

U.S. CHEMICAL SAFETY BOARD

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TESORO ANACORTES RELEASE AND FIRE

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PUBLIC MEETING

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THURSDAY,  
MAY 1, 2014

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U.S. CHEMICAL SAFETY BOARD MEMBERS PRESENT:

RAFAEL MOURE-ERASO, Ph.D., Chairperson,  
U.S. Chemical Safety Board  
MARK A. GRIFFON, Member, U.S. Chemical Safety  
Board  
BETH J. ROSENBERG, Sc.D., M.P.H., Member,  
U.S. Chemical Safety Board

STAFF PRESENT:

RICHARD C. LOEB, General Counsel  
HILLARY COHEN, Communications Manager  
LAUREN GRIM, Investigator  
DON HOLMSTROM, Director, Western Regional  
Office  
JOHN LAU, Deputy Managing Director  
DAN TILLEMA, Team Lead

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Adjourn

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

(12:23 p.m.)

CHAIR MOURE-ERASO: Good evening,  
and welcome to this US Chemical Safety Board  
Public Meeting that we are organizing today as  
announced in the Federal Register for this  
specific date.

My name is Rafael Moure-Eraso, and  
I am the Chairperson of the Chemical Safety  
Board. At the entrance, you saw that there  
are copies of the agenda on what we are going  
to be covering today, and also a copy of the  
final report that we are going to be -- that  
the Board is going to be voting on today.

I am here in this -- on the  
platform with my fellow Board Members, Dr.  
Beth Rosenberg and Mark Griffon to my left.  
To my right, I have Mr. Richard C. Loeb, the  
General Counsel of the Chemical Safety Board.

We have at the next table the  
Western Regional Office's Director, Mr. Don  
Holstrom, and he is accompanied by the CSB's

1 investigator lead for the Tesoro  
2 Investigation, Mr. Dan Tillema, and other  
3 members of the team that are going to be  
4 introduced later on in the program.

5 Also with us here from the  
6 Washington Staff is Mr. John Lau, the Deputy  
7 Manager Director, and (inaudible) other  
8 members of the CSB Communications Department.

9 I have to point out to you the  
10 exits if there will be a fire or a problem in  
11 this building during our meetings. You have  
12 to become aware of the exits that we have on  
13 the three sides for emergency, if necessary.

14 Also, I would like to ask that you  
15 mute your cell phones so that they don't  
16 interrupt the proceedings.

17 This meeting is specifically to  
18 record a public vote of the Board on the final  
19 version of the investigation report  
20 catastrophic rupture of heat exchanger Tesoro  
21 Anacortes Refinery, and the hard copy text of  
22 the report we are voting on, as I said, is on

1 the table at the entrance.

2 This vote will bring to a  
3 conclusion the CSB investigation process and  
4 will deliver to the families of the Tesoro  
5 workers, their loved ones, friends and  
6 stockholders and members of the public our  
7 dedicated effort in determining what were the  
8 causal factors of the accident, and our  
9 recommendations to prevent similar actions in  
10 the future.

11 As you will see in the report, we  
12 have dedicated this report as follows. This  
13 report is dedicated to the two women and five  
14 men who lost their lives in the Tesoro  
15 Anacortes Refinery incident on April 2 of  
16 2010.

17 I would like to mention their  
18 names and ask for some moments of silence to  
19 honor their memory. They are Kathryn Powell,  
20 Donna Van Dreumel, Daniel Aldridge, Matthew  
21 Bowen, Matthew Gumbel, Darrin Hoines, and Lew  
22 Janz.

1                   So, we're dedicating this work to  
2                   the seven people that lost their lives, and  
3                   this report is the culmination of four years  
4                   of work of the Chemical Safety Board, and  
5                   represents what I believe is the agency's  
6                   finest hour in terms of the report's quality  
7                   of the technology investigation and the  
8                   analysis of public policy.

9                   We do recognize that it took  
10                  longer than you and we will have liked. But  
11                  I hope you all will agree that in the end, it  
12                  left no stone unturned in the report of what  
13                  happened and what needs to be done.

14                  The CSB Tesoro investigation team  
15                  has spent literally thousands of hours on this  
16                  investigation and the production of this final  
17                  report. As you remember, the Chemical Safety  
18                  Board presented the last staff graph of the  
19                  report on January 31st, 2014, at this same  
20                  hall, and requested for the workers of the  
21                  Tesoro Anacortes and other stakeholders on the  
22                  results of the investigation to provide public

1 comments on this last staff report. This was  
2 done January 31st, in this place.

3 We also put the report in our  
4 website and requested that anyone who wanted  
5 to submit reading comments should -- should  
6 submit it to our website in their report.

7 We got hundreds of pages of  
8 comments that were evaluated by the CSB  
9 investigation team. Almost 200 comments from  
10 52 different parties. The staff evaluated the  
11 comments and incorporated them with the CSB  
12 Board Members comments that were submitted  
13 when appropriate in a separate 120-page  
14 document, that is also available on our  
15 website: the comments and our responses.

16 These comments came from a variety  
17 of sources, from the American Petroleum  
18 Institute, from the Refinery Action  
19 Collaborative, from the United Steelworkers,  
20 local and international, and also from a  
21 consortium of 38 national organizations, which  
22 specifically expressed strong support to our

1 call on the report for the adoption of  
2 inherently safer technologies in such areas as  
3 piping and other equipment in the process as  
4 it appeared in the report.

5 Of a special note in the written  
6 comments are the comments of the Tesoro  
7 Council of United Steelworkers, which  
8 represent the workers of all Tesoro facilities  
9 in the United States, represented by the  
10 United Steelworkers.

11 In their comments, the Tesoro  
12 Council endorsed again recommendations to  
13 institute inherently safer technologies, and  
14 recommendation so substantially improve the --  
15 personally, including the families of the  
16 victims about this terrible accident. Again,  
17 our thoughts and our hearts go to them for  
18 their terrible losses.

19 I have stated that this was a very  
20 difficult report to produce. Technically, it  
21 required repeated methodological analysis that  
22 took the better part of a year to conduct. It

1 included computer simulations of the process  
2 that you can examine and look at the report.

3 You can see the results and you  
4 can see the appendix, the computer simulation.  
5 It includes an exhaustive analysis of a  
6 reliable safety test that is called the Nelson  
7 Curve, that failed to prevent this explosion.

8 The CSB also conducted a  
9 comprehensive regulatory analysis that allowed  
10 making recommendations for very significant  
11 goal-oriented process of safety management  
12 improvements.

13 The most important finding of this  
14 investigation is that in order to prevent  
15 additional fatalities and catastrophic actions  
16 in the US refineries, the nation needs to move  
17 forward to a new 21st Century regulatory  
18 regime.

19 We need to move forward from the  
20 current 20-year-old OSHA process safety  
21 management of PSM or PSM regulations that are  
22 the current (inaudible) of refinery safety.

1                   We need to move, as I said, toward  
2                   the 21st Century with a goal-oriented process  
3                   safety regulatory framework with a more  
4                   vigorous safety management regulatory regime.  
5                   We are proposing in this report through our  
6                   recommendations to the State of Washington the  
7                   necessary changes to move ahead on process --  
8                   with a safety regime with the robust  
9                   attributes that will reflect the lessons the  
10                  Chemical Safety Board has learned in our  
11                  investigations in the refinery sector.

12                  It has to be clear that  
13                  perpetuating the current safety management  
14                  system, the sign in the last century is not  
15                  going to prevent deaths or major chemical  
16                  fires or explosions in this sector.

17                  Our experience is that it's not  
18                  working. Also, it will not (inaudible) do  
19                  enough to fix our very real refinery safety  
20                  problems. We're finding some recommendations  
21                  are designed to prevent the circumstances that  
22                  allowed the fatalities to occur at Tesoro, as

1 well as it applied to the entire refinery  
2 sector in the US.

3 We offer, if you will see the  
4 agenda, a very complete report from the staff  
5 on our recommendations. I am going to give  
6 you some highlights on them where I think are  
7 the most important parts.

8 The report makes 16 detailed  
9 recommendations. The recommendations are made  
10 to the EPA, to the Washington legislature, the  
11 Washington State legislature, and to the Labor  
12 and Industry (inaudible) to the Tesoro  
13 Corporation and to the Tesoro Anacortes  
14 Refinery, and to the United Steelworkers.

15 All are aimed to prevent accidents  
16 in the refinery sector in the State of  
17 Washington and nationwide.

18 The three most notable are first  
19 to the Washington State. We are going to  
20 (inaudible) the existing system process safety  
21 management regulations for refineries with new  
22 and more rigorous goal-setting requirements.

