of this project. This particular project involved a lot of universities and students and demonstrates industry's cooperation not just with CSEN but PHMSA so this is an example of what we have previously they also might have mentioned about the collaboration across the board. This is also the model that we can look forward to using to allow our future research to be developed so I just wanted to explain that and thank you as well to you all for that process.

MR. O'NEIL: John O'Neil from Nortico. The question is regarding the ultrasound, I understand it was students, were they qualified and certified or are they just inexperienced students?

MR. MAJORS: Well Iowa State has a professor who has experience and he was overseeing the students and he trained them personally so.

MR. O'NEIL: Okay the other comment I had was I just want to say that there is no depth sizing technique available, that's incorrect. It is used

regularly in the nuclear industry and my question was-was there any attempts made to have depth measurements that you achieved?

MR. MAJORS: We were more concerned with crack leak and crack propagation more than depth.

MR. O'NEIL: Aren't they related though?

MR. MAJORS: Yes they are related but for the focus and the aspect of this and the timing of the project we weren't able to go into the depth aspect of it. That was something that was discussed in a future phase but we are actually discussing what efforts, what will be the next phase so, correct depth is something that we were aware of.

MR. O'NEIL: And so if you have some understanding.

MR. MAJORS: And we are open to suggestions on.

MR. O'NEIL: Some suggestions on how we can do that please.

MR. PAQUET: Exactly. All right, well done again, you guys are making me so proud. Great time so let's go ahead and take a twelve minute break

since this ended a little bit earlier than normal, trust me I will start in twelve minutes, restrooms are over there in that corner and the coffee shop is right out here to the left.

MR. PAQUET: All right so our next presenter is the same as the last presenter, Leonard Majors, cargo tank rollover special study, so ahead, you are on the clock.

MR. MAJORS: Good morning again I am Leonard Majors and I am here to talk about the cargo tank rollover study. Rollovers are you know, approximately twenty-two percent of all HM crashes involving cargo tanks. According to the FMCSA study you know we found human drivers are the number one contributor to rollovers.

What we propose to do in our research is to determine the impacts of the rollover video that was produced by FMCFA. We would like to know has that any effect on driving behavior, has any incident reduction occurred, do we need to go further with outreaching with that video.

Also what we want to look at the train

requirements in the 49CFR to determine if there is any additional you know measures that we can take at PHMSA to improve and reduce the number of rollovers. Also we want to research and probe the industry to see what training requirements are, what training policies are that you have that we could piggyback on or highlight to have an effect on rollovers.

And in addition we did a survey over a year, we started in October 2012, we are looking at rollover incidents base week, any rollover incident that occurred in the one year period we were collecting data on it and trying to find out you know, speed, road conditions, weather conditions and we were trying to determine how we can pursue what the driver experiences, thank you.

MR. PAQUET: Before I see if there is any comments, I just want to make some clarifications now, we are on the ongoing parts of the research and development projects, the ongoing projects and then later on today we will start talking about proposed ones so if it seems a little shorter than the first one, that's why because they are ongoing.

Also you can see on the agenda we use the words contain, communicate and classify because that is the three c's of the hydrogen regulations. Classify, contain and communicate and there are some other c's and we will talk about those. Anyway, I will open it up for questions.

MR. CONLEY: John Conley, a question first, I read through the white paper, I retired a long time ago, two weeks, and there's a statement here that I want to make sure that we are using the same language. It says during the first and second quarters of fiscal year 2013, there were a total of thirteen incidents involving death or injury. Was that death or injury because of the crash or because of the hazardous material?

MR. MAJORS: Where it says here it was in the first quarter. We are still trying to you know go back and get coroner reports on the incident, more data on the incident and that number may be a little high or it may be a little low.

MR. CONLEY: I would suggest for all of our sakes, the agencies, the industry and everybody

else's, any time that a number like that is used that we break it out because we know that there is not probably thirteen deaths for hazmat a year. So I think it would be good for everybody, your contractors, yourself, and industry to point out the number of deaths from the hazmat, since this is a hazmat study, just an observation that I think would help all of us, thank you.

DR. COVINO: I know you didn't think I was going to say anything. I'm Josephine Covino of the Department of Defense. The question I had on rollovers, I would encourage you to measure all of the mechanical turbulence in that rollover. Mostly understand the shock loading that you could have inside the truck and the reason being that we within the Department of Defense have evaluated our commodities and how we, what the rollover frequency is and what the drops is so thus giving what the shock loading would be to our systems.

That number goes a long way in helping us improve the classification process and it would be nice if you get an independent value on that number

from and I could talk to you on what the numbers are.

MR. MAJORS: Okay thank you.

MS. HILTON: Cynthia Hilton, Institute of Makers of Explosives, we all know what a cargo tank is but I just want to make sure that this project is limited to articulated vehicles, the reason I am asking is that a couple of years ago straight trucks, there was a lot of discussion about stability control and our straight trucks we provided the department with a lot of data about our relative center of gravity. We operate most of the off-road conditions which are very unstable to roadways and so we just want to make sure that you are just looking at cargo tanks right now, you are not looking at straight trucks.

You are when you are talking about stability control and I don't want you to answer John.

MR. SIMMONS: Well twenty-five percent of cargo tank rollovers are straight trucks. That's a problem.

MS. HILTON: Why do you have the

microphone?

MR. PAQUET: Because you handed it off to me.

MR. SIMMONS: As we all know cargo tank rollovers have been with us for quite some time. We are taking a serious of steps including video training including a study that was done in 2009 and the results of at least that particular study, identify that drivers contribute to these rollovers, that's number one, the majority of them.

Number two is that yes there are other things in that study that we did previously, that was related to the electronic stability of those great road designs and different things of that sort. We want to focus on primarily, is those contributable actions of the driver. Now TRV has provided us a study and John I believe you were a part of that with the role of human factor in preventing cargo tank rollovers so what I believe we are trying to pursue is the opportunity of looking at the driver's piece in this.

The electronic stability and other aspects

of the cargo tank itself is within another department. Our friends at NHTSA are making some headway on that so what we want to do is focus on the ability as it relates to the training of the driver.

MR. PAQUET: All right any other questions about this ongoing project? I will just point over to this front table here, well thank you Leonard.

MR. MAJORS: Thank you.

MR. PAQUET: All right, sorry that was definitely I meant Mark.

MR. TOUGHIRY: Good morning. As you know the time is limited, they told me no opening jokes, no introduction, perhaps most of you know me but I am going to introduce my name anyway, I'm Mark Toughiry, the old timer at Hazmat, engineer of research. The subject of my presentation today is just emission is an ongoing project that started with the Department of Defense Navy with the collaboration of PHMSA engineering department and its ongoing and the collaborator for the ongoing project is basically all of the municipal fire stations in the United States.

I would like to personally thank and

appreciate all of that was donated for this ongoing project that we have. Let's get exactly to the content of the project and what are the objectives of us doing this kind of project.

I am sure most of you know that self-contained breathing apparatus these are commonly called air cylinders, these are the cylinders that fire fighters put them on the back to fight the fire. Traditionally they were steel cylinders, lately for the past twenty years or so there is a wide usage of these cylinders that are made from composite structure and that I am going to tell you what we are trying to achieve from this project.

Number one we want to assess the cylinders to see how safe these cylinders are when they are reaching the end of their fifteen year shelf life which was originally designed for these cylinders to be used.

Number two basically we thought that since we are doing a lot of destructive testing, we are doing a lot of performance testing, let's now try a non-destructive testing and see if this technique

could protect the cylinder well ahead of its failure so for this project we are doing physical testing and non-destructive testing.

Briefly I describe what these composite cylinders are that I am referring. The most commonly used composite cylinders in the United States and perhaps in the world are the composite cylinders that are fully wrapped with carbon fibers and most of them are metallic liner and most of them are aluminum liner. With that DOT has established DOT CFFC which stands for carbon fiber fully wrapped composite cylinders with reinforced aluminum liner commonly called DOT CFFC.

The cylinders there has to be a composite cylinder that we are talking about are usually most of them are 6.9 liter volume, they are designed to last forty-five minutes, service pressure is 4,500 psi which as you know is pretty high pressure and they are designed to be used for fifteen year service life. Liners are made out of aluminum 61 t6 and the shell is commonly carbon fiber with resins in the way of glass.

There is a safety factor for these cylinders which is 3.4 simply is the ratio, burst pressure over such pressure. As I mentioned we have performed two types of testing, mechanical testing is simply what we have developed this mechanical testing to be, to take an old cylinder and treat it as a brand new cylinder. We have applied all of the testing that are required to qualify a brand new cylinder to go into service for fifteen years.

And parallel to that mechanical testing, we have also applied nondestructive testing. Mechanical testing for design qualification of cylinders which will either reach the end of fifteen years or they were very close to the end of their fifteen years, includes burst testing, fatigue cycling testing, flaw testing and drop testing. If there are manufacturers among us these are basically all of the fundamental testing that are required to qualify a brand new composite cylinder.

This is a typical burst testing and it is set up for fatigue and cycling testing which basically the fatigue cycling testing we started for

100 psi and brought the upper pressure to status pressure at 65 degrees centigrade or 149 degrees so it was the developed pressure of the cylinder.

This is a flaw test assessing which simply we took some of these cylinders we damaged them on purpose to measure damage and then put them in tests to see how they last.

This is a typical drop testing, which basically met all of the, we tried to duplicate the brand new cylinders and also pushed the envelope a little higher by increasing the height and the weight.

Two nondestructive testing were applied on every one of the cylinders during this mechanical testing, or strain gauging, but basically were measuring the stress, applied the stress on the cylinder during the puncturization and also a parallel applied non-destructive testing called mortar during the initial testing.

This is a typical straight aging set up and basically if somebody would ask what is more than the configuration testing, this is a fairly new

technique, the principal of this testing starts from acoustic emission testing, which has been used in the United States across the board for over twenty years. This is just the typical set up, the stressor set up on the left, on the right the result of the cylinder which has defect and predicted to be failed before it makes any burst pressure.

Conclusion, by the completion of this recent project we are hoping to get the following conclusion. Whether or not this CVA, DOT CFFT cylinders could safety be used beyond fifteen years. Secondly how could we apply this modern configuration during the de-qualification to detect any unseen problem that occurred during the operation, with that I go straight to the questions.

MR. PAQUET: All right, who's up, yes?

MR. HOPKINS: Richard Hopkins, International Association of Firefighters. As you are talking about forty-five minute cylinders are you doing any testing with thirty minute cylinders and sixty minute cylinders?

MR. TOUGHIRY: The answer is additionally

no. That is exactly why we picked forty-five minutes to basically stay in between and to see if the result would be a little more relevant across the board. Also as far as I know forty-five minutes are the most commonly used cylinders.

MR. HOPKINS: There is still quite a few fire departments that are using thirty minute cylinders and Hazmat sixty minute cylinders are out there in use as well.

MR. TOUGHIRY: So are you concerned that the data may not be applicable to thirty-minutes?

MR. HOPKINS: Yes, I am just wondering again if something like the drop test, if there would be any difference you know between the size of the cylinders as far as the way it would impact, and are you looking at the move the cylinders maybe as far as maybe any heat that they have been exposed to on the, that you could tell from, you know the outside of it?

MR. TOUGHIRY: Yes, thank you, that is an excellent question. We are looking at the cylinders which when used for close to fifteen years in all kinds of conditions so the cylinders you are getting

in your shop for testing, there is a large number of samples we are testing, could be any of the above and we also of course, we identified the cylinders before we put them into this mechanical testing to see what type of problem it has.

First of all to see if modern testing could detect the problem, second if that heat affected area, dropped area or cut area actually impacted its service life and how did it affect it.

MR. MILLER: Good morning, thank you. Richard Miller, International Association of Fire Chiefs. First of all I would like to say thank you very much for doing this study and having tried to coordinate getting you the bottles, I am going to continue to do that for you so that the study goes on. Is the power point going to be available to start distributing to show some of the people that have helped contribute bottles what is going on with the process?

MR. PAQUET: Yes. All of the presentations that you see today will be available on our website shortly, probably within the next week or

so, we are going to finish them up.

MR. TOUGHIRY: Absolutely, we need to make sure, if we haven't already all of the folks that helped whether they are helping, gave these samples, the folks who donated samples, we need to get copies. We already have the list and we have asked for their names and thanks everyone.

MR. CONLEY: John Conley, very quickly just a comment as much as anything else, but the two gentlemen from IFC and myself, the carbon tank rollover video that was mentioned earlier we have come up with another version of it, working with the DOT where we have like a two minute introduction to firefighters, for firefighters, because we are seeing way too many firefighters killed or injured in cargo tank rollovers.

Using your resources and the gentlemen from IFC they are free, you can down load them. Anybody we can get them out to, we have sent out like seven hundred, our national tank has sent out like seven hundred, but we can save some lives I think.

MR. TOUGHIRY: Thank you.

MR. WERT: Jack Wert with the Compressed Gas Association. Mark if you could two quick questions. Has this research been completed on the ability to re-qualify these composite cylinders to actually be able to make that assessment?

MR. TOUGHIRY: Let's see if I understand your question Jack, are you saying that are we assessing more than the configuration to be used for assessing cylinders for additional service life, is that the question or not?

MR. WERT: Well not just the mobile acoustic emission but the whole package that you listed, you are going to do the study based on first, and after you looked at all that data, if it passed that criteria, then you were going to apply MAE and

MR. TOUGHIRY: Not the straight gauge, it would not be applicable.

MR. WERT: Have you got to the point that you feel you can make that assessment as a requalification after fifteen years?

MR. TOUGHIRY: Excellent question and the answer, Jack, we are getting closer but we are not

there yet.

MR. WERT: Thank you, the second question would be do you have an idea or have you set a goal if you will on what that extension period would be?

MR. TOUGHIRY: Well we have already set up one precedent for only one application, a very, very unique application but very limited use. The maximum for additional service life was fifteen years with the requirement of being assessed once every five years using the very detailed extended inspection using CG pamphlet C6-2 as well as application of MEO testing during the re-qualification so I did not answer your question comprehensibly because I dabbled only for one application. That is one of our goals, to see if we could do this across the board.

MR. WERT: So you have not made that step.

MR. TOUGHIRY: That is correct yes.

MR. WERT: Thank you very much sir.

MR. TOUGHIRY: Sure.

MR. PAQUET: All right I'm very proud of Mark, Mark and I have had meetings together, good job Mark.

MR. TOUGHIRY: Just follow the direction. Thank you everyone.

MR. PAQUET: Thank you, excellent job Mark. All right so our next presentation Ben Moore, he is coming up here right now, Ben Moore the floor is yours.

MR. MOORE: Good morning everyone as he said I am Ben Moore, again I am an engineer with the Office of Hazardous Materials, Engineering and Research. I am just going to talk to you about our ongoing research projects and some of our upcoming projects packaging testing.

Just to give a little background, back roughly in the early 90's, 1990 I may be a year or two off, we at PHMSA and we harmonize with the UN to move from a specification base packaging system to one that's more performance oriented. This offered industry more greater flexibility and potentially lower costs without any change in safety and potentially improvements as well.

The main problem is that since then we haven't had many changes to put in the HMR, it's all

very, very similar. There has been some additions, a few things, but a lot of it is just very, not a lot has changed in over twenty-five years and that could be an issue.

What this has led to is a number of variations amongst the various testing facilities across the country that includes our third party labs and the self-certifiers who test their own packages to put on the market. So we have a number of ongoing initiatives right now.

One regarding the conditioning time of packages prior to the drop test, specifically that's about IBCs. Another one on the corner drop selection for combination packaging. Our test methods and the gases used for that, the afflictions of higher static test fittings and some simultaneous by various tests, it is just a stack, but it's pretty much everything we do.

Now as far as the conditioning time goes, IBC have very large packaging and they are holding a lot of material or test contents rather. It could take a while to get all of that onto the necessary

temperature of zero degrees Fahrenheit. We are just kind of looking at how long we should be testing for and over-conditioning matter and how long it takes to get there to that temperature.

Some of those things revealed that a number of facilities around the country do use to have different times that they use in their in-house methods, again we don't have anything set in stone but by how long things are supposed to be done for and some of our experiments have shown a difference in the time it takes for the IBC to reach, just depending on how it's performed.