1 The details will be presented by the staff.

2 The CSB also recommended to the  
3 State of Washington that they develop an  
4 effective three-part guide participatory  
5 system with equal representatives of the  
6 regulator, the company and the workers'  
7 representatives to oversee the enhanced  
8 safety management system in the Tesoro plant  
9 and in the plants in Washington State.

10 To the EPA, we are asking to  
11 revise regulations to require inherently safer  
12 technologies in the hierarchy of controls when  
13 establishing safeguards to process hazards.  
14 And lastly, to the Tesoro Corporate and  
15 Anacortes Refinery, we are recommending that  
16 they implement a continuous improvement  
17 process safety culture program, as I mentioned  
18 before, with effective participation of the  
19 state regulatory agency, EPA and the United  
20 Steelworkers.

21 This continuous improvement safety  
22 culture program is aimed to change the

1 attitude of accepting non-routine risk as  
2 normal and also to implement a revised API 941  
3 that deals with alloys for hydrogen service at  
4 high temperatures that requires a specifically  
5 and generally safer technologies on the  
6 selections of metal alloys to protect from  
7 high temperature hydrogen attack.

8 A detailed presentation of all the  
9 critical recommendations will be done, as I  
10 say, by the staff. Now, this is the end of my  
11 introductory remarks. I would like to ask my  
12 fellow Board Members if they have any opening  
13 statements. Dr. Rosenberg?

14 MEMBER ROSENBERG: Thank you.  
15 Good evening. I'd like to offer my  
16 condolences to the family, friends and  
17 community of the seven people who died here.  
18 I hope that the work that the CSB has done  
19 will provide some closure and help prevent  
20 further tragedies.

21 The report covers many topics, but  
22 I would just like to highlight a few. The

1 first is the practice of running maintenance  
2 and doing repairs on equipment that is  
3 running. We understand that the heat  
4 exchangers have been redesigned so that they  
5 cannot be partially shut down.

6 That is good for the people  
7 working on this particular heat exchangers,  
8 but Tesoro and the whole industry needs to  
9 stop this dangerous practice.

10 The second thing the report  
11 recommends is specific changes to the PSM  
12 regulation that will make refineries safer,  
13 and those will be elaborated on in the report.

14 More broadly, the idea of an  
15 alternative regulatory regime that is used in  
16 the UK and Australia called the safety case is  
17 discussed. We, the Board, and the  
18 investigators and everyone at this table are  
19 absolutely unified in our commitment to worker  
20 health and our disgust and aspiration with the  
21 status quo.

22 We are divided about whether a

1 safety case regime in the US would benefit or  
2 harm workers. I have serious reservations  
3 about a three-party system that relies on the  
4 equal part of labor, government and industry.

5 I worry that in the US two of the  
6 three parties, labor and government, are too  
7 weak to counterbalance the power of industry.  
8 While the notion of a safety case regime is  
9 raised in this report, no recommendations flow  
10 from it. But I look forward to further  
11 discussion of this topic.

12 Lastly, as a near term improvement  
13 to refinery safety, the report supports more  
14 inspectors for Labor and Industry. Labor and  
15 Industry currently has four inspectors to  
16 inspect more than 250 PSM-covered facilities.

17 We understand that the idea of an  
18 annual -- of a full annual inspection of all  
19 refineries in the state has been under  
20 discussion. The CSB strongly supports a  
21 better resourced Labor and Industry.

22 If this investigation will help

1 get more well-compensated, well-trained  
2 inspectors, the seven tragic deaths will not  
3 be in vain. Thank you.

4 CHAIR MOURE-ERASO: Thank you, Dr.  
5 Rosenberg. Mark Griffon, Board Member,  
6 introductory remarks?

7 MEMBER GRIFFON: Thank you, Mr.  
8 Chairman. I wanted to also express my  
9 condolences to the family and friends of the  
10 seven workers tragically killed in this  
11 incident.

12 I also want to apologize for how  
13 long it has taken us to complete this report.  
14 Four years is way too long, and the CSB needs  
15 to do better.

16 Having said that, I'm very happy  
17 that we're here tonight with a final report  
18 and I'm hopeful that the findings and  
19 recommendations will be helpful in improving  
20 safety in the refinery sector.

21 This report highlights  
22 deficiencies of the facility, as well as

1 deficiencies with process safety regulations.  
2 First at the facility level, it must be  
3 emphasized that this incident wasn't simply a  
4 result of not using the correct material for  
5 the heat exchanger. The badly corroded metal  
6 was a symptom of broader process safety  
7 problems.

8 Other adequate process controls;  
9 can anything be changed to slow the rate of  
10 failing? Can the inspection process be  
11 improved? I hope that Tesoro and the industry  
12 as a whole continue to look at the spectrum of  
13 safeguards, including the use of safer  
14 materials that can be put into place to reduce  
15 the risk of this type of incident.

16 It is my understanding that some  
17 of these factors have already been considered  
18 by Tesoro, and that process modifications have  
19 been made such that heat exchangers only  
20 require change out every three to four years,  
21 rather than every six months, greatly reducing  
22 the frequency of required shutdowns and

1 restarts. This is a positive change in my  
2 view.

3           The second facility level issue,  
4 and perhaps most important, are the  
5 organizational findings and the findings  
6 related to safety culture. It seems as though  
7 there was a complacency about the hazards and  
8 risk faced in this type of operation.

9           I'm not talking about workers  
10 becoming complacent, but rather about  
11 organizational complacency. The idea of  
12 paying attention to the small problems which  
13 may highlight system weaknesses must come from  
14 the top, and Tesoro management should take a  
15 close look at this.

16           Lastly, the regulations and the  
17 regulator. A key finding in the report is  
18 that the regulator, the Department of Labor  
19 and Industry's division of Departmental  
20 Occupational Safety and Health, DOSH, is not  
21 adequately resourced, specifically with regard  
22 to process safety management, PSM, inspectors.

1 More inspectors to cover more than 250  
2 facilities.

3 The CSB is recommending that the  
4 state address this issue, by increasing the  
5 number of PSM inspectors at DOSH. As far as  
6 the regulations, our final report identifies  
7 several gaps in the current process safety  
8 management regulation, and we are recommending  
9 specific improvements to this regulation.

10 The report also discusses other  
11 approaches to regulating high hazard  
12 facilities including an approach known as the  
13 safety case. The Board has raised several  
14 questions about the effectiveness of the  
15 safety case approach, and about the challenges  
16 to such a regime change in the United States.

17 While this type of change is not  
18 recommended in the Tesoro report, it will be  
19 studied further. This incident had a  
20 devastating affect on the entire community,  
21 and I hope that our investigation and the  
22 recommendations to the company and the state

1 and the regulator can lead to changes to help  
2 prevent such tragedies in the future. Thank  
3 you.

4 CHAIR MOURE-ERASO: Thank you,  
5 Member Griffon. The next issue on the agenda  
6 is the presentation of the CSB report by the  
7 staff. So, I am going to ask Mr. Don  
8 Holmstrom to describe how this part of the  
9 meeting is going to go, and to introduce his  
10 investigative team. So, Don?

11 MR. HOLMSTROM: Thank you, Dr.  
12 Moure-Eraso. Good evening. My name is Don  
13 Holmstrom. I'm the Director of the CSB's  
14 Western Regional Office in Denver, Colorado.

15 In January, we presented the  
16 investigation findings, and proposed  
17 recommendations of the Tesoro Anacortes  
18 Refinery investigation for public comment.

19 Tonight, we will discuss the  
20 public comments that we received and their  
21 impact on the draft report, and deliver out  
22 updated proposed recommendations to the Board.

1                   The Board will then have the  
2                   opportunity to discuss the report and ask  
3                   questions of the team. The Board will then  
4                   vote on the report and the proposed  
5                   recommendations.

6                   Tonight, investigators Dan Tillema  
7                   and Lauren Grimm will present updates on the  
8                   report, and I will deliver the teams's  
9                   proposed recommendations.

10                  Dan Tillema will now discuss the  
11                  selection of the public comments received.

12                  Dan?

13                  INVESTIGATOR TILLEMA: Thanks,  
14                  Don. We received 193 comments from 53  
15                  different groups and individuals. We'd like  
16                  to thank everyone who submitted comments.  
17                  These individuals and organizations are listed  
18                  on the slide. We carefully considered each  
19                  comment that was considered.

20                  The United Steelworkers submitted  
21                  comments to the CSB. One comment submitted is  
22                  that they believe fouling(phonetic) was the

1 root cause of the Tesoro incident.

2 The CSB does not present its  
3 findings in terms of root causes. Instead,  
4 there are many causal factors that contribute  
5 to the occurrence of a major process safety  
6 incident. We make recommendations to prevent  
7 certain causes and causal factors.

8 The CSB recognizes that major  
9 chemical accidents have multiple causes, that  
10 may include technical, organizational and  
11 regulatory causes.