What we would like to do is determine when a more uniform time frame, for how long this should take and get to a point where everyone is doing the same thing, if possible and you will see on pretty much every slide that I have that we want to establish uniformity across the test lives we want everyone doing the same thing as much as possible and it doesn't necessarily have to be anything that we are aware or anything that we are doing but we would just like to get the best way for everybody.

And here is just a couple composite IBC's I don't think the left one is actually used for Hazmat but you get the idea. Again going on to the corner drop for combinations, there is eight corners on a box, every box or a box-shaped object. They all have to be tested on the drop on the corner. We found which the weakest corner, would be the best way of putting it would be and obviously that is going to vary from package to package but we could get to a point where we do know, we have an idea of what the best corner to test on, again for uniformity across the industry and that's just a drop tester, nothing too exciting. That's not a dropping of the corner, obviously.

As far as the leak proof-ness tests go, we offer a number of ways to test, we offer, we want to see if there is any better test methods or alternate test methods versus what the HMR specifically authorizes and we do just have a very general statement that is suitable gasses may be used other than air and be kind of like to fair what those suitable gasses are, maybe some work better than

others or are easier detectable or any cheaper to use, I don't know how that would be but we can look into that.

And we want to evaluate compressed air specifically as one of those. We do know that there are some other methods available and some are being employed by approvals, we want to look into those as well and see how they compare, if they are better or worse. It should be made to put in the HMR, more specifically and again just for uniformity across the industry.

As far as the hydrostatic testing goes we don't again specify where to put your fittings, when you are doing a hydrostatic pressure test that allows labs basically they can put it anywhere and we would like to see if there is any gusts position or really it doesn't affect the test. Our preliminary research so far as shown that it really doesn't make a difference, you pretty much get the same results no matter where you put those fittings in the package.

Do you think we should continue to look at that and again get to where we develop a guide on

where to put those fittings?

And the last one we have is for simultaneous testing of packages. Currently we don't have it, we have to test one package at a time and that leads to a situation in many labs where they are testing multiple packages at a time and that applies to a stack vibration, hydrostatic and leak proofness tests. We just want to see if that has any effects on the results of the testing versus the testing of an individual package at one given time and if it's adequate to test all three at once.

And again we just want to get some more uniformity, if it works out then. Just some packages being tested all at once, I guess that looks like a recruitment site. For some of the future stuff we are looking at, again we have route cause research, so we are looking into the reuse, reconditioning manufacturing of packages and then further some more leak proofness testing, specifically regarding IBC's.

As far as the root cause of our research goes, we just want to see if we can do any analytical research of our packaging data for root causes of the

failures, to determine any bid elements to identify the root cause of the failures and create a method to identify gaps and vulnerabilities within our regulations and then we will provide recommendations based on that.

Next one thanks. For the re-manufacturing, or re-conditioning, reuse or re-manufacturing we just wanted to determine if in addition to leak proofness testing, there is any other testing that would be good to use when re-using re-manufacturing or reconditioning packages, currently that is as far as re-use and re-manufacturing and reconditioning goes that's all that is required for a package and we are, we would like to see if that is adequate, or perhaps we should look more into that to determine if there is more that should be done to those packages before they are reused and put back on the street.

And then the final one for IBCs we have, we want to look at the leak proofness testing because we are very vague in some aspects of this test, we don't even say how long the test should be performed

for simply stating a suitable length of time and that has led to a situation where we don't really know what a suitable length of time is to determine failure and we just wanted to take a look at that as well as the various methods of detecting leaks throughout the test and see if there is a good way of doing that and again provide some recommendations and perhaps make some changes to regulations to better reflect that research and that's what I've got.

MR. PAQUET: I suspect there is going to be some questions and we have twelve minutes for questions right now.

MR. PETTIT: All right, CL Pettit with Reusable Industrial Packaging Association, that next to the last line really through me, can you elaborate a little more of what other tests you might be looking at or candidates to applied reconditioning beyond the leak proofness test and where will that be done is that all in and what will be the roll out, can we as re-conditioners be.

MR. MOORE: Right I figured you would have some questions about that one. Right now we are

just, like I said we are in the preliminary, we haven't even started this at all beyond that. Any further, what further tests will have to be determined, I don't have any specifics, obviously more destructive testing is not going to be very good for something you are trying to use again so, but we are looking into that.

Can the industry be involved? I don't know we will see why would that, I don't know how that works. He asked if we can have the industry involved with some of this research, more directly involved than this and I don't have a good answer.

MR. PETTIT: One real quick, I know that time is limited. I would say that shouldn't this come at the UN level perhaps so that when you are delving into a possible, the additional production test for reuse of re-conditional, might that not be better to plop at the UN first or at least be made as a UN paper, I don't know.

MR. MOORE: I mean that's got to come from somewhere, that's all I can really say.

MR. PETTIT: All right, we'll talk.

MR. MOORE: Okay.

MR. PAQUET: Yeah.

MR. RICHARD: Bob Richard from Labelmaster Services basically that is what I was going to say, I applaud your efforts because I think there is a lot of room for improvement in the UN packaging tests.

There is a huge disparity between what's tested by the industry and what the industry finds when they do the test and from one lab to another so the test methods definitely could use some improvement, but as you said I think you could leverage the resources and prove the outcome of this research by taking a simple information paper to the UN and saying we are going to be conducting research, we are going to be doing these tests, they may, you may get some very good comments saying no don't do that test because they have already done it and this is what we found out or they might suggest other tests, other things to look out and then they will be willing to enter into working with you to do some of these tests because especially there are a lot of test labs, that are part of government agencies and

they are very active in doing this. They even have an ongoing where they can prove that they do that, so that was my point.

And then one thing is really my own pet peeve, I just got burned by this by one of my clients is what is the importance of having a specific 8.5 point box. I remember twenty years ago standing in the hallway arguing with Don Berger and Ed Misule about tape on boxes and maybe we should do some research and see really how does tape, the type of tape contribute that much to a boxes ability to pass the UN performance test.

I just had a box tested at a famous third party lab. I used the standard two inch tape because I knew that it was very common, I could easily get it into place and lo and behold I talked to my client and no we use a three inch tape and he needs a slightly different ASTN standard. So now I just spend multi, several thousand dollars doing a test and they can't use the tape, that's a three inch, that's probably a higher superiority because it tests that way. I mean you really have to think about

those things and how it affects us.

MR. PAQUET: And as crazy as it sounds, the discussion about tape will throw us outside of our twenty minute discussion period so I have to defer that comment please we need to have that conversation but Hazmat people can talk about tape for a long time.

MR. MOORE: We love tape.

MS. NAUMAN: Thank you Sue Nauman, Industrial Packaging Alliance of North America and I am well aware of the tape question, it would be a great project. I just have a question for you I know that the third-party labs are working through D10 to you know, settle a lot of these procedures.

MR. MOORE: Yes.

MS. NAUMAN: Are you involving them at all, I think this is a great opportunity to collaborate with you for self-certifiers and third party labs, so I would just recommend that.

DR. EL-SIBAIE: One of my tweaks, if I could provide tweaks is I either want to have the package testing research or so I am sympathetic to

all of these comments. I do agree with the need to continue to be more active participants at the meetings and I would even go one step further than taking a paper to the UN, even before we take a paper to the UN or any other international body, it may be even helpful to float the idea, I mean we probably should be having a discussion of whether this test is too vague or this test doesn't give us the right answer that we all want to have or for an agency that is conducive to good decision making.

So we should be even that at the onset be conducting some initial testing and conducting some research here to provide options and to provide further guidance. It doesn't hurt us and certainly and I have seen it in many cases with them floating the idea, that this is what is going on with our thinking, we really think this test is not giving us what we need and we need a pen and pencil and let's get feedback, maybe there is a reason, maybe a method or reason why a specific test is not used, so I think and I agree 100 percent that we want to have more collaborative process on package testing and the

testing requirements and the process in which the test are being done.

MR. PAQUET: Yes, but let me come back to you, I have to sit out there.

MR. BARRETT: Thank you Ryan, Ben Barrett, this time acting in the capacity as Vice Chairman of the Dangerous Goods Advisory Council. Thank you Ben for this project we appreciate it and I will keep my comments short. DGAC is representing a significant number of packaging labs and I think that it has been their experience that this is a very important ongoing subject right now, of great interest so I will keep my comments short but it is very important.

And I think, I also will make a fifteen second comment on tape. I think this is symptomatic of a prescription inside the test report saying you know a certain component was used and this is very detrimental and we should really take a look at that with research that would establish to what level of prescription is really necessary.

We have been concerned with, while we very much appreciate and respect lots we are also

concerned with their testing failing of very high percentage of packaging successfully tested by our third party professional packaging labs so we would like to see, make sure that the research is done, that the test metrics are definitely verified as being in alignment with legal industry practices and again we would also support involved of the UN. Thank you.

MR. TOUGHIRY: With pleasure, just a piece of the information that is relevant to the retesting, we have alternative testing that is used for different kinds of packaging such as alternatives and something automation and as far as the timing for the whole time we have a number of standards which provides direction with how we manage to hold the pressure to find out if it is equal or not.

MS. NAUMAN: Yes, thank you I just want to recognize, it's Susan Nauman Industrial Packaging Alliance, and I think it is really critical that you are focusing on the verifiability and for that reason it is really good to have collaboration. I have a background and there is a lot of value in having a

test and an operator do that test and then having different operators in other labs, that's how you really get your range on your testing specifications.

MR. PAQUET: Great, excellent, thank you Ben.

MR. MOORE: Thank you.

MR. PAQUET: All right, our next presentation is near and dear to my heart, the paperless hazard communication pilot program and I will introduce Mark Raney.

MR. RANEY: Good morning hopefully everybody can hear me okay and can understand my Boston accent. I'm sure Ryan will keep me honest in the volume I can't help you with the accent. So I am going to be going over and providing a brief summary on the ongoing Paperless Hazard Communication Pilot Program, otherwise known as HM access.

I will be providing a brief background, all of you in the background, I'm sure many in this room are already familiar with it as well as what the intent of the program is, followed by a summary of some of the major accomplishments that we have

completed to date and then what the next steps and expected outcomes of the project are.

So the HM access which stands for hazardous materials automated cargo communications for safe shipments, otherwise known as Paperless Hazard Communications Pilot Program which is all a mouthful so I am going to refer to it as HM access during this presentation was first conceived in 2008 and then in 2009 PHMSA held a public meeting to get feedback on the purpose and objective of the initiative and then in 2011, Spring of 2011 an interagency agreement was established between PHMSA and the Volpe National Transportation System Center.

And if you are not familiar with the Volpe Center, part of the department we are under, we are a part of the US DOT under the Research and Innovative Technology Administration. Now the requirements for the project are defined within Map 21 under Section 33005 the Paperless Hazard Communications Pilot Program.

The goal of the program is to evaluate the feasibility and effectiveness of paperless hazard

communication systems in regards to providing the equivalent or better level of safety to the current paper base requirements.

The evaluation needs to account for the potential impacts as well as the concerns of a variety of stake holders within the hazardous materials community including federal agencies, state authorities, and significantly in terms and regards to law enforcement response community as well as the hazmat industry, meaning shippers and carriers.

The intent of the project is to study the performance, safety, security impacts and associated benefits and costs for using these systems for communicating the paperless shipping, excuse me, the hazardous material shipping paper information as currently required by regulation and it needs to look at under all modes.

There are really three major requirements under map 21. There are three phases the first phase is consultation with hazardous material stake holders. The second phase involves testing the performance of these systems and evaluating the

potential impacts associated with implementation of those systems and thirdly a report needs to be prepared on the results and recommendations for the secretary to provide to Congress.

The initial consultation phase of the project has been completed. Per map 21 we have consulted with HM stake holders on the operational and technological requirements for implementing these systems across all modes. The purpose of these meetings was to obtain information requirements as well as benefit from experiences from others that are already implementing similar efforts, such as EPA with their e manifest system.

We met with ninety plus individual hazardous material stake holders representing all modes, other agencies, associations of different capabilities and of different sizes for all stake holder groups, there are responders, law enforcement, shippers and carriers.

Following these meetings, there was a two day workshop held at headquarters here in September 2012, I know many of the folks in this room were at

that workshop, we thank you for your attendance at that and the purpose of that workshop was to verify the needs and obstacles of implementing the system. So we met with all of those individuals but then during that workshop we discussed the results of our findings form those meetings and we wanted to get additional feedback to make sure what we heard is representative of others that weren't able to meet with us at that time.

The information from those workshops and those meetings were then summarized within two information papers, now those information papers kind of highlight the collective hazardous materials communications priorities, gaps and concerns that are related to implementing these systems as they relate to us.

One paper was focused on the concerns associated with responders in law enforcement and the other was more focused on industry in terms of shippers and carriers, both of those papers are available on the hazardous materials, the HM access public website.

So we completed that first phase in terms of the consultation with stake holders. We are currently in the second phase in preparing for a testing and performance and collecting information on potential impacts.

Last April many of you may have seen, PHMSA posted a website update on plans for a pilot test and then that was followed in July with a sixty day notice. That notice, basically notifying stake holders and the public of the planned pilot test and seeking volunteers to participate with the pilot test and also for a comment and feedback on the data collection that was identified in that notice.

In regards to both the website announcement and the sixty day notice, we have actually received eight-three comments, a majority of which were volunteers to participate in the pilot program. Seventy-three of those eighty-three were actually volunteering to participate in the program, representing all stake holder groups we got a good representation across different communities, both from industry as well as emergency law enforcement

side.

Ten of the comments were more focused on comments in general to using e systems, many of which echoed what is identified in the informational papers and some of which were more focused in terms of future regulatory concerns or changes, which is a little bit outside of what was within the notice.

On November 25th, so right before Thanksgiving, a thirty day notice was published. That thirty day notice addressed responses to the comments that was from the sixty day notice as well as providing the specific questions that are going to be asked as part of the data collection activity that is identified within the sixty day notice.

In the sixty-day notice we identified the type of information we are going to ask and try to collect during the pilot test and during the data gathering to support the potential impact analysis, but and then in the thirty day we actually included all of the specific questions that are going to be included.

So where are we now the PRA packet, that

thirty day notice that was published on November 25th, the comment period has closed, that closed on December 26th and the PRA package is currently with OMB for review. So once we receive OMB's approval on the data collection activities, the next step will be to select participants for the pilot test, those will be selected from the pool of volunteers we have received and we will be looking at those volunteers to one make sure they satisfy the requirements for participation as identified within the public notices as well as looking at their capabilities in regards to which are best suited to be able to aide in the testing of the performance systems per map 21 requirements.

Once we have identified the participants themselves for the pilot test, we will then hold an orientation meeting and actually conduct the pilot test. Those tests are going to be conducted with multiple regions across the US involving all stake holder groups. The tests will one, at least one needs to be conducted within a remote area, per map 21 requirements and they will likely occur over a two

month period.

Concurrent with the pilot test we are also going to be implementing a collection activity to collect information associated with evaluating potential impacts. Now the pilot tests themselves, those are going to be selected participants from the pool of volunteers. Anybody will be able to participate as part of the collection activity for the impact analysis, that will be open to all, not limited to just pilot test participants.

Once we have completed the pilot test, and completed that data collection activity for impacts, a report will be prepared and that report will be per map 21 will summarize the pilot test findings, it will assess the safety and security impacts, including associated benefits and costs for using these systems and then provide a recommendation on whether the regulation should be changed to allow for the option of using the e systems in the future.

It is a large scale project, a very brief summary, there has been a lot of activity but I will open it up to questions and answers at this time.

MR. RICHARD: I am not in a competition Bob Richard, Labelmaster Services. I have been working with a number of stake holders and my company is very interested in this and it can seriously promote safety. Right now even though a vehicle that starts off at a manufacturer's facility and has ten stops on the way and you never have to activate the shipping papers, so you can be on your last leg, you have one drum left on the truck and if there is an incident and the firefighters look at the shipping paper, they are thinking it's a vehicle full of something so that's just ridiculous.

Electronic communications, you can tell them exactly what is on that vehicle and give them time, it is going to cut down on congestion and it is going to make it safer and it is just so much better, so it is almost a no brainer but we have to go through the congressional mandate.

My one question is with regard to the number of the selection of the applicants and a number of pilots, in my mind it would make sense to have as many pilots as possible, you have done a good

job to identify the criteria and how are you going to measure this, this will be good for your report, but it seems like to me that it might be more limited. I would think you would want all of the options of the pilots as long as they follow all the rules and you get the data why not have as many pilots as you possibly can and that's where from your presentation I am still a little bit, I don't understand totally.

How many pilots do you perceive that you will do, are you trying to limit the number or are you open to doing as many as possible?

MR. RANEY: We are not looking to limit the number but they do need, it needs to be focused on use with shippers and carriers. We are not looking to test vendors and consultants, so that is one aspect.

Just one more thing, the tests themselves, we are going to be conducting inspection simulations and emergency response simulations so to participate in those simulations, the participants have to be actually moving hazardous material shipments and the other piece that is kind of a limiting factor in

terms of the numbers and where they can occur, there is two enemies involved.

We have the shippers and the carriers on one side on industry as well as the emergency response and law enforcement and we are going to be relying on the emergency responders and the law enforcement to be conducting the simulations and providing the information so the locations for, in terms of where those participants are will also in some respects, limit the pilot test that can occur and who can be involved with those pilot tests, so they have to be participating within those areas.

MR. RICHARD: So when I read the notice I saw something about excluding vendors, software for instance, my company sells software. What we are doing is we are pulling together a group of people, including shippers and carriers, emergency responders, emergency response information providers, law enforcement and saying we are all going to work together to do a pilot, so if my company is characterized as a vendor, I think that is very unfair because we are bringing shippers, carriers and

emergency responders and prospectors to the table so we want to be characterized as a group of people with an interest in pilots and just because one of those participants, the one with the most effort, happens to be one with software, they should not be excluded, but it's on the record.

MR. RANEY: We have been.

MR. STEVENSON: Boyd Stevenson, American and Chinese Associations. EPA is simultaneously working on electronic hazardous waste manifest and recently indicated that it may be coming to fruition very soon. I wanted to know if you were looking at that possibility of incorporating that such that we would have no haz waste, no physical haz waste manifest and an electronic hazmat shipping paper at the same time. Have you looked at that at all?

MR. RANEY: We have been in close communication with EPA in regards to the manifest system. One different to keep in mind is that an EPA they are actually establishing and going to be administering an electronic system that is going to be utilized. What we are looking at isn't actually

creating a system, which is what we are looking at and a lot of this is based on the feedback that we heard is to more allow for the use of e systems and have it be more performance based requirement.

So not saying you have to use this specific technology to communicate it, but more in terms of you have to meet these requirements to communicate it and with regards to e manifest for hazardous waste, all of the information that is included on the e manifest, those elements are also going to be required as part of the shipping papers, so once electronic shipping papers are allowed, you know the information that is communicated in support of hazardous waste would cover those requirements as well.

MR. PAQUET: All right well thank you Mark. Good job.

MR. GOLDSTEIN: If you don't mind, this is down the road, Jim Goldstein with International Association of Fire Chiefs. One of the issues that I have worked on besides all of this stuff is communications issues, public safety. Listening to

this conversation, at some point down the road, somehow we have to get connected in with the first net, you all have heard of first net, it is going to be a broadband network for first responders and all kinds of applications are being put into their contents. Legislation came out of the so called Egon Bill back in February 2012, they are part of commerce, an independent authority, former chairman and I know a lot of the staff over there so at some point if we just listen to this somehow your application, assuming e net is going to go forward and electronic pagers, that ought to be from a first responder community, ought to be integrated into first net.

Now we may be talking two, three years down the road but I just don't want to get anybody blindsided, you know from the sugar carrier software vendor or the federal agent of PHMSA that just seems like a natural to me and if you need any help on that or any input, I know a lot of the staff and some of the members and I would be happy to help with that.

MR. RANEY: I appreciate that Jim. One

other thing just to make sure everybody understands too, during the pilot test, what we are testing is the existing capabilities out there so we are not going to be providing any equipment. We want to be testing how well the communication performs these systems perform, utilizing the existing resources and equipment of law enforcement emergency responders as they have out there right now.

MR. PAQUET: Thank you, thank you very much. We are going to take a twelve minute break, twelve minutes, be back here in twelve minutes.

BREAK

MR. PAQUET: All right, so a couple of administrative things here oh you came in after the door closed. I was just told that one of the fax number on at least one of the papers is incorrect. I see a lot of Ipads and cell phones out there, if you are faxing something, that's partially your fault. Let's not fax something to us, it will show up on one of our fax machines, but you know it's 21st century so let's try to email these things. Yes, thanks how would you staple these things, so when we post all of

these presentations, there will be a link.

We will create an R&D inbox, it will be email it will be something like PHMSA and R&D, don't write this down, PHMSA R&D.gov just like the approvals at .gov so there will be a link on the website, so click there, that will be a great place for you to send in any comments, email us and we will keep that alive from here on out so it will be a great opportunity for you guys to propose projects and to be in contact with the R&D branch from here on out.

And that will be coming, when we post the presentations that will be there, it is not there now, do not search on your Ipad and try to find it because you will not succeed. All right so our next presenter is Brian Vos from our science branch talking about exposure to risk of exposure thank you Brian.

MR. VOS: Good morning everyone. You have got me for the next two presentations they are about forty minutes, depending on comments. For this one, the risk of exposure to 1.4S explosives to emergency

responders I just wanted to give a very brief disclaimer. The next two talks are based on statements of work that were drawn up by Dr. Spence Watson, formerly of the scientist branch and one of the things we are really looking for in this public forum is to be able to take comments from industry, from others who might be experts in these areas, and maybe fine tune, not stick to the statement or work that was previously drawn up necessarily but really just redefine what we see as a possible problem and move on and see if we can find solutions together.

So why study the risk of exposure for emergency responders to 1.4S explosives and the scope here of course we are just looking at 1.4S we have to start somewhere, obviously there could be risk of exposure from the 1.3's, 1.4's et cetera but the criteria for 1.4S specifically was originally linked to risk assessments for explosive responders but the criteria has changed and the emergency response procedures may have changed, I'm not an expert on emergency response procedures but I imagine there are some people here in the room who may have good

comments on that.

For instance just one very brief example, in the first revision of the manual and test criteria, one of the specifications said that if you have any indention at all in your witness screen, you could not be in 1.4S. Now you are allowed up to 4 millimeter dents in the witness screens and you can still be in 1.4S.

The location of the witness screens used to be five meters from a fire, now it is four meters so all that is really just to say that the criteria may have changed over time. We just want to really do a re-base lining, it is critical that we keep our emergency responders safe when they are responding to events that may have 1.4S explosives and so we really just want to do a study, maybe involving a survey to find out is there a gap between the current criteria for 1.4S and the emergency response such that we know that they are adequately protected from many events that may occur.

So research is necessary to identify if there is any gaps between those two. Very briefly,

getting at the test criteria, I am not getting into the test series 3 and 4 which are more like the thermos ability impact, friction, small scale burning tests, those are really just to determine if your explosive is forbidden for transport or not.

When you get to 1.4S classification, you primarily do it through the test series 6 and you have the 6A test which is a single package, as packaged for transport, you initiate it either with its means of initiation or with a detonator or igniter, I'm not trying to get into the specifics, but essentially in the 6A test you are looking for mass detonation or mass explosion and if there is evidence of that you would be in division 1.1 potentially unless you are on a 6B test.

The 6D test is a more recent test and it is only used at the present for eight UN numbers which reflect certain articles including power cartridge devices, charges for explosives and detonators. The criteria for that is a little more strict, in that essentially it is looking for effects outside of the package and if you have major effects

outside of the package then you cannot be 1.4S for those types of devices.

The 6C bonfire test which I am going to spend a majority of the time talking about is a, you take packages as packaged for transport. You try to get a volume of .15 meters cubed you put them on a fire that kind of relates to the talk earlier that Joe gave about the propane fire. You are trying to have a fire that is around 800 degrees centigrade and you want to have it overlapping the edges of the package by at least a meter.

You are trying to replicate a transport scenario and if you go on to the next page the criteria specifically for 1.4S fireball jet cannot exceed one meter from the packages, fiery projections cannot exceed five meters from the packages. You have witness screens placed on three quadrants from the packages and they cannot be dented more than four millimeters, no projection with kinetic energy greater than 8 jewels and then there is a thermal effect criteria looking at how many kilowatt per meter squared at certain distances so you have a

thermal effect also.

But what they are really just trying to say is that there is very definite and specific criteria that you can evaluate in the test and then you get into what the emergency response is and you start seeing some more subjective terms from the model regulations, sorry next line, from the model regulations definitions of the 1.4S and I am not going to read it verbatim but essentially you have substances and articles confined within the package unless the package is degraded by fire and that talks about projection and thermal effects limited to the extent that they do not significantly hinder firefighting or other emergency response efforts in the immediate vicinity of the package.

And the italics in there are all mine, they are not in the book. But there is some subjectivity in that, in the first revision of the manual and test criteria, it used to say immediate vicinity and then in parenthesis it says for instance five meters. That is no longer in the book, I think a lot of people probably still just historically go

by that guidance but it is not prescriptive.

The Emergency Response Guide, you have some of the similar language effects usually confined to the immediate vicinity of the packages and then if fire threatens the 1.4S packages, consider isolating at least 15 meters in all directions. Now that is for the general public, but as far as firefighters or emergency response themselves, it says they can fight the fire from a reasonable distance and once again we just want to see if there is a gap between the test criteria that we have used to assign 1.4S next slide and what the emergency response currently is.

Now these bullets, this is my last slide, these come from the original statement of work, we don't intend to try to limit, like this is the direction we would go with the research, we really want to solicit comments from interested parties and you guys on what we could do.

But for instance, it would probably include a survey of interested parties to see well what is the typical gear for a responder or firefighter, what are the typical procedures that

they might approach if they are trying to fight a fire that they know has 1.4S explosives in it.

We could try to do a survey or a comparison between different test methods or physical risk responders for fire and fragment and survey and see which one maybe is the best way to initiate the firefighters emergency response to the criteria and in the end we could have field trials with typical 1.4S articles, there are not so many typical 1.4S substances because usually it is the packaging that gets the substance to 1.4S whereas you have articles that might inherently fall in the 1.4S category so it's pretty wide open at this point, it really just comes down to when we debated the UN level doing harmonization, we debate around these criteria and we just want to make sure that we haven't strayed too far from what the emergency response was or the risk for the emergency response that this criteria were originally closely associated with, so that's it for the presentation.

MR. PAQUET: Yes, we have some action.

DR. COVINO: Josephine Covino, Department

of Defense Explosive Safety Board that was a nice presentation. I am just going to suggest that the Department of Defense has spent a lot of money because upon ships we do have to fight fires and the thing is that one of the discriminators that is used which you don't have as a test criteria is time dependence of reactions, time dependence is very important because you know a fire fighter needs to know is 1.4S going to stay 1.4S if it is subject to a fire for a half hour, or a fire for two hours, a degradation of the material so are you considering putting that kind of stuff in there?

MR. VOS: We are open to pretty much anything. We are really hoping to get a lot of comment on that, so yes.

MR. PAQUET: And remember this is a proposed project, so this is where you guys, your comments both today and follow up comments will help us to find what direction we go so this is where we need, well right now we need brief comments, but all of your comments will be provided to us.

MS. HILTON: Cynthia Hilton, Institute of

Makers of Explosives so we were, I really Brian I really do appreciate your presentation, so you could imagine that when we first saw it we kind of went huh and then, you know because we went back and looked a little more, and we didn't see any of that emergency responders in there at all and so for a risk base so but what I understand is this going back to my members, I would say that this UN that you are relooking at a test, reaffirming tests and what you are really trying to, it sounds to me, so tell me if I got this wrong, that you are saying that the ER guidance now may not be, it might be too conservative based on how we are packaging and how we are managing this project now, is that correct?

MR. VOS: I think at this point I would not be making any statement as to which needs to be changed or even if there is a gap it is not like I am coming and saying well the ERG is clearly wrong, it needs to be more specific. One of the things that hopefully we can find out with a survey for emergency response is well how would you typically, what would you interpret as significantly hindering or

approachable distances and things like that.

Really it just comes down to we want to make sure that emergency response is safe. There may not be incidents in the path where firefighters have been injured fighting fire, yeah that would get at the risk but that doesn't mean you need to set your criteria and the hazard a large distance apart. You want to make sure that when a firefighter is approaching that they are protected with a significant safety factor, just seeing how close they are really at this point.

MS. HILTON: Okay but the deliverable out of this is like, it's towards the new ERG would say is that where this is going?

MR. PAQUET: We don't know that's part of the problem, we are just trying to see, so that could be certainly.

MR. VOS: I wouldn't want to answer the question by saying our goal is to change the ERG and we are looking for date to support that, because that would be incorrect.

MR. BARRETT: Hello Ben Barrett, Sporting

Arms and Ammunitions Manufacturers Institute. I am, my comments are not going to be particularly brief, I believe this research project is a response to something that our organization spearheaded and I want to say that originally we felt that this proposal is misguided at best but Brian we are very encouraged to see that you are involved with this and also that PHMSA is taking a new look at this and I say that factually we are going to be generally supportive.

I wanted to establish our credentials, CNB has partnered with two fire training videos with the International Association of Fire Chiefs so we are very concerned, and very active in the protection of fire fighters. There is a gap between the 1.4S criteria and response procedures, not only if it weren't for us, but it weren't for other than us and that gap in our opinion is that the regulations are overly prescriptive.

The criteria that one must pass to achieve a 1.4S rating of an explosive is something that flammable liquids and aerosols many times will fail

so many hazardous materials will not pass this test as far as a 1.4S rating and everyone needs to understand that and then once we do achieve the 1.4S rating, we are treated more strictly than these other products that won't pass it and that is very important.

With regard to what originally stimulated this, you have to pass five different criteria and as our colleague mentioned the time within the rate of heat output is one of those criteria. There are five stringent criteria and you have to pass them all. What are our recent change was is that beyond passing all five technical criteria, some of the rating were certainly subjective the additional six requirements, that if there was someone in plain clothes that might be in the immediate vicinity, you would say he passed all of the criteria but you are still not 1.4S because subjectively we think it might hurt a paramedic.

The fact is that paramedics and policemen, fire fighters would have more protection, but people without personal protective equipment cannot stand

five yards, five meters from a dangerous fire, I'm sorry, they have no business standing next to a burning truck, you know tire fires, et cetera.

So that's our reservations, but Brian, I believe that you are going to do some good work here. We have been studying we are doing research of our own. We want to study to see the energy requirements of projectiles as they relate to fire fighter turnout gear that is something we would be willing to partner on.

Another thing is that we have seen screens from this bonfire test that you are going to talk about next, there are problems with the metrics on those and that is very technical and needs to be improved, so that's our comments, thank you.

MR. PAQUET: Thank you and this is again, providing comments afterwards really will help to shape this and all of the other proposed projects, so thank you very much. All right Brian you are still there so you are good to go.

MR. VOS: All right, so the next step, this is still new research that is being proposed.

Feasibility of improving the UN test series 6C bonfire test, you can go to the next slide.

The title sounds very broad like we are looking at everything related to the 6C. I am scaling it back a little bit and specifically looking at bullet two. Current procedures prevent difficulties in measuring the thermal output of energy and energetic events, specifically looking at the thermal flux. So we are proposing research to identify if perhaps new technology or procedures can help quantify the thermal events in the current test set up.

I will walk through what the thermal events are or the thermal flux that is necessary for different divisions and then come back to you if there is new technology that can help us measure it. Luckily I don't have to repeat myself too much on this because the previous presentation already talked a little bit about the set up for the 6C bonfire test and Joe already talked about it also with the propane burner.

So you have your witness screens four

meters from the package edge, next slide. This is just in a nutshell the division 1.1, 1.2, 1.3, 1.4 and division 1.4S criteria and I am just highlighting the thermal effect criteria. Now of course, thermal effect is also a little bit reflected in the fireball being greater than four meters and the fiery projection greater than fifteen meters but there is an additional criteria that talks about essentially the heat output in terms of kilowatts per meter squared at various distance from the fire and that specifically is what we are looking at with this proposed research.