12 The axi map, located in appendix A  
13 of the report, shows all of the identified  
14 causal factors. Tube side following is  
15 included. The causal factor the CSB decided  
16 to focus its recommendations on, which will  
17 result in the greatest possible prevention of  
18 this type of incident, is material of  
19 construction, inherently safer design, or  
20 using materials that are less susceptible to  
21 HTHA could have prevented this incident.

22 This approach is high-ranking on

1 the hierarchy of controls, whereas tracking of  
2 fouling rates -- administrative control.  
3 APIRP 571 specifically guides its users that  
4 stainless steels and high chromium allow  
5 steels are not susceptible to HTHA at  
6 conditions normally seen in refineries.

7 The America Petroleum Institute,  
8 API, submitted comments to the CSB. Some of  
9 their comments included proposed additional  
10 assumptions to include in the model, such as  
11 a lack of heat transfer due to (inaudible)  
12 bypass stream, evaluation of a higher  
13 percentage of fouling in the A&D heat  
14 exchangers, and considering a mail  
15 distribution of flow between the two heat  
16 exchanger banks.

17 However, CSB's (inaudible) model  
18 was based upon data gathered during the  
19 investigation. Due to the distance between  
20 the shell inlet nozzle and the CAN1-CAN2 weld  
21 seam, at which severe HTHA occurred, as well  
22 as a small baffle to shell clearance, the CSB

1 is confident that heat transfer occurred  
2 between the shell inlet and CAN1-CAN2 weld  
3 seam.

4 In addition, as discussed in the  
5 report, the following distributions model are  
6 based upon visual observations of fouling when  
7 the heat exchangers were brought offline for  
8 cleaning.

9 The CSB has no evidence to support  
10 higher percentages of fouling in the A&D heat  
11 exchangers, and finally Tesoro's measured  
12 process data does not support a flow  
13 mail(phonetic) distribution, such as a 60/40  
14 split, rather than a 50/50 split.

15 The CSB would like to note that  
16 the investigation team offered to discuss the  
17 HISIS(phonetic) model, its assumptions and the  
18 model inputs in detail with API, but API  
19 ultimately declined this offer.

20 API also communicated to the CSB  
21 that their reference performance based  
22 language, which CSB considers permissive

1 language that uses a mixture of should and  
2 shall type language, should be considered a  
3 feature of API standards and not a criticism.

4           However, the CSB strongly believes  
5 that when the industry identifies a technical  
6 issue that if unmitigated can lead to a major  
7 process safety incident, it is API's  
8 responsibility to require its users to take  
9 action to prevent such an occurrence.

10           The CSB will continue to make  
11 recommendations to API, to ensure that its  
12 standards contain minimum requirements to  
13 effectively prevent major process safety  
14 incidents.

15           API proposed a new carbon steel  
16 nelson curve location, different than the  
17 CSB's proposed carbon steel location for non  
18 post-weld heat treated carbon steel.

19           This proposed curve would be 50  
20 degrees Fahrenheit below and 50 PSIA hydrogen  
21 partial pressure to the left of the current  
22 curve, which we'll show on the next slide.

1 This proposed location is based upon several  
2 failures below the carbon steel nelson curve,  
3 which were within 50 degrees of the curve.

4 The CSB does not think that this  
5 proposed location is sufficient. Post-weld  
6 heat treating is low on the hierarchy of  
7 controls and subject to error. One carbon  
8 steel nelson curve would help to ensure  
9 prevention of HTHA on all carbon steel  
10 equipment.

11 This graph shows the API proposed  
12 location of the new non-post weld heat treated  
13 carbon steel nelson curve in red. You can see  
14 that this curve is not below the process  
15 conditions estimated by the CSB at which HTHA  
16 occurred in Tesoro B and the heat exchangers.

17 The CSB proposed location of the  
18 carbon steel nelson curve shown here in orange  
19 is a conservative approach to prevent HTHA.  
20 The CSB's carbon steel nelson curve is located  
21 below estimated conditions, at which HTHA  
22 occurred at Tesoro.

1           A public comment was submitted,  
2           which disagreed with the idea of using a  
3           minimum number of personnel as a requirement.  
4           The comment stated that if an operation isn't  
5           safe enough for seven, then it isn't safe  
6           enough for one. The CSB whole-heartedly  
7           agrees that any personnel exposure to a  
8           hazardous condition, whether it is one person  
9           or seven people, is unacceptable.

10                   However, in hazardous or  
11           potentially hazardous operations, best  
12           practice is to reduce the individuals present  
13           to essential personnel only. Many of the  
14           employees present at the Tesoro heat  
15           exchangers on the night of the incident would  
16           not have been considered essential personnel.

17                   The Tesoro Council of the United  
18           Steelworkers of the (inaudible) file union  
19           leaders at Tesoro refineries across the  
20           country expressed additional concerns stating,  
21           "The Tesoro Council supports the CSB's  
22           recommendation that Tesoro improve its process

1 safety culture."

2 Our members have years of  
3 experience working in refineries and for  
4 Tesoro, and believe that Tesoro's safety  
5 culture is severely lacking and in dire need  
6 of strengthening."

7 On February 12, 2014, another  
8 Tesoro refinery located in Martinez,  
9 California, experienced a process safety  
10 incident where two of its employees were  
11 sprayed with sulfuric acid from a sampling  
12 station shown in this photo.

13 Workers were again sprayed with  
14 acid at the same refinery, within the same  
15 unit, one month later. Because of the  
16 occurrence of these various process safety  
17 incidents, the CSB will be further evaluating  
18 Tesoro's corporate-wide process safety  
19 culture.

20 The CSB received strong a  
21 favorable support for the inherently safer  
22 technology recommendations by a majority of

1 the individuals and organizations who  
2 submitted public comments.

3           These parties believed that the  
4 only foolproof way to prevent tragic  
5 consequences is through the use of safer  
6 chemicals and processes. And when safer  
7 alternatives are available, effective and  
8 feasible, they should be required.

9           The Tesoro Council of the United  
10 Steelworkers also strongly supports the CSB's  
11 recommendation to the EPA for inherently safer  
12 technologies.

13           Several groups communicated their  
14 concerns about recommendations to the EPA on  
15 inherently safer technologies. These groups  
16 believe that IST decisions are extremely  
17 complex and cannot be and should not be  
18 determined by a governmental agency.

19           They believe there is no one-size-  
20 fits-all method to ensure one process or  
21 material is safer than another without  
22 considering site-specific characteristics.

1 CSB would like to clarify to these  
2 groups that the CSB recommendations do not ask  
3 that EPA identifies what IST approaches  
4 companies must use. Rather, the CSB is  
5 recommending that EPA require facilities to  
6 perform a documented inherently safer systems  
7 analysis when establishing safeguards.

8 It will still be up to individual  
9 facilities to evaluate their operation, and  
10 determine how to implement inherently safer  
11 design. This analysis will be subject to  
12 regulatory review.

13 The CSB acknowledges that there  
14 often is no one-size-fits-all approach to  
15 inherently safer design and rigorous analyses  
16 must be performed by the operating company to  
17 determine the best inherently safer design  
18 approach.

19 Investigator Lauren Grimm will now  
20 present changes made to the report.

21 INVESTIGATOR GRIMM: Thanks, Dan.  
22 We did make several changes to the report due

1 to public comments, as well as conversations  
2 with our Board. Many of these changes were  
3 language clarifications due to some of the  
4 public comments that we received.

5 We will now summarize some of the  
6 content changes that were made to the report.  
7 The CSB team now proposes to recommend a new  
8 API RP941 carbon steel nelson curve that is a  
9 right angle, which indicates HTHA can occur at  
10 conditions greater than 400 degrees Fahrenheit  
11 and 50 PSIA hydrogen partial pressure.

12 Multiple individuals who submitted  
13 comments found that the flat 400 degree line  
14 was confusing, and we agreed.

15 Many of the public comments  
16 submitted to the CSB expressed concern that  
17 the EPA would be determining what safeguards  
18 are required to implement inherently safer  
19 technology. The intent of this recommendation  
20 is for EPA to require facilities to perform  
21 inherently safer system analyses, and the use  
22 of a hierarchy of controls in establishing

1       safeguards for process hazards.

2                       This analysis will then be subject  
3       to regulatory review. The language of this  
4       recommendation was restructured to clarify its  
5       meaning.

6                       Following CSB's investigation of  
7       the Tesoro Martinez, California sulfuric acid  
8       process safety incidents, the CSB determined  
9       that the regulator should be involved in  
10      implementing Tesoro's process safety culture  
11      continuous improvement program.

12                      The proposed recommendation has  
13      been rephrased to reflect this change. The  
14      investigation team is also now proposing  
15      updated regulatory changes to the Board for  
16      the State of Washington, rather than  
17      prescribing a change to a specific model or  
18      regime, the investigation team is proposing  
19      more rigorous process safety management  
20      attributes and features based on the team's  
21      regulatory analysis.

22                      These changes are intended to

1     augment the current PSM regulations. The  
2     emphasis is on preventative inspection and  
3     audits by the regulator to ensure appropriate  
4     process safety management features are in  
5     place to help prevent the occurrence of  
6     process safety incidents.

7                     Proposed features of the enhanced  
8     PSM model for the State of Washington include  
9     development of a more comprehensive process  
10    hazard analysis. This includes applying  
11    inherent safety and the hierarch of controls  
12    to drive risks to as low as reasonable  
13    practical, or ALARP.

14                    In addition, facilities will  
15    document that their safeguards are effective,  
16    and include an evaluation of damage mechanism  
17    hazards. Another proposed feature is an  
18    increased role of the regulator.

19                    The team proposes that Washington  
20    establish a regulator that is well-funded,  
21    well-staffed, and technically qualified. This  
22    group will also review PHA's and conduct

1       preventative audits and inspections.

2                   The team also proposes that safety  
3 standards used as (inaudible) have minimum  
4 requirements to help prevent major process  
5 safety incidents. And finally, we propose  
6 greater involvement in process safety  
7 strategies by both the workers and their  
8 representatives.

9                   Don Holmstrom will now deliver the  
10 team's proposed recommendations.

11                   MR. HOLMSTROM: Thank you, Lauren  
12 Grimm. I'm going to be going through the 16  
13 recommendations the CSB draft report contains,  
14 which we're proposing or presenting to the  
15 Board for a vote this evening.

16                   I would emphasize that these  
17 recommendations are what we refer to as the  
18 engine that drives safety change. Our  
19 investigation obviously is very important but  
20 the recommendations adoption is key to what  
21 drives change and leads to greater prevention  
22 of these types of incidents.

1                   At the CSB, once the  
2                   recommendations are voted on by the Board,  
3                   they are then -- we have a recommendation  
4                   staff that tracks them. We send out  
5                   notifications. We follow them and track them  
6                   to completion and implementation.

7                   As part of that process, the Board  
8                   votes on the status of those recommendations,  
9                   where they are opened at acceptable response  
10                  or unacceptable, etcetera, in the final  
11                  disposition of the recommendations in terms of  
12                  whether they're successfully adopted and that  
13                  status is a vote of the Board.

14                  So, we don't just issue reports.  
15                  We take very seriously, like other agencies  
16                  such as the National Transportation Safety  
17                  Board we model after.

18                  Our first recommendation is to the  
19                  Environmental Protection Agency. That's  
20                  recommendation number one. Revise the  
21                  chemical accident prevention provisions to  
22                  require the documented use of inherently safer

1 systems analysis in the hierarchy of controls  
2 to the greatest extent feasible when  
3 facilities are establishing safeguards for  
4 identified process hazards.

5 Goals shall be to reduce the risk  
6 of major accidents to the greatest extent  
7 practicable. To be interpreted it's  
8 equivalent to as low as reasonably practical,  
9 or ALARP. Include requirements for inherently  
10 safer systems analysis to be automatically  
11 triggered for all management of change,  
12 incident investigation and process hazard  
13 analysis reviews and recommendation prior to  
14 the construction of new process, process unit  
15 rebuilds, significant process repairs and in  
16 the development of corrective actions.

17 Recommendation 2 to the EPA:  
18 Until recommendation 1 is in effect, enforce  
19 through the Clean Air Act's general duty  
20 clause the use of inherently safer systems  
21 analysis in the hierarchy of controls to the  
22 greatest extent feasible when facilities are

1 establishing safeguards for identified process  
2 hazards.

3 In recommendation number 3 to the  
4 EPA, development guidance for the required use  
5 of inherently safer systems analysis in the  
6 hierarchy of controls for enforcement.

7 Recommendation 4 to the EPA:  
8 Effectively participate in the Tesoro  
9 Anacortes Refinery Process Safety Culture  
10 Survey Oversight Committee, as recommended in  
11 recommendation number 15. Incorporate the  
12 expertise of process safety culture experts in  
13 the development interpretation of the safety  
14 culture surveys.

15 Ensure the effective participation  
16 of the workforce and their representatives in  
17 the development of the surveys and the  
18 implementation of corrective actions.

19 Our next set of recommendations is  
20 to the Washington State legislature and the  
21 Governor of Washington. Recommendation 5:  
22 Based on the findings of this report, augment

1 your existing process safety management  
2 regulations for petroleum refineries in the  
3 State of Washington with the following more  
4 rigorous goal-setting attributes.

5           A: A comprehensive process safety  
6 hazard analysis written by the company that  
7 includes, One: Systematic analysis and  
8 documentation of all major hazards and  
9 safeguards using the hierarchy of controls to  
10 reduce those risks to as low as reasonably  
11 practical or ALARP.

12           Two: Documentation of the  
13 recognized methodologies, rationale and  
14 conclusions used to claim that safeguards  
15 intended to control hazards will be effective.  
16 Three, document damage mechanism hazard  
17 reviews conducted by a diverse team of  
18 qualified personnel.

19           This review shall be an integral  
20 part of the process hazard analysis cycle and  
21 shall be conducted on all PSM covered process  
22 piping circuits and process equipment.

1           The damage mechanism hazard review  
2 shall identify potential damage mechanisms and  
3 consequences of failure, and shall ensure  
4 effective safeguards are in place to control  
5 hazards presented by those damage mechanisms.

6           Require the analysis and  
7 incorporation of applicable industry best  
8 practices and inherently safer design to the  
9 greatest extent feasible into this review.

10           Four: Documented use of inherently  
11 safer systems analysis in the hierarchy of  
12 controls to the greatest extent feasible in  
13 establishing safeguards for identified process  
14 hazards.

15           The goals shall be to drive the  
16 risk of major accidents to as low as  
17 reasonably practical, or ALARP. Include  
18 requirements for inherently safer systems  
19 analysis to be automatically triggered for all  
20 management of change and process hazard  
21 analysis reviews prior to the construction of  
22 new processes, process unit rebuilds,

1 significant process repairs and in the  
2 development of corrective actions from  
3 incident investigation and recommendations.

4 B: A thorough review of the  
5 comprehensive process hazard analysis by  
6 technically competent regulatory personnel.

7 Also for the State of Washington,

8 C: Required preventative audits and  
9 preventative inspections by the regulator. D:  
10 Require that all safety codes, standards,  
11 employer internal procedures and recognize and  
12 generally accepted good engineering practices  
13 or RAGAGEP used in the implementation of  
14 regulations contain adequate minimum  
15 requirements.

16 E: A model for the regulator, the  
17 company and workers and their representatives  
18 play an equal and essential role in the  
19 direction of preventing major accidents;<sup>1</sup>  
20 require an increased role for workers in  
21 management of process safety by establishing  
22 a rights and responsibilities of workers and

<sup>1</sup> Prior to the public meeting, this language was removed from the final recommendation that was ultimately voted on and approved by the CSB board.

1 their representatives on health and safety  
2 related matters.

3 The election of safety  
4 representatives and the establishment of  
5 safety committees with equal representation  
6 between management and labor to serve health  
7 and safety related functions.

8 The elected representatives should  
9 have a legally-recognized role that goes  
10 beyond consultation in activities such as the  
11 development of the comprehensive process  
12 hazard analysis, management change, incident  
13 investigations, audits and identification, and  
14 effective control of hazards.

15 The representatives should also  
16 have the authority to stop work that is  
17 perceived to be unsafe or that presents a  
18 serious hazard until the regulator intervenes  
19 to resolve the safety concern.

20 Workforce participation practices  
21 should be documented by the company and  
22 regulator. And F: requires reporting of

1 information to the public to the greatest  
2 extent feasible.

3 We have the comprehensive process  
4 hazard analysis, which includes a list of  
5 safeguards implemented and standards utilized  
6 to reduce risk, and process safety indicators  
7 that demonstrate the effectiveness of  
8 safeguards and management systems.

9 Recommendation number 6 to the  
10 State of Washington: Establish a well-funded,  
11 well-staffed, technically qualified regulator  
12 with a compensation system, meaning salary and  
13 benefits, to ensure the Washington Department  
14 of Labor and Industry regulator has the  
15 ability to attract and retain a sufficient  
16 number of employees with a necessary skills  
17 and experience to ensure regulator technical  
18 qualifications.

19 Periodically conduct a market  
20 analysis and benchmarking review to ensure  
21 that compensation system remains competitive  
22 with Washington State petroleum refineries.