If you just go to the next slide. This just breaks down the thermal effect for 1.3, 1.4 and 1.4S. So it's based on the average thermal flux at various distances, there is also, because of difficulties in directly measuring the thermal flux with the radiometers, you have a lot of background noise perhaps, especially in a wood fire and then it's hard to do a correction for that.

There is a shortcut given in the manual testing criteria where you can look at the burn time

and the known mass of explosives and that you have to essentially, the easiest way to say it is if you want to have a lower class of classification the burn needs to take place over a longer amount of time.

If it burns too rapidly and you get all of that heat and energy output at once you are going to get a higher classification so the difficulty though with doing the calculation is that there is a note in the manual testing criteria that says essentially in some trials you will have separate identifiable events in which case you can use the burn of that identifiable event.

What that really comes down to is if you run a bonfire test and you have two drums on there and you see drum one go and drum two go and you can measure the time, you can use the calculation because you know the exact mass in those drums. When you start getting into situations where you might have fourteen packages on a fire, each of which might have ten individual inner packages, you might see separate events but not know whether that was four inner packages that went, or was it three, if you don't

know the mass, you can't use the calculation.

What we have seen in practice is therefore a lot of labs look at it and says well the note doesn't apply, you can't use the calculation because if you don't see the separate identifiable events essentially the calculation is worthless, so what it really comes down to on this project is saying that thermal effect is something that has been agreed upon, it is in the book, it is something that we measure but in practice trying to get the measurement and quantify 1.3 vs. 1.4 vs. 1.4S a lot of labs might just throw up their hands and say well we can't measure it but don't worry all of the other criteria are met, so I think we can agree upon the fact that we do want to know what that thermal flux is and that it is not exceeded we have to come up with a way to reproducibly record it and measure it, especially when you start looking at just not making sure we are consistent across six explosive test labs that we have in the states, but then you start looking internationally what other test labs do also.

Next slide, this is actually the last one.

So direct measurement with radiometers may be difficult due to issues of calibration, baseline corrections, especially wood fires, perhaps there is new technology that can overcome this, burn time calculation only works if the mass of materials is known.

We have had some people suggest well if you used higher speed cameras perhaps you can get to a point where you could see each individual event, even if you had fourteen packages for instance, and you could see well ok, there is the two second time for one of those inner packages, that's one pound of material, now I can use the calculation and determine if the thermal flux is exceeded or not.

The last point, propane fire may burn more evenly with less background noise. This is really carry-over from the propane test that Joe was talking about earlier where if you have a much flatter baseline for a thermal flux, it might be possible to use your radiometers at certain distances and actually more accurately measure the thermal flux that is related just to the energetic event and be

able to quantify that so once again just like I said on the previous project, we are not stuck on any one solution, we are really just looking at it as is there a way to reproducibly measure the thermal flux that we can use.

The orange book, the manual testing criteria tries not to be prescriptive in how we set up the tests too much but we want to make sure that we are able to reliably and reproducibly calculate the thermal flux so.

MR. PAQUET: Thank you Brian, I should have went back.

MR. BARRETT: Ben Barrett, we are directly affected by this project this is the last time I am going to speak. This original project was had a very broad title of improving a test but only tests smokeless powder system, very specific scenarios, we objected to that. We are optimistic about working with Brian and PHMSA with reconfigured projects so thank you for that.

I want to make one other comment to you Ryan is that this is the first time that we have

participated in a PHMSA public meeting like this and it is a very impressive format, I just want to say job well done to you and Lucy and your staff.

MR. PAQUET: Thank you, but we are not done yet.

MS. HILTON: Again Brian, thank you very much. You know we are like, generally supportive of this stuff that you are doing to help out and in the broader UN look at these tests so I guess my only question here is you said that it appeared to be broader and narrowed it down to this thing.

We had submitted a letter suggesting a number of things that could be done to enhance the 6C test and I wonder if you could just kind of on that in general, you felt you had to narrow it because the budget isn't there, you had to narrow it because what we are hearing here today is your plan of work for the next twelve months and you really couldn't do more, could you generally comment on the other improvements that would be worthwhile to pursue on a 6C.

MR. VOS: Sure, really all that it comes

down, I'm somewhat familiar with the comments you sent in although it's been a while since I have looked at them. I think really we just looked at the thermal effect and the thermal flux as being perhaps low hanging fruit where when we see reports come in from our test labs, the thermal flux is not perhaps addressed as well as soon of the other criteria, is it very easy for instance, or much easier be careful what I say, to measure the 20 jewel for instance and the 8 jewel and whether they are correct or not, whether it should be set at 20 jewels or 8 jewels at least they can try to get that measurement and come in and say whether it was exceeded or not.

When it comes to thermal flux it is a very set criteria in the book but people have had a lot of difficulty in measuring it so we were just looking at somewhere to start. Are we opposed to opening it back up and looking at something that maybe takes into account projection or fireballs and things like that, I don't think so but we would want to make sure that we have the resources to, however broad we get, we have to find, make sure that we have the resources

to cover everything so we can either try to do this one, and one type of thing with the thermal flux and do it well or perhaps have resources spread too thin if we look at too many things, but at this point we are still developing the proposal so we are open to further comment, definitely.

MR. SMITH: Greg Smith once again, personal investigator on Agent 14 which is a project funded by the Transportation Research Board that is looking at developing some new tests for the testing and I want to say a couple of observations for you, number one, for doing that work I know how difficult it can be to develop these tests.

And then, so my compliments on a job well done and the comment that I wanted to share is that when you are developing tests like this, something that we found in the work that we are doing is that it is sometimes useful to keep separate in your mind the idea of simulating an event in the field and measuring a physical property of the substance that you are transporting.

In my own personal opinion it is that when

you are doing testing, it is better to measure the physical property of the material and I am not saying, this is just my opinion, so for instance when you are classifying flammable liquids and gas as you may look at auto emission temperature or lower rates of flammability, these are physical properties with the substance safety not directly predicted behavior in the field.

And I know that predicting behavior in the field is an important part of assessing the risk of transporting materials but when you try and measure properties of material and predict performance at the same time, those two issues creates enormous difficulty so I just want to advocate that whenever you are developing a new test that you consider whether it makes sense to measure some intrinsic property that separately extrapolates field behavior or try to do it all at one time.

MR. VOS: Thank you, actually if I can respond too. It seems like three comments have had a very similar theme as far as kind of referring back to the statement of work previously we are not set

necessarily on only looking at the 6C bonfire test and the 6A and the 6B but that would probably be the preference because as soon as you start getting into advocating, like the previous statement the work that might have gone into, well we are going to have a separate test, we are going to look at a single package, a separate burn, you start adding significant cost.

It would be much preferred if we can work within the current test set up and maybe just have better instrumentation and better data collection, that would be the preference but we don't want to limit ourselves, either way at this point, so thank you.

MR. SANTIS: Lon Santis from the ET Research and Hess laboratory and this is very encouraging Brian because one of the things that I think is encountered out there between the labs are differences in how a test is approached and one lab for example may read in the manual that thermal flux measurements are part of the test and go through great lengths to accomplish that whereas another lab

may throw up their hands and say well, you know we looked at the video and so you end up with kind of despairing approaches between the labs so this could hopefully provide some consistency on these great ideas.

MR. VOS: Thank you.

MR. PAQUET: All right, good job. All right now I will introduce Dr. Richard Tarr for our next presentation.

DR. TARR: Hello everyone, can you all hear me? Morning still, okay I'm talking, this research project is going to cover two very diverse fields in the area of fireworks. We are going to talk about novelties we are going to talk about chained shells so vast extremes. When I get my first thought, the first area that I am going to talk about are chained shells.

Well what we have found is under first you have to understand how fireworks are handled by the department. We have a standard from the APA standard and as long as you comply with this standard we submit your application to us, we review the

application process it and issue you an approval.

These shells that go up to ten inches in size contain a fair amount of explosive material and under our default system, our class is 1.3 explosives. Now there is a series of these shells that are chained together and those basically handle shells of size from two inches up to five inches and what we found is the standard that we follow does not directly address the issue of chained shells.

So we are trying to develop a research proposal to look at and I guess to assure ourselves that the risk of these shells in chained and unchained configurations represent the same risk in transportation. So these are just some images of typical pathogens, you can't necessarily see a whole lot of difference between the image of unchained, a box of unchained shells and the box of chained shells but when you ignite a chained shell, those shells go off virtually simultaneous. It is an extremely rapid transition through that chain and we really just want to answer the question, is that rapidness of lighting potentially ten shells simultaneously versus a box, a

typical box will contain, of three inch shells, will contain seventy two shells and this random box of seventy-two shells react similarly to a box of chains that will have seven chains, or seventy shells so the research issue, to answer that question, these are the configurations that we should potentially look at.

These are the chains that are utilized by the industry today. Three inch shells I think in my opinion are by far the most common shells out there but up to five inch shells also occur. We would certainly think, looking at the two extremes would be a reasonable approach.

Whether we need to look at intermittent sizes, probably not necessary but really we are reaching out for proposals to see if people believe that is the best approach to this type of research. What do we want to know, I mean we have been approving chains currently under our system and we are just looking to sort of dot the I and cross the T to assure ourselves that the risk of these chains really represent the same risk of unchained shells

and because maybe it's really just dotting the I so we can be absolutely certain.

Under the UN default classification system, which we don't use, they are silent on this issue of chained and unchained. Silent on many issues of fireworks classification so it is presumed that chains would be acceptable under that system but unfortunately the APA standard we follow today is also silent on the chain and unchained so we are attempting to address the issue, but this is the basis of this research proposal.

I probably should entertain questions specifically, if anyone has any specific questions on the chain issue before we move to the novelty issue.

UNIDENTIFIED AUDIENCE MEMBER: Why, why do they do that?

DR. TARR: Why do they chain? Well for finales, you set off, you want a lot of shells in the sky at the same time and to you know, it is just a convenience it's all about convenience.

MR. MILLER: Richard Miller International Association of Fire Chiefs, having been a fire

marshal and doing inspections on the sites and then inspection of transportation of these, are you going to consider any key boxes which have similar sizes and can have the same effect, three inch shells in a ---

DR. TARR: I mean we do know that 1.3 cakes can shoot off a lot of material, phenomenally fast. It's not been proposed, I mean you can certainly propose it. There is a lot of materials in those cakes that, the issue with the chains of course is we have chains of a flash composition versus chains of normal display shells and we do need to sort of also address that issue, that flash composition chains, do they potentially transition out of 1.3 to a 1.1 classification.

MR. MILLER: Good enough.

DR. TARR: Ready for novelties, well novelties have been around for a long time. I don't know if you know what the novelties are but they have been around for over twenty years, incorporated into the APA standard, officially I am guessing a little over ten years ago, maybe fifteen years ago but they

have always been around.

They were handled under some very old approvals that date back to the mid 80's the next slide will show you. Basically five novelties that we recognize today and I will show you what they are. The little party poppers we all know well, we can find everywhere, the snaps, the snakes, um an 20 smokes, she's a very small, probably the least common novelty that I see and then sparklers. We have all seen sparklers they are a very small five gram sparklers.

These are the five known novelties that we recognize at the Department of Transportation. These novelties get a very unique status. They don't have to be reviewed to us they are not transported as explosives unless they go on an aircraft they basically are shipped as an unregulated commodity. They have to meet packaging restrictions a lot of restrictions, but one of the issues of course is you want to establish criteria for we get petitions for new materials that want to be considered novelties under the new APA standard that is under review.

There are other materials that want to be considered novelties but we don't' really have a firm handle on all of the characteristics of a novelty so one of the goals of this project is to really classify or quantify those properties of these novelty materials so that we know how to expand the family for these other potential candidates, so we are really going to try to really quantify the properties of novelties, establish that criteria and hopefully potentially take this idea to the UN.

The UN doesn't recognize these novelty items, they consider them all still standard fireworks but we don't believe inherently that they represent an explosive risk, so our expected outcome of course is to have a solid handle on the property of novelties so we can expand the field to other potential items and have this criteria readily available for everyone, any questions?

MR. PAQUET: All right, well then we are good. We are going to take lunch right now we are going to go to the next presentation which is also Dr. Tarr, let me pull it up and after that we will go

to lunch.

DR. TARR: This actually works out well for me, I don't have to sit here and sweat, you know, get it all done.

This next project deals with firework waste. I mean there is waste in the explosive industry, all kinds and in the firework industry and waste is a loose term here because it is not necessarily trash. I mean firework waste is generated by many areas you know, manufacturing just being one but a lot of product that is seized, collected, brought in, it's not in compliance, it goes into storage and it can sit in storage for an extended period of time and you know this product has to be dealt with and you know there is a lot of environmental laws but basically we have a lot of explosive material out there under this guise of firework waste that has to be addressed.

And we are dealing with basically two levels of waste, consumer fireworks that you know, say seized in a state that doesn't permit fireworks, or you know display fireworks that were

non-compliant, they didn't have approvals, and they just end up sitting there. Fireworks that maybe got wet, damaged in transportation and then the other end of waste, fireworks, you know every fourth of July there are thousands of shows and I don't know that there is any show that manages to shoot a hundred percent of their shells and those shells come out of those shows in various conditions with the matches still attached, partially fired, damaged, broken shells.

We have this whole array of scenarios we have to deal with in terms of firework waste. It can be cases, pallets and pallets of fireworks that look pristine, new as can be and yet they have to be dealt with and unfortunately we are looking for, to develop a methodology, we have had, we have issued several approvals over the past to industry like Disney and NP who have been very proactive in trying to deal with their waste situation and develop some strategies to deal with the waste, but we want an industrial standard, an industry standard for dealing with firework waste in these various situations that

exist.

Whether we are dealing with pallet loads and thousands and thousands of pounds to I have a single three inch shell and I need, I don't have appropriate packaging to put it in but I still have to get it transported back to a bunker. So we want to look at you know, evaluate each of these situations, the relative risk they each represent. Of course, I think cost factors in if we make it too complicated or too difficult my fear is that no one is going to do it.

I feel today the problem is essentially ignored and but it represents a huge risk and go to the next slide, I have a picture. Yeah, we have millions of pounds and this is a horrible event that happened out in Hawaii where they were, people were trying to deal with pallet loads of waste fireworks and they were trying to soak them into diesel and they ended up going into the bunker doing this work and the incident occurred and five people died in this event and you know the Chemical Safety Board has pointed out that we lack a standard for dealing with

either these large quantities or small quantities of firework waste out there in the industry and I want to be, at least for DOT extremely proactive in developing at least a minimum standard that we can all be comfortable with and if we take these fireworks and we do this and we figure out how much time we need to effectively remedy these products safe to be put back into the transport system, so that's our goal. We want to see what's out there and we want to establish a best practice, one that, you know, acknowledge what the various situations are, there may not be one shoe that is going to fit every situation but can we find the solution for the majority of situations that we face out there with this massive amount of waste fireworks, um, they are just sitting in bunkers, being stored, being collected, you know that's what we have to deal with, that's the challenge we are faced with, any questions? Julie

MS. HECKMAN: I let you off easily on the novelties and the chained shells but I do have a few comments on this. You know I think, I want to

clarify that the waste situation is not necessarily an industry problem. It is a problem with the confiscation that is going on nationwide typically by the local or the state enforcement authorities, say California only very nominal what we call safe and sane fireworks are permitted but for some reason the full line comes in so they confiscate all of these fire rockets and all of these things that are more energetic and are regulated by the CBSC but they are not legal in that jurisdiction so the local fire people they confiscate them and they are the ones that have this problem with how do we get rid of them.

Industry, when we have waste, we need to comply with the environmental regulations, you know, if you are going to store it, you have to have a permit for that. If you are going to treat it, you need to have a permit for it and the industry follows those EPA regulations very, very tightly.

As a result of the Chemical Safety Board accident investigation I would clarify it was a government contractor that was doing the disposal and

had no familiarity with fireworks and so why they got the contract and why they were messing with that product just stuns me and the whole industry was horrified to see that five people died because of that.