1                    Recommendation 7 to the State of  
2                    Washington: Work with a regulator, petroleum  
3                    refinery industry, labor and other relevant  
4                    stakeholders in the State of Washington to  
5                    develop and implement a system that collects,  
6                    tracks and analyzes process safety leading and  
7                    lagging indicators from operators and  
8                    contractors to promote continuous process  
9                    safety improvement.

10                    At a minimum this program shall A:  
11                    require the use of leading and lagging process  
12                    safety indicators to actively monitor the  
13                    effectiveness of process safety management  
14                    system and safeguards for major accident  
15                    prevention; include leading and lagging  
16                    indicators that are measurable, actionable and  
17                    standardized; include indicators that measure  
18                    safety culture such as incident reporting and  
19                    action item implementation from that reporting  
20                    culture.

21                    Require that the reported data be  
22                    used for continuous process safety improvement

1 and accident prevention.

2 B: Analyze data to identify trends  
3 and poor performers and public annual reports  
4 with the data at facility and corporate  
5 levels.

6 C: Require companies to publically  
7 report required indicators annually at  
8 facility and corporate levels.

9 For the State of Washington,  
10 again, D: Use process safety indicators, one,  
11 to drive continuous improvement for major  
12 accident prevention by using the data to  
13 identify industry and facility safety trends  
14 of efficiencies and two, to determine  
15 appropriate allocation of regulatory resources  
16 and inspections.

17 E: Be periodically updated to  
18 incorporate new learning from worldwide  
19 industry improvements in order to drive  
20 continuous major accident process safety  
21 improvement in the State of Washington.

22 Next set of recommendations is for

1 the Washington State Department of Labor and  
2 Industry's Division of Occupational Safety and  
3 Health. Recommendation 8: Perform a  
4 verification audit at all Washington petroleum  
5 refineries to ensure, A: Prevention of HTHA  
6 requirement failure and safe operation of the  
7 equipment; audit HTHA prevention and process  
8 condition monitoring techniques used at all  
9 Washington petroleum refineries. Verify that  
10 all effective equipment in use meets the  
11 requirements contained in recommendation R10.

12 B: For non-routine work, a written  
13 hazard evaluation is performed by a multi-  
14 disciplinary team and where feasible conducted  
15 during the job planning process prior to the  
16 day of the job execution.

17 Verify that each facility has an  
18 effective written decision-making protocol  
19 used to determine when it is necessary to shut  
20 down a process or safely perform work or  
21 conduct repairs. Ensure the program reflects  
22 the guidance in the CCPS risk-based process

1 safety book related to hazardous non-routine  
2 work.

3 C: Effective programs are in place  
4 to control the number of essential personnel  
5 present during all hazardous non-routine work.

6 Recommendation 9 to L&I:  
7 Effectively participate in the Tesoro  
8 Anacortes Refinery Process Safety Culture  
9 Survey Oversight Committee as recommended in  
10 recommendation 15.

11 Incorporate the expertise of  
12 process safety culture experts in the  
13 development and interpretation of the safety  
14 culture survey results. Ensure the effective  
15 participation of the workforce and their  
16 representatives in the development of the  
17 surveys and in the implementation of  
18 corrective actions.

19 Next set of recommendations is to  
20 the American Petroleum Institute.

21 Recommendation Number 10: Revise American  
22 Petroleum Institute recommended practice 941,

1 entitled, "Steels for hydrogen service at  
2 elevated temperatures and pressures, petroleum  
3 refineries and chemical plants."

4 Two: Clearly establish the  
5 minimum necessary shall requirements to  
6 prevent HTHA equipment failures using a format  
7 such as that used in the (inaudible) AIHA Z10  
8 2012 standard, entitled, "Occupational Safety  
9 and Health Management Systems."

10 Require the use of inherently  
11 safer materials to the greatest extent  
12 feasible. Require verification of actual  
13 operating conditions to confirm that material  
14 of construction selection prevents HTHA  
15 equipment failure and prohibit the use of  
16 carbon steel and processes that operate above  
17 400 degrees Fahrenheit and greater than 50  
18 PSIA hydrogen partial pressure.

19 Recommendation 11 to the API:  
20 Revise American Petroleum Institute  
21 recommended practice 581, entitled, "Risk-  
22 based Inspection Technology," to clearly

1 establish the minimum necessary shall  
2 requirements to prevent HTHA equipment  
3 failures using a format such as that used in  
4 ANCI HIHA Z10 2012, Occupational Health and  
5 Safety Management Systems.

6 Prohibit the use of carbon steel  
7 in processes that operate above 400 degrees  
8 Fahrenheit and greater than 50 PSIA hydrogen  
9 partial pressure, and require verification of  
10 actual operating conditions to determine  
11 potential equipment damage mechanisms.

12 The next set of recommendations is  
13 to Tesoro Refining and Marketing Company,  
14 Recommendations 12 and 13: Participate with  
15 API in the recommended practice 941 revisions  
16 to establish minimum requirements to prevent  
17 HTHA failures and to require the use of  
18 inherently safer design.

19 Following the API RP941 revisions,  
20 develop and implement a plan to meet the new  
21 RP941 requirements. Improve process safety  
22 management programs for damage mechanisms

1 hazards to require the hierarchy of controls  
2 and the use of inherently safer design.

3 Recommendation 14 to Tesoro  
4 Corporate: Revise and improve current Tesoro  
5 programs to identify and control damage  
6 mechanisms hazards.

7 The next recommendation is to the  
8 Tesoro Anacortes Refinery, Recommendation 15:  
9 Implement a Process Safety Culture Continuous  
10 Improvement Program at the Tesoro Anacortes  
11 Refinery, including a written procedure for  
12 periodic process safety culture surveys across  
13 the workforce.

14 The Process Safety Culture Program  
15 shall be overseen by a tri-part committee of  
16 Tesoro management, United Steelworkers  
17 representatives, Washington State Department  
18 of Labor and Industries Division of  
19 Occupational Safety and Health, and the US  
20 Environmental Protection Agency.

21 The process safety culture program  
22 shall include a focus on items that measure at

1 a minimum: Willingness to report incidents,  
2 normalization of hazardous conditions, burden  
3 of proof of safety and plant process safety  
4 programs and practices and management  
5 involvement and commitment to process safety.

6 The periodic Process Safety  
7 Culture Report shall be made available to the  
8 workforce. The minimum frequency of Process  
9 Safety Culture surveys shall be at least once  
10 every three years.

11 Finally to the United Steelworkers  
12 Local 12-591, Recommendation 16: Effectively  
13 participate in the Process Safety Oversight  
14 Committee to continually improve any  
15 identified process safety culture issues at  
16 the Tesoro Anacortes Refinery.

17 That concludes the staff  
18 presentation. The Board will now give  
19 comments and questions on the draft report.  
20 Chairman Moure-Eraso, thank you.

21 CHAIR MOURE-ERASO: Thank you, Don  
22 and the Tesoro Investigative Team. As is

1 custom in this type of meeting, the Board will  
2 have the opportunity to have some discussions  
3 and questions to the staff that prepared the  
4 report.

5 I would like to get started with  
6 one question that I make to anybody on the  
7 team. We have in this report extensive  
8 recommendations for the State of Washington.  
9 My question is has the staff had any contact  
10 with the State of Washington to gauge their  
11 willingness to act on these recommendations,  
12 and what kind of context or predictions do you  
13 make on the possibilities of action on this?

14 INVESTIGATOR TILLEMA: We have had  
15 some very preliminary discussions, but I think  
16 they were intrigued by the idea of making  
17 improvements to the process safety system and  
18 were willing to work with us going forward.

19 CHAIR MOURE-ERASO: Thank you. I  
20 would like to ask Board Member Rosenberg if  
21 she has questions. No? Board Member Griffon,  
22 do you have questions?

1                   MEMBER GRIFFON: Really just one.  
2                   I'm very interested in the section on  
3                   organizational failures in the safety culture  
4                   parts. I wondered -- I know we're not going  
5                   through the whole report and findings, but can  
6                   you highlight or give an overview of some of  
7                   the findings supporting Recommendations 15 and  
8                   16, the Process Safety Culture Continuous  
9                   Improvement Program? Because I think I'd be  
10                  interested in hearing those on the record.  
11                  Just an overview of it.

12                  INVESTIGATOR TILLEMA: I will in  
13                  just a minute. So, at the bottom of  
14                  Recommendation 15, we talk about the  
15                  willingness to report incidents. Part of that  
16                  stems from the top investigation of the  
17                  multiple leaks and fires, and there was some  
18                  complacency related to those identified in  
19                  that investigation.

20                  The normalization of hazardous  
21                  conditions is again related to the leaks and  
22                  fires that were taking place in the start ups

1 of these exchangers.

2 The burden of proof of safety  
3 relates -- really, this is a bigger issue that  
4 goes back to the damage mechanism hazard  
5 reviews that were being conducted as far back  
6 as when Shell owned the refinery.

7 The damage mechanism hazard  
8 reviews were using the design conditions of  
9 the heat exchangers to make a determination of  
10 whether or not each THA was a susceptible  
11 damage mechanisms for the heat exchangers.

12 Based on the design conditions,  
13 the analysis was consistently that these  
14 exchangers were not susceptible to HTHA.

15 So, when we talk about burden of  
16 proof of safety, what we're talking about  
17 there is that the culture of those analyses  
18 being done by experts that Tesoro hired; the  
19 culture of those evaluations was such that the  
20 assumption would be that you had to prove  
21 there was a hazard, rather than prove to me  
22 that these design conditions are truly

1 applicable, and that I don't need additional  
2 instrumentation, or that we don't need to look  
3 at upgraded materials of construction,  
4 especially when you consider the frequency of  
5 the following.

6           The management involvement and  
7 commitment to process safety is more of just  
8 a high level necessary feature of a process  
9 safety program to ensure that the program will  
10 be effective.

11           So, that stems more from what is  
12 necessary of a process safety culture program  
13 to make it an effective system, rather than  
14 stemming from actual incident causes.

15           MEMBER GRIFFON: Thank you. The  
16 only other thing I wanted to say is I wanted  
17 to just sort of add on to the Chairman's  
18 question. I think we have quite extensive  
19 recommendations to the state and several parts  
20 and subparts, and I think it is going to be  
21 critical going forward that we work pretty  
22 closely with them on the intent of -- of

1 strengthening the current process safety  
2 management system.

3 I'm sure we will do that. So,  
4 thank you.

5 INVESTIGATOR TILLEMA: I would say  
6 we agree with that, and it is our intent to  
7 meet with them.

8 CHAIR MOURE-ERASO: Are there any  
9 more questions from the Board to the staff?  
10 Okay, so, we are going to move to the next  
11 item of the agenda. This is the Board vote.  
12 I make a motion. I move that the Chemical  
13 Safety Board approve Investigation Report  
14 21008IWA, Catastrophic rupture of a heat  
15 exchanger at the Tesoro Anacortes Refinery  
16 that occurred in April 2, 2010, with all  
17 findings and recommendations as contained in  
18 the May 1st, 2014 final report. Do I hear a  
19 second?

20 MEMBER ROSENBERG: Second.

21 CHAIR MOURE-ERASO: This has been  
22 moved and seconded for the approval of the

1 report. Is there any discussion? Anybody  
2 from the Board want to make any comments?

3 I have a comment to make that is  
4 related to the report. I feel that -- I feel  
5 very encouraged by the suggestions and the  
6 remarks of Board Member Griffon on the -- the  
7 desirability to study the safety case in the  
8 US experience.

9 I intend to engage the agency to  
10 work on the suggestion. I still feel that the  
11 sector that will be benefitting the most from  
12 this type of study of the safety case is the  
13 refinery sector. So, that's the comment that  
14 I offer in relation to the report. Any other  
15 comments?

16 MEMBER GRIFFON: Yes. Just to  
17 follow up on that, and I do support further  
18 study of the safety culture idea. I mean the  
19 safety case idea. As many people know, this  
20 was a recommendation in a Drefit(Phonetic)  
21 Chevron report as well. I think it is clear  
22 to me the further study of this is needed to

1 look at the effectiveness of it, as well as  
2 hurdles to implementation in the United  
3 States.

4 I'm glad and encouraged that we're  
5 separating it out and moving ahead with this  
6 report. So, I look forward to working with  
7 the staff going forward on that issue.

8 Thanks.

9 CHAIR MOURE-ERASO: Thank you,  
10 Mark Griffon. Then I will call the question,  
11 and I pass the microphone to the General  
12 Counsel of the Agency.

13 MR. LOEB: The question is on the  
14 table. I will call the roll. Dr. Rosenberg?

15 MEMBER ROSENBERG: Yes.

16 MR. LOEB: Mr. Griffon?

17 MEMBER GRIFFON: Yes.

18 MR. LOEB: And the Chairman?

19 CHAIR MOURE-ERASO: Yes.

20 MR. LOEB: The motion is approved.

21 MEMBER ROSENBERG: I don't think  
22 my mic was on, but yes.

1                   MR. LOEB: It was approved  
2                   regardless.

3                   CHAIR MOURE-ERASO: Thank you very  
4                   much for the vote, and I am -- I would like to  
5                   make a comment. I'm very glad that this is a  
6                   unanimous decision from the Board, and that we  
7                   are going to proceed.

8                   This is only the beginning of the  
9                   process. We make recommendations, and now we  
10                  have to try to get actions of these  
11                  recommendations. That is a long -- it's a  
12                  very difficult road to hoe, as you can  
13                  imagine. But this is just the beginning of  
14                  the process, not the end of it.

15                  I would like to state that this  
16                  concludes the business portion of the meeting.  
17                  Of the people that are here, if any of you has  
18                  any additional remarks on top of the ones that  
19                  we heard on January 31st, I request that you  
20                  give your remarks and limit them to three  
21                  minutes.

22                  We would like to finish the

1 meeting in 30 minutes. If you have further  
2 questions or comments on any matter that  
3 refers to the report, we encourage you to  
4 approach us here and discuss it either with  
5 the staff and/or with the board on additional  
6 questions.

7 Now, do I see anybody that would  
8 like to make a statement or to talk on the  
9 report?

10 MR. GARY: My name is Steve Gary.  
11 I'm President of the United Steelworkers Local  
12 12-591. The report was not available to me  
13 until earlier today. I haven't really had  
14 time to evaluate it.

15 So, others may have comments to  
16 specifics in the report, but I just wanted to  
17 share a little bit about what this process  
18 felt like.

19 It is a bittersweet moment for us.  
20 I'm very happy for a final report, but I  
21 remain extremely frustrated it has taken so  
22 long. I want to just give you a sense of who

1 we are, and why we feel this way.

2 When I say we, it's more than just  
3 union members and coworkers, or neighbors.  
4 We're family here. We had two fathers working  
5 in the refinery at the time of the tragedy.  
6 One responded to the tragedy.

7 Each father had a son involved in  
8 the tragedy, and both fathers had jobs to do  
9 without knowing whether or not their son  
10 survived.

11 We are the ones who lost our  
12 lives. We are the ones who shut down those  
13 units and put out those fires. We're the ones  
14 who located the bodies. We are the ones who  
15 helped and comforted those who are still alive  
16 but could not really be saved. Nothing could  
17 be done.

18 We're the ones who wept with the  
19 family members and tried to find words when no  
20 words were possible or meaningful. Finally,  
21 we're the ones who became determined to learn  
22 and to do all that was necessary to ensure

1 that no more tragedies occurred in an industry  
2 characterized by too many injuries, too many  
3 fatalities. As one video says, "An industry  
4 out of control."

5 We knew we couldn't do this on our  
6 own. We knew we needed help. People with  
7 white hats, so to speak, coming to help us.

8 CSB had a good reputation in 2010.  
9 They looked like such an organization. CSB  
10 assured us that they could produce a full  
11 report in a timely manner. They assured us  
12 that open communications with us would be  
13 maintained.

14 We feel CSB should consider the  
15 good reputation they had in 2010 with  
16 stakeholders like ourselves and compare that  
17 with what it is now; that many of those  
18 assurances have not been met.

19 We hope you can more effectively  
20 manage yourselves to avoid creating a legacy  
21 of internal strife, division and broken  
22 promises that we have experienced. Because

1 the white hats that we thought you were four  
2 years ago have sometimes seemed more like the  
3 white hats our senior managers wear, managers  
4 who often say the right things, while too  
5 often failing to do the right things. The  
6 kind of right things that could've prevented  
7 this tragedy.

8 We are prepared to move forward.  
9 We are still determined. We will work with  
10 others, equally determined to reduce risk in  
11 this industry that has not shown an ability to  
12 do this on their own.

13 We will use this report and others  
14 that may follow to do all we can to reduce  
15 risk. When we reduce risk, we protect our  
16 own. We remain determined and committed to  
17 that goal. Thank you very much.

18 CHAIR MOURE-ERASO: Thank you very  
19 much. For the record, if you can, please  
20 identify yourself.

21 MR. NIBARGER: My name is Kim  
22 Nibarger. I work for the United Steelworkers

1 Health Safety and Environment Department, and  
2 this is also my home local.

3 The USW, which represents a  
4 majority of workers at the Tesoro Anacortes  
5 Refinery is concerned about the breakdown of  
6 the CSB management system that caused the  
7 report on the failure of the exchanger on the  
8 CRE to take four years to produce.