The National Fire Protection Association technical committee on pyrotechnics has been directed by the Chemical Safety Board to do pretty much what you've outlined. We have to try to put together guidelines on how you know, how to properly dispose of fireworks.

The conservatives trying to take a local fire person who is ordered to do the confiscation and educate them on how to assess what that product is, you know it might be legal and good to get back into commerce where they could use the product as it was intended to be verses this confiscation of illegal explosives like M80's and quarter sticks that are incredibly deadly and lethal, maybe you want the bomb squad, somebody who is thoroughly trained to assess that and then tell somebody how to dispose of that product.

So I applaud you for your interest, I do think this is going to be one tough nut to crack because of the variety of products out there and each situation. You know you would have to bring an expert in to look at the product, thanks.

MR. PAQUET: I just have one question, could we break down the scope? Should we look at the fireworks as 60% of what comes into the United States, or upwards, so at what point to G world could we break that down and study just one of those, I mean we get certainly the approval and permits division when somebody wants to do a number of fireworks or they come down for a special permit or for the x number, a firework that hasn't been approved, or its' components, Disneyland deals with sweeping up all of the stuff that falls out of the air so for us to be able to give them the x number we have to test it and we don't know what it is, so I guess my question to you would be, understanding where we are trying to go is there a part of that world, a part of that scope that we should be focusing on.

MS. HECKMAN: The permitting process for industry number that needs to get rid of it and coming up with how do we test all of the varieties to say what would the classification be? I think that can be done.

I think trying to come up with disposal methods to put out in general public with product and demand, now I mean, if it was like in Hawaii, those were overloaded 1.4 all they had to do was go shoot a couple of them and then look at them, it would have been better to just shoot that product that to try to tear it apart and soak it in diesel and all of that, we just don't want to have I guess, our industry affiliated with putting down guidance that anybody could look at in dealing with explosives to try to get rid of it.

I think this special permit and that type of analysis, yeah, I think that can be done because it is going to be like this confused project every day where members of the industry who are familiar with the products that they need to get rid of, but you know we typically tell them, have them pick it

up, you know it is going to cost you an arm and a leg but at least it is going to be handled safely.

DR. TARR: Thank you.

MR. PAQUET: All right so now lunch time, some instructions for lunch that I need to give you. If you plan on staying in the building we have a really good cafeteria that is in the other building so basically what you have to do is go out to the atrium, take a right, go down the stairs, come up the other side of the stairs, the cafeteria is there.

If you want to leave the building we have about three or four years ago, probably, Carl you were here, there were no restaurants, there was a Subway and a Five Guys and that was it but now they have a bunch of restaurants, we have an Italian place, we have a Nando's chicken, we have Pot Belly's, we still have the Subway and Five Guys, if you want to go to one of them you have to leave the building and most of them are either to the left, down by the water or to the right, we also have a whole slew of food trucks that will be parked outside along that road. We will be back here at 1:05, if

you are leaving the building we will have somebody posted out there starting about ten of one to start ferrying you back in, any questions just find a PHMSIN and they will give you instructions, thank you guys.

LUNCH

MR. PAQUET: All right, a couple of administrative things, we have a sign in sheet, please sign the sign in sheets on your tables. We also have some comment forms, I would love to see those as well, they will also be posted on the website with all of the presentations as well as the email address when that is created, so all of that information will be on the R&D website, and you can keep coming back to it, we hope to have all of that information posted within the next week.

We are going to start because I promised we would so I like to keep my promises, there are still people sitting down in the back and the next speaker is Dr. Refaat Shafkey from the engineering branch.

DR. SHAFKEY: Good afternoon and if you

cannot see me, the fault is not with me, it is with the poor design of this podium so that now that I have given you a perspective of how I look at things I will start with my presentation.

Okay safety effectiveness of pressure relief devices that is the first one, so I'll lead with safety effectiveness of pressure relief devices. The pressure relief devices can release flammable gasses and if they are surrounded by other cylinders they can have a chain reaction with raising PRD's in other cylinders and then a small fire can end up becoming a big inferno leading to mass casualties or property damage or environmental damage or things that are all to dear to us and should be.

On a smaller scale a PRD release can lead to physical injury to personnel and staff standing nearby so you are essentially we want to see if the PRD's actually enhance safety or sometimes undermine it, I guess that's the bottom line, next slide please.

Now I know some of the people here are very well versed in pressure relief devices. Dr.

Richards tells me that he has his PhD in PRD's so I am having a little chill here but I still have to keep it fairly basic because keep it interesting for everybody else that may not be all that skilled and knowledgeable in PRD's.

So essentially a PRD is a pressure or a temperature activated device. The purpose is that should the temperature or the pressure in the cylinder go high enough that the cylinder can have a catastrophic rupture the PRD would actually act and release the pressure before it bursts, so it's kind of a leak before burst type of device.

Now why use PRD's right, we don't have to use them, but here's our regulations they require us to use them Section 173.301F which states that a cylinder filled with gas must be equipped with one or more pressure relief devices, size selected as to the type, location and in accordance with CDA S1.7.

So we have to use them because our regulations require them on most of the gasses with the exception of the 2.3 toxic inhalation gas, so that's why we use them here in the United States, but

in fact this is not universal and that is one of the reasons why we want to study these and see if others have a better chance, if they have a better experience, why not learn from that, next one please.

Where exactly are they located, typically on transportable cylinders, the type in fielding, part of the value, as you can see the PRD is under that cap over there and next one please.

Different types of PRD's. Typically we have these four types that are shown here, there are more but these are the typical ones. Figure one shows a CD1 rupture disc, essentially what it does is once the pressure in the cylinder develops to the set pressure of the disc it just pops the disc and the contents are emptied out so that the cylinder does not have to reach the burst pressure.

The second one is in figure 2, type CD2 and CD3, these are fusible plug type devices and the way they work is once the temperature, as the temperature goes up the fusible metal melts and it causes the contents of the cylinder to end. CD2 has a fusible temperature of 165 and I think CD3 has a

212 degree fusible temperature. These are typically used in low pressure cylinders.

Then we have a combination fusible and this type of device in CD3, CD4, CD5, what we have is a fusible disc and there is a vacuum of rupture disc so both the temperature and the pressure would be needed to activate this device so the temperature would cause the physical melt and the pressure would cause the ruptured disc to pop. If only thing one thing works then the other one wouldn't be effective, so if only the fusible disc melts, there is not enough pressure.

And finally we have figure 4 which is a CG7 it is a re-closable type, all of these other ones that I just showed you were you know, once they open the contents are vented out. The CG7 is a re-closable type, spring loaded device. Once the pressure reaches the set type the seat pops up and causes the contents to vent out and if the pressure drops it is supposed to come back and reclose the vent, but that is the one that is typically used in the propane industry.

Now we will take a look at some of the accidents. Here is the one propane cylinder fire recently in central Florida and this was a night fire, in the upper part you can see the inferno which was visible for miles and it was actually a propane cylinder storage facility and from what we know is that one of these cylinders the PRD's actually vented and for whatever reason it caught fire and once that happened it was a refilling facility for the storage warehouse and it kind of got other cylinders into the loop and each subsequent venting cylinder ended up being fuel for the fire and eventually there was a big explosion and the other picture you see here is the morning after the result of all that, next slide please.

These were the consequences, injuries, fire critical and no fatalities and over two hundred responders had to be called in to contain the fire, 53,000 cylinders, the building destroyed, and the fire could be visible seven to ten miles away from the plant.

So a lot of property life and property

damage and disruption, here is another one. It involved on a second fire in Dallas, Texas. The fire started from the trailer in the upper left corner and these were mobile settling trailers and there is no confirmation of what exactly started the fire but it looks like one of the fusible discs on one of the cylinders popped and that started the fire and that left two other cylinders getting engulfed in the fire, you can see all these little candlesticks here. These are all PRD's, popped PRD's which eventually led to the middle picture there and then the aftermath you can see on the right one.

This happened to be close to Interstate 35 in Dallas, Texas which is very busy, especially there and these cylinders were actually jettisoned all across the freeway there and they had to close the freeway in all directions. There were three injuries and two serious and the building was completely damaged. They had to inspect several bridges in that area before they could be reopened and also Dallas doesn't have a whole lot of community rail but they had one or two lanes and they had to close one of

them, so quite a lot of damage.

Here is another one propane fire in Tulsa, Oklahoma, this was a distributable facility and one of these propane tanks vented out from the PRD for whatever reason, it could have been oil filled or a bad PRD, you know these PRD's are fairly cheap devices, they do not always function all that well and I guess maybe somebody was smoking nearby and that started the fire and then it spread to other cylinders and other PRD's acting and then becoming a chain reaction and this was the outcome you know I guess nine plus, it doesn't look like nine, seems a lot more than nine, I guess maybe they didn't count some of them, they only counted the ones there.

So cylinder damage and typically these fires I'm told amount to four to ten million dollars worth of damage so just to avoid all of those things from happening I guess we want to take a closer look at what the PRD's actually do. I mean sure the intention is good but we want to go beyond the myth and the perception and see what they really, really do in an accident and to that effect we want to look

at the accidents or incidents where PRD's are used and where they are not used, and typically in Europe they don't use PRD's on propane.

I think UK was the only country that used to use PRD's on acetylene and they have stopped doing them all together so and they're generally speaking they are, you never really hear of a propane fire or acetylene fire in Europe. And they offer PRD's, surely their cylinders are a little bit different and their handling is a little bit different, all of those factors have to be studied to see what role the PRD's actually play in fire situations and another aspect which could be tied into this study is to see if a different type of storage, if we could segregate the cylinders into smaller lots so that if you have a little fire it is limited to one lot that can be contained and doesn't speak through the entire facility.

Another thing we can do is to, which is very, very good is how the emergency responders should respond to these fires. The fire situation where the PRD's are used and where the PRD's are not

used and finally I guess the last one here is to sort of go back with what Dr. El-Sibaie said earlier on that we have only very limited resources so we have to leverage them to be most effective and since propane cylinders apparently are I guess that Plato's rule applies here as well, eighty percent of the flammable gas fires are related to propane, so maybe we can put a little extra emphasis on looking at propane cylinders because they also have the greatest explosive problem and we want to get the greatest bang, the maximum bang for the buck which is very limited so that is all I have. I appreciate it, thank you for listening I will be happy to take any comments, questions.

MR. PAQUET: All right.

MR. CALDARERA: Mike Caldarera, National Propane Gas Association, first I was wondering do you know what the root cause was of the incident that occurred in Florida, has that been determined yet?

DR. SHAFKEY: No, that report is not final yet, but I am just going with the preliminary report. Excuse me the preliminary information is that it

started from a PRD.

MR. CALDARERA: And you just mentioned that eighty percent of the incidents related, of the PRD incidents or assumed incidents were related propane, I wanted to see where you got that statistic, but the other thing I would say is you talk about one of the areas of research in fact, on or safety with emergency responders, our industry has a pretty really strong program called propane emergency which is dedicated to providing fire fighters with a variety of scenarios of incidents in helping the responders to respond and how to properly respond from a tactical perspective.

There is a number of scenarios, I don't recall if we have some here with regard to the collection cylinders and the incident that we saw but I would certainly go back and look at that, and we would like to provide you information to you as well.

DR. SHAFKEY: Certainly you are very welcome. The purpose here is, it's is nothing is conclusive yet. We want input from all of the stake holders which includes you and again this is not, the

original intent of our proposal was not to limit the program at all but considering what you know you just heard earlier on, we have to just sort of get maximum utilization for our research dollars and concentrate on the areas which have the greatest impact on public safety. Steve how are you?

MR. GENTRY: Steve Gentry, Worthington Industries, Refaat you might want to not go with the person initial reports because that is not what I was told in Florida occurred. On your acetylene fire that was a Worthington facility and it wasn't our facility, and all of our product was there and there was a cracked manifold and that was the source of that fire.

I kind of like where you are going on it but none only the liquefied gasses, I would like to work with you a lot on, but I have a real problem with the liquefied gasses.

DR. SHAFKEY: I appreciate your comment, as I said, nothing is done yet. We are simply going to look at it and since our process and procedure does require to issue proper notice to all of the

stake holders to get all of the time to comment on these things so unless all of those stake holders are on board, I mean nothing is going to be done.

We are simply exploring the possibilities and at this stage you are very welcome to team up with us and help us. We haven't given any conclusion yet we have simply looked at a few things and have identified something that has been a source of a problem here.

MR. PAQUET: And again, this is why we are here, to provide these comments.

MR. MILLER: Richard Miller, International Association of Fire Chiefs and it looks like a very interesting project. Certainly I think one of the things as you move forward that you should look to is the national standard codes and how they affect storage and commodity storage and compatibility and total amounts and how they can be secured and so forth and certainly that, the initial reports, I really like have the quantitative part in this report that some of them look like they actually BLEVE and that's different.

DR. SHAFKEY: The BLEVE comes in a little later, that's when you had that explosion but when you saw that little candlestick, those started off, it may not have, you know Steve mentioned that it had some ruptured manifold or something but at some, I don't think that is clear either, because I don't have a final report on that one either, but what you had there on the final picture was all of the PRD's, which led to the BLEVE or the explosion.

MR. MILLER: I also want to expand on what you said, I believe you are not only looking at the PRD on the cylinders and pressure vessels, but also how bad these devices function, in the case of propane for example, we were looking to see how CV7 functions, it's actually does what it is intended to do.

MR. TOUGHIRY: Thank you Mark.

MR. PAQUET: Excellent, all right great.

DR. SHAFKEY: Thank you.

MR. PAQUET: And our next presentation is from Bill Fink. Bill's excited because he gets to tell me what to do.

MR. FINK: Bill Fink, PHMSA approvals and permits, good afternoon all improving the safety of the modern nitrate products containing ammonium nitrate or products containing ammonium nitrate during transportation, next slide.

Again remembering that our mission is to protect people from the risks right inherent in the transportation of hazardous materials, well something about that is if you are continuously improving, you have to know what your current risks are and if you want to improve you have to reduce those risks, so it is a continuous improvement project, right, so the scope of this project is going to be bulk transportation and the goal is again understanding what is the current risk, explore strategies that would reduce that risk significantly right and understanding the economic impact.

In other words, such that we don't get a bang for our dollar and seek input from the stake holders because that is what we are after today. The stake holders, what kind of risk reduction do they think they may or may not require.

Just a couple of things here quickly, about ammonium nitrate, ammonium nitrate is used to make laughing gas, nitrous oxide. And the way you do that is you take ammonium nitrate, you heat it up and then for the next part of the reaction you spend all of your time cooling it down, but there is a lot of energy released and that energy that is released is the energy that is of concern to us in prolonged fires, next slide.

Okay some facts about every 53 million truck miles, we have a truck fire, right, trucks carry a large amount of fuel. Those eighteen rubber tires, they are fixed to the vehicle and if they are placed underneath the cargo they can start to heat that pot up and get that reaction that we just saw going and releasing that energy.

Truck fuel fed fires last three quarters to an hour and a quarter typically and emergency responders get there at absolutely the wrong time, after the fire has been burning for a couple of minutes, after the material has had a chance to heat up, next slide please.

Some of the incidents that we have had during the last forty two years, there has been four, three fatalities in Australia, zero in Canada, eighteen in Romania and you can see that there are seven fire fighters and two of the news crews and then in Mexico, twenty-five fatalities. This truck fire occurred opposite a soccer arena and as people were letting out, everybody likes to watch a fire.

Again, fire is the problem, heat transfer is the enemy so what should we do. Fire prevention most of all, can we prevent the fire. Insulation is one of the methods that I thought might work. Another is shielding and then any other method that people would like to propose I would be very interested, next slide.

This is a liquid hydrogen trailer, fire underneath it, didn't spill a drop of hydrogen. Why, it's starts with a superb insulation. One of the things I would like to point out though is this fender here is aluminum, it's not there anymore, so again aluminum would not be one of the materials that I would look to utilize.

Shielding, pretty effective, pretty cheap, pretty low tech, right, oil filled fire, and you have a couple of guys standing behind the shield and they are protected from the fire. Shielding is a really interesting passive, inexpensive way to maybe accomplish this but again we are going to have to do some calculations and make some determinations, next slide.