9 We are also disturbed that we were  
10 not able to get a revised copy to us to review  
11 before this morning so we could offer some  
12 constructive comments on the final report  
13 being presented here for approval by the  
14 Board.

15 We question the value that a  
16 report four years old brings. The company has  
17 long since rebuilt the damaged equipment,  
18 using a material that is less susceptible to  
19 high temperature hydrogen attack, HTHA.

20 We feel that the report has not  
21 given adequate emphasis to a number of  
22 contributing factors that deserve more

1 attention than what they reserve, considering  
2 the claim that this report was four years in  
3 the making.

4           The fouling of the tubes that led  
5 to the six-month exchanger cleanings was a  
6 huge contributor to the wear and tear suffered  
7 by the exchangers in the process. Had this  
8 issue been identified and corrected, the  
9 exchangers may have operated three to five  
10 years between necessary cleanings.

11           This would've eliminated numerous  
12 heat up and cool down cycles. The company has  
13 made operational changes to reduce the fouling  
14 of the tubes and to prolong operational life  
15 between the cleanings.

16           The poor flow control systems, the  
17 manual valves as opposed to automatic  
18 controlled valves, contributed to the  
19 fluctuation of temperatures on start up. Had  
20 the controls been automated sooner, operators  
21 would've been better able to maintain a  
22 temperature on the exchangers. Not only

1 during startup, but also during operation.

2 This would've enabled control of  
3 temperatures inside of the nelson curve, and  
4 may have slowed the high temperature hydrogen  
5 attack. Short time durations for a large  
6 number of temperature cycles can increase the  
7 susceptibility to HTHA.

8 The increase of hydrogen to the  
9 unit and additional points of feed may have  
10 likely contributed to the demise of the  
11 exchangers.

12 A robust management change  
13 conducted on any of these issues would've also  
14 identified potential areas of additional  
15 review that may have allowed deviations to be  
16 identified and rectified, which would've  
17 prevented this disaster.

18 The fact that the exchanger was  
19 not post-weld heat treated was quite likely  
20 the weak point in the construction that  
21 allowed the failure. The identified damage  
22 mechanism in the sister exchanger was

1 recognized in the heat affected zone and the  
2 failed exchanger separated along those same  
3 weld seams.

4 The CSB report notes eight  
5 identified failures of vessels below the  
6 nelson curve. But they failed to mention that  
7 these failures were all carbon steel vessels  
8 that were not both weld heat treated.

9 All of these factors contributed  
10 to the failure of the exchanger, yet were  
11 sacrificed in the report in favor of HTHA.  
12 While the dominant mechanism of failure may  
13 have been HTHA, it does not manifest itself  
14 without these influencing factors.

15 The USW strongly supports the use  
16 of inherently safer technology, but does not  
17 want employers who read this report to  
18 downplay the importance of maintenance and  
19 inspection in these aging facilities.

20 We agree that maintenance and  
21 inspection is lower on the hierarchy of  
22 controls, but that does not mean it is not

1 important. There's no other way to determine  
2 if equipment is susceptible to failure without  
3 inspection.

4 IST is inherently safer. Not fail  
5 safe. Any time a replacement of equipment is  
6 determined from proper inspection protocols,  
7 IST should be a determining factor in the  
8 replacement.

9 Any new construction should also  
10 use IST as a criterion for determining  
11 equipment construction as well as process  
12 parameters, including temperatures, pressures  
13 and volumes of hazardous properties of  
14 ingredients.

15 So, recommendations: Use of as  
16 low as reasonably practicable, or ALARP, or  
17 greatest extent feasible, are objectives we  
18 should work to achieve. But it can't be put  
19 into place without defining ground rules as to  
20 how it is determined.

21 There needs to be some definition  
22 to what these terms encompass. We appreciate

1 the change in recommendation R5 to strengthen  
2 the current PSM standard. This should be the  
3 first objective: improve and strengthen what  
4 we have in place.

5 We do support what elements of the  
6 safety case may be beneficial, and work toward  
7 incorporating them into the PSM standard. The  
8 USW has proposals on improvements to PSM, as  
9 well as suggested elements to the safety case  
10 that may be advantageous to add to the PSM  
11 standard.

12 The fact that you have replaced  
13 the word safety case throughout the report  
14 with more rigorous goal-setting attributes or  
15 similar language is not lost on this. The USW  
16 supports leading and lagging indicator  
17 collection and analysis as well as  
18 dissemination not only to workers, but to the  
19 community as well.

20 The USW has done extensive work on  
21 indicators, and that is the number of  
22 suggested indications that should be tracked.

1 The USW would support a third party assessment  
2 under guidelines we have developed, not only  
3 for adequacy of the company's PSM elements,  
4 but also safety assessments by the employees.

5 The USW has contributed to the  
6 governor's task force recommendations in  
7 California and our Anacortes local has had  
8 numerous meetings with L&I on how to make  
9 these facilities safer.

10 Do not forget that no matter how  
11 many technical issues are identified, only if  
12 they are corrected will there be any reduction  
13 to injury and death to the workers. That is  
14 our ultimate goal: to ensure that all workers  
15 go home at the end of the day in the same  
16 conditions they arrived.

17 No matter how stringent the  
18 regulations are, ultimately unless the  
19 employer executes their own written plan, this  
20 type of tragedy will continue to happen in the  
21 petrochemical industry in this country.

22 As was stated in the OSHA report

1 on an accident that took place almost a  
2 quarter of a century ago, the most critical  
3 responsibilities for chemical process safety  
4 rests not with government agencies, but with  
5 industry, and specifically with each  
6 petrochemical producer at each location and  
7 workplace.

8 Through regulation, enforcement  
9 and technical assistance, training and other  
10 means, OSHA acts to ensure that employers  
11 fulfill their responsibility with regard to  
12 chemical process safety for employees as well  
13 as other types of worker hazards.

14 OSHA's role, however, is not that  
15 of a supervisory body for the industry or for  
16 individual plants; as specified in the OSHA  
17 act, responsible for the safe operation of any  
18 work place always remains with the employer.  
19 That fact has not changed.

20 We had hoped you would've  
21 considered our written comments, as well as  
22 several other contributors, who mirrored many

1 of our points and made the changes suggested  
2 to reflect the failed management systems that  
3 caused or allowed this tragedy to take place.

4 We hope you will consider this for  
5 your future written reports and  
6 recommendations. Thank you.

7 CHAIR MOURE-ERASO: Thank you. I  
8 would like to request we limit the comments to  
9 three minutes so that everybody has the same  
10 time.

11 MR. CLEAVE: Good evening. My  
12 name is Walter Cleave. I'm a proud member of  
13 Steelworkers Local 12591. I stand here  
14 tonight on my own behalf.

15 I appreciate the opportunity to  
16 address you in particular, Dr. Moure-Eraso,  
17 once again in a public setting. I realize the  
18 final report became available this morning,  
19 and I have had a few minutes to review it.

20 Without rehashing the history of  
21 our interactions, this late timing I think is  
22 yet another in a string of disrespectful

1 gestures on the part of CSB management.

2 I can't -- I can accept the report  
3 as it is presented, but there is a degree of  
4 disrespect in it too. The report does not  
5 represent four years of work. Most of the  
6 information and analysis in the report was  
7 available within a year or so of the tragedy.

8 Nevertheless, here we are four-  
9 plus years later, debating a report that is  
10 still incomplete. When I say incomplete, I  
11 want to be absolutely clear. The incomplete  
12 report is not the fault of the investigators.  
13 It is purely, simply a failure of CSB  
14 management.

15 Incomplete I think is a fair  
16 assessment since a number of major issues are  
17 only briefly mentioned or not dealt with in a  
18 meaningful way.

19 For example, high temperature  
20 hydrogen attack is the focus of the report,  
21 and all other possible contributing damage  
22 mechanisms have been virtually ignored.

1                   Any mechanism responsible for  
2                   causing damage to those exchangers should've  
3                   been explored in depth. Also, the training  
4                   aspect of this tragedy continues to be  
5                   overlooked.

6                   Had only personnel been trained on  
7                   the specific hazards of the unit, been allowed  
8                   to operate the equipment, operators from other  
9                   teams would've likely been needed. They  
10                  would've been likely on overtime.

11                  And so, seven additional operators  
12                  would not have been onsite at the time.  
13                  Additionally, the importance of thorough  
14                  mechanical integrity program including  
15                  effective equipment inspections seems to be  
16                  minimized by the report.

17                  It seems that almost any  
18                  inspection technique applied, sophisticated or  
19                  not, would've found a crack 3/10th of an inch  
20                  deep and 48 inches long.

21                  Finally, the process safety  
22                  culture plays an important part in several

1 aspects of these deaths, yet the cultural  
2 (inaudible) recommendations are few.

3 In contrast to the omissions, the  
4 report goes to great depth to present a safety  
5 case, now referred to as a robust, goal-based  
6 regulatory approach as a remedy for each and  
7 every identified cause.

8 Certainly, there are positive  
9 aspects, positive elements of the safety case  
10 regime that could be used to improve existing  
11 process safety management language.

12 But the safety case is clear:  
13 superiority over existing PSM language is not  
14 supported by the report. No statistical  
15 evidence of clear superiority is offered, and  
16 according to public comments from individuals  
17 with regulatory and process safety experience,  
18 this hard evidence of safety case superiority  
19 does not exist.

20 This report seems to be somebody's  
21 private agenda.

22 All that said, there are positive

1 aspects to the report, and they are much  
2 appreciated. I look forward to seeing a four  
3 party process safety culture committee in  
4 action, and I look forward to seeing  
5 meaningful improvements made to existing  
6 regulatory language.

7 Maybe now with the release of an  
8 acceptable final report, each of us can get on  
9 with our safety related efforts. Again, thank  
10 you for the opportunity to speak.

11 CHAIR MOURE-ERASO: Thank you very  
12 much. I appreciate your remarks.

13 MR. ANDERSON: My name is Ryan  
14 Anderson. I too am a proud member of Local  
15 12591, United Steelworkers, as well as the  
16 Tesoro Unit Chair, and a member of the Tesoro  
17 Nationwide Council.

18 I just wanted to speak tonight  
19 briefly. First off, thank the investigators  
20 and all the hard work everyone put in on this  
21 investigation. I thank the Board Members for  
22 being here to vote on this and finalize it.

1                   I had prepared remarks, but I too  
2                   didn't have access to the report until this  
3                   morning, nor did I have access to the  
4                   responses by the CSB to the public comments,  
5                   nor did we have information on the format of  
6                   this meeting so that I could properly prepare  
7                   comments.

8                   So, they're going to stay in my  
9                   back pocket. I'm just going to kind of go  
10                  from what I've seen and what I've heard  
11                  tonight. I'll speak briefly to the reference  
12                  to the Tesoro Nationwide Council's comments as  
13                  far as our strong support to inherently safer  
14                  technologies.

15                  Yes, we do support inherently  
16                  safer technologies. However, we all work at  
17                  facilities that were built very long ago. Our  
18                  facility was built in 1955. There's numerous,  
19                  numerous sites built previous to that. Very  
20                  few built after that.

21                  So, the realities that we live in  
22                  is equipment that is 50-60 years old. The

1 reality we live in as an industry is it has  
2 been and still is out of control; that their  
3 MO is to run to failure, not to replace  
4 equipment until it catastrophically fails,  
5 breaks, or is no longer usable.

6           So, while the hierarchy of  
7 controls may be low as a causal factor for  
8 inspection, it is absolutely mandatory and we  
9 feel that it should've been highlighted and  
10 brought forth more as a recommendation to the  
11 industry. Because without inspection, this  
12 old equipment will fail. A crack one-third of  
13 an inch deep and four feet long is  
14 unacceptable. Had somebody crawled inside  
15 that shell, they would've seen it with a  
16 flashlight.

17           Secondly, the tube fouling.  
18 Again, tracking the tube fouling, while it may  
19 be low on the hierarchy of controls as a  
20 causal factor, it is old equipment. It is  
21 absolutely imperative that these companies  
22 evaluate what is creating these issues and fix

1       them.

2                       Yes, we can engineer away the  
3       problem. That takes money. Something they  
4       don't like to spend.

5                       So, again, I will state that I am  
6       disappointed in the lack of communication and  
7       forthrightness with this final report. It is  
8       reminiscent of, as my colleague Steve said,  
9       some of the white hats that manage our own  
10      refinery.

11                      They give us as little information  
12      as possible and let us guess what's going on.  
13      Thank you very much and I appreciate your  
14      time.

15                      CHAIR MOURE-ERASO: Thank you.

16                      MR. MILLER: Good evening. My  
17      name is David Miller, and I'm the Standards  
18      Director of the American Petroleum Institute,  
19      API. API appreciates the opportunity to  
20      provide these comments at tonight's meeting.

21                      The oil and natural gas industry  
22      is committed to operating in a safe and

1 responsible manner, while minimizing our  
2 impact on the environment. Protecting the  
3 health and safety of our workers, our  
4 contractors and our neighbors is a moral  
5 imperative and a top priority for the  
6 industry.

7 No incident is acceptable. Our  
8 industry takes every incident seriously and  
9 continued vigilance is essential to helping  
10 prevent future incidents.

11 An integral part of our efforts to  
12 improve refinery safety is our standards  
13 program. The standards program is accredited  
14 by the American National Standards Institute,  
15 or ANSI, which is the authority on standards  
16 here in the United States. The program  
17 undergoes regular audits and the program is  
18 one of API's longest-running programs.

19 The standards are referenced in  
20 federal regulations by six agencies,  
21 approximately 130 API standards are  
22 referenced, and here in the State of

1 Washington there are 180 API standards cited  
2 over 3,300 times in state regulations with 33  
3 here in Washington State cited 130 times.

4 Part of the work that we do of  
5 course is continuous improvement and looking  
6 at revisions to our standards. When we had an  
7 opportunity to review the draft report, we  
8 undertook an exhaustive review of it, and we  
9 met with the CSB's Denver Investigation Staff  
10 to better understand the use of modeling  
11 techniques and the subsequent analysis.

12 After that meeting, we provided  
13 written comments to the CSB draft report. Our  
14 comments addressed three primary areas being  
15 API standards and their initial  
16 characterization in the draft report, aspects  
17 of the CSB modeling, and some of the draft  
18 recommendations.

19 Regarding the API standards, we  
20 appreciate the CSB response in the comment  
21 registry that API standards provide very  
22 valuable information to the industry.

1                   We are already working on, and I  
2                   provided these comments in my written report,  
3                   and also in the comments we made in January,  
4                   work on the next edition of RP941. That draft  
5                   document should be available for public review  
6                   very shortly.

7                   Regarding the use and the adequacy  
8                   of the modeling used to prepare the draft  
9                   report, again we've provided substantive  
10                  information and engineering analysis,  
11                  including our concerns that the model's high  
12                  sensitivity to baseline assumptions and inputs  
13                  especially when coupled with the relatively  
14                  small sample size led to conservative  
15                  recommendations.

16                  Based on our review, I would like  
17                  to highlight our comments regarding the draft  
18                  recommendations prohibit the use of carbon  
19                  steel above 400 degrees F. We believe that  
20                  this recommendation, along with the comment  
21                  that the carbons nelson curve is inaccurate  
22                  and cannot be relied upon is based again, as

1 I said, on this erroneous modeling it is not  
2 supported by the operational experience in  
3 proven engineering practices.

4 One other quick note. As I said,  
5 we did meet with the staff in advance of  
6 preparing the comments. We did have the  
7 discussion about the possibility of a follow  
8 on meeting in keeping with some of the other  
9 comments about how tight the time schedule  
10 was, the offer for the time to meet was  
11 roughly two days or so before the comments  
12 were actually due.

13 In closing, I'd like to say that  
14 the effectiveness of any safety program is  
15 only as good as the commitment made to its  
16 preparation, implementation and execution, and  
17 has been stated the site operator is  
18 ultimately responsible to ensure safe  
19 operations.

20 In closing, every incident is both  
21 one too many and a powerful incident for API  
22 and the industry to improve training,

1 operating procedures, technology and our  
2 industry standards.

3 Our thoughts remain with the  
4 families of those who lost their lives in this  
5 tragic accident. However, we also stand ready  
6 to work with the CSB and all interested  
7 stakeholders to improve refinery safety.

8 Again, thank you for the  
9 opportunity to present.

10 CHAIR MOURE-ERASO: Thank you.  
11 Are there any other comments? Okay, I would  
12 like to say in closing that I feel like, again  
13 as I said in my opening remarks, I believe  
14 that this report is the finest hour of the  
15 Chemical Safety Board.

16 I believe it is an excellent  
17 report, and I am very proud of the work of  
18 this staff that took so many years to produce.  
19 So, not having any other comments, I declare  
20 this meeting closed.

21 (Whereupon, the above-entitled  
22 matter went off the record at 1:54 p.m.)

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C E R T I F I C A T E

MATTER: Tesoro Anacortes Release and Fire

DATE: 05-01-14

I hereby certify that the attached transcription of pages 1 to 98 inclusive are to the best of my belief and ability a true, accurate, and complete record of the above referenced proceedings as contained on the provided audio recording.

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**NEAL R. GROSS**

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