Other things that we could do, reduce the mass of the fuel, super singles, right less rubber, in the road, and then distance the tires and fuel from the combustibles. I picked this particular cargo because sometimes the bad example sometimes is the best. You see this is what I would call a Michigan truck, lots of the axles, if you have been up in Michigan they put the eleven, twelve, thirteen axles underneath the vehicle so lots of axles, lots of rubber underneath the cargo space so I would expect that not to be a good design, next slide.

So some of the deliverables from this is we would like to see strategies for consideration, some of the energy calculations that go with those

strategies, what's the additional costs, what are the reduced risks, right again getting no bang for our buck and then proof of the concept and absolutely, absolutely stake holder input because the stake holders are the people who are going to have to help us make some decisions so thank you. Question?

MS. HILTON: Cynthia Hilton with the Institute of Makers of Explosives you are very brave to stand up there and say those things. Our industry consumes 75% of AN who represents the largest manufacturer of this product in the United States. We are very much opposed to this. We are struggling to find out why with your limited resources that this would be a project you would put forward.

Going back forty-two years wow, the incident in Mexico, it's so discouraging to think that you all think the incident in Mexico, that was Amco, it's a 1.5 and if that hasn't happened in Romania, hmmm, anyway you should come talk to us and we will tell you what we know about these incidents but in the United States you had no deaths ever from this, this is one of the safest products.

We have saved lives in the transition from nitroglycerin based products to AN and you all should be given us an award so we have huge issues with this thing, we just, if you want to look at fires and risk and saving lives, it's not AN you need to be looking at.

So I would love someone to explain to us so I can explain to our industry why you have focused on this product. I know that maybe it's politically, and you know I seem to be talking to that now, but can we hear back from you on that.

MR. FINK: Yes, well I think one of the things we want to look at is the ammonium nitrate and ammonium nitrate contained materials are inside this scope. Secondly I think we have to look at the issue at West Texas last April 17th and wait for those results to come out before we can move forward. Also we are seeking.

MS. HILTON: A limited amount of money, really West Texas.

MR. PAQUET: It's only a proposal.

MR. FINK: That's correct.

MS. HILTON: I though what we are here, is this not what the scope of work is for the next twelve months?

MR. FINK: Right so we could elect not to do this scope of work or we could elect to do it. I would like to hear from you on that, right, yes.

MR. STEVENSON: Boyd Stevenson, American Trucking Association. I will not repeat Cynthia's comments except to say that we share the same concerns. Also just want to note that I have struggled for many of the reasons that Cynthia has identified to see how some of the areas that you are looking into as far as proof of concept could be used in any sort of way to demonstrate any sort of benefit that would outweigh the costs and I just haven't seen that fortuitously makes me wonder whether or not this research is necessary, given that we already know that there are very few societal costs since we haven't had incidents.

MR. PAQUET: And that's exactly what came back, a proposal, we are in that section of the program today, so if the covent to the proposal is we

don't think we should go through with this because there is, provide us with input that's great.

DR. COVINO: Josephine Covino, Department of Defense the Safety Board, at first I wasn't going to say anything but I do have to say something that I do think fire and shielding aspects, whether it is on a transportation truck, whatever the material is, for example, let's take that hydrogen fire that you know the tires were burning, blah, blah, blah, you don't know from a fire fighter's perspective how close those fire fighters who fought that fire were to almost being killed. For them to have put their hands in harm's way I actually think these kinds of experiments are worthwhile to understand.

Because hazardous materials a lot of them are very flammable, understanding the time dependent of that fire so that the fire fighters could fight the fires so you don't make the whole city a problem I think is very important. However, you scope it, that's my big question but I do think the time dependence of the fire events is important.

MS. ABDELKADER: Sarah Abdelkader I am

interested in getting this comment because I appreciate what you said about the fatalities and according to your span in looking at the data, but what I am missing to put it in context is in contrast with what, so when you made that comment I was looking for, but here is a suggestion for what you should focus on so that I can protest. Like there is a lot of fatalities in that commodity, so why don't you look at, because this has a lot of fatalities, injuries in the U.S. this is what you should do because basically to me as a risk analyst, what you are saying this is a low risk, you shouldn't spend time or research money on it, this is a high risk, go for that.

MR. PAQUET: You don't need to respond. We've been having this conversation back and forth right now, but what I will say is that just last year, because last year we put out some research, what were are top risks, cargo tank rollovers was top and flammable liquids and so certainly your comments are very valid Cynthia and we can, I am saying that there is very little risk, I got you, but I just

don't want to get into necessarily the back and forth because it is not productive. It was a very good question.

MR. FINK: Yes absolutely.

MR. PAQUET: Actually listening to the debate and not being an expert, you posted it in question form in my mind was pressed either now or later for a personal answer and how do you set the priorities and create the agenda of the research topics that you want to consider because maybe that's what we are really getting at is if we are going to spend research dollars, how do we make sure they are prioritized to that special program.

Now if lack of insulation or if there is demonstrably a big program around ammonium nitrate transport then it should be of high priority. If there are other things that demonstrably have bigger problems then they need to be a higher priority so I would like to see if you could comment about it at some point.

MR. RICHARD: Previously being a regulator and working here at PHMSA, it's not always, I mean I

had industry people saying they were not having accidents, why look at this, it's low probability, high consequence. So I think with this issues I am not saying whether it is a high consequence or not, but you know that's the part, I don't know if anybody has ever proved that so that's the issue. I'm not convinced because hey we are not having any actions so we don't need to look at this.

There are limited resources, it is difficult to pick the projects, but I think the high consequence and low probabilities are part of the equation.

MR. PAQUET: I think that there is a lot of opportunity for constructive comments on this specific one.

MS. HILTON: I want to make a constructive comment here which is we should be looking at risk. We don't have an unlimited pool, I think you would agree with that, a limited pool, we should be looking at risk and there is risk out there but I think you should go back and look at the data, it is not one particular product, none, so just focus on that

because there was an industrial accident where no one followed what is best practiced, you know West Texas, there is a total lack of what anyone in our industry would say this is how you manage this product, you can expect bad things to happen.

You can't you know, what do they say, you can't live like.

MR. PAQUET: I don't want to use the word stupid.

MS. HILTON: You can't legislative stupid but you know if you follow the rules and the best practices you are not going to have these problems. We do looking at West Texas, now recommend when a fire has engaged AN you do not fight this fire. We just put out a video for the fire fighter community with the endorsement of the International Association of Fire Chief's saying thank you very much and it speaks to this issue, we are trying to save lives, to Jo's comment about how close should they be. We have been watching the fire report, not AN, you know because that is our product and if AN is concerned, and we do get concerned because the fire fighters get

too close and we believe in training and we would like to keep those people out of harm's way.

MR. PAQUET: Thank you.

MR. FINK: Nobody is asleep.

MR. PAQUET: Nobody's asleep anymore, excellent.

MR. FINK: Thank you very much.

MR. PAQUET: What is going on here, all right our next presentation Dr. Steve Hwang.

DR. HWANG: Good afternoon, it looks like we saw enough fireworks and explosions so it's about time to change gears. What I am going to talk about is the slide large format, lithium batteries. It's not a proposal we have an interagency agreement with Navy research center right now to fulfill this task. It lasts until 2015 and after that we need to have further proposal to continue and of course a large format lithium batteries, I tend to speed up a little bit later but if I do it, you know, keep me, let me slow down.

Large format lithium batteries have a unique challenge in managing risk in transportation.

Why because large means big, according to the UN definition, large means anything greater than 12 kilograms and I, you know 12 kilogram is you know if you envision how big that could be about this size battery that is about 12 kilograms but if you look at automotive batteries, like a maybe a hundred or a couple hundred kilogram size. Of course if you look at different applications you can have a couple thousand kilogram batteries as well in different applications like in let's see, in military applications they have these huge batteries for mounting on ships, et cetera.

Or even they even use the international space station, I was in Houston, Texas too, they are concerned about the use of batteries and the safety of batteries. Of course you know about the use of batteries in aircraft et cetera.

So the second reason why it poses challenge is because the lithium batteries have high energy density per unit kilogram, per unit weight. That is the beauty of the lithium battery to begin with but at the same time it causes hazards. So in

terms of not only chemical hazards, but also electrical hazards, it can short circuit, not only short circuit but also because of chemicals it can burn or it can run or have what's called a runway et cetera.

So our purpose of this research is right now is to, I mean in a broad sense, I am going to go into specifics later, but to have safe batteries when you transport them for large batteries. Of course more batteries too you know we want to make sure that they are transported safely.

We also receive a lot of the manufacturers' concerns. I do many a variation of many approvals and we want to make sure that those concerns are investigated so that manufacturers can be in compliance, next one please.

So what we have right now ongoing in terms of research program is I have five highlights here. One is concerning battery testing, that is, I mean there are eight battery testings you have to do in order to meet the important UN test requirements and we are going to go into specifics one by one later.

Second one concerns, let me see, the hazards associated with transporting batteries by aircraft. Aircraft we had about a hundred accidents, incidents I would say on aircraft in the last fifteen years, the reason batteries on the market about fifteen years ago, it's not, before then there was some other batteries, but we only have the incident report on aircraft, we don't have any incident report by motor vehicle or any other modes because it wasn't required, reporting wasn't required until about a few years ago.

Third one is we want to have some procedure developed for doing some forensic analysis of batteries, on failed batteries because if a battery fails then instead of looking at the source of the batteries, you want to have examined the interiors of the batteries by using x-rays, or CT scans to understand what is going on inside the batteries.

Fourth one is the project concerning prototype lithium batteries. As some of you know the prototype, regulations concerning prototype issue

lithium batteries are kind of loose. At the UN level of course, you know HMR is taken from the UN promulgation and that is a common practice here so that we can harmonize the regulations and in doing so creates a lot of problems because you know, it can have, the approvals can have different transportation requirements because we do it on a case by case basis so something that the Navy uses we are trying to look at in terms of specific approvals being issued.

Fourth one, I'm sorry fifth one is we want to look at some kind of case study as to how we can do this forensic analysis when you have failed batteries, next one please.

Of course there are many applications of these large batteries, in terms of automotive and the military applications and of course they use some of these batteries in storage of energy, et cetera, and aircraft and also at the space station I mentioned, next one.

That's a huge battery about the third size of this battery that they used for radar for Navy applications. So in order to have the outcome of, we

just indicated, these are specific tests that the Navy research center has to do and we will go through these each one by one, next one please.

Since I have only ten minutes I cannot go through, read all of this. This is the test or procedure we were looking at. The test procedure we need right now we have to issue at the UN level as far as I know is what is called the shock test, among other tests. People say you know all of these tests, the tests are not perfect so they are examining all of these one by one right now but the shock test is the one which is being looked at pretty closely, so that's one we just finished at the Navy research center, I will go through some of the equipment apparatus and what we need et cetera.

And we finally have to look at the current the requirement in terms of what is called, in terms of shock test, in terms of the acceleration, G force, G force of Earth is 1 G and then right now for small batteries it requires 150 G for large batteries it requires 50 G. It is not a separate number, it goes with what is called the postulation and I was

supposed to bring a battery but I didn't I'm sorry so I am going to use my mobile phone battery.

Before I show you the equipment we use, basically they do, you can do, it's called the shock test by two ways. One machine they can use is what is called the shaker or vibration machine, in Maryland they have that and we did the test at that facility and the test is expensive.

More easier and a common way of doing is what is called the drop tower. Simply you drop the battery at certain height on the floor, whatever the surface would be. I should stay here of course I'm sorry. So, no that's all right, so basically you drop this battery on the floor and before I go through the specific examples, since we have all this endurance in the morning and also we might be a little groggy now so I want to give you an example, a test.

If I drop this here on the floor what kind of G force and postulation do you think you can expect to have? I dropped it, what kind of G force and postulation did this battery get? G is, I'm sorry, G force, this is approximately for the, this

is small, it is not big battery, small battery, the climate is it has to meet 150 G and 6 milliseconds and this about the force you are going to encounter so if I see a fire, or damage et cetera it's fine, that's with the shock test, but if you have a huge battery like this and if you drop it from here to the floor, it's pretty high and what kind of G force do you think you would get? It's not the same G force.

What it is-is if you drop it on the floor like this unless you change the floor, postulation doesn't change. It's about 6 milliseconds and not 11 milliseconds. It has to be softer than this to get 11 milliseconds. 6 milliseconds and if you drop the battery like this from here to the floor the G force will be instead of 150 G it would be around 50 G.

What I said was that as mass goes down at the same height, G force goes down so that's a problem industry is facing with, in other words, what I am saying is if you have a, I drop this like this and it is 150 G, and if I take a big one here like this it is 50 G but in order to bring, it could be 40 G, let's say it's 40G instead of 50 so in order to

make it to 50 G you have to raise the height of this and then as it goes bigger and bigger you have to raise quite a bit and then you damage the battery so that is the problem they are looking out.

So I'm sorry I don't want to go into too much of this so let me go back, so what we want to do is we want to keep the operation of this battery within this range, this is fourth inch temperature scale, you have heard about this, I don't see any battery experts here actually so if you heat the battery above 100 degrees anything, a lot of things could happen, there is acetylene inside here it could melt and also a lot of things could happen, this could happen if the battery would burn, it happens a lot of times, in many cases.

And this is the instrument that we used at the Maryland research center and this is the 16 kilogram, 75 pound battery and there is a lot of wires here for instrumentation. This is a fireproof chamber in case there is a fire we want to contain that is why it is a fireproof chamber and other things in mind, remotely, this is for my computer

screen as you can see, you can measure the G force by using the computer monitor and using spirometer, a spirometer is a small device you put on the battery and when it hits acceleration G's actually if you remember it is a change of velocity with respect to time, that is what acceleration is.

If you attain certain velocity but velocity is not G, the change of velocity with respect to time that is what the G is and then to various things using this monitor. That is what the computer does, so and that is a test part. Another part we want to look at is the radius, right now the 35 kilograms is the radiant for transportation on aircraft and we receive a lot of this for exceeding this weight.

People say it impedes the ability to transport and they are trying to look at the various factors like battery manual system, state of charge and the packaging et cetera and whether they will need to improve the overall safety of the transportation, next one please.

This is of course the forensic analysis

you get to look at the inside of the batteries to see whether we can really determine the cause of the failure in terms of the components by tracing the components and of course some of the test method which is lacking right now is what is called internal short circuiting, nobody came out with a method yet because they don't know how to do it yet, so by looking at the internals maybe they can figure out what happened to it and this is the prototype batteries, we tried to examine what the CA's approvals ratio there regarding prototype batteries so that we can have some consistent requirements and those are not to duplicate the approvals for similar designs and marketable issuance of approvals for international shipments.

This is a large packaging. We want to look at large packaging in terms of how we can improve the failure mode and not only to prevent them on the runway, but also we try to look at the fire suppressant, right now halon only is fire suppressant that is allowed and we are trying to make a different fire suppressant as well.

And this is case study to look at the failed batteries in terms of the new codes analysis and fire safety et cetera.

This is well there are a lot of things that we can look at later on. This gives you an idea of some of the areas we can look at, it's a full area and I don't know, you know, that's why we have this, I thought we have this forum to get some input from the public and some of the things that our contract that we came out with looks like. So we have to study in the next phase, this is not under contract yet, and study the effectiveness, different kinds of material being the promulgation I think that is something, and investigate the use of hydro fluorinated electric as a suppressant and also maybe the mixing material within the battery et cetera.

And what we also, we don't want to stop the investigation of the battery failures because right now there are a lot of issues associated with that, thank you.

MR. PAQUET: Thank you Dr. Hwang, that was excellent, any questions on lithium batteries?

MR. RICHARD: Can we go back to the slide that has the objectives, the outlines, it was the first or second slide that had the different components of this research so the purpose of this meeting is to try to influence it or get comments on it, so if I look at this and thank you Steve for the presentation, next one this one right here.

So first of all my first comment would be this is very, very blunt and I think what I liked about the presentation was talking about the shock test because I totally agree you know, that there needs to be work there. Actually there is an organization called Costa, you are well aware of you guys were there this week and they have a proposal that they are going to submit to the Brussels meeting that is going to be held.

DR. HWANG: I saw that yes.

MR. RICHARD: But perhaps some further research would be helpful there because it is not totally perfect. I have a real concern with this piece of forensic analysis. I work with a company called Exponent and I am going to call it, these

companies have research scientists on their staff that are very intently accommodated and they do forensics on a daily basis for all types of companies and I really think, I don't think the research dollars will be well spent by trying to standardize a method for conducting forensic analysis because there is many ways to do it depending on the battery design, the battery chemistry, the size and so I don't know if it could really be achieved here I think there are people that are very good at doing that already and perhaps you should talk to them before you do further research on that.

As far as the packaging, I'm working with a company called Americase, we were actually invited to speak at their meeting and we have a packaging and there is other manufacturers out there, our competitors that have packagings that contain a thermal runway of the batteries on the packaging and there is a pending approval that you guys have with one of these packagings.

So the technology is there, I am not sure of research in that regard would even be worthwhile

because there is so many different things that we are looking at right now, we have different materials, materials that you can actually put in, that is similar to packaging peanuts that when they are exposed to heat they will actually melt and consume the battery and some other things, so there is a lot to do.

I think this is overly aggressive and maybe you should narrow the focus of that research to something that is more tangible that you can achieve.

DR. HWANG: Let me.

MR. PAQUET: You are out of time, maybe in the second part. So thank you very much Steve I appreciate it. We are actually going to go through Joe Nicklous's presentation and then we will take a break, just keep going well we will see. We don't know how Joe's going to be.

MR. NICKLOUS: Thank you sir, all right glad to see everybody made it back this afternoon and it has been energetic to say the least. So, the odorization of LP gas, liquefied petroleum gas, it's my second topic of the day and there is some concern

regarding odorization. There have been incidents and instances where the odorant of an odorized LP gas has "faded" over time given the chemistries involved.

There are multiple chemistries, they are all listed within the section of the regulations that is on the screen. There was a specific incident in Massachusetts supposedly odorized with ethyl mercaptan but the big question is why study odorization.

We want to determine the absolute cause or multiple causes of this odorant fade phenomenon. And it is important because unodorized LPG is odorless and presents pretty big dangers. So when you get it into the hands of consumers and end users, you don't want to necessarily have an unodorized LPG.

So next slide, so far things that we do know. Steel cylinders, tanks are subject to oxidation. Oxidation appears to occur regardless of the state of the cylinder. Continuous use seems to have desensitized or deactivated reaction for this oxidation however it is present in all typically more show faster oxidation rates due to the deactivation

aspect, not a hundred percent sure of all of that so part of the reason why this is on the table for at least thought and consideration.

This is the incident that garnered a lot of public interest into this specific topic. A quick summary, July 30, 2010 seven injuries, one fatality, liquid samples confirm virtually no ethyl mercaptan present in what was termed, or deemed to be a odorized LPG gas.

So these are just the recommended or thought about areas we hope to identify or at least ask questions on. We know there has been a lot of research that has been done, I know it goes back roughly thirtyish years. It's hard to get an accurate snapshot of everything that is known about this area so first and foremost, what has been done, what's changed since then, obviously new technologies, new different chemistries, linings to tanks et cetera.

Determining the effectiveness of the "sniff" test, is there a better way to come up with is the gas still odorized. Is it odorized

sufficiently and then are there ways to prevent the current odorants from this fading aspect. Is there an additional additive to slow down the oxidation? Is there a potential new odorant out there and there are and we realize there are some serious issues to identifying a new odorant and all of a sudden recommending the use of a new odorant and first and foremost on those I would say you would have to train the entire American public that natural gas wouldn't, gas wouldn't smell like "gas" if it doesn't have the same scent to a human.

You would also have to get something that would be as humans are as sensitive to. It would have to be unique, you wouldn't want to encounter this all of the time and think you are smelling gas. Potential but we realize there is a lot of concern there.

The last question is, is there a way to condition the newer un-deactivated steel from speeding up this oxidation process. Is there something that you can treat the steel with that would slow it down? So there is some really

beginning discussions, there is nothing really hard and fast this is kind of just a thought provoking discussion but we do realize that there is a concern there, there is a risk there and we want to look into potentially stopping it from happening again.

MR. PAQUET: Thank you Joe.

MR. CALDARERA: Mike Caldarera, National Propane Gas Association. One think Joe I think can we agree that this issue is limited to rail cars and not over the road trucks because those incidents that we have seen, the issues we have seen with odor fade, you know in the last year, a couple of years is really confined to rail cars, we have nothing related to over the road vehicles.

MR. NICKLOUS: I think we can agree that the incidents that have happened have been involving rail cars but I think it also extends to any potential steel cylinder, steel containment vessel that is out there, we do have the storage tanks as well as the rail cars. I wouldn't say it's a, the five pound canister or the you know the propane canister you use in your barbeque grill, it would be

the primary concern because you are using it fast enough that the odorant fade doesn't have a chance to take effect.

This is more I think it is more fundamental, just in general the chemistry. Is there anything chemistry involves that we can stop the fade, slow it down, prevent it from happening, identify a new chemical that wouldn't have that property of oxidation and "therefore fade".

MR. CALDARERA: Part of it is when you look at the rail cars, there are occasions with rail cars, you know after they get loaded on they may sit on the side for some period of time so they would have some stratification maybe some of those phenomena occur in addition to what you had mentioned before. You don't really see that as much with once you have bulk plant or at a consumer tank, because those are typically filled and refilled enough so that you don't get that stratification so it is sort of less of an issue and also it is a new issue with older tanks, clearly is the newer tanks, or those that have been in a different service, hydro or more

properly cleaned so those are the phenomenon. You also referred to there has been a lot of work and studies done on this and it certainly behooves to revisit that someone necessarily duplicated.

With respect to a new odorant, I mean anything is possible, I can tell you I think ethyl mercaptan over the years, and I'm just saying this anecdotally from what I know that ethyl mercaptan is proved to be the best odorant and I think it is detectable down to.4 parts per billion or something so and even as it is now it is not necessarily a mandated again in regs or in codes, it is typically, that's become the accepted practice so that's where that stands and unless we had something new, you had to go through all of the retraining and that sort of thing.

It's hard to get your arms around it we know it's out there. It's not, I wouldn't say it is as common an issue but the fact that it is an issue remains and we do need to look at it.

MR. NICKLOUS: And I think that's exactly the point of the research is that primarily the

literature review about what's happened before and then what's changed since that's been done, if there is anything to update.

DR. WONG: Kin Wong, I guess maybe it's time I say something. There was a chemical, it was a fortune 500 company that made chemicals and I have the guidance call for customers that I had in the company twenty years ago and it was well recognized at the time that this fading, especially one against pneumatic pens and the guidance was to, when you put in the odor you have the mental detection to make sure that you have concentration in there, so maybe another approach is better packaging for to check, to make sure that what you put in is there you know and it does the job and that was in effect for many years and the high material available and it is cheap and has been effective as an odorant.

MR. GENTRY: Steve Gentry, Burlington Industries, I am an old propane guy too. There are a lot of good reports starting back in 1976 on odor fade. That started back then it was the NLPGA, the National Propane Gas Association had another name

back then. They got in trouble with the golf association. Anyhow, if you go back in there you are going to see there have been studies done all the way since I was first involved in 1975, up to today.

I agree with what you were saying about ethyl mercaptan, we looked at different odorants, the Sheriton Hotel in Charleston, South Carolina, somebody knocked the bottle over and we had to evacuate the Sheriton Hotel, I think, but I would like to share with you Dr. Roberts report will tell you when you look at steel tanks, the issue is not the steel tanks, the issue is the water wasn't taken out of the steel tanks and you have to pretty much be a metal artist or get involved into the chemistry of it, what you will find out that it is not a FE203 issue, it is an FDO issue, it's not rust in the tank that causes problems, as you know there is red rust, it's before it turns red and it might say, and I've done product liability on odor fade since 1971 and I can tell you we have never had an odor fade in the sulfur, never once had an odor fade in the sulfur, we have been accused of it, but you had an odor fade and

recalled tank cars and my gut feel is there was, I think there is a problem getting the water out of these old rail cars, that is just a gut feeling, I can't prove it but I think you really have to look into it, this thing has been looked after for 40 years now.

MR. NICKLOUS: And again that's, I think the primary starting point is doing the literature search, getting it all in one spot, review it all and see if there is anything that has changed, see if there is anything that can be recommended on the practices, is it strictly to rail cars and/or storage tanks as well, things along those lines.

MR. GOLDSTEIN: Yeah, just a general comment on this issue. I guess a little bit is part of the culprit and compliments to you for this. The IFC and the National Association of State Fire Marshals got involved with this. The incident up in North Mass that you mentioned back in 2010, the state fire marshal up there came to IFC and they changed their rates from a C test to doing 2 testing and so there was that issue and we were aware of a lot of

the different studies that have been done.

We filed comments with the Consumer Products Safety Commission to get into their plan, into their budget and candidly they were basically blowing us off and not even met with us so we think this is a worthwhile project in the recognition of all of the projects been done, we have met with Mike and his colleagues at the Propane Gas Association. For the purposes of today I really want to compliment PHMSA, you guys have really been open to discussions for this issue and Chief Butters just walked in, we weren't supposed to notice.

It is something new though but you guys have really been in the forefront of this so I really want to thank you for even addressing this potential issue. We do think it is important and a lot of our membership does and the fire marshals because of the fact that a lot of studies have been done, but somehow it is still happening or has occurred and it is one of those things where it doesn't happen a lot but when it does it has a big impact obviously so really on this point we will be filing comments

hopefully that you will take this one.

I just really want to compliment you because you are about the only agency that even wants to see us anywhere and talk to us so compliments to you all.

MR. PAQUET: Thank you.

MR. NICKLOUS: I think the other important part of that is to get some of the people that have access to those reports currently to send them in as part of the public comment period because we will be happy to look at them at that point, as soon as I get my hands on them.

MR. GOLDSTEIN: I apologize.

MR. PAQUET: You are pushing my time limit here.

MR. GOLDSTEIN: I know, that's why I didn't want to take a break. By the way, having said all of that with what Mike said and this other gentleman, we are probably not in any material disagreement in where you have to look even though I do think we would still say probably the rail seems to be where the focus has been but part of that is

some of the incidents they found in Massachusetts because they were looking at the rail and they are doing the tube test, so you want to talk about a sniff test, we would love for you and we will do it with comments, say look at the tube test as an alternate and what do you think of that.

Probably the new odorant, I probably agree with Mike that that's probably one where we don't think that I would spend much time with any. I really think that's we have heard rumors that some of the imported may not be as good as the domestic but again that is all speculation and my sense too and it is dangerous when somebody who does government relations has a sense, but part of it is the steel tanks, the water, possibly linked to time sitting on a rail car where trucks normally don't, but at least from our standpoint we would not exclude a truck Jim Goldstein with the International Association of Fire Chiefs.

MR. PAQUET: All right although I was requested not to take a break because our W8 administrator is here, I figure it's time to do a

break, eight minutes, an eight minute break.

BREAK

MR. PAQUET: All right I want to set some ground rules for the rest of the discussion today. It is going to be more open. I am still going to limit you guys to five minutes okay, so there's that time. Understand that I will be hovering around you and when my timer goes over at five minutes maybe even a little before that, I'll tell you it's time to wrap up.

Please, please, please provide constructive comments. Do not expect a full on conversation and certainly don't expect to hear something that is the official word of the Pipeline and Hazardous Material Safety Administration because although Deputy Administrator Conners is here we are still not in that position to do that in this forum. So please do not ask us a question that is going to put us in a corner. If you ask a question that puts us in a corner, for whatever reason, I will intercede, just letting you know.

Don't set expectations please this is a productive and constructive communication. Provide comments that we can act upon. If there is something that you say that "Oh my, that's a terrible idea, please don't do that project". That is a comment that we do not act upon. We cannot do that project and that is a constructive comment. If you say what in the world are you thinking is horrible and I need you to answer me right now, the answer is going to be, thank you very much for the constructive comments, let's move on. So I am just setting the ground rules, setting the expectations.

All right Carole and Lucy are up here, they will be heading up most of the responses, I am sure that they can defer to whoever they want, but you may not respond, because if it is just a constructive comment the response is going to be thank you very much for that constructive comment, okay.

So the floor is open. I assume that there will be plenty of hands so please, the floor is open, unless you guys want to start.

DR. LEBLANC: Would that be okay if I started with some lessons learned that I would like to take away from this. Thank you very much.

Okay first thing I heard today is duplication appears to be very important to most of you people, just about everybody in this room. So what we are going to do is make a list of the projects that you have all heard of today and meet with Charles Spence and his staff in particular to make plans to determine how many aren't related to other things that are going on in the globe, I would imagine that many of them are.

The second thing I am going to do is obviously promote the tech divisions in person engagement with overseas events and I know how difficult that can be sometimes in terms of limited travel. That seems to be the only way to really ensure that that takes place.

The second thing I learned today and that is about Tim. I have heard enough about Tim to realize that that is something we just have to nail. I admire they have this science drive the policy and

the other way around, so we just have to do that, we just have to lay out that test and just get her done.

The other thing I think I've learned today is that we are delighted with the industry engagement, you are a very important staple to us but I think we have to work harder for the other stake holders like first responders, other first responders, those kinds of stake holders that perhaps have very limited travel budgets. We went through the same problem with HM Access we are just going to have to work harder on that.

On a personal note, we have recently gone through a number of retirements and tragically a death. We have recently promoted Joe Nicklous to Chief and so I would like you all to consider Brian Vos to be a very important contact person and lead in the explosives program and then finally the process.

A lot of these projects came about as a consequence of the interim work that PHMSA was doing, especially with Ryan's group and what we see saw was our workload and problems coming up over and over again. So although this is the first R&D Forum, what

are some of the suggestions we could do going forward in making sure that we keep this engagement, especially in terms of prioritizing these projects.

So I'm thinking at the very least we need to meet more on a routine, maybe less formal way and have within six months, sort of an update session, whether or not that is you know, as a teleconference so that you all understand that we have listened and we are going to make adjustments to these research projects.

And then finally how do we select the projects with such limited funding. Who is going to make the decision about what is high risk, what is low risk and all of the things that go in between and so I have some familiarity with that with the state program, I don't know there is a couple of you from Massachusetts, we have done similar things with industry there, that led to the Kennedy Award, Innovations and Government Award from Harvard, where we actually did compose together the Toxic Use Reduction Act, or TORA and those components that were agreed upon by make stake holders.

And then I recreated that same process of decision making for the Pentagon in terms of their decision making processes for the treatment of hazmat and the right of those policies. So those are some of the things that I am just thinking about going forward.

I don't know if any of you are familiar with the solvent alternatives or solvent substitution workshops that came out of the Clean Air Act but EPA, of course at that time, the significant new snap program and those were some of the processes that we may want to look at in terms of decisions going forward together. I think I have probably said too much, but I just wanted you to get a heads up on what I was thinking.

MR. VOS: Thank you.

MS. HILTON: Cynthia Hilton, IME. First of all I want to apologize to everyone and I did apologize to Bob, that was not the best but anyway I am really grateful, I am that you have held this Forum. We support this program, we support MAP-21 provision, we want you to be successful and I'm glad

you are listening to us.

I do want to say some comments and respond to a very good question and a point that Jo made. So Texas City, Fort Neil, Oklahoma City and West Texas are not products for our industry. So when you look at bad things, I'm sorry the context is ammonium nitrate, those are not products for our industry. We manage these products differently and again, we consume 80% of that product.

Billions of pounds of this stuff is used and manufactured every year. Not one AM is used at the site that it is manufactured. Transportation is a huge important component of that. So one of the things that you need to look at for the people who are asking about risk is what is your exposure?

This particular product project let's look at tractors and trucks 80% of AM goes by rail. 50% by trucks, 5% by barge so again if you are looking at exposure, maybe you should have a rail project on this.

And the threat -- maybe we should go back and look at your data, because we love your data, we

love your data. So '73 since the beginning of time there has been 139 truck fire incidents with 5.1 product and none were AM and since 1973 there have been 11,407 incidents involving 5.1 product, 4 involve AM, 0 fatalities, so it gets back to what is the problem we are trying to solve.

In a perfect world we would have zero risk. But we don't live in a perfect world, we all came here today and if you were anywhere near my car, you are safe, there is a God, the way I drive. Anyway in West Texas since that was raised, there was a rail car on site, it did not propagate to the rail car, it did not propagate to another bin that they had in there so that should tell you something about the threat, so to your question what are we doing about safety, we are stern believers in training our emergency responders.

We advocated for that strongly, we've gone to the hill, we have gotten you permission to be more flexible with your grant money, give more money to training, we need to keep the training up. We have ideas, since West Texas that your ERG needs to be

improved. We would love to work with whoever is working on the ERG to try to help with that.

Do we think we need R&D on this? We do not think we need R&D. Other things, if you didn't have money, it is kind of a related thing and this may be something that Jo would be interested in but the UN is looking at revalidating all of the tests, okay and we have talked a lot about the UN6 series, UN8 series, their D test which is A&E's so those are explosives are you know for the bulk A&E's and our guys think that this test, I'll just read you, it requires large sample and when a large sample fails, that presents its own risks, right?

So in we think that the current test doesn't match a typical accidental fire so we would love to work with some people about improving that test. Australia is also looking at this, you and Australia partner up on that.

And I was you know, somewhere in the stratosphere so I didn't quite hear what the deliverable, I do have a question here, the deliverable on this tire fire project was going to

be, I'd like to be able to know.

MR. FINK: Sure, let's talk about that. Deliverables were strategies for consideration, in order words open to any strategy. Energy calculations around those strategies, Bill Fink from PHMSA, strategies for consideration not just limited to those that were presented. Energy calculations around those strategies, additional costs to the currently offered design, in other words with the strategy comes an additional cost and that could be a negative number too.

The risk frequency calculation, in other words, what is the current risk for the general population and then what would be the reduced risk with the specific strategy and then if you stack strategies how that might reduce this risk and then the last thing was proof of concept via experimental data.

MR. PAQUET: And Cynthia even if you didn't get it, it will be posted.

MS. HILTON: Okay, just one question generally, this is

MR. PAQUET: Hold on, wait please.

MS. HILTON: This is a proposal so is it really too early, like I have no idea if you went ahead with this, you know how much, do you have in mind, if this would be a fourth of your budget, or a tenth or anything like that? And can you tell us a little bit, just generally on your project to identify, how do you get to that point of giving them a budget for any of these projects, how does that?

DR. LEBLANC: Well it certainly can change. For example with the recent episode in Canada with the real accident, thank you, sorry, it certainly can change Cynthia so we have to be responsive to things that we can't possibly predict in terms of what accidents might come PHMSA's way and we need to be nimble enough to react to that.

So it is, we try to do two things. We need to of course be reactive, that is part of being a regulator but we would also like to think that R&D provides PHMSA with the ability to respond to future risks and be proactive. Proactive is a funny word to the stake holders mostly in this room right, because

it could sound like we are probably going to fine you for things you don't know about yet and that is not the case at all.

But it does speak to PHMSA's unique mission in comparison to industry, right because our stake holders are not just industry they are also the American public and first responders. So all I can say is we will put more and more effort into being transparent with those decisions and to inform you as soon as we can, but can I give you a time table as to the decisions, probably not except to say that you will be engaged, you will remain engaged.

So often times it becomes a situation where you have got x amount of money and some projects are cheaper, less expensive than others and some will be shorter in duration and you just have to be very strategic or select those projects when you select them, if that makes any sense.

If you are hit with budgets in industry you do the same thing do, I would imagine.

MS. HECKMAN: Julie Heckman, American Pyrotechnics Association, I just really appreciate

the opportunity to be here today and hear where the agency is going and am thankful that you are engaging the stake holders. In follow up to the comment about how you decide which projects will get money, which ones are the highest priority, two that I really didn't comment on this morning but I believe would be really low priority for the agency concern the novelties and the chained fused shells. While I guess these move across the U.S. we haven't had an incidents with them and the firework industry is so small compared to the commodities out there.

However, those are two projects depending on the extent of research you are looking for that I think if you came to the APA and said hey Julie, we really want to know how these chained fused shells perform based on ones that aren't chained, will APA do some tests. We could probably do that for you and it is not going to be hundreds of thousands of dollars of testing, but if you said and we would feel a little bit better if we had some data or we had you do this and you gave us some parameters and what you were looking for.

Same thing with the novelties, I can't offer that up on the waste issue because that is a much more challenging project and we really have to look at cutting the scope a little bit on that, but I think not just my industry, I think with the gas people, if you are asking about the odorant, which I thought was really fascinating because I am sitting here trying to figure out what does it have to do with transportation, you know, what the odorant is, but I think maybe if you tapped into the regulated industry as much as you can on things that you need and that might help save some of the dollars that you are looking for or your limited funds.

MR. PAQUET: Come on guys, come on up.

MR. SANTIS: Thank you. I think that was an opening, talking about proactive research because I am going to throw out something in a proactive sense, something you haven't talked about today an idea that came about through APT research in Los Angeles with APT research.

In preparation for this meeting we had some of our scientists get together and conference

and brainstorm, one of the things that we thought was important, what could PHMSA do in terms of the research, especially in emerging areas and one of the scientists, Eric Wilson brought up the idea of the impact of increased use of liquefied natural gas, LNG and not in the sense of the safety of that in and of itself, I'm sure that's being taken care of and looked out and is going to be safe, but the question was how would the increase of that product on the roads and perhaps even as fuel tanks on the trucks that are carrying explosives, how would that effect the performance of the explosives in an incident as compared to a similar incident with the diesel powered vehicle.

And so the question was, well does anybody know? Nobody could come up with any research or any testing that has ever been done with any compressed gas in relation to how it might affect explosives. And when you get right down to it, it would be, does it make a division 1.3 explosive mass detonate instead of not, does it make a 1.4 explosive mass detonate instead of not. Does it make a division 1.5

explosive go more probably like a 1.1.

So it is just something that we threw out there, maybe next year it is something to talk about a little more in depth but I will throw it out there and see if there are any comments, if anybody has any ideas on that.

MR. PAQUET: Thank you.

MR. VOCKE: Bill Vocke from the, I am the Executive Director of the Interagency Coordinating Community on Oil Pollution Research and I want to thank you for this very well done Forum. It is a very good opportunity to discuss research and development. What my question is, there has been a dramatic increase in rail and truck transport with crude oils, especially the Balkan crudes. Are you considering any research into the relative risk shipment by rail and truck?

DR. LEBLANC: The short answer is yes, yes, yes. Short answer yes, it's probably consuming so much of our time right now and absolutely an idea if you wanted to call him.

DR. EL-SIBAIE: Yes, it's an emerging area

of course. I will be lying to you if I say we were doing research now, we are behind the curve and we are trying to catch up so research in support of rule-making and other measures that we need to take, but if I can just take a question and answer it really broadly.

My hope and my plan and certainly what I deem as necessary is not to limit the R&D, we have heard a lot of technical things and they are important and clearly the change there that we are going to have to make is what Cynthia and others have spoken of. We have to be more risk driven and we have to be more collaborative with the industry by the way, and certainly Julie and Cynthia we don't want it to be that that is what you guys can do and you already have done, or they have done already and to the sense that we collaborate and go to the experts and seek their input and of course figure out a way to do this objectively and so that is what we are going to do on the technical side.

But one thing that we haven't done or we don't do in a planned fashion is this compactual

research piece. Understanding the commodity flow, we have very little data, firsthand, very little data of commodities or not as good of an understanding of the data that we have as we should have so commodity flow, how things are changing, what kinds of additional risks you present to us are the, you know, are the existing system of the right point, it may have been what we were doing, how to chip it away maybe things change, so yes I would hope that our intent is to do more analysis to understanding how things are changing and how this affects us.

MR. VOCKE: In our committee, PHMSA is a member of the committee, you get representation from the pipeline side but I am really interested in coordinating with you, collaborating, we are just trying to get some of the research done. We have fifteen agencies on the committee side so there are a lot of opportunities for work together on those issues, thank you very much.

MR. STEVENSON: Boyd Stevenson, ATA. First of all I want to echo a lot of the other comments that I have heard today. I think in the

seven years that I have been with ATA I have been in and out of the DOT buildings more times than I could count and this has definitely been the meeting with the most comedy and respect between people, both government, industry and on all side. I really want to hand it to you all, I am really you have done an amazing job.

I also want to let you know we at ATA do a lot of research on commodity flow and we would be happy to sell that to you. We might have a government discount.

AUDIENCE MEMBER: Can you give us a free sample?

MR. STEVENSON: It self-destructs. But I also want to say one area, and this is probably the most boring kind of research to do out there is, given some of our interactions that we have seen with the 5800 recording and things there, I think it would be very useful to do some analyses on the results of some of the data that PHMSA is taking in and what it is producing and how changes to what is indeed collected and how it is being collected can yield

information that is more useful for driving the future research.

Like I said that is the kind of study that no one really wants to read but it is the kind that is implemented and incredibly useful both for us in industry and in government.

DR. WONG: I have a couple of comments. I'm Kin Wong with PHMSA. One, since an explosive and I just want to let you know and some of you already know there is another form that the federal government has called an Agency on Explosives. Its' membership is limited to federal agencies but we do welcome outside speakers so if you have ideas and the advantage of the group is that we have pretty much all of the federal agencies across the government, from the State Department, to CIA to ATF to everything, they are interested in explosives and compounds and we also don't limit to any topic so from rendering to law enforcement to policy to technology and disposal all of those things, so if you are interested you know to present ideas and stuff, we don't have a research budget so we don't

do, but we can still get the ears of all agencies and some of them you know have ideas.

The other thing is I want to talk about commodity someone told me some of the compounds, interested materials, I guess I should say, sometimes we say compounds but the interest and sometimes we handle with confidentiality and secrecy. For example an idea that is actually a complete commodity full analysis however is classified and it is in the possession of the Coast Guard so you know, unless you have security cameras and certain things that you can get to.

And the other thing that we are calling for is I encounter again with AN and I'm not trying to pick on AN, and what happens is it has many names, you know, you can collecting data from rail to waterway it goes by, see when I was at EPA we used cast iron, you know, because we want a specific chemical, you know, with a very specific quality and all this different molds and it's hard to compile data so that's all.

MR. PAQUET: All right.

MR. BORNHORST: Good afternoon everybody, I am Richard Bornhorst with the FDA. I would just like to say that I am supportive of the direction that you are going in with your program. The more research you can do the better, I definitely believe that research should drive regulation. Analysis should drive regulation and not the international community and I see that all the time. They come up with these one page papers with no explanation as to why something needs to be changed and I think they need to start doing their homework because we are trying to do our homework and it is only fair.

Also in addition to me working at the IAN, I am the chairman of the Hazardous Materials Transportation Committee at TRD and this week is the TRD meeting and we have over 11,000 participants. It is a great venue to discuss research, there is a lot of academia there and one of the things that keep on occurring throughout the week is I kept on being approached by not Hazmat professionals, freight professionals, transport professionals and they all had a lot of questions about crude oil and rail and

that is justifiable so because of the accident but there is also a lot of questions about LNG and rail, LNG and domestic waterways and growth of the chemical industry.

On Tuesday we actually by chance, we did have a really good session on the growth of the chemical industry and how that affects emergency responsibility and one of the things that I would like to suggest is as you move forward and do this research, I think that once you start having results, it's not about just putting a report together and pursuing regulatory change, it's about getting the word out there about the great things that we are doing and if you can encourage people to submit papers to tier B and give their peer review in the broader research community, I think that it will bring a higher level of visibility to Hazmat because I know for a fact that there is a lot of transport people out there that are eager to see some of these issues resolved.

They just don't know enough about Hazmat, we know that. Let's get plugged into these groups

and I can't stress enough the importance of not letting stuff sit on the shelf. I have seen a lot of good research done and you know people leave or retire and nothing happens and again if there is a way for them to set up a national plan of where we want to go with this and stick to the plan I would be supportive of that as well, thank you for this meeting and thank you for the opportunity to comment.

MR. PAQUET: Thank you Rick, I appreciate it.

MR. SCHICK: Hi, I'm Tom Schick I'm with American Chemistry Council. I just want to second Boyd's motion about the sharing the openness here, the entire staff and a special mention to our facilitator.

(APPLAUSE)

MR. SCHICK: I just want to let you know that we have the review of our five year data and it is on our website so please do check it out and if you have any comments or any ways that we could improve it next time, please fill it out.

MS. HILTON: To your comment about

commodity flow and Boyd's and yours about five year data and then you answered it, but you know one of the things that industry collectively has urged you to do is you know your hazmat transportation, whatever you want to call it, the OTA which no longer exists, you know, with a big report in '86 that we all quoted from and then you all tried to update it in '98 and we still refer to that '98 stuff so I don't know if that is a research project or what it is but you know everybody needs a denominator because we think you have, I've told you this before, a huge success story.

You are so successful given what happens and you should tell it more.

MR. PAQUET: Thank you Cynthia. All right last call, I am going to start flicking the lights off and on. Listen I really appreciate all of you playing by my rules today, I was a little bit of the taskmaster and it was only one person that went over but it was worth it because it was interactive so I appreciate you participating, you coming here, this is our first one, please provide us with comments on

how we can do next year better.

Should it be two days, should it be you know one day of industry research? We want to know that information, that's just, so please provide us, this is going to be annual, this is the first annual, which means guess what, there has to be another one next year and so I am going to allow Dr. El-Sibaie to give our closing comments and then we can all escort you out.

DR. EL-SIBAIE: I'm not going to keep you, thank you so much for coming. I told you this morning I did not expect this crowd so that's a good surprise. It means that you care about what we do and transparency I think is what we are beginning with, transparency leads to correcting behavior so we want to put out stuff out there, we want to hear from you and we want to impress upon you the need to make your case objectively and provide us the basis for why you object or if you want us to change direction what is the reason by which you want us to change direction.

Because you know we, in spite of our worst

behavior we tend to be on the rational side most of the time so we would like to have a reason as to why you want us to do things differently and it has to be related back to the public on the goals, these are the only goals that we have here at PHMSA and the DOT.

Of course second is our goal, we don't want to shut down anyone or impact, impact in the industry or impact towards humans. Really it's about the conscience you want to make sure at the end of the day everybody is winning. Industry is winning and certainly the public which we are paid to protect is also winning, so that's our goal.

I set goals for this morning, this is a modest program. I gave you what our budget is, it's not an excuse for us, but certainly it is the beginning. I hate that it is modest for the task I think the amount of funding is not adequate given the broad issue of questions and challenges that we have and we also are recognized, I recognize that our goal or intent is not to duplicate it or complicate any R&D effort that has to be run by the industry, the

bulk of the R&D and for good reason.

Ours is different and ours should be targeted on safety challenges and the safety questions that we need to have a mission with. If there will be a point of perception is that the industry is looking at the same issues that we are interested in and it helps indicate our, and give the industry what it needs to be, that's where we are going to collaborate but we really respect your feedback and we really value your feedback and if you provide it to us often and you provide us with the context national, oh my gosh, we could really use it.

So thank you so much, again thank you for indulging us today and thanks for my staff, you did a great job. Everybody did a great job and we are really appreciative for you.

MR. PAQUET: All right so we started the day with someone that wouldn't interrupt and we are going to end the day with somebody who won't interrupt either.

MR. SCHICK: Thanks and I appreciate that, just let me say a few quick words. As I said, and as

Cynthia has said this morning, this program, this R&D effort is hugely important to us because it is going to obviously help all of you we hope and has Magdy said the public that we are all here to protect but I also want to give a shout out to Magdy and his team because we have talked about R&D and hazmat and this is just a, I give him a lot of credit for making this happen because it has been a long time coming.

It has been needed we have a very ambitious R&D program on our pipeline side, but it is something that we needed here and Magdy and Carole and everybody, you have a great team here and so I am looking forward to great results and your participation is going to make it work so you have our attention.

MR. PAQUET: Thank you Tim. That's it

(APPLAUSE)

Whereupon at 3:02 p.m., the research and development forum meeting adjourned.